AN5116-06B

Optical Line Terminal Equipment

GPON Configuration Guide

Version: C

Code: MN000000520

FiberHome Telecommunication Technologies Co., Ltd.

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Fiberhome Telecommunication Technologies Co., Ltd.

Address: No.5 Dongxin Rd., Hongshan Dist., Wuhan, China
Zip code: 430073
Tel: +86 27 8769 1549
Fax: +86 27 8769 1755
Website: http://www.fiberhomegroup.com

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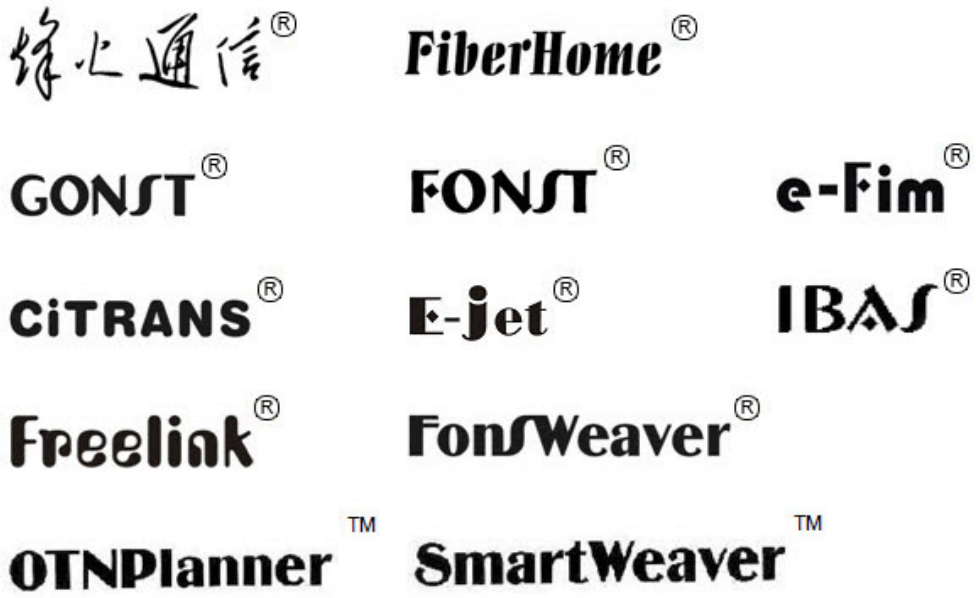

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Preface

Related Documentation

Document	Description
AN5116-06B Optical Line Terminal Equipment Documentation Guide	Introduces the retrieval method, contents, releasing, reading approach, and suggestion feedback method for the complete manual set for the AN5116-06B.
AN5116-06B Optical Line Terminal Equipment Product Description	Introduces the AN5116-06B's network location, functional features, hardware structure, FTTx application model, equipment configuration, network management system and technical specifications. It is the foundation of the complete manual set. Other manuals extend and enrich the concepts introduced in the Product Description.
AN5116-06B Optical Line Terminal Equipment Feature Description	Introduces the key features supported by the AN5116-06B, including GPON / EPON access, GPON / EPON terminal management, VLAN, multicast, voice and safety; and introduces these functions in details in terms of definition, features, specification, principle description, references and so on.
AN5116-06B Optical Line Terminal Equipment EPON Configuration Guide	Introduces the method for configuring the EPON services supported by the AN5116-06B via the ANM2000, such as basic configuration, voice service configuration, data service configuration, multicast service configuration, and software upgrading configuration, to guide users on start-up for various services and software upgrading.
AN5116-06B Optical Line Terminal Equipment GPON Configuration Guide	Introduces the method for configuring the GPON services supported by the AN5116-06B via the ANM2000, such as basic configuration, voice service configuration, data service configuration, multicast service configuration, and software upgrading configuration, to guide users on start-up for various services and software upgrading.
AN5116-06B Optical Line Terminal Equipment Hardware Description	Introduces the appearance, structure, functions, technical specifications, and operating method for the AN5116-06B's cabinet, PDP, subrack, cards, cables and wires, facilitating users' mastery of the hardware features of the equipment.

Document	Description
AN5116-06B Optical Line Terminal Equipment Installation Guide	Introduces the overall installation and acceptance inspection procedures from unpacking inspection to power-on examination after the equipment is delivered on site, and provides reference information (e.g. safety principles and wiring scheme of various interfaces) to guide users to install the equipment.
AN5116-06B Optical Line Terminal Equipment GUI Reference	Introduces the shortcut menu for every card of the AN5116-06B on the ANM2000, including the function, parameter explanation, precautions and configuration example of every command in the shortcut menu of each card, to help users master the operation of the AN5116-06B using the ANM2000.
AN5116-06B Optical Line Terminal Equipment Component Replacement	Introduces the operation procedures for replacing the AN5116-06B's components, including preparations, precautions, early operations, operation process and subsequent operations, so as to guide users with the component replacement on the hardware.
AN5116-06B Optical Line Terminal Equipment Routine Maintenance	Introduces the daily, weekly, monthly, quarterly and annual routine maintenance operations on the AN5116-06B. Users are able to eliminate silent failures in the equipment operation process as early as possible via implementing the routine maintenance.
AN5116-06B Optical Line Terminal Equipment Alarm and Event Reference	Introduces the AN5116-06B's alarm / event information, including alarm/ event names, alarm / event levels, possible causes, effects on the system, and processing procedures, to guide users on effective alarm / event processing.
AN5116-06B Optical Line Terminal Equipment Troubleshooting Guide	Introduces the fault processing principles and methods of fault diagnosis and isolation for the AN5116-06B. Also discusses the typical fault cases of various EPON / GPON services. In case of complex issues, users can contact FiberHome for technical support according to the instructions in this document.

Version

Version	Description
A	Initial version Corresponds to the AN5116-06B with hardware version GPON V2.0. Version information of the ANM2000: ◆ Version No.: V3.0T1 ◆ Build: 05.07.05.04SP1
B	Corresponds to the AN5116-06B with hardware version GPON V2.1. Version information of the ANM2000: ◆ Version No.: V3.0T1 ◆ Build: 05.07.05.08SP1
C	Corresponds to the AN5116-06B with hardware version GPON V3.1. Version information of the ANM2000: ◆ Version No.: V3.0R2 ◆ Build: 05.07.06.04SP1

This manual mainly introduces the basic configuration and service start-up via the network management system for the AN5116-06B. It aims to acquaint users with technology, functions and application of the equipment, and provide users with technical support.

Intended Readers

This manual is intended for the following readers:

- Commissioning engineers
- Equipment room maintenance engineers

To utilize this manual, these prerequisite skills are necessary:

- Access network technology
- GPON principles
- Ethernet switch technology
- Computer network technology
- Basic operation methods of the ANM2000

Conventions

Terminology Conventions

Terminology	Convention
AN5116-06B	AN5116-06B Optical Line Terminal Equipment
EC4B	4×EPON-C Interface Card (type B)
EC8B	8×EPON-C Interface Card (type B)
GC4B	4×GPON-C Interface Card (type B)
GC8B	8×GPON-C Interface Card (type B)
XG2B	2×10G EPON-C Interface Card (type B)
C155A	4×GE + 1×10GE Optical Interface Uplink Card (CES Mode)
CE1B	32×E1 Optical Interface Card (CES mode) (type B)
PUBA	Public Card (type A)
HSWA	Core Switch Card (EPON) (card No.: 2.115.334)
	Core Switch Card (type A) (card No.: 2.115.331)
HU1A	4×GE + 1×10GE Optical Interface Uplink Card
HU2A	2×GE + +2×10GE Optical Interface Uplink Card
GU6F	6×GE Optical Interface Uplink Card

Symbol Conventions

Symbol	Convention	Description
	Note	Important features or operation guide.
	Caution	Possible injury to persons or systems, or cause traffic interruption or loss.
	Warning	May cause severe bodily injuries.
➔	Jump	Jumps to another step.
→	Cascading menu	Connects multi-level menu options.
↔	Bidirectional service	The service signal is bidirectional.
→	Unidirectional service	The service signal is unidirectional.

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1 Overview

☑ Configuration Flow

☑ Introduction to Terminal Equipment

1.1 Configuration Flow

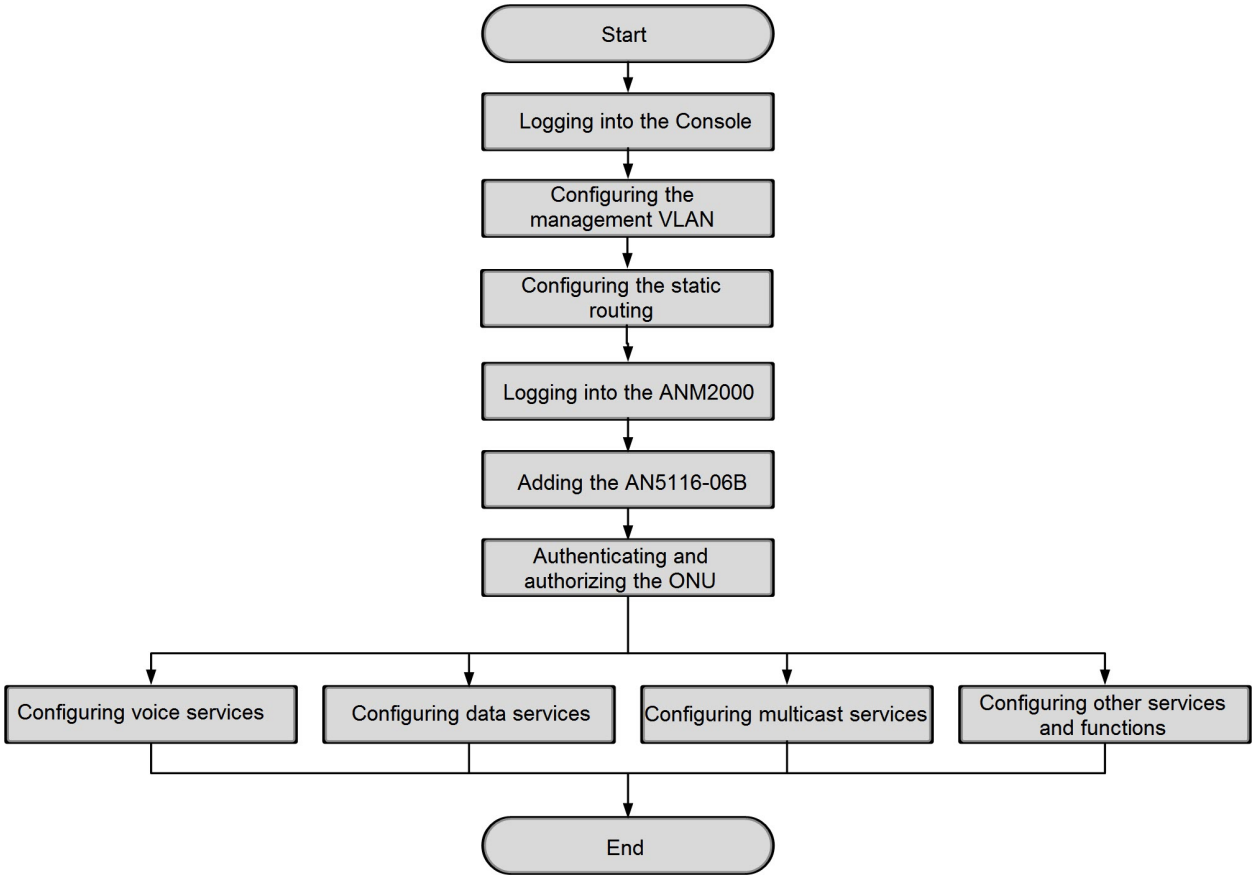


Figure 1-1 General flow for configuring services and functions

1.2 Introduction to Terminal Equipment

The ONU equipment comprises two types: Type 1 and Type 2. See Table 1-1 and Table 1-2 for detailed types and reference to configurations.

Table 1-1 List of ONU type-Type 1

Product Type	Product Sub-type	Description	Product Code on ANM20000	Product Code for Configuration
AN5506-04	AN5506-04-B1	4×FE+2×POTS	AN5506-04-B	AN5506-04-B
AN5506-06	AN5506-06-E	16×FE+4×E1	AN5506-06-E	AN5506-04-B
AN5506-07	AN5506-07-A2H	16×FE	AN5506-07-A2	AN5506-04-B
	AN5506-07-B2H	16×FE+16×POTS, hybrid wiring	AN5506-07-B	AN5506-04-B

Table 1-2 List of ONU type-Type 2

Product Type	Product Sub-type	Product Description	Product Code on ANM20000	Product Code for Configuration
AN5506-01	AN5506-01-A1G	1×GE	AN5506-01-A1	AN5506-10-B1
	AN5506-01-B1	1×FE+1×POTS	AN5506-01-B1	AN5506-10-B1
AN5506-04	AN5506-04-A1	4×FE	AN5506-04-A1	AN5506-10-B1
	AN5506-04-A1G	4×GE	AN5506-04-A1	AN5506-10-B1
	AN5506-04-A1GN	4×GE, NAT supported, WEB configuration supported	AN5506-04-A1	AN5506-10-B1
	AN5506-04-A3	4×FE	AN5506-04-A1	AN5506-10-B1
	AN5506-04-A3N	4×FE, NAT supported, WEB configuration supported	AN5506-04-A1	AN5506-10-B1
	AN5506-04-AW	4×FE	AN5506-04-A1	AN5506-10-B1
	AN5506-04-B2	4×FE+2×POTS	AN5506-04-B2	AN5506-10-B1
	AN5506-04-B2G	4×GE+2×POTS	AN5506-04-B2	AN5506-10-B1
	AN5506-04-B2GN	4×GE+2×POTS, NAT supported, WEB configuration supported	AN5506-04-B2	AN5506-10-B1
	AN5506-04-B3	4×FE+2×POTS	AN5506-04-B2	AN5506-10-B1
	AN5506-04-B3N	4×FE+2×POTS, NAT supported, WEB configuration supported	AN5506-04-B2	AN5506-10-B1
	AN5506-04-B4	4×FE+2×POTS	AN5506-04-B2	AN5506-10-B1
	AN5506-04-C1	4×FE+2×POTS +1×CATV	AN5506-04-C1	AN5506-10-B1
	AN5506-04-C1N	4×FE+2×POTS +1×CATV, NAT supported	AN5506-04-C1	AN5506-10-B1
	AN5506-04-F1	4×FE+2×POTS+Wi-Fi	AN5506-04-F1	AN5506-10-B1
	AN5506-04-G1	4×FE+2×POTS+Wi-Fi +1×CATV	AN5506-04-G1	AN5506-10-B1
	AN5506-04-P1	4×FE+2×RS485/RS232	AN5506-04-P1	AN5506-10-B1
AN5506-07	AN5506-07-A1H	16×FE	AN5506-07-A1	AN5506-10-B1
	AN5506-07-B1H	16×FE+16×POTS, hybrid wiring	AN5506-07-B1	AN5506-10-B1

Table 1-2 List of ONU type-Type 2 (Continued)

Product Type	Product Sub-type	Product Description	Product Code on ANM20000	Product Code for Configuration
	AN5506-07-B1HD	16×FE+16×POTS, dedicated voice port	AN5506-07-B1	AN5506-10-B1
	AN5506-07-A1K	16×FE+POE	AN5506-07-A1K	AN5506-10-B1
AN5506-09	AN5506-09-A1H	8×FE	AN5506-09-A1	AN5506-10-B1
	AN5506-09-A1K	8×FE+POE	AN5506-09-A1K	AN5506-10-B1
	AN5506-09-B1H	8×FE+8×POTS, hybrid wiring	AN5506-09-B1	AN5506-10-B1
	AN5506-09-B1HD	8×FE+8×POTS, dedicated voice port	AN5506-09-B1	AN5506-10-B1
AN5506-10	AN5506-10-A1H	24×FE	AN5506-10-A1	AN5506-10-B1
	AN5506-10-B1H	24×FE+24×POTS, hybrid wiring	AN5506-10-B1	AN5506-10-B1
	AN5506-10-B1HD	24×FE+24×POTS, dedicated voice port	AN5506-10-B1	AN5506-10-B1
	AN5506-10-B1HDX	24×FE+24×POTS, dedicated voice port, dual PON ports	AN5506-10-B1	AN5506-10-B1
	AN5506-10-A1K	24×FE+POE	AN5506-10-A1K	AN5506-10-B1
AN5006–20	AN5006-20	Small-sized integrated PON MDU device	AN5006-20	AN5006-20
HG260		4×FE+2×POTS+Wi-Fi	HG260	HG260
HG266		4×FE+2×POTS	HG266	HG266

2 Configuring the ANM2000 Management Path

- ☑ Logging into the Console
- ☑ Configuring the ANM2000 Management Path
- ☑ Logging into the ANM2000

2.1 Logging into the Console

2.1.1 First-time Login to the Console

Prerequisites

- The connections with the network management computer are completed.
- The network management computer is turned on normally.
- The equipment is powered on normally.
- The username and password of the AN5116-06B's CLI network management system are available.

Operation procedures

Note:

The Windows XP operating system is used as an example here.

Caution:

To enhance the security of the system, users should memorize their passwords and keep them secret. Regularly changing passwords is strongly recommended.

1. Click the **Start** menu at the desktop, and select **All Programs→Accessories →Telecom→HyperTerminal** to bring up the **Connection Description** dialog box.
2. In the **Connection Description** dialog box, perform the following configurations:
   - **Name**: Fill in the name of a connection object, such as **FiberHome CLI Control Terminal**.
   - **Icon**: Select an icon for this connection.

   Click **OK**, and the Connect To dialog box appears.

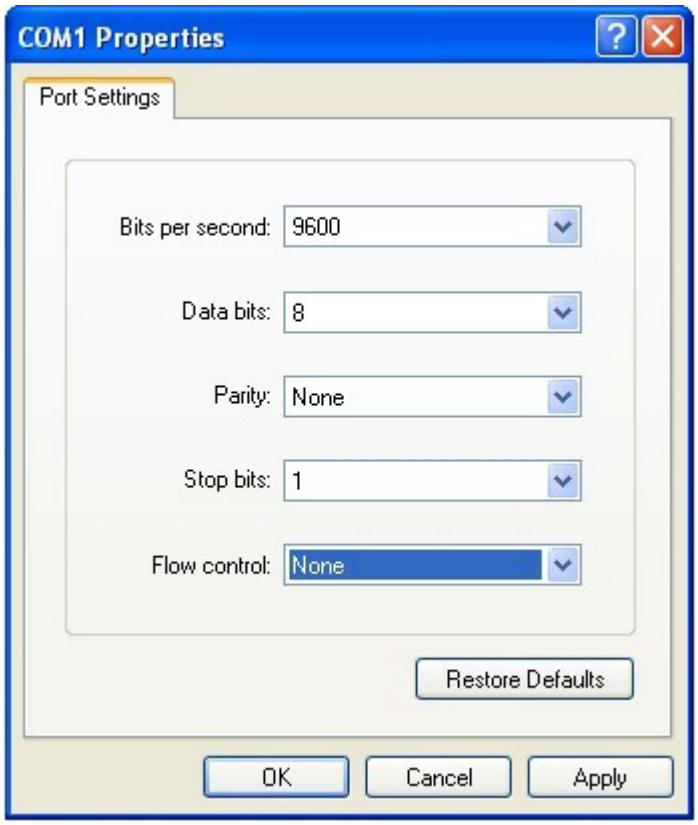
3. In the **Connect To** dialog box, select the **COM1**port. The **COM1** port is on the PC end connected to the serial port line; the other end of the serial port line is connected to the **CONSOLE** port on the core switch card.

Click **OK**, and the COM1 Properties dialog box appears.

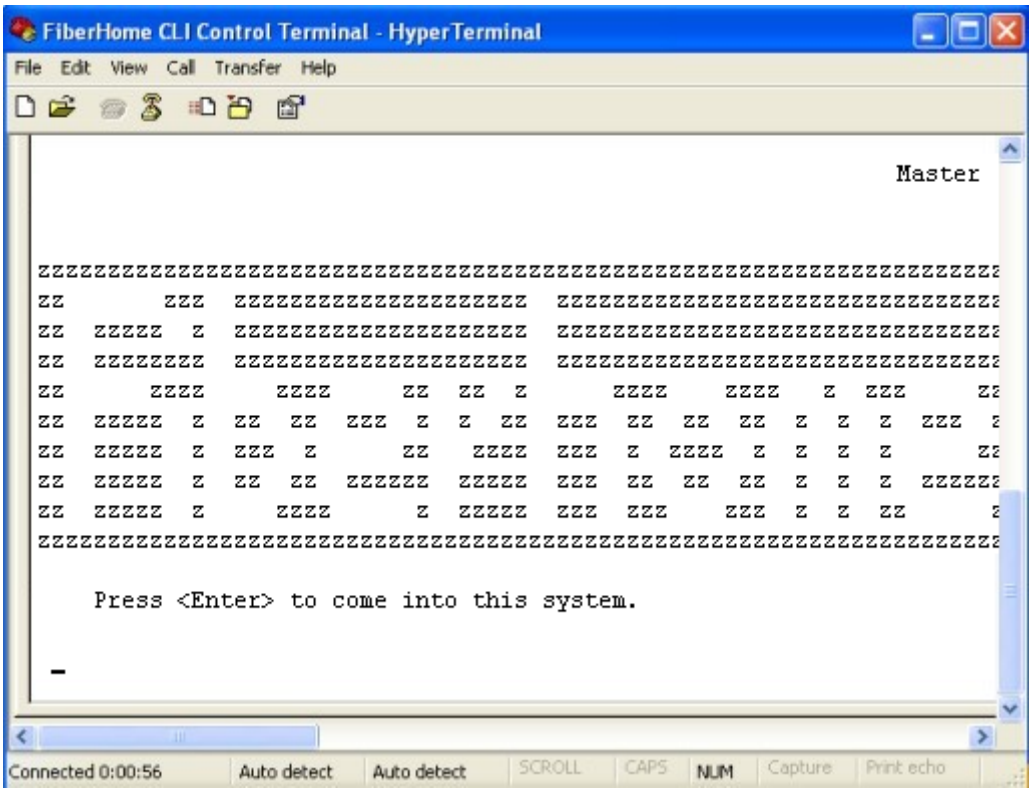
4. In the **COM1 Properties** dialog box, you can click the Restore Defaults button directly. The default configurations are as below:

   - **Bits per second**: 9600

- **Data bits**: 8
- **Parity**: None
- **Stop bits**: 1
- **Flow control**: None



Click **OK**, and the Console can be started up.



5. Press the **Enter** key, and input the username and the password to log into the CLI network management system. The commands are as follows:

`Login:`**GEPON**

// The default user is common user, and the user name is GEPON.

`Password:`*****

// The initial password is GEPON.

`User>`**enable**

// Under the common user mode, use the enable command to enter the administrator mode.

`Password:`*****

// The initial password of administrator account is GEPON.

`Admin#`

// After the prompt Admin# appears, you can input command lines to perform network management operations on the AN5116-06B.

Note:

- If the command prompt is **User>**, the system is in common user mode; if the command prompt is **Admin#**, the system is in administrator mode.
- The username is case sensitive, while the password should be capitalized.

6. Select **File→Save** from the menu bar of the Console window to save the configurations for the Console.

2.1.2 Non-first-time Login to the Console

Prerequisites

- The connections with the network management computer are completed.
- The network management computer is turned on normally.
- The equipment is powered on normally.
- The Console for the AN5116-06B's CLI network management system has been set up (the following takes the **FiberHome CLI Control Terminal** as an example).

Operation procedures

1. Select **Start→Program→Accessories→Telecom→HyperTerminal→ FiberHome CLI Control Terminal** from the desktop to bring up the **Telnet default?** alter box. Click **Yes** to make HyperTerminal the default Telnet program, or click **No** otherwise. After this confirmation, the established Console is started.

Note:

To establish a shortcut for convenience, drag **FiberHome CLI Control Terminal** to the desktop.

2.2 Configuring the ANM2000 Management Path

2.2.1 Configuration Rules

- If the IP address of the ANM2000 client end and the equipment management IP address are not in the same network segment, you should set the static routing to perform routing forwarding.
- Under the tag mode, an uplink port can be configured with multiple management VLANs. However, under the untag mode, an uplink port can be configured with only one management VLAN. To configure several management VLANs under the tag mode, users need to configure the management VLANs on different uplink ports respectively.
- While configuring the static routing, you need to configure the destination network segment IP address, mask and the gateway address of next-hop routing.
- QinQ management of VLANs is supported to provide users with double-layer management paths.

2.2.2 Network Diagram

The AN5116-06B can support several management VLANs and manage the equipment in a complex network environment. See the network diagram of the ANM2000 as shown in Figure 2-1. The ANM2000 client end manages the AN5116-06B through the equipment's uplink ports. The following are two management ways: in-band management and management through gateway. Client end 1 manages the AN5116-06B through LAN, and client end 2 manages it through gateway.

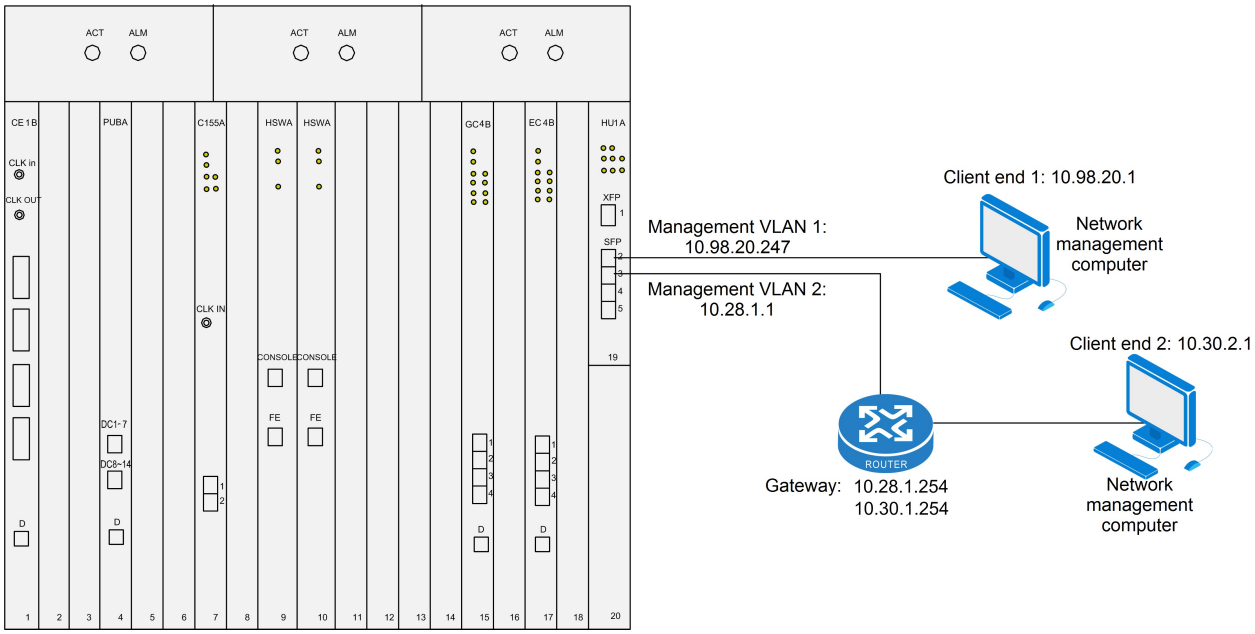


Figure 2-1 The ANM2000 network diagram

2.2.3 Planning Data

In the in-band management mode, VLANs are classified into the management VLANs and service VLANs to separate the network management information from service information. When managing the AN5116-06B in the in-band mode, you need to configure the management VLAN and static routing as shown in Table 2-1.

Table 2-1 Planning data for configuring the ANM2000 management path

Item		Description	Example	
Configuring the management VLAN	Management VLAN name	Configure it according to the network planning of operators	a	b
	Management VLAN ID	Configure it according to the network planning of operators	4000	4001
	In-band network management interface	Slot number and port number of the card including an uplink port	19:2	19:3
	Management VLAN tag	Configure it as untagged	untagged	untagged
	Management IP	Configure it according to the network planning of operators	10.98.20.247	10.28.1.1

Table 2-1 Planning data for configuring the ANM2000 management path (Continued)

Item		Description	Example	
	Bit number of subnet mask	Configure it according to the network planning of operators	16	16
Configuring the static routing	Destination network segment	Configure it according to the network planning of operators	-	10.30.1.254
	Mask	Configure it according to the network planning of operators	-	255.255.0.0
	The next-hop IP address	Configure it according to the network planning of operators	-	10.28.1.254

2.2.4 Configuration Flow

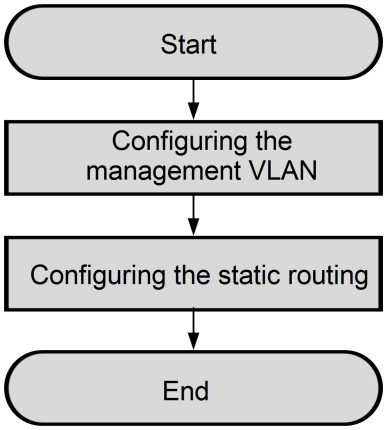


Figure 2-2 Flow of configuring the ANM2000 management path

2.2.5 Configuring the Management VLAN

Command format

Table 2-2 Command format for configuring the management VLAN

Command
`cd service`
`set manage vlan name <name> vid <vid> inputport <portlist> [untagged| tagged]`
`set manage vlan name <name> ip <A.B.C.D/M> {<A.B.C.D>}*1`

Configuration procedures

1. Enter the service directory.

```
Admin#cd service
Admin\service#
```

2. Create the management VLAN.

```
Admin\service#set manage vlan name a vid 4000 inputport 19:2 untagged
Admin\service#set manage vlan name b vid 4001 inputport 19:3 untagged
Admin\service#
```

3. Set the management IP address and the mask.

```
Admin\service#set manage vlan name a ip 10.98.20.247/16
Admin\service#set manage vlan name b ip 10.28.1.1/16
Admin\service#
```

2.2.6 Configuring the Static Routing

Command format

Table 2-3 Command format for configuring the static routing

Command
cd service
add static route destination <A.B.C.D > gateway <A.B.C.D> mask <A.B.C.D >

Configuration procedures

1. Enter the service directory.

```
Admin#cd service
Admin\service#
```

2. Add the static routing.

```
Admin\service#add static route destination 10.30.1.254 gateway 10.28.1.254 mask
255.255.0.0
Admin\service#
```

2.2.7 End of Configuration

After the above steps, the configuration of the ANM2000 management path has been completed. Users can manage and maintain the AN5116-06B by logging into the ANM2000 on network management computer.

2.3 Logging into the ANM2000

Prerequisites

- The Informix database has been correctly installed and the related services have been started.
- The ANM2000 server end / client end has been correctly installed.
- The ANM2000 network management computer has been normally started.
- The configuration of the ANM2000 management path has been completed.

Operation procedures

1. Double-click the ANM2000 icon 

on the desktop to bring up the **ANM2000 User Login** dialog box.
2. Enter the user name and the password (they are both **1** by default), and click the **OK** button. After the authentication you will access the main GUI of the ANM2000.

3 Adding Device

- ☑ Configuration Rules
- ☑ Configuration Flow
- ☑ Adding a Management Domain
- ☑ Adding a System
- ☑ Adding a Module
- ☑ Adding a Card
- ☑ Authorizing a Card
- ☑ Configuring the SNMP Trap Receiver Address
- ☑ Configuring the SNMP Time System
- ☑ Synchronizing Time
- ☑ Saving Current Configuration Data into the Flash

3.1 Configuration Rules

- If the in-band network management mode is used in configuring the IP address, subnet mask and gateway of the system, the IP address of the system should be consistent with the equipment IP address set for the in-band management VLAN, so that the network management server can communicate normally with the AN5116-06B. For example, if the equipment IP address set for the management VLAN is 10.98.20.247, the IP address of the system should also be set to 10.98.20.247.
- If the network management computer and the AN5116-06B are not in the same LAN in the configuration of the IP address, subnet mask and gateway of the system, the AN5116-06B should be managed through the gateway. In such case, the IP address of system and the gateway IP address of the equipment set for the management VLAN should be in the same network segment, so that the network management computer can access and manage the AN5116-06B by the gateway. For example, if the gateway IP address of the equipment set for the management VLAN is 10.28.1.x (the subnet mask being 255.255.255.0), the IP address of the system should also be set to 10.28.1.x (the subnet mask being 255.255.255.0).

3.2 Configuration Flow

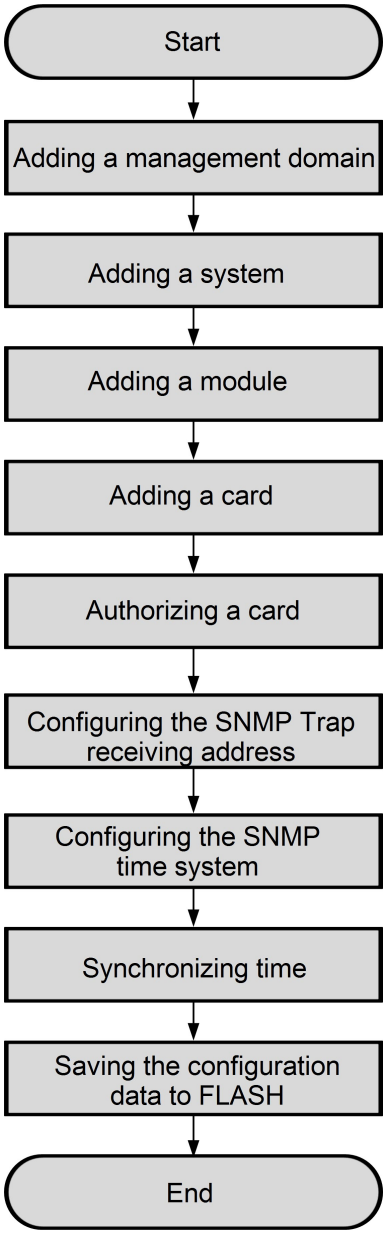


Figure 3-1 Flow chart for adding device

3.3 Adding a Management Domain

Configuration procedures

1. Right-click a blank area of the **Object Tree** pane and select **Add Domain** from the shortcut menu to bring up the **Add Domain** dialog box, as shown in Figure 3-2.

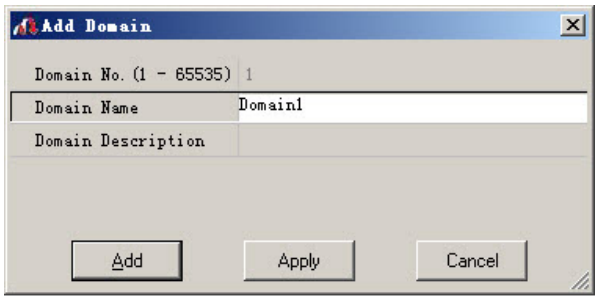


Figure 3-2 The Add Domain dialog box

2. Configure the parameters in the **Add Domain** dialog box. Fill in the **Domain Description** according to your demand.
3. After completing setting the parameters, click the **Add** button and the created management domain 1 appears in the **Object Tree** pane, as shown in Figure 3-3.

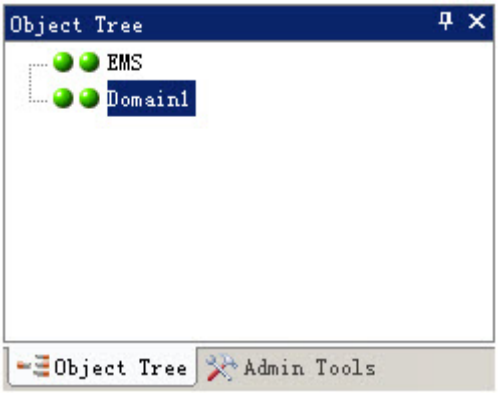


Figure 3-3 The added management domain

3.4 Adding a System

Configuration procedures

1. Right-click on the management domain object created in the **Object Tree** pane, select **Add Shelf Device→GEPON→Add AN5116-06B System** from the shortcut menu to bring up the Add System dialog box.
2. Configure the parameters in the **Add System** dialog box as shown in Figure 3-4.

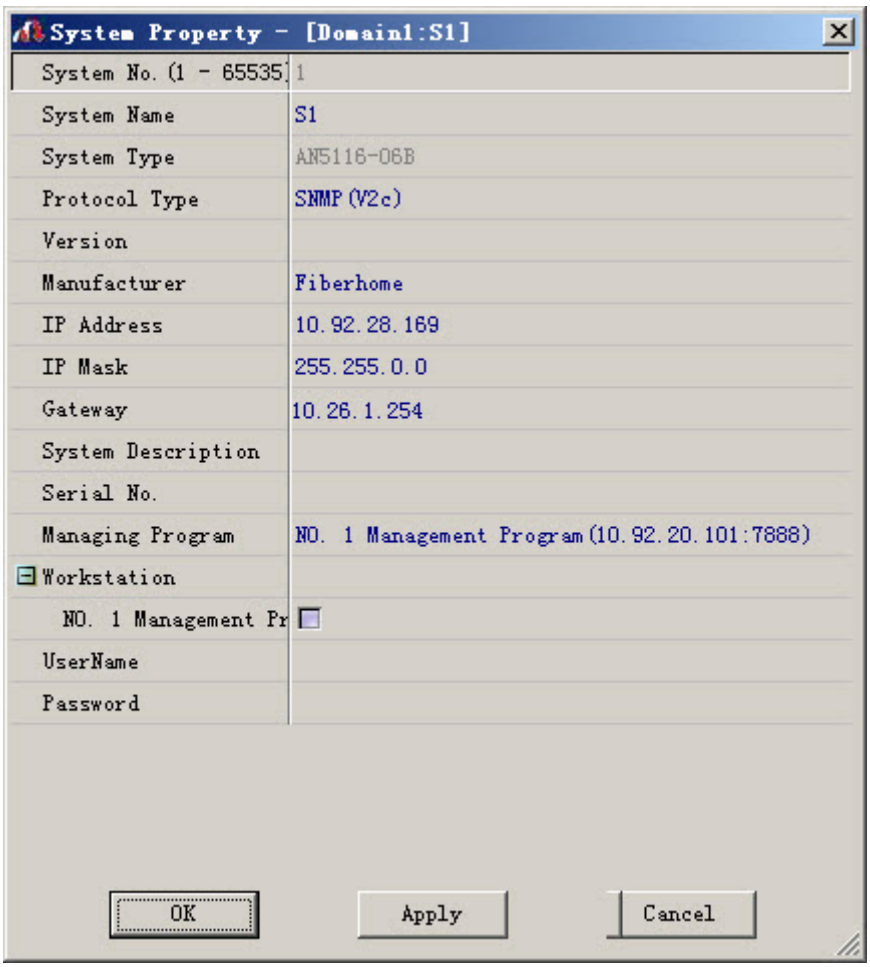


Figure 3-4 Adding the AN5116-06B system

3. After completing the parameters setting, click the **OK** button, and the created system 1 appears in the **Object Tree** pane.

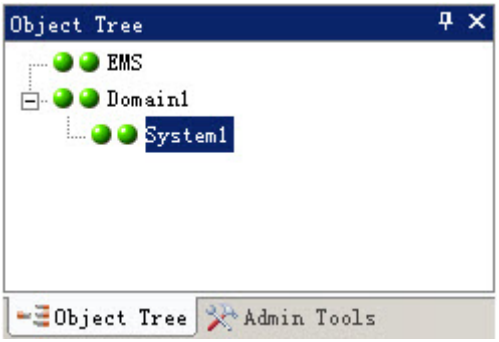


Figure 3-5 The added system in the Object Tree pane

3.5 Adding a Module

Configuration procedures

1. Right-click the AN5116-06B system in the **Object Tree** pane, and select **Add Module** from the shortcut menu to bring up the **Add Module** dialog box.
2. Configure the parameters in the **Add Module** dialog box as shown in Figure 3-6.

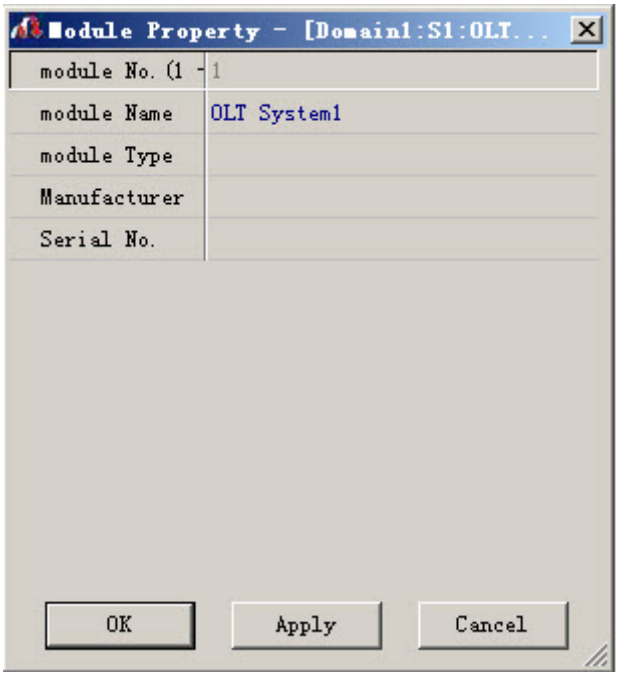


Figure 3-6 Adding a module

3. After completing configuration, click the **OK** button, and the created module appears in the **Object Tree** pane.

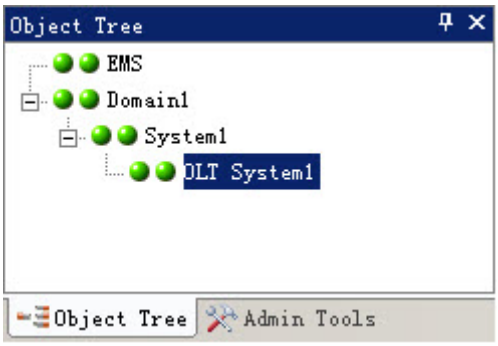


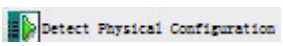
Figure 3-7 The added module in the Object Tree pane

3.6 Adding a Card

- Automatic adding: You can use the function of detecting physical configuration to add a card automatically if it is present.
- Manual adding: You can pre-configure to add a card if it is not present. The manual adding is also available if the card is present.

3.6.1 Adding a Card Automatically

Configuration procedures

1. Right-click the AN5116-06B system in the **Object Tree** pane, and select **Detect Physical Configuration** from the shortcut menu to bring up the **Detect Physical Configuration** dialog box.
2. Then select the system object to be detected in the object tree on the left side of the window.
3. Select **Setting→Auto Update Objects** from the menu bar.
4. Click the 

button, the progress and the result of the detection will be displayed in the lower right part of the window, as shown in Figure 3-8.

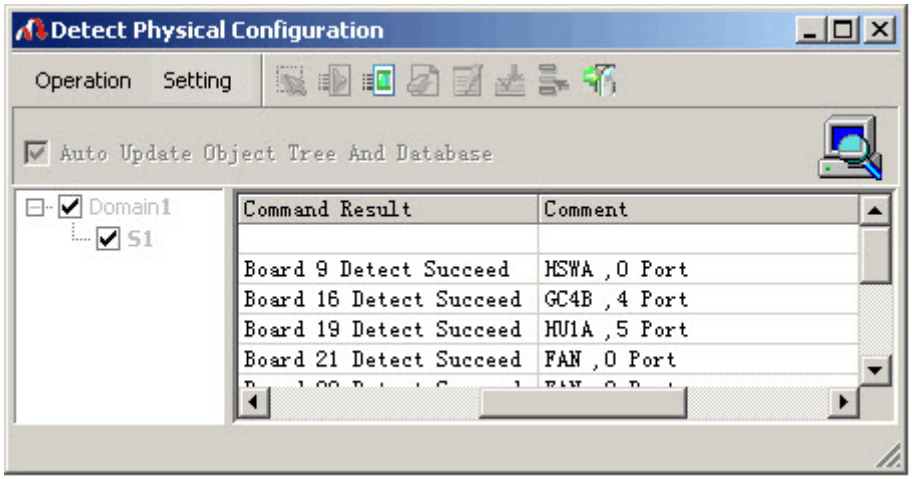


Figure 3-8 Result of physical configuration detection

5. Click the AN5116-06B module in the Object Tree pane in the main window to check if the cards displayed in the subrack view are consistent with the results of physical detection; if consistent, the cards are added successfully.

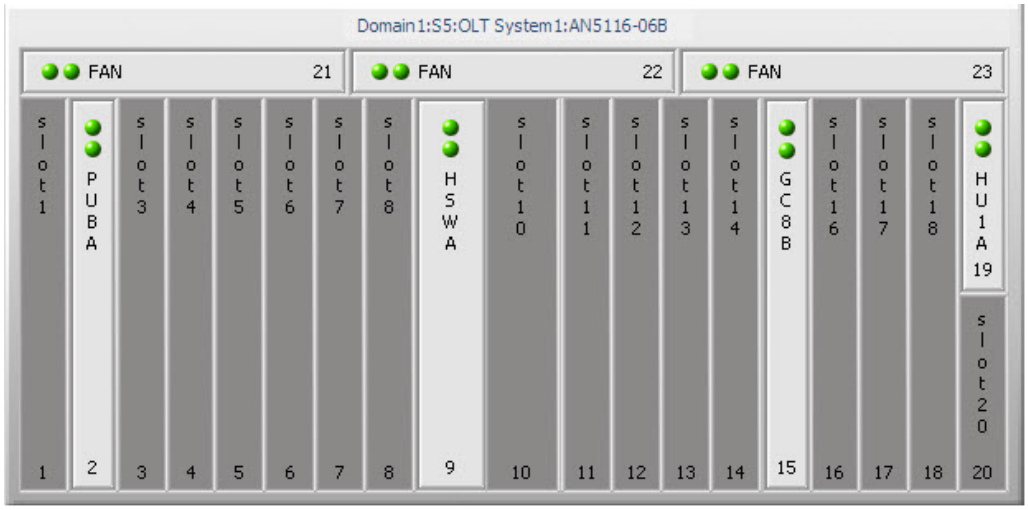


Figure 3-9 The AN5116-06B subrack view

3.6.2 Adding a Card Manually

Slot distribution

After adding the AN5116-06B module, click this module in the Object Tree and its subrack view will appear in the view area of the Device View tab, as shown in Figure 3-10.

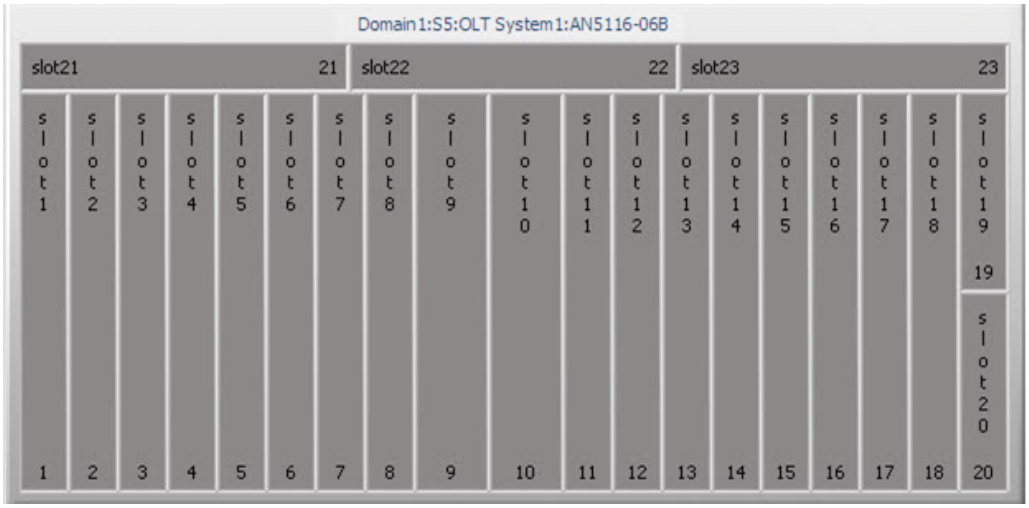


Figure 3-10 The AN5116-06B subrack view (no card added)

The cards that can be configured in the AN5116-06B subrack view are listed in Table 3-1.

Table 3-1 Card configuration of the AN5116-06B

Card Name Abbreviation	Slot	Quantity
HSWA	9, 10	1 to 2
EC4B/EC8B	1 to 8, 11 to 18	0 to 16
XG2B	1 to 8, 11 to 18	0 to 16
GC4B/GC8B	1 to 8, 11 to 18	0 to 16
C155A	1 to 8, 11 to 18	0 to 2
CE1B	1 to 8, 11 to 18	0 to 2
HU1A/HU2A/GU6F	19, 20	1 to 2
PUBA	1 to 8, 11 to 18	1
FAN	21 to 23	0 to 3

Configuration procedures

1. Right-click the slot to be added with a card and select **Add Card** from the shortcut menu. Then select the desired card type in the submenu that appears subsequently. See Figure 3-11.

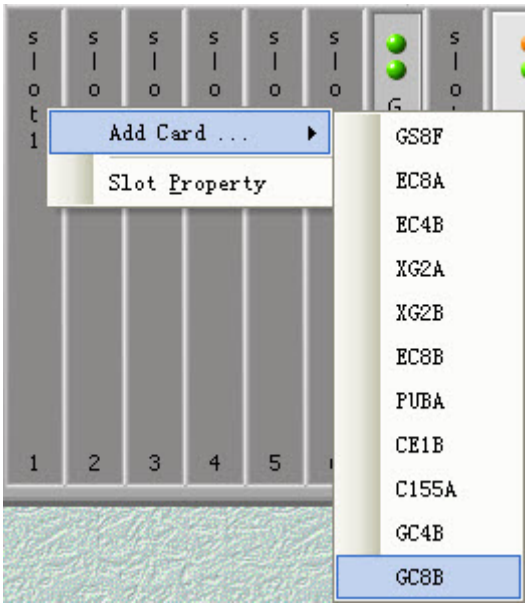


Figure 3-11 Adding a card manually

2. The **Add Board** dialog box will appear, as shown in Figure 3-12.

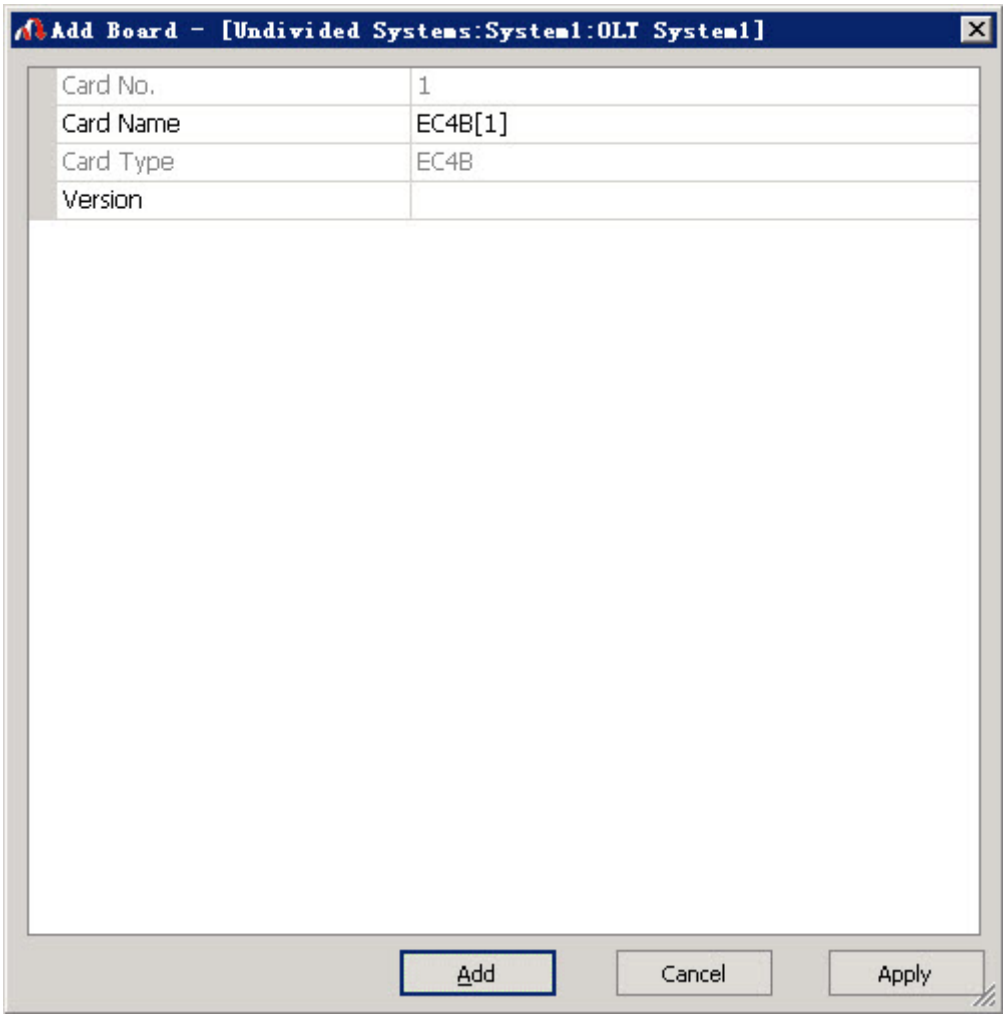


Figure 3-12 Adding a card

3. Use the default values for the card property parameters. Then click the **Add** button.

Modifying cards

- Modify the card properties.

  Right-click the card to be modified in the subrack view or the Object Tree on the left, and select **Property** from the shortcut menu. Then modify the card properties in the dialog box that appears.

- Delete a card.

Right-click the card to be deleted in the subrack view or the Object Tree on the left, and select **Delete** from the shortcut menu. The card will then be deleted.

- Change the type of a card.

  Right-click the card to be modified in the subrack view and select **Reset To** from the shortcut menu. Then select the new card type in the submenu. After replacing the card, reconfigure parameters for the new card or use the system default configurations.

3.7 Authorizing a Card

- Authorizing a card which is present: You can use the function of detecting physical configuration to authorize a card if it is present.
- Authorizing a card which is not present: you can pre-authorize a card if it is not present. When the actual card is powered up, the ANM2000 can check the type and operate the service configuration as long as the types match.

3.7.1 Authorizing a Card Which Is Present

Parameter description

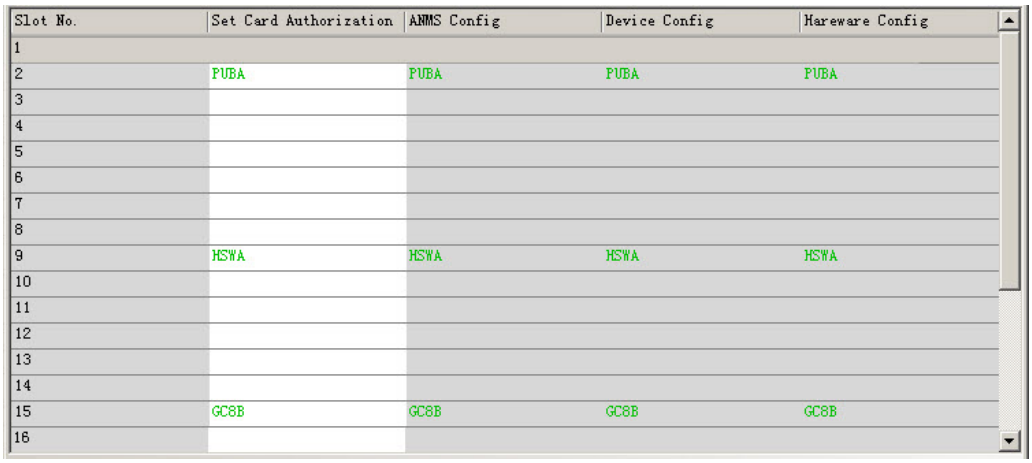
Table 3-2 The parameters in the card authorization window

Parameter	Explanation	Instruction
Slot No.	Card slot number	Read-only item
Set Card Authorization	For selecting the card type to be authorized, in the condition of pre-authorizing.	Optional item
ANMS Config	The type of cards added into the ANM2000.	Read-only item
Device Config	The type of cards pre-authorized and saved into the RAM of the equipment.	Read-only item
Hardware Config	The type of cards physically added into the slots in equipment.	Read-only item

Configuration procedures

1. Right-click the AN5116-06B system in the **Object Tree** pane, and select **Card Config** from the shortcut menu to bring up the **Set Card Authorization** dialog box.

2. Click the button in the tool bar to authorize all the cards which are present.



Slot No.	Set Card Authorization	ANMS Config	Device Config	Hareware Config
1				
2	PUBA	PUBA	PUBA	PUBA
3				
4				
5				
6				
7				
8				
9	HSWA	HSWA	HSWA	HSWA
10				
11				
12				
13				
14				
15	GC8B	GC8B	GC8B	GC8B
16				

Figure 3-13 Configuring card authorization

Caution:

After a card is authorized, the ANM2000 will refresh the status and other information about this card. If users detect that one card's actual status is not consistent with the status displayed on the ANM2000, they can perform card authorization to update it. If the status displayed on the ANM2000 keeps inconsistent with the actual status of the card after card authorization, the users should contact FiberHome for troubleshooting.

3.7.2 Pre-authorizing a Card Which Is Not Present

Parameter description

Table 3-3 The parameters in the card authorization window

Parameter	Explanation	Instruction
Slot No.	Card slot number	Read-only item
Configuring card authorization	For selecting the card type to be authorized, in the condition of pre-authorizing.	Optional item
ANMS Config	The type of cards added into the ANM2000.	Read-only item

Table 3-3 The parameters in the card authorization window (Continued)

Parameter	Explanation	Instruction
Device Config	The type of cards pre-authorized and saved into the RAM of the equipment.	Read-only item
Hardware Config	The type of cards physically added into the slots in equipment.	Read-only item

Configuration procedures

Take pre-authorizing the EC4B card in Slot 2 as an example, the detailed operation steps are as follows:

1. Right-click the AN5116-06B system in the **Object Tree** pane, and select **Card Config** from the shortcut menu to bring up the **Set Card Authorization** dialog box.
2. Click the corresponding blank area under the Set Card Authorization item of Slot 2, and choose the EC4B card in the pull-down list.
3. Click the button in the tool bar and then click **Yes** in the dialog box that appears, so as to complete the operation of pre-authorization, as shown in Figure 3-14.

Slot No.	Set Card Authorization	ANMS Config	Device Config	Hardware Config
1				
2	EC4B	EC4B	EC4B	
3				
4	PUBA	PUBA	PUBA	PUBA
5				
6	EC4B	EC4B	EC4B	
7				
8				
9	HSWA	HSWA	HSWA	HSWA
10	HSWA	HSWA	HSWA	
11				
12				
13				
14				
15	GC4B	GC4B	GC4B	GC4B
16	GC4B	GC4B	GC4B	
17				
18				
19	HU1A	HU1A	HU1A	HU1A
20				

Figure 3-14 Completing card pre-authorization

Note:

- Since the card is not present, the Hardware Config is blank.
- If it is necessary to modify the type of the cards pre-authorized, users only need to re-pre-authorize the cards.

3.8 Configuring the SNMP Trap Receiver Address

1. Right-click the active HSWA card in the **Object Tree** pane and select **Config→ SNMP Trap Server** from the shortcut menu to access the **SNMP Trap Server** window.
2. Click the button on the toolbar. In the **Please Input the Rows for Add:** dialog box that appears subsequently, type **1** and click **OK** to add a TRAP receiver address
3. Configuring the SNMP Trap receiver address, the community name and the SNMP version.
4. Click the button on the toolbar to complete the configuration, as shown in Figure 3-15.

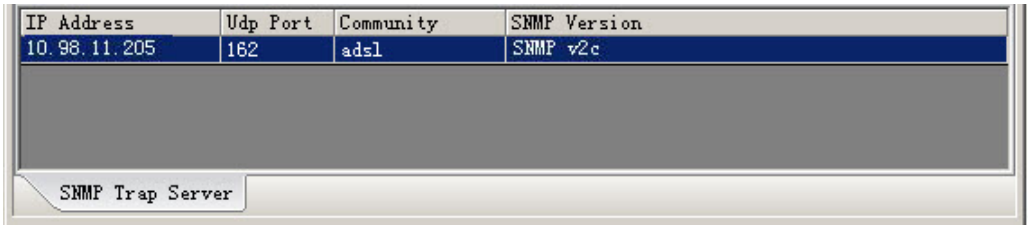


Figure 3-15 Configuring the SNMP Trap receiver address

3.9 Configuring the SNMP Time System

1. Right-click the active HSWA card in the **Object Tree** pane, and select**Time-Config→Time Management** from the short-cut menu to access the **Time Mode** window, and select the **Snmp System Time Config** tab.

2. Click the button on the toolbar. In the **Please Input the Rows for Add:** dialog box that appears subsequently, type **1** and click **OK** to add an IP address of the network management server.

Note:

To configure the IP address of the network management server in the SNMP time system, you need to select **Configuration→Batch Config System Manager** from the menu bar to check the IP address of the current server among the administrator objects.

3. Configure the EMS synchronization interval and the IP address of the EMS server.
4. Click the button on the toolbar to complete the configuration, as shown in Figure 3-16.

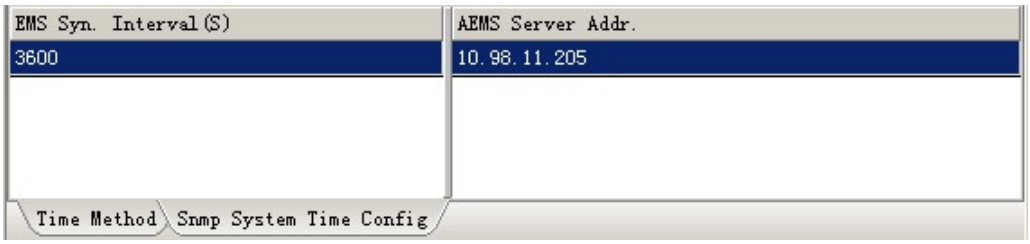


Figure 3-16 Configuring the SNMP time system

3.10 Synchronizing Time

Configuration procedures

Note:

Having being connected to the ANM2000 server, the equipment will apply to the ANM2000 server for synchronizing time. If connected to multiple ANM2000 servers, the AN5116-06B will apply to the first ANM2000 server connected to it for time synchronization. If you want to choose another ANM2000 server to perform time synchronization for the equipment, you can reconfigure the SNMP time system.

1. Right-click the AN5116-06B system in the **Object Tree** pane and select **Configure and Command→Time Synchronization** from the shortcut menu. A **Sending Commands…** dialog box will appear then, as shown in Figure 3-17.

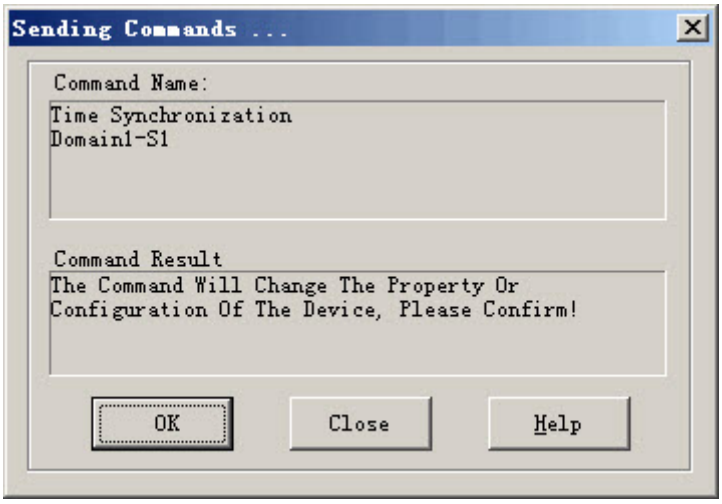


Figure 3-17 Synchronizing the time of the system

2. Click **OK** to start executing the time synchronization command.
3. After the time synchronization is completed successfully, click the **Close** button.

3.11 Saving Current Configuration Data into the Flash

Configuration procedures

Right-click the active HSWA card, and select **Control Command→Save Config to Flash**.

4 ONU Authentication and Authorization

- Configuration Rules
- Example for Authorization without Authentication
- Example for Authentication and Authorization Based on Physical Identifier
- Example for Authentication and Authorization Based on Password
- Example for Authentication and Authorization Based on Logical Identifier
- Example for Authentication Mode Switching with Original ONU Configuration Maintained
- Example for Authentication Mode Switching without Maintaining Original ONU Configuration
- Example for ONU Deauthorization

4.1 Configuration Rules

- The AN5116-06B GPON equipment supports eight ONU authentication modes: non-authentication, authentication based on physical identifier, authentication based on physical identifier + password, authentication based on password, authentication based on logical identifier, authentication based on logical identifier (without password), hybrid authentication based on physical identifier + logical identifier, and hybrid authentication based on physical identifier + logical identifier (without password).
- The AN5116-06B supports the ONU pre-configuration. In the configuration of the whitelist, the operation of specifying the slot number, PON port No., ONU No. and ONU type means to pre-configure the ONU. It is not necessary to specify the ONU No. in Pre-configuration. The ONU No. is assigned by the core switch card automatically if it is not specified.
- In the authentication modes based on physical identifier, physical identifier + password, and password, when you choose to authorize the ONU by configuring the corresponding whitelist, the accessed ONU can be authorized only when it is consistent with the configuration on the corresponding whitelist.
- In the authentication modes based on physical identifier, physical identifier + password, and password, when you choose to authorize the ONU using the whitelist generated by getting unauthorized ONU automatically, the ONU will be authorized automatically.
- The authentication modes based on physical identifier and physical identifier + password are for authenticating the physical address of the ONU. If the password is contained, then the password needs to be authenticated at the same time.
- The authentication modes based on logical identifier (with or without password) are for authenticating the SN (Serial Number) of the ONU. The SN is designated by the network operator. The authentication mode based on logical identifier (without password) requires no authentication of password.
- In the hybrid authentication modes, users can choose to implement the authentication on either physical identifier or logical identifier. For example, while pre-configuring an ONU, users can choose either to configure the SN of the ONU in the logical SN whitelist or to configure the MAC address of the ONU in the physical identifier whitelist.

- In the non-authentication mode, all the ONUs will be authorized automatically.
- For deauthorizing the ONU in the authentication modes based on physical identifier, physical identifier + password, and password, users only need to delete the ONU from the current ONU authorization whitelist.
- Users can switch between the authentication modes according to the requirement and choose to or not to keep the original ONU authentication information and configuration. If choosing to keep ONU authentication information and configuration under the original authentication mode, users can switch between the authentication mode directly. If choosing not to keep the ONU authentication information and configuration under the original authentication mode, users can delete the related information of the whitelist under the original authentication mode before the switching.
- The card authorization should be completed before authentication and authorization of the ONU.

4.2 Example for Authorization without Authentication

4.2.1 Example Introduction

When the PON port authentication mode is set to non-authentication, the validity of the ONU connected to the PON port does not need authentication. After the ONU is physically connected, powered on and registered, the OLT will detect the ONU and authorize it automatically.

4.2.2 Configuration Flow

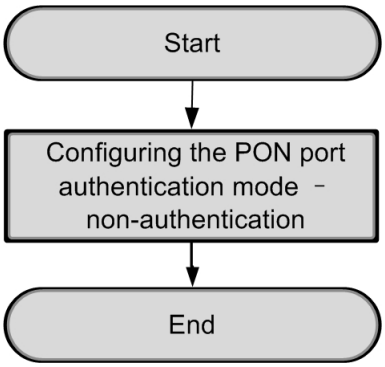


Figure 4-1 Flow chart for configuring the non-authentication mode

4.2.3 Configuring PON Port Authentication Mode

Configure the authentication mode of the ONU connected to the PON port 2 of the GC4B card in Slot 5 to non-authentication. The configuration procedures are as follows:

1. Right-click the active HSWA card in the **Object Tree** pane, and select **ONU Authentication→PON Authentication Mode** from the shortcut menu that appears to bring up the **PON Authentication Mode** window.
2. Select **NO Authentication** from the pull-down list of **Authentication mode** for the PON port 2 in Slot 15.
3. Click the button on the toolbar to complete the configuration, as shown in Figure 4-2.

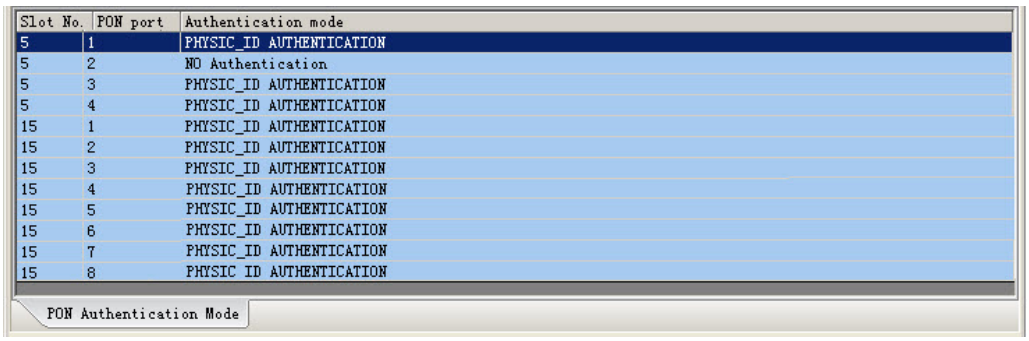


Figure 4-2 Configuring the non-authentication mode

4.2.4 End of Configuration

After the non-authentication mode is successfully configured for the ONU, the OLT will authorize all ONUs that are powered on and registered under this PON port.

4.3 Example for Authentication and Authorization Based on Physical Identifier

4.3.1 Example Introduction

In the practical example for the authentication and authorization based on physical identifier, the ONU is authorized in two ways:

- Authenticating and authorizing manually: authenticating and authorizing the ONU manually by pre-configuring the ONU physical identifier authentication whitelist.
- Authenticating and authorizing automatically: directly get the actual ONU physical address by getting the unauthorized ONU automatically to authenticate and authorize the ONU automatically.

4.3.2 Planning Data

Table 4-1 Planning data for configuring the authentication mode based on the physical identifier

Command		Configuration Instruction	Configuration Example (Manual Authentication and Authorization)	Configuration Example (Automatic Authentication and Authorization)
Configuring PON port authentication mode	Slot No.	Configure according to the No. of the slot actually used.	15	15
	PON port No.	Configure according to the No. of the PON port actually used.	2	2
	Authentication mode	Configure according to the network planning of the operator.	Physical identifier authentication	Physical identifier authentication

Table 4-1 Planning data for configuring the authentication mode based on the physical identifier (Continued)

Command		Configuration Instruction	Configuration Example (Manual Authentication and Authorization)	Configuration Example (Automatic Authentication and Authorization)
Configuring ONU physical address whitelist	Physical address	Configure according to the actual status of the ONU.	FHTT0024010d	-
	Slot No.	Configure according to the No. of the slot actually used.	5	-
	PON port No.	Configure according to the No. of the PON port actually used.	2	-
	ONU Type	Configure according to the type of the ONU actually used.	AN5506-04–B	-
	ONU No.	Configure according to the network planning of the operator.	1	-

4.3.3 Configuration Flow

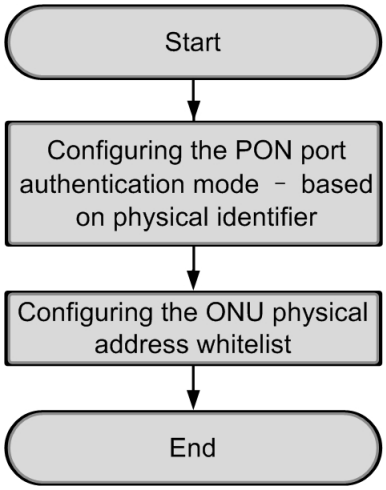


Figure 4-3 Flow chart for configuring the physical identifier authentication mode

4.3.4 Configuring PON Port Authentication Mode

Configure the authentication mode of the ONU connected to the PON port 2 of the GC4B card on Slot 15 to physical identifier authentication. The operation steps are as follows:

1. Right-click the active HSWA card in the **Object Tree** pane, and select **ONU Authentication→PON Authentication Mode** from the shortcut menu that appears to bring up the **PON Authentication Mode** window.
2. Select **PHYSIC_ID AUTHENTICATION** from the pull-down list of **Authentication mode** for the PON port 2 in Slot 15.
3. Click the  button on the toolbar to complete the configuration, as shown in Figure 4-4.

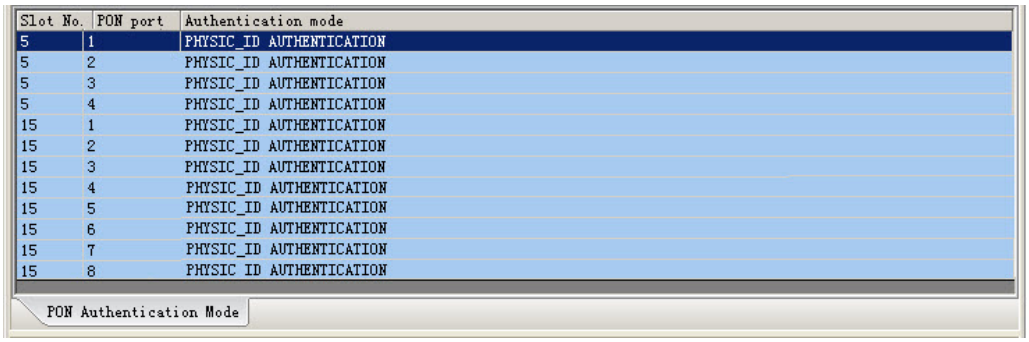


Figure 4-4 Configuring the physical identifier authentication mode

4.3.5 Configuring the ONU Physical Address Whitelist

4.3.5.1 Authenticating and Authorizing the ONU Manually

Pre-configure the ONU physical address whitelist manually, and authenticate and authorize the ONU with the physical address of FHTT0024010d.

1. Right-click the active HSWA card in the **Object Tree** pane, and select **ONU Authentication→ONU Physic_ID Address Whitelist** from the shortcut menu that appears to bring up the **Physical Address White List Setting** window.

2. Click the button on the toolbar. In the **Please Input the Rows for Add:** dialog box that appears subsequently, type **1** and click **OK** to add a physical identifier whitelist, and configure according to the planned data in Table 4-1.

Note:

The ONU authentication based on physical identifier does not need the ONU password. We recommend you to leave the password item unfilled.

3. Click the Write Selected Rows To Device button on the toolbar to complete the pre-configuration, as shown in Figure 4-5.

Physical ID	Password	Slot No.	PON No.	ONU Type	ONU No.	Implemented Status
FHTT0024010d		15	2	AN5506-04-B	1	Implemented

Figure 4-5 Successful pre-authentication configuration-based on physical identifier

4.3.5.2 Authenticating and Authorizing the ONU Automatically

Authenticate and authorize the ONU whose physical address is FHTT0024010d automatically through getting unauthorized ONU automatically. Below are the operation procedures:

1. Right-click the active HSWA card in the **Object Tree** pane, and select **ONU Authentication→ONU Physic_ID Address Whitelist** from the shortcut menu that appears to bring up the **Physical Address White List Setting** window.
2. Click the button in the tool bar to bring up the **Get Unauthorized ONU** dialog box.
3. In the **Get Unauthorized ONU** dialog box, click the pull-down lists under the **Slot No \ PON No** item to select Slot 15 and PON No. 2. And then click the **Get Unauthorized ONU** button at the bottom part of the dialog box to display the unauthorized ONUs in the pane, and select the ONU with the physical address FHTT0024010d.

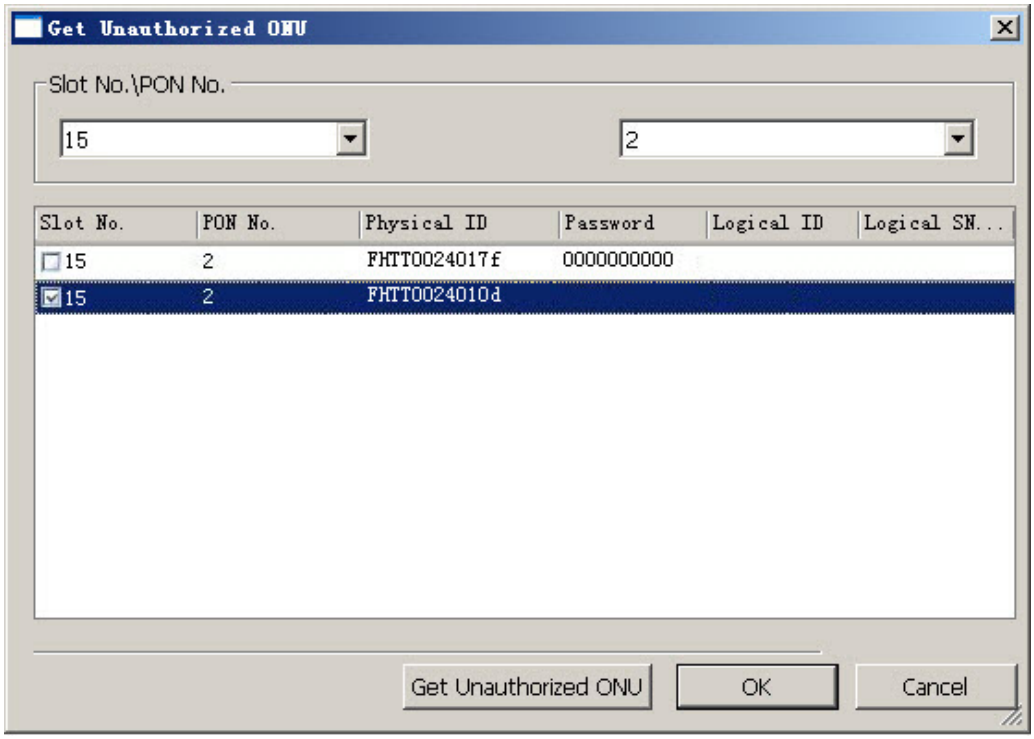


Figure 4-6 The Get Unauthorized ONU dialog box-based on physical identifier

4. Click **OK** and return to the **Physical Address White List Setting** window.
5. Click the 

button to send the configuration command. If Implemented is displayed under the Implemented Status item, the authorization is successful, as shown in Figure 4-7.

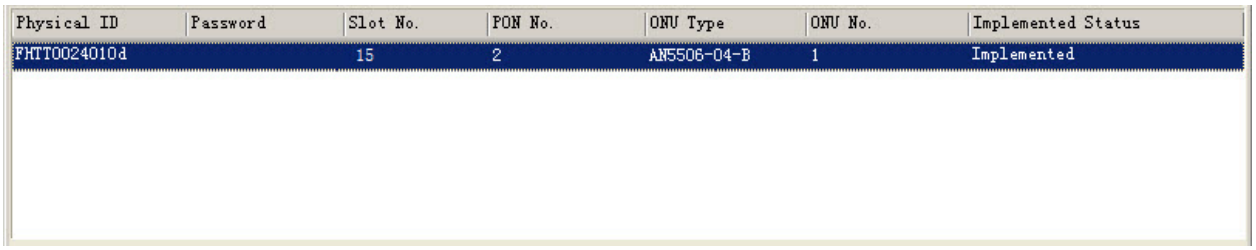


Figure 4-7 Successful automatic authorization-based on physical identifier

4.3.6 End of Configuration

After the configuration is successful, the OLT has authenticated and authorized the ONU whose physical address is FHTT0024010d, and users will be able to configure services for this ONU.

Check the ONU list under the PON port 2 in Slot 15, as shown in Figure 4-8.

Object Name	ONU Authorized No.	ONU Type	Slot No.	PON No.	ONU MAC/SN	Password	Logical ID	Logical IDPassword	Spliter Port NO.
PON2-AN5506-04-B[1]	1	AN5506-04-B	15	2	FHTT0024010d				

Figure 4-8 The ONU list - based on physical identifier

Note:

If you only pre-authorize the ONU, and the ONU is not actually connected with the PON port, then the state indicator LED of the ONU on the ONU list is grey.

4.4 Example for Authentication and Authorization Based on Password

4.4.1 Example Introduction

In this example for the authentication and authorization based on password, the ONU is authorized in two ways:

- Authenticating and authorizing manually: authenticating and authorizing the ONU manually by pre-configuring the ONU password whitelist.
- Authenticating and authorizing automatically: authenticating and authorizing the ONU automatically by getting the unauthorized ONU automatically.

4.4.2 Planning Data

Table 4-2 Planning data for configuring the password authentication mode

Command		Configuration Instruction	Configuration Example (Manual Authentication and Authorization)	Configuration Example (Automatic Authentication and Authorization)
Configuring PON Port Authentication Mode	Slot No.	Configure according to the No. of the slot actually used.	5	5
	PON port No.	Configure according to the No. of the PON port actually used.	2	2
	Authentication mode	Configure according to the network planning of the operator.	Password authentication	Password authentication
Configuring ONU password whitelist	Password	Configure according to the network planning of the operator. The value should be equal to or less than 10 digits.	12345	-
	Slot No.	Configure according to the No. of the slot actually used.	5	-
	PON port No.	Configure according to the No. of the PON port actually used.	2	-
	ONU Type	Configure according to the type of the ONU actually used.	AN5506-04-B	-
	ONU No.	Configure according to the network planning of the operator.	1	-

4.4.3 Configuration Flow

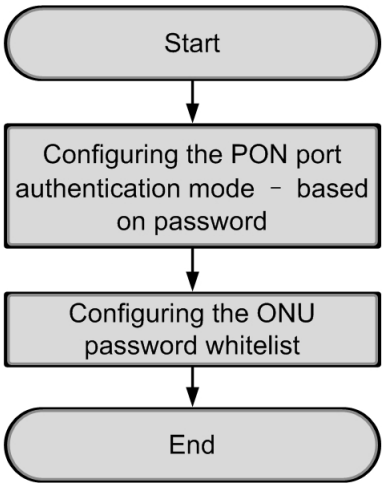
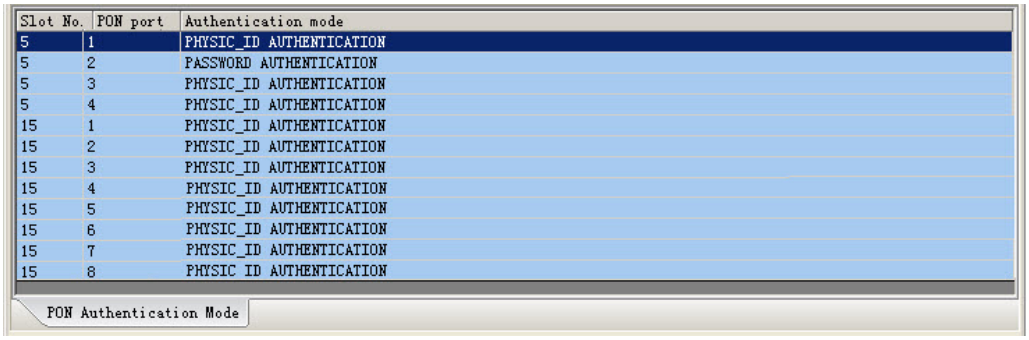


Figure 4-9 Flow chart for configuring the password authentication mode

4.4.4 Configuring PON Port Authentication Mode

Configure the authentication mode of the ONU connected to the PON port 2 of the GC4B card in Slot 5 to password authentication. The configuration procedures are as follows:

1. Right-click the active HSWA card in the **Object Tree** pane, and select **ONU Authentication→PON Authentication Mode** from the shortcut menu that appears to bring up the **PON Authentication Mode** window.
2. Select **PASSWORD AUTHENTICATION** from the pull-down list of **Authentication mode** for the PON port 2 in Slot 5.
3. Click the  button on the toolbar to complete the configuration, as shown in Figure 4-10.



Slot No.	PON port	Authentication mode
5	1	PHYSIC_ID AUTHENTICATION
5	2	PASSWORD AUTHENTICATION
5	3	PHYSIC_ID AUTHENTICATION
5	4	PHYSIC_ID AUTHENTICATION
15	1	PHYSIC_ID AUTHENTICATION
15	2	PHYSIC_ID AUTHENTICATION
15	3	PHYSIC_ID AUTHENTICATION
15	4	PHYSIC_ID AUTHENTICATION
15	5	PHYSIC_ID AUTHENTICATION
15	6	PHYSIC_ID AUTHENTICATION
15	7	PHYSIC_ID AUTHENTICATION
15	8	PHYSIC ID AUTHENTICATION

PON Authentication Mode

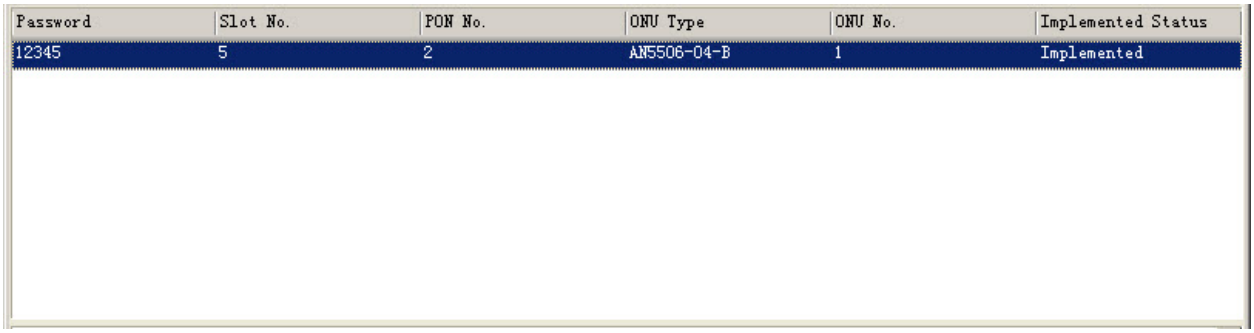
Figure 4-10 Configuring the password authentication mode

4.4.5 Configuring the ONU Password Whitelist

4.4.5.1 Authenticating and Authorizing the ONU Manually

Pre-configure the ONU password whitelist manually, and authenticate and authorize the ONU with the password of 1234.

1. Right-click the active HSWA card in the Object Tree pane, and select **ONU Authentication→ONU Password Whitelist** from the shortcut menu that appears to bring up the **Password White List Setting** window.
2. Click the  button on the toolbar. In the **Please Input the Rows for Add:** dialog box that appears subsequently, type **1** and click **OK** to add a password whitelist, and configure according to the planned data in Table 4-2.
3. Click the  button on the toolbar to send the configuration command. If Implemented is displayed under the Implemented Status item, the authorization is successful, as shown in Figure 4-11.



Password	Slot No.	PON No.	ONU Type	ONU No.	Implemented Status
12345	5	2	AN5506-04-B	1	Implemented

Figure 4-11 Successful pre-authentication configuration-manual password authentication

4.4.5.2 Authenticating and Authorizing the ONU Automatically

Authenticate and authorize the ONU with the password of 12345 automatically through getting unauthorized ONU automatically.

1. Right-click the active HSWA card in the **Object Tree** pane, and select **ONU Authentication→ONU Password Whitelist** from the shortcut menu that appears to bring up the **Password White List Setting** window.
2. Click the  button in the tool bar to bring up the **Get Unauthorized ONU** dialog box.
3. In the **Get Unauthorized ONU** dialog box, click the pull-down lists under the **Slot No \ PON No** item to select Slot 5 and PON No. 2. And then click the **Get Unauthorized ONU** button at the bottom part of the dialog box to display the unauthorized ONUs in the pane, and select the ONU with the password 12345.

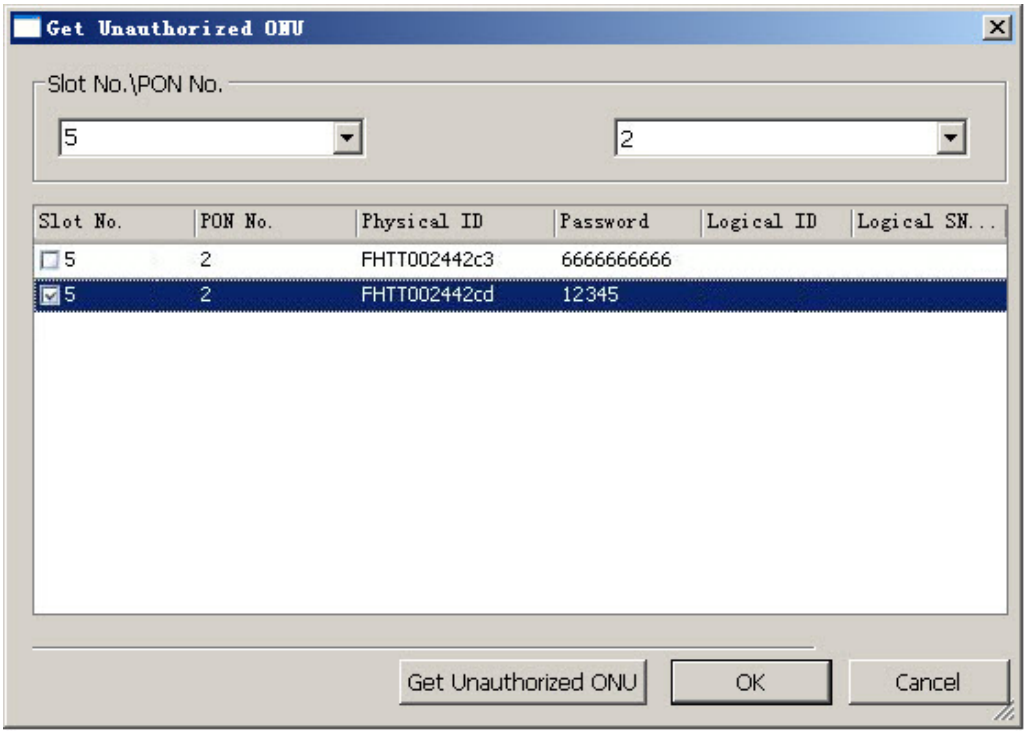


Figure 4-12 The Get Unauthorized ONU dialog box – automatic password authentication

4. Click **OK** and return to the **Password White List Setting** window.
5. Click the 

button to send the configuration command. If Implemented is displayed under the Implemented Status item, the authorization is successful, as shown in Figure 4-13.

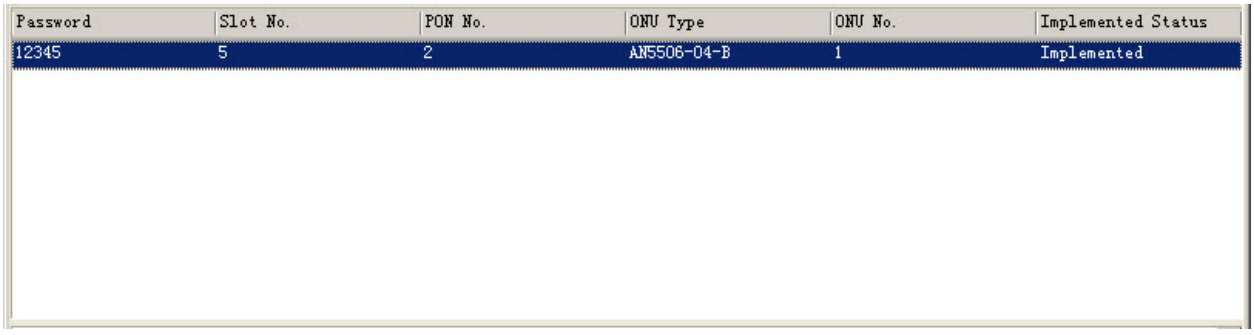


Figure 4-13 Successful automatic authorization – based on password

4.4.6 End of Configuration

After the configuration is successful, the OLT has authenticated and authorized the ONU whose password is 12345, and users will be able to configure services for this ONU.

Check the ONU list under the PON port 2 in Slot 5, as shown in Figure 4-14.

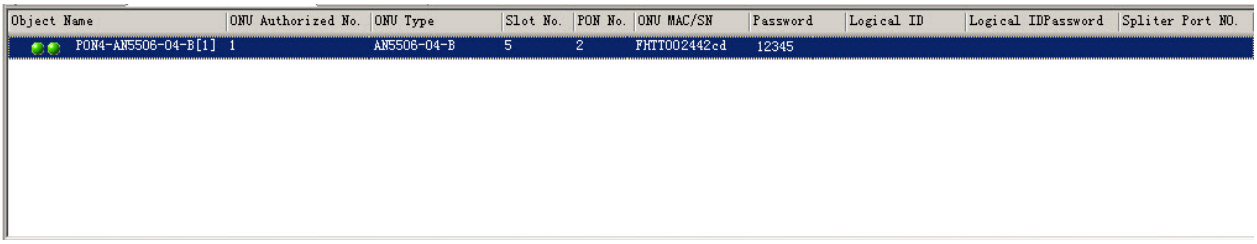


Figure 4-14 The ONU list – based on password

Note:

If you only pre-authorize the ONU, and the ONU is not actually connected with the PON port, then the state indicator LED of the ONU on the ONU list is grey, and the column ONU MAC/SN is blank.

4.5 Example for Authentication and Authorization Based on Logical Identifier

4.5.1 Example Introduction

4.5.2 Planning Data

Table 4-3 Planning data for configuring the authentication mode based on the logical identifier

Command		Configuration Instruction	Configuration Example
Configuring PON Port Authentication Mode	Slot No.	Configure according to the No. of the slot actually used.	5
	PON port No.	Configure according to the No. of the PON port actually used.	2

Table 4-3 Planning data for configuring the authentication mode based on the logical identifier (Continued)

Command		Configuration Instruction	Configuration Example
	Authentication mode	Configure according to the network planning of the operator.	Logical identifier authentication (with password)
Configuring ONU logical SN whitelist	Logical SN	Configure according to the network planning of the operator. The value should be equal to or less than 24 digits.	FHTT00421245
	Password	Configure according to the network planning of the operator. The value should be equal to or less than 12 digits.	-
	Slot No.	Configure according to the No. of the slot actually used.	5
	PON No.	Configure according to the No. of the PON port actually used.	2
	ONU Type	Configure according to the type of the ONU actually used.	AN5506-04-B
	ONU No.	Configure according to the network planning of the operator.	1

4.5.3 Configuration Flow

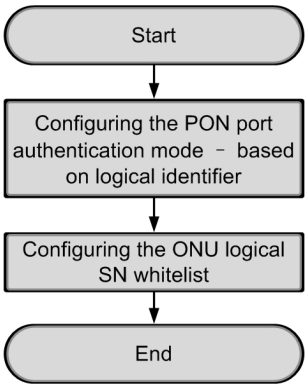


Figure 4-15 Flow chart for configuring the logical identifier authentication mode

4.5.4 Configuring PON Port Authentication Mode

Configure the authentication mode of the ONU connected to the PON port 2 of the GC4B card on Slot 5 to logical identifier authentication. The operation steps are as follows:

1. Right-click the active HSWA card in the **Object Tree** pane, and select **ONU Authentication→PON Authentication Mode** from the shortcut menu that appears to bring up the **PON Authentication Mode** window.
2. Select **LOGICAL_ID AUTHENTICATION** from the pull-down list of **Authentication mode** for the PON port 2 in Slot 5.
3. Click the  button on the toolbar to complete the configuration, as shown in Figure 4-16.

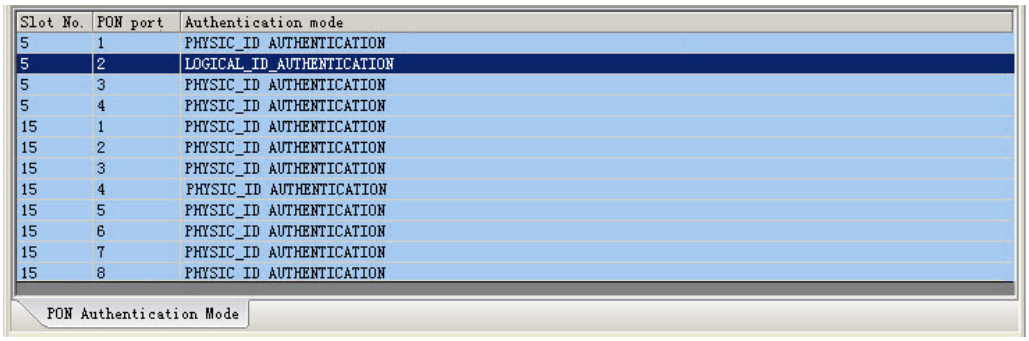


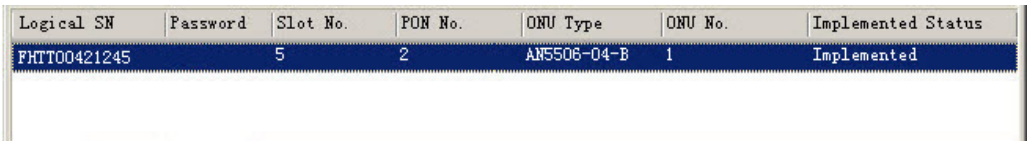
Figure 4-16 Configuring the logical identifier authentication mode

4.5.5 Configuring Logical ID Whitelist

Pre-configure an FTTH ONU (AN5506-04-B), which is connected to the No.2 PON port on the GC4B card in Slot 5. The ONU No. is 1, and the SN of the ONU for authentication is FHTT00421245. The operation procedures are as follows:

1. Right-click the HSWA[9] card in the **Object Tree** pane, and select **ONU Authentication→ONU Logical_ID Whitelist** from the shortcut menu that appears to bring up the **Logical SN White List Setting** window.
2. Click the  button on the toolbar. In the Please Input the Rows for Add: dialog box that appears subsequently, type 1 and click OK to add a logical identifier whitelist. Configure according to the planning data in Table 4-3.

3. Click the button on the toolbar to send the configuration command. If Implemented is displayed under the Implemented Status item, the pre-authorization is successful, as shown in Figure 4-17.



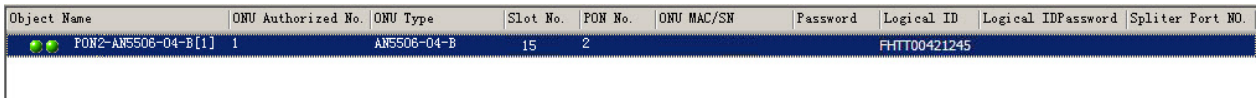
Logical SN	Password	Slot No.	PON No.	ONU Type	ONU No.	Implemented Status
FHTT00421245		5	2	AN5506-04-B	1	Implemented

Figure 4-17 Successful pre-authentication configuration-based on logical identifier

4.5.6 End of Configuration

Once the ONU is powered on and registered after successful pre-configuration of the authentication and authorization based on logical identifier, the OLT will compare the ONU information that it has collected with the SN whitelist. If the authentication is successful, the ONU will be authorized automatically.

Check the ONU list under the PON port 2 in Slot 5, as shown in Figure 4-18.



Object Name	ONU Authorized No.	ONU Type	Slot No.	PON No.	ONU MAC/SN	Password	Logical ID	Logical IDPassword	Spliter Port NO.
PON2-AN5506-04-B[1]	1	AN5506-04-B	15	2			FHTT00421245		

Figure 4-18 The ONU list - based on logical identifier

4.6 Example for Authentication Mode Switching with Original ONU Configuration Maintained

4.6.1 Example Introduction

The authentication mode switching with original ONU configuration maintained is applicable when users only want to switch the authentication mode, but do not want to change the ONU configurations. The ONU configurations under the original mode will be not be deleted during the switching, but the current services will be suspended. When this ONU is successfully authenticated under the new mode, the services will restore automatically.

This example shows how to switch the physical identifier authentication mode to the password authentication mode. Make sure that the ONU is equipped with password.

4.6.2 Configuration Flow

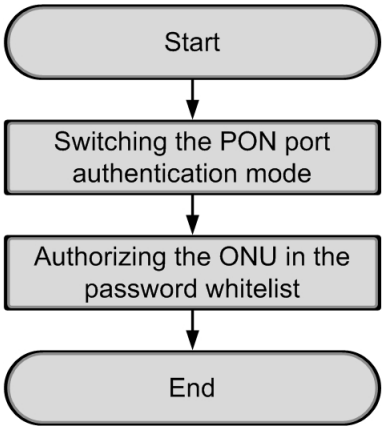


Figure 4-19 Flow chart for configuring authentication mode switching with original ONU configuration maintained

4.6.3 Switching PON Port Authentication Mode

Switch the authentication mode of the ONU connected to the PON port 2 of the GC4B card in Slot 5 from the physical identifier authentication to the password authentication. The operation steps are as follows:

1. Right-click the active HSWA card in the **Object Tree** pane, and select **ONU Authentication→PON Authentication Mode** from the shortcut menu that appears to bring up the **PON Authentication Mode** window.
2. Select **PASSWORD AUTHENTICATION** from the pull-down list of **Authentication mode** for the PON port 2 in Slot 5.
3. Click the  button on the toolbar to complete the configuration, as shown in Figure 4-20.

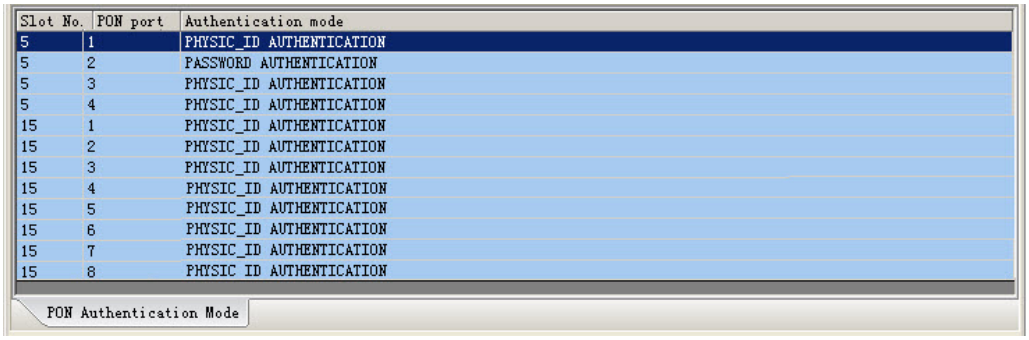


Figure 4-20 Switching authentication mode-maintaining the original ONU configuration

4.6.4 Configuring the ONU in Password Whitelist

Reauthorize the ONU connected to the PON port 2 in Slot 5 in the password whitelist. The operation steps are as follows:

1. Right-click the active HSWA card in the **Object Tree** pane, and select **ONU Authentication→ONU Password Whitelist** from the shortcut menu that appears to bring up the **Password White List Setting** window.
2. Click the  button in the tool bar to bring up the **Get Unauthorized ONU** dialog box.
3. In the **Get Unauthorized ONU** dialog box, click the pull-down lists under the **Slot No \ PON No** item to select Slot 5 and PON No. 2. And then click the **Get Unauthorized ONU** button to display the unauthorized ONUs in the pane, and select the ONU with the physical address FHTT0024010d.

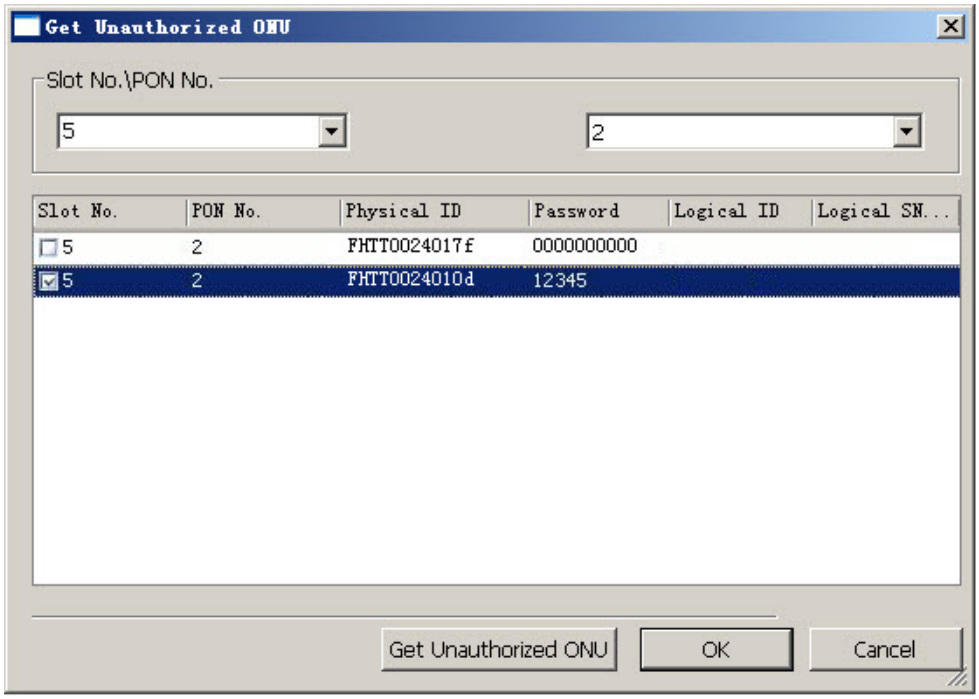


Figure 4-21 The Get Unauthorized ONU dialog box – maintaining original ONU configuration

4. Click **OK** and return to the **Password White List Setting** window.
5. Click the Write Selected Rows To Device button to send the configuration command. If Implemented is displayed under the Implemented Status item, the authorization is successful, as shown in Figure 4-22.

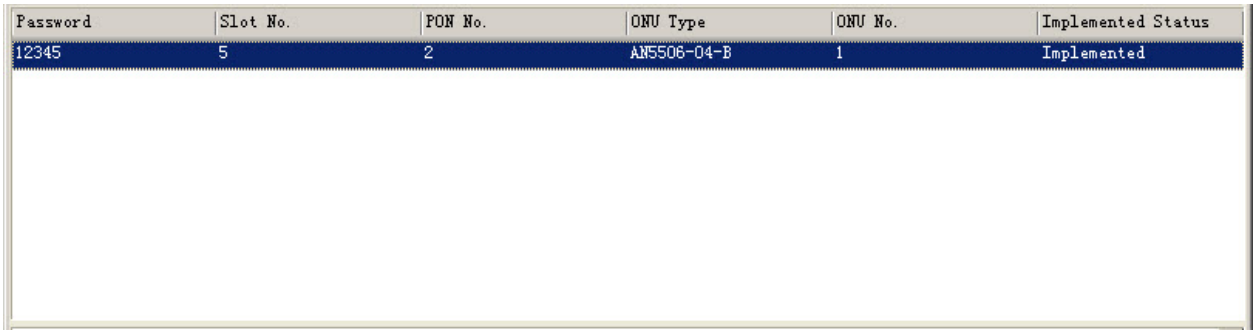
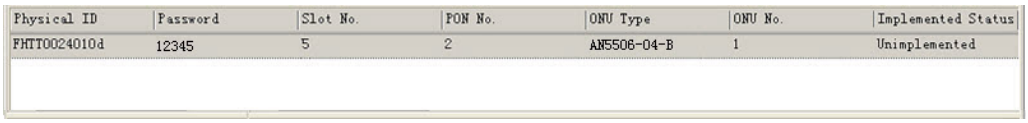


Figure 4-22 Successful password whitelist authorization-maintaining the original ONU configuration

4.6.5 End of Configuration

After the mode switching, the ONU services configured under the original authentication mode will not be deleted. The authorized status of the ONU will become **Unimplemented** by the operation of **Read Device** in the whitelist of the original mode, as shown in Figure 4-23.



Physical ID	Password	Slot No.	PON No.	ONU Type	ONU No.	Implemented Status
FHTT0024010d	12345	5	2	AN5506-04-B	1	Unimplemented

Figure 4-23 The physical address whitelist after the switching-maintaining the original ONU configuration

Check the ONU list under the PON port 2 in Slot 5. The information of this ONU has not changed after the switching, as shown in Figure 4-24.

Object Name	ONU Authorized No.	ONU Type	Slot No.	PON No.	ONU MAC/SN	Password	Logical ID	Logical IDPassword	Spliter Port NO.
PON2-AN5506-04-B[1]	1	AN5506-04-B	5	2	FHTT0024010d	12345			

Figure 4-24 The ONU list - maintaining the original ONU configuration

4.7 Example for Authentication Mode Switching without Maintaining Original ONU Configuration

4.7.1 Example Introduction

The original ONU configuration will not be maintained if the ONU authorization information in the whitelist under the original authentication mode is deleted before mode switching. After the mode switching is completed successfully, the users should reconfigure the ONU services.

This example shows how to switch the physical identifier authentication mode to the password authentication mode. Make sure that the ONU is configured with password.

4.7.2 Configuration Flow

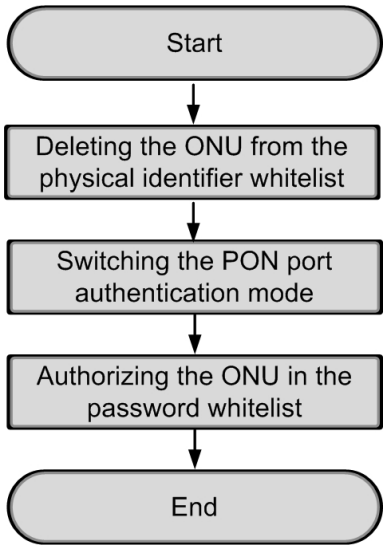


Figure 4-25 Flow chart for configuring authentication mode switching without maintaining the original ONU configuration

4.7.3 Deleting ONU from Physical Identifier Whitelist

Delete the ONU information from the physical address whitelist.

1. Right-click the active HSWA card in the **Object Tree** pane, and select **ONU Authentication→ONU Physic_ID Address Whitelist** from the shortcut menu that appears to bring up the **Physical Address White List Setting** window.
2. Select the ONU whose physical address is FHTT0024010d and then click the Delete From Device button. In the dialog box that appears, click **OK** to delete the authorization information of the ONU from the whitelist, as shown in Figure 4-26.

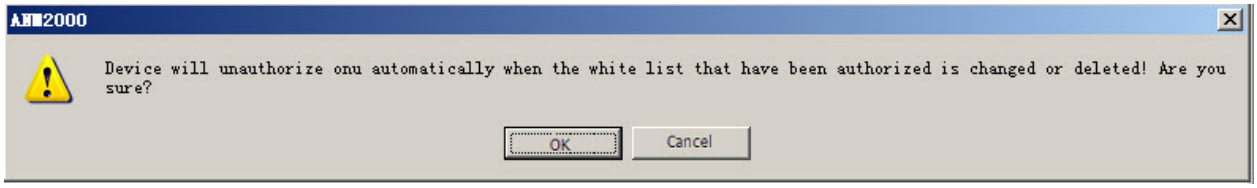
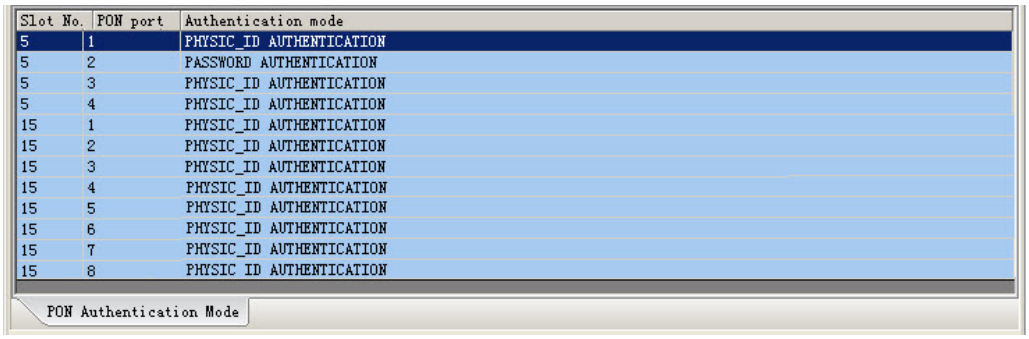


Figure 4-26 Deleting the ONU authorization information-without maintaining the original ONU configuration

4.7.4 Switching PON Port Authentication Mode

Switch the authentication mode of the ONU connected to the PON port 2 of the GC4B card in Slot 5 from the physical identifier authentication to the password authentication. The operation steps are as follows:

1. Right-click the active HSWA card in the **Object Tree** pane, and select **ONU Authentication→PON Authentication Mode** from the shortcut menu that appears to bring up the **PON Authentication Mode** window.
2. Select **PASSWORD AUTHENTICATION** from the pull-down list of **Authentication mode** for the PON port 2 in Slot 5.
3. Click the  button on the toolbar to complete the configuration, as shown in Figure 4-27.



Slot No.	PON port	Authentication mode
5	1	PHYSIC_ID AUTHENTICATION
5	2	PASSWORD AUTHENTICATION
5	3	PHYSIC_ID AUTHENTICATION
5	4	PHYSIC_ID AUTHENTICATION
15	1	PHYSIC_ID AUTHENTICATION
15	2	PHYSIC_ID AUTHENTICATION
15	3	PHYSIC_ID AUTHENTICATION
15	4	PHYSIC_ID AUTHENTICATION
15	5	PHYSIC_ID AUTHENTICATION
15	6	PHYSIC_ID AUTHENTICATION
15	7	PHYSIC_ID AUTHENTICATION
15	8	PHYSIC_ID AUTHENTICATION

PON Authentication Mode

Figure 4-27 Switching the authentication mode – without maintaining original ONU configuration

4.7.5 Configuring the ONU in Password Whitelist

Reauthorize the ONU connected to the PON port 2 in Slot 5 in the password whitelist. The operation steps are as follows:

1. Right-click the active HSWA card in the **Object Tree** pane, and select **ONU Authentication→ONU Password Whitelist** from the shortcut menu that appears to bring up the **Password White List Setting** window.
2. Click the  button in the tool bar to bring up the **Get Unauthorized ONU** dialog box.

3. In the **Get Unauthorized ONU** dialog box, click the pull-down lists under the **Slot No \ PON No** item to select Slot 5 and PON No. 2. And then click the **Get Unauthorized ONU** button to display the unauthorized ONUs in the pane, and select the ONU with the physical address FHTT0024010d.

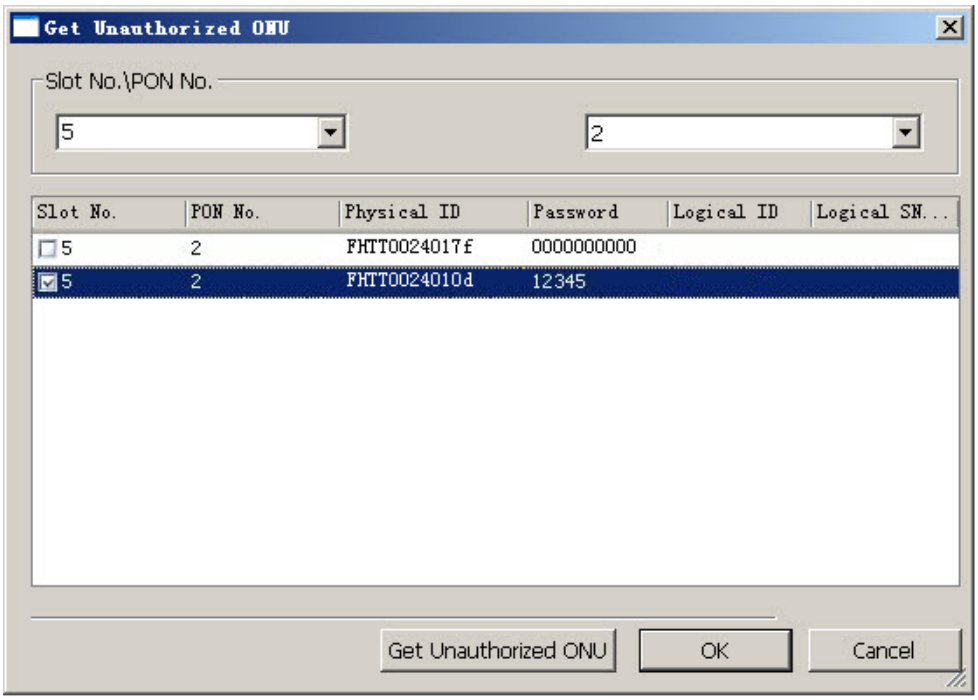


Figure 4-28 The Get Unauthorized ONU dialog box – without maintaining original ONU configuration

4. Click **OK** and return to the **Password White List Setting** window.
5. Click the Write Selected Rows To Device button to send the configuration command. If Implemented is displayed under the Implemented Status item, the authorization is successful, as shown in Figure 4-29.

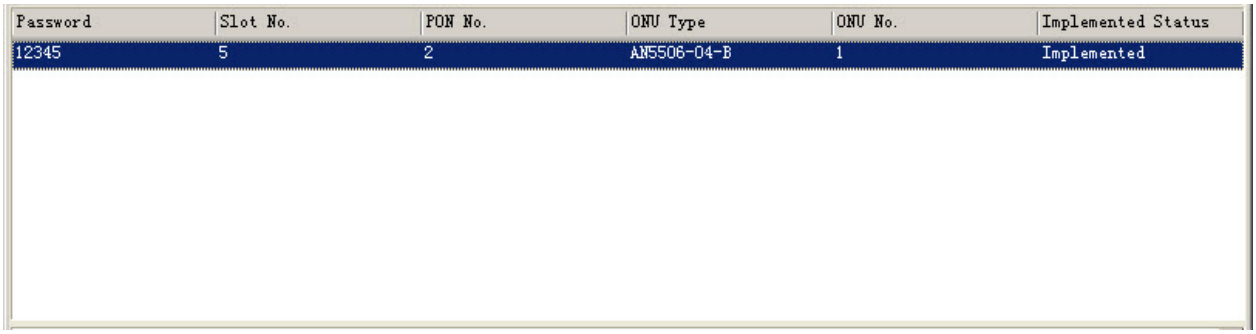


Figure 4-29 Successful password whitelist authorization-without maintaining the original ONU configuration

4.7.6 End of Configuration

After the mode switching, the ONU authorization configured in the original physical address whitelist will be deleted. Under the new authentication mode, the ONU will be authenticated and authorized based on the password.

Check the ONU list under the PON port 2 in Slot 5, as shown in Figure 4-30.

Object Name	ONU Authorized No.	ONU Type	Slot No.	PON No.	ONU MAC/SN	Password	Logical ID	Logical IDPassword	Spliter Port NO.
PON2-AN5506-04-B[1]	1	AN5506-04-B	5	2	FHTT00240104	12345			

Figure 4-30 The ONU list – without maintaining original ONU configuration

4.8 Example for ONU Deauthorization

4.8.1 Example Introduction

To deauthorize the ONU, you only need to delete the ONU from the ONU current authorization whitelist. Once the ONU is deauthorized, there will be no information on this ONU in the ONU list, and its entire configuration information will also be deleted.

This example shows the ONU deauthorization in the authentication mode based on physical identifier.

4.8.2 Configuration Flow

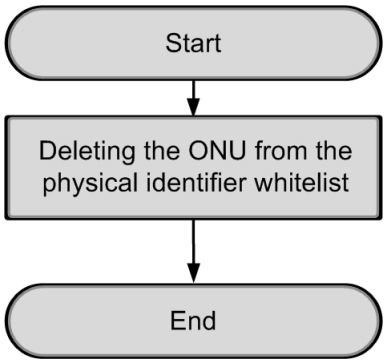


Figure 4-31 Flow chart for configuring ONU deauthorization

4.8.3 Deleting ONU from Physical Identifier Whitelist

Delete the ONU information from the physical identifier whitelist.

1. Right-click the active HSWA card in the **Object Tree** pane, and select **ONU Authentication→ONU Physic_ID Address Whitelist** from the shortcut menu that appears to bring up the **Physical Address White List Setting** window.
2. Select the ONU whose physical address is FHTT0024010d and then click the Delete From Device button. In the dialog box that appears, click **OK** to delete the authorization information of the ONU from the whitelist, as shown in Figure 4-32.

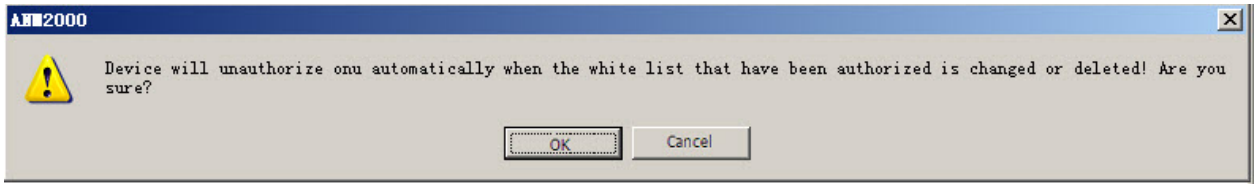


Figure 4-32 Deleting ONU authorization information

4.8.4 End of Configuration

After the ONU in the physical identifier whitelist is deauthorized, the information about this ONU will not be in the ONU list any more.

5 Configuring Voice Services

- Configuring the VoIP Services – H.248 Example
- Configuring the VoIP Services – SIP Example
- Optional Functions

5.1 Configuring the VoIP Services – H.248 Example

5.1.1 Configuration Rules

- When the softswitch platform uses the H.248 protocol to control the access terminals, you should set the MGC protocol type to the H.248 protocol for VoIP services, and set the protocol port No. to 2944.
- In the configuration of VoIP service VLAN, if you use single VLAN, you should make sure the signaling VLAN ID is within the range of the local end service VLAN ID. If you use stacked VLANs, you should assign the S-VLAN IDs within the range of the local end service VLAN IDs and assign the CVLAN IDs as needed.

5.1.2 Network Diagram

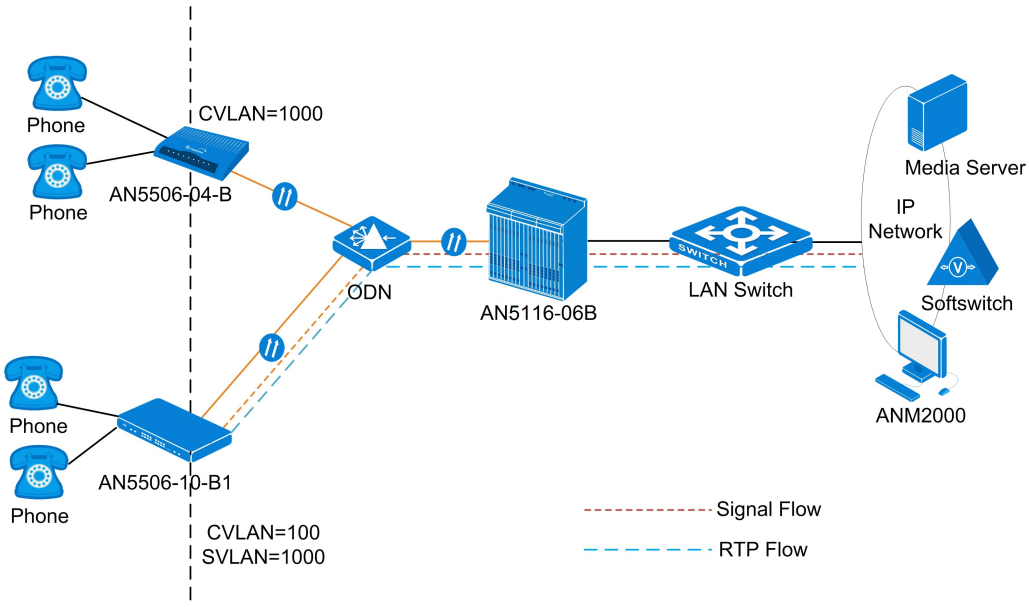


Figure 5-1 The VoIP service network based on the H.248 protocol

As shown in the figure above, the GPON system conducts signaling interaction with the softswitch based on the H.248 protocol to implement call control. The ONU uses the standard speech encoding technology to convert the subscriber's voice signals into IP packets. These IP packets are uplinked by the OLT to the IP network for transmission. Thus VoIP services are implemented for the subscribers under the GPON system.

5.1.3 Configuring the Services Respectively

5.1.3.1 Planning Data

The AN5116-06B uses the HU1A card and GC8B card as the network-side interface card and client-side interface card respectively. The PUBA card is compulsory; the AN5506-04-B and AN5506-10-B1 are used as the remote end ONUs. The planning data are as follows:

Table 5-1 Planning data on the OLT side of the VoIP service based on the H.248 protocol (configuring respectively)

Item		Description	Example	
ONU Information	ONU Type	The type of the ONU actually used.	AN5506-04-B	AN5506-10-B1
	Slot No.	The number of the actually used slot on the PON interface card.	15	
	PON No.	The number of the PON port actually used.	1	
	ONU Auth No.	Configure according to the network planning of the operator.	1	2
Local End Service VLAN	Service Name	Configure according to the network planning of the operator.	ngn1	
	Starting VLAN ID	The begin VLAN ID number of the uplink port service. Configure according to the network planning of the operator.	1000	
	VLAN ID End	The end VLAN ID number of the uplink port service. Configure according to the network planning of the operator.	1000	
	Interface No.	The number of the uplink port actually used.	20:SFP1	

Table 5-1 Planning data on the OLT side of the VoIP service based on the H.248 protocol (configuring respectively) (Continued)

Item		Description	Example
	TAG / UNTAG	The TAG processing mode of the uplink service VLAN. There are two options: **TAG** and **UNTAG**. ◆ **UNTAG** means that when the uplink data packet passes the port, its tag will be automatically stripped and it keeps going in the untagged mode. And for the downlink data packet in the untagged mode, when passing the port, it will be attached with tag and it keeps going in the tagged mode. ◆ **TAG** means that when the uplink / downlink data packet passes the port, its tag will not be stripped and it keeps going in the tagged mode.	TAG
	Service Type	Select ngn for VoIP services.	NGN
	Slot Bind Mode	Select Auto Bind for service VLAN.	Auto Bind
NGN Uplink Interface	Signaling Service Name	This item should be consistent with the Service Name set in the **Local End Service VLAN** configuration.	ngn1
	Protocol Type	Select H.248 in this example.	H.248
	MGC1 IP Address / BACK UP SIP Registrar Server Address	The IP address or domain name of the primary softswitch platform MGC.	10.80.20.1
	MGC1 Port No.	The communication port number of the primary softswitch platform MGC. The default value is 2944.	2944

Table 5-1 Planning data on the OLT side of the VoIP service based on the H.248 protocol (configuring respectively) (Continued)

Item		Description	Example			
	Keep-alive	Controls whether the ONU regularly sends keep-alive messages to the softswitch platform MGC. Options available are **Enable Active**, **Enable Passive** and **Disable**.	Enable Active			
	Master / Slave DNS Server	The master / slave DNS IP address. You need to configure the DNS server when the MGC is configured as the domain name. When the MGC is configured as the IP address, this item is invalid.	-			
	DHCP	Enable or disable the DHCP function. The default setting is Disable.	Disable			
NGN Configuration	Signaling Service Name	This item should be consistent with the Service Name set in the **Local End Service VLAN** configuration.	ngn1			
	Telephone Number	The logical number within the system, for configuring the index in the system. It is recommended to configure this item as the actual phone number defined by the softswitch. The value range is 1 to 99999999.	888800-01	888800-02	888800-03	888800-04
	ONU Public IP	When the DHCP or the PPPoE function is enabled, the IP address assigned to the ONU dynamically will override the public IP address assigned to the ONU by the system. Configure according to the network planning of the operator.	10.90.60.1		10.90.60.2	
	ONU Public IP Subnet Mask	Configure according to the network planning of the operator.	255.255.0.0		255.255.0.0	
	ONU Public IP Gateway	Configure according to the network planning of the operator.	10.90.1.254		10.90.1.254	

Table 5-1 Planning data on the OLT side of the VoIP service based on the H.248 protocol (configuring respectively) (Continued)

Item		Description	Example			
	Endpoint Domain Name / SIP User Name Postfix	The domain name of the gateway. Configure this item according to the operator's network planning.	10.90.60.1		10.90.60.2	
	ONU Protocol Port No.	Configure this item according to the operator's network planning; the default setting is 2944.	2944		2944	
	Endpoint User Name / SIP Telephone No.	TID NAME. Configure this item according to the operator's network planning.	a/1	a/2	a/3	a/4

Table 5-2 Data planning on the ONU side of the VoIP service based on the H.248 protocol (configuring respectively)

Item		Description	Example (AN5506-04-B)		Example (AN5506-10-B1)	
ONU VoIP Bandwidth Configuration	Service Type	Select voip in this example.	voip		voip	
	Fixed Bandwidth (Kbyte/s)	Configure this item according to the operator's network planning. The default setting is 16.	16		16	
	Assured Bandwidth (Kbyte/s)	Configure this item according to the operator's network planning. The default setting is 0.	0		0	
	Maximum Bandwidth (Kbyte/s)	Configure this item according to the operator's network planning. The default setting is 64.	64		64	
ONU VoIP Service Configuration	Port No.	The No. of the port on the ONU that is connected with the subscriber phone physically.	1	2	1	2
	Phone Number	This item should be consistent with the **Telephone Number** in the NGN uplink subscriber data configuration.	888800-01	888800-02	888800-03	888800-04
	Signal VLAN ID	The voice service VLAN ID; it is the C-VLAN ID when the QinQ State is set to Enable.	1000	1000	100	100

Table 5-2 Data planning on the ONU side of the VoIP service based on the H.248 protocol (configuring respectively) (Continued)

Item		Description	Example (AN5506-04-B)		Example (AN5506-10-B1)	
	Voice Codec Mode	Configure this item according to the operator's network planning. The default setting is G.711A.	G.711A	G.711A	G.711A	G.711A
	Fax Model	Configure this item according to the operator's network planning; the default setting is Transparent.	Trans-parent	Trans-parent	Trans-parent	Trans-parent
	DTMF Mode	Configure this item according to the operator's network planning; the default setting is Transparent.	Trans-parent	Trans-parent	Trans-parent	Trans-parent
	Fax Control Mode	Configure this item according to the operator's network planning; the default setting is Passthrough.	Pass-through	Pass-through	Pass-through	Pass-through
	Echo Cancel	Configure this item according to the operator's network planning; it is selected by default.	Selected	Selected	Selected	Selected
	Silence Sp	Configure this item according to the operator's network planning; it is selected by default.	Selected	Selected	Selected	Selected
	Input Gain	Configure this item according to the operator's network planning. The default setting is 0.	0	0	0	0
	Output Gain	Configure this item according to the operator's network planning. The default setting is 0.	0	0	0	0
	QinQ State	Configure this item according to the operator's network planning; the default setting is Disable.	Disable	Disable	Enable	Enable
	SVLAN ID	It is SVLAN ID when the QinQ is enabled. The SVLAN ID value should be within the uplink VLAN ID. It is invalid when the QinQ is disabled.	-	-	1000	1000
	Outer COS	It is the outer VLAN priority when the QinQ is enabled; it is invalid when QinQ is disabled.	-	-	7	7

Table 5-2 Data planning on the ONU side of the VoIP service based on the H.248 protocol (configuring respectively) (Continued)

Item		Description	Example (AN5506-04-B)		Example (AN5506-10-B1)	
	Inner COS	It is the inner VLAN priority when the QinQ is enabled; it is invalid when QinQ is disabled.	-	-	7	7

5.1.3.2 Configuration Flow

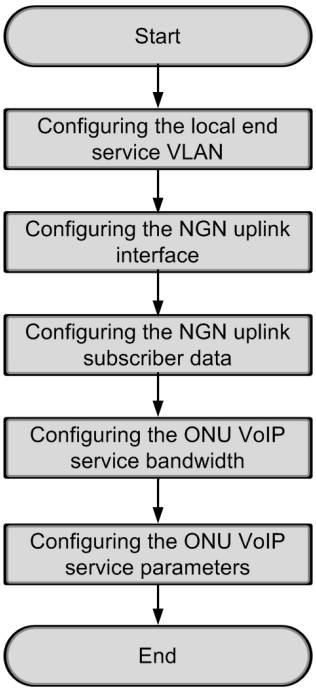


Figure 5-2 Flow chart for configuring the VoIP services respectively-H.248

5.1.3.3 Configuring the Local End Service VLAN

1. Right-click the active HSWA card in the **Object Tree** pane and select **Config→Local VLAN→Local End Service VLAN** from the shortcut menu to access the **Local End Service VLAN** window.
2. Click the button on the toolbar. In the **Please Input the Rows for Add:** dialog box that appears subsequently, type **1** and click **OK** to add a logical identifier whitelist.

3. Configure the parameters according to the planning data in Table 5-1.
4. Click the button on the toolbar to complete the configuration, as shown in Figure 5-3.

Figure 5-3 Configuring the local end service VLAN - H.248 example

5.1.3.4 Configuring the NGN Uplink Interface

1. Right-click the active HSWA card in the **Object Tree**pane and select **Voice Config→NGN Interface** from the shortcut menu to access the **NGN Interface** window.
2. Click the button on the toolbar. In the **Please Input the Rows for Add:** dialog box that appears subsequently, type **1** and click **OK** to add an NGN uplink interface.
3. Configure the parameters according to the planning data in Table 5-1.
4. Click the button on the toolbar to complete the configuration, as shown in Figure 5-4.

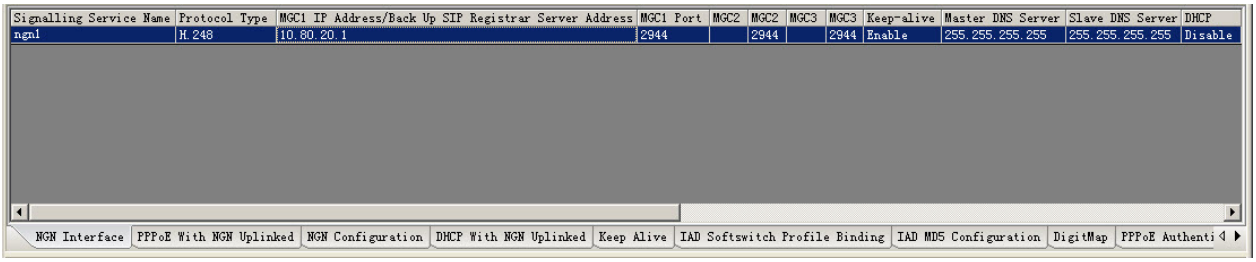


Figure 5-4 Configuring the NGN uplink interface - H.248 example

5.1.3.5 Configuring the NGN Uplink Subscriber Data

1. Right-click the active HSWA card in the **Object Tree**pane and select **Voice Config→NGN Configuration** from the shortcut menu to access the **NGN Configuration** window.

2. Click the button on the toolbar. In the **Please Input the Rows for Add:** dialog box that appears subsequently, type **4** and click **OK** to add four NGN uplink subscriber information entries.
3. Configure the parameters according to the planning data in Table 5-1.
4. Click the button on the toolbar to complete the configuration, as shown in Figure 5-5.

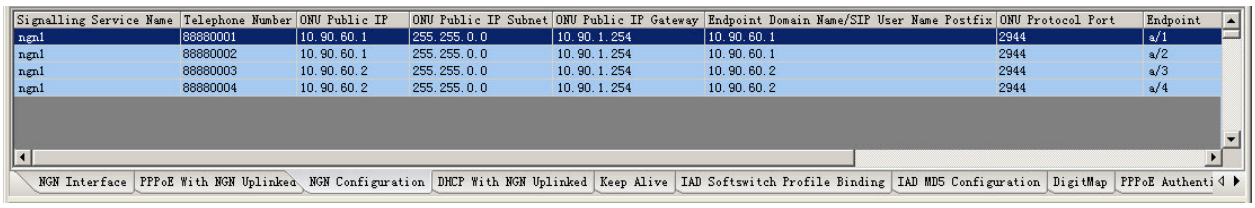


Figure 5-5 Configuring the NGN uplink subscriber data - H.248 example

5.1.3.6 Configuring the VoIP Service Bandwidth of the ONU

1. Click the GC8B card in the **Object Tree** pane to display all ONUs connected to the GC8B card in the right pane. Right-click the **PON1-AN5506-04-B[1]** ONU and select **Config→Bandwidth config** from the shortcut menu to access the **Bandwidth Config** window.
2. Click the button on the toolbar. In the **Please Input the Rows for Add:** dialog box that appears subsequently, type **1** and click **OK** to add a VoIP service.
3. Configure the parameters according to the planning data in Table 5-2.
4. Click the button on the toolbar to complete the configuration, as shown in Figure 5-6.

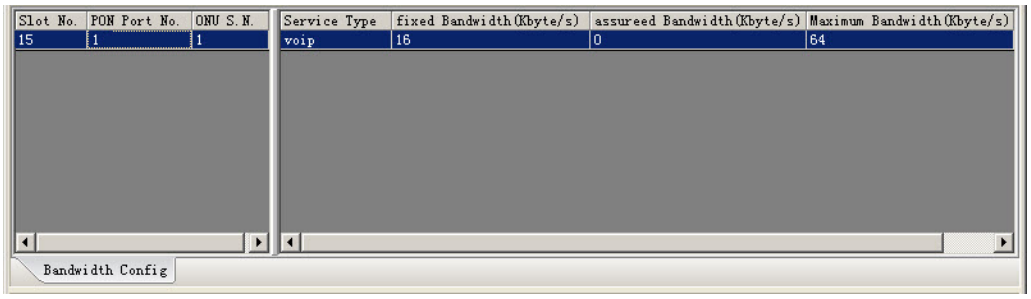


Figure 5-6 AN5506-04-B bandwidth configuration – H.248 example

5. Configure the bandwidth in the same way for the PON1-AN5506-10-B1[2] of the GC8B[15] card, as shown in Figure 5-7.

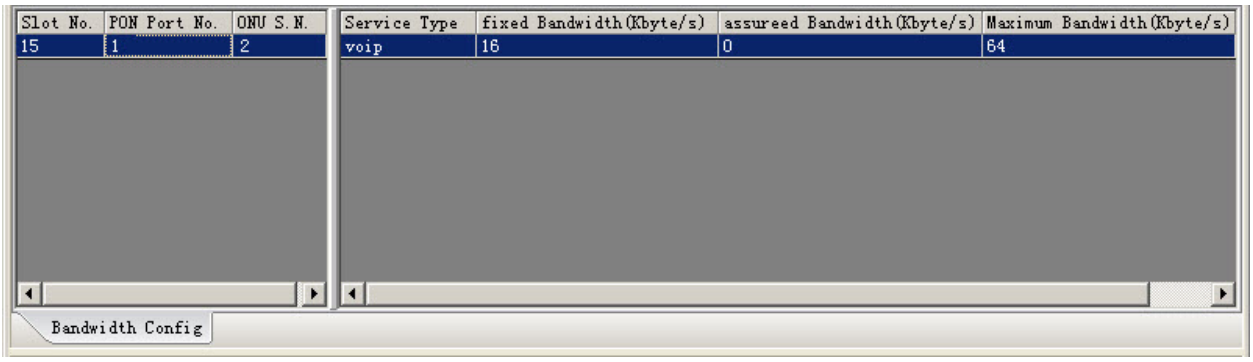


Figure 5-7 AN5506-10-B1 bandwidth configuration – H.248 example

5.1.3.7 Configuring the VoIP Service Parameters of the ONU

1. Click the GC8B card in the **Object Tree** pane to display all ONUs connected to the GC8B card in the right pane. Right-click the **PON1-AN5506-04-B[1]** ONU and select **Config→Service Config** from the shortcut menu to bring up the configuration dialog box. Then click the **Voice Config** tab to access the Voice Config dialog box.
2. Select **FXS1** in **Voice Port List** and configure the parameters according to the planning data in Table 5-2, as shown in Figure 5-8.

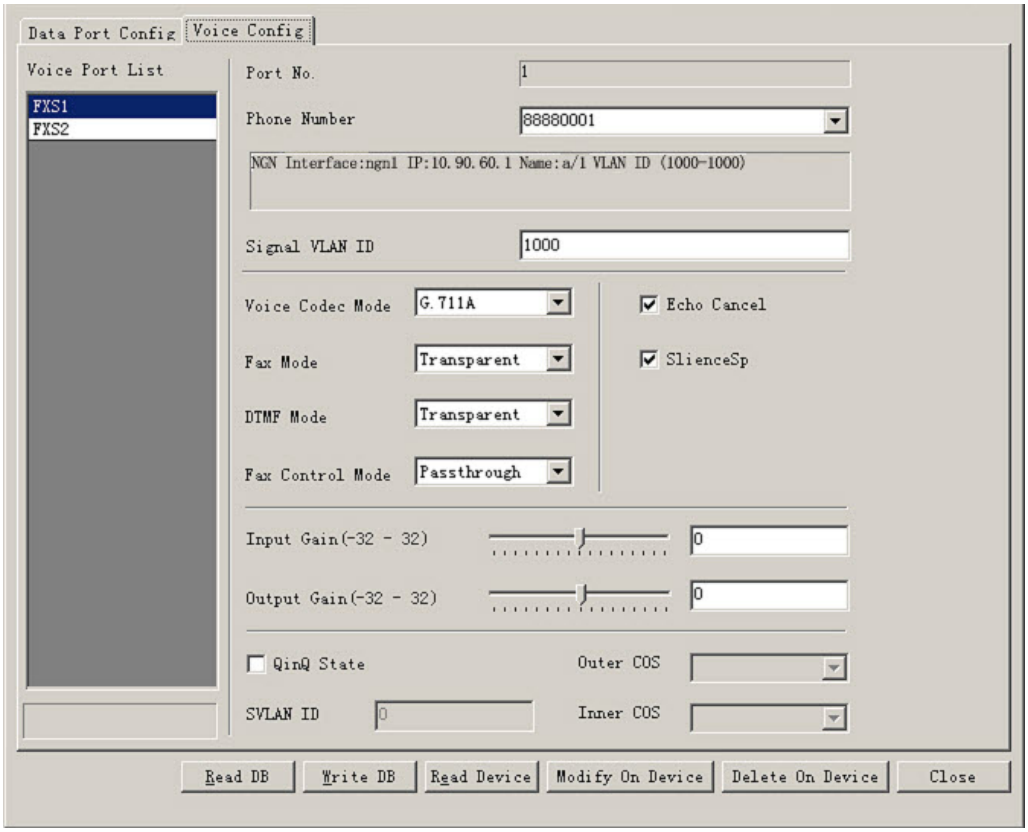


Figure 5-8 FXS1 voice configuration of the AN5506-04-B – H.248 example

3. Select **FXS2** in **Voice Port List** and configure the parameters according to the planning data in Table 5-2, as shown in Figure 5-9.

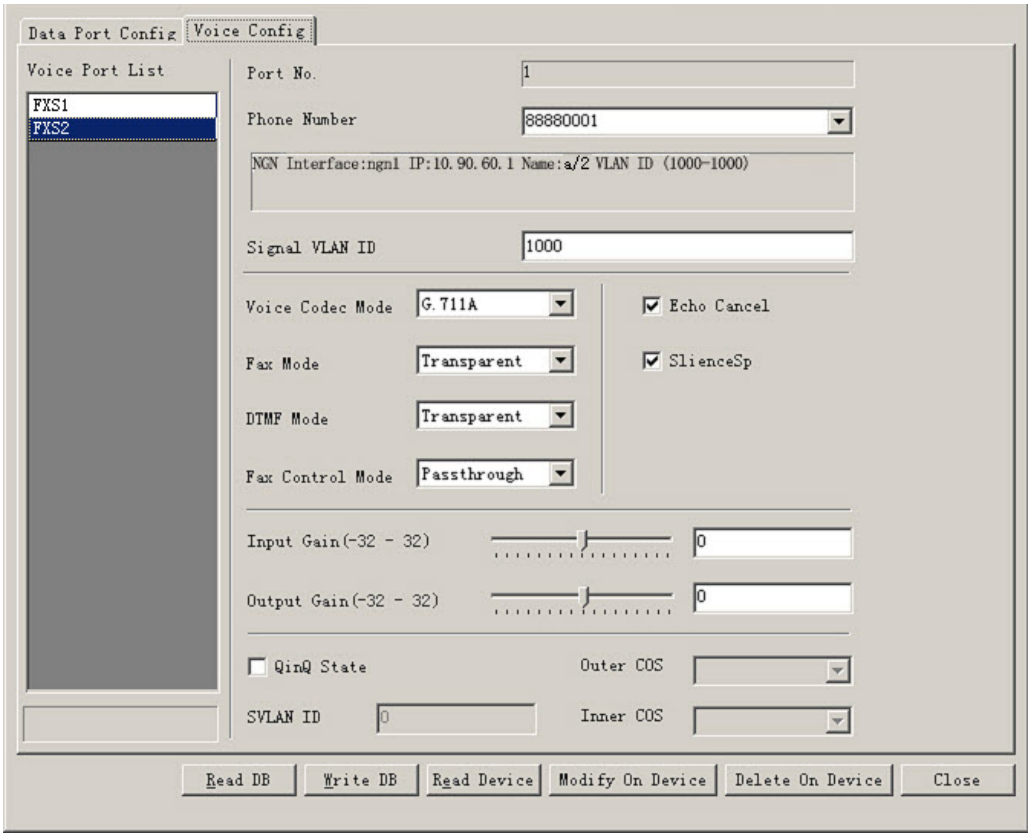


Figure 5-9 FXS2 voice configuration of the AN5506-04-B – H.248 example

4. Click the **Modify Data on Device** button to complete the voice service configuration for the **PON1-AN5506-04-B[1]**.
5. Click the GC8B card in the Object Tree pane to display all ONUs in the right pane. Right-click the **PON1-AN5506-10-B1[2]** ONU and select **Config→ Service Config**from the shortcut menu to bring up the configuration dialog box. Then click the **Voice Config** tab.
6. Select **FXS1** in **Voice Port List** and configure the parameters according to the planning data in Table 5-2, as shown in Figure 5-10.

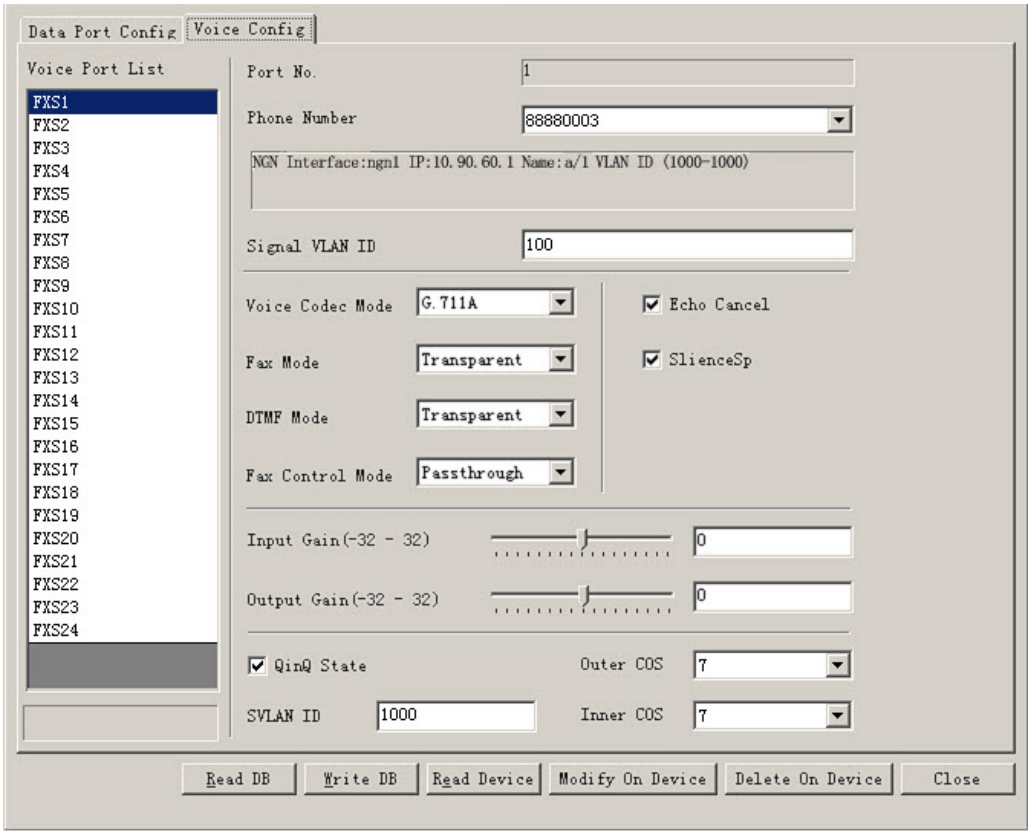


Figure 5-10 FXS1 voice configuration of the AN5506-10-B1 – H.248 example

7. Select **FXS2** in **Voice Port List** and configure the parameters according to the planning data in Table 5-2, as shown in Figure 5-11.

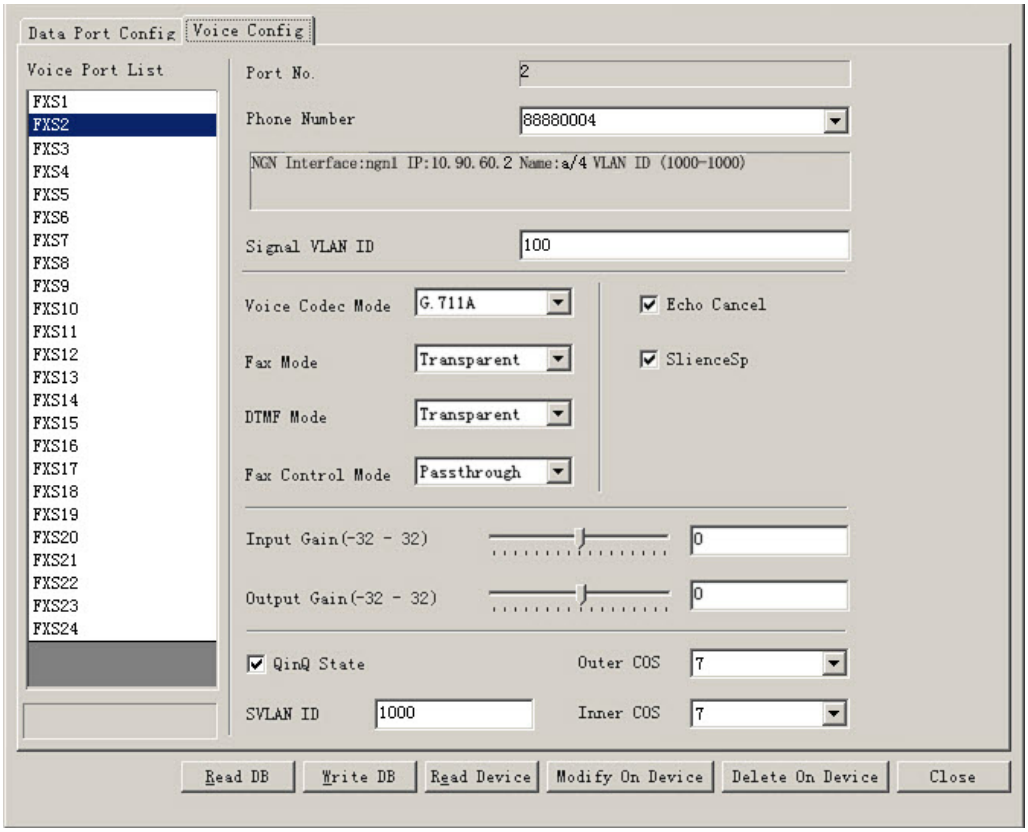


Figure 5-11 FXS2 voice configuration of the AN5506-10-B1 – H.248 example

8. Click the **Modify Data on Device** button to complete the voice service configuration for the**PON1-AN5506-10-B1[2]**.

5.1.3.8 End of Configuration

The subscribers under the FXS1 and FXS2 ports of the AN5506-04-B with the authorization No.1 and the subscribers under the FXS1 and FXS2 port of the AN5506-10-B1 with the authorization No.2 under the PON port 1 of the GC8B card in Slot 15 can access the voice service. Subscribers can call each other normally.

5.1.4 Configuring the Services in a Batch Manner

5.1.4.1 Planning Data

The AN5116-06B uses the HU1A card and GC8B card as the network-side interface card and client-side interface card respectively. The PUBA card is compulsory; the AN5506-04-B and AN5506-10-B1 are used as the remote end ONUs. The planning data are as follows:

Table 5-3 Planning data on the OLT side of the VoIP service based on the H.248 protocol (configuring in a batch manner)

Item		Description	Example	
ONU Information	ONU Type	The type of the ONU actually used.	AN5506-04-B	AN5506-10-B1
	Slot No.	The number of the actually used slot on the PON interface card.	15	
	PON No.	The number of the PON port actually used.	1	
	ONU Auth No.	Configure according to the network planning of the operator.	1	2
Local End Service VLAN	Service Name	Configure according to the network planning of the operator.	ngn1	
	Starting VLAN ID	The begin VLAN ID number of the uplink port service. Configure according to the network planning of the operator.	1000	
	VLAN ID End	The end VLAN ID number of the uplink port service. Configure according to the network planning of the operator.	1000	
	Interface No.	The number of the uplink port actually used.	20:SFP1	

Table 5-3 Planning data on the OLT side of the VoIP service based on the H.248 protocol (configuring in a batch manner) (Continued)

Item		Description	Example
	TAG / UNTAG	The TAG processing mode of the uplink service VLAN. There are two options: **TAG** and **UNTAG**. ◆ **UNTAG** means that when the uplink data packet passes the port, its tag will be automatically stripped and it keeps going in the untagged mode. And for the downlink data packet in the untagged mode, when passing the port, it will be attached with tag and it keeps going in the tagged mode. ◆ **TAG** means that when the uplink / downlink data packet passes the port, its tag will not be stripped and it keeps going in the tagged mode.	TAG
	Service Type	Select NGN for VoIP services.	NGN
	Slot Bind Mode	Select Auto Bind for service VLAN.	Auto Bind
NGN Uplink Interface	Signaling Service Name	This item should be consistent with the **Service Name** set in the **Local End Service VLAN** configuration.	ngn1
	Protocol Type	Select H.248 in this example.	H.248
	MGC1 IP Address / Back Up SIP Registrar Server Address	The IP address or domain name of the primary softswitch platform MGC.	10.80.20.1
	MGC1 Port No.	The communication port number of the primary softswitch platform MGC. The default value is 2944.	2944
	Keep-alive	Controls whether the ONU regularly sends keep-alive messages to the softswitch platform MGC. Options available are **Enable Active**, **Enable Passive** and **Disable**.	Enable Active

Table 5-3 Planning data on the OLT side of the VoIP service based on the H.248 protocol (configuring in a batch manner) (Continued)

Item		Description	Example
	Master / Slave DNS Server	The master / slave DNS IP address. You need to configure the DNS server when the MGC is configured as the domain name. When the MGC is configured as the IP address, this item is invalid.	-
	DHCP	Enable or disable the DHCP function. The default setting is Disable.	Disable

Table 5-4 Planning data on the ONU side of the VoIP service based on the H.248 protocol (configuring in a batch manner)

Item		Description	Example	
Bandwidth Config Profile	Profile Name	The name of the voice service bandwidth profile with an upper limit of 32 characters. Configure according to the network planning of the operator.	a	
	Service Type	Select VOIP in this example.	VOIP	
	Fixed Bandwidth (Kbyte/s)	Configure this item according to the operator's network planning. The default setting is 16.	16	
	Assured Bandwidth (Kbyte/s)	Configure this item according to the operator's network planning. The default setting is 0.	0	
	Maximum Bandwidth (Kbyte/s)	Configure this item according to the operator's network planning. The default setting is 64.	64	
ONU Configuration	Slot No.	The number of the actually used slot on the PON interface card.	15	15
	PON No.	The number of the PON port actually used.	1	1
	ONU No.	Select the authorization number of the ONU to be configured.	1	2
	GPON Bandwidth	Select the bandwidth profile to be bound with the ONU.	a	a

Table 5-4 Planning data on the ONU side of the VoIP service based on the H.248 protocol (configuring in a batch manner) (Continued)

Item		Description	Example	
ONU POTS Advanced Configure Profile	Profile Name	The name of the advanced profile of the ONU voice port with an upper limit of 20 characters, including numbers (0 to 9), letters (a to z and A to Z), and underlines. Configure according to the network planning of the operator.	c	
	Voice Codec Mode	Configure this item according to the operator's network planning. The default setting is G.711A.	G.711A	
	Fax Mode	Configure this item according to the operator's network planning; the default setting is Transparent.	Transparent	
	Silence Switch	Configure this item according to the operator's network planning; it is selected by default.	Enable	
	Echo Cancel	Configure this item according to the operator's network planning; it is selected by default.	Enable	
	Input Gain (DB)	Configure this item according to the operator's network planning. The default setting is 0.	0	
	Output Gain (DB)	Configure this item according to the operator's network planning. The default setting is 0.	0	
	DTMF Mode	Configure this item according to the operator's network planning; the default setting is Transparent.	Transparent	
	Fax Control Mode	Configure this item according to the operator's network planning; the default setting is Passthrough.	Passthrough	
ONU Voice Basic Configure	Slot No.	The number of the actually used slot on the PON interface card.	15	
	PON No.	The number of the PON port actually used.	1	
	ONU No.	Select the authorization number of the ONU to be configured.	1	2

Table 5-4 Planning data on the ONU side of the VoIP service based on the H.248 protocol (configuring in a batch manner) (Continued)

Item		Description	Example			
	IP Config Mode	Select static, PPPoE, or DHCP mode to get IP address. The default setting is static.	static		static	
	ONU Static Public IP	When the DHCP or the PPPoE function is enabled, the IP address assigned to the ONU dynamically will override the public IP address assigned to the ONU by the system. Configure according to the network planning of the operator.	10.90.60.1		10.90.60.2	
	ONU Static Public IP Mask	Configure according to the network planning of the operator.	255.255.0.0		255.255.0.0	
	ONU Static Public IP Gateway	Configure according to the network planning of the operator.	10.90.1.254		10.90.1.254	
ONU POTS Configure	Slot No.	The number of the actually used slot on the PON interface card.	15			
	PON No.	The number of the PON port actually used.	1			
	ONU No.	Select the authorization number of the ONU to be configured.	1		2	
	Port No.	Select the No. of the ONU port actually connected with the user's telephone.	1	2	1	2
	Port Enable	Select Enable.	Enable	Enable	Enable	Enable
	Signaling Service Name	This item should be consistent with the **Service Name** in the NGN Configuration.	ngn1	ngn1	ngn1	ngn1
	Signal VLAN ID	The voice service VLAN ID; it is the C-VLAN ID when the QinQ State is set to Enable.	1000	1000	100	100
	SVLAN State	Configure this item according to the operator’s network planning; the default setting is Disable.	Disable	Disable	Enable	Enable
	SVLAN ID	It is SVLAN ID when the QinQ is enabled. The SVLAN ID value should be within the uplink VLAN ID. It is invalid when the QinQ is disabled.	-	-	1000	1000

Table 5-4 Planning data on the ONU side of the VoIP service based on the H.248 protocol (configuring in a batch manner) (Continued)

Item		Description	Example			
	Voice Port Profile ID	Select the ONU pots advanced configuration profile to be bound with the ONU.	c	c	c	c
	Endpoint Domain Name	The domain name address of the gateway. Configure this item according to the operator's network planning.	10.90.60.1	10.90.60.1	10.90.60.2	10.90.60.2
	ONU Protocol Port No.	Configure this item according to the operator's network planning; the default setting is 2944.	2944	2944	2944	2944
	Endpoint User Name / SIP Telephone Number	The Termination ID corresponding to the port. Configure this item according to the operator's network planning.	a/1	a/2	a/3	a/4

5.1.4.2 Configuration Flow

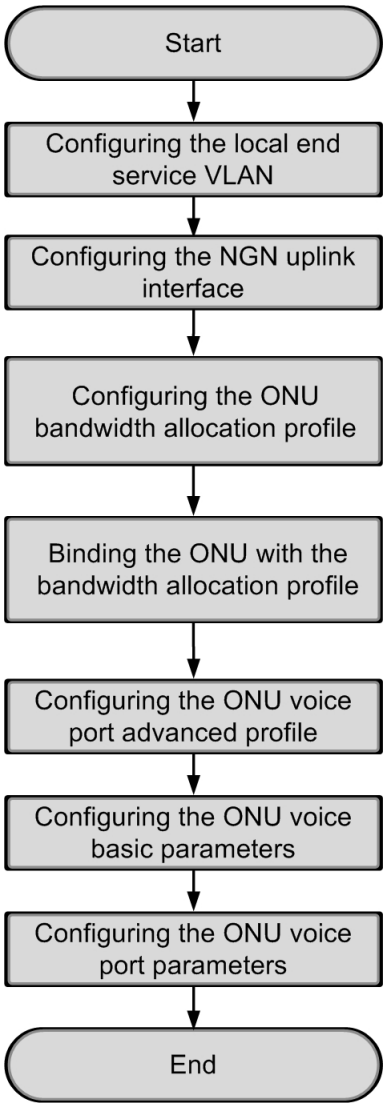


Figure 5-12 Flow chart for configuring the VoIP services in a batch manner - H.248

5.1.4.3 Configuring the Local End Service VLAN

Refer to Configuring the Local End Service VLAN for configuration procedures.

5.1.4.4 Configuring the NGN Uplink Interface

Refer to Configuring the NGN Uplink Interface for configuration procedures.

5.1.4.5 Configuring the ONU Bandwidth Allocation Profile

1. Right-click the active HSWA card in the **Object Tree** pane and select **Config→ GPON Service Bandwidth Config Profile** from the shortcut menu to access the **GPON Service Bandwidth Config Profile** window.
2. Click the button on the toolbar. In the **Please Input the Rows for Add:** dialog box that appears subsequently, type **1** and click **OK** to add a bandwidth allocation profile. Enter **a** in the **Profile Name** column.
3. Select profile **a**, and click a blank area in the right pane. Then click the button on the toolbar. In the **Please Input the Rows for Add:** dialog box that appears subsequently, type **1** and click **OK** to add a service.
4. Configure the parameters according to the planning data in Table 5-3.
5. Click the button on the toolbar to complete the configuration, as shown in Figure 5-13.

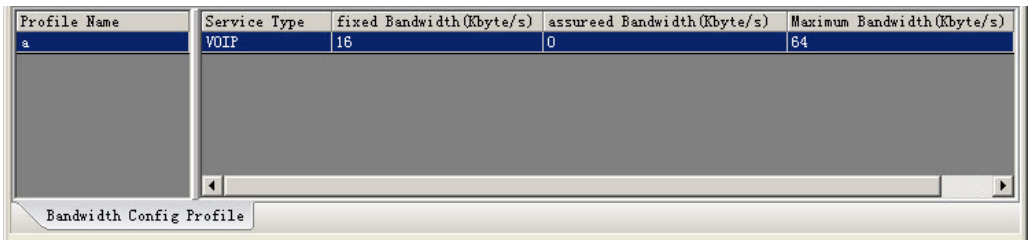


Figure 5-13 The ONU bandwidth allocation profile – H.248 example

5.1.4.6 Binding the ONU with the Bandwidth Allocation Profile

1. Right-click the system in the **Object Tree** pane, select **Config→Batch Configure→ONU Config** from the short-cut menu that appears to access the **ONU Config** window.
2. Click the **Set Object as Condition** button, select AN5506-04-B[1] and AN5506-10-B1[2] under the PON port 1 of the GC8B card in Slot 15 from the drop-down list of the Object, and click the **OK** button.
3. The detailed information of the object will be displayed in the right pane. Configure the parameters according to the planning data in Table 5-3, and select **a** in the drop-down lists of **GPON Bandwidth**.

4. Click the button on the toolbar to complete the configuration, as shown in Figure 5-14.

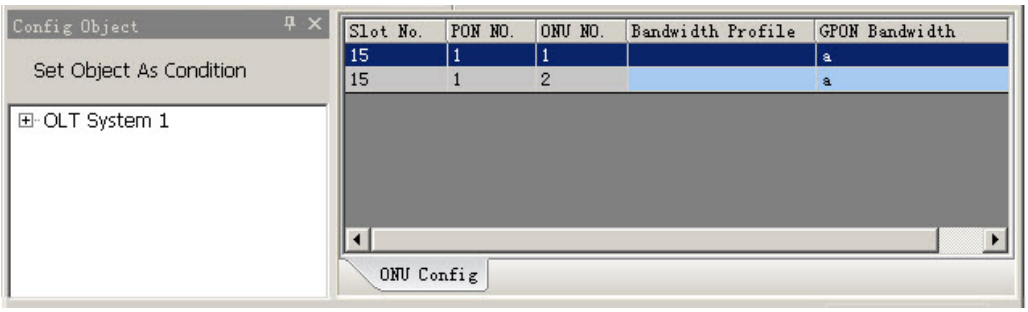


Figure 5-14 ONU configuration – H.248 example

5.1.4.7 Configuring the ONU Voice Port Advanced Profile

1. Right-click the system in the **Object Tree** pane, select **Config→Profile Definition→ONU POTS Advanced Configure Profile** to access the **ONU POTS Advanced Configure Profile** window.
2. Click the button on the toolbar. In the **Please Input the Rows for Add:** dialog box that appears subsequently, type **1** and click **OK** to add an ONU voice port advanced profile.
3. Configure the parameters according to the planning data in Table 5-3.
4. Click the button on the toolbar to complete the configuration, as shown in Figure 5-15.

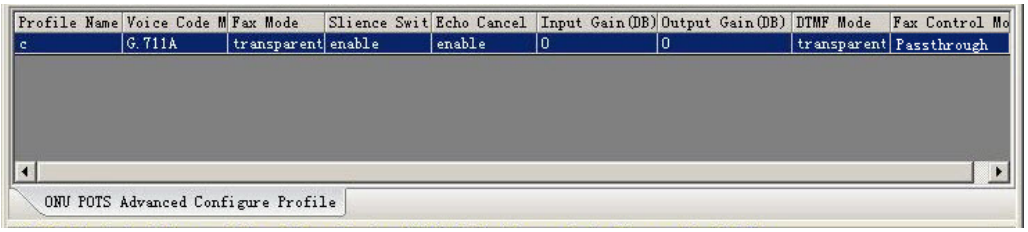


Figure 5-15 ONU voice port advanced configuration profile – H.248 example

5.1.4.8 Configuring the Basic Voice Parameters for the ONU

1. Right-click the system in the **Object Tree** pane and select **Config→Batch Configure→ONU Voice Basic Configure** from the short-cut menu that appears to access the **ONU Voice Basic Configure** window.
2. Click the **Set Object as Condition** button, select AN5506-04-B[1] and AN5506-10-B1[2] under the PON port 1 of the GC8B card in Slot 15 from the drop-down list of the Object, and click the **OK** button.
3. The detailed information about the object will be displayed in the right pane. Configure the parameters according to the planning data in Table 5-4.
4. Click the button on the toolbar to complete the configuration, as shown in Figure 5-16.

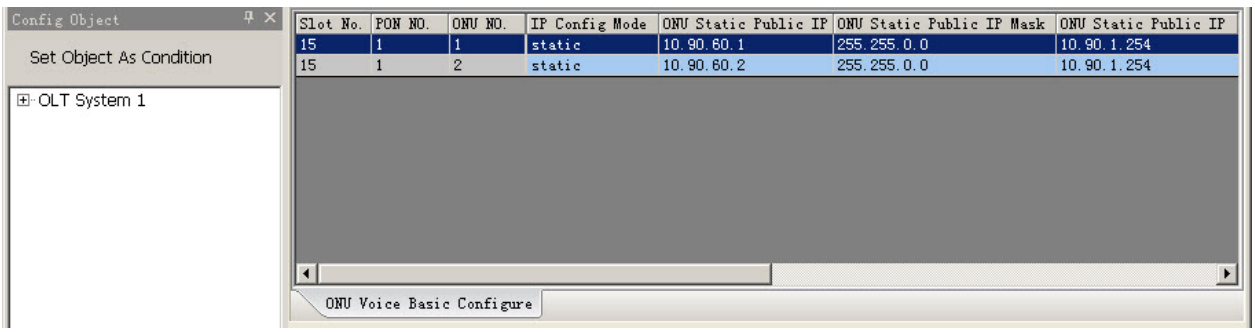
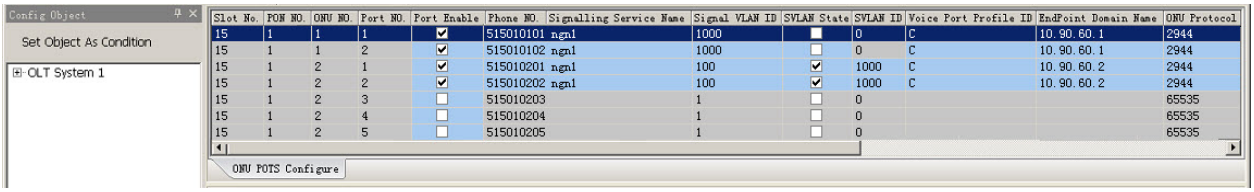


Figure 5-16 Basic voice configuration for the ONU – H.248 example

5.1.4.9 Configuring the ONU Voice Port Parameters

1. Right-click the system in the **Object Tree** pane and select **Config→Batch Configure→ONU POTS Configure** from the short-cut menu that appears to access the **ONU POTS Configure** window.
2. Click the **Set Object as Condition** button, select AN5506-04-B[1] and AN5506-10-B1[2] under the PON port 1 of the GC8B card in Slot 15 from the drop-down list of the Object, and click the **OK** button.
3. The detailed information about the object will be displayed in the right pane. Configure the parameters according to the planning data in Table 5-4.
4. Click the button on the toolbar to complete the configuration, as shown in Figure 5-17.



Slot No.	PON NO.	ONU NO.	Port NO.	Port Enable	Phone NO.	Signalling Service Name	Signal VLAN ID	SVLAN State	SVLAN ID	Voice Port Profile ID	EndPoint Domain Name	ONU Protocol
15	1	1	1	☑	515010101	ngn1	1000	☐	0	C	10.90.60.1	2944
15	1	1	2	☑	515010102	ngn1	1000	☐	0	C	10.90.60.1	2944
15	1	2	1	☑	515010201	ngn1	100	☑	1000	C	10.90.60.2	2944
15	1	2	2	☑	515010202	ngn1	100	☑	1000	C	10.90.60.2	2944
15	1	2	3	☐	515010203		1	☐	0			65535
15	1	2	4	☐	515010204		1	☐	0			65535
15	1	2	5	☐	515010205		1	☐	0			65535

Figure 5-17 ONU voice port configuration – H.248 example

5.1.4.10 End of Configuration

The subscribers under the FXS1 and FXS2 ports of the AN5506-04-B with the authorization No.1 and the subscribers under the FXS1 and FXS2 ports of the AN5506-10-B1 with the authorization No.2 under the PON port No.1 of the GC8B card in Slot 15 can access the voice service. Subscribers can call each other normally.

5.2 Configuring the VoIP Services – SIP Example

5.2.1 Configuration Rules

- When the softswitch platform uses the SIP to control the access terminals, you should set the MGC protocol type to SIP for VoIP services, and set the protocol port No. of the access registrar and the proxy server to 5060.
- In the configuration of VoIP service VLAN, if you use single VLAN, you should make sure the signaling VLAN ID is within the range of the local end service VLAN ID. If you use stacked VLANs, you should assign the S-VLAN IDs within the range of the local end service VLAN IDs and assign the signaling VLAN IDs as needed.

5.2.2 Network Diagram

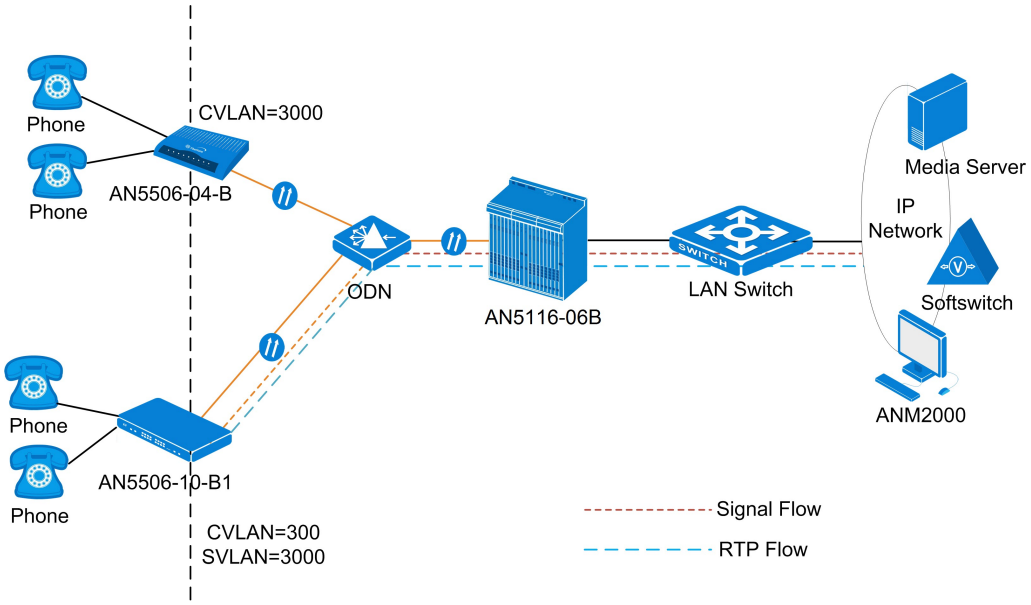


Figure 5-18 The VoIP service network based on the SIP

As shown in the figure above, the GPON system conducts signaling interaction with the softswitch based on the SIP to implement call control. The ONU uses the standard speech encoding technology to convert the subscriber's voice signals into IP packets. These IP packets are uplinked by the OLT to the IP network for transmission. Thus VoIP services are implemented for the subscribers under the GPON system.

5.2.3 Configuring the Services Respectively

5.2.3.1 Planning Data

The AN5116-06B uses the HU1A card and GC8B card as the network-side interface card and client-side interface card respectively. The PUBA card is compulsory; the AN5506-04-B and AN5506-10-B1 are used as the remote end ONUs. The planning data are as follows:

Table 5-5 Planning data on the OLT side of the VoIP service based on the SIP (configuring respectively)

Item		Description	Example	
ONU Information	ONU Type	Configure according to the type of the ONU actually used.	AN5506-04-B	AN5506-10-B1
	Slot No.	Configure this item according to the No. of the actually used slot on the PON interface card.	15	
	PON No.	Configure according to the No. of the PON port actually used.	1	
	ONU Auth No.	Configure according to the network planning of the operator.	1	2
Local End Service VLAN	Service Name	Configure according to the network planning of the operator.	ngn3	
	Starting VLAN ID	The start service VLAN ID of the uplink interface. Configure according to the network planning of the operator.	3000	
	VLAN ID End	The end service VLAN ID of the uplink interface. Configure according to the network planning of the operator.	3000	
	Interface No.	Configure according to the No. of the uplink port actually used.	20:SFP1	

Table 5-5 Planning data on the OLT side of the VoIP service based on the SIP (configuring respectively) (Continued)

Item		Description	Example
	TAG / UNTAG	The TAG processing mode of the uplink service VLAN. There are two options: **TAG** and **UNTAG**. ◆ **UNTAG** means that when the uplink data packet passes the port, its tag will be automatically stripped and it keeps going in the untagged mode. And for the downlink data packet in the untagged mode, when passing the port, it will be attached with tag and it keeps going in the tagged mode. ◆ **TAG** means that when the uplink / downlink data packet passes the port, its tag will not be stripped and it keeps going in the tagged mode.	TAG
	Service Type	Select ngn for VoIP services.	ngn
	Slot Bind Mode	Select Auto Bind for service VLAN.	Auto Bind
NGN Uplink Interface	Signaling Service Name	This item should be consistent with the Service Name set in the **Local End Service VLAN** configuration.	ngn3
	Protocol Type	Select SIP in this example.	SIP
	SIP Registrar Server Address	The IP address or domain name of the SIP registrar.	10.80.20.3
	SIP Registrar Server Port	The port number of the SIP registrar. The default setting is 5060.	5060
	SIP Proxy Server Address	The IP address or domain name of the SIP proxy server.	10.80.20.3

Table 5-5 Planning data on the OLT side of the VoIP service based on the SIP (configuring respectively) (Continued)

Item		Description	Example			
	SIP Proxy Server Port	The port number of the SIP proxy server. The default setting is 5060.	5060			
	SIP Expires (S)	The timeout period of the SIP. The value ranges from 60 to 3600; the unit is second. The default setting is 3600 seconds.	3600			
NGN Configuration	Signaling Service Name	This item should be consistent with the Service Name set in the **Local End Service VLAN** configuration.	ngn3			
	Telephone Number	The logical number within the system, for configuring the index in the system. It is recommended to configure this item as the actual phone number defined by the softswitch. The value ranges from 1 to 99999999.	888800-01	888800-02	888800-03	888800-04
	ONU Public IP	When the DHCP or the PPPoE function is enabled, the IP address assigned to the ONU dynamically will override the public IP address assigned to the ONU by the system. Configure according to the network planning of the operator.	10.90.60.1		10.90.60.2	
	ONU Public IP Subnet Mask	Configure according to the network planning of the operator.	255.255.0.0		255.255.0.0	
	ONU Public IP Gateway	Configure according to the network planning of the operator.	10.90.1.254		10.90.1.254	
	SIP Telephone No.	Configure according to the network planning of the operator.	888800-01	888800-02	888800-03	888800-04

Table 5-5 Planning data on the OLT side of the VoIP service based on the SIP (configuring respectively) (Continued)

Item		Description	Example			
	SIP User Name	The user name of the SIP endpoint and the SIP registrar. Configure this item according to the operator's network planning.	test1	test2	test3	test4
	SIP User Password	The user password of the SIP endpoint and the SIP registrar. Configure this item according to the operator's network planning.	test1	test2	test3	test4

Table 5-6 Planning data on the ONU side of the VoIP service based on the SIP (configuring respectively)

Item		Description	Example (AN5506-04-B)		Example (AN5506-10-B1)	
ONU VoIP Bandwidth Configuration	Service Type	Select voip in this example.	voip		voip	
	Fixed Bandwidth (Kbyte/s)	Configure this item according to the operator's network planning. The default setting is 16.	16		16	
	Assured Bandwidth (Kbyte/s)	Configure this item according to the operator's network planning. The default setting is 0.	0		0	
	Maximum Bandwidth (Kbyte/s)	Configure this item according to the operator's network planning. The default setting is 64.	64		64	
ONU VoIP Service Configuration	Port No.	The No. of the port on the ONU that is connected with the subscriber phone physically.	1	2	1	2
	Phone Number	This item should be consistent with the Telephone Number in the NGN Configuration.	888800-01	888800-02	888800-03	888800-04
	Signal VLAN ID	The voice service VLAN ID; it is the C-VLAN ID when the QinQ State is set to Enable.	3000	3000	300	300

Table 5-6 Planning data on the ONU side of the VoIP service based on the SIP (configuring respectively) (Continued)

Item		Description	Example (AN5506-04-B)		Example (AN5506-10-B1)	
	Voice Codec Mode	Configure this item according to the operator's network planning. The default setting is G.711A.	G.711A	G.711A	G.711A	G.711A
	Fax Model	Configure this item according to the operator's network planning; the default setting is Transparent.	Trans-parent	Trans-parent	Trans-parent	Trans-parent
	DTMF Mode	Configure this item according to the operator's network planning; the default setting is Transparent.	Trans-parent	Trans-parent	Trans-parent	Trans-parent
	Fax Control Mode	Configure this item according to the operator's network planning; the default setting is Passthrough.	Pass-through	Pass-through	Pass-through	Pass-through
	Echo Cancel	Configure this item according to the operator's network planning; it is selected by default.	Selected	Selected	Selected	Selected
	Silence Sp	Configure this item according to the operator's network planning; it is selected by default.	Selected	Selected	Selected	Selected
	Input Gain	Configure this item according to the operator's network planning. The default setting is 0.	0	0	0	0
	Output Gain	Configure this item according to the operator's network planning. The default setting is 0.	0	0	0	0
	QinQ State	Configure this item according to the operator's network planning; the default setting is Disable.	Disable	Disable	Enable	Enable

Table 5-6 Planning data on the ONU side of the VoIP service based on the SIP (configuring respectively) (Continued)

Item		Description	Example (AN5506-04-B)		Example (AN5506-10-B1)	
	SVLAN ID	It is SVLAN ID when the QinQ is enabled. The SVLAN ID value should be within the uplink VLAN ID. It is invalid when the QinQ is disabled.	-	-	3000	3000
	Outer COS	It is the outer VLAN priority when the QinQ is enabled; it is invalid when QinQ is disabled.	-	-	7	7
	Inner COS	It is the inner VLAN priority when the QinQ is enabled; it is invalid when QinQ is disabled.	-	-	7	7

5.2.3.2 Configuration Flow

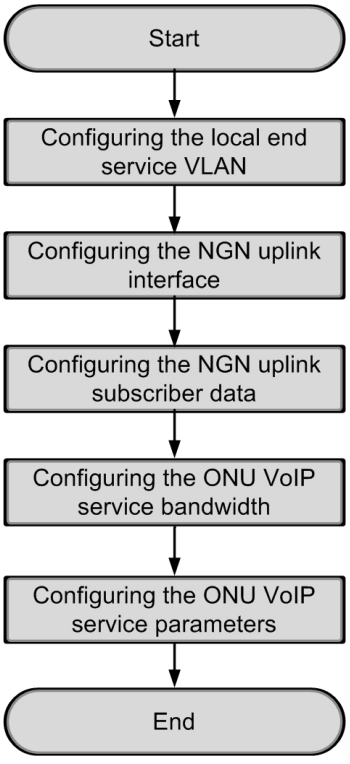


Figure 5-19 Flow chart for configuring the VoIP services respectively-SIP

5.2.3.3 Configuring the Local End Service VLAN

1. Right-click the active HSWA card in the **Object Tree** pane and select **Config→Local VLAN→Local End Service VLAN** from the shortcut menu to access the **Local End Service VLAN** window.
2. Click the button on the toolbar. In the **Please Input the Rows for Add:** dialog box that appears subsequently, type **1** and click **OK** to add a local VLAN.
3. Configure the parameters according to the planning data in Table 5-5.
4. Click the button on the toolbar to complete the configuration, as shown in Figure 5-20.

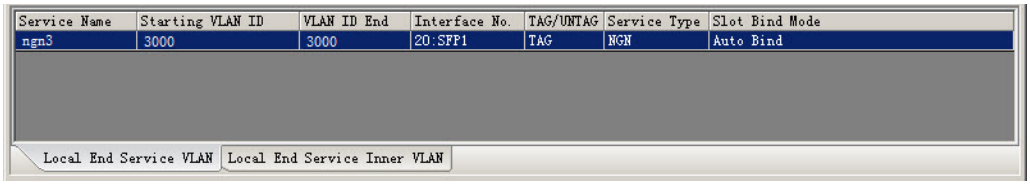


Figure 5-20 Configuring the local end service VLAN - SIP example

5.2.3.4 Configuring the NGN Uplink Interface

1. Right-click the active HSWA card in the **Object Tree**pane and select **Voice Config→NGN Interface** from the shortcut menu to access the **NGN Interface** window.
2. Click the button on the toolbar. In the **Please Input the Rows for Add:** dialog box that appears subsequently, type **1** and click **OK** to add an NGN uplink interface.
3. Configure the parameters according to the planning data in Table 5-5.
4. Click the button on the toolbar to complete the configuration, as shown in Figure 5-21.

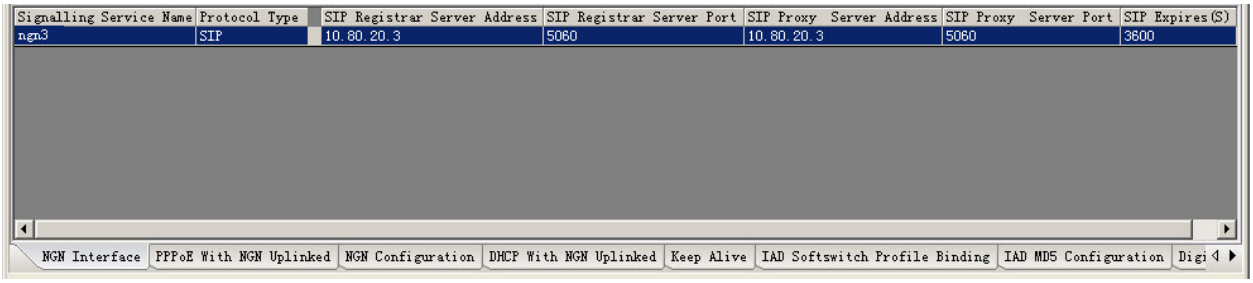


Figure 5-21 Configuring the NGN uplink interface - SIP example

5.2.3.5 Configuring the NGN Uplink Subscriber Data

1. Right-click the active HSWA card in the **Object Tree**pane and select **Voice Config→NGN Configuration** from the shortcut menu to access the **NGN Configuration** window.
2. Click the  button on the toolbar. In the **Please Input the Rows for Add:** dialog box that appears subsequently, type **4** and click **OK** to add four NGN uplink subscriber information entries.
3. Configure the parameters according to the planning data in Table 5-5.
4. Click the  button on the toolbar to complete the configuration, as shown in Figure 5-22.

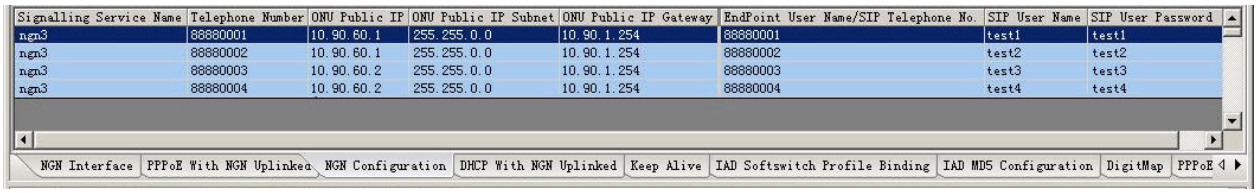


Figure 5-22 Configuring the NGN uplink subscriber data - SIP example

5.2.3.6 Configuring the VoIP Service Bandwidth of the ONU

1. Click the GC8B card in the **Object Tree** pane to display all ONUs connected to the GC8B card in the right pane. Right-click the **PON1-AN5506-04-B[1]** ONU and select **Config→Bandwidth config** from the shortcut menu to access the **Bandwidth Config** window.

2. Click the button on the toolbar. In the **Please Input the Rows for Add:** dialog box that appears subsequently, type **1** and click **OK** to add a VoIP service.
3. Configure the parameters according to the planning data in Table 5-6.
4. Click the button on the toolbar to complete the configuration, as shown in Figure 5-23.

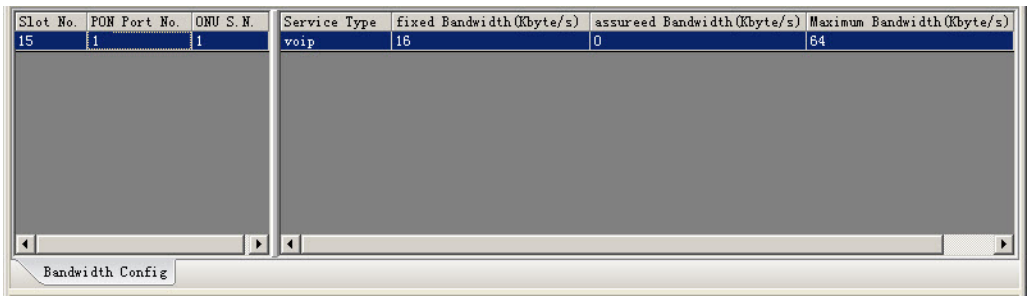


Figure 5-23 AN5506-04-B bandwidth configuration – SIP example

5. Configure the bandwidth in the same way for the PON1-AN5506-10-B1[2] of the GC8B[15] card, as shown in Figure 5-24.

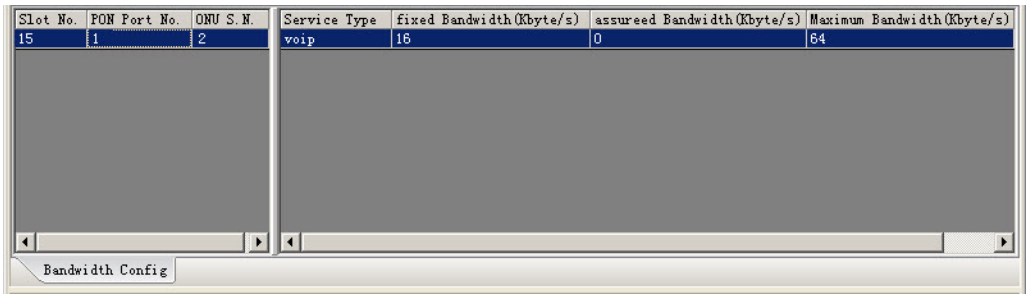


Figure 5-24 AN5506-10-B1 bandwidth configuration – SIP example

5.2.3.7 Configuring the VoIP Service Parameters of the ONU

1. Click the GC8B card in the **Object Tree** pane to display all ONUs connected to the GC8B card in the right pane. Right-click the **PON1-AN5506-04-B[1]** ONU and select **Config→Service Config** from the shortcut menu to bring up the configuration dialog box. Then click the **Voice Config** tab to access the Voice Config dialog box.
2. Select **FXS1** in **Voice Port List** and configure the parameters according to the planning data in Table 5-6, as shown in Figure 5-25.

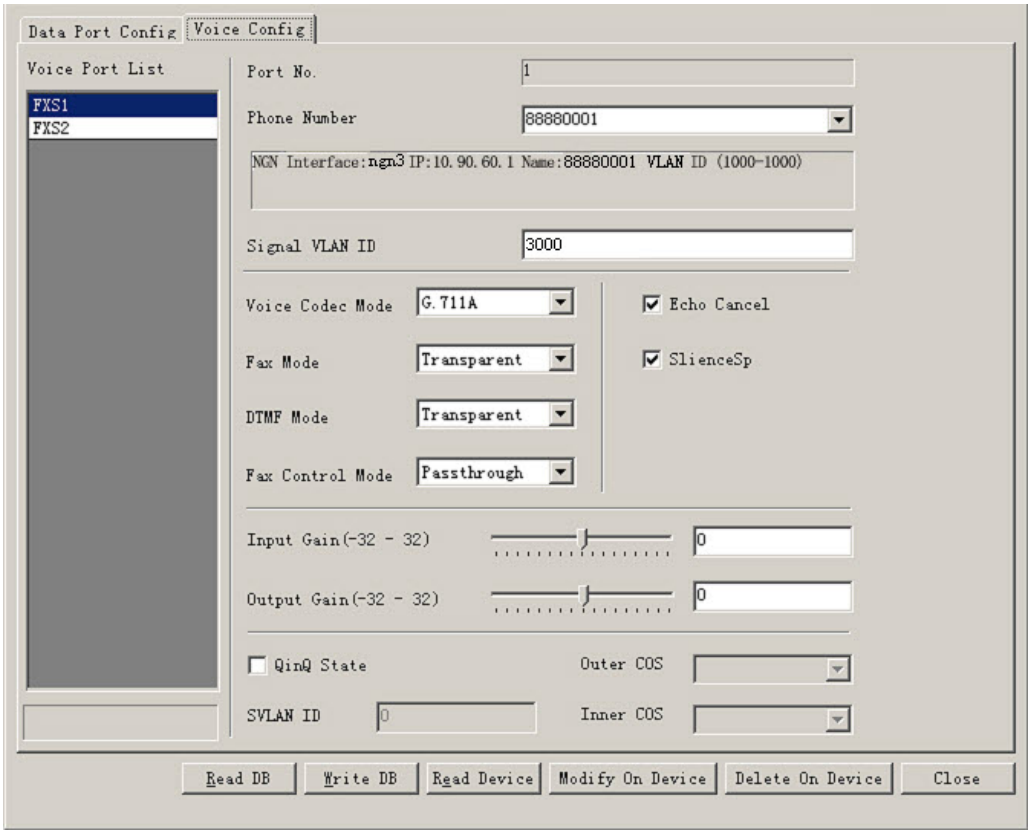


Figure 5-25 FXS1 voice configuration of the AN5506-04-B – SIP example

3. Select **FXS2** in **Voice Port List** and configure the parameters according to the planning data in Table 5-6, as shown in Figure 5-26.

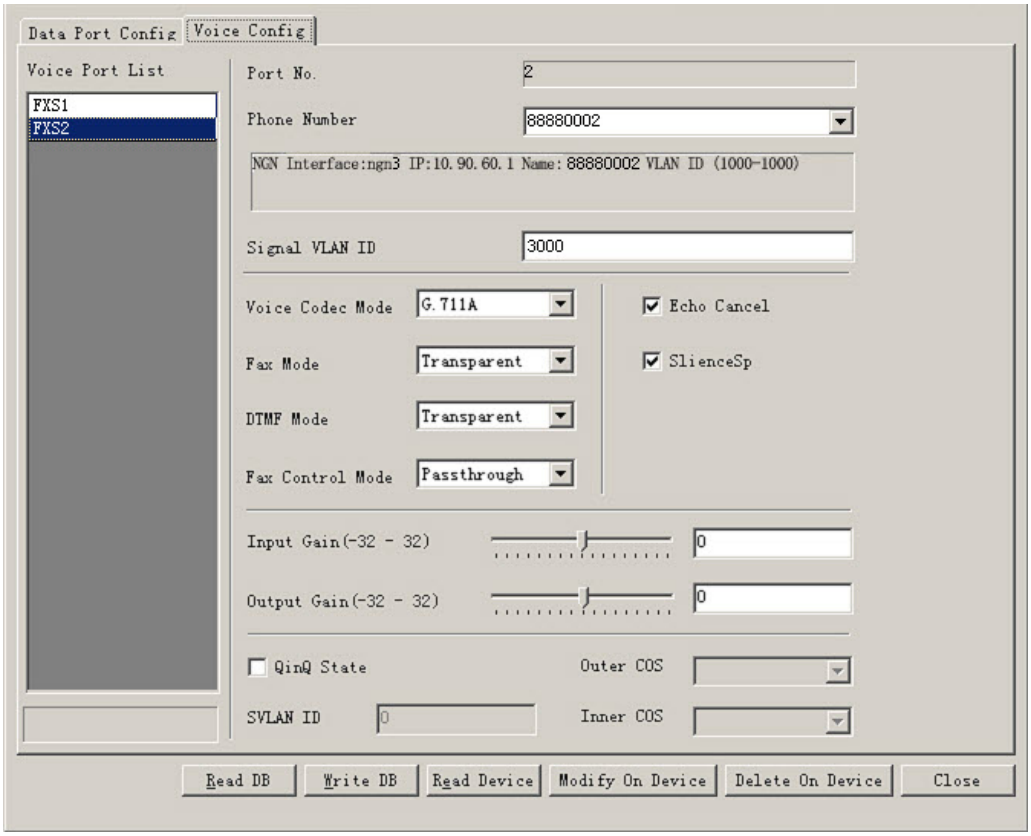


Figure 5-26 FXS2 voice configuration of the AN5506-04-B – SIP example

4. Click the **Modify Data on Device** button to complete the voice service configuration for the **PON1-AN5506-04-B[1]**.
5. Click the GC8B card in the Object Tree pane to display all ONUs in the right pane. Right-click the **PON1-AN5506-10-B1[2]** ONU and select **Config→ Service Config**from the shortcut menu to bring up the configuration dialog box. Then click the **Voice Config** tab to bring up the **Voice Config** dialog box.
6. Select **FXS1** in **Voice Port List** and configure the parameters according to the planning data in Table 5-6, as shown in Figure 5-27.

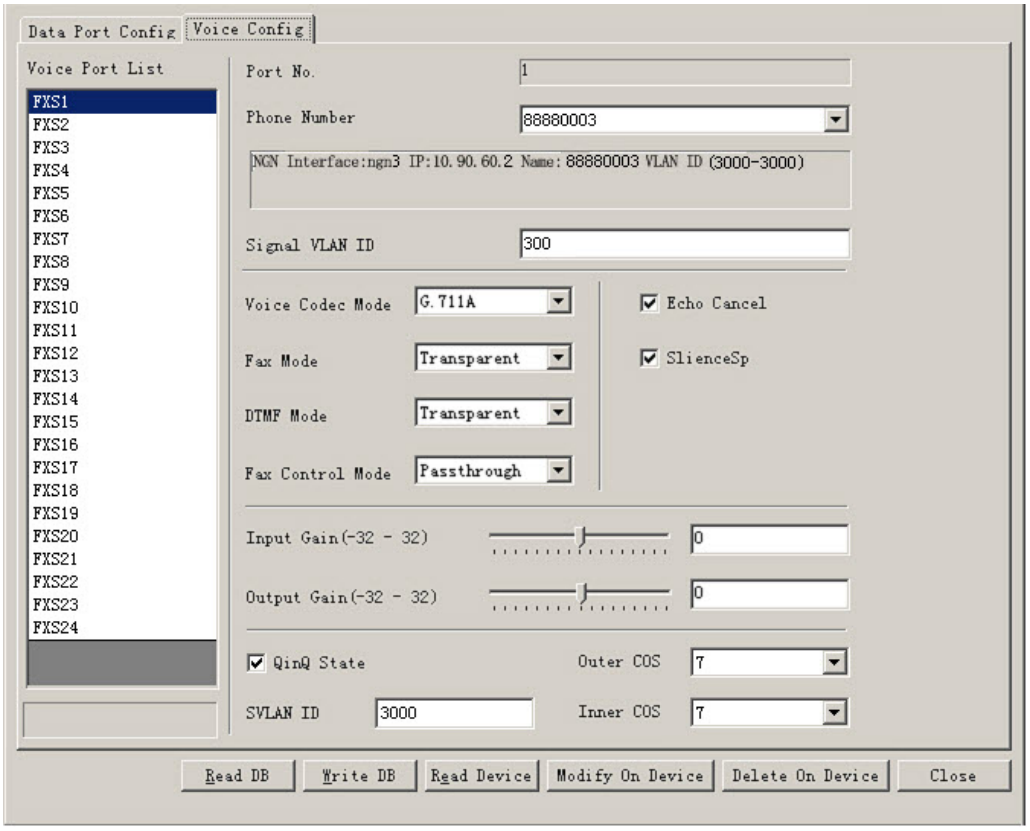


Figure 5-27 FXS1 voice configuration of the AN5506-10-B1 – SIP example

7. Select **FXS2** in **Voice Port List** and configure the parameters according to the planning data in Table 5-6, as shown in Figure 5-28.

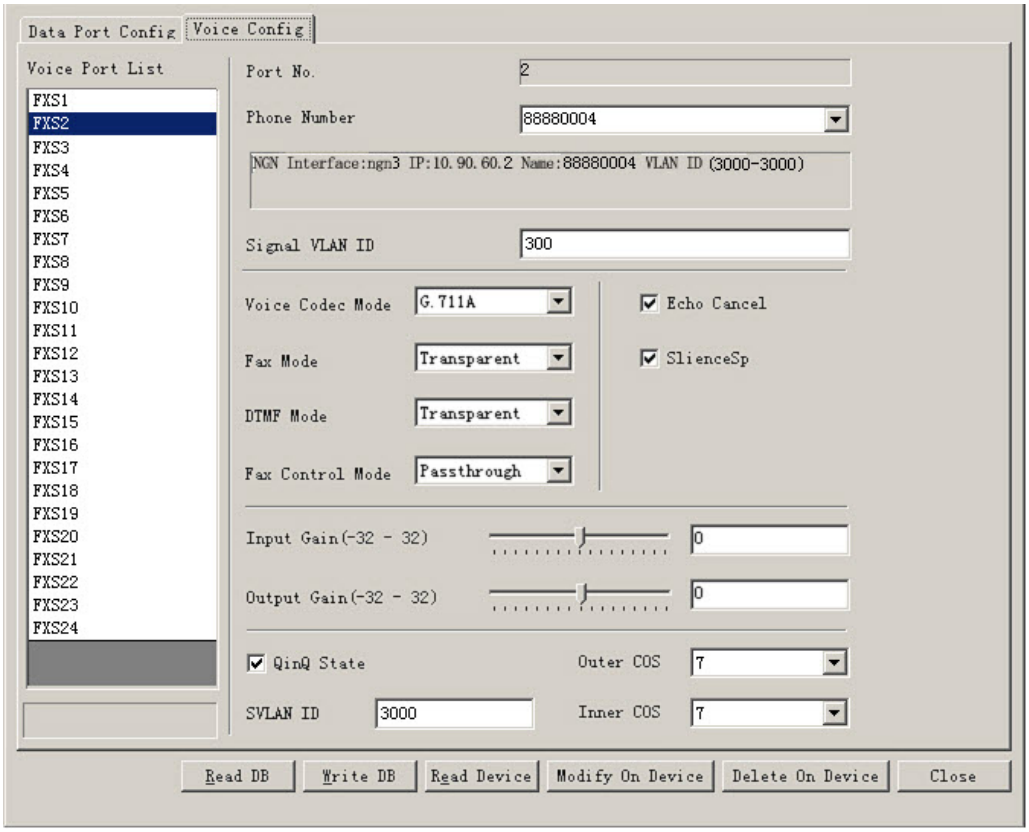


Figure 5-28 FXS2 voice configuration of the AN5506-10-B1 – SIP example

8. Click the **Modify Data on Device** button to complete the voice service configuration for the**PON1-AN5506-10-B1[2]**.

5.2.3.8 End of Configuration

The subscribers under the FXS1 and FXS2 ports of the AN5506-04-B with the authorization No.1 and the subscribers under the FXS1 and FXS2 ports of the AN5506-10-B1 with the authorization No.2 under the PON port No.1 of the GC8B card in Slot 15 can access the voice service. Subscribers can call each other normally.

5.2.4 Configuring the Services in a Batch Manner

5.2.4.1 Planning Data

The AN5116-06B uses the HU1A card and GC8B card as the network-side interface card and client-side interface card respectively. The PUBA card is compulsory; the AN5506-04-B and AN5506-10-B1 are used as the remote end ONUs. The planning data are as follows:

Table 5-7 Planning data on the OLT side of the VoIP service based on the SIP (configuring in a batch manner)

Item		Description	Example	
ONU Information	ONU Type	The type of the ONU actually used.	AN5506-04-B	AN5506-10-B1
	Slot No.	The number of the actually used slot on the PON interface card.	15	
	PON No.	The number of the PON port actually used.	1	
	ONU Auth No.	Configure according to the network planning of the operator.	1	2
Local End Service VLAN	Service Name	Configure according to the network planning of the operator.	ngn3	
	Starting VLAN ID	The begin VLAN ID number of the uplink port service. Configure according to the network planning of the operator.	3000	
	VLAN ID End	The end VLAN ID number of the uplink port service. Configure according to the network planning of the operator.	3000	
	Interface No.	The number of the uplink port actually used.	20:SFP1	

Table 5-7 Planning data on the OLT side of the VoIP service based on the SIP (configuring in a batch manner) (Continued)

Item		Description	Example
	TAG / UNTAG	The TAG processing mode of the uplink service VLAN. There are two options: **TAG** and **UNTAG**. ◆ **UNTAG** means that when the uplink data packet passes the port, its tag will be automatically stripped and it keeps going in the untagged mode. And for the downlink data packet in the untagged mode, when passing the port, it will be attached with tag and it keeps going in the tagged mode. ◆ **TAG** means that when the uplink / downlink data packet passes the port, its tag will not be stripped and it keeps going in the tagged mode.	TAG
	Service Type	Select NGN for VoIP services.	NGN
	Slot Bind Mode	Select Auto Bind for service VLAN.	Auto Bind
NGN Uplink Interface	Signaling Service Name	This item should be consistent with the **Service Name** set in the **Local End Service VLAN** configuration.	ngn3
	Protocol Type	Select SIP in this example.	SIP
	MGC1 IP Address / Back Up SIP Registrar Server Address	The IP address or domain name of the SIP registrar.	10.80.20.3
	SIP Registrar Server Port	The port number of the SIP registrar. The default setting is 5060.	5060
	SIP Proxy Server Address	The IP address or domain name of the SIP proxy server.	10.80.20.3
	SIP Proxy Server Port	The port number of the SIP proxy server. The default setting is 5060.	5060

Table 5-7 Planning data on the OLT side of the VoIP service based on the SIP (configuring in a batch manner) (Continued)

Item		Description	Example
	SIP Expires (S)	The timeout period of the SIP. The value ranges from 60 to 3600; the unit is second. The default setting is 3600 seconds.	3600

Table 5-8 Planning data on the ONU side of the VoIP service based on the SIP (configuring in a batch manner)

Item		Description	Example (AN5506-04-B)	Example (AN5506-10-B1)
Bandwidth Config Profile	Profile Name	The name of the voice service bandwidth profile with an upper limit of 32 characters. Configure according to the network planning of the operator.	a	
	Service Type	Select VOIP.	VOIP	
	Fixed Bandwidth (Kbyte/s)	Configure this item according to the operator's network planning. The default setting is 16.	16	
	Assured Bandwidth (Kbyte/s)	Configure this item according to the operator's network planning. The default setting is 0.	0	
	Maximum Bandwidth (Kbyte/s)	Configure this item according to the operator's network planning. The default setting is 64.	64	
ONU Configuration	Slot No.	The number of the actually used slot on the PON interface card.	15	15
	PON No.	The number of the PON port actually used.	1	1
	ONU No.	Select the authorization number of the ONU to be configured.	1	2
	GPON Bandwidth	Select the bandwidth profile to be bound with the ONU.	a	a

Table 5-8 Planning data on the ONU side of the VoIP service based on the SIP (configuring in a batch manner) (Continued)

Item		Description	Example (AN5506-04-B)	Example (AN5506-10-B1)
ONU POTS Advanced Configure Profile	Profile Name	The name of the advanced profile of the ONU voice port with an upper limit of 20 characters, including numbers (0 to 9), letters (a to z and A to Z), and underlines. Configure according to the network planning of the operator.	c	
	Voice Codec Mode	Configure this item according to the operator's network planning. The default setting is G.711A.	G.711A	
	Fax Mode	Configure this item according to the operator's network planning; the default setting is Transparent.	Transparent	
	Silence Switch	Configure this item according to the operator's network planning; it is selected by default.	Enable	
	Echo Cancel	Configure this item according to the operator's network planning; it is selected by default.	Enable	
	Input Gain (DB)	Configure this item according to the operator's network planning. The default setting is 0.	0	
	Output Gain (DB)	Configure this item according to the operator's network planning. The default setting is 0.	0	
	DTMF Mode	Configure this item according to the operator's network planning; the default setting is Transparent.	Transparent	
	Fax Control Mode	Configure this item according to the operator's network planning; the default setting is Passthrough.	Passthrough	
ONU Voice Basic Configure	Slot No.	The number of the actually used slot on the PON interface card.	15	
	PON No.	The number of the PON port actually used.	1	

Table 5-8 Planning data on the ONU side of the VoIP service based on the SIP (configuring in a batch manner) (Continued)

Item		Description	Example (AN5506-04-B)		Example (AN5506-10-B1)	
	ONU No.	Select the authorization number of the ONU to be configured.	1		2	
	IP Configure Mode	Select static, PPPoE, or DHCP mode to get IP address. The default setting is static.	static		static	
	ONU Static Public IP	When the DHCP or the PPPoE function is enabled, the IP address assigned to the ONU dynamically will override the public IP address assigned to the ONU by the system. Configure according to the network planning of the operator.	10.90.60.1		10.90.60.2	
	ONU Static Public IP Mask	Configure according to the network planning of the operator.	255.255.0.0		255.255.0.0	
	ONU Static Public IP Gateway	Configure according to the network planning of the operator.	10.90.1.254		10.90.1.254	
ONU POTS Configure	Slot No.	The number of the actually used slot on the PON interface card.	15			
	PON No.	The number of the PON port actually used.	1			
	ONU No.	Select the authorization number of the ONU to be configured.	1		2	
	Port No.	The number of the ONU port actually connected with the user's telephone.	1	2	1	2
	Port Enable	Select Enable.	Enable	Enable	Enable	Enable
	Signaling Service Name	This item should be consistent with the **Service Name** in the NGN Configuration.	ngn3	ngn3	ngn3	ngn3
	Signal VLAN ID	The voice service VLAN ID; it is the C-VLAN ID when the QinQ State is set to Enable.	3000	3000	300	300
	SVLAN State	Configure this item according to the operator’s network planning; the default setting is Disable.	Disable	Disable	Enable	Enable

Table 5-8 Planning data on the ONU side of the VoIP service based on the SIP (configuring in a batch manner) (Continued)

Item		Description	Example (AN5506-04-B)		Example (AN5506-10-B1)	
	SVLAN ID	It is SVLAN ID when the QinQ is enabled. The SVLAN ID value should be within the uplink VLAN ID. It is invalid when the QinQ is disabled.	-	-	3000	3000
	Voice Port Profile ID	Select the ONU pots advanced configuration profile to be bound with the ONU.	c	c	c	c
	ONU Protocol Port No.	Configure this item according to the operator's network planning; the default setting is 5060.	5060	5060	5060	5060
	SIP Telephone No.	Configure according to the network planning of the operator.	88880-001	88880-002	88880-003	88880-004
	SIP User Name	The user name of the SIP endpoint and the SIP registrar. Configure this item according to the operator's network planning.	test1	test2	test3	test4
	SIP User Password	The user password of the SIP endpoint and the SIP registrar. Configure this item according to the operator's network planning.	test1	test2	test3	test4

5.2.4.2 Configuration Flow

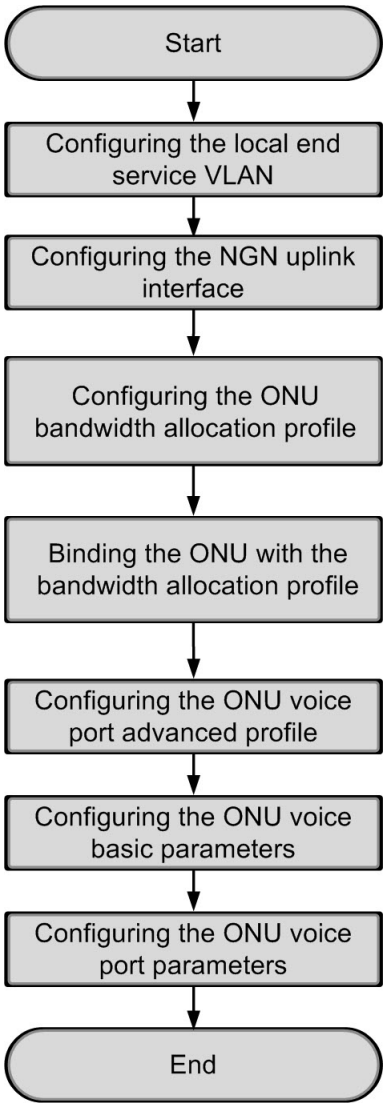


Figure 5-29 Flow chart for configuring VoIP services in a batch manner - SIP

5.2.4.3 Configuring the Local End Service VLAN

Refer to Configuring the Local End Service VLAN for configuration procedures.

5.2.4.4 Configuring the NGN Uplink Interface

Refer to Configuring the NGN Uplink Interface for configuration procedures.

5.2.4.5 Configuring the ONU Bandwidth Allocation Profile

1. Right-click the active HSWA card in the **Object Tree** pane and select **Config→ GPON Service Bandwidth Config Profile** from the shortcut menu to access the **GPON Service Bandwidth Config Profile** window.
2. Click the button on the toolbar. In the **Please Input the Rows for Add:** dialog box that appears subsequently, type **1** and click **OK** to add a bandwidth allocation profile. Enter **a** in the **Profile Name** column.
3. Select profile **a**, and click a blank area in the right pane. Then click the button on the toolbar. In the **Please Input the Rows for Add:** dialog box that appears subsequently, type **1** and click **OK** to add a service.
4. Configure the parameters according to the planning data in Table 5-8.
5. Click the button on the toolbar to complete the configuration, as shown in Figure 5-30.

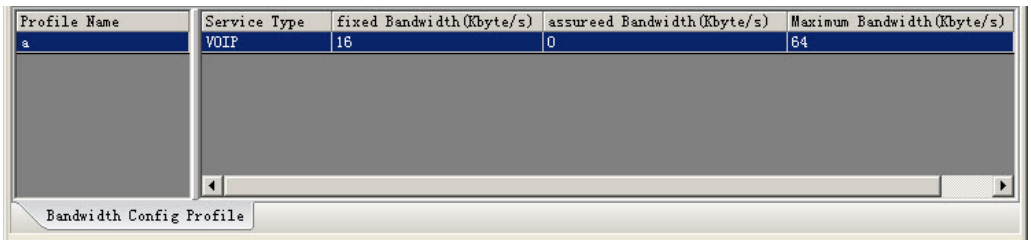


Figure 5-30 The ONU bandwidth allocation profile – SIP example

5.2.4.6 Binding the ONU with the Bandwidth Allocation Profile

1. Right-click the system in the **Object Tree** pane, select **Config→Batch Configure→ONU Config** from the short-cut menu that appears to access the **ONU Config** window.
2. Click the **Set Object as Condition** button, select AN5506-04-B[1] and AN5506-10-B1[2] under the PON port 1 of the GC8B card in Slot 15 from the drop-down list of the Object, and click the **OK** button.
3. The detailed information of the object will be displayed in the right pane. Configure the parameters according to the planning data in Table 5-8, and select **a** in the drop-down lists of **GPON Bandwidth**.

4. Click the button on the toolbar to complete the configuration, as shown in Figure 5-31.

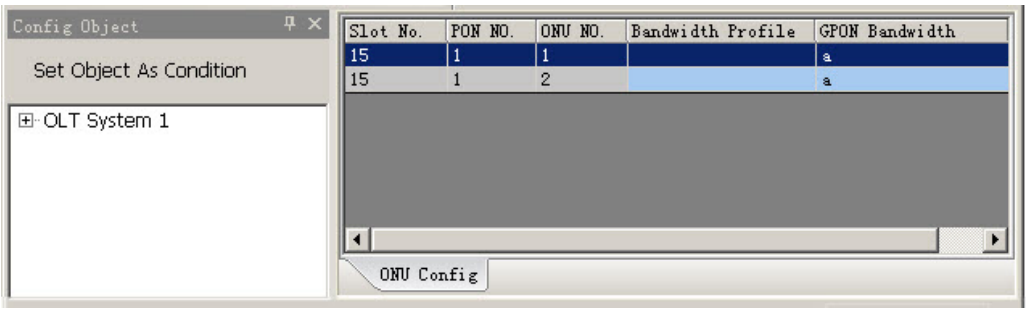


Figure 5-31 ONU configuration in a batch manner– SIP example

5.2.4.7 Configuring the ONU Voice Port Advanced Profile

1. Right-click the system in the **Object Tree** pane, and select **Config→Profile Definition→ONU POTS Advanced Configure Profile** to access the **ONU POTS Advanced Configure Profile** window.
2. Click the button on the toolbar. In the **Please Input the Rows for Add:** dialog box that appears subsequently, type **1** and click **OK** to add an ONU voice port advanced profile.
3. Configure the parameters according to the planning data in Table 5-8.
4. Click the button on the toolbar to complete the configuration, as shown in Figure 5-32.

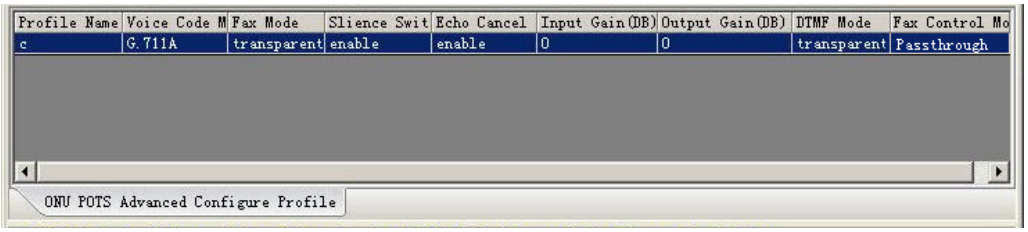


Figure 5-32 ONU voice port advanced configuration profile – SIP example

5.2.4.8 Configuring the Basic Voice Parameters for the ONU

1. Right-click the system in the **Object Tree** pane and select **Config→Batch Configure→ONU Voice Basic Configure** from the short-cut menu that appears to access the **ONU Voice Basic Configure** window.
2. Click the **Set Object as Condition** button, select AN5506-04-B[1] and AN5506-10-B1[2] under the PON port 1 of the GC8B card in Slot 15 from the drop-down list of the Object, and click the **OK** button.
3. The detailed information about the object will be displayed in the right pane. Configure the parameters according to the planning data in Table 5-8.
4. Click the button on the toolbar to complete the configuration, as shown in Figure 5-33.

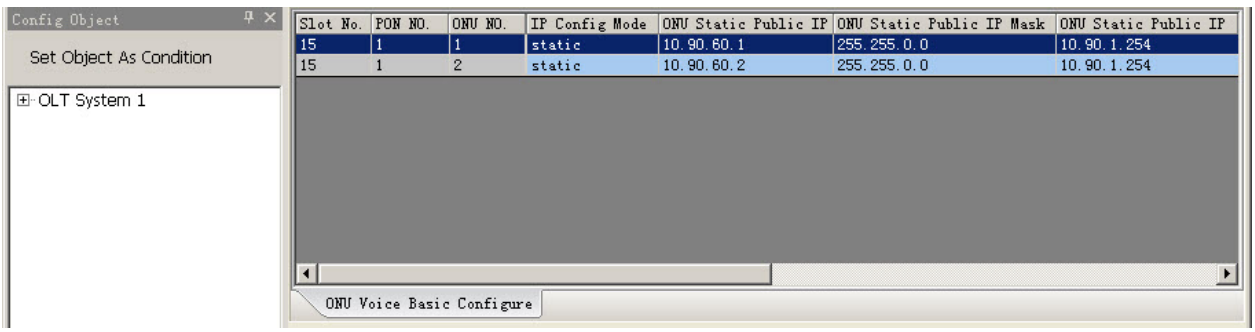


Figure 5-33 Basic voice configuration for the ONU – SIP example

5.2.4.9 Configuring the ONU Voice Port Parameters

1. Right-click the system in the **Object Tree** pane and select **Config→Batch Configure→ONU POTS Configure** from the short-cut menu that appears to access the **ONU POTS Configure** window.
2. Click the **Set Object as Condition** button, select AN5506-04-B[1] and AN5506-10-B1[2] under the PON port 1 of the GC8B card in Slot 15 from the drop-down list of the Object, and click the **OK** button.
3. The detailed information about the object will be displayed in the right pane. Configure the parameters according to the planning data in Table 5-8.
4. Click the button on the toolbar to complete the configuration, as shown in Figure 5-34.

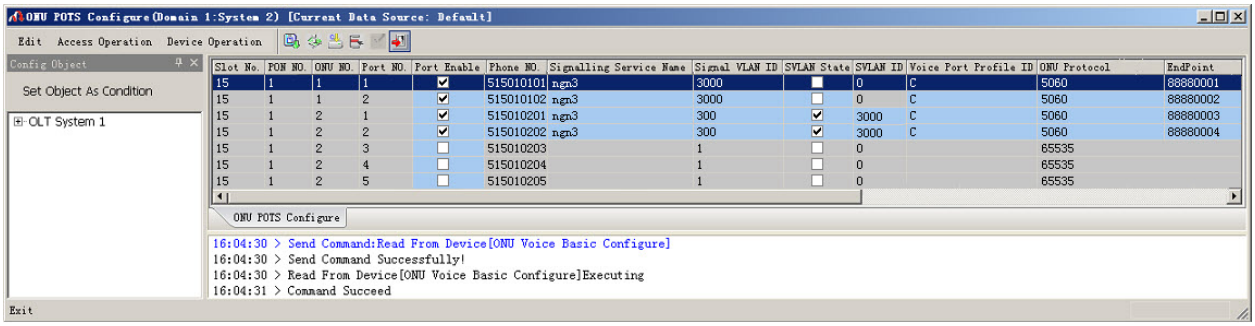


Figure 5-34 ONU voice port configuration – SIP example

5.2.4.10 End of Configuration

The subscribers under the FXS1 and FXS2 ports of the AN5506-04-B with the authorization No.1 and the subscribers under the FXS1 and FXS2 ports of the AN5506-10-B1 with the authorization No.2 under the PON port No.1 of the GC8B card in Slot 15 can access the voice service. Subscribers can call each other normally.

5.3 Optional Functions

5.3.1 Configuring NGN Uplink PPPoE Parameters for a Single ONU

Prerequisites

Configuration of relevant NGN parameters (including static public network IP address) for the target ONU has been completed. After the PPPoE configuration takes effect, the static IP address configured previously will be overridden by the IP address obtained dynamically.

Planning data

Table 5-9 Planning data for configuring NGN uplink PPPoE parameters for a single ONU

Item	Description	Example
Slot No.	The slot No. of the service interface card under which the ONU is located. The value range is 1 to 8 and 11 to 18.	14
PON No.	The No. of the PON port under which the ONU is located. The range is 1 to 4 and 1 to 8.	1
ONU S.N.	The authentication No. of the ONU. The range is 1 to 64.	1
PPPoE Enable	Whether to enable the PPPoE dialing function on the ONU (IAD) to get the IAD IP address for communication with the MGC.	Enable
PPPoE User Name	The PPPoE user name. It is invalid when the PPPoE Enable item is set to Disable.	test
PPPoE User Password	The PPPoE user password. It is invalid when the PPPoE Enable item is set to Disable.	test

Configuration procedures

1. Right-click the active HSWA card in the **Object Tree** pane and select **Voice Config→PPPoE with NGN Uplinked** from the shortcut menu to access the **PPPoE with NGN Uplinked** window.
2. Click the button on the toolbar. In the **Please Input the Rows for Add: dialog box** that appears subsequently, type **1** and click **OK** to add a PPPoE configuration entry.
3. Configure the parameters according to the planning data in Table 5-9.
4. Click the button on the toolbar to complete the configuration, as shown in Figure 5-35.

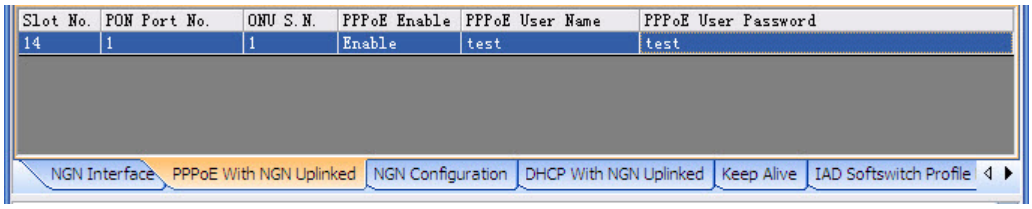


Figure 5-35 Configuring NGN uplink PPPoE parameters for a single ONU

5.3.2 Configuring NGN Uplink PPPoE Parameters for ONUs in a batch manner.

Prerequisites

Configuration of relevant NGN parameters (including static public network IP address) for the target ONU has been completed. After the PPPoE configuration takes effect, the static IP address configured previously will be overridden by the IP address obtained dynamically.

Planning data

Table 5-10 Planning data for configuring NGN uplink PPPoE parameters for ONUs in a batch manner

Item	Description	Example	
Slot No.	The slot No. of the service interface card under which the ONU is located. The value range is 1 to 8 and 11 to 18.	14	
PON Port No.	The No. of the PON port under which the ONU is located. The range is 1 to 2, 1 to 4 or 1 to 8.	1	
ONU S.N.	The authentication No. of the ONU. The range is 1 to 64.	1	2
ONU Type	Configure according to the type of the ONU actually used.	AN5506-04-B	AN5506-10-B1
IP Config Mode	Select the modes for obtaining the IP address: static, PPPoE, and DHCP. The default setting is static.	PPPoE	
PPPoE Enable	Whether to enable the PPPoE dialing function on the ONU (IAD) to get the IAD IP address for communication with the MGC.	Enable	
PPPoE User Name	The PPPoE user name. It is invalid when the PPPoE Enable item is set to Disable.	test	
PPPoE User Password	The PPPoE user password. It is invalid when the PPPoE Enable item is set to Disable.	test	

Configuration procedures

1. Right-click the system in the **Object Tree** pane and select **Config→Batch Configure→ONU Voice Basic Configure** from the short-cut menu that appears to access the **ONU Voice Basic Configure** window.
2. Click “Set Object As Condition”, and in the **Object Tree** pane that appears, select the objects that you need to configure in a batch manner according to the planning data shown in Table 5-10, as shown in Figure 5-36.

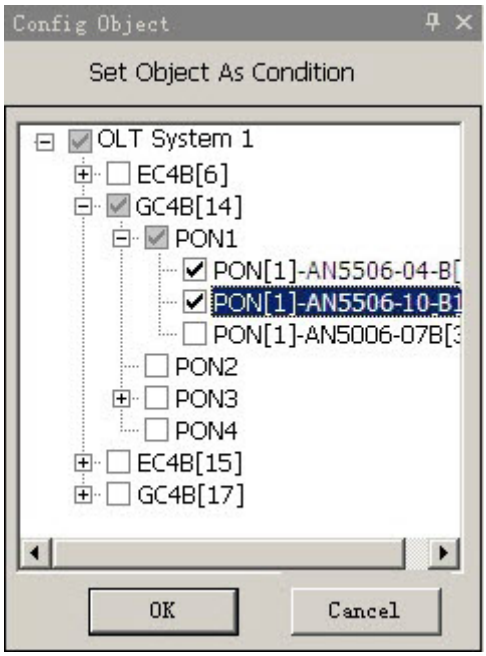


Figure 5-36 Configuring objects for GPON configuration in a batch manner

3. Click **OK**, and perform basic configurations for the ONU voice service in the right pane according to the planning data shown in Table 5-10.
4. Click the  button on the toolbar to complete the configuration, as shown in Figure 5-37.

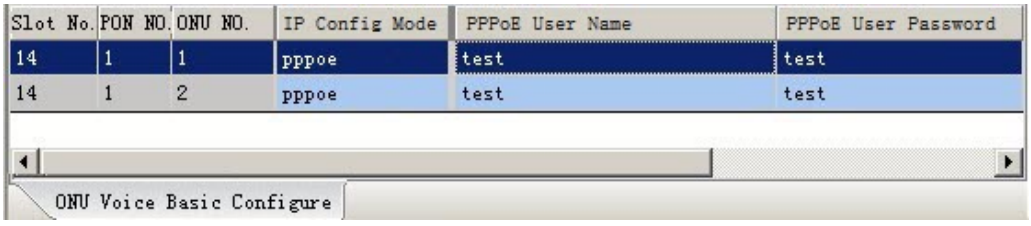


Figure 5-37 ONU voice basic configuration-pppoe

5.3.3 Configuring the DHCP Function for the NGN Uplink of a Single ONU

Prerequisites

You have set the **DHCP Enable** in the **NGN Interface** to **Enable**.

Planning data

Table 5-11 Planned data for configuring the DHCP function of the NGN uplink interface

Item	Description	Example
Slot No.	Configure this item according to the No. of the actually used slot on the service interface card.	15
PON Port No.	Configure this item according to the No. of the PON port actually used.	1
ONU No.	Configure this item according to the type of the ONU actually used.	1
DHCP Enable	Configure this item according to the network planning of the operator.	Enable
DHCP Option60 Enable	Configure this item according to the network planning of the operator.	Enable
DHCP Option60 Value	Configure this item according to the network planning of the operator.	test

Configuration procedures

1. Right-click the active HSWA card in the **Object Tree** pane and select **Voice Config→DHCP With NGN Uplinked** from the shortcut menu to access the **DHCP With NGN Uplinked** window.
2. Click the  button on the toolbar. In the **Please Input the Rows for Add:** dialog box that appears subsequently, type **1** and click **OK** to add an NGN uplink configuration entry.
3. Configure the parameters according to the planning data in Table 5-11.
4. Click the  button on the toolbar to complete the configuration, as shown in Figure 5-38.

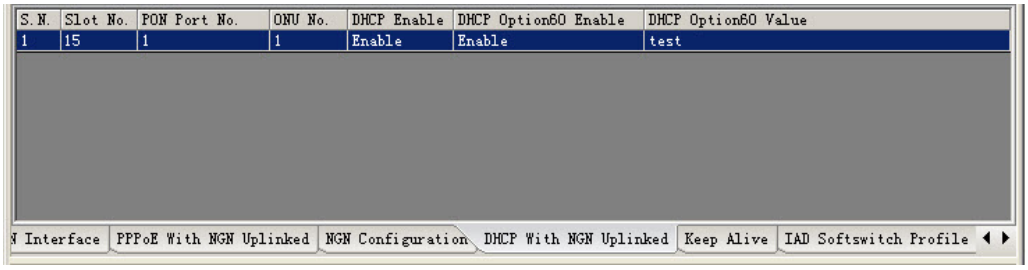


Figure 5-38 Configuring the DHCP function for the NGN uplink interface

5.3.4 Configuring the DHCP Function for the NGN Uplink of ONUs in a Batch Manner

Prerequisites

You have set the **DHCP Enable** in the **NGN Interface** to **Enable**.

Planning data

Table 5-12 Planned data for configuring the DHCP function of the NGN uplink interface for ONUs in a batch manner

Item	Description	Example	
Slot No.	Configure this item according to the No. of the actually used slot on the service interface card.	14	
PON Port No.	Configure this item according to the No. of the PON port actually used.	1	
ONU No.	Configure this item according to the type of the ONU actually used.	1	2
ONU Type	Configure according to the type of the ONU actually used.	AN5506-04-B	AN5506-10-B1
IP Config Mode	Select the modes for obtaining the IP address: static, PPPoE, and DHCP. The default setting is static.	DHCP	
DHCP Option60 Enable	Configure this item according to the network planning of the operator.	Enable	
DHCP Option60 Value	Configure this item according to the network planning of the operator.	test	

Configuration procedures

1. Right-click the system in the **Object Tree** pane and select **Config→Batch Configure→ONU Voice Basic Configure** from the short-cut menu that appears to access the **ONU Voice Basic Configure** window.
2. Click “Set Object As Condition”, and in the **Object Tree** pane that appears, select the objects that you need to configure in a batch manner according to the planning data in Table 5-12, as shown in Figure 5-39.

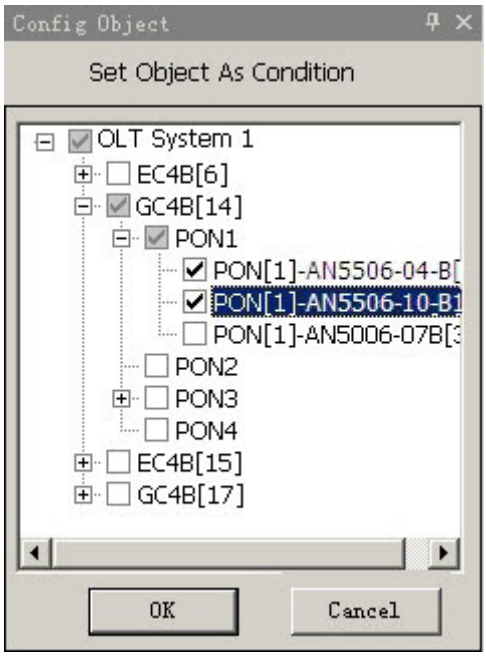


Figure 5-39 Configuring objects for GPON configuration in a batch manner

3. Click **OK**, and perform basic configurations for the ONU voice service in the right pane according to the planning data in Table 5-12.
4. Click the  button on the toolbar to complete the configuration, as shown in Figure 5-40.

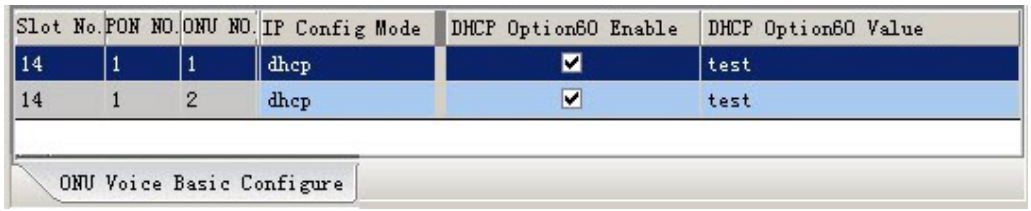


Figure 5-40 ONU voice basic configuration-dhcp

5.3.5 Configuring the Advanced Profile Parameters for the Softswitch

5.3.5.1 Configuring Softswitch Intercommunication Profiles

Configuration Rules

- The RTP resource settings are only specific to the H.248 protocol.
- The digitmap settings are only specific to the SIP protocol.

Planning data

Table 5-13 Planning data for configuring softswitch intercommunication profiles

Item	Description	Example
Profile Name	The name of the softswitch intercommunication profile of the AN5116-06B. The string can consist of letters, numbers and underlines.	ngn1
RTP Name Fixed Part	The prefix of the RTP name.	RTP/
RTP Name Var Begin	The value range: 0 to 65534. The RTP Name Var Begin value must be smaller than the RTP Name Var End value. The default setting is 4000.	4000
RTP Name Var End	The value range: 0 to 65534. The RTP Name Var End value must be larger than the RTP Name Var Begin value. The default setting is 9000.	9000
RTP Name Var Step	The increment for the variable part of the RTP name. The value ranges from 1 to 65534. The default setting is 1.	1
RTP Name Fixed Length	You can select fixed or unfixed for the length of the RTP name. The default setting is fixed, i.e., the variable part of the RTP name is filled with 0 so that the name has the fixed length.	fixed
Digit Map Begin Timer (s)	The Digit Map Begin Timer is the time of waiting for a dialing. The value ranges from 1 to 254; the unit is second. The default setting is 16.	16

Table 5-13 Planning data for configuring softswitch intercommunication profiles (Continued)

Item	Description	Example
Digit Map Short Timer (s)	The digit string has matched a numbering scheme of the DigitMap but with more digits it may match an alternative numbering scheme as well. Therefore, you need to configure the time of waiting to receive digits. The value ranges from 1 to 254; the unit is second. The default setting is 4.	4
Digit Map Long Timer (s)	When at least one digit is required to match any numbering scheme of DigitMap, you need to set the time of waiting for receiving the digit. The value ranges from 1 to 254; the unit is second. The default setting is 16. The value ranges from 1 to 254; the unit is second. The default setting is 16.	16
Notify Match Each Map	The matching result will be reported as soon as the digit string matches any numbering scheme of DigitMap. The default setting is Notify Match Only.	Notify Match Only
VBD State	Whether to enable the function of controlling the VBD Tx Interval (ms) and the VBD Rx Interval (ms) items. The default setting is Disable.	Disable
VBD Tx Interval (ms)	The time interval for sending packets. The value ranges from 1 to 254; the unit is ms. The default setting is 20.	20
VBD Rx Interval (ms)	The time interval for receiving packets. The value ranges from 1 to 254; the unit is ms. The default setting is 10.	10
VBD Voice Coder	The speech encoding method used in the T.30 transparent mode. The options include G711U, G711A, and Unmodified. The default setting is Unmodified.	G711U
Off Hook Warning Tone Timeout	Register the howler tone timeout function to stop playing the howler tone when the timer is expired. The default setting is Unregistered.	Unregistered
Flash Threshold (ms)	The FLASH low-pulse width. The value ranges from 90 to 120; the unit is ms. The default setting is 90 ms.	90
RFC2833 Nego State	Whether to register the RFC2833 auto-negotiation function to encapsulate DTMF based on the RFC2833. The default setting is Non-auto-negotiation.	Non-auto-negotiation
Def RFC2833 PT	The default RFC2833 loading mode. The value ranges from 96 to 127. The default setting is 97.	97

Table 5-13 Planning data for configuring softswitch intercommunication profiles (Continued)

Item	Description	Example
Def RFC2198 PT	The default RFC2198 loading mode. The value ranges from 96 to 127. The default setting is 96.	96
T38 Event Detect Mode	The mode for detecting and reporting the T.38 event. The options include normal, only V21 and all V21.	normal
Caller ID Mode	The caller ID modes include the FSK mode and the DTMF mode. The default setting is FSK.	FSK
On Hook Detect Time (ms)	The polling check time for on-hook events. The value ranges from 90 to 2500; the unit is ms. The default setting is 600 ms.	600
Dialing Tone Timeout (s)	The dialing tone timeout value. The value ranges from 1 to 254 seconds. The default setting is 60 seconds.	60
No Answer Tone Timeout (s)	The ringing (no answer tone) timeout value: if the set period of time expires, it is considered that nobody answers the phone. The value ranges from 1 to 254 seconds; The default setting is 60 seconds.	60
Busy Tone Timeout (s)	The busy tone timeout value. The value ranges from 1 to 254 seconds. The default setting is 60 seconds.	60
ROHT Timeout (s)	The timeout value for the howler tone played after the busy tone. The value ranges from 1 to 254 seconds; The default setting is 60 seconds.	60
Retransmission Timeout (s)	The retransmission timeout value: the timer counts the time after the MG sends a request to the MGC; if the timer is expired, the MG will stop sending the request. The value ranges from 1 to 60. The default setting is 25 seconds.	25
EC Mode	Correct the packets with some errors; the default setting is Disable.	Enable
CLI Language	The CLI language used by the IAD, Chinese or English.	English
NGN Register Timer Threshold (s)	The value ranges from 1 to 3600; the default setting is 600 seconds.	600
NGN Register User Threshold	The value ranges from 1 to 4096; the default setting is 1.	1
Alive format	You can select Notify or Service Change. The default configuration is Notify.	Notify

Configuration procedures

1. Right-click the system in the **Object Tree** pane, and select **Config→Profile Definition→Softswitch Parameters Profile** to access the **Softswitch Parameters Profile** window.
2. Click the button on the toolbar. In the **Please Input the Rows for Add:** dialog box that appears subsequently, type **1** and click **OK** to add a softswitch intercommunication parameter profile.
3. Configure the parameters of the softswitch intercommunication profile according to the planning data in Table 5-13.
4. Click the button on the toolbar to complete the configuration, as shown in Figure 5-41.

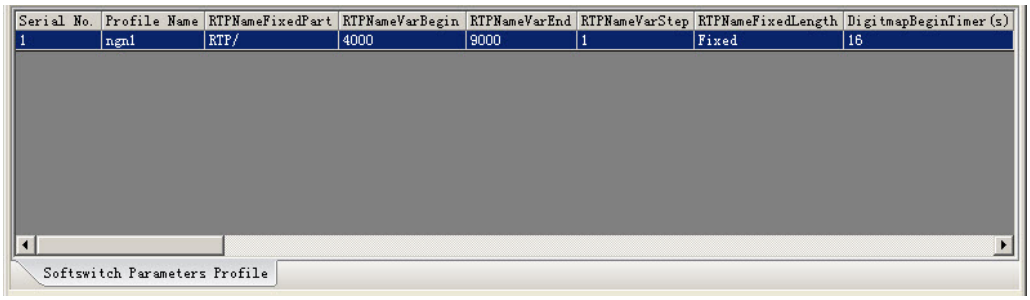


Figure 5-41 Configuring softswitch intercommunication profiles

5.3.5.2 Binding Softswitch Intercommunication Profiles

Planning data

Table 5-14 Planning data for binding the softswitch intercommunication profiles

Item	Description	Example
Slot No.	Configure this item according to the No. of the actually used slot on the service interface card.	15
PON No.	Configure according to the No. of the PON port actually used.	1
ONU No.	Configure according to the type of the ONU actually used.	1
Profile Name	The name of the softswitch intercommunication parameter profile.	ngn1

Configuration procedures

1. Right-click the active HSWA card in the **Object Tree** pane and select **Config→ IAD Softswitch Profile Binding** from the shortcut menu to access the **IAD Softswitch Profile Binding** window.
2. Click the button on the toolbar. In the **Please Input the Rows for Add:** dialog box that appears subsequently, type **1** and click **OK**.
3. Configure the parameters according to the planning data in Table 5-14.
4. Click the button on the toolbar to complete the configuration, as shown in Figure 5-42.

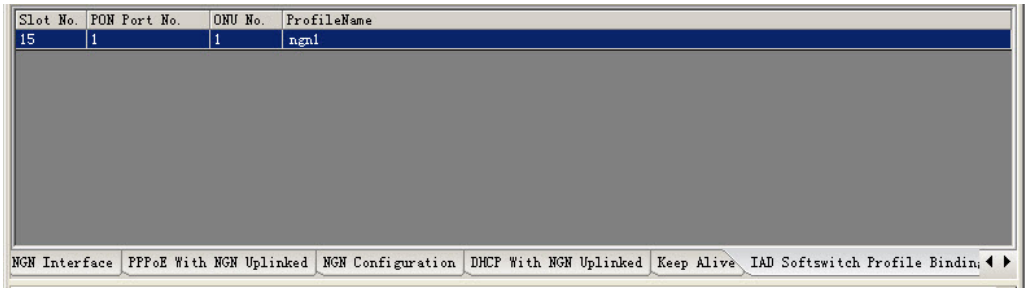


Figure 5-42 Binding softswitch intercommunication profiles

5.3.5.3 Binding Softswitch Intercommunication Profiles in a Batch Manner

Planning data

Table 5-15 Planning data for binding the softswitch intercommunication profiles in a batch manner

Item	Description	Configuration example	
Slot No.	Configure this item according to the No. of the actually used slot on the service interface card.	14	
PON No.	Configure according to the No. of the PON port actually used.	1	
ONU No.	Configure according to the type of the ONU actually used.	1	2
ONU Type	Configure according to the type of the ONU actually used.	AN5506-04-B	AN5506-10-B1

Table 5-15 Planning data for binding the softswitch intercommunication profiles in a batch manner (Continued)

Item	Description	Configuration example	
IP Configuration Mode	Select the modes for obtaining the IP address: static, PPPoE, and DHCP. The default setting is static.	static	static
ONU Static Public IP	When the DHCP or the PPPoE function is enabled, the IP address assigned to the ONU dynamically will override the public IP address assigned to the ONU by the system. Configure according to the network planning of the operator.	192.168.1.1	192.168.1.2
ONU Static Public IP Mask	Configure according to the network planning of the operator.	255.255.0.0	255.255.0.0
ONU Static Public IP Gateway	Configure according to the network planning of the operator.	192.168.1.254	192.168.1.254
Profile Name	The name of the softswitch intercommunication parameter profile.	ngn1	

Configuration procedures

1. Right-click the system in the Object Tree pane and select **Config→Batch Configure→ONU Voice Basic Configure** from the short-cut menu that appears to access the ONU Voice Basic Configure window.
2. Click “Set Object As Condition”, and in the **Object Tree** pane that appears, select the objects that you need to configure in a batch manner according to the planning data shown in Table 5-15, as shown in Figure 5-43.

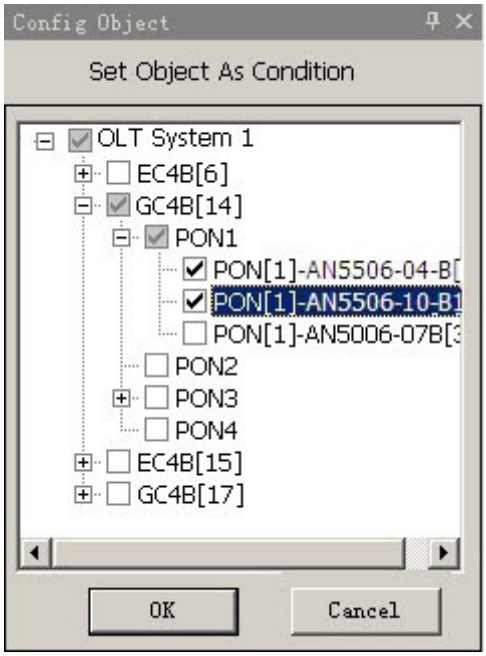


Figure 5-43 Configuring objects for GPON configuration in a batch manner

3. Click OK, and perform basic configurations for the ONU voice service in the right pane according to the planning data shown in Table 5-15.
4. Click the button on the toolbar to complete the configuration, as shown in Figure 5-44.

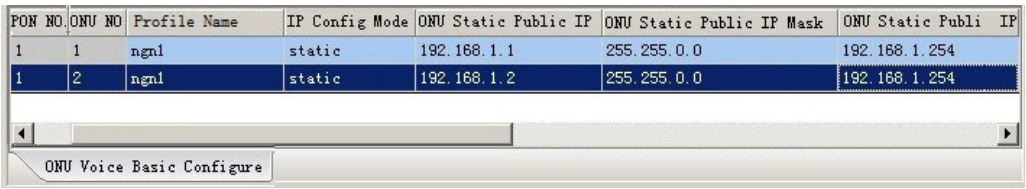


Figure 5-44 ONU voice basic configuration

5.3.6 Configuring the NGN Heartbeat Parameters

Prerequisites

Set the **Keep Alive** in the **Uplink Interface** to **Enable Active** or **Enable Passive**.

Planning data

Table 5-16 Planning data for configuring the NGN heartbeat parameters

Item	Description	Example
Signaling Service Name	This item should be consistent with the Service Name set in the **Local End Service VLAN** configuration.	ngn1
Alive Interval (s)	The period of sending keep-alive messages. The value ranges from 1 to 43200; the unit is second; The default setting is 30 seconds.	30
Alive Times	The maximum timeout times that the softswitch platform MGC permits the ONU to send the keep-alive messages; if the value is exceeded, it is considered that the MGC loses its communication with the ONU. The value ranges from 1 to 120; The default setting is 3.	3

Configuration procedures

1. Right-click the active HSWA card in the **Object Tree**pane and select **Voice Config→Keep Alive** from the shortcut menu to access the **Keep Alive** window.
2. Click the button on the toolbar. In the **Please Input the Rows for Add:** dialog box that appears subsequently, type **1** and click **OK**.
3. Configure the parameters according to the planning data in Table 5-16.
4. Click the button on the toolbar to complete the configuration, as shown in Figure 5-45.

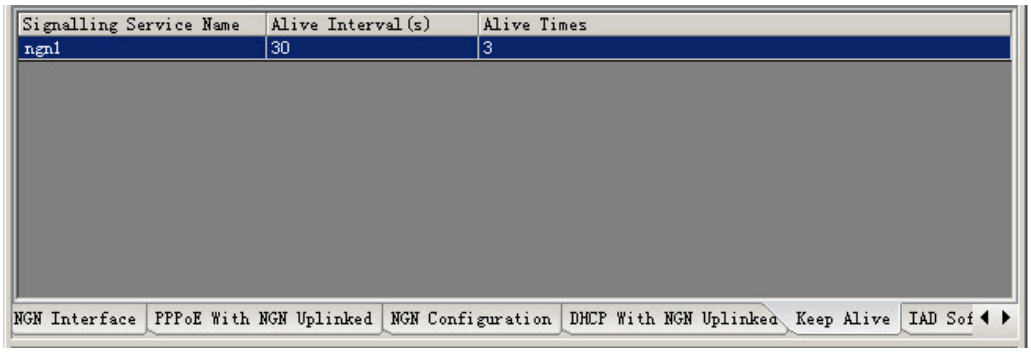


Figure 5-45 Configuring the NGN heartbeat parameters

5.3.7 Configuring the IAD MD5 Authentication

Prerequisites

The endpoint domain name has been configured in the NGN uplink subscriber data.

Planning data

Table 5-17 Planning data for configuring the IAD MD5 authentication

Item	Description	Example
Endpoint domain name	Set this item consistent with the endpoint domain name configured in the NGN uplink subscriber data.	10.90.60.1
MD5 State	Configure according to the network planning of the operator.	Enable
MGID	Configure according to the network planning of the operator.	1234567
KEY	Configure according to the network planning of the operator.	0123456789ABCDEF
DHG value (g)	Configure according to the network planning of the operator.	2
DHP value (p)	Configure according to the network planning of the operator.	FFFFFFFFFFFFFFFFA63A3620F44-C42E9625E7EC6E485B5766D51C2454-FE1356DF25F1437302B0A6DCD3A431-BEF9519B38E3404D-D514A08793B139B22020BBEA68A67C-C7429024E0880DC1CD1C4C6628-B2168C234C90FDAA2FFFFFFFFFFFFF-FFF

Configuration procedures

1. Right-click the active HSWA card in the **Object Tree**pane and select **Voice Config→IAD MD5 Configuration** from the shortcut menu to access the **IAD MD5 Configuration** window.

2. Click the button on the toolbar. In the **Please Input the Rows for Add:** dialog box that appears subsequently, type **1** and click **OK** to add an IAD MD5 authentication entry.
3. Configure the parameters according to the planning data in Table 5-17.
4. Click the button on the toolbar to complete the configuration, as shown in Figure 5-46.

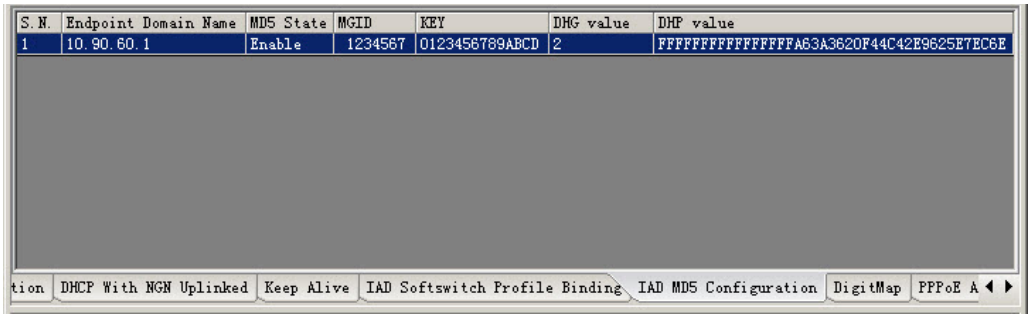


Figure 5-46 Configuring the IAD MD5 authentication

5.3.8 Registering / Unregistering the NGN User

Prerequisites

The operation object is the a user's telephone number. This telephone number should have been configured in the system, and this number and the corresponding NGN configuration should have been sent to the destination ONU.

Planning data

Table 5-18 Planning data for registering / unregistering the NGN users

Item	Description	Example
Phone Number	Enter the configured NGN user telephone number.	77770001
Register / Unregister	Configure this item according to the actual situation.	Register

Configuration procedures

1. Right-click the active HSWA card in the **Object Tree** pane and select **Control Command→NGN User Register/Unregister** from the shortcut menu to bring up the **NGN User Register/Unregister** window.

2. Configure the parameters according to the planning data in Table 5-18.
3. Click the button on the toolbar to complete the configuration, as shown in Figure 5-47.

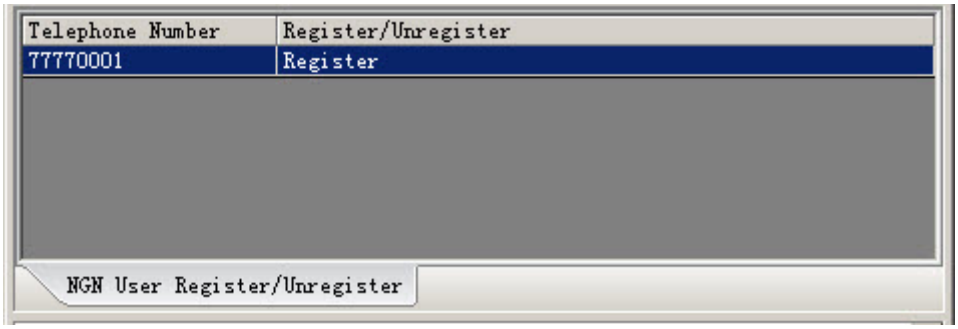


Figure 5-47 Registering / unregistering NGN users

5.3.9 Configuring the Digitmap

Prerequisites

The VoIP service has been started up, and the configuration of the softswitch intercommunication profile has been completed.

Planning data

Table 5-19 Planning data for configuring the digitmap

Item	Description	Configuration procedures
Digit map	Configure according to the network planning of the operator.	[2-9]XXXXXXX|1[12]X|1[35]XXXXXXXXX

Configuration procedures

1. Right-click the active HSWA card in the **Object Tree** pane and select **Voice Config→DigitMap** from the shortcut menu to access the **DigitMap** window.
2. Configure the digitmap according to the planning data in Table 5-19.
3. Click the button on the toolbar to complete the configuration, as shown in Figure 5-48.

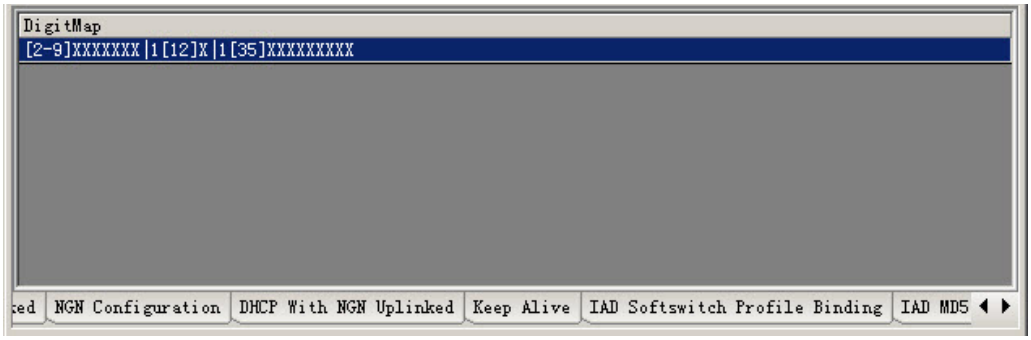


Figure 5-48 Configuring the digitmap

6 Configuring Data Services

- Example for Data Service Configuration – in the VLAN Transparent Transmission Mode
- Example for Data Service Configuration – in the TAG Mode
- Example for Data Service Configuration – in the VLAN 1:1 Translation Mode
- Example for Data Service Configuration – in the VLAN N:1 Translation Mode
- Example for Data Service Configuration-in the Flexible QinQ Mode

6.1 Example for Data Service Configuration – in the VLAN Transparent Transmission Mode

6.1.1 Configuration Rules

- The VLAN transparent transmission mode: The Ethernet data uploaded from the subscriber side will be added with a VLAN ID when passing the subscriber's home gateway. Then, the data will be processed in the following two modes:
  - The CVLAN ID will be transparently transmitted and added with an SVLAN ID when passing the ONU. After being uploaded to the AN5116-06B, the data service will not be processed by the AN5116-06B, but transparently transmitted to the upper layer network side equipment.
  - The CVLAN ID will be transparently transmitted and uploaded to the AN5116-06B via the ONU. After adding the SVLAN ID to the data service, the AN5116-06B will transmit the data service to the upper layer network side equipment.
- The VLAN ID of the ONU ranges from 1 to 4085.
  - If stacked VLANs are used for the data service, the SVLAN ID should be within the range of the local VLAN.
  - If single VLAN is used for the data service, the CVLAN ID should be within the range of the local VLAN.
- The ONU data service configuration can be implemented in the service profile or the ONU service configuration. If the data service configurations of the ONUs are the same, the batch configurations can be implemented using the service profile.
- The sum of the fixed bandwidth and assured bandwidth of the service in the bandwidth allocation should not exceed the configured maximum bandwidth.
- A LAN port of the AN5506-04-B ONU supports up to 16 data services, so does a LAN port of the AN5506-10-B1 ONU.
- While configuring the service type in bandwidth allocation, select **Broadband Internet access** for Type 1 ONUs and select **Integrate Service** for Type 2 ONUs.

6.1.2 Network Diagram

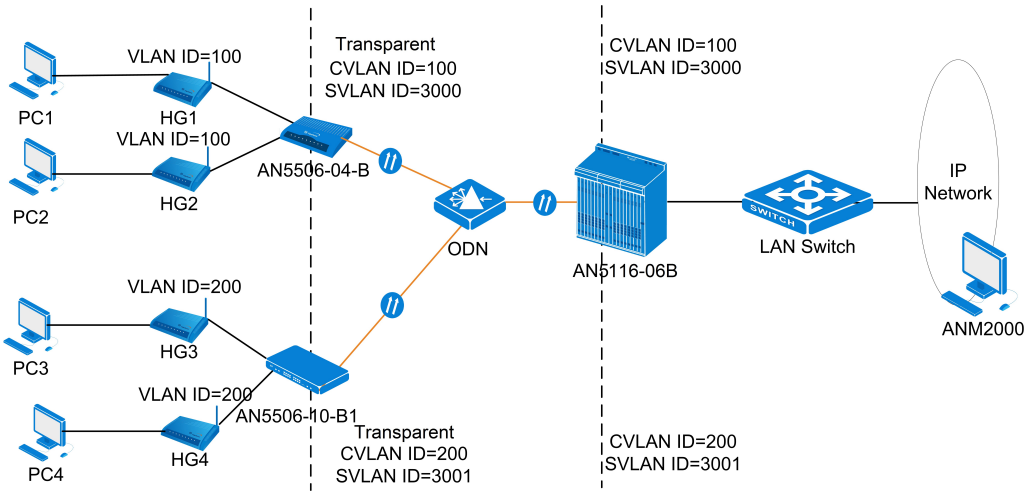


Figure 6-1 The data service network in the VLAN transparent transmission mode

- As shown in the figure above, in the uplink direction, each subscriber's PC is connected to an ONU via a home gateway HG, which adds a layer of VLAN ID to the data service from the PC. When the services are received at the ONU, the ONU will transparently transmit the first VLAN tag, add an SVLAN ID to the data service and then transmit the data service to the OLT using a splitter. The OLT will not process the service but transmit it to the upper layer network via the uplink port directly.
- In the downlink direction, the data services carrying stacked VLANs pass by the OLT without being processed. The services are transmitted to the corresponding ONUs via the splitter. The ONUs strip the SVLAN and transparently transmit the CVLAN. Then the data carrying CVLAN only are transmitted to the corresponding HGs. The HGs strip the CVLAN and transmit the data to the subscribers' PCs.

The AN5506-04-B and the AN5506-10-B1 are used as ONUs in this example. The AN5116-06B uses the HU1A and the GC8B as the interface cards at the network side and the subscriber side respectively. And the HSWA card is compulsory.

6.1.3 Configuring Data Services Respectively (for Type 1 ONU)

Refer to Table 1-1 for specific product types of Type 1 ONUs.

6.1.3.1 Planning data

Table 6-1 The planned data of data service configuration at the OLT side in the transparent transmission mode (configured respectively)

Item		Description	Example
ONU Information	Slot No.	The number of the slot actually used.	15
	PON Port No.	The number of the PON port actually used.	1
	ONU Auth No.	Configure this item according to the network planning of the operator.	1
	ONU Type	The type of the ONU	AN5506-04-B
Local End Service VLAN	Service Name	Configure this item according to the network planning of the operator.	data1
	VLAN ID Begin	The begin VLAN ID number of the uplink port service.	3000
	VLAN ID End	The end VLAN ID number of the uplink port service. The begin VLAN ID should not be larger than the end VLAN ID.	3001
	Interface No.	The number of the uplink port actually used.	19:SFP2
	TAG / UNTAG	The TAG processing mode of the uplink service VLAN. There are two options: **TAG** and **UNTAG**. ◆ **UNTAG** means that when the uplink data packet passes the port, its tag will be automatically stripped and it keeps going in the untagged mode. And for the downlink data packet in the untagged mode, when passing the port, it will be attached with tag and it keeps going in the tagged mode. ◆ **TAG** means that when the uplink / downlink data packet passes the port, its tag will not be stripped and it keeps going in the tagged mode.	TAG
	Service Type	Select **data** for the data service.	data
	Slot Bind Mode	Select Auto Bind.	Auto Bind

Table 6-2 The planning data of data service configuration at the ONU side in the transparent transmission mode (configured respectively)

Item		Description	Example
Bandwidth configuration	Service Type	Select broadband Internet access.	Broadband Internet access

Table 6-2 The planning data of data service configuration at the ONU side in the transparent transmission mode (configured respectively) (Continued)

Item		Description	Example	
	Fixed Bandwidth (Kbyte/s)	The fixed bandwidth allocated for an ONU's uplink service. Even if the service does not use the bandwidth resource, other services cannot occupy the resource. The default setting is 16.	16	
	Assured Bandwidth (Kbyte/s)	The minimum bandwidth for provisioning an ONU's uplink service. If the bandwidth resource is not used by this service, then the resource may be released for other services to use. The default setting is 0.	0	
	Maximum Bandwidth (Kbyte/s)	The maximum bandwidth allocated for an ONU's uplink service. The sum of the fixed bandwidth value and the assured bandwidth value should not be larger than the maximum bandwidth value. The default setting is 64.	1280	
Configuring the ONU port basic information	Port No.	The actually used ONU port	1	2
	Enable / Disable Port	Configure this item according to the operator's network planning; the default setting is Enable.	Default	
	Port Auto Negotiation	Configure this item according to the operator's network planning; the default setting is Enable.	Default	
	Port Speed	Unconfigurable when auto negotiation is enabled. The default speed is 100Mbit/s.	Default	
	Duplex	Unconfigurable when auto negotiation is enabled. The default value is full-duplex.	Default	
	Flow Control Enable / Disable	Configure this item according to the operator's network planning; the default setting is Disable.	Default	
Configuring the ONU port service parameters	TAG Mode	Configured as Tag or Untag according to the network planning of the operator. In the **Tag** mode the uplink data packets are tagged, whereas in the **Untag** mode the uplink data packets are untagged.	Tag	
	Service Type	Configured as Unicast or Multicast.	Unicast	
	COS (Ethernet priority)	When the CVLAN mode is set to **Transparent**, this item should be consistent with tCOS (priority in the PON). The value of priority ranges from 0 to 7. 7 stands for the highest priority level, and 0 stands for the lowest one. When the Tag mode is set to **Untag**, this item is unconfigurable.	0	

Table 6-2 The planning data of data service configuration at the ONU side in the transparent transmission mode (configured respectively) (Continued)

Item		Description	Example
	VLAN ID	When the CVLAN mode is set to Transparent, the VLAN mode should be consistent with the CVLAN ID. When the Tag mode is set to Untag, this item is unconfigurable. The value ranges from 1 to 4085.	100
	CVLAN Mode	When the Tag mode is set to **Untag**, the CVLAN mode can be set to Tag or Transparent. When the Tag mode is set to **Tag**, the CVLAN mode can set to Translation or Transparent.	Transparent
	CVLAN ID	Configure according to the network planning of the operator. The range is 1 to 4085.	100
	COS (priority in the PON)	The CVLAN priority, ranging from 0 to 7. 7 stands for the highest priority level, and 0 stands for the lowest one.	0
	Ds Encrypt State	The default setting is Disable.	Disable
	QinQ State	Enable / disable the QinQ configuration	Enable
	SVLAN ID	Unconfigurable when the QinQ configuration is disabled. The value ranges from 1 to 4085.	3000
	Service Name	This item should be consistent with the **Service Name** in local end service VLAN configuration. Unconfigurable when the **QinQ State** is set to Disable.	data1
	COS (priority in the PON)	The SVLAN priority, ranging from 0 to 7. 7 stands for the highest priority level, and 0 stands for the lowest one. Unconfigurable when the QinQ State is set to Disable.	0

6.1.3.2 Configuration Flow

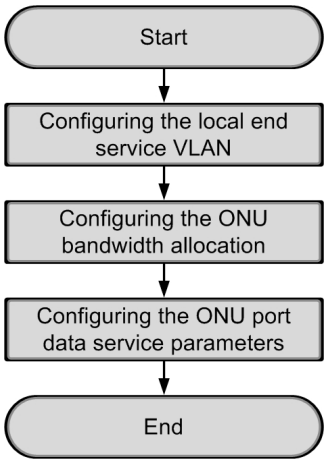


Figure 6-2 Flow chart for configuring data services respectively in the transparent transmission mode (for the AN5506-04-B)

6.1.3.3 Configuring the Local End Service VLAN

1. Right-click the active HSWA card in the **Object Tree** pane and select **Config→ Local VLAN→Local End Service VLAN** from the shortcut menu to access the **Local End Service VLAN** window.
2. Click the button on the toolbar. In the **Please Input the Rows for Add:** dialog box that appears subsequently, type **1** and click **OK** to add a local VLAN.
3. Configure according to the planning data in Table 6-1.
4. Click the button on the toolbar to complete the configuration, as shown in Figure 6-3.

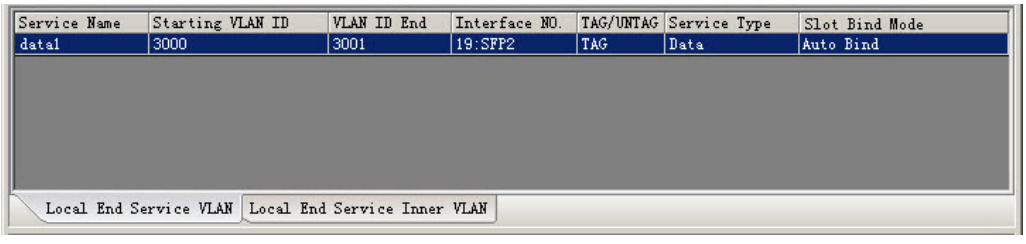


Figure 6-3 Configuring the local end service VLAN for the AN5506-04-B in the transparent transmission mode (configured respectively)

6.1.3.4 Configuring the Bandwidth Allocation

1. Click the GC8B card in the **Object Tree** pane to display all ONUs connected to the GC8B card in the right pane. Right-click the **PON1-AN5506-04-B[1]** ONU and select **Config→Bandwidth config** from the shortcut menu to access the **Bandwidth Config** window.
2. Click the button on the toolbar. In the **Please Input the Rows for Add:** dialog box that appears subsequently, type **1** and click **OK**.
3. Configure according to the planning data in Table 6-2.
4. Click the button on the toolbar to complete the configuration, as shown in Figure 6-4.

Figure 6-4 Configuring the GPON service bandwidth for the AN5506-04-B in the transparent transmission mode (configured respectively)

6.1.3.5 Configuring the ONU Port Data Service Parameters

1. Click the GC8B[15] card in the **Object Tree** pane to display all ONUs connected to the GC8B card in the right pane. Right-click the **PON1-AN5506-04-B[1]** ONU and select **Config→Service Config** from the shortcut menu. Then select the **ONU Port Config** tab.
2. Select **LAN1** from the **Data Port List**, and click **Add** to create a data service.
3. Configure according to the planning data in Table 6-2.

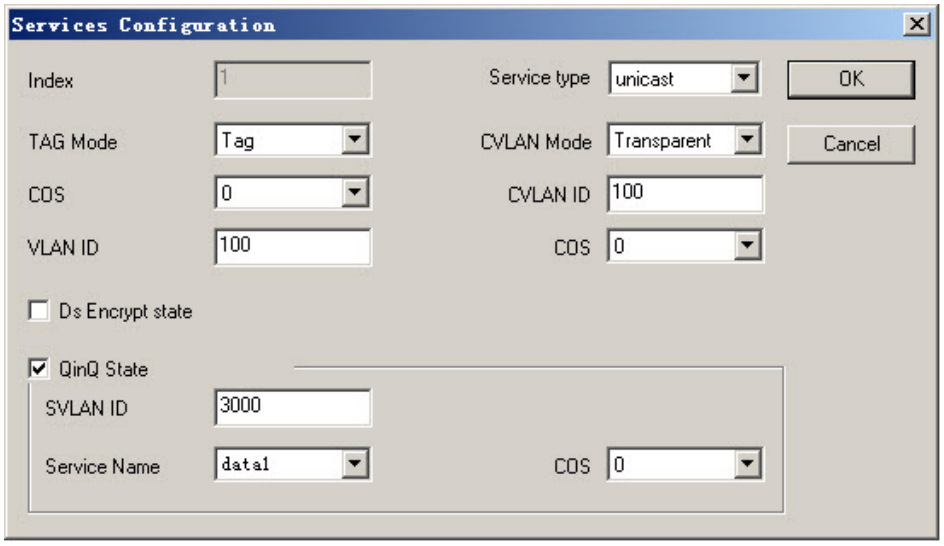


Figure 6-5 Service configuration for the AN5506-04-B in the transparent transmission mode (configured respectively)

4. Click **OK** and return to the **ONU Port Config** tab. Right-click **LAN1** in the **Data Port List** and select **Copy Port Config**. Right-click **LAN2** and select **Paste Port Config**.
5. Click the **Modify on Device** button to complete the service configuration for the AN5506-04-B, as shown in Figure 6-6.

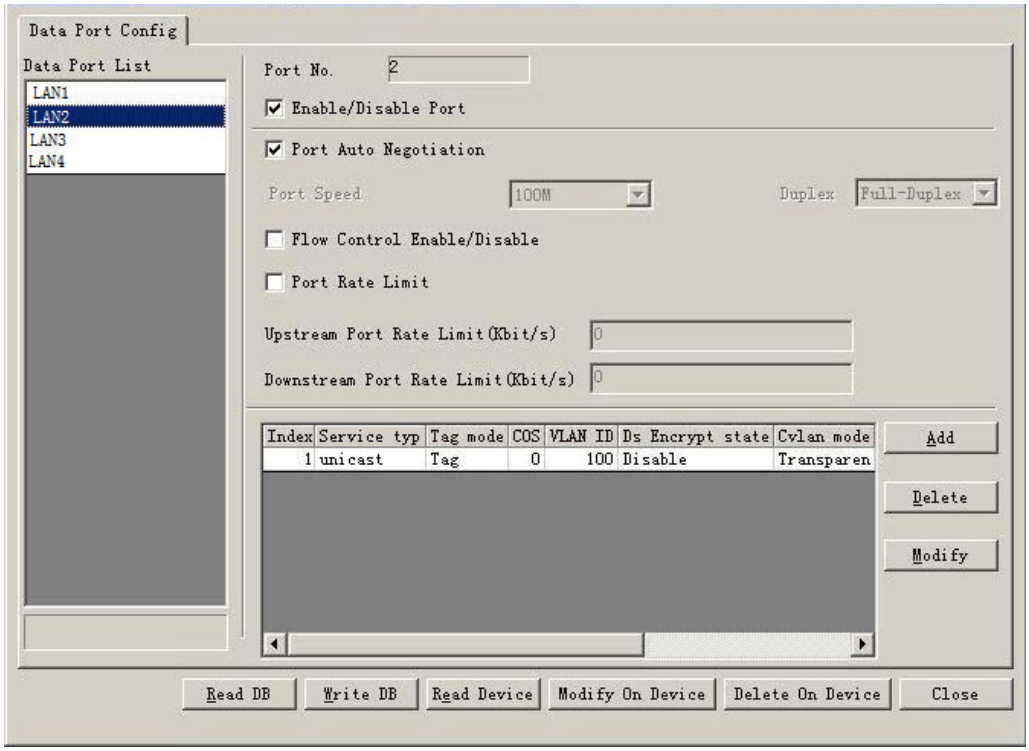


Figure 6-6 The port service configuration completed for the AN5506-04-B in the transparent transmission mode (configured respectively)

6.1.3.6 End of Configuration

PC1 to PC4 can make normal access to Internet.

6.1.4 Configuring Data Services in a Batch Manner (for Type 1 ONU)

Refer to Table 1-1 for specific product types of Type 1 ONUs.

6.1.4.1 Planning data

Table 6-3 The planning data of data service configuration at the OLT side in the transparent transmission mode (in a batch manner)

Item		Description	Example
ONU Information	Slot No.	The number of the slot actually used.	15
	PON Port No.	The number of the PON port actually used.	1
	ONU Auth No.	Configure this item according to the network planning of the operator.	1
	ONU Type	The type of the ONU	AN5506-04-B
Local End Service VLAN	Service Name	Configure this item according to the network planning of the operator.	data1
	VLAN ID Begin	The begin VLAN ID number of the uplink port service.	3000
	VLAN ID End	The end VLAN ID number of the uplink port service. The begin VLAN ID should not be larger than the end VLAN ID.	3001
	Interface No.	The number of the uplink port actually used.	19:SFP2
	TAG / UNTAG	The TAG processing mode of the uplink service VLAN. There are two options: **TAG** and **UNTAG**. ◆ **UNTAG** means that when the uplink data packet passes the port, its tag will be automatically stripped and it keeps going in the untagged mode. And for the downlink data packet in the untagged mode, when passing the port, it will be attached with tag and it keeps going in the tagged mode. ◆ **TAG** means that when the uplink / downlink data packet passes the port, its tag will not be stripped and it keeps going in the tagged mode.	TAG
	Service Type	Select **data** for the data service.	data
	Slot Bind Mode	Select Auto Bind.	Auto Bind

Table 6-4 The planning data of data service configuration at the ONU side in the transparent transmission mode (in a batch manner)

Item		Description	Example
Bandwidth Profile	Profile Name	The name of the bandwidth allocation profile	a
	Service Type	Select broadband Internet access.	Broadband Internet access

Table 6-4 The planning data of data service configuration at the ONU side in the transparent transmission mode (in a batch manner) (Continued)

Item		Description	Example
	Fixed Bandwidth (Kbyte/s)	The fixed bandwidth allocated for an ONU's uplink service. Even if the service does not use the bandwidth resource, other services cannot occupy the resource. The default setting is 16.	16
	Assured Bandwidth (Kbyte/s)	The minimum bandwidth for provisioning an ONU's uplink service. If the bandwidth resource is not used by this service, then the resource may be released for other services to use. The default setting is 0.	0
	Maximum Bandwidth (Kbyte/s)	The maximum bandwidth allocated for an ONU's uplink service. The sum of the fixed bandwidth value and the assured bandwidth value should not be larger than the maximum bandwidth value. The default setting is 64.	1280
Data service profile configuration	Profile Name	Configure this item according to the network planning of the operator.	b
	Enable / Disable	Enable is selected by default.	Enable
	Auto Negotiation	Enable is selected by default.	Enable
	Speed (bit/s)	The default setting is 10Mbit/s. Unconfigurable when the **Auto Negotiation** is enabled.	-
	Duplex Mode	Full-duplex is selected by default. Unconfigurable when the **Auto Negotiation** is enabled.	-
	Flow	Disable is selected by default.	Disable
	Port Limit Enable / Disable	Disable is selected by default.	Disable
	Port Uplink Limit	The default value is 0. Unconfigurable when the port limit is disabled.	-
	Port Downlink Limit	The default value is 0. Unconfigurable when the port limit is disabled.	-
	TAG Mode	Configured as Tag or Untag according to the network planning of the operator. In the **Tag** mode the uplink data packets are tagged, whereas in the **Untag** mode the uplink data packets are untagged.	Tag

Table 6-4 The planning data of data service configuration at the ONU side in the transparent transmission mode (in a batch manner) (Continued)

Item			Description	Example
	COS		When the CVLAN mode is set to **Transparent**, the VLAN mode should be consistent with the COS. The value ranges from 0 to 7. When the Tag mode is set to **TAG**, this item is unconfigurable.	0
	VLAN ID		When the CVLAN mode is set to **Transparent**, the VLAN mode should be consistent with the CVLAN ID. When the Tag mode is set to **Untag**, this item is unconfigurable. The value ranges from 1 to 4085.	100
	Ds Encrypt State		Disable is selected by default.	Disable
	CVLAN Mode		When the Tag mode is set to **Untag**, the CVLAN mode can be set to Tag or Transparent. When the Tag mode is set to **Tag**, the CVLAN mode can set to Translation or Transparent.	Transparent
	CVLAN ID		Configure according to the network planning of the operator. The range is 1 to 4085.	100
	COS		The CVLAN priority, ranging from 0 to 7.	0
	QinQ State		Enable / disable the QinQ configuration. Disable is selected by default.	Enable
	VLAN Name		Consistent with the service name in the local end service VLAN configuration. Unconfigurable when the **QinQ State** is set to Disable.	data1
	SVLAN ID		The value ranges from 1 to 4085. Unconfigurable when the **QinQ State** is set to Disable.	3000
	COS		The SVLAN priority, ranging from 0 to 7. 7 stands for the highest priority level, and 0 stands for the lowest one. Unconfigurable when the **QinQ State** is set to Disable.	0
Service profile configuration	Profile Name		Configure this item according to the network planning of the operator.	c
	ONU Type		The type of the actually used ONU	AN5506-04-B
	ONU Subprofile Config	Profile Type	The bandwidth allocation profile should be selected.	Bandwidth allocation profile

Table 6-4 The planning data of data service configuration at the ONU side in the transparent transmission mode (in a batch manner) (Continued)

Item			Description	Example	
		Profile Name	Consistent with the profile name configured in the bandwidth allocation profile.	a	
	Port Type		The type of the actually used port	FE port	
	Port No.		The number of the actually used port	1	2
	ONU Port Profile Config	Profile Type	The data service profile should be selected.	Data service profile	
		Profile Name	The profile name configured in the data service profile	b	
Service profile binding	Profile ID		The profile name configured in the service profile	c	
	Action		Bind the ONU to the service profile.	Attach	
	Slot No.		The number of the slot actually used.	15	
	PON No.		The number of the PON port actually used.	1	
	ONU S.N.		The ONU authorization number assigned according to the network planning of the operator	1	

6.1.4.2 Configuration Flow

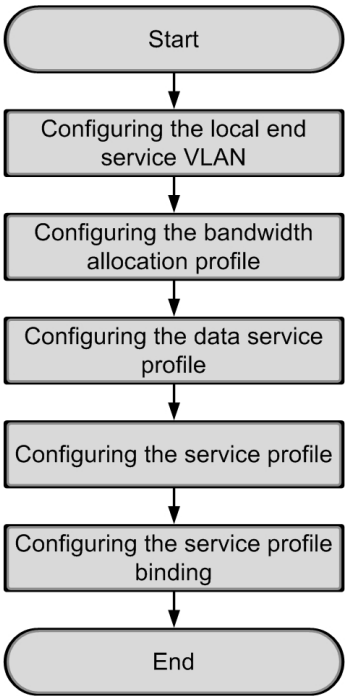


Figure 6-7 Flow chart for configuring data services in the transparent transmission mode for the AN5506-04-B in a batch manner

6.1.4.3 Configuring the Local End Service VLAN

Refer to Configuring the Local End Service VLAN for configuration procedures.

6.1.4.4 Configuring the Bandwidth Allocation Profile

1. Right-click the active HSWA[9] card in the **Object Tree** pane and select **Config →GPON Service Bandwidth Config Profile** from the shortcut menu to access the **GPON Service Bandwidth Config Profile** window.
2. Click the left pane and click the button on the toolbar. In the **Please Input the Rows for Add:** dialog box that appears subsequently, type **1** and click **OK**. Double-click the **Profile Name** blank field and enter **a**.
3. Click the right pane and click the button. Enter **1** in the **Please Input the Rows for Add:** dialog box that appears and click the **OK** button.
4. Configure according to the planning data in Table 6-4.

5. Click the button on the toolbar to complete the configuration, as shown in Figure 6-8.

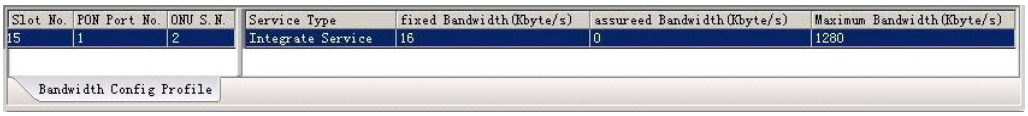


Figure 6-8 The ONU bandwidth allocation profile for the AN5506-04-B in the transparent transmission mode (in a batch manner)

6.1.4.5 Configuring the Data Service Profile

1. Right-click the active HSWA card in the **Object Tree** pane and select **Config→ Data Service Profile** from the shortcut menu, and select the **Data Service Profile** tab.
2. Click the left pane and click the button. Enter **1** in the **Please Input the Rows for Add:** dialog box that appears and click **OK** to add a data service profile b. Configure the basic parameters of the port according to the planning data in Table 6-4.
3. Click the right pane and click the button. Enter **1** in the **Please Input the Rows for Add:** dialog box that appears and click **OK**. Configure the VLAN tags of the traffic flow according to the planning data in Table 6-4.
4. Click the button on the toolbar to complete the configuration, as shown in Figure 6-9.

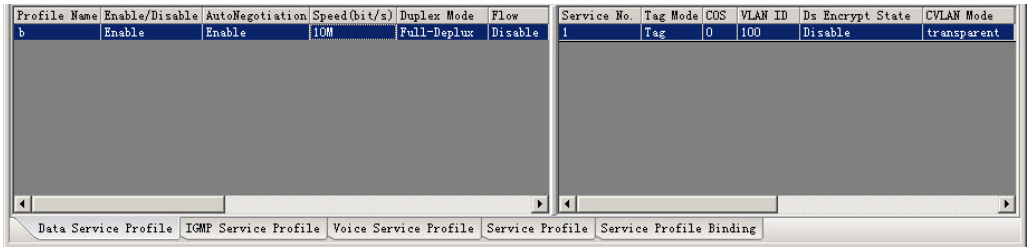


Figure 6-9 The data service profile for configuring the AN5506-04-B in the transparent transmission mode (in a batch manner)

6.1.4.6 Creating a Service Profile

1. Right-click the active HSWA card in the **Object Tree** pane and select **Config→ Service Profile** from the shortcut menu, and select the **Service Profile** tab.

2. Click the left pane, and then click the button on the toolbar. In the **Please Input the Rows for Add:** dialog box that appears subsequently, type **1** and click **OK** to add a service profile.
3. Double-click the **Profile Name** blank field and enter **c**. Click the **ONU Type** list box and select **AN5506-04-B** from the drop-down list. Click the **ONU Subprofile Config** field to bring up the **ONU Subprofile Config** dialog box.
4. In the **ONU Subprofile Config** dialog box, click the **Add** button to add a profile. Click the **Profile Type** list box and select **Bandwidth Config Profile**. Click the **Profile Name** list box and select **a**.

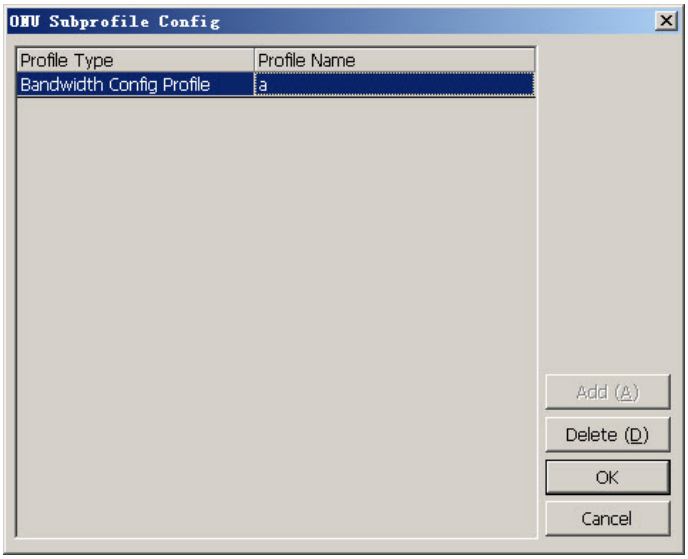


Figure 6-10 The ONU subprofile configuration for the AN5506-04-B in the transparent transmission mode (in a batch manner)

5. Click **OK** and return to the **Service Profile** window.
6. Click the right pane, and then click the button in the toolbar. Enter **2** in the **Please Input the Rows for Add:** dialog box that appears and click the **OK** button.
7. Click the **Port Type** list box and select **LAN**. Double-click the **Port No.** blank field and enter **1**. Repeat the procedure to enter **2**. Double-click the **ONU Port Profile Config** field to bring up the **ONU Port Profile Config** dialog box.
8. In the **ONU Port Profile Config** dialog box, click the **Add** button to add a profile. Click the **Profile Type** list box and select **Data Service Profile**. Click the **Profile Name** list box and select **b**.

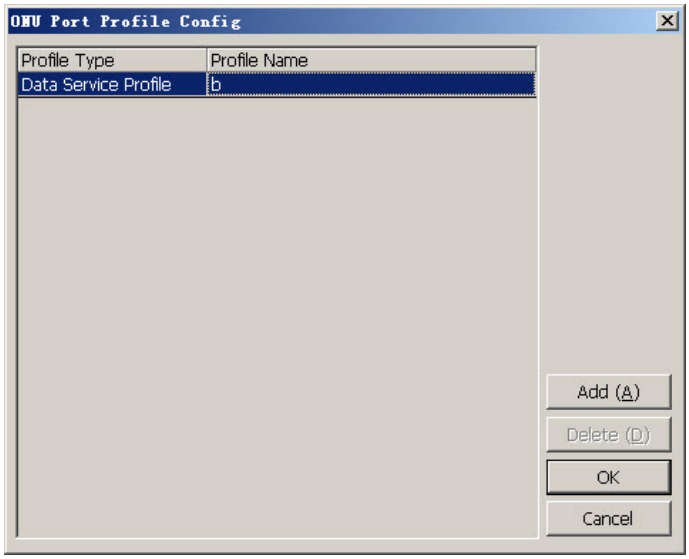


Figure 6-11 The ONU port subprofile configuration for the AN5506-04-B in the transparent transmission mode (in a batch manner)

9. Click **OK** and return to the **Service Profile** window.
10. Click the button on the toolbar to complete the configuration, as shown in Figure 6-12.

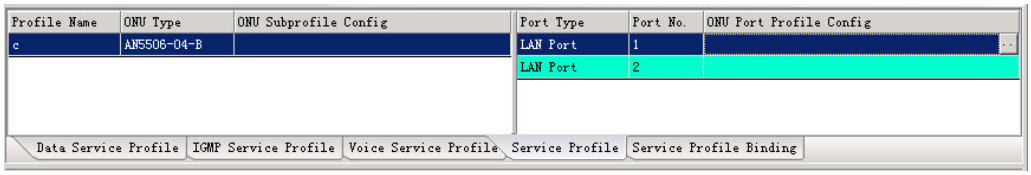


Figure 6-12 The service profile configuration for the AN5506-04-B in the transparent transmission mode (in a batch manner)

6.1.4.7 Binding the ONU to the Service Profile

1. Right-click the active HSWA card in the **Object Tree** pane and select **Config→ Service Profile Config** from the shortcut menu, and select the **Service Profile Binding** tab.
2. Click the right pane and click the button on the toolbar. Enter **1** in the **Please Input the Rows for Add:** dialog box that appears and click the **OK** button.

3. Double-click the **ONU S.N.** field to bring up the **Select Objects** dialog box. Select **AN5506-04-B[1]** in the dialog box.

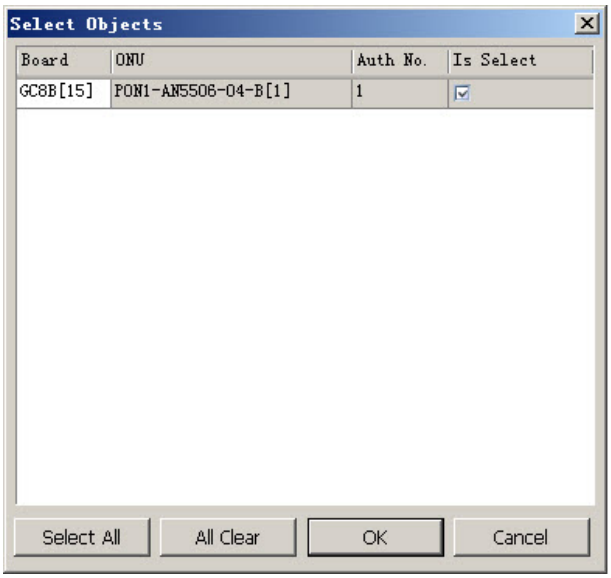


Figure 6-13 The Select Objects dialog box for configuring the AN5506-04-B in the transparent transmission mode (in a batch manner)

4. Click **OK** and return to the **Service Profile Binding** window.
5. Click the button on the toolbar, and click **OK** in the alert box that appears. The configuration is completed as shown in Figure 6-14.

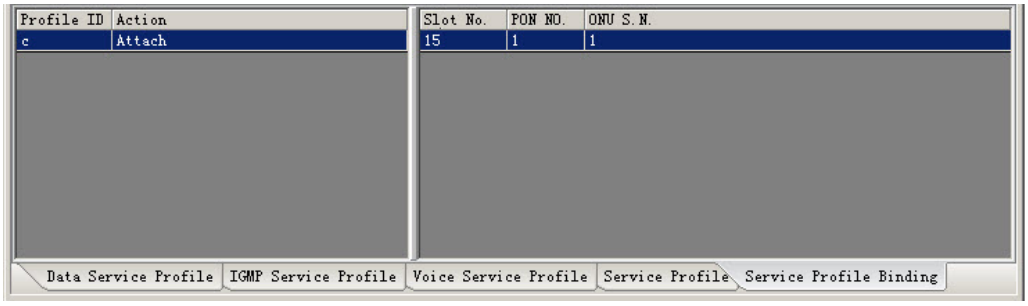


Figure 6-14 Binding the AN5506-04-B to the service profile-configuring the AN5506-04-B in the transparent transmission mode in a batch manner

6.1.4.8 End of Configuration

PC1 to PC4 can make normal access to Internet.

6.1.5 Configuring Data Services Respectively (for Type 2 ONU)

Refer to Table 1-2 for specific product types of Type 2 ONUs.

6.1.5.1 Planning data

Table 6-5 The planning data at the OLT side in the transparent transmission mode for the AN5506-10-B1 (configured respectively)

Item		Description	Example
ONU Information	Slot No.	The number of the actually used slot.	15
	PON Port No.	The number of the actually used PON port	1
	ONU S.N.	Configure this item according to the network planning of the operator.	2
	ONU Type	The type of the ONU	AN5506-10-B1
Local End Service VLAN	Service Name	Configure this item according to the network planning of the operator.	data1
	VLAN ID Begin	The begin VLAN ID number of the uplink port service.	3000
	VLAN ID End	The end VLAN ID number of the uplink port service. The begin VLAN ID should not be larger than the end VLAN ID.	3001
	Interface No. (uplink interface No. or TRUNK group No.)	The number of the actually used uplink port.	19:SFP2

Table 6-5 The planning data at the OLT side in the transparent transmission mode for the AN5506-10-B1 (configured respectively) (Continued)

Item		Description	Example
	TAG / UNTAG	The TAG processing mode of the uplink service VLAN. There are two options: **TAG** and **UNTAG**. ◆ **UNTAG** means that when the uplink data packet passes the port, its tag will be automatically stripped and it keeps going in the untagged mode. And for the downlink data packet in the untagged mode, when passing the port, it will be attached with tag and it keeps going in the tagged mode. ◆ **TAG** means that when the uplink / downlink data packet passes the port, its tag will not be stripped and it keeps going in the tagged mode.	TAG
	Service Type	Select **data** for the data service.	data
	Slot Bind Mode	Select Auto Bind.	Auto Bind

Table 6-6 The planning data at the ONU side in the transparent transmission mode for the AN5506-10-B1 (configured respectively)

Item		Description	Example
Bandwidth configuration	Service Type	Select integrate service.	Integrate Service
	Fixed Bandwidth (Kbyte/s)	The fixed bandwidth allocated for an ONU's uplink service. Even if the service does not use the bandwidth resource, other services cannot occupy the resource. The default setting is 16.	16
	Assured Bandwidth (Kbyte/s)	The minimum bandwidth for provisioning an ONU's uplink service. If the bandwidth resource is not used by this service, then the resource may be released for other services to use. The default setting is 0.	0
	Maximum Bandwidth (Kbyte/s)	The maximum bandwidth allocated for an ONU's uplink service. The sum of the fixed bandwidth value and the assured bandwidth value should not be larger than the maximum bandwidth value. The default setting is 64.	1280

Table 6-6 The planning data at the ONU side in the transparent transmission mode for the AN5506-10-B1 (configured respectively) (Continued)

Item		Description	Example	
Configuring the ONU port basic information	Port No.	The actually used ONU port	1	2
	Enable / Disable Port	Configure this item according to the operator's network planning; the default setting is Enable.	Default	
	Port Auto Negotiation	Configure this item according to the operator's network planning; the default setting is Enable.	Default	
	Port Speed	Unconfigurable when the port auto negotiation is enabled. The default setting is 100Mbit/s.	Default	
	Duplex	Unconfigurable when the port auto negotiation is enabled. The default value is full-duplex.	Default	
	Flow Control Enable / Disable	Configure this item according to the operator's network planning; the default setting is Disable.	Default	
Configuring the ONU port service parameters	TLS	Configure according to the network planning of the operator. Select TLS or No TLS.	No TLS	
	Service Type	Select unicast.	Unicast	
	VLAN Mode	Configure according to the network planning of the operator. Select Tag or Transparent.	Transparent	
	TPID	The default setting is 33024.	33024	
	CVLAN ID	Configure according to the network planning of the operator. The value ranges from 1 to 4085.	200	
	Priority Or COS	The CVLAN priority, ranging from 0 to 7. 7 stands for the highest priority level, and 0 stands for the lowest one.	0	
	QinQ State	Enable / disable the QinQ configuration	Enable	
	Service Name	Corresponding to the service name configured in the local VLAN.	data1	
	VLAN ID	Configure the SVLAN ID according to the network planning of the operator within the range of 1 to 4085.	3001	
	TPID	The default setting is 33024.	33024	
	Priority Or COS	The SVLAN priority, ranging from 0 to 7. 7 stands for the highest priority level, and 0 stands for the lowest one.	0	

6.1.5.2 Configuration Flow

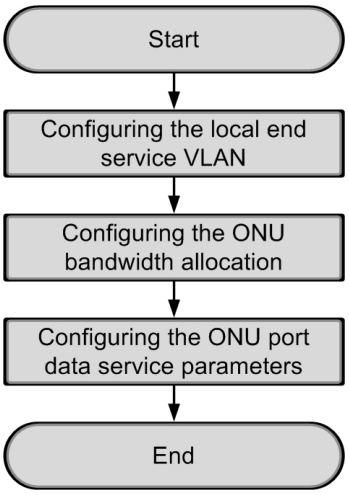


Figure 6-15 Flow chart for configuring data services respectively in the transparent transmission mode (for the AN5506-10-B1)

6.1.5.3 Configuring the Local End Service VLAN

Refer to Configuring the Local End Service VLAN for configuration procedures.

6.1.5.4 Configuring the Bandwidth Allocation

1. Click the GC8B[15] card in the **Object Tree** pane to display all ONUs connected to the GC8B card in the right pane. Right-click the **PON1-AN5506-10-B1[2]** ONU and select **Config→Bandwidth config** from the shortcut menu to access the **Bandwidth Config** window.
2. Click the right pane, and then click the button on the toolbar. Enter **1** in the **Please Input the Rows for Add:** dialog box that appears and click the **OK** button.
3. Configure according to the planning data in Table 6-6.
4. Click the button on the toolbar, and click **OK** in the dialog box that appears. The configuration is completed as shown in Figure 6-16.

Figure 6-16 Configuring the GPON service bandwidth for the AN5506-10-B1 in the transparent transmission mode (configured respectively)

6.1.5.5 Configuring the ONU Port Data Service Parameters

1. Click the GC8B[15] card in the **Object Tree** pane to display all ONUs connected to the GC8B card in the right pane. Right-click the **AN5506-10-B1[2]** ONU and select **Config→Service Config** from the shortcut menu. Then select the **ONU Port Config** tab.
2. Select **LAN1** from the **Data Port List**. Click **Add** to create a data service, and configure it according to the planning data in Table 6-6.

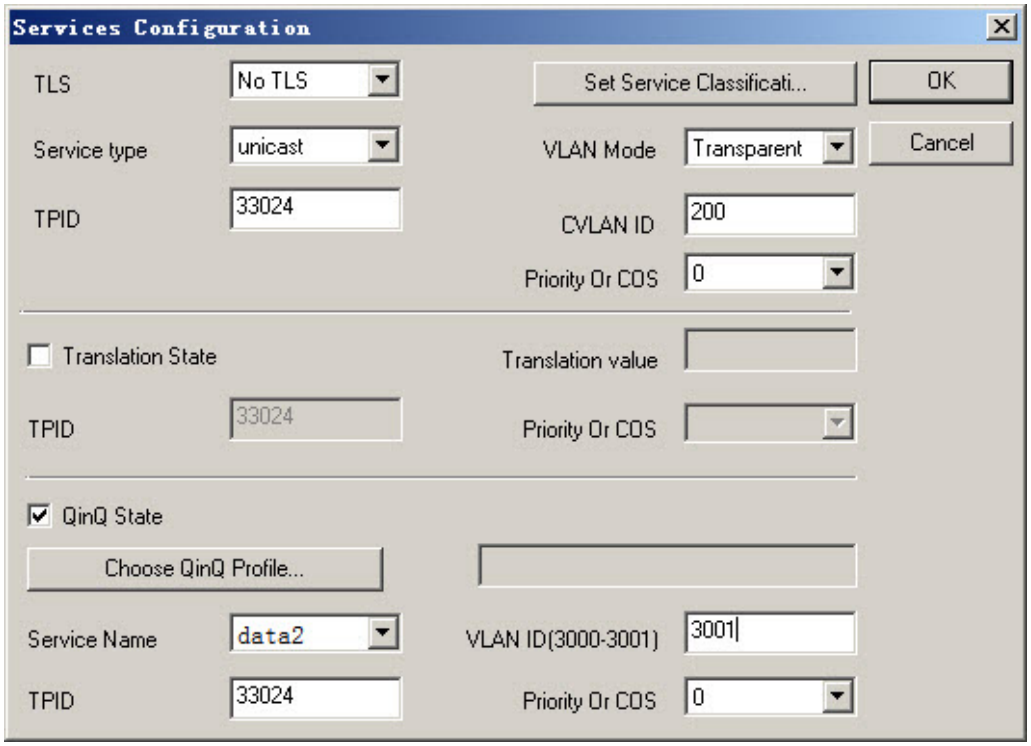


Figure 6-17 Service configuration for the AN5506-10-B1 in the transparent transmission mode (configured respectively)

3. Click **OK** and return to the **Copy Port Config** tab. Right-click **LAN1** in the **Data Port List** and select **Copy Port Config**. Right-click **LAN2** and select **Paste Port Config**.
4. Click the **Modify on Device** button to complete the service configuration for the AN5506-10-B1, as shown in Figure 6-18.

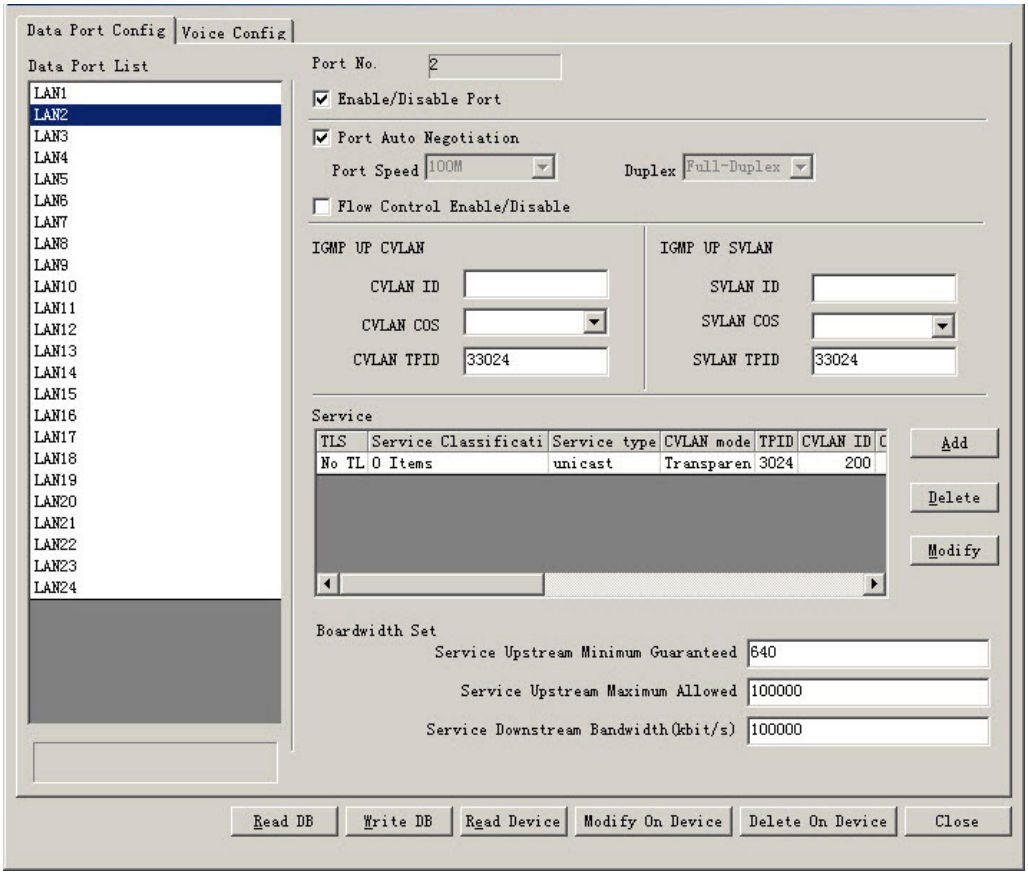


Figure 6-18 The port service configuration completed for the AN5506-10-B1 in the transparent transmission mode (configured respectively)

6.1.5.6 End of Configuration

PC1 to PC4 can make normal access to Internet.

6.1.6 Configuring Data Services in a Batch Manner (for Type 2 ONU)

Refer to Table 1-2 for specific product types of Type 2 ONUs.

6.1.6.1 Planning data

Table 6-7 The planning data at the OLT side for the AN5506-10-B1 in the transparent transmission mode (in a batch manner)

Item		Description	Example
ONU Information	Slot No.	The number of the actually used slot.	15
	PON Port No.	The number of the actually used PON port	1
	ONU S.N.	Configure this item according to the network planning of the operator.	2
	ONU Type	The type of the ONU	AN5506-10-B1
Local End Service VLAN	Service Name	Configure this item according to the network planning of the operator.	data1
	VLAN ID Begin	The begin VLAN ID number of the uplink port service.	3000
	VLAN ID End	The end VLAN ID number of the uplink port service. The begin VLAN ID should not be larger than the end VLAN ID.	3001
	Interface No. (uplink interface No. or TRUNK group No.)	The number of the actually used uplink port.	19:SFP2
	TAG / UNTAG	The TAG processing mode of the uplink service VLAN. There are two options: **TAG** and **UNTAG**. ◆ **UNTAG** means that when the uplink data packet passes the port, its tag will be automatically stripped and it keeps going in the untagged mode. And for the downlink data packet in the untagged mode, when passing the port, it will be attached with tag and it keeps going in the tagged mode. ◆ **TAG** means that when the uplink / downlink data packet passes the port, its tag will not be stripped and it keeps going in the tagged mode.	TAG
	Service Type	Select **data** for the data service.	data
	Slot Bind Mode	Select Auto Bind.	Auto Bind

Table 6-8 The planning data at the ONU side for the AN5506-10-B1 in the transparent transmission mode (in a batch manner)

Item		Description	Example
Bandwidth allocation profile	Profile Name	The name of the bandwidth allocation profile	a
	Service Type	Select integrate service.	Integrate Service
	Fixed Bandwidth (Kbyte/s)	The fixed bandwidth allocated for an ONU's uplink service. Even if the service does not use the bandwidth resource, other services cannot occupy the resource. The default setting is 16.	16
	Assured Bandwidth (Kbyte/s)	The minimum bandwidth for provisioning an ONU's uplink service. If the bandwidth resource is not used by this service, then the resource may be released for other services to use. The default setting is 0.	0
	Maximum Bandwidth (Kbyte/s)	The maximum bandwidth allocated for an ONU's uplink service. The sum of the fixed bandwidth value and the assured bandwidth value should not be larger than the maximum bandwidth value. The default setting is 64.	1280
Binding bandwidth allocation profile	Slot No.	The number of the actually used slot.	15
	PON No.	The number of the actually used PON port	1
	ONU No.	The ONU authorization number assigned according to the network planning of the operator	2
	GPON Bandwidth Profile	The name of the configured bandwidth allocation profile	a
Configuring the service model profile	Profile Name	Configure this item according to the network planning of the operator.	b
	Service Type	Select unicast.	Unicast
	CVLAN Mode	Configure the CVLAN mode of the service as **tag** or **transparent**.	transparent
	QinQ State	Enable / disable the QinQ configuration. Disable is selected by default.	Enable
Configuring the SVLAN profile	Profile Name	The SVLAN profile name	c
	SVLAN Name	Corresponding to the service name configured in the local VLAN.	data1
	STPID	The default setting is 33024.	33024

Table 6-8 The planning data at the ONU side for the AN5506-10-B1 in the transparent transmission mode (in a batch manner) (Continued)

Item		Description	Example	
	SVLAN	The value ranges from 1 to 4085.	3001	
	SCOS	The SVLAN priority. The value ranges from 0 to 7. 7 stands for the highest priority level, and 0 stands for the lowest one.	0	
Configuring the ONU data port	Port No.	The number of the actually used ONU port	1	2
	Enable / Disable	Select **Enable**.	Enable	
	MAC Limit	Configured without MAC limit.	0	
Configuring the ONU data service	CTPID	The default setting is 33024.	33024	
	CVLAN ID	The CVLAN ID, ranging from 1 to 4085.	200	
	CCOS	The CVLAN priority. The value ranges from 0 to 7. 7 stands for the highest priority level, and 0 stands for the lowest one.	0	
	SVLAN Name	Corresponding to the service name in the local VLAN service configuration.	data1	
	Service Profile	Select the configured service model profile.	b	
	SVLAN Profile	Select the configured SVLAN profile.	c	

6.1.6.2 Configuration Flow

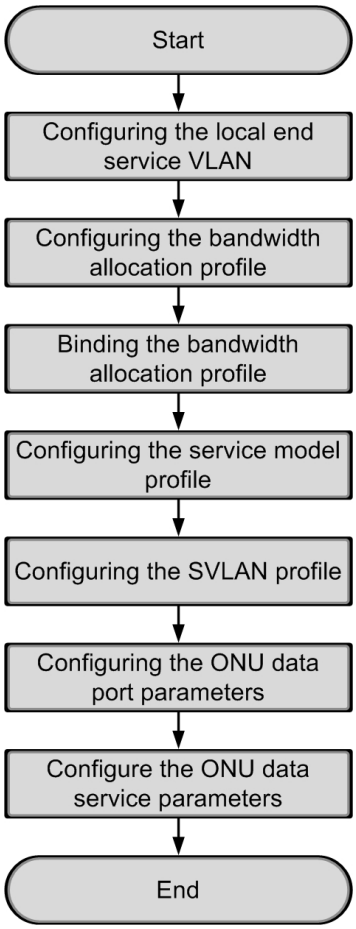


Figure 6-19 Flow chart for configuring data services in the transparent transmission mode for the AN5506-10-B1 in a batch manner

6.1.6.3 Configuring the Local End Service VLAN

Refer to Configuring the Local End Service VLAN for configuration procedures.

6.1.6.4 Configuring the Bandwidth Allocation Profile

1. Right-click the active HSWA[9] card in the **Object Tree** pane and select **Config →GPON Service Bandwidth Config Profile** from the shortcut menu to access the **GPON Service Bandwidth Config Profile** window.

2. Click the left pane and click the button on the toolbar. In the **Please Input the Rows for Add:** dialog box that appears subsequently, type **1** and click **OK**. Double-click the **Profile Name** blank field and enter **a**.
3. Click the right pane, and then click the button on the toolbar. Enter **1** in the **Please Input the Rows for Add:** dialog box that appears and click the **OK** button.
4. Configure according to the planning data in Table 6-8.
5. Click the button on the toolbar to complete the configuration, as shown in Figure 6-20.

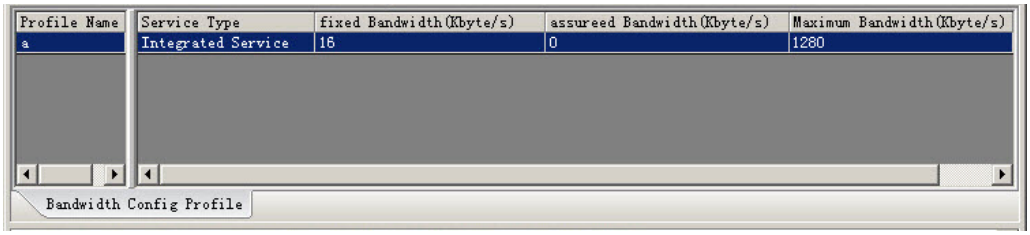


Figure 6-20 The ONU bandwidth allocation profile-configuring the AN5506-10-B1 in the transparent transmission mode (in a batch manner)

6.1.6.5 Binding bandwidth allocation profile

1. Right-click the designated system in the **Object Tree** pane, select **Config→ Batch Configure→ONU Config** from the short-cut menu that appears to access the **ONU Config** window.
2. Click **Set Object as Condition** in the **Config Object** pane, and all configuration objects will appear in the lower pane. Select the AN5506-10-B1[2] under the No.1 PON in Slot 15 and click the **OK** button.

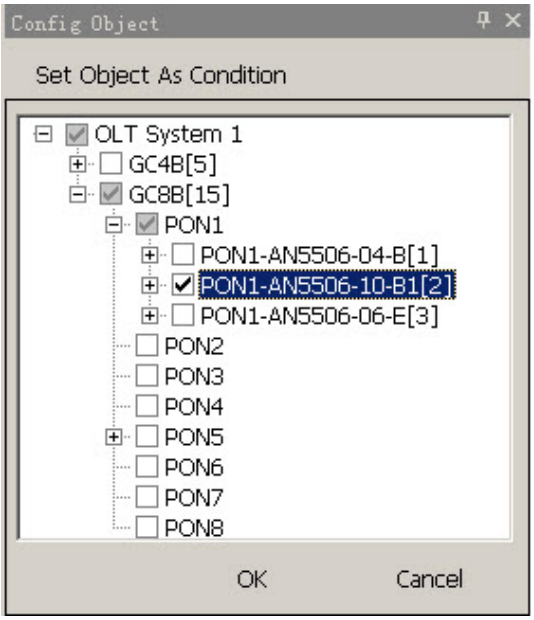


Figure 6-21 Setting the objects to which the bandwidth profile is bound-configuring the AN5506-10-B1 in a batch manner

3. The specific configuration information of the object will appear in the right pane. Click the **GPON Bandwidth Profile** list box and select the configured bandwidth profile **a**.
4. Click the button on the toolbar to complete the configuration. Figure 6-22 shows a successful configuration.

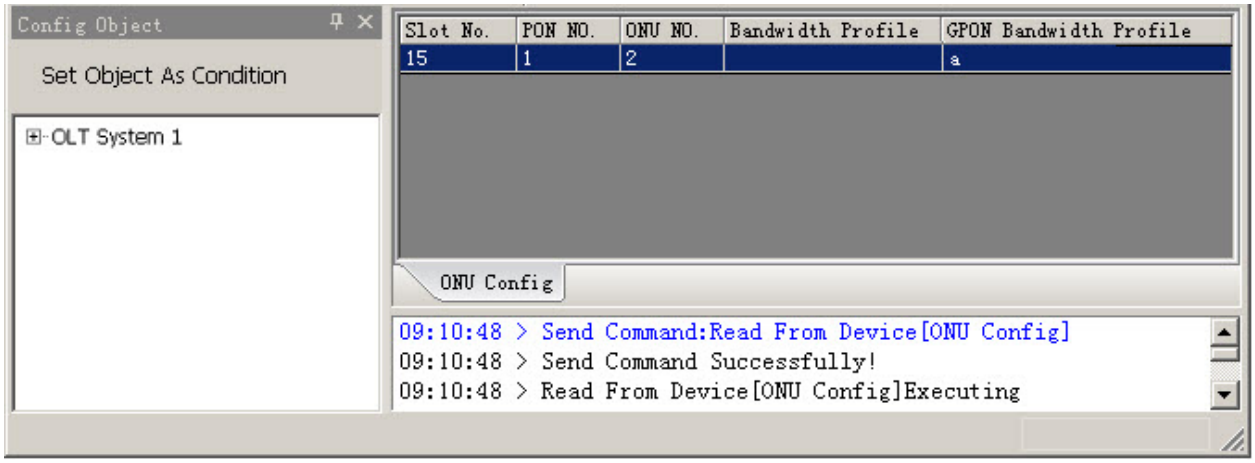


Figure 6-22 Binding the bandwidth allocation profile - configuring the AN5506-10-B1 in the transparent transmission mode in a batch manner

6.1.6.6 Configuring the Service Model Profile

1. Right-click the designated system in the **Object Tree** pane, select **Config→ Profile Definition→Service Model Profile** from the short-cut menu that appears to access the **Service Model Profile** window.
2. Click the button on the toolbar. In the **Please Input the Rows for Add:** dialog box that appears subsequently, type **1** and click **OK** to add a service model profile
3. Configure according to the planning data in Table 6-8.
4. Click the button on the toolbar to complete the configuration, as shown in Figure 6-23.

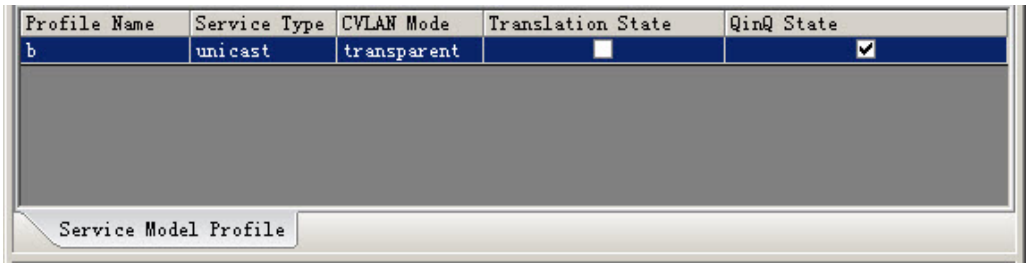


Figure 6-23 Configuring the service model profile-configuring the AN5506-10-B1 in the transparent transmission mode in a batch manner

6.1.6.7 Configuring the SVLAN Profile

1. Right-click the designated system in the **Object Tree** pane, select **Config→ Profile Definition→SVLAN Profile** from the short-cut menu that appears to access the **SVLAN Profile** window.
2. Click the button on the toolbar. In the **Please Input the Rows for Add:** dialog box that appears subsequently, type **1** and click **OK** to add an SVLAN profile.
3. Configure according to the planning data in Table 6-8.
4. Click the button on the toolbar to complete the configuration, as shown in Figure 6-24.

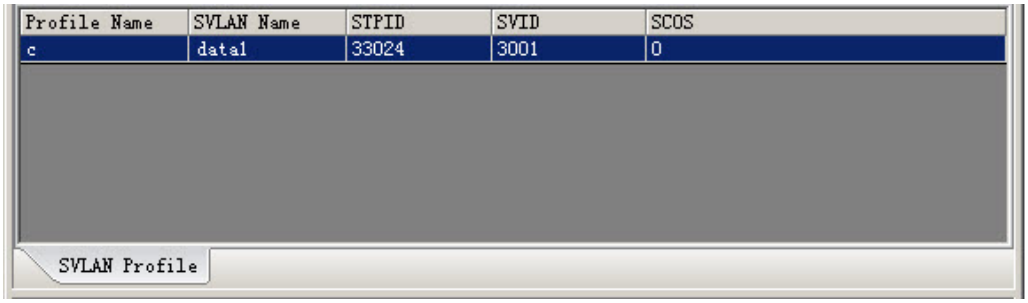


Figure 6-24 Configuring the SVLAN profile-configuring the AN5506-10-B1 in the transparent transmission mode in a batch manner

6.1.6.8 Configuring the ONU Data Port Parameters

1. Right-click the designated system in the **Object Tree** pane and select **Config→ Batch Configure→ONU Data Port Config** from the short-cut menu that appears to access the **ONU Data Port Config** window.
2. Click **Set Object as Condition** in the **Config Object** pane, and all configuration objects will appear in the lower pane. Select LAN1 and LAN2 ports of the AN5506-10-B1[2] listed under the No.1 PON in Slot 15 and click the **OK** button.

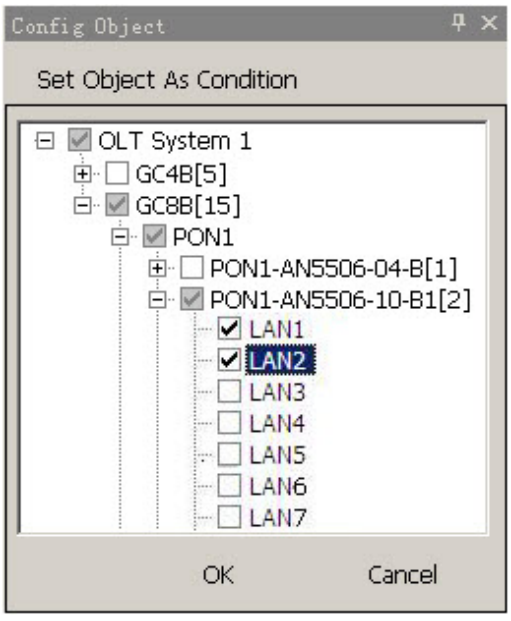


Figure 6-25 Setting the condition object of the ONU data port parameters-configuring the AN5506-10-B1 in the transparent transmission mode in a batch manner

3. The specific configuration information about the object will be displayed in the right pane. Configure according to the planning data in Table 6-8.
4. Click the button on the toolbar to complete the configuration, as shown in Figure 6-26.

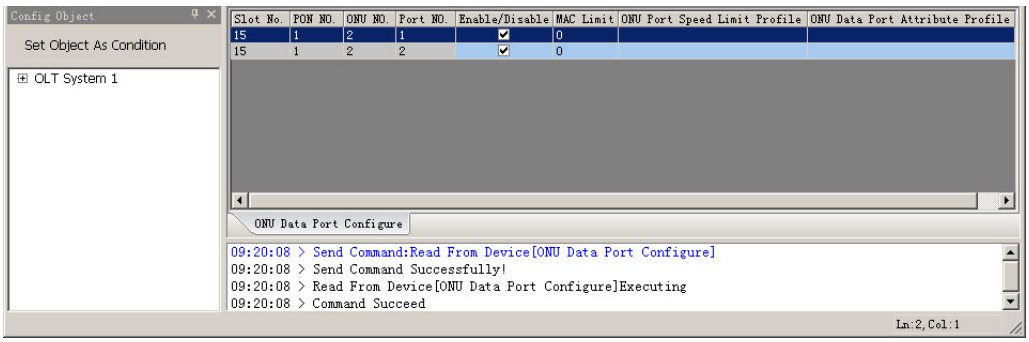


Figure 6-26 Configuring the ONU data port parameters-configuring the AN5506-10-B1 in the transparent transmission mode in a batch manner

6.1.6.9 Configuring the ONU Data Service Parameters

1. Right-click the designated system in the **Object Tree** pane and select **Config→ Batch Configure→ONU Data Service Configure** from the short-cut menu that appears to access the **ONU Data Service Configure** window.
2. Click the button on the toolbar to bring up the **Add Item Number** dialog box. Select LAN1 and LAN2 ports of the ONU and click **OK** to return to the **ONU Data Service Configure** window.

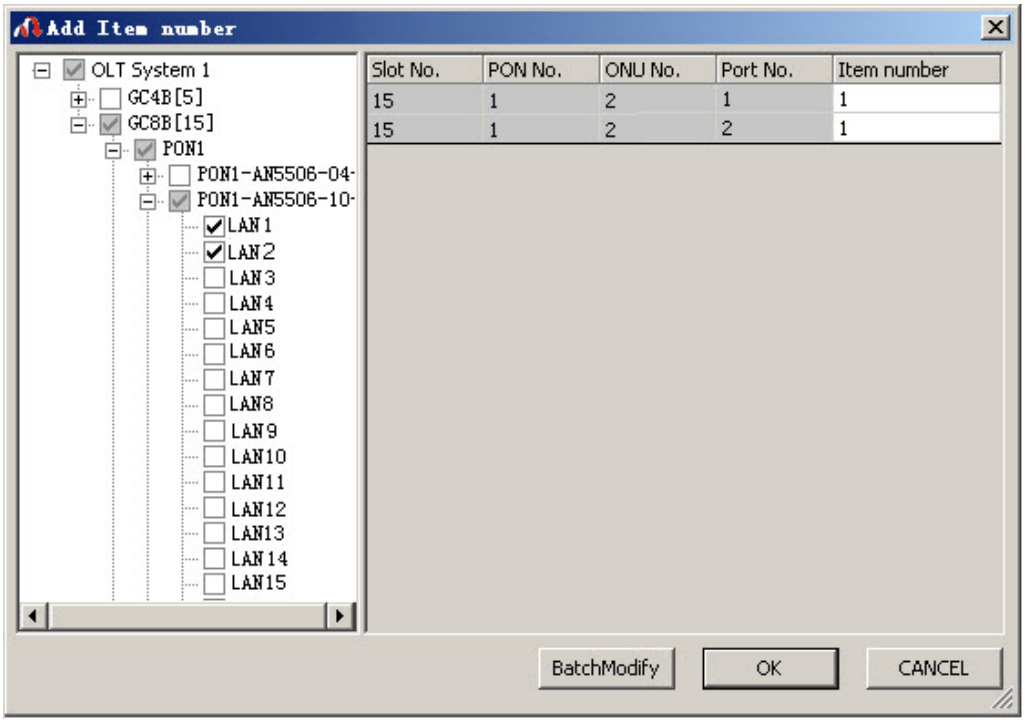


Figure 6-27 Setting the condition object of the ONU data service parameters-configuring the AN5506-10-B1 in the transparent transmission mode in a batch manner

3. The specific configuration information about the object will be displayed in the right pane. Configure according to the planning data in Table 6-8.
4. Click the button on the toolbar to complete the configuration, as shown in Figure 6-28.

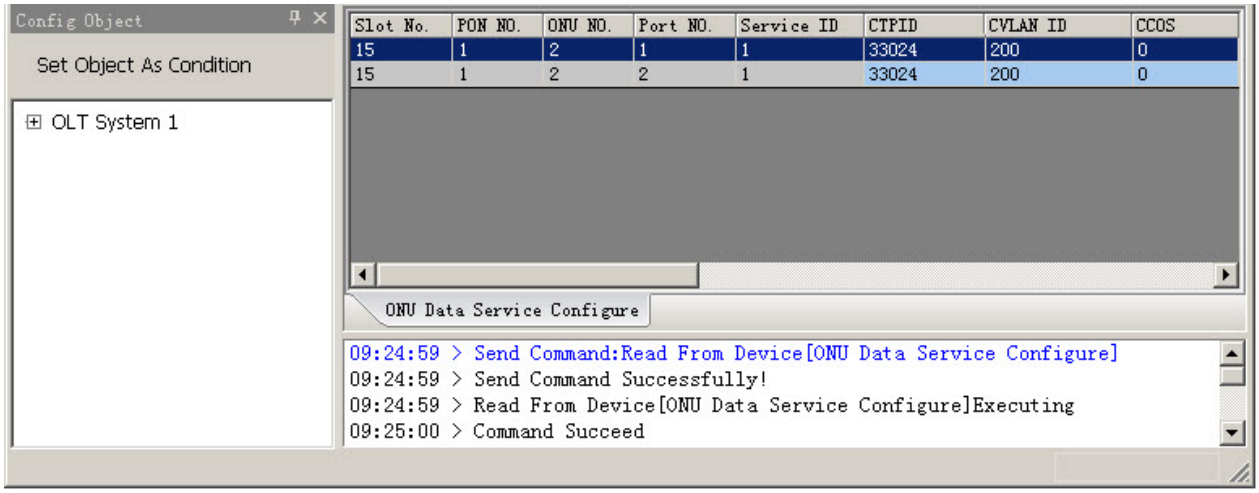


Figure 6-28 Configuring the ONU data service parameters-configuring the AN5506-10-B1 in the transparent transmission mode in a batch manner

6.1.6.10 End of Configuration

PC1 to PC4 can make normal access to Internet.

6.2 Example for Data Service Configuration – in the TAG Mode

6.2.1 Configuration Rules

- In the TAG mode, the data are processed in two ways:
  - The client-side Ethernet data are added with the VLAN ID and SVLAN ID via the ONU, and are then transmitted to the AN5116-06B. The data service will not be processed by the AN5116-06B, but transparently transmitted to the upper layer network side equipment.
  - The client-side Ethernet data are added with the VLAN ID via the ONU, and are then transmitted to the AN5116-06B. After adding the SVLAN ID to the data service, the AN5116-06B will transmit the data service to the upper layer network side equipment.
- The VLAN ID of the ONU ranges from 1 to 4085.

- If stacked VLANs are used for the data service, the SVLAN ID should be within the range of the local VLAN.
- If single VLAN is used for the data service, the CVLAN ID should be within the range of the local VLAN.

- The ONU data service configuration can be implemented in the service profile or the ONU service configuration. If the data service configurations of the ONUs are the same, the batch configurations can be implemented using the service profile.
- The sum of the fixed bandwidth and assured bandwidth of the service in the bandwidth allocation should not exceed the configured maximum bandwidth.
- An FE port of the AN5506-04-B can support up to four data services, and an FE port of the AN5506-10-B1 can support up to 16 data services.
- While configuring the service type in bandwidth allocation, select **Broadband Internet access** for Type 1 ONUs and select **Integrate Service** for Type 2 ONUs.

6.2.2 Network Diagram

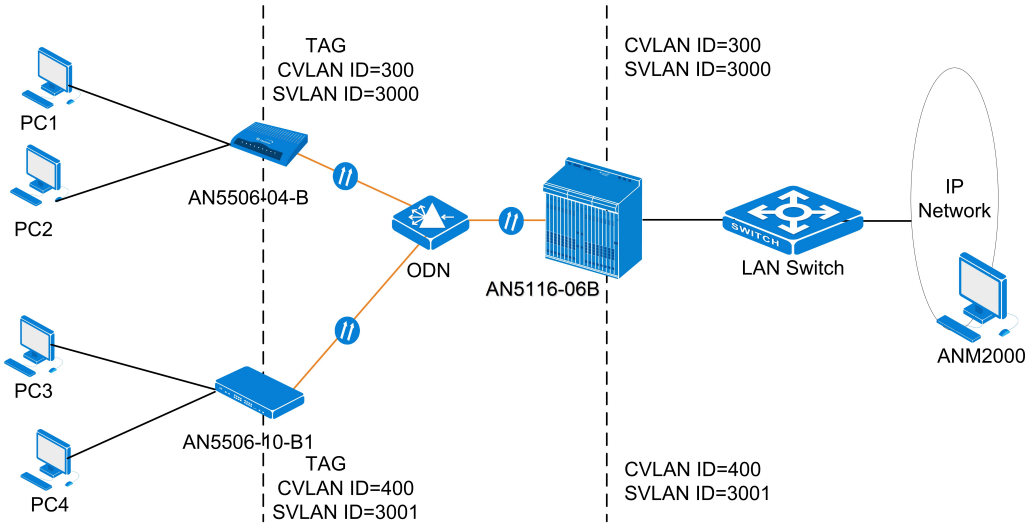


Figure 6-29 The data service network in the TAG mode

- As shown in the figure above, in the uplink direction, the data services from the subscribers' PCs are added with the CVLAN and SVLAN via the ONUs. Then the data with stacked VLANs are transmitted to the OLT via the splitter. The OLT will not process the services but transmit them to the upper layer network via the uplink port directly.
- In the downlink direction, the data services carrying stacked VLANs pass by the OLT without being processed. The services are transmitted to the corresponding ONUs via the splitter. Then the ONUs strip the SVLAN and CVLAN, and transmit the data to the subscribers' PCs.

The AN5506-04-B and the AN5506-10-B1 are used as ONUs in this example. The AN5116-06B uses the HU1A and the GC8B as the interface cards at the network side and the subscriber side respectively. And the HSWA card is compulsory.

6.2.3 Configuring Data Services Respectively (for Type 1 ONU)

Refer to Table 1-1 for specific product types of Type 1 ONUs.

6.2.3.1 Planning data

Table 6-9 The planning data at the OLT side in the TAG mode for the AN5506-04-B (configured respectively)

Item		Description	Example
ONU Information	Slot No.	The number of the actually used slot.	15
	PON Port No.	The number of the actually used PON port	1
	ONU S.N.	Configure this item according to the network planning of the operator.	1
	ONU Type	The type of the ONU	AN5506-04-B
Local End Service VLAN	Service Name	Configure this item according to the network planning of the operator.	data2
	VLAN ID Begin	The begin VLAN ID number of the uplink port service.	3000
	VLAN ID End	The end VLAN ID number of the uplink port service. The begin VLAN ID should not be larger than the end VLAN ID.	3001

Table 6-9 The planning data at the OLT side in the TAG mode for the AN5506-04-B (configured respectively) (Continued)

Item		Description	Example
	Interface No. (uplink interface No. or TRUNK group No.)	The number of the actually used uplink port.	19:SFP2
	TAG / UNTAG	The TAG processing mode of the uplink service VLAN. There are two options: **TAG** and **UNTAG**. ◆ **UNTAG** means that when the uplink data packet passes the port, its tag will be automatically stripped and it keeps going in the untagged mode. And for the downlink data packet in the untagged mode, when passing the port, it will be attached with tag and it keeps going in the tagged mode. ◆ **TAG** means that when the uplink / downlink data packet passes the port, its tag will not be stripped and it keeps going in the tagged mode.	TAG
	Service Type	Select **data** for the data service.	data
	Slot Bind Mode	Select **Auto Bind**.	Auto Bind

Table 6-10 The planning data at the ONU side in the TAG mode for the AN5506-04-B (configured respectively)

Item		Description	Example
Bandwidth configuration	Service Type	Select broadband Internet access.	Broadband Internet access
	Fixed Bandwidth (Kbyte/s)	The fixed bandwidth allocated for an ONU's uplink service. Even if the service does not use the bandwidth resource, other services cannot occupy the resource. The default setting is 16.	16
	Assured Bandwidth (Kbyte/s)	The minimum bandwidth for provisioning an ONU's uplink service. If the bandwidth resource is not used by this service, then the resource may be released for other services to use. The default setting is 0.	0
	Maximum Bandwidth (Kbyte/s)	The maximum bandwidth allocated for an ONU's uplink service. The sum of the fixed bandwidth value and the assured bandwidth value should not be larger than the maximum bandwidth value. The default setting is 64.	1280

Table 6-10 The planning data at the ONU side in the TAG mode for the AN5506-04-B (configured respectively) (Continued)

Item		Description	Example	
Configuring the ONU port basic information	ONU Port Used	The number of the actually used ONU port	1	2
	Enable / Disable Port	Configure this item according to the operator's network planning; the default setting is Enable.	Default	
	Port Auto Negotiation	Configure this item according to the operator's network planning; the default setting is Enable.	Default	
	Port Speed	Unconfigurable when the port auto negotiation is enabled. The default setting is 100Mbit/s.	Default	
	Duplex	Unconfigurable when the port auto negotiation is enabled. The default value is full-duplex.	Default	
	Flow Control Enable / Disable	Configure this item according to the operator's network planning; the default setting is Disable.	Default	
Configuring the ONU port service parameters	TAG Mode	Configured as Tag or Untag according to the network planning of the operator. In the **Tag** mode the uplink data packets are tagged, whereas in the **Untag** mode the uplink data packets are untagged.	Untag	
	Service Type	Select **unicast**.	Unicast	
	COS (Ethernet priority)	When the CVLAN mode is set to **Transparent**, this item should be consistent with the COS (priority in the PON). The value ranges from 0 to 7. When the Tag mode is set to **TAG**, this item is unconfigurable.	-	
	VLAN ID	When the CVLAN mode is set to Transparent, the VLAN ID should be consistent with the CVLAN ID. When the Tag mode is set to Untag, this item is unconfigurable. The value ranges from 1 to 4085.	-	
	CVLAN Mode	When the Tag mode is set to **Untag**, the CVLAN mode can be set to Tag or Transparent. When the Tag mode is set to **Tag**, the CVLAN mode can set to Translation or Transparent.	Tag	
	CVLAN ID	Configure according to the network planning of the operator. The value ranges from 1 to 4085.	300	
	COS (priority in the PON)	The CVLAN priority, ranging from 0 to 7. 7 stands for the highest priority level, and 0 stands for the lowest one.	0	
	Ds Encrypt State	Disable is selected by default.	Disable	
	QinQ State	Enable / disable the QinQ configuration	Enable	

Table 6-10 The planning data at the ONU side in the TAG mode for the AN5506-04-B (configured respectively) (Continued)

Item		Description	Example
	SVLAN ID	Unconfigurable when the QinQ State is set to Disable. The value ranges from 1 to 4085.	3000
	Service Name	Corresponding to the service name in the local end service VLAN configuration. Unconfigurable when the **QinQ State** is set to Disable.	data2
	COS (priority in the PON)	The SVLAN priority, ranging from 0 to 7. 7 stands for the highest priority level, and 0 stands for the lowest one. Unconfigurable when the QinQ State is set to Disable.	0

6.2.3.2 Configuration Flow

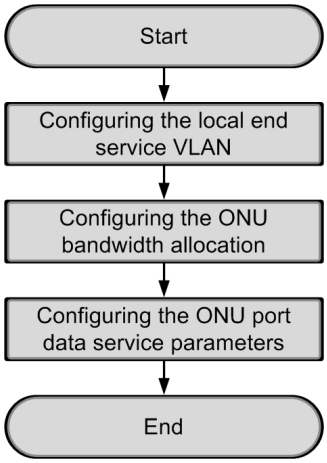


Figure 6-30 Flow chart for configuring data services respectively in the TAG mode (for the AN5506-04-B)

6.2.3.3 Configuring the Local End Service VLAN

1. Right-click the HSWA[9] card in the **Object Tree** pane and select **Config→ Local VLAN→Local End Service VLAN** from the shortcut menu to access the **Local End Service VLAN** window.
2. Click the button on the toolbar. In the **Please Input the Rows for Add:** dialog box that appears subsequently, type **1** and click **OK** to add a local VLAN.
3. Configure according to the planning data in Table 6-9.

4. Click the button on the toolbar to complete the configuration, as shown in Figure 6-31.

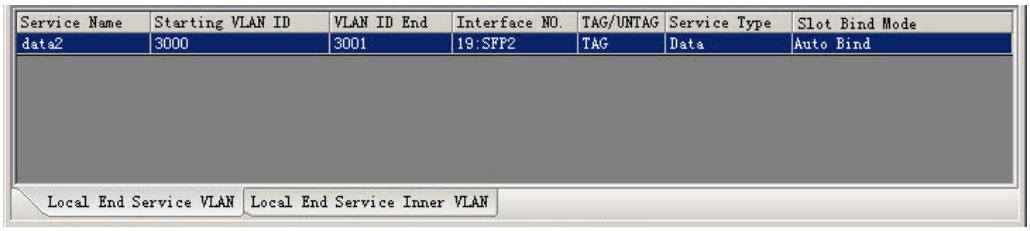


Figure 6-31 Configuring the local end service VLAN for the AN5506-04-B in the TAG mode (configured respectively)

6.2.3.4 Configuring the Bandwidth Allocation

1. Click the GC8B[15] card in the **Object Tree** pane to display all ONUs connected to the GC8B card in the right pane. Right-click the **PON1-AN5506-04-B[1]** ONU and select **Config→Bandwidth config** from the shortcut menu to access the **Bandwidth Config** window.
2. Click the right pane, and then click the button on the toolbar. Enter **1** in the **Please Input the Rows for Add:** dialog box that appears and click the **OK** button.
3. Configure according to the planning data in Table 6-10.
4. Click the button on the toolbar to complete the configuration, as shown in Figure 6-32.

Figure 6-32 Configuring the GPON service bandwidth for the AN5506-04-B in the TAG mode (configured respectively)

6.2.3.5 Configuring the ONU Port Data Service Parameters

1. Click the GC8B[15] card in the **Object Tree** pane to display all ONUs connected to the GC8B card in the right pane. Right-click the **PON1-AN5506-04-B[1]** ONU and select **Config→Service Config** from the shortcut menu. Then select the **ONU Port Config** tab.
2. Select **LAN1** from the **Data Port List**, and click **Add** to create a data service.
3. Configure according to the planning data in Table 6-10.

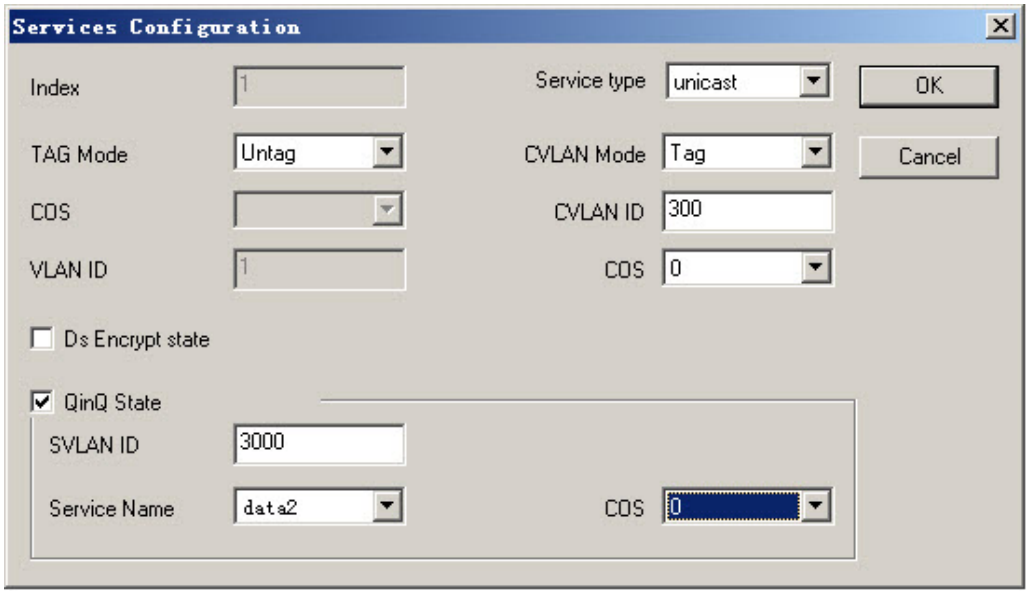


Figure 6-33 Configuring the service for the AN5506-04-B in the TAG mode (configured respectively)

4. Click **OK** and return to the **ONU Port Config** tab. Right-click **LAN1** in the **Data Port List** and select **Copy Port Config**. Right-click **LAN2** and select **Paste Port Config**.
5. Click the **Modify on Device** button to complete the service configuration for the AN5506-04-B, as shown in Figure 6-34.

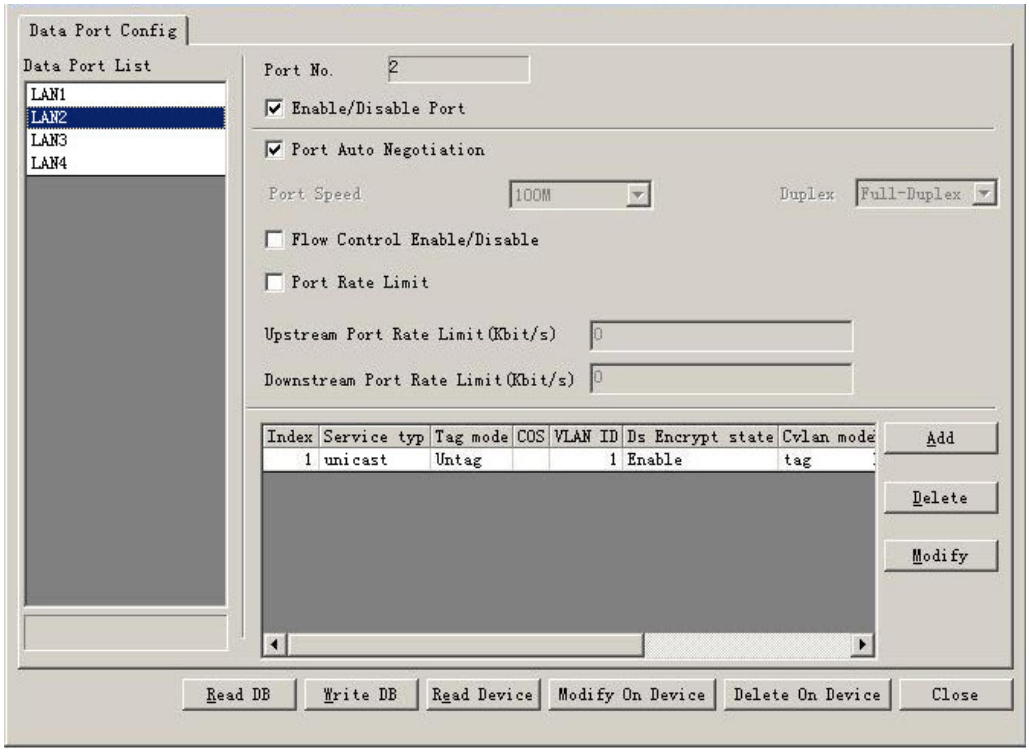


Figure 6-34 The port service configuration completed for the AN5506-04-B in the TAG mode (configured respectively)

6.2.3.6 End of Configuration

PC1 to PC4 can make normal access to Internet.

6.2.4 Configuring Data Services in a Batch Manner (for Type 1 ONU)

Refer to Table 1-1 for specific product types of Type 1 ONUs.

6.2.4.1 Planning data

Table 6-11 The planning data at the OLT side in the TAG mode for the AN5506-04-B (configured in a batch manner)

Item		Description	Example
ONU Information	Slot No.	The number of the actually used slot.	15
	PON Port No.	The number of the actually used PON port	1
	ONU S.N.	Configure this item according to the network planning of the operator.	1
	ONU Type	The type of the ONU	AN5506-04-B
Local End Service VLAN	Service Name	Configure this item according to the network planning of the operator.	data2
	VLAN ID Begin	The begin VLAN ID number of the uplink port service.	3000
	VLAN ID End	The end VLAN ID number of the uplink port service. The begin VLAN ID should not be larger than the end VLAN ID.	3001
	Interface No. (uplink interface No. or TRUNK group No.)	The number of the actually used uplink port.	19:SFP2
	TAG / UNTAG	The TAG processing mode of the uplink service VLAN. There are two options: **TAG** and **UNTAG**. ◆ **UNTAG** means that when the uplink data packet passes the port, its tag will be automatically stripped and it keeps going in the untagged mode. And for the downlink data packet in the untagged mode, when passing the port, it will be attached with tag and it keeps going in the tagged mode. ◆ **TAG** means that when the uplink / downlink data packet passes the port, its tag will not be stripped and it keeps going in the tagged mode.	TAG
	Service Type	Select **data** for the data service.	data
	Slot Bind Mode	Select **Auto Bind**.	Auto Bind

Table 6-12 The planning data at the ONU side in the TAG mode for the AN5506-04-B (configured in a batch manner)

Item		Description	Example
Bandwidth allocation profile	Profile Name	The name of the bandwidth allocation profile	a
	Service Type	Select broadband Internet access.	Broadband Internet access
	Fixed Bandwidth (Kbyte/s)	The fixed bandwidth allocated for an ONU's uplink service. Even if the service does not use the bandwidth resource, other services cannot occupy the resource. The default setting is 16.	16
	Assured Bandwidth (Kbyte/s)	The minimum bandwidth for provisioning an ONU's uplink service. If the bandwidth resource is not used by this service, then the resource may be released for other services to use. The default setting is 0.	0
	Maximum Bandwidth (Kbyte/s)	The maximum bandwidth allocated for an ONU's uplink service. The sum of the fixed bandwidth value and the assured bandwidth value should not be larger than the maximum bandwidth value. The default setting is 64.	1280
Data service profile configuration	Profile Name	Configure this item according to the network planning of the operator.	b
	Enable / Disable	Enable is selected by default.	Enable
	Auto Negotiation	Enable is selected by default.	Enable
	Speed (bit/s)	The default setting is 10Mbit/s. Unconfigurable when the **Auto Negotiation** is enabled.	-
	Duplex Mode	Full-duplex is selected by default. Unconfigurable when the **Auto Negotiation** is enabled.	-
	Flow	Disable is selected by default.	Disable
	Port Limit Enable / Disable	Disable is selected by default.	Disable
	Port Uplink Limit	The default value is 0. Unconfigurable when the port limit is disabled.	-
	Port Downlink Limit	The default value is 0. Unconfigurable when the port limit is disabled.	-

Table 6-12 The planning data at the ONU side in the TAG mode for the AN5506-04-B (configured in a batch manner) (Continued)

Item		Description	Example
	Tag Mode	Configured as Tag or Untag according to the network planning of the operator. In the **Tag** mode the uplink data packets are tagged, whereas in the **Untag** mode the uplink data packets are untagged.	Untag
	COS	The value ranges from 0 to 7. When the Tag mode is set to **TAG**, this item is unconfigurable.	-
	VLAN ID	When the Tag mode is set to **Untag**, this item is unconfigurable. The value ranges from 1 to 4085.	-
	Ds Encrypt State	Disable is selected by default.	Disable
	CVLAN Mode	When the Tag mode is set to **Untag**, the CVLAN mode can be set to Tag or Transparent. When the Tag mode is set to **Tag**, the CVLAN mode can set to Translation or Transparent.	Tag
	CVLAN ID	Configure according to the network planning of the operator. The value ranges from 1 to 4085.	300
	COS	The CVLAN priority, ranging from 0 to 7.	0
	QinQ State	Enable / disable the QinQ configuration. Disable is selected by default.	Enable
	Service Name	Corresponding to the service name in the local end service VLAN configuration. Unconfigurable when the **QinQ State** is set to Disable.	data2
	SVLAN ID	The value ranges from 1 to 4085. Unconfigurable when the **QinQ State** is set to Disable.	3000
	COS	The SVLAN priority, ranging from 0 to 7. 7 stands for the highest priority level, and 0 stands for the lowest one. Unconfigurable when the **QinQ State** is set to Disable.	0
Service profile configuration	Profile Name	Configure this item according to the network planning of the operator.	c
	ONU Type	The type of the actually used ONU	AN5506-04-B

Table 6-12 The planning data at the ONU side in the TAG mode for the AN5506-04-B (configured in a batch manner) (Continued)

Item			Description	Example	
	ONU Subprofile Config	Profile Type	The bandwidth allocation profile should be selected.	Bandwidth Config Profile	
		Profile Name	Corresponding to the profile name configured in the bandwidth allocation profile.	a	
	Port Type		The type of the actually used port	FE port	
	Port No.		The number of the actually used port	1	2
	ONU Port Profile Config	Profile Type	The data service profile should be selected.	Data Service Profile	
		Profile Name	The profile name configured in the data service profile	b	
Service profile binding	Profile ID		The profile name configured in the service profile	c	
	Action		Bind the ONU to the service profile.	Attach	
	Slot No.		The number of the actually used slot.	15	
	PON No.		The number of the actually used PON port	1	
	ONU S.N.		The ONU authorization number assigned according to the network planning of the operator	1	

6.2.4.2 Configuration Flow

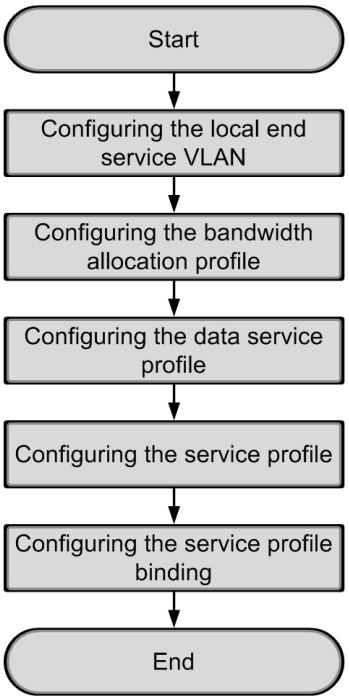


Figure 6-35 Flow chart for configuring data services in the TAG mode in a batch manner (for the AN5506-04-B)

6.2.4.3 Configuring the Local End Service VLAN

Refer to Configuring the Local End Service VLAN for configuration procedures.

6.2.4.4 Configuring the Bandwidth Allocation Profile

1. Right-click the active HSWA[9] card in the **Object Tree** pane and select **Config →GPON Service Bandwidth Config Profile** from the shortcut menu to access the **GPON Service Bandwidth Config Profile** window.
2. Click the left pane, and then click the button on the toolbar. In the **Please Input the Rows for Add:** dialog box that appears subsequently, type **1** and click **OK**. Double-click the **Profile Name** blank field and enter **a**.
3. Click the right pane, and then click the button on the toolbar. Enter **1** in the **Please Input the Rows for Add:** dialog box that appears and click the **OK** button.

4. Configure according to the planning data in Table 6-12.
5. Click the button on the toolbar to complete the configuration, as shown in Figure 6-36.

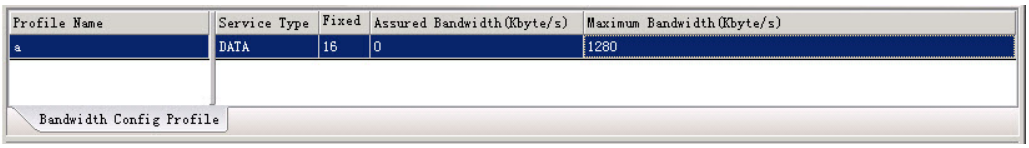


Figure 6-36 The ONU bandwidth allocation profile-configuring the AN5506-04-B in the TAG mode (in a batch manner)

6.2.4.5 Configuring the Data Service Profile

1. Right-click the HSWA[9] card in the **Object Tree** pane and select **Config→ Data Service Profile** from the shortcut menu, and select the **Data Service Profile** tab.
2. Click the left pane, and then click the button. Enter **1** in the **Please Input the Rows for Add:** dialog box that appears and click **OK** to add a data service profile b. Configure the basic parameters of the port according to the planning data in Table 6-12.
3. Click the right pane, and then click the button. Enter **1** in the **Please Input the Rows for Add:** dialog box that appears and click **OK**. Configure the VLAN tags of the traffic flow according to the planning data in Table 6-12.
4. Click the button on the toolbar to complete the configuration, as shown in Figure 6-37.

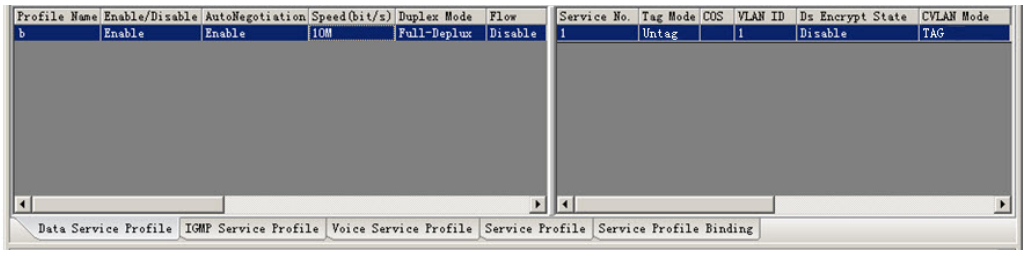


Figure 6-37 The data service profile for configuring the AN5506-04-B in the TAG mode (in a batch manner)

6.2.4.6 Creating a Service Profile

1. Right-click the HSWA[9] card in the **Object Tree** pane, select **Config→Service Profile** from the shortcut menu, and then select the **Service Profile** tab.
2. Click the left pane, and then click the button on the toolbar. In the **Please Input the Rows for Add:** dialog box that appears subsequently, type **1** and click **OK** to add a service profile.
3. Double-click the **Profile Name** blank field and enter **c**. Click the **ONU Type** list box and select **AN5506-04-B** from the drop-down list. Click the **ONU Subprofile Config** field to bring up the **ONU Subprofile Config** dialog box.
4. In the **ONU Subprofile Config** dialog box, click the **Add** button to add a profile. Click the **Profile Type** list box and select **Bandwidth Config Profile**. Click the **Profile Name** list box and select **a**.

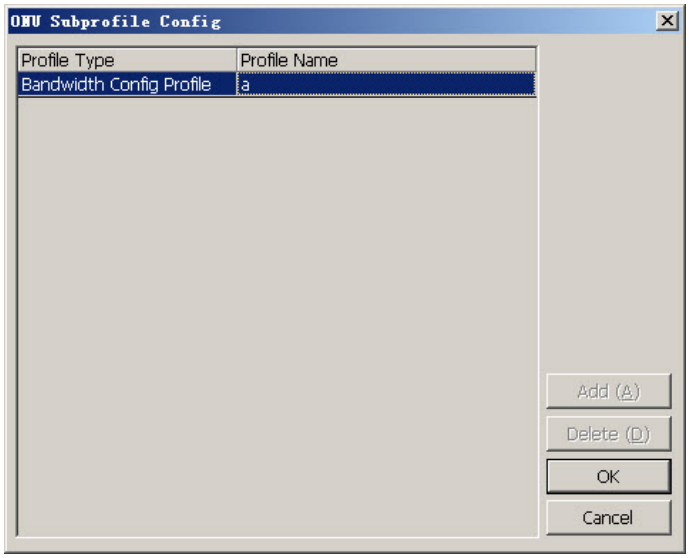


Figure 6-38 The ONU subprofile configuration for the AN5506-04-B in the TAG mode (in a batch manner)

5. Click **OK** and return to the **Service Profile** window.
6. Click the right pane, and then click the button on the toolbar. Enter **2** in the **Please Input the Rows for Add:** dialog box that appears and click the **OK** button.
7. Click the **Port Type** list box and select **LAN**. Double-click the **Port No.** blank field and enter **1**. Repeat the procedure to enter **2**. Double-click the **ONU Port Profile Config** field to bring up the **ONU Port Profile Config** dialog box.

8. In the **ONU Port Profile Config** dialog box, click the **Add** button to add a profile. Click the **Profile Type** list box and select **Data Service Profile**. Click the **Profile Name** list box and select **b**.

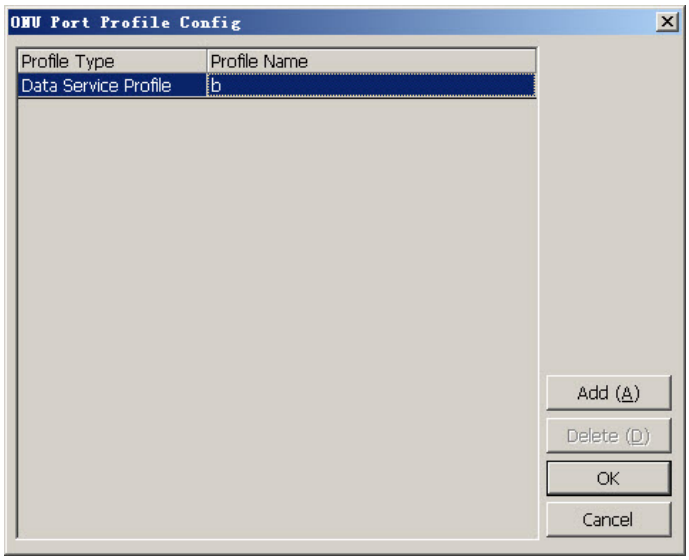


Figure 6-39 The ONU port subprofile configuration for the AN5506-04-B in the TAG mode (in a batch manner)

9. Click **OK** and return to the **Service Profile** window.
10. Click the button on the toolbar to complete the configuration, as shown in Figure 6-40.

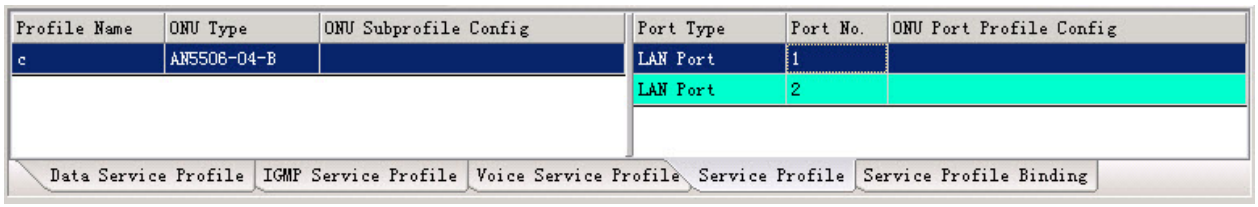


Figure 6-40 The service profile configuration for the AN5506-04-B in the TAG mode (in a batch manner)

6.2.4.7 Binding the ONU to the Service Profile

1. Right-click the HSWA[9] card in the **Object Tree** pane, select **Config→Service Profile Config** from the shortcut menu, and then select the **Service Profile Binding** tab.

2. Click the right pane, and then click the button on the toolbar. Enter **1** in the **Please Input the Rows for Add:** dialog box that appears and click the **OK** button.

3. Double-click the **ONU S.N.** field to bring up the **Select Objects** dialog box. Select **AN5506-04-B[1]** in the dialog box.

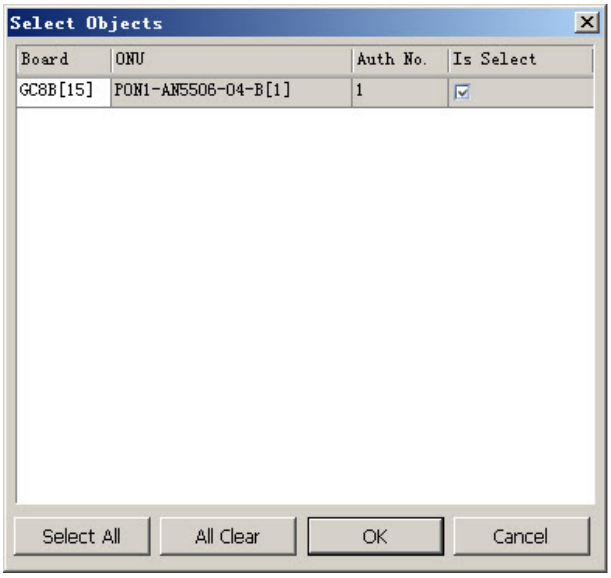


Figure 6-41 Configuring the ONU number - configuring the AN5506-04-B in the TAG mode (in a batch manner)

4. Click **OK** and return to the **Service Profile Binding** window.

5. Click the button on the toolbar, and click **OK** in the alert box that appears. The configuration is completed as shown in Figure 6-42.

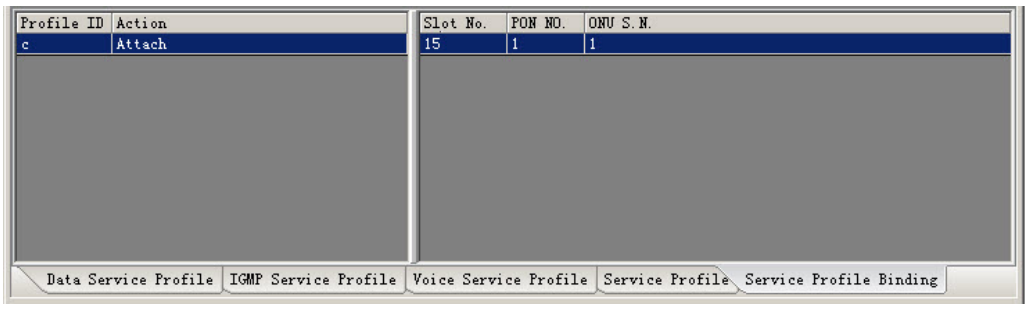


Figure 6-42 Binding the AN5506-04-B to the service profile-configuring the AN5506-04-B in the TAG mode in a batch manner

6.2.4.8 End of Configuration

PC1 to PC4 can make normal access to Internet.

6.2.5 Configuring Data Services Respectively (for Type 2 ONU)

Refer to Table 1-2 for specific product types of Type 2 ONUs.

6.2.5.1 Planning data

Table 6-13 The planning data at the OLT side in the TAG mode for the AN5506-10-B1 (configured respectively)

Item		Description	Example
ONU Information	Slot No.	The number of the actually used slot.	15
	PON Port No.	The number of the actually used PON port	1
	ONU S.N.	Configure this item according to the network planning of the operator.	2
	ONU Type	The type of the ONU	AN5506-10-B1
Local End Service VLAN	Service Name	Configure this item according to the network planning of the operator.	data2
	VLAN ID Begin	The begin VLAN ID number of the uplink port service.	3000
	VLAN ID End	The end VLAN ID number of the uplink port service. The begin VLAN ID should not be larger than the end VLAN ID.	3001
	Interface No. (uplink interface No. or TRUNK group No.)	The number of the actually used uplink port.	19:SFP2

Table 6-13 The planning data at the OLT side in the TAG mode for the AN5506-10-B1 (configured respectively) (Continued)

Item		Description	Example
	TAG / UNTAG	The TAG processing mode of the uplink service VLAN. There are two options: **TAG** and **UNTAG**. ◆ **UNTAG** means that when the uplink data packet passes the port, its tag will be automatically stripped and it keeps going in the untagged mode. And for the downlink data packet in the untagged mode, when passing the port, it will be attached with tag and it keeps going in the tagged mode. ◆ **TAG** means that when the uplink / downlink data packet passes the port, its tag will not be stripped and it keeps going in the tagged mode.	TAG
	Service Type	Select **data** for the data service.	data
	Slot Bind Mode	Select **Auto Bind**.	Auto Bind

Table 6-14 The planning data at the ONU side in the TAG mode for the AN5506-10-B1 (configured respectively)

Item		Description	Example	
Bandwidth configuration	Service Type	Select integrate service.	Integrate Service	
	Fixed Bandwidth (Kbyte/s)	The fixed bandwidth allocated for an ONU's uplink service. Even if the service does not use the bandwidth resource, other services cannot occupy the resource. The default setting is 16.	16	
	Assured Bandwidth (Kbyte/s)	The minimum bandwidth for provisioning an ONU's uplink service. If the bandwidth resource is not used by this service, then the resource may be released for other services to use. The default setting is 0.	0	
	Maximum Bandwidth (Kbyte/s)	The maximum bandwidth allocated for an ONU's uplink service. The sum of the fixed bandwidth value and the assured bandwidth value should not be larger than the maximum bandwidth value. The default setting is 64.	1280	
Configuring the ONU port basic information	Port No.	The number of the actually used ONU port	1	2
	Enable / Disable Port	Configure this item according to the operator's network planning; the default setting is Enable.	Default	

Table 6-14 The planning data at the ONU side in the TAG mode for the AN5506-10-B1 (configured respectively) (Continued)

Item		Description	Example
	Port Auto Negotiation	Configure this item according to the operator's network planning; the default setting is Enable.	Default
	Port Speed	Unconfigurable when the port auto negotiation is enabled. The default setting is 100Mbit/s.	Default
	Duplex	Unconfigurable when the port auto negotiation is enabled. The default value is full-duplex.	Default
	Flow Control Enable / Disable	Configure this item according to the operator's network planning; the default setting is Disable.	Default
Configuring the ONU port service parameters	TLS	Configure according to the network planning of the operator. Select TLS or No TLS.	No TLS
	Service type	Select **unicast**.	unicast
	VLAN Mode	Configure according to the network planning of the operator. Select tag or transparent.	tag
	TPID	The default setting is 33024.	33024
	CVLAN ID	Configure according to the network planning of the operator. The value ranges from 1 to 4085.	400
	Priority Or COS	The CVLAN priority, ranging from 0 to 7. 7 stands for the highest priority level, and 0 stands for the lowest one.	0
	QinQ State	Enable / disable the QinQ configuration	Enable
	Service Name	Corresponding to the service name configured in the local VLAN.	data2
	VLAN ID	Configure the SVLAN ID according to the network planning of the operator within the range of 1 to 4085.	3001
	TPID	The default setting is 33024.	33024
	Priority Or COS	The SVLAN priority, ranging from 0 to 7. 7 stands for the highest priority level, and 0 stands for the lowest one.	0

6.2.5.2 Configuration Flow

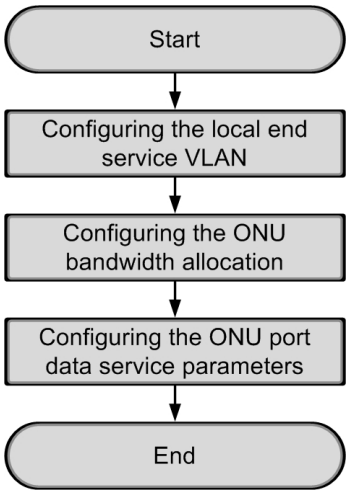


Figure 6-43 Flow chart for configuring data services respectively in the TAG mode (for the AN5506-10-B1)

6.2.5.3 Configuring the Local End Service VLAN

Refer to Configuring the Local End Service VLAN for configuration procedures.

6.2.5.4 Configuring the Bandwidth Allocation

1. Click the GC8B[15] card in the **Object Tree** pane to display all ONUs connected to the GC8B card in the right pane. Right-click the **PON1-AN5506-10-B1[2]** ONU and select **Config→Bandwidth config** from the shortcut menu to access the **Bandwidth Config** window.
2. Click the right pane, and then click the button on the toolbar. Enter **1** in the **Please Input the Rows for Add:** dialog box that appears and click the **OK** button.
3. Configure according to the planning data in Table 6-14.
4. Click the button on the toolbar, and click **OK** in the dialog box that appears. The configuration is completed as shown in Figure 6-44.

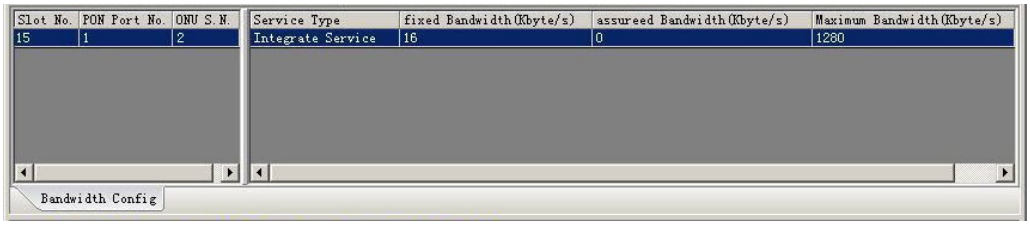


Figure 6-44 Configuring the GPON service bandwidth for the AN5506-10-B1 in the TAG mode (configured respectively)

6.2.5.5 Configuring the ONU Port Data Service Parameters

1. Click the GC8B[15] card in the **Object Tree** pane to display all ONUs connected to the GC8B card in the right pane. Right-click the **AN5506-10-B1[2]** ONU and select **Config→Service Config** from the shortcut menu. Then select the **ONU Port Config** tab.
2. Select **LAN1** from the **Data Port List**. Click **Add** to create a data service, and configure it according to the planning data in Table 6-14.

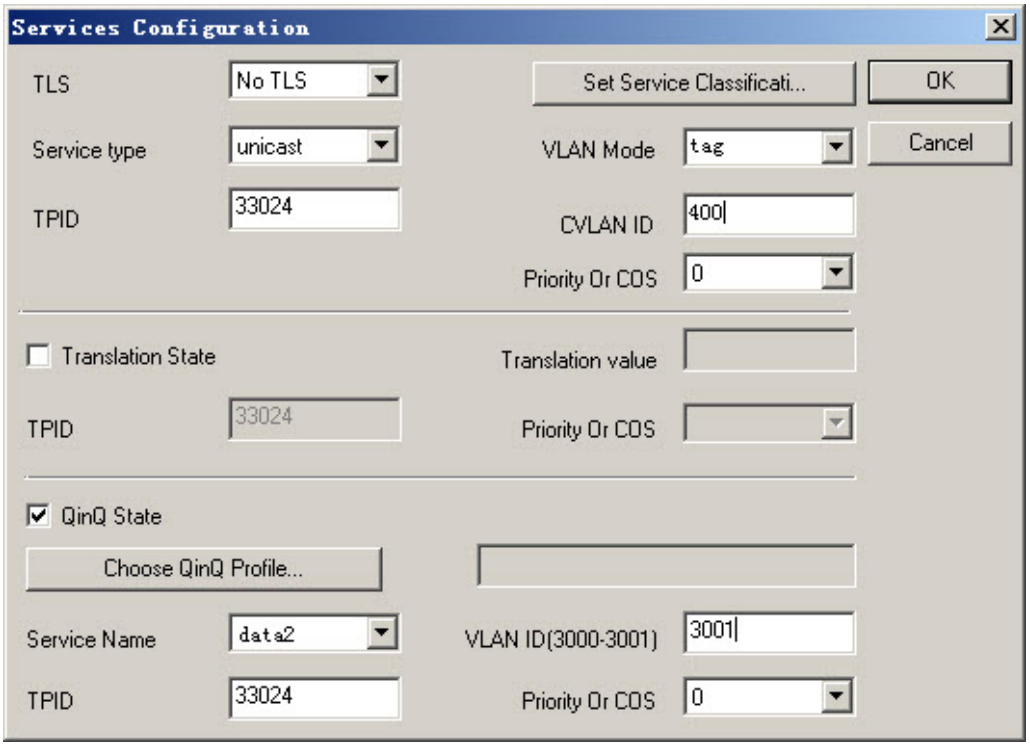


Figure 6-45 Configuring the service for the AN5506-10-B1 in the TAG mode (configured respectively)

3. Click **OK** and return to the **ONU Port Config** tab. Right-click **LAN1** in the **Data Port List** and select **Copy Port Config**. Right-click **LAN2** and select **Paste Port Config**.

4. Click the **Modify on Device** button to complete the service configuration for the AN5506-10-B1, as shown in Figure 6-46.

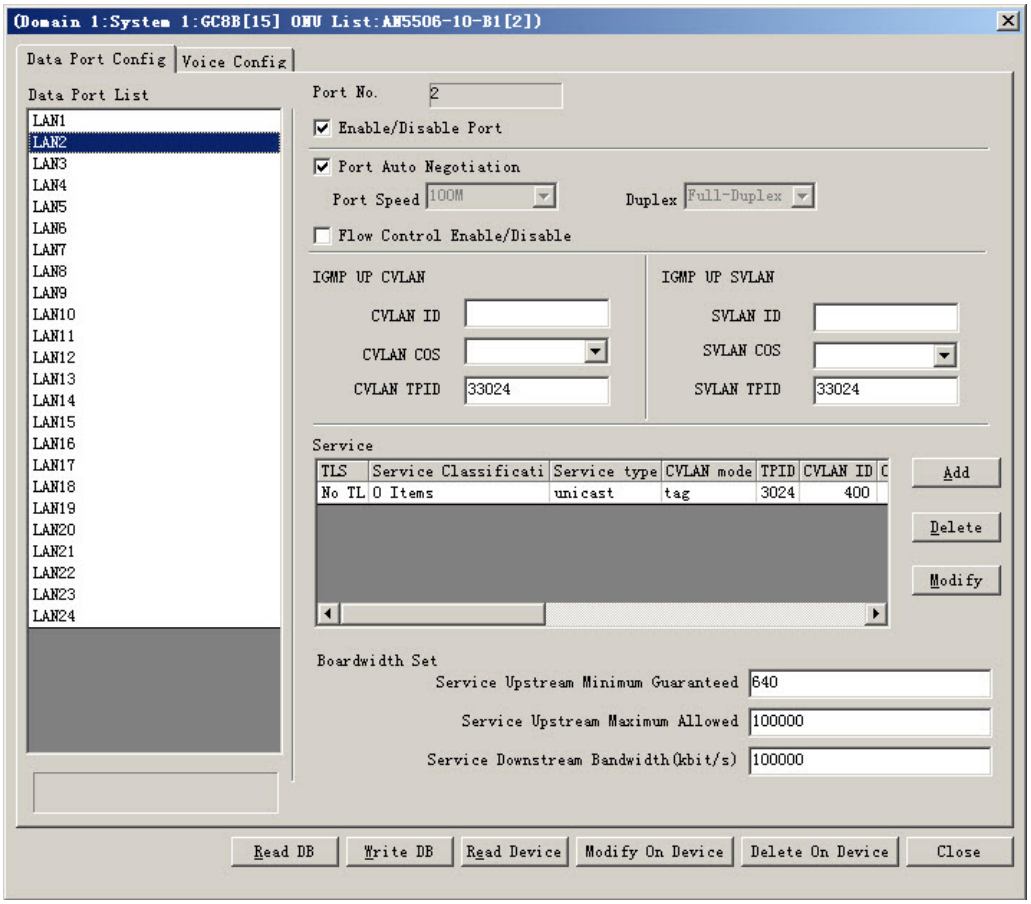


Figure 6-46 The port service configuration completed for the AN5506-10-B1 in the TAG mode (configured respectively)

6.2.5.6 End of Configuration

PC1 to PC4 can make normal access to Internet.

6.2.6 Configuring Data Services in a Batch Manner (for Type 2 ONU)

Refer to Table 1-2 for specific product types of Type 2 ONUs.

6.2.6.1 Planning data

Table 6-15 The planning data at the OLT side in the TAG mode for the AN5506-10-B1 (configured in a batch manner)

Item		Description	Example
ONU Information	Slot No.	The number of the actually used slot.	15
	PON Port No.	The number of the actually used PON port	1
	ONU S.N.	Configure this item according to the network planning of the operator.	2
	ONU Type	The type of the ONU	AN5506-10-B1
Local End Service VLAN	Service Name	Configure this item according to the network planning of the operator.	data2
	VLAN ID Begin	The begin VLAN ID number of the uplink port service.	3000
	VLAN ID End	The end VLAN ID number of the uplink port service. The begin VLAN ID should not be larger than the end VLAN ID.	3001
	Interface No. (uplink interface No. or TRUNK group No.)	The number of the actually used uplink port.	19:SFP2
	TAG / UNTAG	The TAG processing mode of the uplink service VLAN. There are two options: **TAG** and **UNTAG**. ◆ **UNTAG** means that when the uplink data packet passes the port, its tag will be automatically stripped and it keeps going in the untagged mode. And for the downlink data packet in the untagged mode, when passing the port, it will be attached with tag and it keeps going in the tagged mode. ◆ **TAG** means that when the uplink / downlink data packet passes the port, its tag will not be stripped and it keeps going in the tagged mode.	TAG
	Service Type	Select **data** for the data service.	data
	Slot Bind Mode	Select **Auto Bind**.	Auto Bind

Table 6-16 The planning data at the ONU side in the TAG mode for the AN5506-10-B1 (configured in a batch manner)

Item		Description	Example
Bandwidth allocation profile	Profile Name	The name of the bandwidth allocation profile	a
	Service Type	Select integrate service.	Integrate Service
	Fixed Bandwidth (Kbyte/s)	The fixed bandwidth allocated for an ONU's uplink service. Even if the service does not use the bandwidth resource, other services cannot occupy the resource. The default setting is 16.	16
	Assured Bandwidth (Kbyte/s)	The minimum bandwidth for provisioning an ONU's uplink service. If the bandwidth resource is not used by this service, then the resource may be released for other services to use. The default setting is 0.	0
	Maximum Bandwidth (Kbyte/s)	The maximum bandwidth allocated for an ONU's uplink service. The sum of the fixed bandwidth value and the assured bandwidth value should not be larger than the maximum bandwidth value. The default setting is 64.	1280
Binding bandwidth allocation profile	Slot No.	The number of the actually used slot.	15
	PON NO.	The number of the actually used PON port	1
	ONU NO.	The ONU authorization number assigned according to the network planning of the operator	2
	GPON Bandwidth Profile	The name of the configured bandwidth allocation profile	a
Configuring the service model profile	Profile Name	Configure this item according to the network planning of the operator.	b
	Service Type	Select **unicast**.	unicast
	CVLAN Mode	Configure the CVLAN mode of the service as **tag** or **transparent**.	tag
	QinQ State	Enable / disable the QinQ configuration. Disable is selected by default.	Enable
Configuring the SVLAN Profile	Profile Name	The SVLAN profile name	c
	SVLAN Name	Corresponding to the service name in the local end service VLAN configuration.	data2
	STPID	The default setting is 33024.	33024
	SVID	The value ranges from 1 to 4085.	3001
	SCOS	The SVLAN priority. The value ranges from 0 to 7. 7 stands for the highest priority level, and 0 stands for the lowest one.	0

Table 6-16 The planning data at the ONU side in the TAG mode for the AN5506-10-B1 (configured in a batch manner) (Continued)

Item		Description	Example	
Configuring the ONU data port	Port No.	The number of the actually used ONU port	1	2
	Enable / Disable	Select **Enable**.	Enable	
	MAC Limit	Configured without MAC limit.	0	
Configuring the ONU data service	CTPID	The default setting is 33024.	33024	
	CVLAN ID	The CVLAN ID, ranging from 1 to 4085.	400	
	CCOS	The CVLAN priority. The value ranges from 0 to 7. 7 stands for the highest priority level, and 0 stands for the lowest one.	0	
	Service Name	Corresponding to the service name configured in the local VLAN.	data2	
	Service Profile	Select the configured service model profile.	b	
	SVLAN Profile	Select the configured SVLAN profile.	c	

6.2.6.2 Configuration Flow

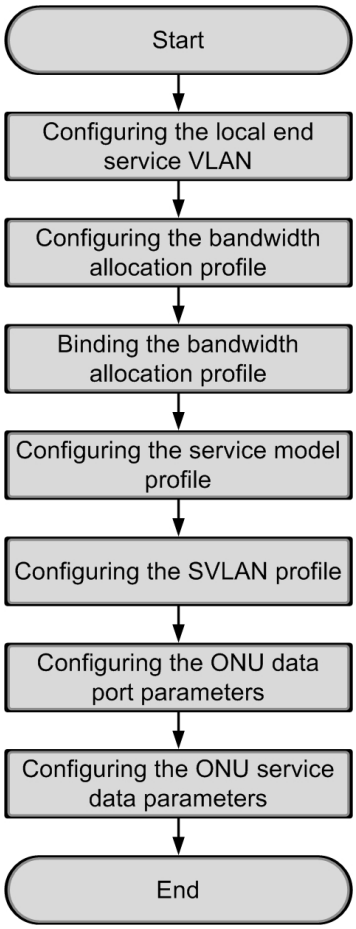


Figure 6-47 Flow chart for configuring data services in the TAG mode for the AN5506-10-B1 in a batch manner

6.2.6.3 Configuring the Local End Service VLAN

Refer to Configuring the Local End Service VLAN for configuration procedures.

6.2.6.4 Configuring the Bandwidth Allocation Profile

1. Right-click the HSWA[9] card in the **Object Tree** pane and select **Config→ GPON Service Bandwidth Config Profile** from the shortcut menu to access the **GPON Service Bandwidth Config Profile** window.

2. Click the left pane, and then click the button on the toolbar. In the **Please Input the Rows for Add:** dialog box that appears subsequently, type **1** and click **OK**. Double-click the **Profile Name** blank field and enter **a**.
3. Click the right pane, and then click the button on the toolbar. Enter **1** in the **Please Input the Rows for Add:** dialog box that appears and click the **OK** button.
4. Configure according to the planning data in Table 6-16.
5. Click the button on the toolbar to complete the configuration, as shown in Figure 6-48.

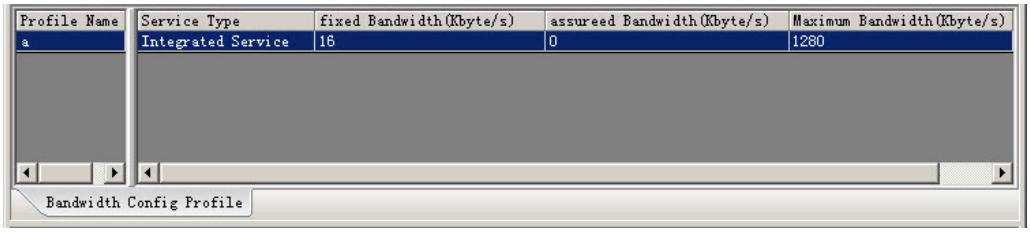


Figure 6-48 The ONU bandwidth allocation profile-configuring the AN5506-10-B1 in the TAG mode in a batch manner

6.2.6.5 Binding bandwidth allocation profile

1. Right-click the designated system in the **Object Tree** pane, select **Config→ Batch Configure→ONU Config** from the short-cut menu that appears to access the **ONU Config** window.
2. Click **Set Object as Condition** in the **Config Object** pane, and all configuration objects will appear in the lower pane. Select the AN5506-10-B1[2] under the No.1 PON in Slot 15 and click the **OK** button.

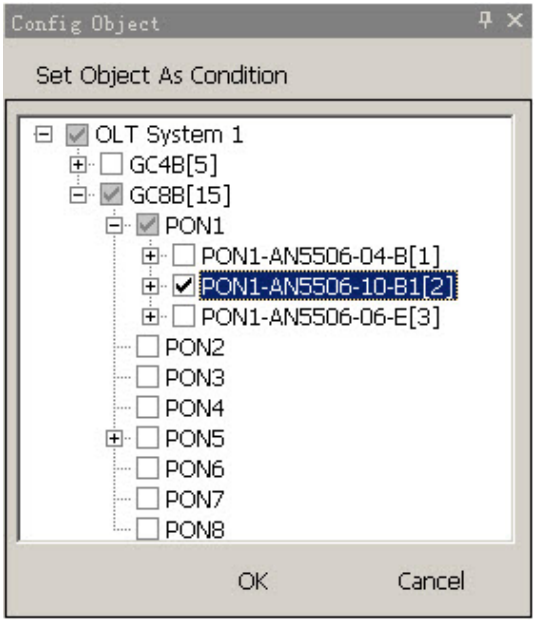


Figure 6-49 Setting the objects to which the bandwidth profile is bound-configuring the AN5506-10-B1 in the TAG mode in a batch manner

3. The specific configuration information of the object will appear in the right pane. Click the **GPON Bandwidth Profile** list box and select the configured bandwidth profile **a**.
4. Click the button on the toolbar to complete the configuration. Figure 6-50 shows a successful configuration.

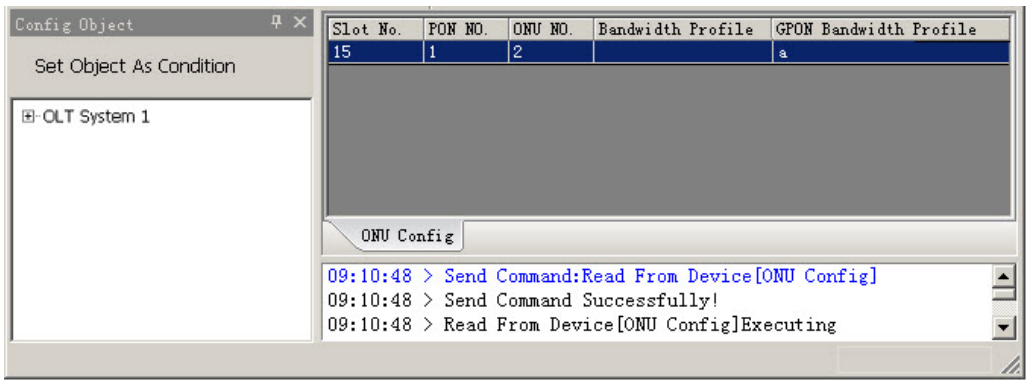


Figure 6-50 Binding the bandwidth allocation profile - configuring the AN5506-10-B1 in the TAG mode in a batch manner

6.2.6.6 Configuring the Service Model Profile

1. Right-click the designated system in the **Object Tree** pane, and select **Config→Profile Definition→Service Model Profile** from the short-cut menu that appears to access the **Service Model Profile** window.
2. Click the button on the toolbar. In the **Please Input the Rows for Add:** dialog box that appears subsequently, type **1** and click **OK** to add a service model profile
3. Configure according to the planning data in Table 6-16.
4. Click the button on the toolbar to complete the configuration, as shown in Figure 6-51.

Figure 6-51 Configuring the service model profile-configuring the AN5506-10-B1 in the TAG mode in a batch manner

6.2.6.7 Configuring the SVLAN Profile

1. Right-click the designated system in the **Object Tree** pane, select **Config→Profile Definition→SVLAN Profile** from the short-cut menu that appears to access the **SVLAN Profile** window.
2. Click the button on the toolbar. In the **Please Input the Rows for Add:** dialog box that appears subsequently, type **1** and click **OK** to add an SVLAN profile.
3. Configure according to the planning data in Table 6-16.
4. Click the button on the toolbar to complete the configuration, as shown in Figure 6-52.

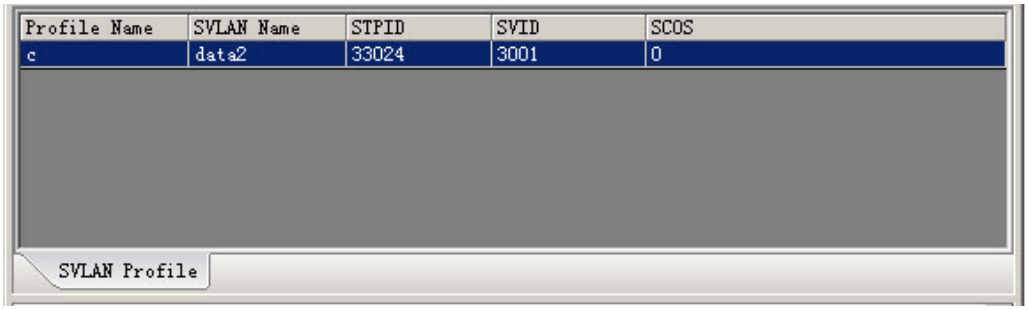


Figure 6-52 Configuring the SVLAN profile-configuring the AN5506-10-B1 in the TAG mode in a batch manner

6.2.6.8 Configuring the ONU Data Port Parameters

1. Right-click the designated system in the **Object Tree** pane and select **Config→Batch Configure→ONU Data Port Config** from the short-cut menu that appears to access the **ONU Data Port Config** window.
2. Click **Set Object as Condition** in the **Config Object** pane, and all configuration objects will appear in the lower pane. Select LAN1 and LAN2 ports of the AN5506-10-B1[2] listed under the No.1 PON in Slot 15 and click the **OK** button.

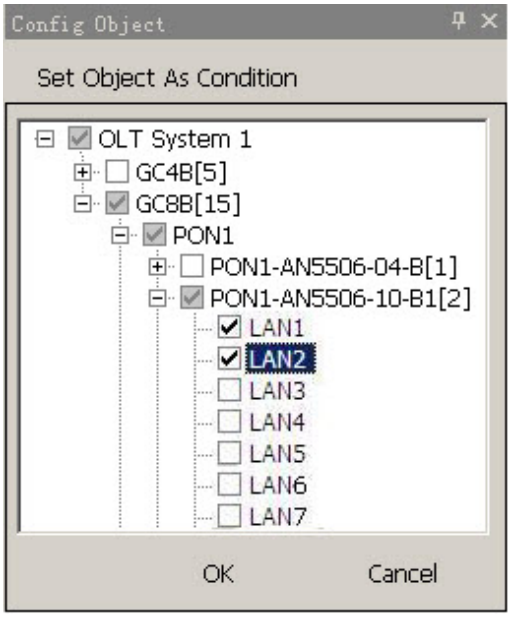


Figure 6-53 Setting the condition object of the ONU data port parameters-configuring the AN5506-10-B1 in the TAG mode in a batch manner

3. The specific configuration information about the object will be displayed in the right pane. Configure according to the planning data in Table 6-16.
4. Click the button on the toolbar to complete the configuration, as shown in Figure 6-54.

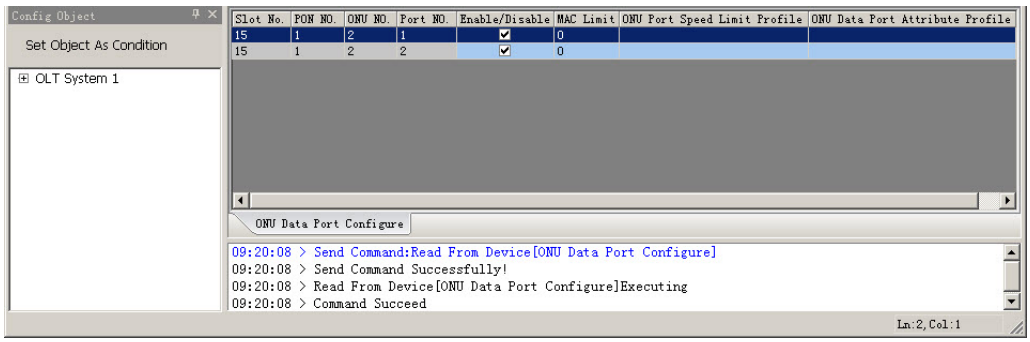


Figure 6-54 Configuring the ONU data port parameters-configuring the AN5506-10-B1 in the TAG mode in a batch manner

6.2.6.9 Configuring the ONU Data Service Parameters

1. Right-click the designated system in the **Object Tree** pane and select **Config→ Batch Configure→ONU Data Service Configure** from the short-cut menu that appears to access the **ONU Data Service Configure** window.
2. Click the button on the toolbar to bring up the **Add Item Number** dialog box. Select LAN1 and LAN2 ports of the ONU and click **OK** to return to the **ONU Data Service Configure** window.

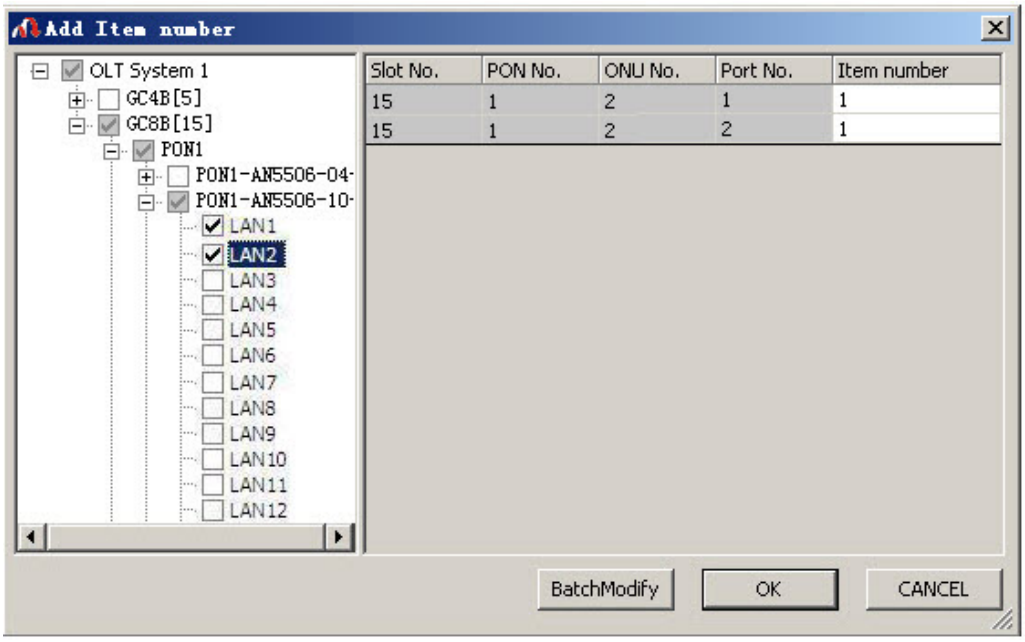


Figure 6-55 Setting the condition object of the ONU data service parameters-configuring the AN5506-10-B1 in the TAG mode in a batch manner

3. The specific configuration information about the object will be displayed in the right pane. Configure according to the planning data in Table 6-16.
4. Click the button on the toolbar, and click **OK** in the alert box that appears to complete the configuration as shown in Figure 6-56.

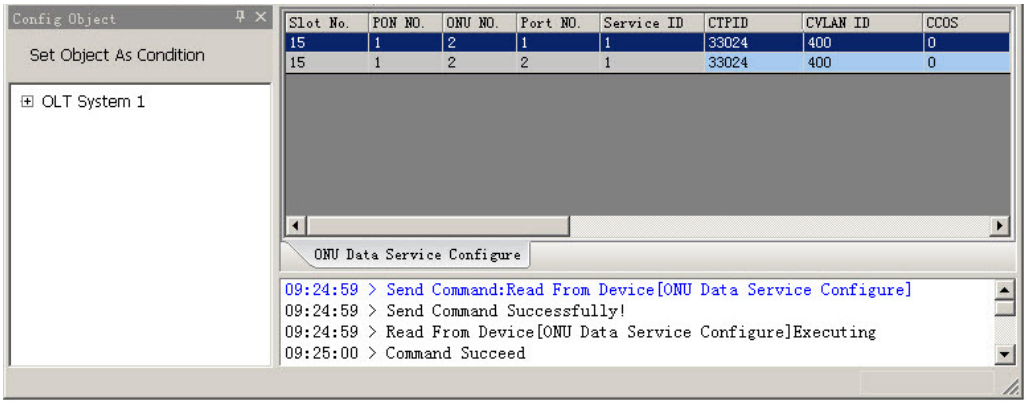


Figure 6-56 Configuring the ONU data service parameters-configuring the AN5506-10-B1 in the TAG mode in a batch manner

6.2.6.10 End of Configuration

PC1 to PC4 can make normal access to Internet.

6.3 Example for Data Service Configuration – in the VLAN 1:1 Translation Mode

6.3.1 Configuration Rules

- The translation mode: The Ethernet data uploaded from the subscriber side will be added with a VLAN ID when passing the subscriber's home gateway. After being received by the ONU, the data will be processed in the following three ways:
  - The ONU converts the VLAN ID into one that meets the requirements of the carrier and adds an SVLAN ID to it. After that, the ONU sends the data to the AN5116-06B. The AN5116-06B will not process the data, but transparently transmit them to the upper layer network side equipment.
  - The ONU converts the VLAN ID into one that meets the requirements of the carrier and sends the data to the AN5116-06B. The AN5116-06B adds an SVLAN ID to the data, and then sends the data service to the upper layer network side equipment.
  - The ONU transparently transmits the CVLAN ID and sends the data to the AN5116-06B. The AN5116-06B converts the VLAN ID into one that meets the requirements of the carrier and adds an SVLAN ID to it. After that, the AN5116-06B sends the data service to the upper layer network side equipment.
- If you choose to add the SVLAN at the OLT side, the data in the **User VLAN Layer 1** of the OLT QinQ field should be consistent with the CVLAN ID added by the ONU. Select the action **transparent**, enter the SVLAN ID in the **New VID** box after **User VLAN Layer 2**, and select the action **attach**.
- When you bind the PON port of the GC4B card to the OLT QinQ domain, all the ONUs under the PON port will forward data as per the rules defined in the QinQ domain. When you bind the ONU to the OLT QinQ, the QinQ rules only work to the bound ONU.

- The VLAN ID of the ONU ranges from 1 to 4085.
  - To add stacked VLAN tags to the data service, the SVLAN ID must be within the preset range of the local VLAN.
  - To add a single VLAN tag to the data service, the CVLAN ID must be within the preset range of the local VLAN.
- The ONU data service configuration can be implemented in the service profile or the ONU service configuration. If the data service configurations of the ONUs are the same, the batch configurations can be implemented using the service profile.
- The sum of the fixed bandwidth and assured bandwidth of the service in the bandwidth allocation should not exceed the configured maximum bandwidth.
- An FE port of the AN5506-04-B can support up to four data services, and an FE port of the AN5506-10-B1 can support up to 16 data services.
- Each PON port can bind up to 32 VLAN operation tables.
- While configuring the service type in bandwidth allocation, select **Broadband Internet access** for Type 1 ONUs and select **Integrate Service** for Type 2 ONUs.

6.3.2 Network Diagram

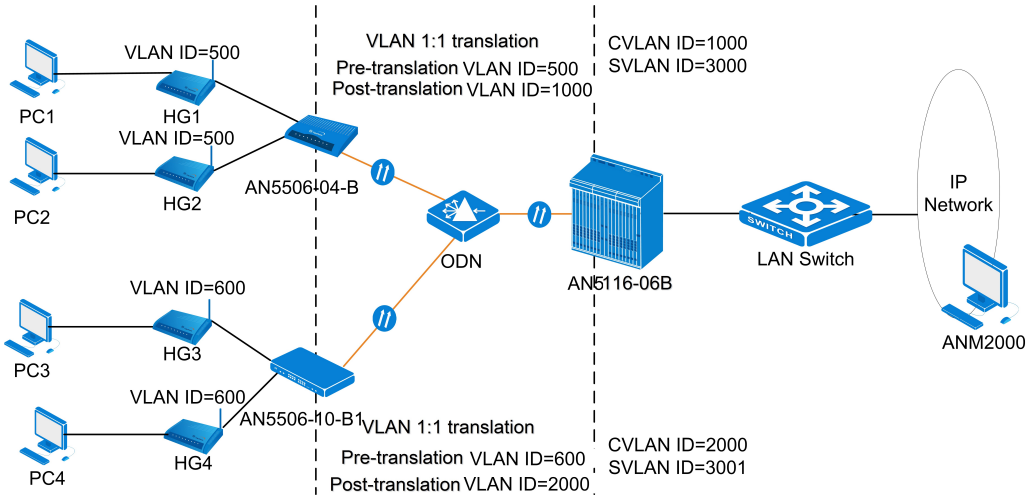


Figure 6-57 The data service network diagram (in the VLAN 1:1 translation mode)

- In the uplink direction, the data services from the subscribers' PCs pass by the HGs and are added with CVLAN tags. After that, the data services are sent to the ONUs, which translate the CVLAN tags and transmit the data services to the OLT via the splitter. The OLT adds SVLAN tags to the data services and then transmit them to the upper layer network via the uplink port directly.
- In the downlink direction, the data services carrying stacked VLAN tags pass by the OLT. The OLT strips the SVLAN tags, and transmits the data services to the corresponding ONUs via the splitter. The ONUs translate the CVLAN tags and send the data services to the corresponding HGs. The HGs strip the CVLAN tags and transmit the data to the subscribers' PCs.

The AN5506-04-B and the AN5506-10-B1 are used as ONUs in this example. The AN5116-06B uses the HU1A and the GC8B as the interface cards at the network side and the subscriber side respectively. And the HSWA card is compulsory.

6.3.3 Configuring Data Services Respectively (for Type 1 ONU)

Refer to Table 1-1 for specific product types of Type 1 ONUs.

6.3.3.1 Planning data

Table 6-17 The planning data at the OLT side in the VLAN 1:1 translation mode for the AN5506-04-B (configured respectively)

Item		Description	Example
ONU Information	Slot No.	The number of the actually used slot.	15
	PON Port No.	The number of the actually used PON port	1
	ONU S.N.	Configure this item according to the network planning of the operator.	1
	ONU Type	The type of the ONU	AN5506-04-B
Local End Service VLAN	Service Name	Configure this item according to the network planning of the operator.	data3
	VLAN ID Begin	The begin VLAN ID number of the uplink port service.	3000
	VLAN ID End	The end VLAN ID number of the uplink port service. The begin VLAN ID should not be larger than the end VLAN ID.	3001

Table 6-17 The planning data at the OLT side in the VLAN 1:1 translation mode for the AN5506-04-B (configured respectively) (Continued)

Item			Description	Example
	Interface No. (uplink interface No. or TRUNK group No.)		The number of the actually used uplink port.	19:SFP2
	TAG / UNTAG		The TAG processing mode of the uplink service VLAN. There are two options: **TAG** and **UNTAG**. ◆ **UNTAG** means that when the uplink data packet passes the port, its tag will be automatically stripped and it keeps going in the untagged mode. And for the downlink data packet in the untagged mode, when passing the port, it will be attached with tag and it keeps going in the tagged mode. ◆ **TAG** means that when the uplink / downlink data packet passes the port, its tag will not be stripped and it keeps going in the tagged mode.	TAG
	Service Type		Select **data** for the data service.	data
Creating OLT QinQ domain	Domain name		OLT QinQ domain name. Up to 1024 QinQ domains can be configured. The QinQ domain name should not be more than 16 bytes and should be composed of only numbers, letters or underlines.	aa
Configuring OLT QinQ domain	Service Type		The default setting is single.	Shared
	VLAN layer 1	CVLAN ID	The CVLAN ID transparently transmitted	1000
		CVLAN priority	The CVLAN priority transparently transmitted The value ranges from 0 to 7. 7 stands for the highest priority level and 0 stands for the lowest one.	0
		Action	If the **user VLAN layer 1** has been configured, you can set the action to **transparent** or **translation**; if the **user VLAN layer 1** is not configured, you can set the action to **transparent** or **attach**.	Transparent
		Tag protocol identification	The default setting is 33024.	Default

Table 6-17 The planning data at the OLT side in the VLAN 1:1 translation mode for the AN5506-04-B (configured respectively) (Continued)

Item			Description	Example
	VLAN layer 2	OLT SVLAN priority	The SVLAN priority. The value ranges from 0 to 7. 7 stands for the highest priority level and 0 stands for the lowest one.	0
		Action	Select the **attach**.	Attach
		Tag protocol identification	The default setting is 33024.	Default
		New VID	SVLAN ID	3000
Configuring service uplink rules for OLT QinQ domain	Binding type		Configure this item according to the network planning of the operator.	VLAN Layer 1
	Operator		Configure this item according to the network planning of the operator.	=
	Binding value		Configure this item according to the network planning of the operator.	1000
Configuring service downlink rules for OLT QinQ domain	Binding type		Configure this item according to the network planning of the operator.	VLAN Layer 1
	Operator		Configure this item according to the network planning of the operator.	=
	Binding value		Configure this item according to the network planning of the operator.	1000
Binding PON port to QinQ domain	Action		Configure this item according to the network planning of the operator.	Binding
	Domain name		Select the domain name configured in creating the OLT QinQ domain.	aa

Table 6-18 The planning data at the ONU side in the VLAN 1:1 translation mode for the AN5506-04-B (configured respectively)

Item		Description	Example
Bandwidth configuration	Service Type	Select broadband Internet access.	Broadband Internet access
	Fixed Bandwidth (Kbyte/s)	The fixed bandwidth allocated for an ONU's uplink service. Even if the service does not use the bandwidth resource, other services cannot occupy the resource. The default setting is 16.	16

Table 6-18 The planning data at the ONU side in the VLAN 1:1 translation mode for the AN5506-04-B (configured respectively) (Continued)

Item		Description	Example
	Assured Bandwidth (Kbyte/s)	The minimum bandwidth for provisioning an ONU's uplink service. If the bandwidth resource is not used by this service, then the resource may be released for other services to use. The default setting is 0.	0
	Maximum Bandwidth (Kbyte/s)	The maximum bandwidth allocated for an ONU's uplink service. The sum of the fixed bandwidth value and the assured bandwidth value should not be larger than the maximum bandwidth value. The default setting is 64.	1280
Configuring the ONU port basic information	Port No.	The number of the actually used ONU port	1
	Enable / Disable Port	Configure this item according to the operator's network planning; the default setting is Enable.	Default
	Port Auto Negotiation	Configure this item according to the operator's network planning; the default setting is Enable.	Default
	Port Speed	Unconfigurable when the port auto negotiation is enabled. The default setting is 100Mbit/s.	Default
	Duplex	Unconfigurable when the port auto negotiation is enabled. The default value is full-duplex.	Default
	Flow Control Enable / Disable	Configure this item according to the operator's network planning; the default setting is Disable.	Default
Configuring the ONU port service parameters	TAG Mode	Configured as Tag or Untag according to the network planning of the operator. In the **Tag** mode the uplink data packets are tagged, whereas in the **Untag** mode the uplink data packets are untagged.	Tag
	Service type	Select **unicast**.	unicast
	COS	When the **CVLAN Mode** is set to translation, the value here means the service priority before translation. The value ranges from 0 to 7. When the Tag mode is set to **TAG**, this item is unconfigurable.	0
	VLAN ID	When the **CVLAN Mode** is set to **translation**, the value here means the VLAN ID before translation. When the Tag mode is set to Untag, this item is unconfigurable. The value ranges from 1 to 4085.	500
	CVLAN Mode	When the Tag mode is set to **Untag**, the CVLAN mode can be set to Tag or Transparent. When the Tag mode is set to **Tag**, the CVLAN mode can set to Translation or Transparent.	Translation

Table 6-18 The planning data at the ONU side in the VLAN 1:1 translation mode for the AN5506-04-B (configured respectively) (Continued)

Item		Description	Example
	CVLAN ID	The VLAN ID after translation; the value ranges from 1 to 4085.	1000
	COS	The VLAN priority after translation, ranging from 0 to 7. 7 stands for the highest priority level, and 0 stands for the lowest one.	0
	Ds Encrypt State	Disable is selected by default.	Disable
	QinQ State	Enable / disable the QinQ configuration	Disable
	SVLAN ID	Unconfigurable when the QinQ State is set to Disable. The value ranges from 1 to 4085.	-
	Service Name	Corresponding to the service name in the local end service VLAN configuraiton. Unconfigurable when the **QinQ State** is set to Disable.	-
	COS	The SVLAN priority, ranging from 0 to 7. 7 stands for the highest priority level, and 0 stands for the lowest one. Unconfigurable when the QinQ State is set to Disable.	-

6.3.3.2 Configuration Flow

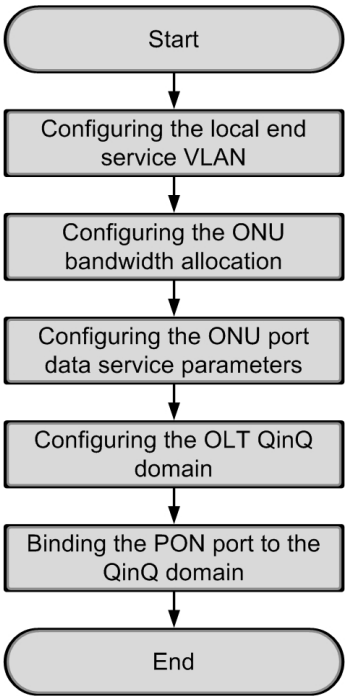


Figure 6-58 Flow chart for configuring data services respectively in the VLAN 1:1 translation mode (for the AN5506-04-B)

6.3.3.3 Configuring the Local End Service VLAN

1. Right-click the HSWA[9] card in the **Object Tree** pane and select **Config→ Local VLAN→Local End Service VLAN** from the shortcut menu to access the **Local End Service VLAN** window.
2. Click the button on the toolbar. In the **Please Input the Rows for Add:** dialog box that appears subsequently, type **1** and click **OK** to add a service local VLAN entry.
3. Configure according to the planning data in Table 6-17.
4. Click the button on the toolbar to complete the configuration, as shown in Figure 6-59.

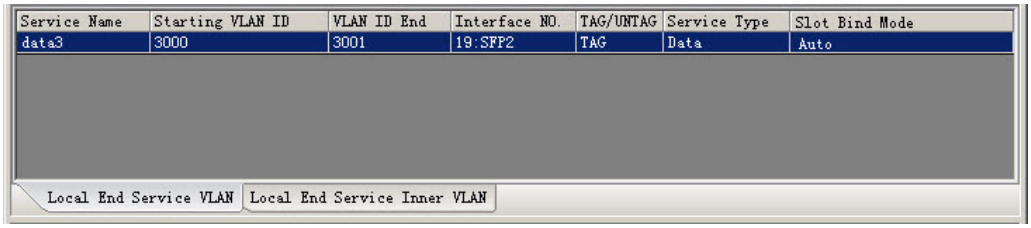


Figure 6-59 The local end service VLAN data in the VLAN 1:1 translation mode for the AN5506-04-B (configured respectively)

6.3.3.4 Configuring the Bandwidth Allocation

1. Click the GC8B[15] card in the **Object Tree** pane to display all ONUs connected to the GC8B card in the right pane. Right-click the **PON1-AN5506-04-B[1]** ONU and select **Config→Bandwidth config** from the shortcut menu to access the **Bandwidth Config** window.
2. Click the right pane, and then click the button on the toolbar. Enter **1** in the **Please Input the Rows for Add:** dialog box that appears and click the **OK** button.
3. Configure according to the planning data in Table 6-18.
4. Click the button on the toolbar, and click **OK** in the alert box that appears. The configuration is completed as shown in Figure 6-60.

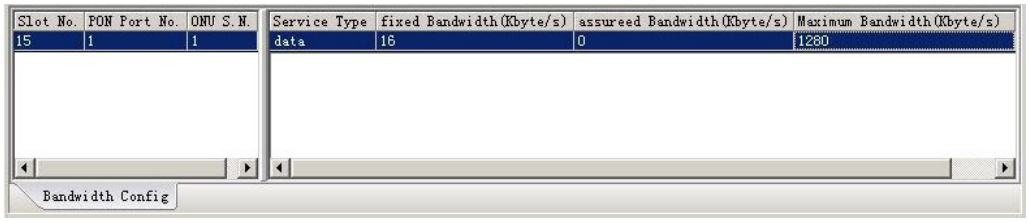


Figure 6-60 Configuring the GPON service bandwidth for the AN5506-04-B in the VLAN 1:1 translation mode (configured respectively)

6.3.3.5 Configuring the ONU Port Data Service Parameters

1. Click the GC8B[15] card in the **Object Tree** pane to display all ONUs connected to the GC8B card in the right pane. Right-click the **PON1-AN5506-**

04-B[1] ONU and select **Config→Service Config** from the shortcut menu. Then select the **ONU Port Config** tab.

2. Select **LAN1** from the **Data Port List**, and click **Add** to create a data service.
3. Configure according to the planning data in Table 6-18.

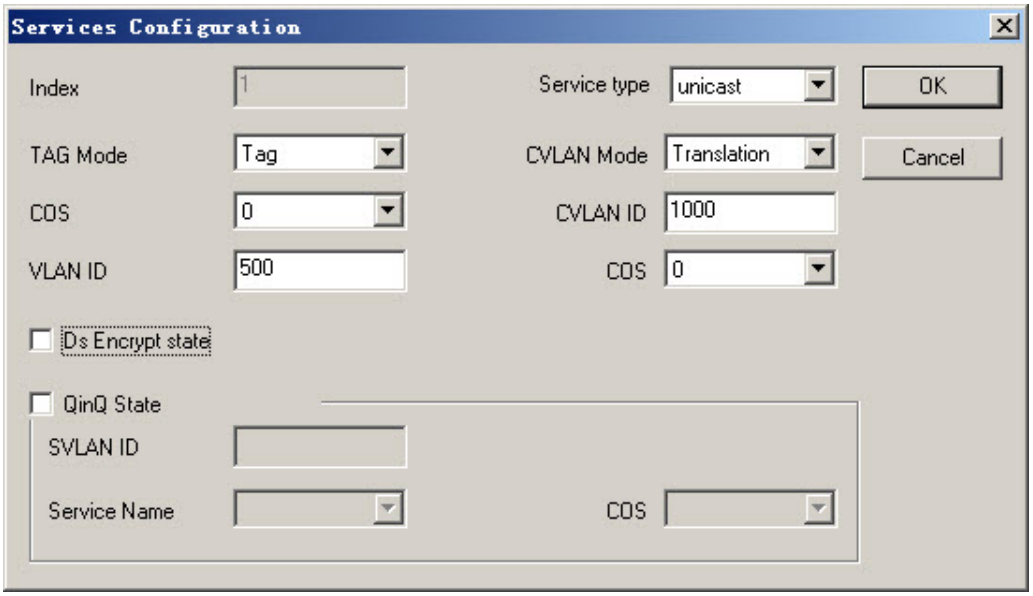


Figure 6-61 Service configuration for the AN5506-04-B in the VLAN 1:1 translation mode (configured respectively)

4. Click **OK** and return to the **ONU Port Config** tab. Right-click **LAN1** in the **Data Port List** and select **Copy Port Config**. Right-click **LAN2** and select **Paste Port Config**.
5. Click the **Modify on Device** button to complete the service configuration for the AN5506-04-B, as shown in Figure 6-62.

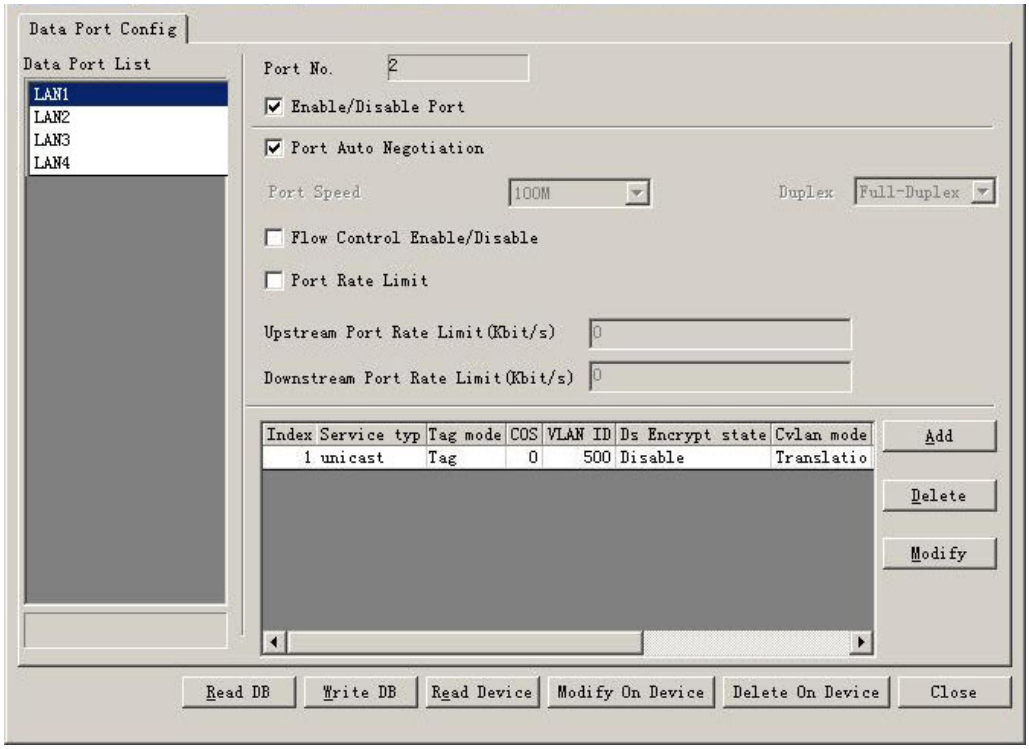


Figure 6-62 Port service configuration completed for the AN5506-04-B in the VLAN 1:1 translation mode (configured respectively)

6.3.3.6 Configuring OLT QinQ Domain

1. Right-click the HSWA[9] card in the **Object Tree** pane and select **Config→OLT QinQ Domain** from the shortcut menu to access the **OLT QinQ Domain** window.
2. Click the button on the toolbar. In the **Please Input the Rows for Add:** dialog box that appears subsequently, type **1** and click **OK** to add an OLT QinQ domain.
3. Configure according to the planning data in Table 6-17.
4. Click the button on the toolbar to complete the configuration, as shown in Figure 6-63.

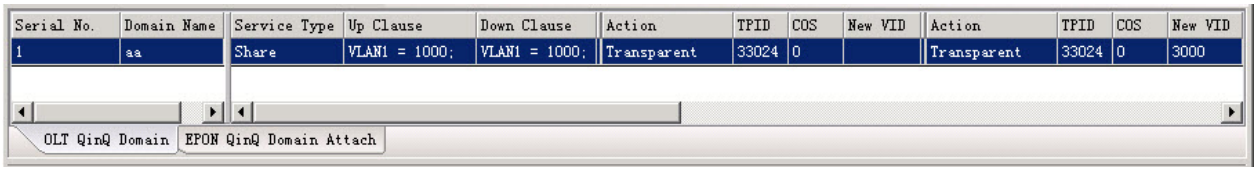


Figure 6-63 Configuring the QLT QinQ domain for the AN5506-04-B in the VLAN 1:1 translation mode (configured respectively)

6.3.3.7 Binding PON Port to QinQ Domain

1. Right-click the GC8B[15] card in the **Object Tree** pane, and select **Config→ PON Attach/Detach Domain** to access the **PON Attach/Detach Domain** window.
2. Select the PON port to be bound to the QinQ domain, and click a blank area in the right pane. Then click the button on the toolbar. In the **Please Input the Rows for Add:** dialog box that appears subsequently, type **1** and click **OK** to add a domain.
3. Configure according to the planning data in Table 6-17.
4. Click the button on the toolbar to complete the configuration, as shown in Figure 6-64.

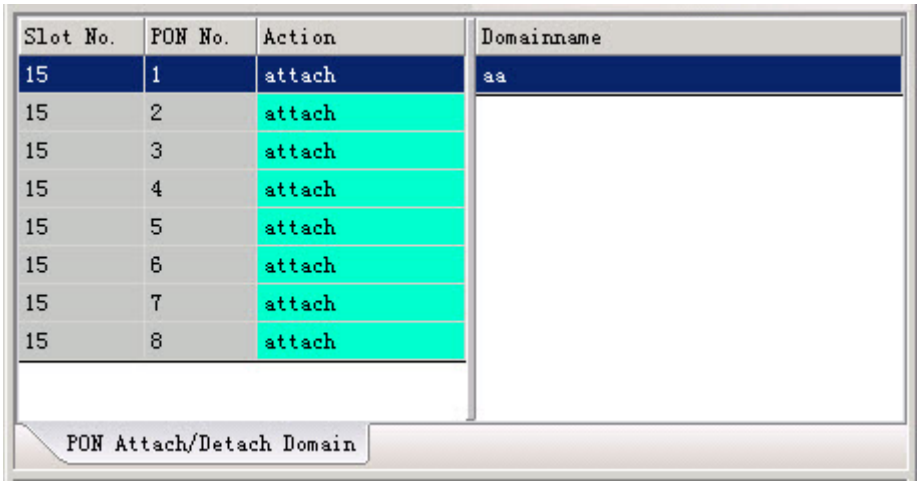


Figure 6-64 Binding the PON port to the QinQ domain-configuring the AN5506-04-B in the VLAN 1:1 translation mode respectively

6.3.3.8 End of Configuration

PC1 to PC4 can make normal access to Internet.

6.3.4 Configuring Data Services in a Batch Manner (for the AN5506-04-B)

See Table 1-1 for the ONU type.

6.3.4.1 Planning Data

Table 6-19 The planned data of data service configuration at the OLT side in the VLAN 1:1 translation mode (in a batch manner)

Item		Description	Example
ONU information	Slot No.	The number of the actually used slot	15
	PON No.	The number of the actually used PON port	1
	ONU No.	Configures according to the network planning of the operator	1
	ONU type	The type of an ONU	AN5506-04-B
Data of the service VLAN in the central office end	Service name	Configures according to the network planning of the operator	data3
	VLAN ID begin	The begin VLAN ID number of the uplink port service.	3000
	VLAN ID end	The end VLAN ID number of the uplink port service. The begin VLAN ID should not be larger than the end VLAN ID.	3001
	Uplink No./TRUNK No.	Configures according to the number of the actually used uplink port.	19:SFP2

Table 6-19 The planned data of data service configuration at the OLT side in the VLAN 1:1 translation mode (in a batch manner) (Continued)

Item			Description	Example
	TAG/UNTAG		The Tag processing mode of the uplink service VLAN can be set as **Tag** or **Untag**. ◆ Under **UNTAG** mode, the TAGs of the uplink packets will be stripped automatically and the packets will be uplinked in the form of UNTAG when they pass the port, whereas the downlink UNTAG packets will be added with designated TAGs. ◆ Under **TAG** mode, the uplink/downlink data packets will not be processed when they pass the port.	Tag
	Service Type		Selects data in correspondence to the data service.	data
Creates OLT QinQ domain	Domain name		The OLT QinQ domain name, and configures up to 1024 QinQ domains. The QinQ domain name should not be more than 16 bytes and only is numbers, characters and the underline.	aa
Configures OLT QinQ domain	Service Type		Single is selected by default.	Share
	VLAN Layer 1	CVLAN ID	The transparently transmitted CVLAN ID.	1000
		CVLAN priority	The transparently transmitted CVLAN priority. The value range is from 0 to 7. 7 is the maximum value while 0 is the minimum value.	0
		Action	If the value of the **subscriber VLAN Layer 1** is configured, the Action can be set as **Transparent** or **Translation**; If the value of the **subscriber VLAN Layer 1** is not given, the Action can be set as **Transparent** or **Add**.	Transparent transmission
		Label protocol identifier	The default value is 33024.	Default
	VLAN Layer 2	OLT SVLAN priority	SVLAN priority The value range is from 0 to 7. 7 is the maximum value while 0 is the minimum value.	0
		Action	Selects **Add**.	Add
		Label protocol identifier	The default value is 33024.	Default

Table 6-19 The planned data of data service configuration at the OLT side in the VLAN 1:1 translation mode (in a batch manner) (Continued)

Item			Description	Example
		New VID	SVLAN ID	3000
Configures the OLT QinQ domain's service uplink rules.	Bind type		Configures according to the network planning of the operator.	VLAN Layer 1
	Operation symbol		Configures according to the network planning of the operator	=
	Bind value		Configures according to the network planning of the operator	1000
Configures the OLT QinQ domain's service downlink rules.	Bind type		Configures according to the network planning of the operator.	VLAN Layer 1
	Operation symbol		Configures according to the network planning of the operator	=
	Bind value		Configures according to the network planning of the operator	1000
Binds the PON port to the QinQ domain.	Action		Configures according to the network planning of the operator	Bind
	Domain name		Selects the domain name configured in the OLT QinQ domain.	aa

Table 6-20 The planned data of data service configuration of the AN5506-04-B at the ONU side in the VLAN 1:1 translation mode (in a batch manner)

Item		Description	Example
Bandwidth allocation profile	Profile name	The bandwidth allocation profile name	a
	Service Type	Selects broadband services to access the Internet.	Broadband services access the Internet.
	Fixed Bandwidth (kbyte/s)	The fixed bandwidth of the ONU's uplink service. Even if the service does not use the bandwidth resource, other services cannot occupy the resource. The default value is 16 kbyte/s.	16
	Assured Bandwidth (kbyte/s)	The minimum bandwidth for provisioning an ONU’s uplink service. If the bandwidth resource is not used by this service, then the resource may be released for other services to use. The default value is 0 kbyte/s.	0

Table 6-20 The planned data of data service configuration of the AN5506-04-B at the ONU side in the VLAN 1:1 translation mode (in a batch manner) (Continued)

Item		Description	Example
	Maximum Bandwidth (kbyte/s)	The maximum bandwidth of an ONU's uplink service. The sum of the fixed bandwidth value and the assured bandwidth value should not be larger than the maximum bandwidth value. The default value is 64 kbyte/s.	1280
Data service profile	Profile name	Configures according to the network planning of the operator	b
	Enable/disable	Enable is selected by default.	Enable
	Auto Negotiation	Enable is selected by default.	Enable
	Rate	The default speed is 10Mbit/s. Unconfigurable when the **auto negotiation** is enabled.	-
	Duplex mode	The default speed is the duplex mode. Unconfigurable when the **auto negotiation** is enabled.	-
	Flow control	The default setting is disable.	Disable
	Port rate control enable/disable	The default setting is disable.	Disable
	Port uplink rate control	The default value is 0. Unconfigurable when the port rate control is disable.	-
	Port downlink rate control	The default value is 0. Unconfigurable when the port rate control is disable.	-
	TAG Mode	Configured as Tag or Untag according to the network planning of the operator. In the **Tag** mode the uplink data packets are tagged, whereas in the **Untag** mode the uplink data packets are untagged.	Tag
	Ethernet priority	When the **CVLAN mode** is **translation**, this item is the service priority before the translation. The priority range is from 0 to 7. Unconfigurable when the **TAG Mode** is the Untag.	0
	VLAN ID	When the **CVLAN mode** is **translation**, this item is the VLAN ID before the translation. Unconfigurable When the **TAG Mode** is Untag. The value range is from 1 to 4085.	500
	Downlink encryption enable switch	The default setting is disable.	Disable

Table 6-20 The planned data of data service configuration of the AN5506-04-B at the ONU side in the VLAN 1:1 translation mode (in a batch manner) (Continued)

Item			Description	Example	
	CVLAN Mode		When the **TAG Mode** is Untag, Tag or transparent transmission can be selected. When the **TAG Mode** is Tag, translation or transparent transmission can be selected.	Translation	
	CVLAN ID		The VLAN ID after translation and the value range is from 1 to 4085.	1000	
	Priority at PON ports		CVLAN priority; the value range is from 0 to 7.	0	
	QINQ enable status		Enable or disable the QinQ configuration and disable by default.	Disable	
	Service VLAN name		Selects the service name configured in the central office VLAN. Unconfigurable when the **QinQ enable status** is disable.	-	
	SVLAN ID		The value range is from 1 to 4085. Unconfigurable when the **QinQ enable status** is disable.	-	
	Priority at PON ports		SVLAN priority; the value range is from 0 to 7. 7 is the highest priority while 0 is the lowest priority. Unconfigurable when the **QinQ enable status** is disable.	-	
Service profile	Profile name		Configures according to the network planning of the operator.	c	
	ONU type		The type of the actually used ONU.	AN5506-04-B	
	Sub-profile configuration in ONU level	Profile type	Selects bandwidth allocation profile.	Bandwidth allocation profile	
		Profile name	The profile name configured in the bandwidth profile of the GPON service.	a	
	Port type		The type of the actually used port.	FE port	
	Port No.		The number of the actually used port.	1	2
	Sub-profile configuration in the port level	Profile type	Selects data service profile.	Data service profile	
		Profile name	The profile name configured in the service data service.	b	
Service profile bind	Profile ID		The profile name configured in the service profile.	c	
	Bind/unbind		Binds service profiles to ONU.	Bind	
	Slot No.		The number of the actually used slot.	15	

Table 6-20 The planned data of data service configuration of the AN5506-04-B at the ONU side in the VLAN 1:1 translation mode (in a batch manner) (Continued)

Item		Description	Example
	PON No.	The number of the actually used PON port	1
	ONU number	The authentication number allocated by the operator according to the network planning.	1

6.3.4.2 Configuration Flow Chart

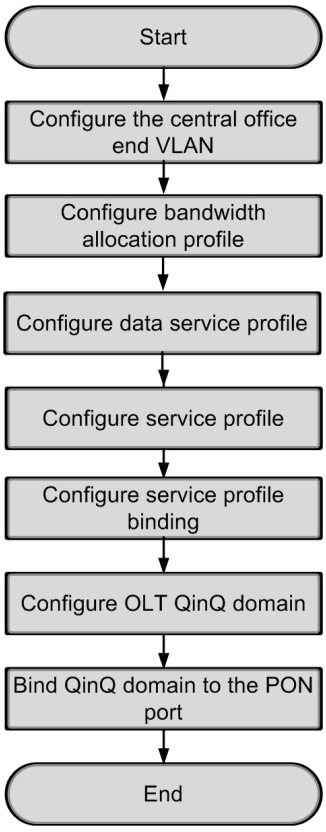


Figure 6-65 The flow of configuring the data service under the VLAN 1:1 translation mode in a batch manner (for the AN5506-04-B)

6.3.4.3 Configuring the Central Office End Service VLAN

See Configuring the Local End Service VLAN for configuration procedures.

6.3.4.4 Configuring the Bandwidth Allocation Profile

1. Right-click the HSWA[9] card in the **Object Tree** pane and select **Service Config Relevance→GPON Service Bandwidth Config Profile** to access the **Bandwidth Config Profile** window.
2. Click the pane on left side and click in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. After clicking **OK**, you should double-click in a blank area of the **Profile Name** and input **a**.
3. Click the pane on right side and click in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. Click **OK**.
4. Configure according to the planned data in Table 6-20.
5. Click in the toolbar and the configuration is completed, as shown in Figure 6-66.

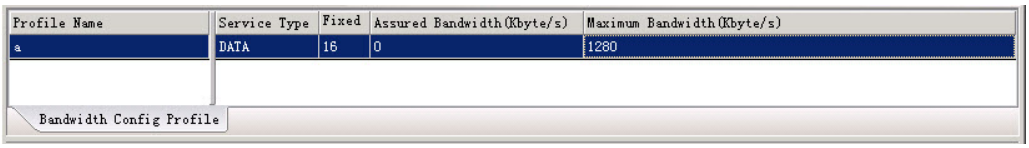


Figure 6-66 The ONU bandwidth allocation profile-configuring the AN5506-04-B under the VLAN 1:1 translation mode in a batch manner

6.3.4.5 Configuring Data Service Profile

1. Right-click the HSWA[9] card in the **Object Tree** pane and select **Service Config Relevance→Service Profile Config** to access the **Data Service Profile** window.
2. Click the pane on left side then click in the toolbar. Input **1** in the **Please Input The Rows for Add:** dialog box and click **OK** to add a data service profile b. Configure basic parameters of the port according to the planned data in Table 6-20.
3. Click the pane on right side then click in the toolbar. Input **1** in the **Please Input The Rows for Add:** dialog box and click **OK**. Configure the VLAN tags of the traffic flow according to the planned data in Table 6-20.
4. Click in the toolbar and the configuration is completed, as shown in Figure 6-67.

Figure 6-67 The data service profile-configuring the AN5506-04-B under the VLAN 1:1 translation mode in a batch manner

6.3.4.6 Creating Service Profile

1. Right-click the HSWA[9] card in the **Object Tree** pane and select **Service Config Relevance→Service Profile Config** from the shortcut menu to access the **Data Service Profile** window and select **Service Profile** tab.
2. Click the pane on left side and click  in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. Click **OK** to add a service profile.
3. Double click the bland field of the **Profile Name** and input **c** and select **AN5506-04-B** from the drop-down list of the **ONU Type**. Double-click the blank area of the **ONU Subprofile Config** to access the **ONU Subprofile Config** dialog box.
4. In the **ONU Subprofile Config** dialog box, click **Add** to add a new profile configuration. Click the **Profile type** drop-down list to select **Bandwidth Config Profile**. Click the **Profile Name** drop-down list to select **a**.

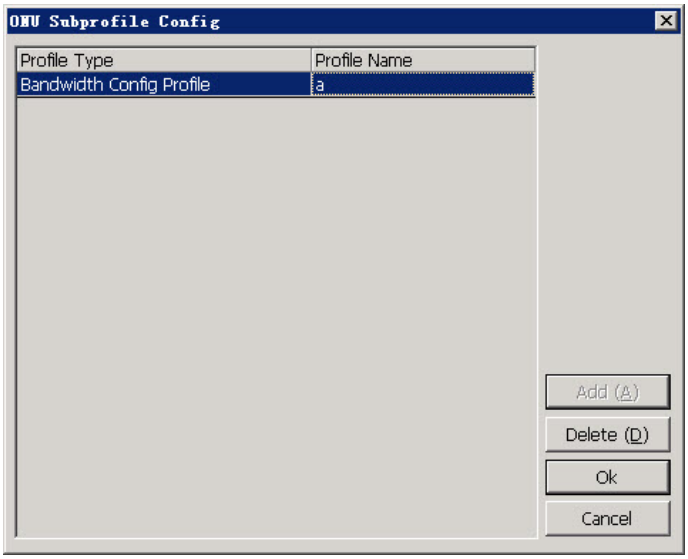


Figure 6-68 The ONU subprofile configuration-configuring the AN5506-04-B under the VLAN 1:1 translation mode in a batch manner

5. Click **OK** to return to **Service Profile** window.
6. Click the pane on right side and click in the toolbar to input **2** in the **Please Input The Rows For Add:** dialog box. Click **OK**.
7. Click the **Port Type** drop-down list to select **LAN port**. Double-click the blank area of the **Port No.** and input **1** and **2**. Double-click the blank area of the **ONU Port Profile Config** to access the **ONU Port Profile Config**.
8. In the **ONU Port Profile Config** dialog box, click **Add** to add a new profile configuration. Click the **Profile type** drop-down list to select **Bandwidth Config Profile**. Click the **Profile Name** drop-down list to select **b**.

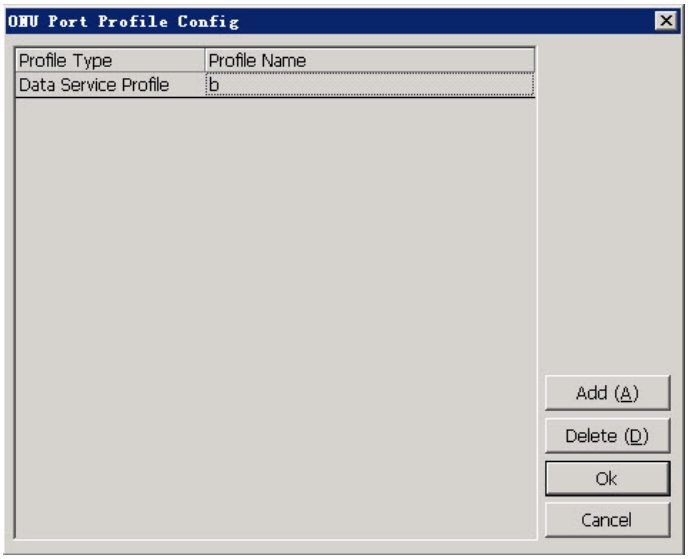


Figure 6-69 The port subprofile configuration-configuring the AN5506-04-B under the VLAN 1:1 translation mode in a batch manner

9. Click **OK** to return to **Service Profile** window.
10. Click in the toolbar and the configuration is completed, as shown in Figure 6-70.

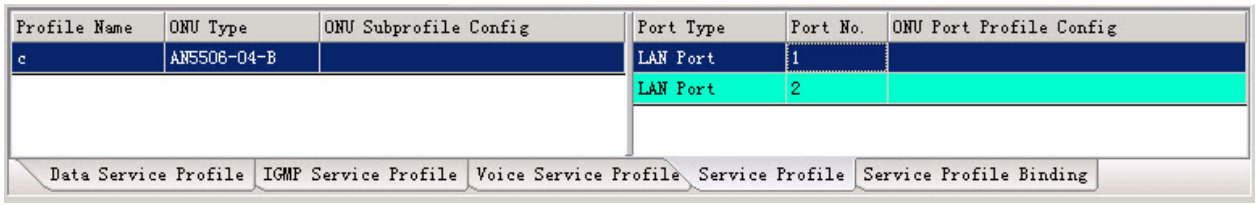


Figure 6-70 The service profile configuration-configuring the AN5506-04-B under the VLAN 1:1 translation mode in a batch manner

6.3.4.7 Binding ONU to Service Profile

1. Right-click the HSWA[9] card in the **Object Tree** pane and select **Service Config Relevance→Service Profile Config** from the shortcut menu to access the **Data Service Profile** window and click **Service Profile Binding** tab.
2. Click the pane on left side and click in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. Click **OK**.

3. Select **c** from the drop-down list of **Profile ID** and select **Attach** from the drop-down list of **Action**.
4. Click the pane on right side and click  in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. Click **OK**.
5. Double-click the **ONU No.** pane to bring up the **Select Objects** window and select AN5506-04-B for the ONU.

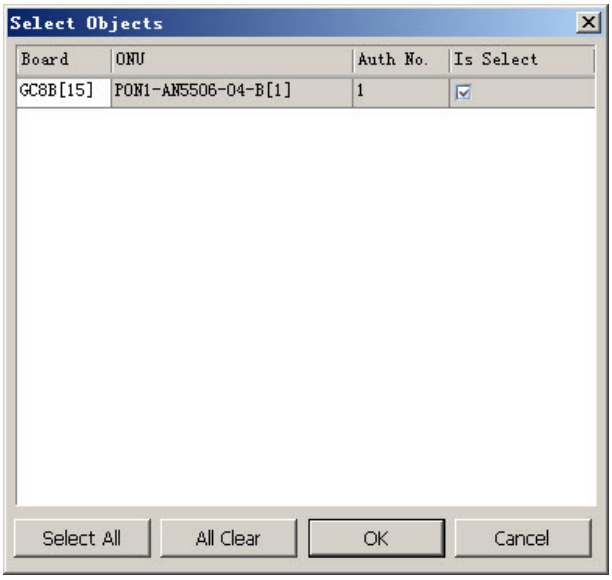


Figure 6-71 The planned data of ONU profile ID configuration for the AN5506-04-B in the VLAN 1:1 translation mode (in a batch manner)

6. Click **OK** to return to **Service Profile Binding** window.
7. Click  in the toolbar and click **OK** in the alert box that appears. The configuration is completed, as shown in Figure 6-72.

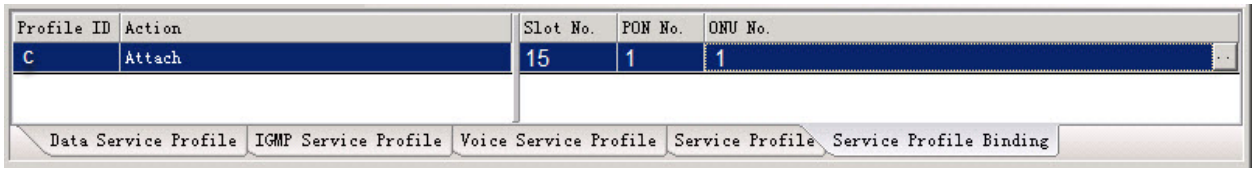


Figure 6-72 Binding the AN5506-04-B to the service profile-configuring under the VLAN 1:1 translation mode in a batch manner

6.3.4.8 Configuring OLT QinQ Domain

1. Right-click the HSWA[9] card in the **Object Tree** pane and select **VLAN Config →OLT QinQ Domain** to access the **OLT QinQ Domain** window.
2. Click the pane on left side and click in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. Click **OK** to create an OLT QinQ domain.
3. Configure according to the planned data in Table 6-19.
4. Click in the toolbar and the configuration is completed, as shown in Figure 6-73.

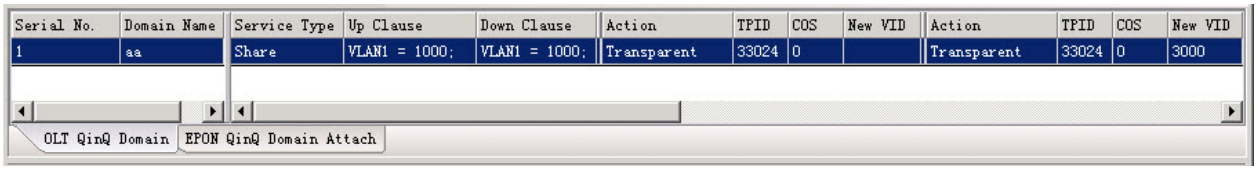


Figure 6-73 Configuring the OLT QinQ domain-configuring the AN5506-04-B under the VLAN 1:1 translation mode in a batch manner

6.3.4.9 Binding PON Port to QinQ Domain

1. Right-click the GC8B[15] card on the **Object Tree** pane and select **Config→ PON Attach/Detach Domain** from the shortcut menu to access the **PON Attach/Detach Domain** window.
2. Click the PON port to be bound with the QinQ domain and click the pane on right side. Click in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. Click **OK** to add a domain name.
3. Configure according to the planned data in Table 6-19.
4. Click in the toolbar and the configuration is completed, as shown in Figure 6-74.

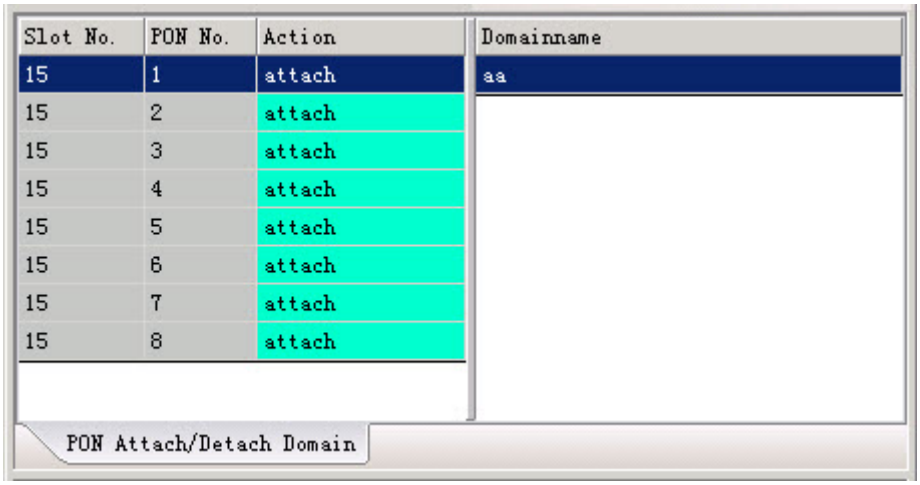


Figure 6-74 Binding the PON port to the QinQ domain-configuring the AN5506-04-B under the VLAN 1:1 translation mode in a batch manner

6.3.4.10 Configuration Result

The PC1 to PC4 can access the Internet normally.

6.3.5 Configuring Data Services Respectively (for the AN5506-10-B1)

See Table 1-2 for the ONU type.

6.3.5.1 Planning Data

Table 6-21 The planned data of data service configuration for the AN5506-10-B1 at the OLT side in the VLAN 1:1 translation mode (configured respectively)

Item			Description	Example
ONU information	Slot No.		The number of the actually used slot.	15
	PON No.		The number of the actually used PON port	1
	ONU Authorization No.		Configures according to the network planning of the operator.	2
	ONU type		The type of an ONU	AN5506-10-B1
Data of the service VLAN in the central office end	Service name		Configures according to the network planning of the operator.	data3
	VLAN ID begin		The begin VLAN ID number of the uplink port service.	3000
	VLAN ID end		The end VLAN ID number of the uplink port service. The begin VLAN ID should not be larger than the end VLAN ID.	3001
	Uplink No./TRUNK No.		Configures according to the number of the actually used uplink port.	19:SFP2
	TAG/UNTAG		The Tag processing mode of the uplink service VLAN can be set as **Tag** or **Untag**. ◆ Under **UNTAG** mode, the TAGs of the uplink packets will be stripped automatically and the packets will be uplinked in the form of UNTAG when they pass the port, whereas the downlink UNTAG packets will be added with designated TAGs. ◆ Under **TAG** mode, the uplink/downlink data packets will not be processed when they pass the port.	Tag
	Service Type		Selects data in correspondence to the data service.	data
Creates OLT QinQ domain	Domain name		The OLT QinQ domain name, and configures up to 1024 QinQ domains. The QinQ domain name should not be more than 16 bytes and only is numbers, characters and the underline.	aa
Configuring OLT QinQ Domain	Service Type		Single is selected by default.	Share
	VLAN Layer 1	CVLAN ID	The transparently transmitted CVLAN ID.	2000
		CVLAN priority	The transparently transmitted CVLAN priority. The value range is from 0 to 7. 7 is the maximum value while 0 is the minimum value.	0

Table 6-21 The planned data of data service configuration for the AN5506-10-B1 at the OLT side in the VLAN 1:1 translation mode (configured respectively) (Continued)

Item			Description	Example
		Action	If the value of the **subscriber VLAN Layer 1** is configured, the Action can be set as **Transparent** or **Translation**; If the value of the **subscriber VLAN Layer 1** is not given, the Action can be set as **Transparent** or **Add**.	Transparent transmission
		Label protocol identifier	The default value is 33024.	Default
	VLAN Layer 2	OLT SVLAN priority	SVLAN priority The value range is from 0 to 7. 7 is the maximum value while 0 is the minimum value.	0
		Action	Selects **Add**.	Add
		Label protocol identifier	The default value is 33024.	Default
		New VID	SVLAN ID	3001
Configures the OLT QinQ domain's service uplink rules.	Bind type		Configures according to the network planning of the operator.	VLAN Layer 1
	Operation symbol		Configures according to the network planning of the operator.	=
	Bind value		Configures according to the network planning of the operator.	2000
Configures the OLT QinQ domain's service downlink rules.	Bind type		Configures according to the network planning of the operator.	VLAN Layer 1
	Operation symbol		Configures according to the network planning of the operator.	=
	Bind value		Configures according to the network planning of the operator.	2000
Binding PON Port to QinQ Domain	Action		Configures according to the network planning of the operator.	Bind
	Domain name		Selects the domain name configured in the OLT QinQ domain.	aa

Table 6-22 The planned data of data service configuration at the ONU side in the VLAN 1:1 translation mode (configured respectively)

Item		Description	Example	
Bandwidth allocation	Service Type	Selects integrate services.	Integrate service	
	Fixed Bandwidth (kbyte/s)	The fixed bandwidth of the ONU's uplink service. Even if the service does not use the bandwidth resource, other services cannot occupy the resource. The default value is 16 kbyte/s.	16	
	Assured Bandwidth (kbyte/s)	The minimum bandwidth for provisioning an ONU's uplink service. If the bandwidth resource is not used by this service, then the resource may be released for other services to use. The default value is 0 kbyte/s.	0	
	Maximum Bandwidth (kbyte/s)	The maximum bandwidth of an ONU's uplink service. The sum of the fixed bandwidth value and the assured bandwidth value should not be larger than the maximum bandwidth value. The default value is 64 kbyte/s.	1280	
Configuring basic information of the ONU port	ONU port	The actually used ONU port.	1	2
	Enable/disable port	Configures according to the network planning of the operator. Enable is selected by default.	Default	
	Port auto-negotiation	Configures according to the network planning of the operator. Enable is selected by default.	Default	
	Port rate	Unconfigurable when the port auto negotiation is enabled. The default speed is 100Mbit/s.	Default	
	Duplex	Unconfigurable when the port auto negotiation is enabled. The default speed is full-duplex.	Default	
	Flow control enable/disable	Configures according to the network planning of the operator. Disable is selected by default.	Default	
Configuring service parameters for the ONU port	TLS	Configures according to the network planning of the operator. Selects TLS or Non TLS.	Non TLS	
	Service Type	Selects **Unicast**.	Unicast	
	VLAN Mode	Configures according to the network planning of the operator. Selects Tag or Transparent.	Transparent transmission	
	Label protocol identifier	The default value is 33024.	33024	
	CVLAN ID	Translates the old VLAN ID.	600	

Table 6-22 The planned data of data service configuration at the ONU side in the VLAN 1:1 translation mode (configured respectively) (Continued)

Item		Description	Example
	Priority or COS	The CVLAN priority; the value range is from 0 to 7. 7 is the highest priority while 0 is the lowest priority.	0
	Translation enable status	Enables/disables the translation configuration.	Enable
	Translate VID	Translates the new VLAN ID value and the value range is from 1 to 4085.	2000
	Label protocol identifier	The default value is 33024.	33024
	Priority or COS	Translates the new VLAN priority level. The value range is from 0 to 7, and 7 is the highest value while 0 is the lowest value.	0

6.3.5.2 Configuration Flow Chart

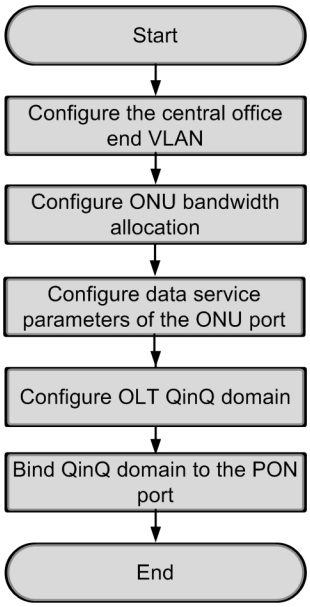


Figure 6-75 The flow of configuring the data service under the VLAN 1:1 translation mode respectively (for the AN5506-10-B1)

6.3.5.3 Configuring the Central Office End Service VLAN

See Configuring the Local End Service VLAN for configuration procedures.

6.3.5.4 Configuring Bandwidth Allocation

1. Click the GC8B[15] card in the **Object Tree** pane and information of all ONUs listed under the GC8B card will be shown in the right pane. Right-click the **AN5506-10-B1[2]** ONU and select **Config→Bandwidth Config** from the shortcut menu to access the **Bandwidth Allocation Configuration** window.
2. Click the pane on right side and click  in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. Click **OK**.
3. Configure according to the planned data in Table 6-22.
4. Click  in the toolbar and click **OK** in the alert box that appears. The configuration is completed, as shown in Figure 6-76.

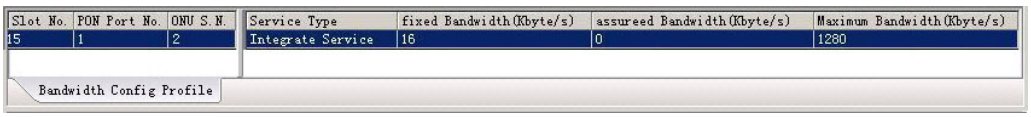


Figure 6-76 ONU bandwidth allocation configuration-configuring the AN5506-10-B1 under the VLAN 1:1 translation mode respectively

6.3.5.5 Configuring Data Service Parameters for the ONU Port

1. Click the GC8B[15] card in the **Object Tree** pane and information of all ONUs listed under the GC8B card will be shown in the right pane. Right-click the **AN5506-10-B1[2]** ONU and select **Config→Service Config** from the shortcut menu to access the **Data Port Config** window.
2. Select **LAN1** from the **Data Port List** and click **Add** to create a data service and configure it according to the planned data in Table 6-22.

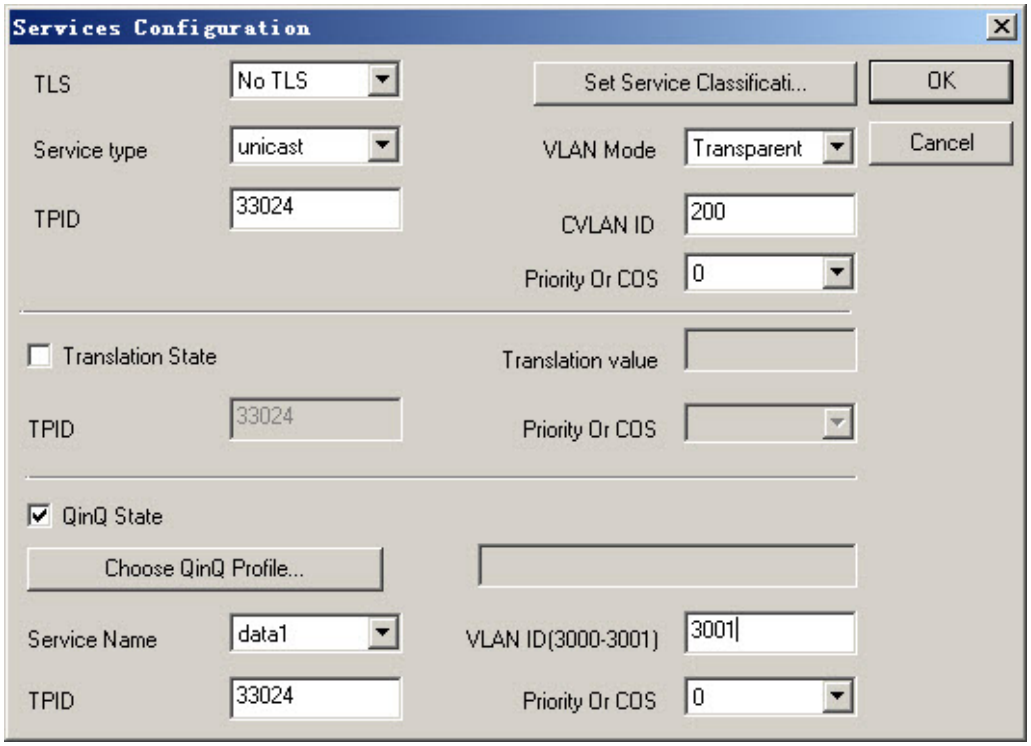


Figure 6-77 The service configuration-configuring the AN5506-10-B1 under the VLAN 1:1 translation mode respectively

3. Click **OK** to return to the **Data Port Config** tab. Right-click the **LAN1** in the **Data Port List** to select **Copy Port Config**. Right-click the **LAN2** and select **Paste Port Config**.
4. After the configuration, click the **Modify on Device** to complete the service configuration for the AN5506-10-B1, as shown in Figure 6-78.

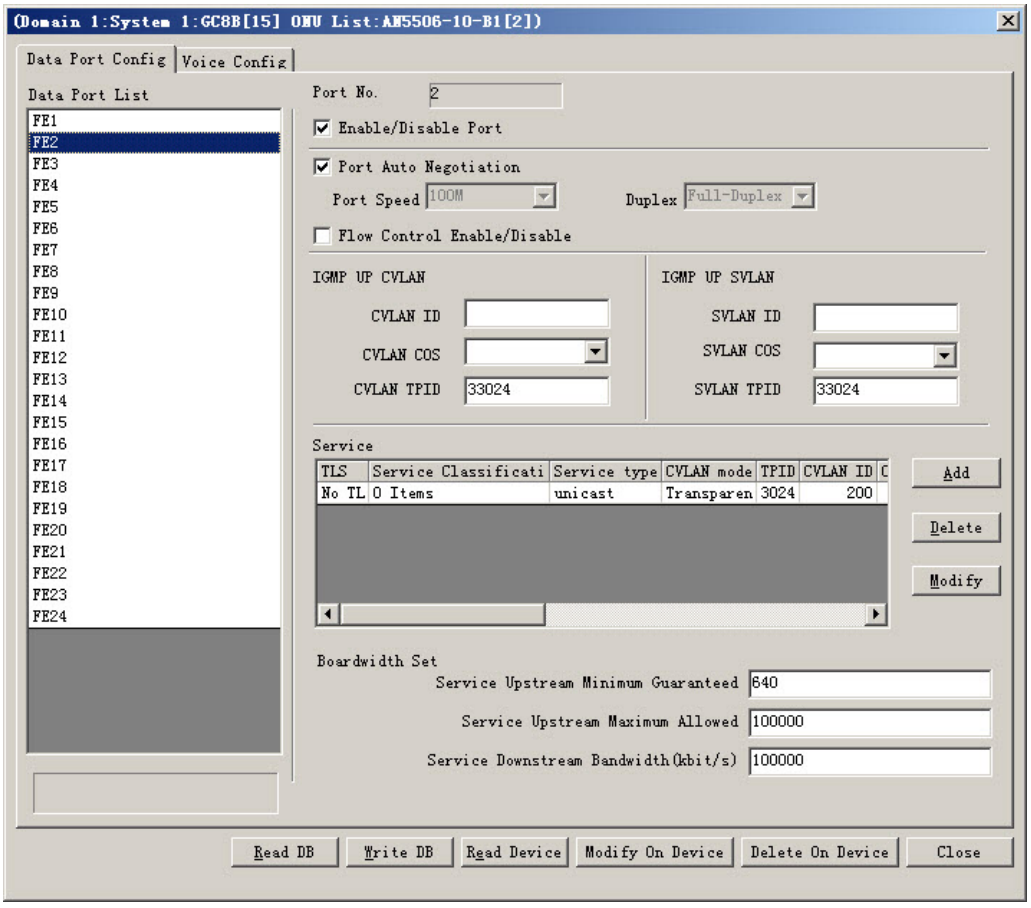


Figure 6-78 The port service configuration is completed-configuring the AN5506-10-B1 under the VLAN 1:1 translation mode respectively

6.3.5.6 Configuring OLT QinQ Domain

1. Right-click the HSWA[9] card in the **Object Tree** pane and select **VLAN Config →OLT QinQ Domain** from the shortcut menu to access the **OLT QinQ Domain** window.
2. click  in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. Click **OK** to create an OLT QinQ domain.
3. Configure according to the planned data in Table 6-21.
4. Click  in the toolbar and the configuration is completed, as shown in Figure 6-79.

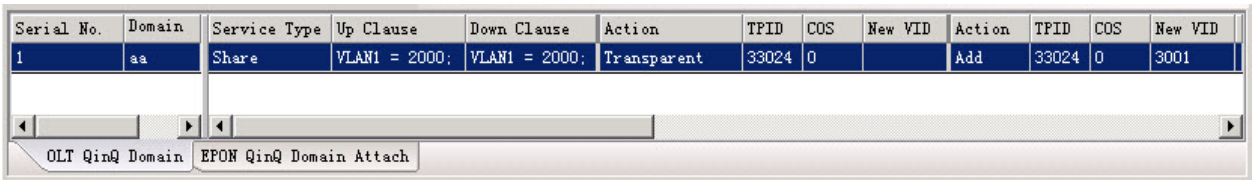


Figure 6-79 Configuring the OLT QinQ domain-configuring the AN5506-10-B1 under the VLAN 1:1 translation mode respectively

6.3.5.7 Binding PON Port to QinQ Domain

1. Right-click the GC8B[15] card on the **Object Tree** pane and select **Config→ PON Attach/Detach Domain** from the shortcut menu to access the **PON Attach/Detach Domain** window.
2. Click the PON port to be bound with the QinQ domain and click the pane on right side. Click  in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. Click **OK** to add a domain name.
3. Configure according to the planned data in Table 6-21.
4. Click  in the toolbar and the configuration is completed, as shown in Figure 6-80.

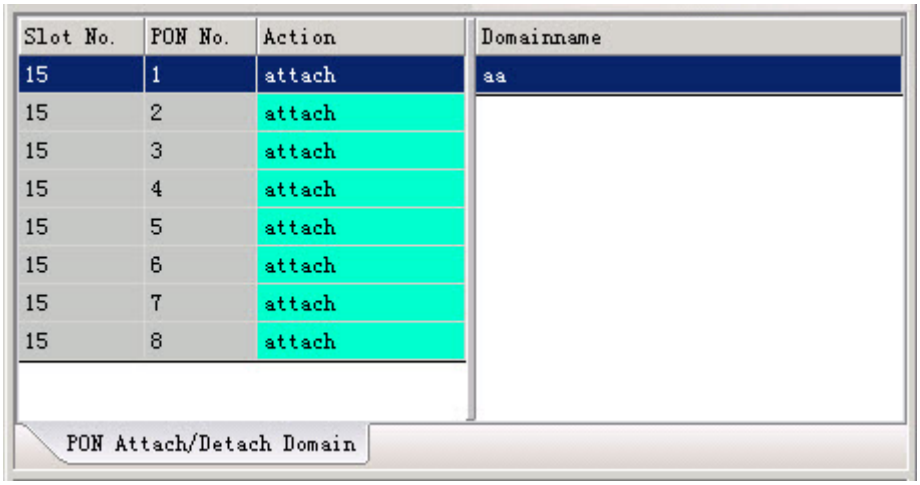


Figure 6-80 Binding the PON port to the QinQ domain-configuring the AN5506-10-B1 under the VLAN 1:1 translation mode respectively

6.3.5.8 Configuration Result

The PC1 to PC4 can access the Internet normally.

6.3.6 Configuring Data Services in a Batch Manner (for the AN5506-10-B1)

See Table 1-2 for the ONU type.

6.3.6.1 Planning Data

Table 6-23 The planned data of data service configuration for the AN5506-10-B1 at the OLT side in the VLAN 1:1 translation mode (in a batch manner)

Item		Description	Example
ONU information	Slot No.	The number of the actually used slot.	15
	PON No.	The number of the actually used PON port	1
	ONU Authorization No.	Configures according to the network planning of the operator.	2
	ONU type	The type of an ONU	AN5506-10-B1
Data of the service VLAN in the central office end	Service name	Configures according to the network planning of the operator.	data3
	VLAN ID begin	The begin VLAN ID number of the uplink port service.	3000
	VLAN ID end	The end VLAN ID number of the uplink port service. The begin VLAN ID should not be larger than the end VLAN ID.	3001
	Uplink No./TRUNK No.	Configures according to the number of the actually used uplink port.	19:SFP2

Table 6-23 The planned data of data service configuration for the AN5506-10-B1 at the OLT side in the VLAN 1:1 translation mode (in a batch manner) (Continued)

Item			Description	Example
	TAG/UNTAG		The Tag processing mode of the uplink service VLAN can be set as **Tag** or **Untag**. ◆ Under **UNTAG** mode, the TAGs of the uplink packets will be stripped automatically and the packets will be uplinked in the form of UNTAG when they pass the port, whereas the downlink UNTAG packets will be added with designated TAGs. ◆ Under **TAG** mode, the uplink/downlink data packets will not be processed when they pass the port.	Tag
	Service Type		Selects data in correspondence to the data service.	data
Creates OLT QinQ domain	Domain name		The OLT QinQ domain name, and configures up to 1024 QinQ domains. The QinQ domain name should not be more than 16 bytes and only is numbers, characters and the underline.	aa
Configuring OLT QinQ Domain	Service Type		Single is selected by default.	Share
	VLAN Layer 1	CVLAN ID	The transparently transmitted CVLAN ID.	2000
		CVLAN priority	The transparently transmitted CVLAN priority. The value range is from 0 to 7. 7 is the maximum value while 0 is the minimum value.	0
		Action	If the value of the **subscriber VLAN Layer 1** is configured, the Action can be set as **Transparent** or **Translation**; If the value of the **subscriber VLAN Layer 1** is not given, the Action can be set as **Transparent** or **Add**.	Transparent transmission
		Label protocol identifier	The default value is 33024.	Default
	VLAN Layer 2	OLT SVLAN priority	SVLAN priority The value range is from 0 to 7. 7 is the maximum value while 0 is the minimum value.	0
		Action	Selects **Add**.	Add
		Label protocol identifier	The default value is 33024.	Default
		New VID	SVLAN ID	3001

Table 6-23 The planned data of data service configuration for the AN5506-10-B1 at the OLT side in the VLAN 1:1 translation mode (in a batch manner) (Continued)

Item		Description	Example
Configures the OLT QinQ domain's service uplink rules.	Bind type	Configures according to the network planning of the operator.	VLAN Layer 1
	Operation symbol	Configures according to the network planning of the operator.	=
	Bind value	Configures according to the network planning of the operator.	2000
Configures the OLT QinQ domain's service downlink rules.	Bind type	Configures according to the network planning of the operator.	VLAN Layer 1
	Operation symbol	Configures according to the network planning of the operator.	=
	Bind value	Configures according to the network planning of the operator.	2000
Binding PON Port to QinQ Domain	Action	Configures according to the network planning of the operator.	Bind
	Domain name	Selects the domain name configured in the OLT QinQ domain.	aa

Table 6-24 The planned data of data service configuration for the AN5506-10-B1 at the ONU side in the VLAN 1:1 translation mode (in a batch manner)

Item		Description	Example
Bandwidth allocation profile	Profile name	The bandwidth allocation profile name	a
	Service Type	Selects integrate services.	Integrate service
	Fixed Bandwidth (kbyte/s)	The fixed bandwidth of the ONU's uplink service. Even if the service does not use the bandwidth resource, other services cannot occupy the resource. The default value is 16 kbyte/s.	16
	Assured Bandwidth (kbyte/s)	The minimum bandwidth for provisioning an ONU’s uplink service. If the bandwidth resource is not used by this service, then the resource may be released for other services to use. The default value is 0 kbyte/s.	0

Table 6-24 The planned data of data service configuration for the AN5506-10-B1 at the ONU side in the VLAN 1:1 translation mode (in a batch manner) (Continued)

Item		Description	Example	
	Maximum Bandwidth (kbyte/s)	The maximum bandwidth of an ONU's uplink service. The sum of the fixed bandwidth value and the assured bandwidth value should not be larger than the maximum bandwidth value. The default value is 64 kbyte/s.	1280	
Binding the bandwidth allocation profile	Slot No.	The number of the actually used slot.	15	
	PON No.	The number of the actually used PON port	1	
	ONU number	The authentication number allocated by the operator according to the network planning.	2	
	GPON bandwidth profile	The name of the configured bandwidth allocation profile	a	
Service type	Profile name	Configures according to the network planning of the operator.	b	
	Service type	Selects Unicast.	Unicast	
	CVLAN Mode	Configures the CVLAN mode of the service. Supports tag and transparent mode.	transparent	
	Translation enable status	Enables/disables the translation configuration.	Enable	
ONU data port configuration	Port No.	The actually used ONU port.	1	2
	Port enable/disable	Enables the port.	Enable	
	MAC limit	Configures as no MAC limit.	0	
ONU data service configuration	CVLAN label protocol identifier	The default value is 33024 kbyte/s.	33024	
	CVLAN ID	The VLAN ID before translation and the value range is from 1 to 4085.	600	
	CVLAN PON priority or COS	CVLAN priority The value range is from 0 to 7. 7 is the highest priority while 0 is the lowest.	0	
	Translation VLAN label protocol identifier	The default value is 33024 kbyte/s.	33024	
	Translation VID	The VLAN ID after translation and the value range is from 1 to 4085.	2000	
	Translation VLAN PON priority or COS	The translation VLAN priority, ranging from 0 to 7, or null.	0	

Table 6-24 The planned data of data service configuration for the AN5506-10-B1 at the ONU side in the VLAN 1:1 translation mode (in a batch manner) (Continued)

Item		Description	Example
	Service model profile	Selects the configured service model profile.	b

6.3.6.2 Configuration Flow Chart

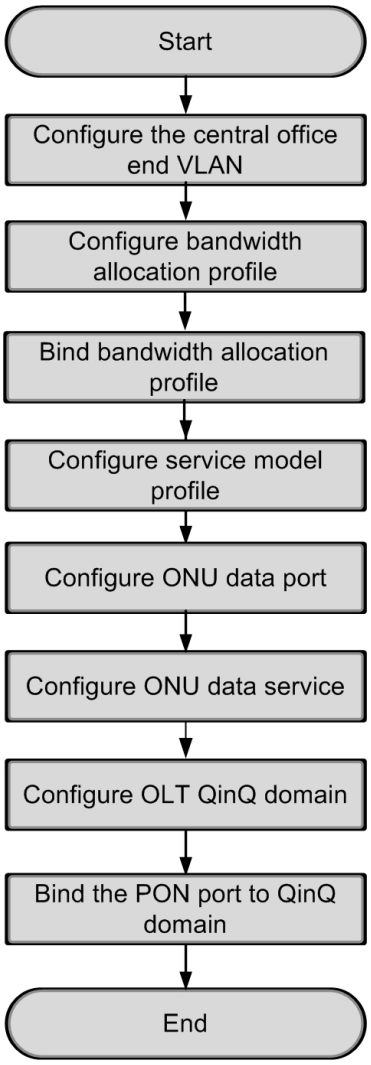


Figure 6-81 The flow of configuring the data service under the VLAN 1:1 translation mode in a batch manner (for the AN5506-10-B1)

6.3.6.3 Configuring the Central Office End Service VLAN

See Planning data for configuration procedures.

6.3.6.4 Configuring the Bandwidth Allocation Profile

1. Right-click the HSWA[9] card in the **Object Tree** pane and select **Service Config Relevance→GPON Service Bandwidth Config Profile** from the shortcut menu to access the **Bandwidth Config Profile** window.
2. Click the pane on left side and click  in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. After clicking **OK**, you should double-click in a blank area of the **Profile Name** and input **a**.
3. Click the pane on right side and click  in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. Click **OK**.
4. Configure according to the planned data in Table 6-24.
5. Click  in the toolbar and the configuration is completed, as shown in Figure 6-82.

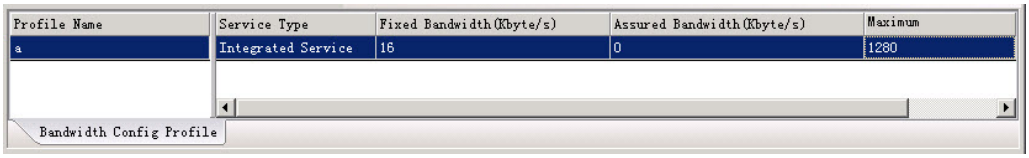


Figure 6-82 The ONU bandwidth allocation profile-configuring the AN5506-10-B1 under the VLAN 1:1 translation mode in a batch manner

6.3.6.5 Binding the Bandwidth Allocation Profile

1. Right-click the designated system in the **Object Tree**, select **Config→Batch Configure→ONU Config** to access the **Config Object** window.
2. Click **Set Object as Condition** in the **Config Object** pane. Select the AN5506-10-B1[2] under the PON port 1 in Slot 15 and click **OK**.

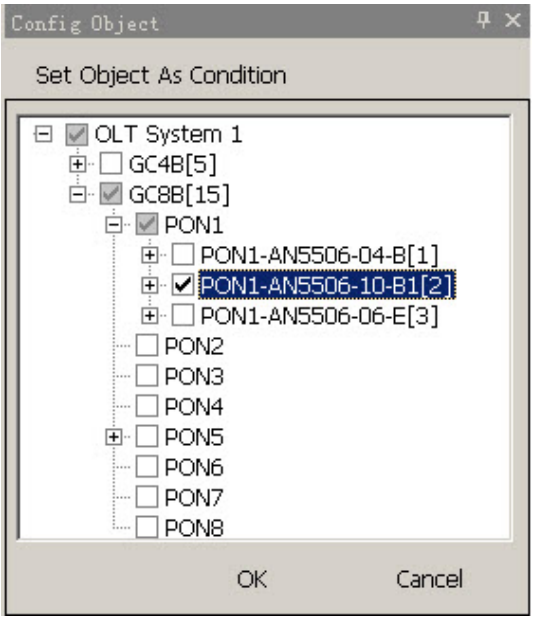


Figure 6-83 Setting the object to bind the bandwidth profile-configuring the AN5506-10-B1 under the VLAN 1:1 translation mode in a batch manner

3. The specific configuration information of the object will display in the right pane. Click the drop-down list of the **GPON Bandwidth Profile** to select the configured bandwidth profile **a**.
4. Click  in the toolbar and the configuration is completed, as shown in Figure 6-84.

Figure 6-84 Binding the bandwidth allocation profile - configuring the AN5506-10-B1 under the VLAN 1:1 translation mode in a batch manner

6.3.6.6 Configuring Service Model Profile

1. Right-click the designated system in the **Object Tree**, select **Config→Profile Definition→Service Model Profile** to access the **Service Model Profile** window.

2. click  in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. Click **OK** to create a service model profile.
3. Configure according to the planned data in Table 6-24.
4. Click  in the toolbar and the configuration is completed, as shown in Figure 6-85.

Figure 6-85 Configuring the service model profile-configuring the AN5506-10-B1 under the VLAN 1:1 translation mode in a batch manner

6.3.6.7 Configuring the ONU Data Port Parameters

1. Right-click the designated system in the **Object Tree**, select **Config→Batch Configure→ONU Data Port Configure** to access the **ONU Data Port Configure** window.
2. Click **Set Object as Condition** in the **Config Object** pane. Select LAN1 and LAN2 of the AN5506-10-B1[2] under the PON port 1 in Slot 15 and click **OK**.

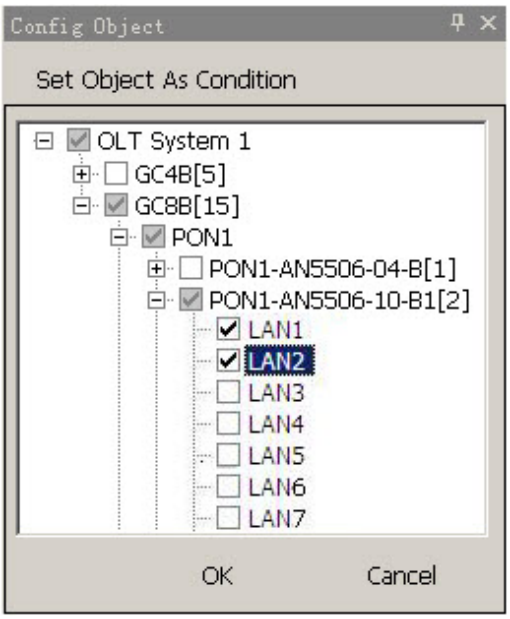


Figure 6-86 Setting the condition object of the ONU data port parameters-configuring the AN5506-10-B1 under the VLAN 1:1 translation mode in a batch manner

3. The specific configuration information of the objects will appear in the right pane. Configure according to the planned data in Table 6-24.
4. Click in the toolbar and the configuration is completed, as shown in Figure 6-87.

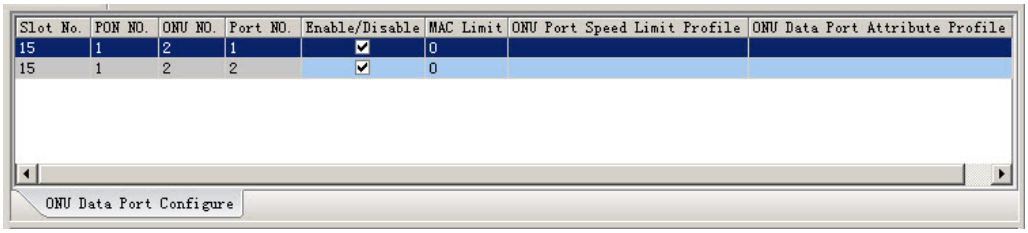


Figure 6-87 Configuring the ONU data port parameters-configuring the AN5506-10-B1 under the VLAN 1:1 translation mode in a batch manner

6.3.6.8 Configuring the ONU Data Service Parameters

1. Right-click the designated system in the **Object Tree**, select **Config→Batch Configure→ONU Data Service Configure** to access the **ONU Data Service Configure** window.
2. Click in the toolbar and the **Add Item number** dialog box appears. Selects LAN1 and LAN2 of the ONU in the left pane and click **OK** to return to the **ONU Data Service Configure** window.

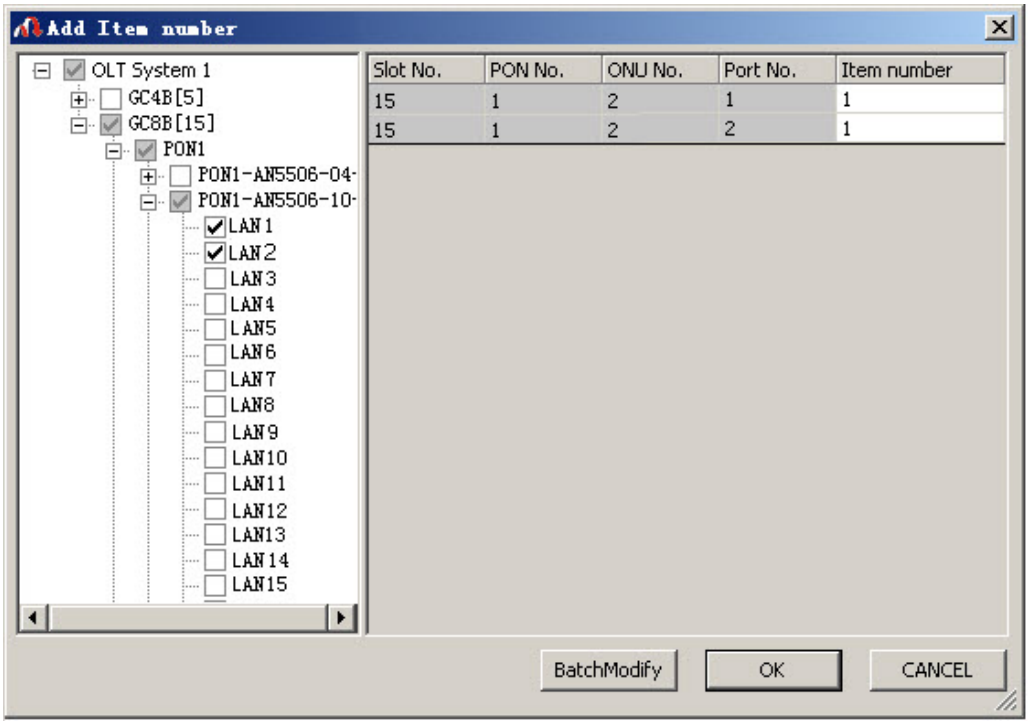


Figure 6-88 Setting the condition object of the ONU data service parameters-configuring the AN5506-10-B1 under the VLAN 1:1 translation mode in a batch manner

3. The specific configuration information of the objects will appear in the right pane. Configure according to the planned data in Table 6-24.
4. Click in the toolbar and click **OK** in the alert box that appears to complete the configuration, as shown in Figure 6-89.

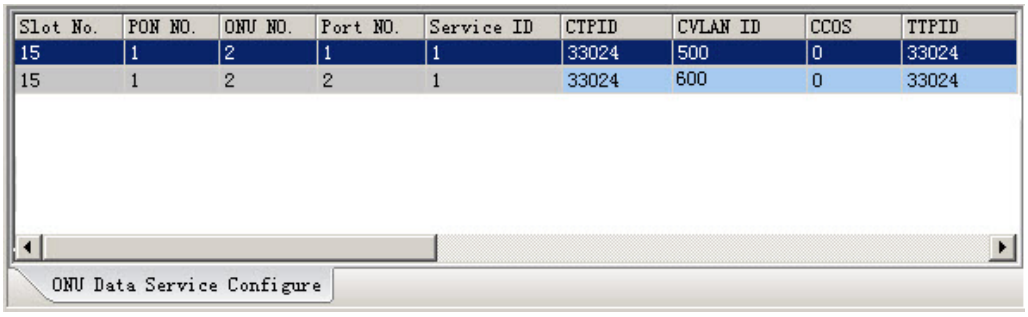


Figure 6-89 Configuring ONU data service parameters-configuring the AN5506-10-B1 under the VLAN 1:1 translation mode in a batch manner

6.3.6.9 Configuring OLT QinQ Domain

1. Right-click the HSWA[9] card in the **Object Tree** pane and select **VLAN Config →OLT QinQ Domain** from the shortcut menu to access the **OLT QinQ Domain** window.
2. click in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. Click **OK** to create an OLT QinQ domain.
3. Configure according to the planned data in Table 6-23.
4. Click in the toolbar and the configuration is completed, as shown in Figure 6-90.

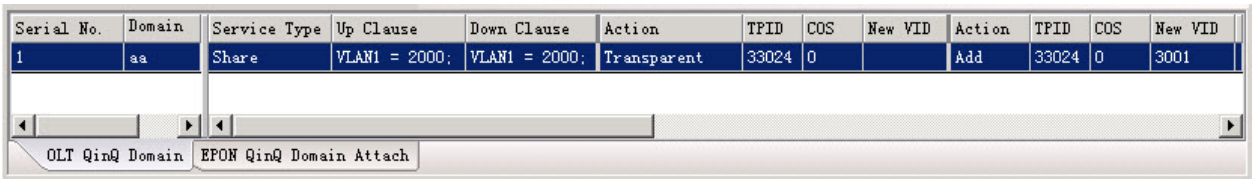


Figure 6-90 Configuring the OLT QinQ domain-configuring the AN5506-10-B1 under the VLAN 1:1 translation mode in a batch manner

6.3.6.10 Binding PON Port to QinQ Domain

1. Right-click the GC8B[15] card on the **Object Tree** pane and select **Config→ PON Attach/Detach Domain** from the shortcut menu to access the **PON Attach/Detach Domain** window.
2. Click the PON port to be bound with the QinQ domain and click the pane on right side. Click in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. Click **OK** to add a domain name.
3. Configure according to the planned data in Table 6-23.
4. Click in the toolbar and the configuration is completed, as shown in Figure 6-91.

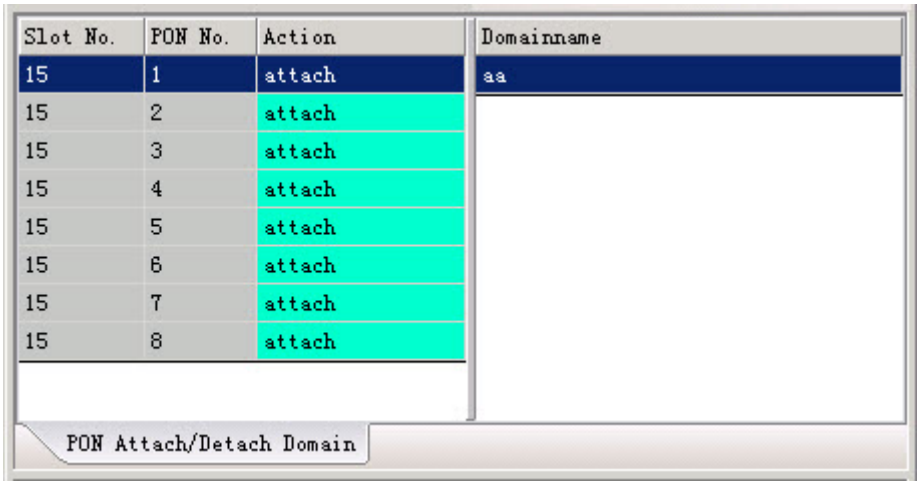


Figure 6-91 Binding the PON port to the QinQ domain-configuring the AN5506-10-B1 under the VLAN 1:1 translation mode in a batch manner

6.3.6.11 Configuration Result

The PC1 to PC4 can access the Internet normally.

6.4 Example for Data Service Configuration – in the VLAN N:1 Translation Mode

6.4.1 Configuration Rules

- Translation mode: The Ethernet data uploaded from the subscriber side will be added with VLAN ID via the home gateway to the ONU. Three processing modes are as follows.
  - The ONU converts the VLAN ID according to the operator's requirements and adds the SVLAN ID and uploads to the AN5116-06B. The AN5116-06B transparently transmits the data service to the upper layer network side equipment without any processing.
  - The ONU converts the VLAN ID according to the operator's requirements and uploads to the AN5116-06B. After adding the SVLAN ID, the AN5116-06B transmits the data service to the upper layer network side equipment.

- The ONU transparently transmits the CVLAN ID to the AN5116-06B. The AN5116-06B converts the VLAN ID according to the operator's requirements. After adding the SVLAN ID, the equipment transmits the data service to the upper layer network side equipment.

- If the SVLAN is added in the OLT side, the data of **Subscriber VLAN Layer 1** of the OLT QinQ domain should be consistent with the CVLAN ID marked by the ONU. Select **Transparent** for action and fill in the SVLAN ID in the **New VID** after the **Subscriber VLAN Layer 2** and select **Add** for action.
- When binding the PON port on the GC48 card to the OLT QinQ domain, all ONUs connected with the PON port forward data according to the rules defined in the QinQ domain. When a ONU is bound to the OLT QinQ domain, the QinQ rules are only valid to the ONU.
- The VLAN ID of the ONU ranges from 1 to 4085.
  - To add stacked VLANs for the data service, the SVLAN ID must be within the central office end VLAN.
  - To add a single VLAN for the data service, the CVLAN ID must be within the central office end VLAN.
- The ONU's data service can achieve in the service profile or ONU service configuration. If the configuration of each ONU's data service is the same, the data service of the service profile can be configured in a batch manner.
- The sum of the fixed bandwidth and asssured bandwidth of the service in the bandwidth allocation should not exceed the maximum bandwidth configuration parameter.
- An FE port of the AN5506-04-B can support up to four data services, and an FE port of the AN5506-10-B1 can support up to 16 data services.
- Each PON port can bind up to 32 VLAN operation tables.
- Configure the service type in the bandwidth allocation. Select **LAN** for the ONU in type 1 and **Integrate** for ONU in type 2.

6.4.2 Networking Diagram

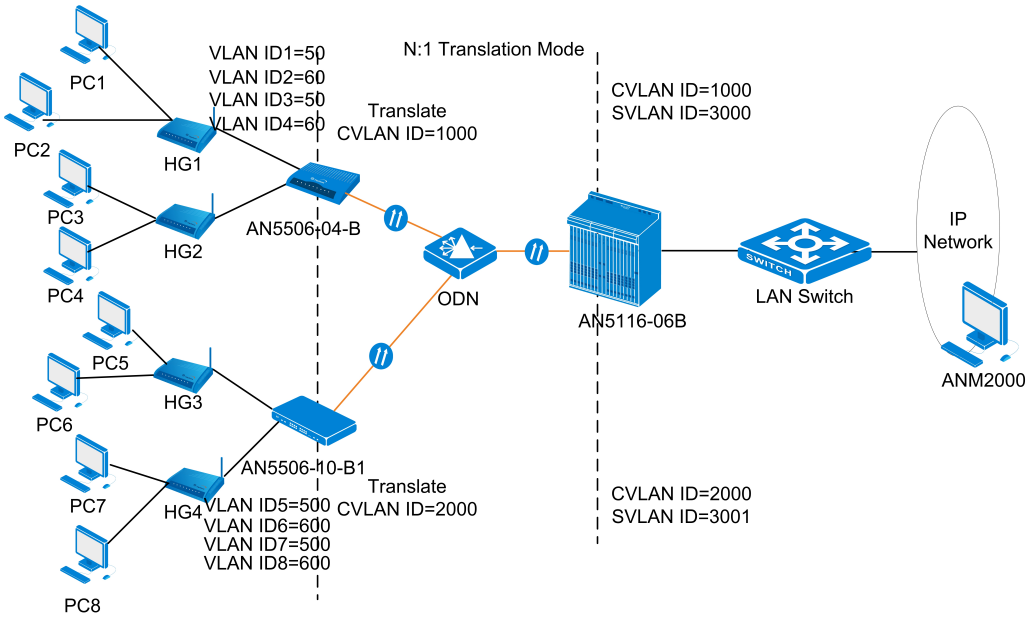


Figure 6-92 Data service network connection under the VLAN N:1 translation mode

- In the uplink direction, each hoemgateway is connected to two PC users. The data service uploaded from different users is added with different CVLANs and then transmitted to the ONUs via the home gateway. The ONUs translate the CLVAN and transmit to the OLT via the splitter. The OLT adds SVLAN to the data service and transmits the packet to the upper layer network via the uplink interface.
- In the downlink direction, the data service with stacked VLANs passes through the OLT. The OLT untags the SVLAN and transmits the data service to the ONU via the splitter. The ONU translates the CVLAN then transmits to the HG. After untagging the CVLAN, the HG transmits data to the PC user.

The AN5506-04-B and the AN5506-10-B1 are used as ONUs in this example. The AN5116-06B uses the HU1A and GC8B card as the interface card at the network side and user side. The HSWA card is compulsory.

6.4.3 Configuring Data Services Respectively (for the ONU in Type 1)

See Table 1-1 for the ONU in type 1.

6.4.3.1 Planning Data

Table 6-25 The planned data of data service configuration for the AN5506-04-B at the OLT side in the VLAN N:1 translation mode (configured respectively)

Item		Description	Example
ONU information	Slot No.	The number of the actually used slot.	15
	PON No.	The number of the actually used PON port	1
	ONU Authorization No.	Configures according to the network planning of the operator.	1
	ONU type	The type of an ONU	AN5506-04-B
Data of the service VLAN in the central office end	Service name	Configures according to the network planning of the operator.	data4
	VLAN ID begin	The begin VLAN ID number of the uplink port service.	3000
	VLAN ID end	The end VLAN ID number of the uplink port service. The begin VLAN ID should not be larger than the end VLAN ID.	3001
	Uplink No./TRUNK No.	Configures according to the number of the actually used uplink port.	19:SFP2
	TAG/UNTAG	The Tag processing mode of the uplink service VLAN can be set as **Tag** or **Untag**. ◆ Under **UNTAG** mode, the TAGs of the uplink packets will be stripped automatically and the packets will be uplinked in the form of UNTAG when they pass the port, whereas the downlink UNTAG packets will be added with designated TAGs. ◆ Under **TAG** mode, the uplink/ downlink data packets will not be processed when they pass the port.	Tag
	Service Type	Selects data in correspondence to the data service.	data
Creates OLT QinQ domain	Domain name	The OLT QinQ domain name, and configures up to 1024 QinQ domains. The QinQ domain name should not be more than 16 bytes and only is numbers, characters and the underline.	aa

Table 6-25 The planned data of data service configuration for the AN5506-04-B at the OLT side in the VLAN N:1 translation mode (configured respectively) (Continued)

Item			Description	Example
Configuring OLT QinQ Domain	Service Type		Single is selected by default.	Share
	VLAN Layer 1	CVLAN ID	The transparently transmitted CVLAN ID.	1000
		CVLAN priority	The transparently transmitted CVLAN priority. The value range is from 0 to 7. 7 is the highest priority while 0 is the lowest.	0
		Action	If the value of the **subscriber VLAN Layer 1** is configured, the Action can be set as **Transparent** or **Translation**; If the value of the **subscriber VLAN Layer 1** is not given, the Action can be set as **Transparent** or **Add**.	Transparent transmission
		Label protocol identifier	The default value is 33024.	Default
	VLAN Layer 2	OLT SVLAN priority	SVLAN priority The value range is from 0 to 7. 7 is the highest priority while 0 is the lowest.	0
		Action	Selects **Add**.	Add
		Label protocol identifier	The default value is 33024.	Default
		New VID	SVLAN ID	3000
Configures the OLT QinQ domain's service uplink rules.	Bind type		Configures according to the network planning of the operator.	VLAN Layer 1
	Operation symbol		Configures according to the network planning of the operator.	=
	Bind value		Configures according to the network planning of the operator.	1000
Configures the OLT QinQ domain's service downlink rules.	Bind type		Configures according to the network planning of the operator.	VLAN Layer 1
	Operation symbol		Configures according to the network planning of the operator.	=
	Bind value		Configures according to the network planning of the operator.	1000
Binding PON Port to QinQ Domain	Action		Configures according to the network planning of the operator.	Bind
	Domain name		Selects the domain name configured in the OLT QinQ domain.	aa

Table 6-26 The planned data of data service configuration for the AN5506-04-B at the ONU side in the VLAN N:1 translation mode (configured respectively)

Item		Description	Example			
Bandwidth allocation	Service Type	Selects broadband services to access the Internet.	Broadband services access the Internet.			
	Fixed Bandwidth (kbyte/s)	The fixed bandwidth of the ONU's uplink service. Even if the service does not use the bandwidth resource, other services cannot occupy the resource. The default value is 16 kbyte/s.	16			
	Assured Bandwidth (kbyte/s)	The minimum bandwidth for provisioning an ONU’s uplink service. If the bandwidth resource is not used by this service, then the resource may be released for other services to use. The default value is 0 kbyte/s.	0			
	Maximum Bandwidth (kbyte/s)	The maximum bandwidth of an ONU’s uplink service. The sum of the fixed bandwidth value and the assured bandwidth value should not be larger than the maximum bandwidth value. The default value is 64 kbyte/s.	1280			
Configuring basic information of the ONU port	ONU port	The actually used ONU port.	1	2		
	Enable/disable port	Configures according to the network planning of the operator. Enable is selected by default.	Default			
	Port auto-negotiation	Configures according to the network planning of the operator. Enable is selected by default.	Default			
	Port rate	Unconfigurable when the port auto negotiation is enabled. The default speed is 100Mbit/s.	Default			
	Duplex	Unconfigurable when the port auto negotiation is enabled. The default speed is full-duplex.	Default			
	Flow control enable/disable	Configures according to the network planning of the operator. Disable is selected by default.	Default			
Configuring service parameters for the ONU port	Service No.	The number of configured service One ONU port can be configured up to six services.	1	2	1	2

Table 6-26 The planned data of data service configuration for the AN5506-04-B at the ONU side in the VLAN N:1 translation mode (configured respectively) (Continued)

Item		Description	Example			
	TAG Mode	Configured as Tag or Untag according to the network planning of the operator. In the **Tag** mode the uplink data packets are tagged, whereas in the **Untag** mode the uplink data packets are untagged.	Tag			
	Service Type	Selects **Unicast**.	Unicast			
	Ethernet priority	When the **CVLAN mode** is **translation**, this item is the service priority before the translation. The priority range is from 0 to 7. Unconfigurable when the **TAG Mode** is the Untag.	0			
	VLAN ID	When the **CVLAN mode** is **translation**, this item is the VLAN ID before the translation. Unconfigurable When the TAG Mode is Untag. The value range is from 1 to 4085.	50	60	50	60
	CVLAN Mode	When the **TAG Mode** is Untag, Tag or transparent transmission can be selected. When the **TAG Mode** is Tag, translation or transparent transmission can be selected.	Translation			
	CVLAN ID	The VLAN ID after translation and the value range is from 1 to 4085.	1000			
	PON priority or COS	The VLAN priority after translation; the value range is from 0 to 7. 7 is the highest priority while 0 is the lowest priority.	0			
	Downlink encryption enable switch	The default setting is disable.	Disable			
	QinQ enable status	Enables / disables the QinQ configuration.	Disable			
	SVLAN ID	Unconfigurable when the QinQ enable status is disable. The value range is from 1 to 4085.	-			
	Service name	Selects the service name configured in the central office VLAN. Unconfigurable when the **QinQ enable status** is disable.	-			
	PON priority or COS	SVLAN priority; the value range is from 0 to 7. 7 is the highest priority while 0 is the lowest priority. Unconfigurable when the QinQ enable status is disable.	-			

6.4.3.2 Configuration Flow Chart

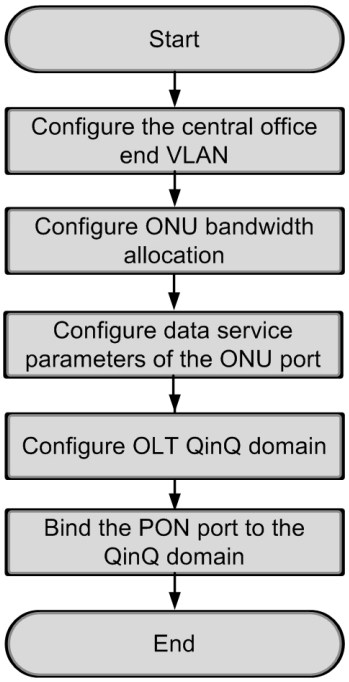


Figure 6-93 The flow of configuring the data service under the VLAN N:1 translation mode respectively (for the AN5506-04-B)

6.4.3.3 Configuring the Central Office End Service VLAN

1. Right-click the HSWA[9] card in the **Object Tree** pane and select **VLAN Config →Local VLAN→Local End Service VLAN** to access the **Local End Service VLAN** window.
2. click  in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. Click **OK** to create a central office end VLAN.
3. Configure according to the planned data in Table 6-25.
4. Click  in the toolbar and the configuration is completed, as shown in Figure 6-94.

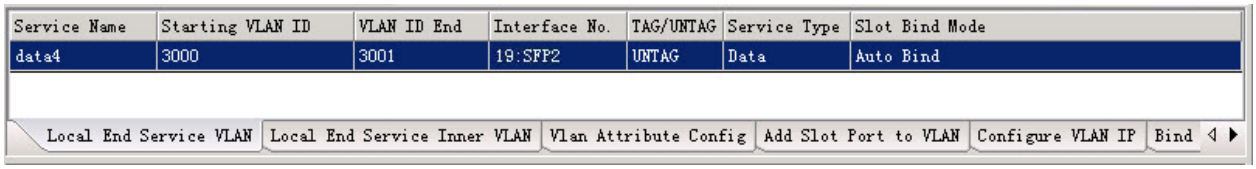


Figure 6-94 The service VLAN local end data configuration-configuring the AN5506-04-B under the VLAN N:1 translation mode respectively

6.4.3.4 Configuring Bandwidth Allocation

1. Click the GC8B[15] card in the **Object Tree** pane and information of all ONUs listed under the GC8B card will be shown in the right pane. Right-click the **AN5506-10-B1[1]** ONU and select **Config→Bandwidth Config** from the shortcut menu to access the **Bandwidth Allocation Configuration** window.
2. Click the pane on right side and click  in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. Click **OK**.
3. Configure according to the planned data in Table 6-26.
4. Click  in the toolbar and click **OK** in the alert box that appears. The configuration is completed, as shown in Figure 6-95.

Figure 6-95 The GPON service bandwidth configuration-configuring the AN5506-04-B under the VLAN N:1 translation mode respectively

6.4.3.5 Configuring Data Service Parameters for the ONU Port

1. Click the GC8B[15] card in the **Object Tree** pane and information of all ONUs listed under the GC8B card will be shown in the right pane. Right-click the **AN5506-10-B1[1]** ONU and select **Config→Service Config** from the shortcut menu to access the **Data Port Config** window.

2. Select **LAN1** in the **Data Port List**. Click **Add** to create two data services.

3. Configure according to the planned data in Table 6-26.

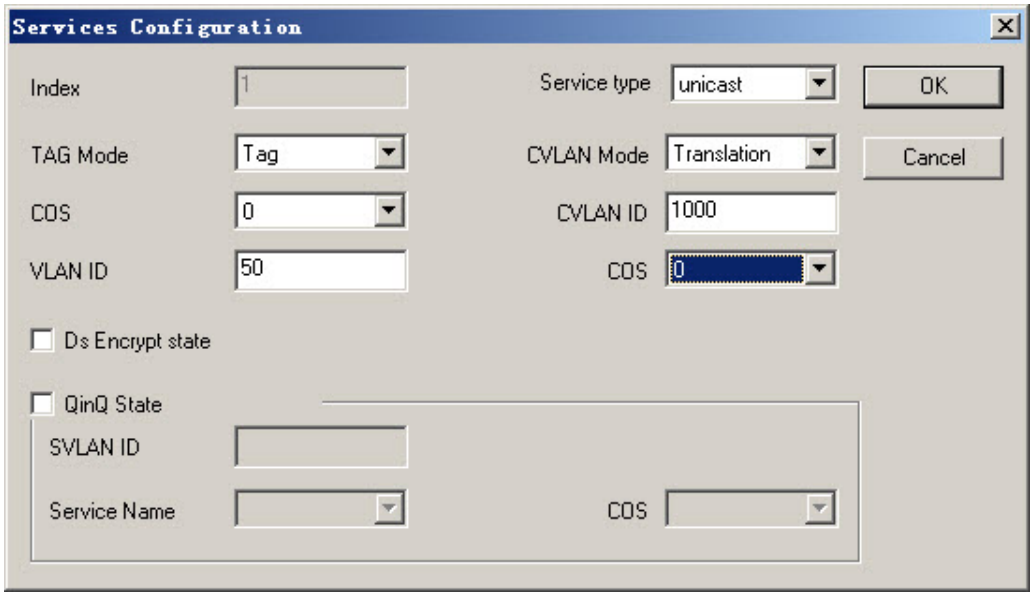


Figure 6-96 The service configuration (VLAN ID is 50)-configuring the AN5506-04-B under the VLAN N:1 translation mode respectively

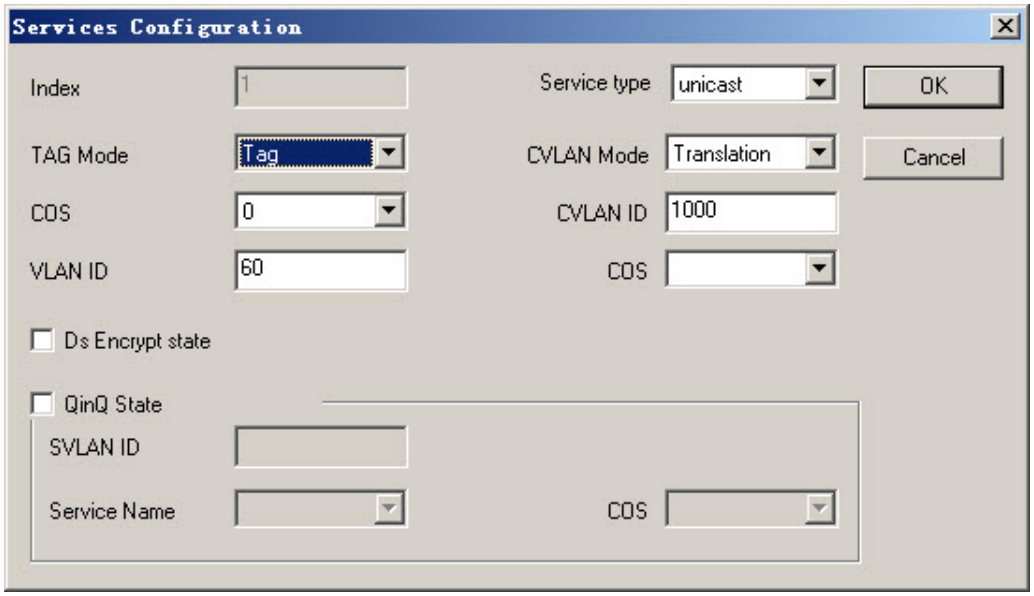


Figure 6-97 The service configuration (VLAN ID is 60)-configuring the AN5506-04-B under the VLAN N:1 translation mode respectively

4. Click **OK** to return to the **Data Port Config** tab. Right-click the **LAN1** in the **Data Port List** to select **Copy Port Config**. Right-click the **LAN2** and select **Paste Port Config**.

5. After the configuration, click the **Modify on Device** to complete the service configuration for the AN5506-04-B, as shown in Figure 6-98.

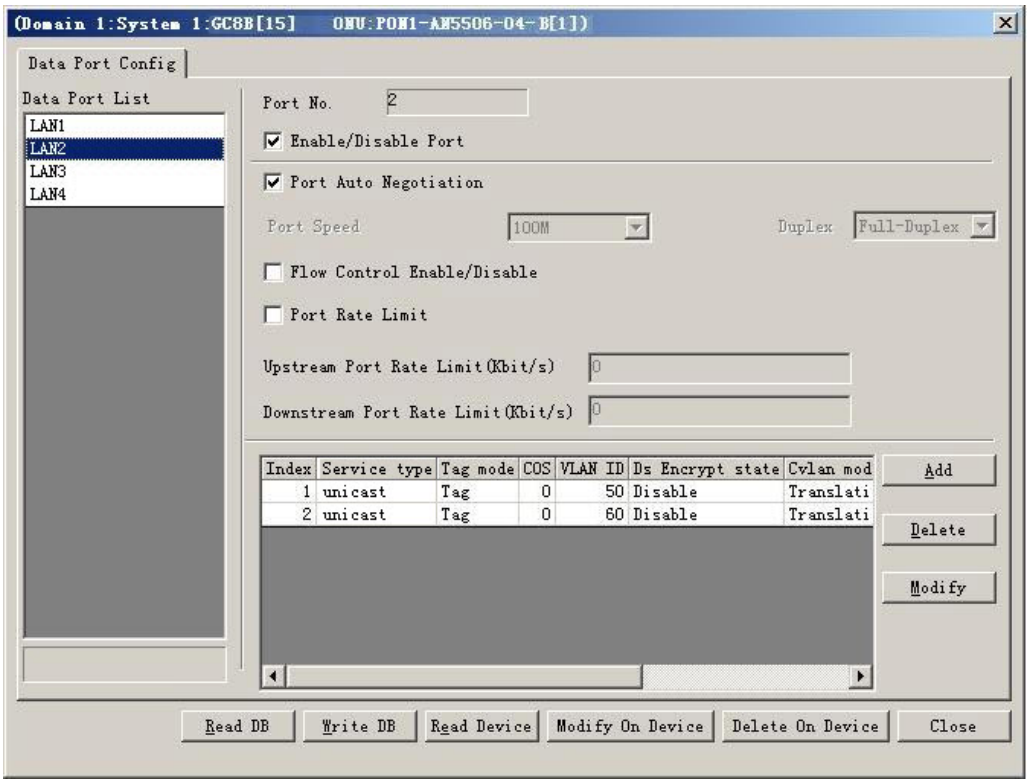


Figure 6-98 The port service configuration is completed-configuring the AN5506-04-B under the VLAN N:1 translation mode respectively

6.4.3.6 Configuring OLT QinQ Domain

1. Right-click the HSWA[9] card in the **Object Tree** pane and select **VLAN Config →OLT QinQ Domain** from the shortcut menu to access the **OLT QinQ Domain** window.
2. click  in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. Click **OK** to create an OLT QinQ domain.
3. Configure according to the planned data in Table 6-25.
4. Click  in the toolbar and the configuration is completed, as shown in Figure 6-99.

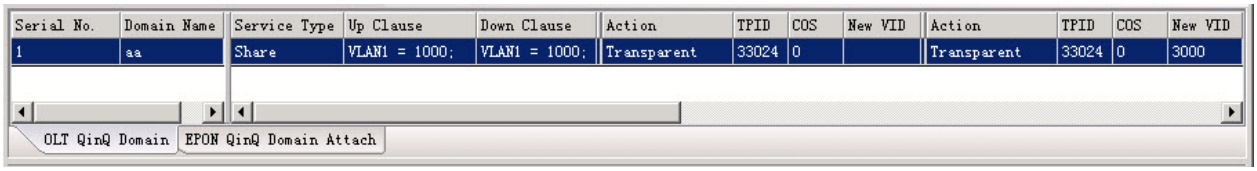


Figure 6-99 Configuring the OLT QinQ domain-configuring the AN5506-04-B under the VLAN N:1 translation mode in a batch manner

6.4.3.7 Binding PON Port to QinQ Domain

1. Right-click the GC8B[15] card on the **Object Tree** pane and select **Config→ PON Attach/Detach Domain** from the shortcut menu to access the **PON Attach/Detach Domain** window.
2. Click the PON port to be bound with the QinQ domain and click the pane on right side. Click in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. Click **OK** to add a domain name.
3. Configure according to the planned data in Table 6-25.
4. Click in the toolbar and the configuration is completed, as shown in Figure 6-100.

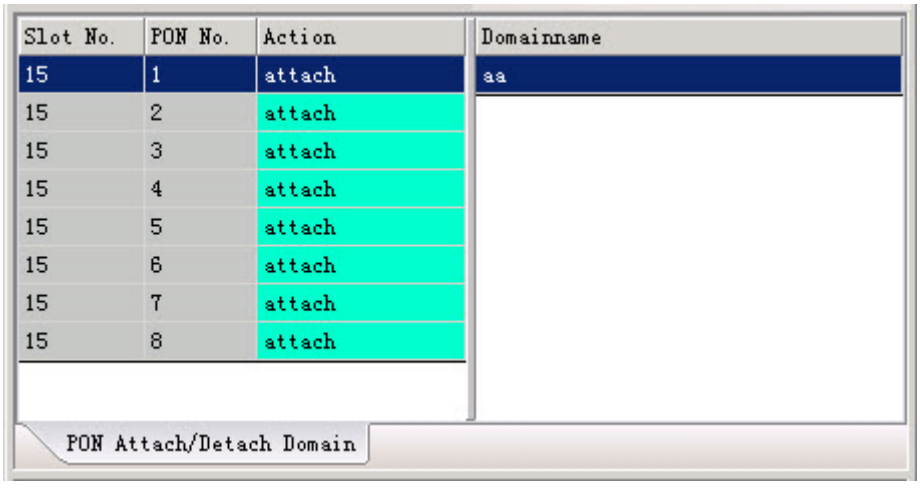


Figure 6-100 Binding the PON port to the QinQ domain-configuring the AN5506-04-B under the VLAN N:1 translation mode in a batch manner

6.4.3.8 Configuration Result

The PC1 to PC8 can access the Internet normally.

6.4.4 Configuring Data Services in a Batch Manner (for the ONU in type 1)

See Table 1-1 for the ONU in type 1.

6.4.4.1 Planning Data

Table 6-27 The planned data of data service configuration at the OLT side in the VLAN N:1 translation mode (in a batch manner)

Item		Description	Example
ONU information	Slot No.	The number of the actually used slot.	15
	PON No.	The number of the actually used PON port	1
	ONU Authorization No.	Configures according to the network planning of the operator.	1
	ONU type	The type of an ONU	AN5506-04-B
Data of the service VLAN in the central office end	Service name	Configures according to the network planning of the operator.	data4
	VLAN ID begin	The begin VLAN ID number of the uplink port service.	3000
	VLAN ID end	The end VLAN ID number of the uplink port service. The begin VLAN ID should not be larger than the end VLAN ID.	3001
	Uplink No./TRUNK No.	Configures according to the number of the actually used uplink port.	19:SFP2

Table 6-27 The planned data of data service configuration at the OLT side in the VLAN N:1 translation mode (in a batch manner) (Continued)

Item			Description	Example
	TAG/UNTAG		The Tag processing mode of the uplink service VLAN can be set as **Tag** or **Untag**. ◆ Under **UNTAG** mode, the TAGs of the uplink packets will be stripped automatically and the packets will be uplinked in the form of UNTAG when they pass the port, whereas the downlink UNTAG packets will be added with designated TAGs. ◆ Under **TAG** mode, the uplink/ downlink data packets will not be processed when they pass the port.	Tag
	Service Type		Selects data in correspondence to the data service.	data
Creates OLT QinQ domain	Domain name		The OLT QinQ domain name, and configures up to 1024 QinQ domains. The QinQ domain name should not be more than 16 bytes and only is numbers, characters and the underline.	aa
Configuring OLT QinQ Domain	Service Type		Single is selected by default.	Share
	VLAN Layer 1	CVLAN ID	The transparently transmitted CVLAN ID.	1000
		CVLAN priority	The transparently transmitted CVLAN priority. The value range is from 0 to 7. 7 is the highest priority while 0 is the lowest.	0
		Action	If the value of the **subscriber VLAN Layer 1** is configured, the Action can be set as **Transparent** or **Translation**; If the value of the **subscriber VLAN Layer 1** is not given, the Action can be set as **Transparent** or **Add**.	Transparent transmission
		Label protocol identifier	The default value is 33024.	Default
	VLAN Layer 2	OLT SVLAN priority	SVLAN priority The value range is from 0 to 7. 7 is the highest priority while 0 is the lowest.	0
		Action	Selects **Add**.	Add

Table 6-27 The planned data of data service configuration at the OLT side in the VLAN N:1 translation mode (in a batch manner) (Continued)

Item			Description	Example
		Label protocol identifier	The default value is 33024.	Default
		New VID	SVLAN ID	3000
Configures the OLT QinQ domain's service uplink rules.	Bind type		Configures according to the network planning of the operator.	VLAN Layer 1
	Operation symbol		Configures according to the network planning of the operator.	=
	Bind value		Configures according to the network planning of the operator.	1000
Configures the OLT QinQ domain's service downlink rules.	Bind type		Configures according to the network planning of the operator.	VLAN Layer 1
	Operation symbol		Configures according to the network planning of the operator.	=
	Bind value		Configures according to the network planning of the operator.	1000
Binding PON Port to QinQ Domain	Action		Configures according to the network planning of the operator.	Bind
	Domain name		Selects the domain name configured in the OLT QinQ domain.	aa

Table 6-28 The planned data of data service configuration for the AN5506-04-B at the ONU side in the VLAN N:1 translation mode (in a batch manner)

Item		Description	Example
Bandwidth allocation profile	Profile name	The bandwidth allocation profile name	a
	Service Type	Selects broadband services to access the Internet.	Broadband services access the Internet.
	Fixed Bandwidth (kbyte/s)	The fixed bandwidth of the ONU's uplink service. Even if the service does not use the bandwidth resource, other services cannot occupy the resource. The default value is 16 kbyte/s.	16
	Assured Bandwidth (kbyte/s)	The minimum bandwidth for provisioning an ONU’s uplink service. If the bandwidth resource is not used by this service, then the resource may be released for other services to use. The default value is 0 kbyte/s.	0

Table 6-28 The planned data of data service configuration for the AN5506-04-B at the ONU side in the VLAN N:1 translation mode (in a batch manner) (Continued)

Item		Description	Example	
	Maximum Bandwidth (kbyte/s)	The maximum bandwidth of an ONU's uplink service. The sum of the fixed bandwidth value and the assured bandwidth value should not be larger than the maximum bandwidth value. The default value is 64 kbyte/s.	1280	
Data service profile	Profile name	Configures according to the network planning of the operator.	b	
	Enable/disable	Enable is selected by default.	Enable	
	Auto Negotiation	Enable is selected by default.	Enable	
	Rate	The default speed is 10Mbit/s. Unconfigurable when the **auto negotiation** is enabled.	-	
	Duplex mode	The default speed is the duplex mode. Unconfigurable when the **auto negotiation** is enabled.	-	
	Flow control	The default setting is disable.	Disable	
	Port rate control enable/ disable	The default setting is disable.	Disable	
	Port uplink rate control	The default value is 0. Unconfigurable when the port rate control is disable.	-	
	Port downlink rate control	The default value is 0. Unconfigurable when the port rate control is disable.	-	
	TAG Mode	Configured as Tag or Untag according to the network planning of the operator. In the **Tag** mode the uplink data packets are tagged, whereas in the **Untag** mode the uplink data packets are untagged.	Tag	
	Ethernet priority	When the **CVLAN mode** is **translation**, this item is the service priority before the translation. The priority range is from 0 to 7. Unconfigurable when the **TAG Mode** is the Untag.	0	
	VLAN ID	When the **CVLAN mode** is **translation**, this item is the VLAN ID before the translation. Unconfigurable When the **TAG** Mode is Untag. The value range is from 1 to 4085.	50	60

Table 6-28 The planned data of data service configuration for the AN5506-04-B at the ONU side in the VLAN N:1 translation mode (in a batch manner) (Continued)

Item			Description	Example	
	Downlink encryption enable switch		The default setting is disable.	Disable	
	CVLAN Mode		When the **TAG Mode** is Untag, Tag or transparent transmission can be selected. When the **TAG Mode** is Tag, translation or transparent transmission can be selected.	Translation	
	CVLAN ID		The VLAN ID after translation and the value range is from 1 to 4085.	1000	
	Priority at PON ports		The CVLAN priority; the value range is from 0 to 7.	0	
	QINQ enable status		Enable or disable the QinQ configuration and disable by default.	Disable	
	Service VLAN name		Selects the service name configured in the central office VLAN. Unconfigurable when the **QinQ enable status** is disable.	-	
	SVLAN ID		The value range is from 1 to 4085. Unconfigurable when the **QinQ enable status** is disable.	-	
	Priority at PON ports		SVLAN priority; the value range is from 0 to 7. 7 is the highest priority while 0 is the lowest priority. Unconfigurable when the **QinQ enable status** is disable.	-	
Service profile	Profile name		Configures according to the network planning of the operator.	c	
	ONU type		The type of the actually used ONU.	AN5506-04-B	
	Sub-profile configuration in ONU level	Profile type	Selects bandwidth allocation profile.	Bandwidth allocation profile	
		Profile name	The profile name configured in the bandwidth profile of the GPON service.	a	
	Port type		The type of the actually used port.	FE port	
	Port No.		The number of the actually used port.	1	2
	Sub-profile configuration in the port level	Profile type	Selects data service profile.	Data service profile	
		Profile name	The profile name configured in the service data service.	b	

Table 6-28 The planned data of data service configuration for the AN5506-04-B at the ONU side in the VLAN N:1 translation mode (in a batch manner) (Continued)

Item		Description	Example
Service profile bind	Profile ID	The profile name configured in the service profile.	c
	Bind/unbind	Binds service profiles to ONU.	Bind
	Slot No.	The number of the actually used slot.	15
	PON No.	The number of the actually used PON port	1
	ONU number	The authentication number allocated by the operator according to the network planning.	1

6.4.4.2 Configuration Flow Chart

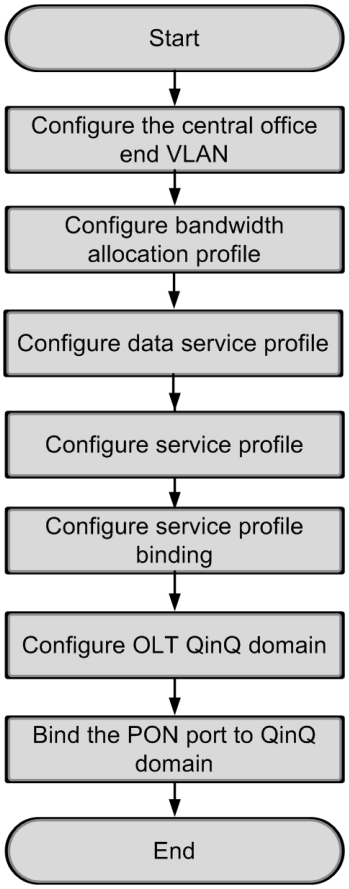


Figure 6-101 The flow of configuring the data service under the VLAN N:1 translation mode in a batch manner (for the AN5506-04-B)

6.4.4.3 Configuring the Central Office End Service VLAN

See Configuring the Central Office End Service VLAN for configuration procedures.

6.4.4.4 Configuring the Bandwidth Allocation Profile

1. Right-click the HSWA[9] card in the **Object Tree** pane and select **Service Config Relevance→GPON Service Bandwidth Config Profile** from the shortcut menu to access the **Bandwidth Config Profile** window.
2. Click the pane on left side and click  in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. After clicking **OK**, you should double-click in a blank area of the **Profile Name** and input **a**.
3. Click the pane on right side and click  in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. Click **OK**.
4. Configure according to the planned data in Table 6-28.
5. Click  in the toolbar and the configuration is completed, as shown in Figure 6-102.

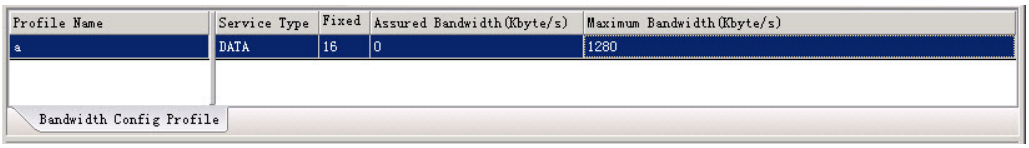


Figure 6-102 The ONU bandwidth allocation profile-configuring the AN5506-04-B under the VLAN N:1 translation mode in a batch manner

6.4.4.5 Configuring Data Service Profile

1. Right-click the HSWA[9] card in the **Object Tree** pane and select **Service Config Relevance→Service Profile Config** to access the **Data Service Profile** window.
2. Click the pane on left side then click  in the toolbar. Input **1** in the **Please Input The Rows for Add:** dialog box and click **OK** to add a data service profile b. Configure basic parameters of the port according to the planned data in Table 6-28.

3. Click the pane on right side then click in the toolbar. Input **2** in the **Please Input The Rows for Add:** dialog box and click **OK**. Configure the VLAN tags of the traffic flow according to the planned data in Table 6-28.
4. Click in the toolbar and the configuration is completed, as shown in Figure 6-103.

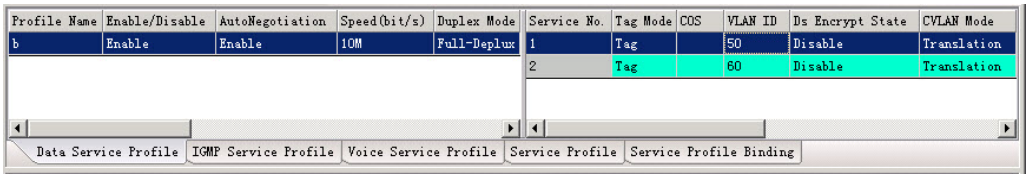


Figure 6-103 The data service profile-configuring the AN5506-04-B under the VLAN N:1 translation mode in a batch manner

6.4.4.6 Creating Service Profile

1. Right-click the HSWA[9] card in the **Object Tree** pane and select **Service Config Relevance→Service Profile Config** from the shortcut menu to access the **Data Service Profile** window and select **Service Profile** tab.
2. Click the pane on left side and click in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. Click **OK** to add a service profile.
3. Double click the bland field of the **Profile Name** and input **c** and select **AN5506-04-B** from the drop-down list of the **ONU Type**. Double-click the blank area of the **ONU Subprofile Config** to access the **ONU Subprofile Config** dialog box.
4. In the **ONU Subprofile Config** dialog box, click **Add** to add a new profile configuration. Click the **Profile type** drop-down list to select **Bandwidth Config Profile**. Click the **Profile Name** drop-down list to select **a**.

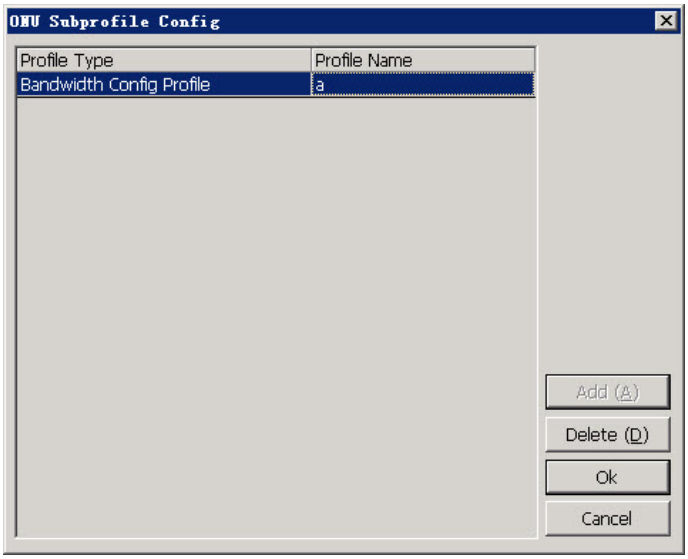


Figure 6-104 The ONU subprofile configuration-configuring the AN5506-04-B under the VLAN N:1 translation mode in a batch manner

5. Click **OK** to return to **Service Profile** window.
6. Click the pane on right side and click in the toolbar to input **2** in the **Please Input The Rows For Add:** dialog box. Click **OK**.
7. Click the **Port Type** drop-down list to select **LAN port**. Double-click the blank area of the **Port No.** and input **1** and **2**. Double-click the blank area of the **ONU Port Profile Config** to access the **ONU Port Profile Config**.
8. In the **ONU Port Profile Config** dialog box, click **Add** to add a new profile configuration. Click the **Profile type** drop-down list to select **Bandwidth Config Profile**. Click the **Profile Name** drop-down list to select **b**.

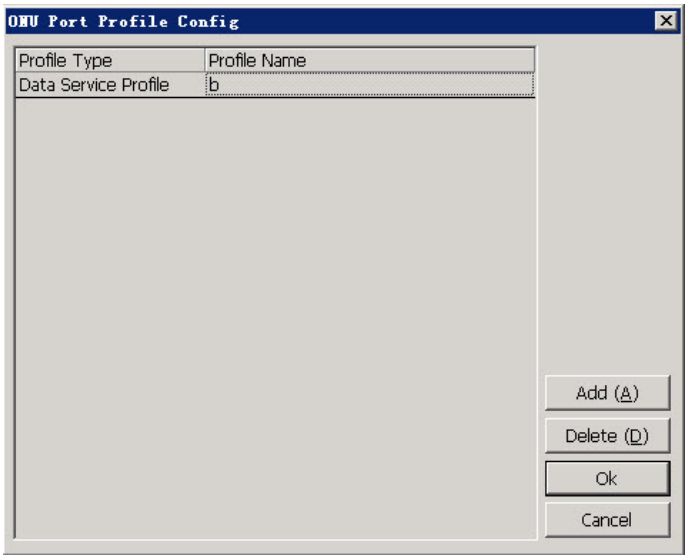


Figure 6-105 The port subprofile configuration-configuring the AN5506-04-B under the VLAN N:1 translation mode in a batch manner

9. Click **OK** to return to **Service Profile** window.
10. Click in the toolbar and the configuration is completed, as shown in Figure 6-106.

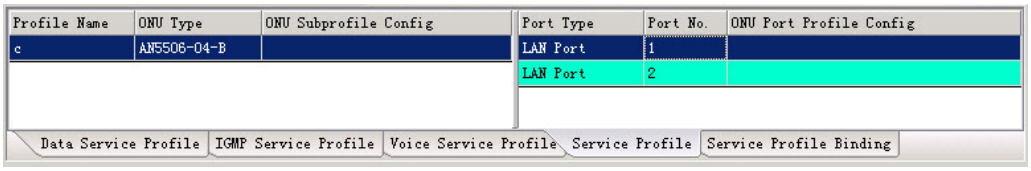


Figure 6-106 The service profile configuration-configuring the AN5506-04-B under the VLAN N:1 translation mode in a batch manner

6.4.4.7 Binding ONU to Service Profile

1. Right-click the HSWA[9] card in the **Object Tree** pane and select **Service Config Relevance→Service Profile Config** from the shortcut menu to access the **Data Service Profile** window and click **Service Profile Binding** tab.
2. Click the pane on left side and click in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. Click **OK**.
3. Select **c** from the drop-down list of **Profile ID** and select **Attach** from the drop-down list of **Action**.

4. Click the pane on right side and click in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. Click **OK**.
5. Double-click the **ONU No.** pane to bring up the **Select Objects** window and select AN5506-04-B for the ONU.

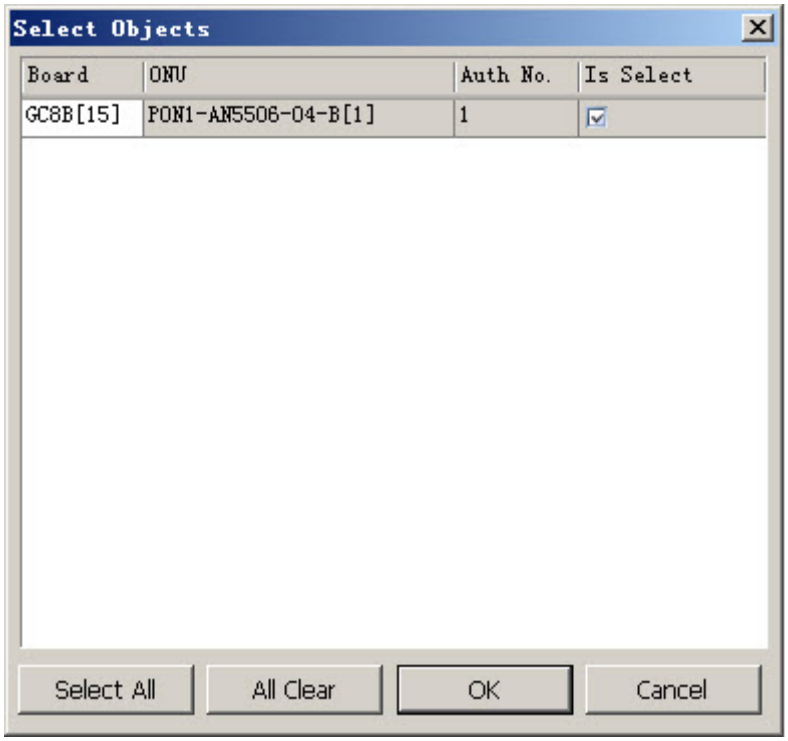


Figure 6-107 The ONU ID detailed configuration-configuring the AN5506-04-B under the VLAN N:1 translation mode in a batch manner

6. Click **OK** to return to **Service Profile Binding** window.
7. Click in the toolbar and click **OK** in the alert box that appears. The configuration is completed, as shown in Figure 6-108.

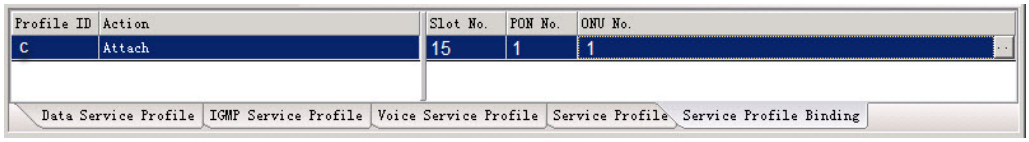


Figure 6-108 Binding the AN5506-04-B to the service profile-configuring the AN5506-04-B under the VLAN N:1 translation mode in a batch manner

6.4.4.8 Configuring OLT QinQ Domain

1. Right-click the HSWA[9] card in the **Object Tree** pane and select **VLAN Config →OLT QinQ Domain** from the shortcut menu to access the **OLT QinQ Domain** window.
2. click in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. Click **OK** to create an OLT QinQ domain.
3. Configure according to the planned data in Table 6-27.
4. Click in the toolbar and the configuration is completed, as shown in Figure 6-109.

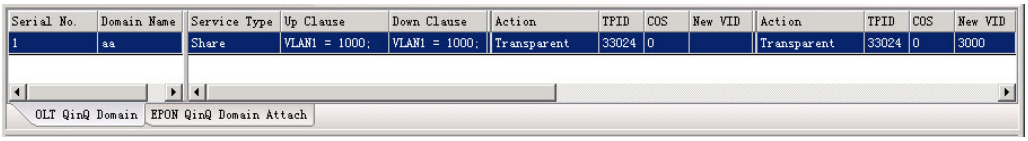


Figure 6-109 Configuring the OLT QinQ domain-configuring the AN5506-04-B under the VLAN N:1 translation mode in a batch manner

6.4.4.9 Binding PON Port to QinQ Domain

1. Right-click the GC8B[15] card on the **Object Tree** pane and select **Config→ PON Attach/Detach Domain** from the shortcut menu to access the **PON Attach/Detach Domain** window.
2. Click the PON port to be bound with the QinQ domain and click the pane on right side. Click in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. Click **OK** to add a domain name.
3. Configure according to the planned data in Table 6-27.
4. Click in the toolbar and the configuration is completed, as shown in Figure 6-110.

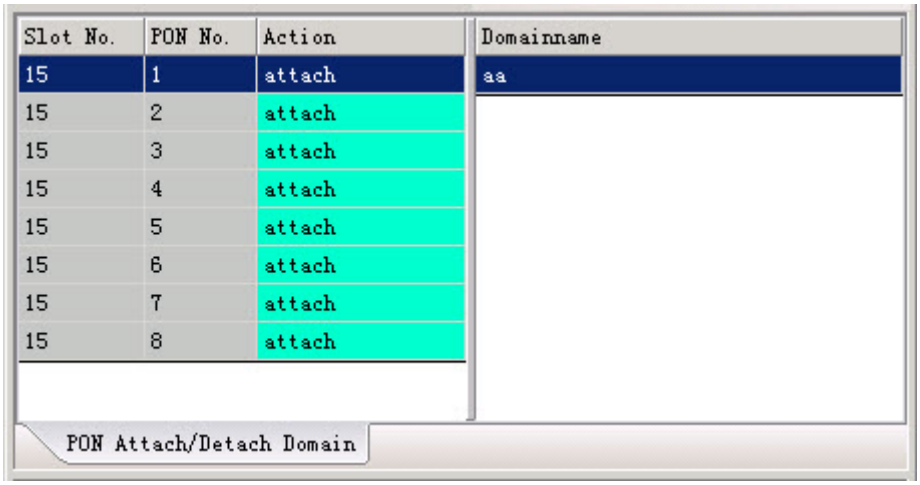


Figure 6-110 Binding the PON port to the QinQ domain-configuring the AN5506-04-B under the VLAN N:1 translation mode in a batch manner

6.4.4.10 Configuration Result

The PC1 to PC8 can access the Internet normally.

6.4.5 Configuring Data Services Respectively (for the ONU in Type 2)

See Table 1-2 for the ONU in type 2.

6.4.5.1 Planning Data

Table 6-29 The planned data of data service configuration for the AN5506-10-B1 at the OLT side in the VLAN N:1 translation mode (configured respectively)

Item		Description	Example
ONU information	Slot No.	The number of the actually used slot.	15
	PON No.	The number of the actually used PON port	1
	ONU Authorization No.	Configures according to the network planning of the operator.	2
	ONU type	The type of an ONU	AN5506-10-B1
Data of the service VLAN in the central office end	Service name	Configures according to the network planning of the operator.	data4
	VLAN ID begin	The begin VLAN ID number of the uplink port service.	3000
	VLAN ID end	The end VLAN ID number of the uplink port service. The begin VLAN ID should not be larger than the end VLAN ID.	3001
	Uplink No./TRUNK No.	Configures according to the number of the actually used uplink port.	19:SFP2
	TAG/UNTAG	The Tag processing mode of the uplink service VLAN can be set as **Tag** or **Untag**. ◆ Under **UNTAG** mode, the TAGs of the uplink packets will be stripped automatically and the packets will be uplinked in the form of UNTAG when they pass the port, whereas the downlink UNTAG packets will be added with designated TAGs. ◆ Under **TAG** mode, the uplink/ downlink data packets will not be processed when they pass the port.	Tag
	Service Type	Selects data in correspondence to the data service.	data
Creates OLT QinQ domain	Domain name	The OLT QinQ domain name, and configures up to 1024 QinQ domains. The QinQ domain name should not be more than 16 bytes and only is numbers, characters and the underline.	aa

Table 6-29 The planned data of data service configuration for the AN5506-10-B1 at the OLT side in the VLAN N:1 translation mode (configured respectively) (Continued)

Item			Description	Example
Configuring OLT QinQ Domain	Service Type		Single is selected by default.	Share
	VLAN Layer 1	CVLAN ID	The transparently transmitted CVLAN ID.	2000
		CVLAN priority	The transparently transmitted CVLAN priority. The value range is from 0 to 7. 7 is the highest priority while 0 is the lowest.	0
		Action	If the value of the **subscriber VLAN Layer 1** is configured, the Action can be set as **Transparent** or **Translation**; If the value of the **subscriber VLAN Layer 1** is not given, the Action can be set as **Transparent** or **Add**.	Transparent transmission
		Label protocol identifier	The default value is 33024.	Default
	VLAN Layer 2	OLT SVLAN priority	SVLAN priority The value range is from 0 to 7. 7 is the highest priority while 0 is the lowest.	0
		Action	Selects **Add**.	Add
		Label protocol identifier	The default value is 33024.	Default
		New VID	SVLAN ID	3001
Configures the OLT QinQ domain's service uplink rules.	Bind type		Configures according to the network planning of the operator.	VLAN Layer 1
	Operation symbol		Configures according to the network planning of the operator.	=
	Bind value		Configures according to the network planning of the operator.	2000
Configures the OLT QinQ domain's service downlink rules.	Bind type		Configures according to the network planning of the operator.	VLAN Layer 1
	Operation symbol		Configures according to the network planning of the operator.	=
	Bind value		Configures according to the network planning of the operator.	2000
Binding PON Port to QinQ Domain	Action		Configures according to the network planning of the operator.	Bind

Table 6-29 The planned data of data service configuration for the AN5506-10-B1 at the OLT side in the VLAN N:1 translation mode (configured respectively) (Continued)

Item		Description	Example
	Domain name	Selects the domain name configured in the OLT QinQ domain.	aa

Table 6-30 The planned data of data service configuration for the AN5506-10-B1 at the ONU side in the VLAN N:1 translation mode (configured respectively)

Item		Description	Example	
Bandwidth allocation	Service Type	Selects integrate services.	Integrate service	
	Fixed Bandwidth (kbyte/s)	The fixed bandwidth of the ONU's uplink service. Even if the service does not use the bandwidth resource, other services cannot occupy the resource. The default value is 16 kbyte/s.	16	
	Assured Bandwidth (kbyte/s)	The minimum bandwidth for provisioning an ONU’s uplink service. If the bandwidth resource is not used by this service, then the resource may be released for other services to use. The default value is 0 kbyte/s.	0	
	Maximum Bandwidth (kbyte/s)	The maximum bandwidth of an ONU’s uplink service. The sum of the fixed bandwidth value and the assured bandwidth value should not be larger than the maximum bandwidth value. The default value is 64 kbyte/s.	1280	
Configuring basic information of the ONU port	ONU port	The actually used ONU port.	1	2
	Enable/disable port	Configures according to the network planning of the operator. Enable is selected by default.	Default	
	Port auto-negotiation	Configures according to the network planning of the operator. Enable is selected by default.	Default	
	Port rate	Unconfigurable when the port auto negotiation is enabled. The default speed is 100Mbit/s.	Default	

Table 6-30 The planned data of data service configuration for the AN5506-10-B1 at the ONU side in the VLAN N:1 translation mode (configured respectively) (Continued)

Item		Description	Example			
	Duplex	Unconfigurable when the port auto negotiation is enabled. The default speed is full-duplex.	Default			
	Flow control enable/disable	Configures according to the network planning of the operator. Disable is selected by default.	Default			
Configuring service parameters for the ONU port	Service No.	The number of configured service One ONU port can be configured up to six services.	1	2	1	2
	TLS	Configures according to the network planning of the operator. Selects TLS or Non TLS.	Non TLS			
	Service Type	Selects **Unicast**.	Unicast			
	VLAN Mode	Configures according to the network planning of the operator. Selects Tag or Transparent.	Transparent transmission			
	Label protocol identifier	The default value is 33024.	33024			
	CVLAN ID	Translates the old VLAN ID.	500	600	500	600
	Priority or COS	The CVLAN priority; the value range is from 0 to 7. 7 is the highest priority while 0 is the lowest priority.	0			
	Translation enable status	Enables/disables the translation configuration.	Enable			
	Translation VID	Translates the new VLAN ID value and the value range is from 1 to 4085.	2000			
	Label protocol identifier	The default value is 33024.	33024			
	Priority or COS	Translates the new VLAN priority level. The value range is from 0 to 7, and 7 is the highest value while 0 is the lowest value.	0			

6.4.5.2 Configuration Flow Chart

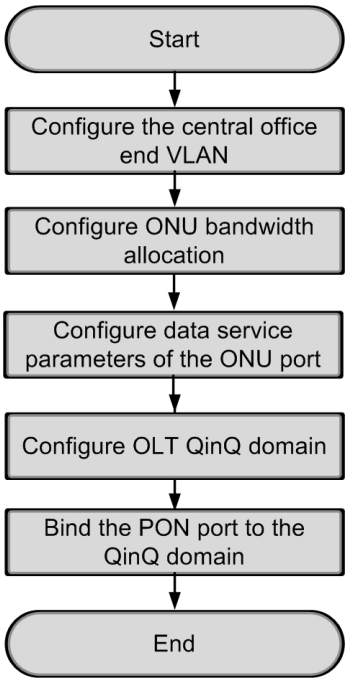


Figure 6-111 The flow of configuring the data service under the VLAN N:1 translation mode respectively (for the AN5506-10-B1)

6.4.5.3 Configuring the Central Office End Service VLAN

See Configuring the Central Office End Service VLAN for configuration procedures.

6.4.5.4 Configuring Bandwidth Allocation

1. Click the GC8B[15] card in the **Object Tree** pane and information of all ONUs listed under the GC8B card will be shown in the right pane. Right-click the **AN5506-10-B1[2]** ONU and select **Config→Bandwidth Config** from the shortcut menu to access the **Bandwidth Allocation Configuration** window.
2. Click the pane on right side and click  in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. Click **OK**.
3. Configure according to the planned data in Table 6-30.
4. Click  in the toolbar and click **OK** in the alert box that appears. The configuration is completed, as shown in Figure 6-112.

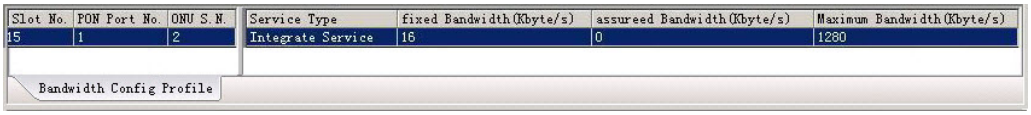


Figure 6-112 The ONU bandwidth allocation configuration-configuring the AN5506-10-B1 under the VLAN N:1 translation mode respectively

6.4.5.5 Configuring Data Service Parameters for the ONU Port

1. Click the GC8B[15] card in the **Object Tree** pane and information of all ONUs listed under the GC8B card will be shown in the right pane. Right-click the **AN5506-10-B1[2]** ONU and select **Config→Service Config** from the shortcut menu to access the **Data Port Config** window.
2. Select **LAN1** from the **Data Port List** and click **Add** to create two data services and configure it according to the planned data in Table 6-30.

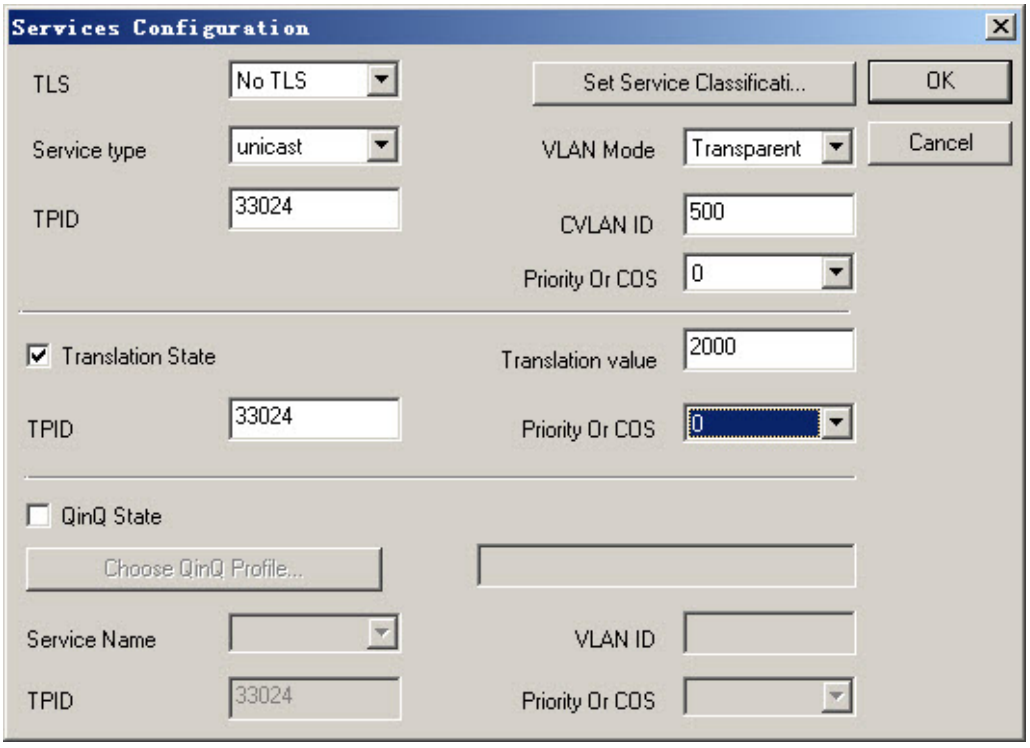


Figure 6-113 The service configuration (CVLAN ID is 500)-configuring the AN5506-10-B1 under the VLAN N:1 translation mode respectively

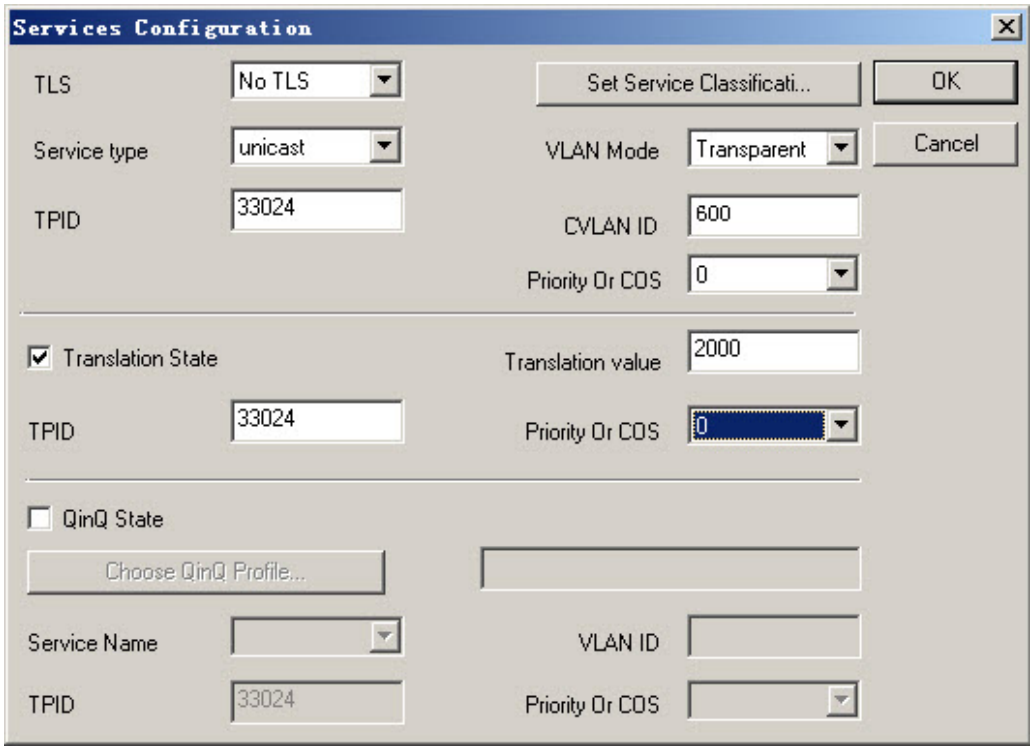


Figure 6-114 The service configuration (CVLAN ID is 600)-configuring the AN5506-10-B1 under the VLAN N:1 translation mode respectively

3. Click **OK** to return to the **Data Port Config** tab. Right-click the **LAN1** in the **Data Port List** to select **Copy Port Config**. Right-click the **LAN2** and select **Paste Port Config**.
4. After the configuration, click the **Modify on Device** to complete the service configuration for the AN5506-10-B1, as shown in Figure 6-115.

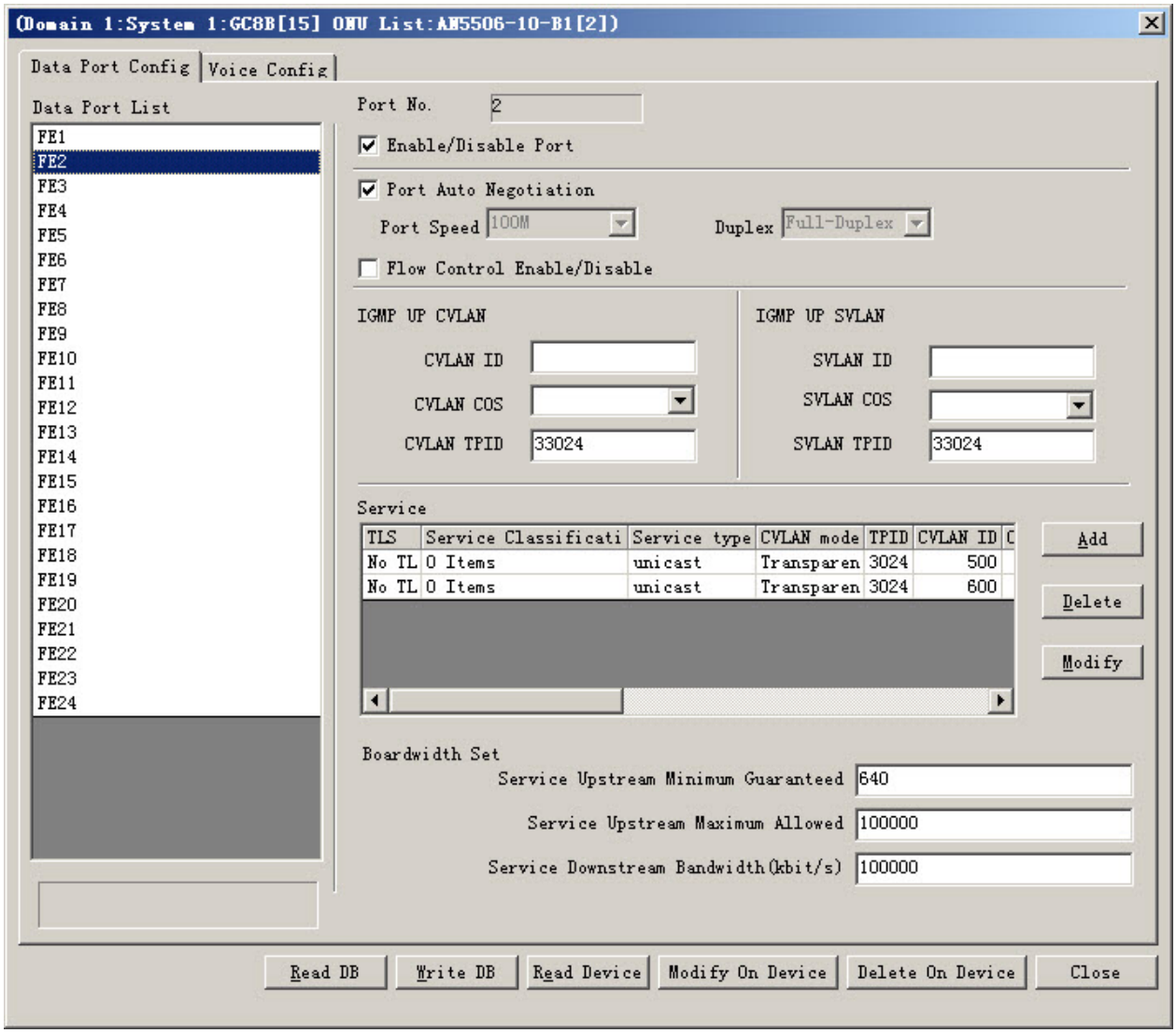


Figure 6-115 The port service configuration is completed-configuring the AN5506-10-B1 under the VLAN N:1 translation mode respectively

6.4.5.6 Configuring OLT QinQ Domain

1. Right-click the HSWA[9] card in the **Object Tree** pane and select **VLAN Config →OLT QinQ Domain** from the shortcut menu to access the **OLT QinQ Domain** window.
2. click  in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. Click **OK** to create an OLT QinQ domain.
3. Configure according to the planned data in Table 6-29.

4. Click in the toolbar and the configuration is completed, as shown in Figure 6-116.

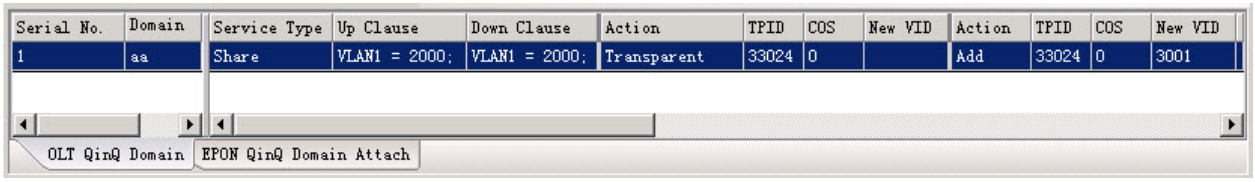


Figure 6-116 Configuring the OLT QinQ domain-configuring the AN5506-10-B1 under the VLAN N:1 translation mode respectively

6.4.5.7 Binding PON Port to QinQ Domain

1. Right-click the GC8B[15] card on the **Object Tree** pane and select **Config→ PON Attach/Detach Domain** from the shortcut menu to access the **PON Attach/Detach Domain** window.
2. Click the PON port to be bound with the QinQ domain and click the pane on right side. Click in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. Click **OK** to add a domain name.
3. Configure according to the planned data in Table 6-29.
4. Click in the toolbar and the configuration is completed, as shown in Figure 6-117.

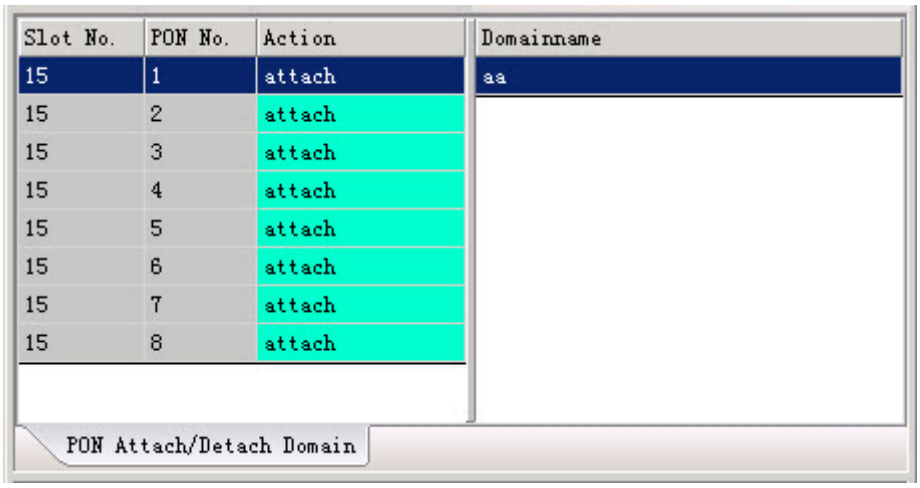


Figure 6-117 Binding the PON port to the QinQ domain-configuring the AN5506-10-B1 under the VLAN N:1 translation mode respectively

6.4.5.8 Configuration Result

The PC1 to PC8 can access the Internet normally.

6.4.6 Configuring Data Services in a Batch Manner (for the ONU in type 2)

See Table 1-2 for the ONU in type 2.

6.4.6.1 Planning Data

Table 6-31 The planned data of data service configuration for the AN5506-10-B1 at the OLT side in the VLAN N:1 translation mode (in a batch manner)

Item		Description	Example
ONU information	Slot No.	The number of the actually used slot.	15
	PON No.	The number of the actually used PON port	1
	ONU Authorization No.	Configures according to the network planning of the operator.	2
	ONU type	The type of an ONU	AN5506-10-B1
Data of the service VLAN in the central office end	Service name	Configures according to the network planning of the operator.	data4
	VLAN ID begin	The begin VLAN ID number of the uplink port service.	3000
	VLAN ID end	The end VLAN ID number of the uplink port service. The begin VLAN ID should not be larger than the end VLAN ID.	3001
	Uplink No./TRUNK No.	Configures according to the number of the actually used uplink port.	19:SFP2

Table 6-31 The planned data of data service configuration for the AN5506-10-B1 at the OLT side in the VLAN N:1 translation mode (in a batch manner) (Continued)

Item			Description	Example
	TAG/UNTAG		The Tag processing mode of the uplink service VLAN can be set as **Tag** or **Untag**. ◆ Under **UNTAG** mode, the TAGs of the uplink packets will be stripped automatically and the packets will be uplinked in the form of UNTAG when they pass the port, whereas the downlink UNTAG packets will be added with designated TAGs. ◆ Under **TAG** mode, the uplink/ downlink data packets will not be processed when they pass the port.	Tag
	Service Type		Selects data in correspondence to the data service.	data
Creates OLT QinQ domain	Domain name		The OLT QinQ domain name, and configures up to 1024 QinQ domains. The QinQ domain name should not be more than 16 bytes and only is numbers, characters and the underline.	aa
Configuring OLT QinQ Domain	Service Type		Single is selected by default.	Share
	VLAN Layer 1	CVLAN ID	The transparently transmitted CVLAN ID.	2000
		CVLAN priority	The transparently transmitted CVLAN priority. The value range is from 0 to 7. 7 is the highest priority while 0 is the lowest.	0
		Action	If the value of the **subscriber VLAN Layer 1** is configured, the Action can be set as **Transparent** or **Translation**; If the value of the **subscriber VLAN Layer 1** is not given, the Action can be set as **Transparent** or **Add**.	Transparent transmission
		Label protocol identifier	The default value is 33024.	Default

Table 6-31 The planned data of data service configuration for the AN5506-10-B1 at the OLT side in the VLAN N:1 translation mode (in a batch manner) (Continued)

Item			Description	Example
	VLAN Layer 2	OLT SVLAN priority	SVLAN priority The value range is from 0 to 7. 7 is the highest priority while 0 is the lowest.	0
		Action	Selects **Add**.	Add
		Label protocol identifier	The default value is 33024.	Default
		New VID	SVLAN ID	3001
Configures the OLT QinQ domain's service uplink rules.	Bind type		Configures according to the network planning of the operator.	VLAN Layer 1
	Operation symbol		Configures according to the network planning of the operator.	=
	Bind value		Configures according to the network planning of the operator.	2000
Configures the OLT QinQ domain's service downlink rules.	Bind type		Configures according to the network planning of the operator.	VLAN Layer 1
	Operation symbol		Configures according to the network planning of the operator.	=
	Bind value		Configures according to the network planning of the operator.	2000
Binding PON Port to QinQ Domain	Action		Configures according to the network planning of the operator.	Bind
	Domain name		Selects the domain name configured in the OLT QinQ domain.	aa

Table 6-32 The planned data of data service configuration for the AN5506-10-B1 at the ONU side in the VLAN N:1 translation mode (in a batch manner)

Item		Description	Example
Bandwidth allocation profile	Profile name	The bandwidth allocation profile name	a
	Service Type	Selects integrate services.	Integrate service
	Fixed Bandwidth (kbyte/s)	The fixed bandwidth of the ONU's uplink service. Even if the service does not use the bandwidth resource, other services cannot occupy the resource. The default value is 16 kbyte/s.	16

Table 6-32 The planned data of data service configuration for the AN5506-10-B1 at the ONU side in the VLAN N:1 translation mode (in a batch manner) (Continued)

Item		Description	Example			
	Assured Bandwidth (kbyte/s)	The minimum bandwidth for provisioning an ONU's uplink service. If the bandwidth resource is not used by this service, then the resource may be released for other services to use. The default value is 0 kbyte/s.	0			
	Maximum Bandwidth (kbyte/s)	The maximum bandwidth of an ONU's uplink service. The sum of the fixed bandwidth value and the assured bandwidth value should not be larger than the maximum bandwidth value. The default value is 64 kbyte/s.	1280			
Binding the bandwidth allocation profile	Slot No.	The number of the actually used slot.	15			
	PON No.	The number of the actually used PON port	1			
	ONU number	The authentication number allocated by the operator according to the network planning.	2			
	GPON bandwidth profile	The name of the configured bandwidth allocation profile	a			
Service type	Profile name	Configures according to the network planning of the operator.	b			
	Service type	Selects Unicast.	Unicast			
	CVLAN Mode	Configures the CVLAN mode of the service. Supports tag and transparent mode.	transparent			
	Translation enable status	Enables/disables the translation configuration.	Enable			
ONU data port configuration	Port No.	The actually used ONU port.	1	2		
	Port enable/disable	Enables the port.	Enable			
	MAC limit	Configures as no MAC limit.	0			
ONU data service configuration	CVLAN label protocol identifier	The default value is 33024 kbyte/s.	33024			
	CVLAN ID	The VLAN ID before translation and the value range is from 1 to 4085.	500	600	500	600

Table 6-32 The planned data of data service configuration for the AN5506-10-B1 at the ONU side in the VLAN N:1 translation mode (in a batch manner) (Continued)

Item		Description	Example
	CVLAN PON priority or COS	CVLAN priority The value range is from 0 to 7. 7 is the highest priority while 0 is the lowest.	0
	Translation VLAN label protocol identifier	The default value is 33024 kbyte/s.	33024
	Translation VID	The VLAN ID after translation and the value range is from 1 to 4085.	2000
	Translation VLAN PON priority or COS	The translation VLAN priority, ranging from 0 to 7, or null.	0
	Service model profile	Selects the configured service model profile.	b

6.4.6.2 Configuration Flow Chart

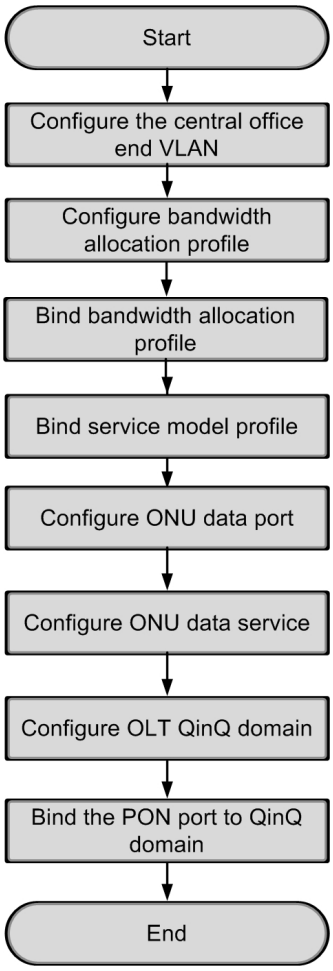


Figure 6-118 The flow of configuring the data service under the VLAN N:1 translation mode in a batch manner (for the AN5506-10-B1)

6.4.6.3 Configuring the Central Office End Service VLAN

See Configuring the Central Office End Service VLAN for configuration procedures.

6.4.6.4 Configuring the Bandwidth Allocation Profile

1. Right-click the HSWA[9] card in the **Object Tree** pane and select **Service Config Relevance→GPON Service Bandwidth Config Profile** from the shortcut menu to access the **Bandwidth Config Profile** window.

2. Click the pane on left side and click in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. After clicking **OK**, you should double-click in a blank area of the **Profile Name** and input **a**.
3. Click the pane on right side and click in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. Click **OK**.
4. Configure according to the planned data in Table 6-32.
5. Click in the toolbar and the configuration is completed, as shown in Figure 6-119.

Figure 6-119 The ONU bandwidth allocation profile-configuring the AN5506-10-B1 under the VLAN N:1 translation mode in a batch manner

6.4.6.5 Binding the Bandwidth Allocation Profile

1. Right-click the designated system in the **Object Tree**, select **Config→Batch Configure→ONU Config** to access the **Config Object** window.
2. Click **Set Object as Condition** in the **Config Object** pane. Select the AN5506-10-B1[2] under the PON port 1 in Slot 15 and click **OK**.

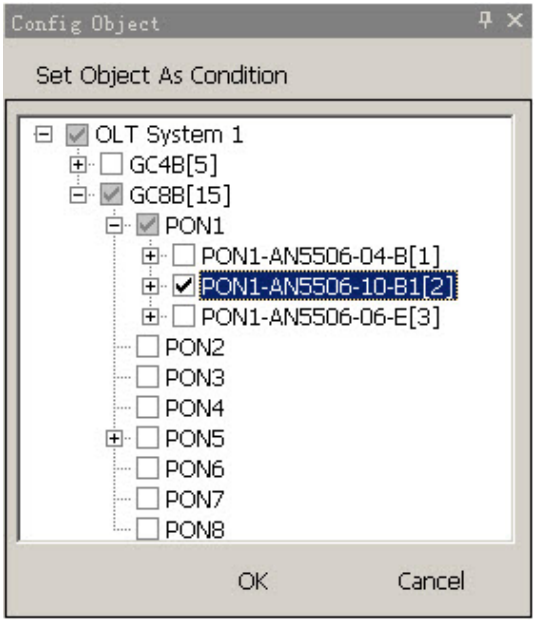


Figure 6-120 Setting the object to bind the bandwidth profile-configuring the AN5506-10-B1 under the VLAN N:1 translation mode in a batch manner

3. The specific configuration information of the object will display in the right pane. Click the drop-down list of the **GPON Bandwidth Profile** to select the configured bandwidth profile **a**.
4. Click in the toolbar and the configuration is completed, as shown in Figure 6-121.

Figure 6-121 Binding the bandwidth allocation profile-configuring the AN5506-10-B1 under the VLAN N:1 translation mode in a batch manner

6.4.6.6 Configuring Service Model Profile

1. Right-click the designated system in the **Object Tree**, select **Config→Profile Definition→Service Model Profile** to access the **Service Model Profile** window.

2. click  in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. Click **OK** to create a service model profile.
3. Configure according to the planned data in Table 6-32.
4. Click  in the toolbar and the configuration is completed, as shown in Figure 6-122.

Figure 6-122 Configuring the service model profile-configuring the AN5506-10-B1 under the VLAN N:1 translation mode in a batch manner

6.4.6.7 Configuring the ONU Data Port Parameters

1. Right-click the designated system in the **Object Tree**, select **Config→Batch Configure→ONU Data Port Configure** to access the **ONU Data Port Configure** window.
2. Click **Set Object as Condition** in the **Config Object** pane. Select LAN1 and LAN2 of the AN5506-10-B1[2] under the PON port 1 in Slot 15 and click **OK**.

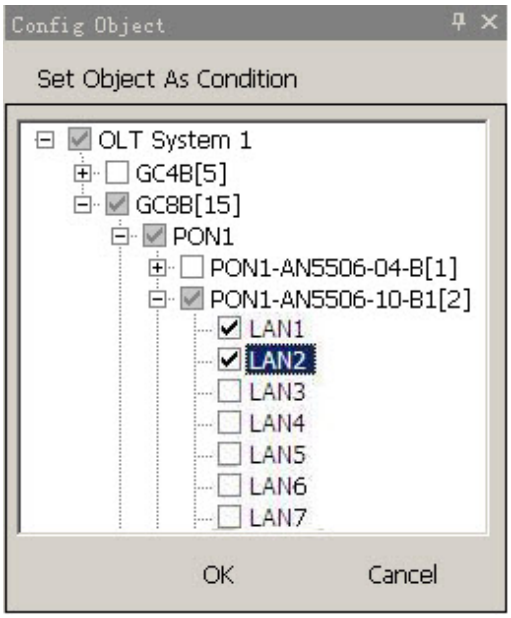


Figure 6-123 Setting the condition object of the data port parameters-configuring the AN5506-10-B1 under the VLAN N:1 translation mode in a batch manner

3. The specific configuration information of the objects will appear in the right pane. Configure according to the planned data in Table 6-32.
4. Click in the toolbar and the configuration is completed, as shown in Figure 6-124.

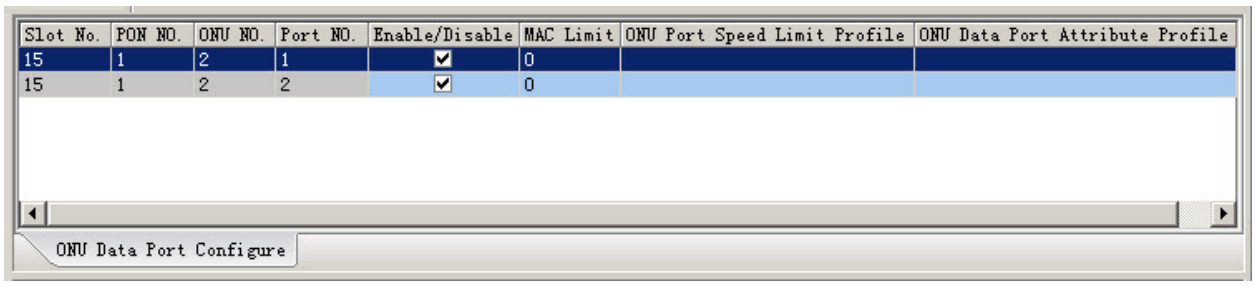


Figure 6-124 Configuring the ONU data port parameters-configuring the AN5506-10-B1 under the VLAN N:1 translation mode in a batch manner

6.4.6.8 Configuring the ONU Data Service Parameters

1. Right-click the designated system in the **Object Tree**, select **Config→Batch Configure→ONU Data Service Configure** to access the **ONU Data Service Configure** window.
2. Click in the toolbar to bring up the **Add Item Number** dialog box. Select LAN1 and LAN2 port of the ONU in the left pane.
3. Click **Batch Modify** to bring up the **Batch Modify** dialog box. Select **Item No.** filed and input **2** in the **Start Value** blank field of the **Parameter Define** pane. Click Modify Selected Item and configure two services for each port.

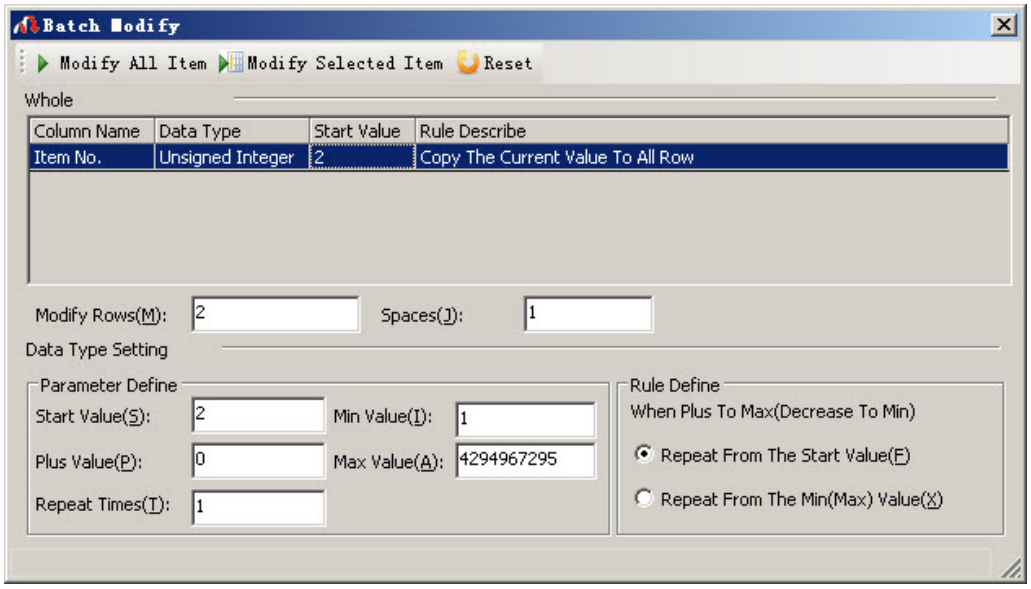


Figure 6-125 Modifying in a batch manner-configuring the AN5506-10-B1 under the VLAN N:1 translation mode in a batch manner

4. Return to the **Add Item Number** dialog box and each port is configured with two services. Click **OK** and return to the **ONU Data Service Config** window.

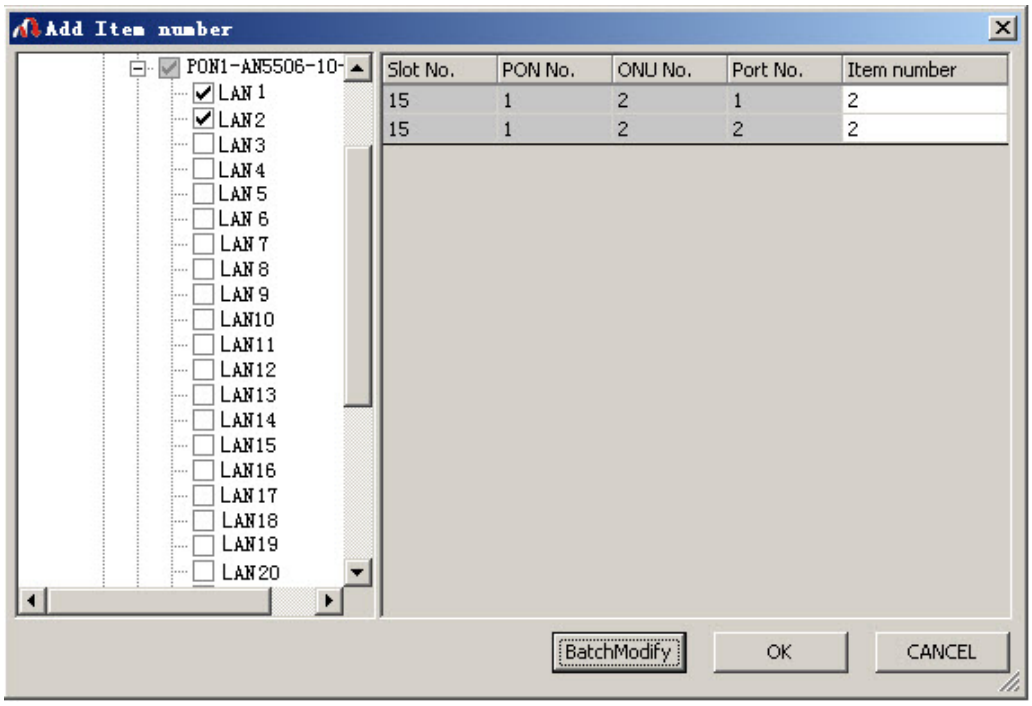


Figure 6-126 Setting the object conditions of the ONU data service parameters-configuring the AN5506-10-B1 under the VLAN N:1 translation mode in a batch manner

5. The specific configuration information of the objects will appear in the right pane. Configure according to the planned data in Table 6-32.
6. Click in the toolbar and click **OK** in the alert box that appears to complete the configuration, as shown in Figure 6-127.

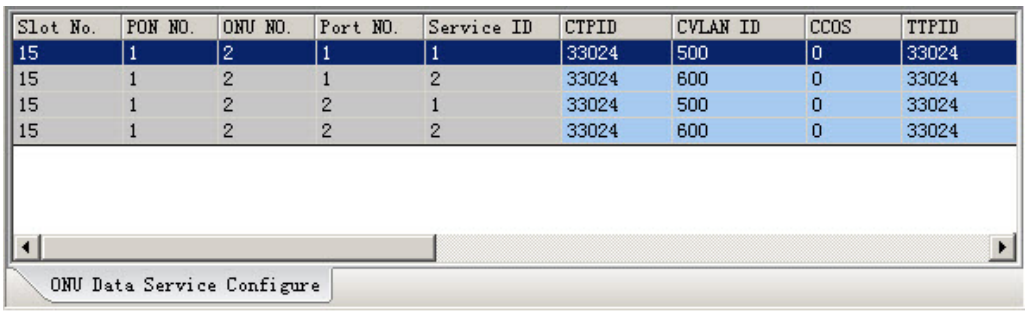


Figure 6-127 Configuring ONU data service parameters-configuring the AN5506-10-B1 under the VLAN N:1 translation mode in a batch manner

6.4.6.9 Configuring OLT QinQ Domain

1. Right-click the HSWA[9] card in the **Object Tree** pane and select **VLAN Config →OLT QinQ Domain** from the shortcut menu to access the **OLT QinQ Domain** window.
2. click in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. Click **OK** to create an OLT QinQ domain.
3. Configure according to the planned data in Table 6-31.
4. Click in the toolbar and the configuration is completed, as shown in Figure 6-128.

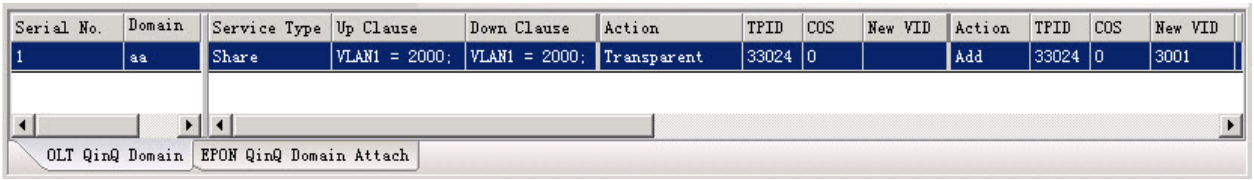


Figure 6-128 Configuring the OLT QinQ domain-configuring the AN5506-10-B1 under the VLAN N:1 translation mode in a batch manner

6.4.6.10 Binding PON Port to QinQ Domain

1. Right-click the GC8B[15] card on the **Object Tree** pane and select **Config→ PON Attach/Detach Domain** from the shortcut menu to access the **PON Attach/Detach Domain** window.
2. Click the PON port to be bound with the QinQ domain and click the pane on right side. Click  in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. Click **OK** to add a domain name.
3. Configure according to the planned data in Table 6-31.
4. Click  in the toolbar and the configuration is completed, as shown in Figure 6-129.

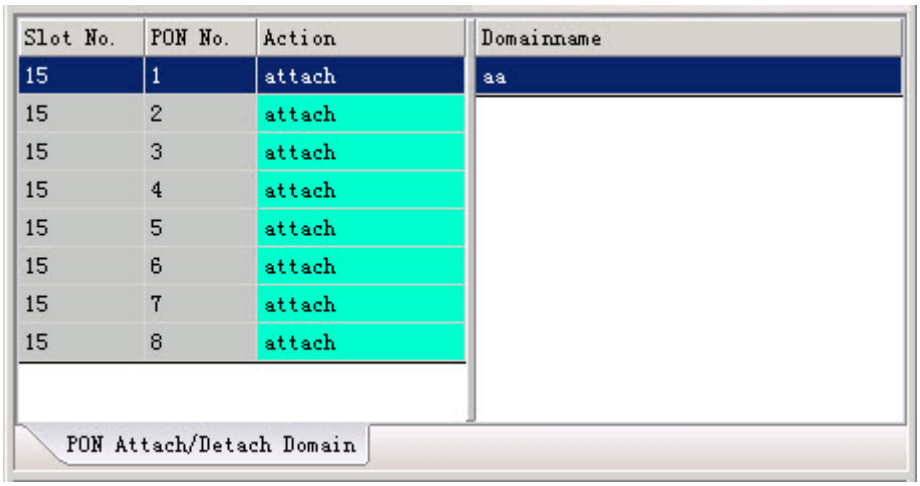


Figure 6-129 Binding the PON port to the QinQ domain-configuring the AN5506-10-B1 under the VLAN N:1 translation mode in a batch manner

6.4.6.11 Configuration Result

The PC1 to PC8 can access the Internet normally.

6.5 Example for Data Service Configuration-in the Flexible QinQ Mode

6.5.1 Configuration Rules

- The AN5116-06B supports the QinQ data service,i.e., the VLAN Stacking.
- Flexible QinQ: The system can process the CVLAN and SVLAN of the service based on the source MAC address, destination MAC address, source IP address, destination IP address, L4 source port number, L4 destination port number, Ethernet type, inner VLAN, outer VLAN, service type, Time to Live, protocol type, Layer 1 CoS, Layer 2 CoS and other conditions.
- Configure the service type in the bandwidth allocation. Select **Data** for the ONU in type 1 and **Integrate** for ONU in type 2.

6.5.2 Networking Diagram

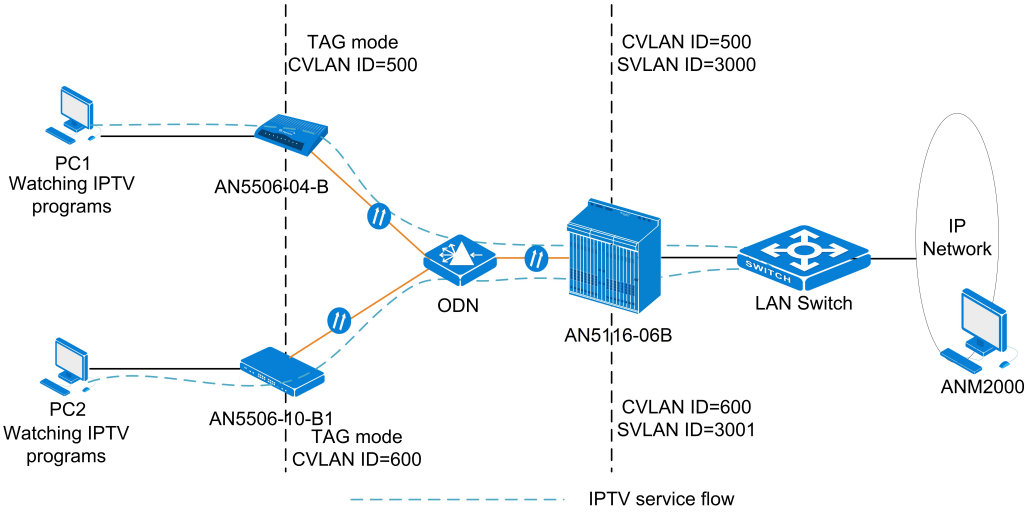


Figure 6-130 Data service network connection under the flexible QinQ mode

- In the uplink direction, each PC is connected to the ONU directly. The data uploaded from the PC is added with a CVLAN ID by the ONU and then transmitted to the OLT by the splitter. The OLT classifies the uploaded data services, adds SVLAN tags to the qualified service flow and transmits the service flow to the upper layer network via the uplink port.

- In the downlink direction, the data service with two VLAN tags pass through the OLT. The OLT classifies the data service flow and untags the SVLAN of the qualified service flow and transmit it to the ONU via the splitter. The ONU untags the CVLAN and transmits data to the subscriber's PC.

The AN5506-04-B and the AN5506-10-B1 are used as ONUs in this example. The AN5116-06B uses the HU1A and GC8B card as the interface card at the network side and user side respectively. The HSWA card is compulsory.

6.5.3 Configuring Data Services in the Flexible QinQ Mode (for the AN5506-04-B)

6.5.3.1 Planning Data

Table 6-33 The planned data of the data service configuration of the AN5506-04-B at the OLT side in the flexible QinQ mode

Item		Description	Example
ONU information	Slot No.	The number of the actually used slot.	15
	PON No.	The number of the actually used PON port	1
	ONU Authorization No.	Configures according to the network planning of the operator.	1
	ONU type	The type of an ONU	AN5506-04-B
Data of the service VLAN in the central office end	Service name	Configures according to the network planning of the operator.	data5
	VLAN ID begin	The begin VLAN ID number of the uplink port service.	3000
	VLAN ID end	The end VLAN ID number of the uplink port service. The begin VLAN ID should not be larger than the end VLAN ID.	3001
	Uplink No./TRUNK No.	Configures according to the number of the actually used uplink port.	19:SFP2

Table 6-33 The planned data of the data service configuration of the AN5506-04-B at the OLT side in the flexible QinQ mode (Continued)

Item		Description	Example
	TAG/UNTAG	The Tag processing mode of the uplink service VLAN can be set as **Tag** or **Untag**. ◆ Under **UNTAG** mode, the TAGs of the uplink packets will be stripped automatically and the packets will be uplinked in the form of UNTAG when they pass the port, whereas the downlink UNTAG packets will be added with designated TAGs. ◆ Under **TAG** mode, the uplink/downlink data packets will not be processed when they pass the port.	Tag
	Service Type	Selects data in correspondence to the data service.	data

Table 6-34 The planned data of data service configuration at the AN5506-04-B ONU side in the flexible QinQ mode

Item		Description	Example
Bandwidth allocation	Service Type	Selects broadband services to access the Internet.	Broadband services access the Internet.
	Fixed Bandwidth (kbyte/s)	The fixed bandwidth of the ONU's uplink service. Even if the service does not use the bandwidth resource, other services cannot occupy the resource. The default value is 16 kbyte/s.	16
	Assured Bandwidth (kbyte/s)	The minimum bandwidth for provisioning an ONU’s uplink service. If the bandwidth resource is not used by this service, then the resource may be released for other services to use. The default value is 0 kbyte/s.	0

Table 6-34 The planned data of data service configuration at the AN5506-04-B ONU side in the flexible QinQ mode (Continued)

Item		Description	Example
	Maximum Bandwidth (kbyte/s)	The maximum bandwidth of an ONU's uplink service. The sum of the fixed bandwidth value and the assured bandwidth value should not be larger than the maximum bandwidth value. The default value is 64 kbyte/s.	1280
Configuring basic information of the ONU port	ONU port	The actually used ONU port.	1
	Enable/disable port	Configures according to the network planning of the operator. Enable is selected by default.	Default
	Port auto-negotiation	Configures according to the network planning of the operator. Enable is selected by default.	Default
	Port rate	Unconfigurable when the port auto negotiation is enabled. The default speed is 100Mbit/s.	Default
	Duplex	Unconfigurable when the port auto negotiation is enabled. The default speed is full-duplex.	Default
	Flow control enable/disable	Configures according to the network planning of the operator. Disable is selected by default.	Default
Configuring service parameters for the ONU port	TAG Mode	Configured as Tag or Untag according to the network planning of the operator. In the **Tag** mode the uplink data packets are tagged, whereas in the **Untag** mode the uplink data packets are untagged.	Untag
	Service Type	Selects **Unicast**.	Unicast
	Ethernet priority	The priority range is from 0 to 7. Unconfigurable when the **TAG Mode** is the Untag.	-

Table 6-34 The planned data of data service configuration at the AN5506-04-B ONU side in the flexible QinQ mode (Continued)

Item		Description	Example
	VLAN ID	Unconfigurable When the TAG Mode is Untag. The value range is from 1 to 4085.	-
	CVLAN Mode	When the **TAG Mode** is Untag, Tag or transparent transmission can be selected. When the **TAG Mode** is Tag, translation or transparent transmission can be selected.	Tag
	CVLAN ID	Configures according to the network planning of the operator. The value range is from 1 to 4085.	500
	PON priority or COS	The CVLAN priority; the value range is from 0 to 7. 7 is the highest priority while 0 is the lowest priority.	0
	Downlink encryption enable switch	The default setting is disable.	Disable
	QinQ enable status	Enables / disables the QinQ configuration.	Disable
	SVLAN ID	Unconfigurable when the QinQ enable status is disable. The value range is from 1 to 4085.	-
	Service name	Selects the service name configured in the central office VLAN. Unconfigurable when the **QinQ enable status** is disable.	-
	PON priority or COS	SVLAN priority; the value range is from 0 to 7. 7 is the highest priority while 0 is the lowest priority. Unconfigurable when the QinQ enable status is disable.	-
OLT QinQ domain	Domain name	The name of flexible QinQ domain	aa
	Service Type	Single is selected by default.	Share

Table 6-34 The planned data of data service configuration at the AN5506-04-B ONU side in the flexible QinQ mode (Continued)

Item			Description	Example
	VLAN Layer 1	CVLAN ID	The transparently transmitted CVLAN ID.	500
		Subscriber VLAN Layer 1	The transparently transmitted CVLAN priority. The value range is from 0 to 7. 7 is the highest priority while 0 is the lowest.	0
		Action	If the value of the **subscriber VLAN Layer 1** is configured, the Action can be set as **Transparent** or **Translation**; If the value of the **subscriber VLAN Layer 1** is not given, the Action can be set as **Transparent** or **Add**.	Transparent transmission
		Label protocol identifier	The default value is 33024.	Default
	Subscriber VLAN Layer 2	Action	Selects **Add**.	Add
		Label protocol identifier	The default value is 33024.	Default
		Priority	SVLAN priority The value range is from 0 to 7. 7 is the highest priority while 0 is the lowest.	0
		New VID	SVLAN ID	3000
Configures the OLT QinQ domain's service uplink rules.	Bind type		Configures according to the network planning of the operator.	Ethernet type
	Operation symbol		Configures according to the network planning of the operator.	=
	Bind value		Configures according to the network planning of the operator.	2048
Configures the OLT QinQ domain's service downlink rules.	Bind type		Configures according to the network planning of the operator.	Source MAC address

Table 6-34 The planned data of data service configuration at the AN5506-04-B ONU side in the flexible QinQ mode (Continued)

Item		Description	Example
	Operation symbol	Configures according to the network planning of the operator.	Match if exist
	Bind value	Configures according to the network planning of the operator.	00-00-00-00-77-77
ONU Bind/unbind domain	Slot No.	The slot number connected with the ONU. Read only.	15
	PON No.	The number of the actually used PON port. Read only.	1
	ONU Authorization No.	Configures according to the network planning of the operator.	1
	Action	Bind the QinQ domain to the ONU.	Bind
	Domain name	Bound QinQ domain	aa

6.5.3.2 Configuration Flow Chart

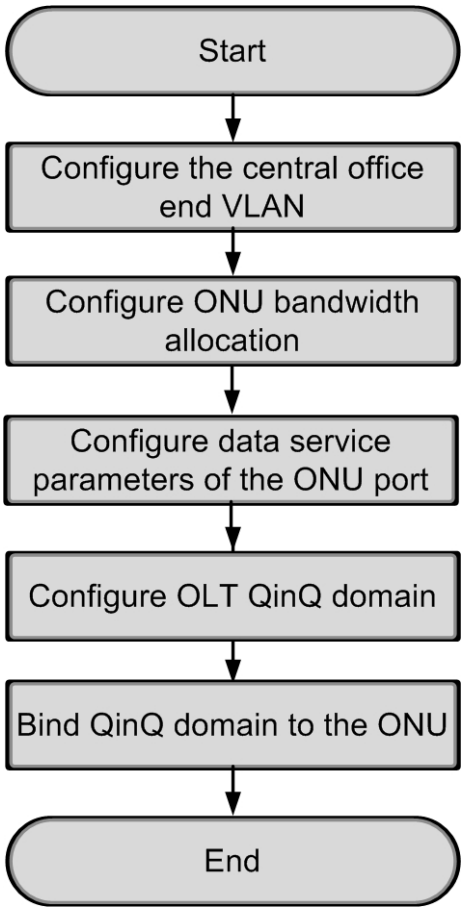


Figure 6-131 The configuration flow of the flexible QinQ data service (for the AN5506-04-B)

6.5.3.3 Configuring the Central Office End Service VLAN

1. Right-click the HSWA[9] card in the **Object Tree** pane and select **VLAN Config →Local VLAN→Local End Service VLAN** to access the **Local End Service VLAN** window.
2. click  in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. Click **OK** to create a central office end VLAN.
3. Configure according to the planned data in Table 6-33.
4. Click  in the toolbar and the configuration is completed, as shown in Figure 6-132.

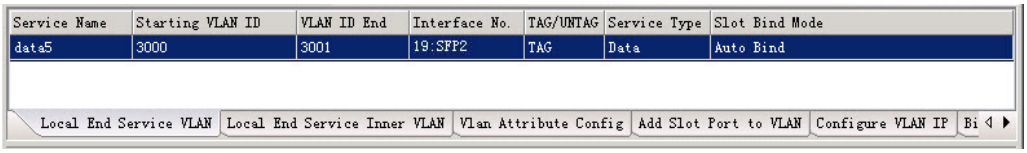


Figure 6-132 The service VLAN local end data configuration-configuring the AN5506-04-B under the flexible QinQ mode

6.5.3.4 Configuring Bandwidth Allocation

1. Click the GC8B[15] card in the **Object Tree** pane and information of all ONUs listed under the GC8B card will be shown in the right pane. Right-click the **AN5506-10-B1[1]** ONU and select **Config→Bandwidth Config** from the shortcut menu to access the **Bandwidth Allocation Configuration** window.
2. Click the pane on right side and click  in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. Click **OK**.
3. Configure according to the planned data in Table 6-34.
4. Click  in the toolbar and click **OK** in the alert box that appears. The configuration is completed, as shown in Figure 6-133.

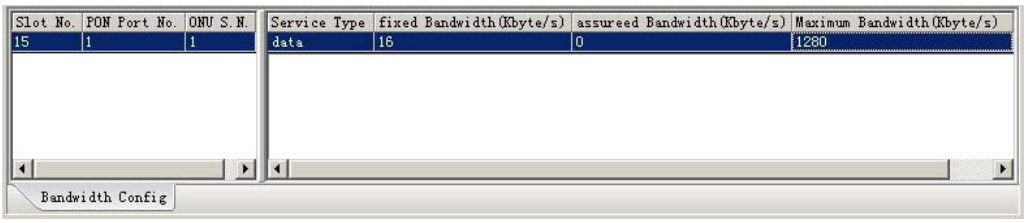


Figure 6-133 The GPON service bandwidth configuration-configuring the AN5506-04-B under the flexible QinQ mode

6.5.3.5 Configuring Data Service Parameters for the ONU Port

1. Click the GC8B[15] card in the **Object Tree** pane and information of all ONUs listed under the GC8B card will be shown in the right pane. Right-click the **AN5506-10-B1[1]** ONU and select **Config→Service Config** from the shortcut menu to access the **Data Port Config** window.
2. Select **LAN1** in the **Data Port List**. Click **Add** to create a data services.

3. Configure according to the planned data in Table 6-34.

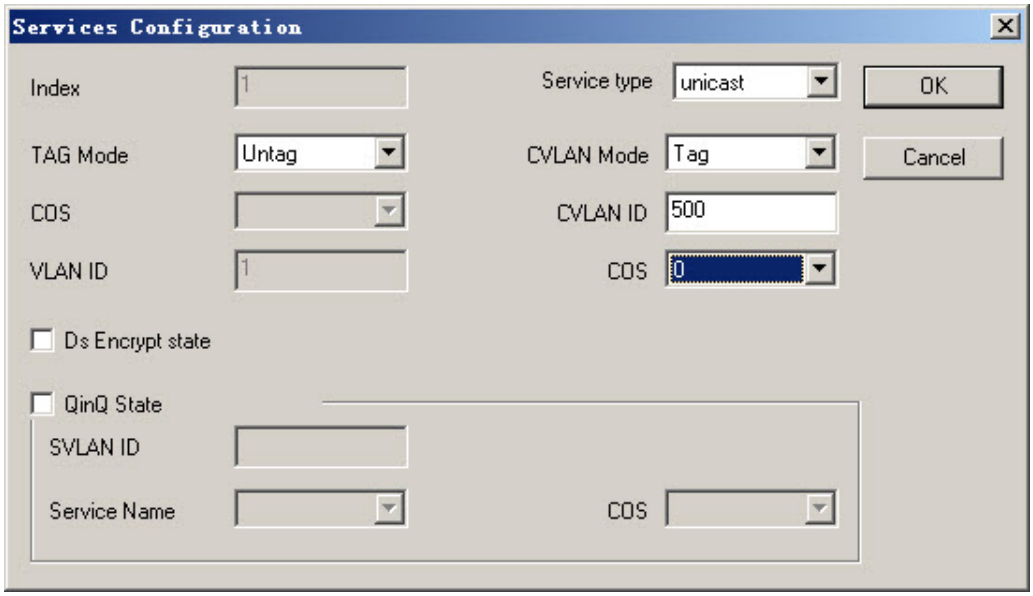


Figure 6-134 Service configuration-configuring the AN5506-04-B under the flexible QinQ mode

4. Click **OK** to return to **Data Port Config** tab.
5. After the configuration, click the **Modify on Device** to complete the service configuration for the AN5506-04-B, as shown in Figure 6-135.

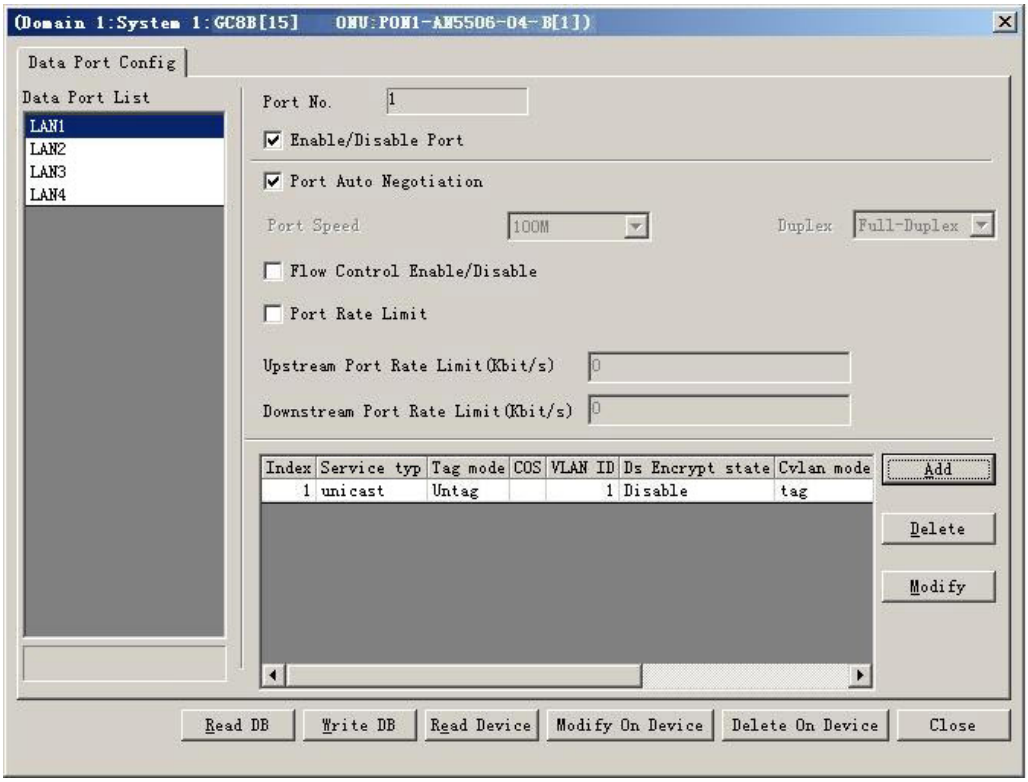


Figure 6-135 The port service configuration is completed-configuring the AN5506-04-B under the flexible QinQ mode

6.5.3.6 Configuring OLT QinQ Domain

1. Right-click the HSWA[9] card in the **Object Tree** pane and select **VLAN Config →OLT QinQ Domain** from the shortcut menu to access the **OLT QinQ Domain** window.
2. click  in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. Click **OK** to create an OLT QinQ domain.
3. Configure according to the planned data in Table 6-34.
4. Click  in the toolbar and the configuration is completed, as shown in Figure 6-136.

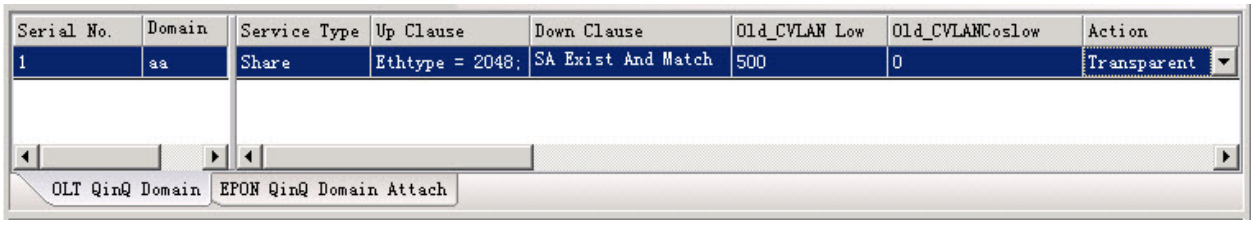


Figure 6-136 QinQ domain-configuring the AN5506-04-B under the flexible QinQ mode

6.5.3.7 Bind the QinQ domain to the ONU.

1. Click the GC8B[15] card in the **Object Tree** pane and information of all ONUs listed under the GC8B card will be shown in the right pane. Right-click the **AN5506-04-B[1]** ONU and select **Config→PON Attach / Detach VLAN Operation Table** from the shortcut menu to access the **PON Attach / Detach VLAN Table** window.
2. Select the PON port 1 and select **Attach** in the drop-down list of **Action** field.
3. Click the pane on right side and click  in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. Click **OK**.
4. Click the drop-down list of **Table Name** and select **aa**.
5. Click  in the toolbar and click **OK** in the alert box that appears. The configuration is completed, as shown in Figure 6-137.

Figure 6-137 Binding the ONU and the domain-configuring the AN5506-04-B under the flexible QinQ mode

6.5.3.8 Configuration Result

The PC1 and PC2 can access the Internet normally.

6.5.4 Configuring Data Services in the Flexible QinQ Mode (for the AN5506-10-B1)

6.5.4.1 Planning Data

Table 6-35 The planned data of the data service configuration of the AN5506-10-B1 at the OLT side in the flexible QinQ mode

Item		Description	Example
ONU information	Slot No.	The number of the actually used slot.	15
	PON No.	The number of the actually used PON port	1
	ONU Authorization No.	Configures according to the network planning of the operator.	2
	ONU type	The type of an ONU	AN5506-10-B1
Data of the service VLAN in the central office end	Service name	Configures according to the network planning of the operator.	data5
	VLAN ID begin	The begin VLAN ID number of the uplink port service.	3000
	VLAN ID end	The end VLAN ID number of the uplink port service. The begin VLAN ID should not be larger than the end VLAN ID.	3001
	Uplink No./TRUNK No.	Configures according to the number of the actually used uplink port.	19:SFP2
	TAG/UNTAG	The Tag processing mode of the uplink service VLAN can be set as **Tag** or **Untag**. ◆ Under **UNTAG** mode, the TAGs of the uplink packets will be stripped automatically and the packets will be uplinked in the form of UNTAG when they pass the port, whereas the downlink UNTAG packets will be added with designated TAGs. ◆ Under **TAG** mode, the uplink/downlink data packets will not be processed when they pass the port.	Tag
	Service Type	Selects data in correspondence to the data service.	data

Table 6-36 The planned data of the data service configuration of the AN5506-10-B1 at the ONU side in the flexible QinQ mode

Item		Description	Example
Bandwidth allocation	Service Type	Selects integrate services.	Integrate service
	Fixed Bandwidth (kbyte/s)	The fixed bandwidth of the ONU's uplink service. Even if the service does not use the bandwidth resource, other services cannot occupy the resource. The default value is 16 kbyte/s.	16
	Assured Bandwidth (kbyte/s)	The minimum bandwidth for provisioning an ONU’s uplink service. If the bandwidth resource is not used by this service, then the resource may be released for other services to use. The default value is 0 kbyte/s.	0
	Maximum Bandwidth (kbyte/s)	The maximum bandwidth of an ONU’s uplink service. The sum of the fixed bandwidth value and the assured bandwidth value should not be larger than the maximum bandwidth value. The default value is 64 kbyte/s.	1280
Configuring basic information of the ONU port	ONU port	The actually used ONU port.	1
	Enable/disable port	Configures according to the network planning of the operator. Enable is selected by default.	Default
	Port auto-negotiation	Configures according to the network planning of the operator. Enable is selected by default.	Default
	Port rate	Unconfigurable when the port auto negotiation is enabled. The default speed is 100Mbit/s.	Default
	Duplex	Unconfigurable when the port auto negotiation is enabled. The default speed is full-duplex.	Default
	Flow control enable/disable	Configures according to the network planning of the operator. Disable is selected by default.	Default
Configuring service parameters for the ONU port	TLS	Configures according to the network planning of the operator. Selects TLS or Non TLS.	Non TLS
	Service Type	Selects **Unicast**.	Unicast

Table 6-36 The planned data of the data service configuration of the AN5506-10-B1 at the ONU side in the flexible QinQ mode (Continued)

Item			Description	Example
	VLAN Mode		Configures according to the network planning of the operator. Selects Tag or Transparent.	Tag
	Label protocol identifier		The default value is 33024.	33024
	CVLAN ID		Configures according to the network planning of the operator. The value range is from 1 to 4085.	600
	Priority or COS		The CVLAN priority; the value range is from 0 to 7. 7 is the highest priority while 0 is the lowest priority.	0
OLT QinQ domain	Domain name		The name of flexible QinQ domain	bb
	Service Type		Single is selected by default.	Share
	VLAN Layer 1	CVLAN ID	The transparently transmitted CVLAN ID.	600
		Subscriber VLAN Layer 1	The transparently transmitted CVLAN priority. The value range is from 0 to 7. 7 is the highest priority while 0 is the lowest.	0
		Action	If the value of the **subscriber VLAN Layer 1** is configured, the Action can be set as **Transparent** or **Translation**; If the value of the **subscriber VLAN Layer 1** is not given, the Action can be set as **Transparent** or **Add**.	Transparent transmission
		Label protocol identifier	The default value is 33024.	Default
	Subscriber VLAN Layer 2	Action	Selects **Add**.	Add
		Label protocol identifier	The default value is 33024.	Default
		Priority	SVLAN priority The value range is from 0 to 7. 7 is the highest priority while 0 is the lowest.	0
		New VID	SVLAN ID	3001
Configures the OLT QinQ domain's service uplink rules	Bind type		Configures according to the network planning of the operator.	Ethernet type
	Operation symbol		Configures according to the network planning of the operator.	=
	Bind value		Configures according to the network planning of the operator.	2048

Table 6-36 The planned data of the data service configuration of the AN5506-10-B1 at the ONU side in the flexible QinQ mode (Continued)

Item		Description	Example
Configures the OLT QinQ domain's service downlink rules	Bind type	Configures according to the network planning of the operator.	Source MAC address
	Operation symbol	Configures according to the network planning of the operator.	Match if exist
	Bind value	Configures according to the network planning of the operator.	00-00-00-00-77-77
ONU Bind/unbind domain	Slot No.	The slot number connected with the ONU. Read only.	15
	PON No.	The number of the actually used PON port. Read only.	1
	ONU Authorization No.	Configures according to the network planning of the operator.	2
	Action	Bind the QinQ domain to the PON port.	Bind
	Domain name	Bound QinQ domain	bb

6.5.4.2 Configuration Flow Chart

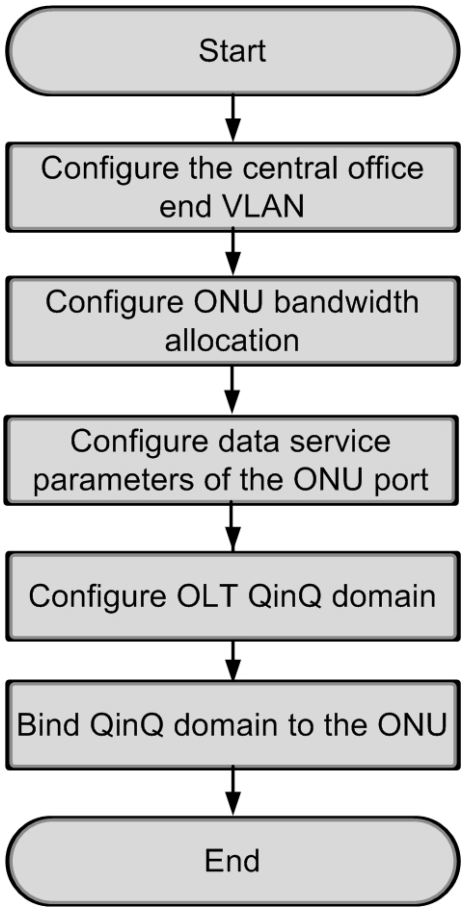


Figure 6-138 The configuration flow of the flexible QinQ data service (for the AN5506-10-B1)

6.5.4.3 Configuring the Central Office End Service VLAN

See Configuring the Central Office End Service VLAN for configuration procedures.

6.5.4.4 Configuring Bandwidth Allocation

1. Click the GC8B[15] card in the **Object Tree** pane and information of all ONUs listed under the GC8B card will be shown in the right pane. Right-click the **AN5506-10-B1[2]** ONU and select **Config→Bandwidth Config** from the shortcut menu to access the **Bandwidth Config** window.
2. Click the pane on right side and click  in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. Click **OK**.

3. Configure according to the planned data in Table 6-36.
4. Click in the toolbar and click **OK** in the alert box that appears. The configuration is completed, as shown in Figure 6-139.

Figure 6-139 The GPON service bandwidth configuration-configuring the AN5506-10-B1 under the flexible QinQ mode

6.5.4.5 Configuring Data Service Parameters for the ONU Port

1. Click the GC8B[15] card in the **Object Tree** pane and information of all ONUs listed under the GC8B card will be shown in the right pane. Right-click the **AN5506-10-B1[2]** ONU and select **Config→Service Config** from the shortcut menu to access the **Data Port Config** window.
2. Select **LAN1** from the **Data Port List** and click **Add** to create a data service and configure it according to the planned data in Table 6-36.

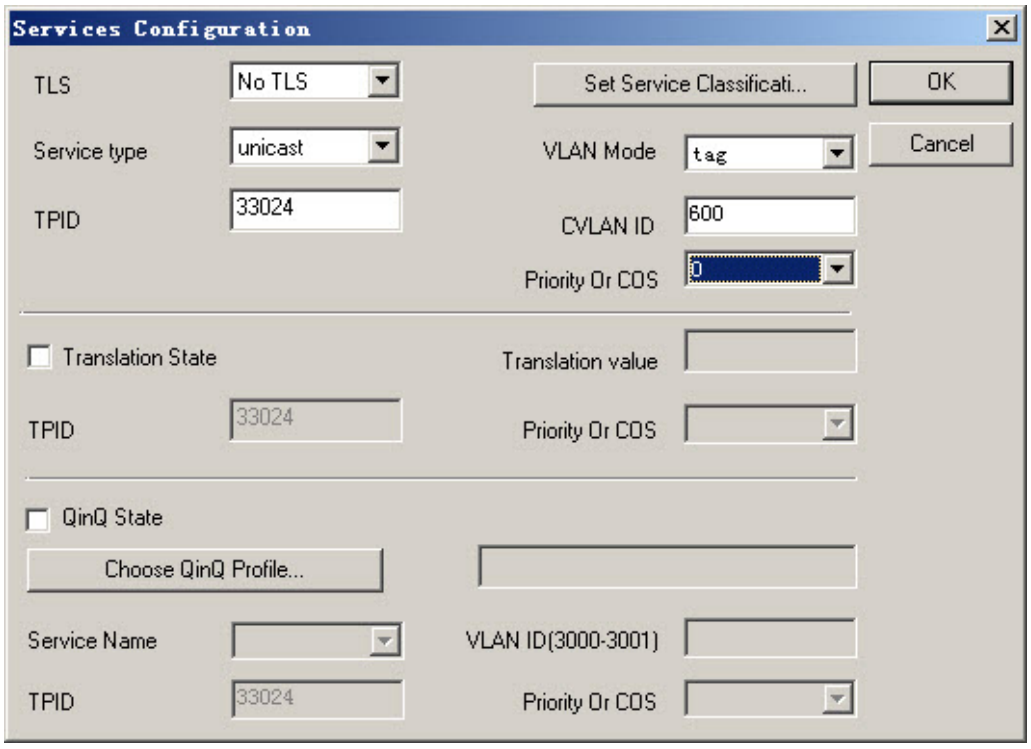


Figure 6-140 The service configuration-configuring the AN5506-10-B1 under the flexible QinQ mode

3. Click **OK** to return to **Data Port Config** tab.
4. After the configuration, click the **Modify on Device** to complete the service configuration for the AN5506-10-B1, as shown in Figure 6-141.

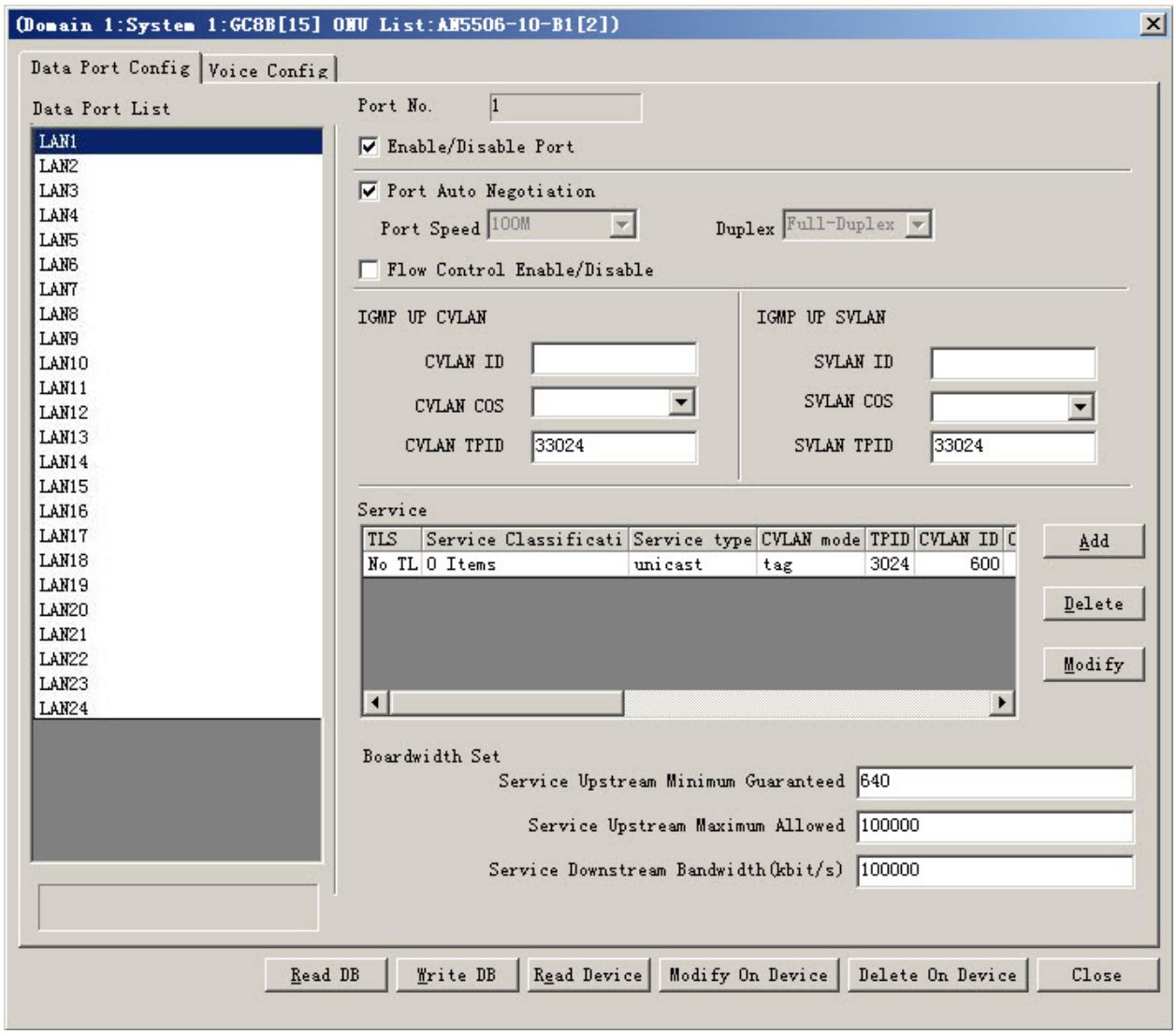


Figure 6-141 The port service configuration is completed-configuring the AN5506-10-B1 under the flexible QinQ mode

6.5.4.6 Configuring OLT QinQ Domain

1. Right-click the HSWA[9] card in the **Object Tree** pane and select **VLAN Config** →**OLT QinQ Domain** from the shortcut menu to access the **OLT QinQ Domain** window.

2. click in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. Click **OK** to create an OLT QinQ domain.
3. Configure according to the planned data in Table 6-36.
4. Click in the toolbar and the configuration is completed, as shown in Figure 6-142.

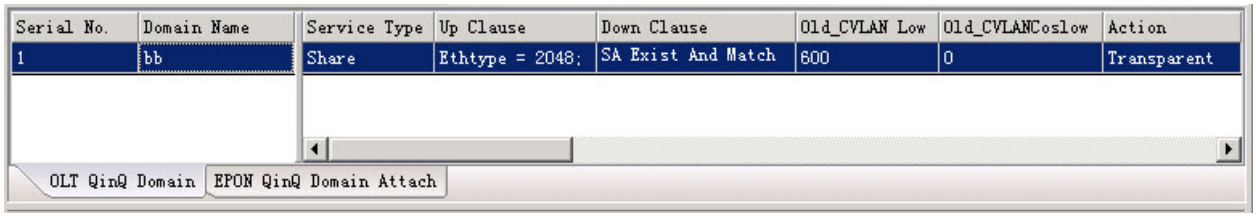


Figure 6-142 The QinQ mode-configuring the AN5506-10-B1 under the flexible QinQ mode

6.5.4.7 Bind the QinQ domain to the ONU.

1. Click the GC8B[15] card in the **Object Tree** pane and information of all ONUs listed under the GC8B card will be shown in the right pane. Right-click the **AN5506-10-B[2]** ONU and select **Config→PON Attach / Detach Domain** from the shortcut menu to access the **PON Attach / Detach Domain** window.
2. Select the PON port 1 and select **Attach** in the drop-down list of **Action** field.
3. Click the pane on right side and click in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. Click **OK**.
4. Click the drop-down list of **Table Name** and select **bb**.
5. Click in the toolbar and click **OK** in the alert box that appears. The configuration is completed, as shown in Figure 6-143.

Figure 6-143 Binding the ONU and the domain-configuring the AN5506-10-B1 under the flexible QinQ mode

6.5.4.8 Configuration Result

The PC1 and PC2 can access the Internet normally.

7 Multicast Service Configuration

- Example for Multicast Service Configuration-Proxy-Snooping Mode
- Example for Multicast Service Configuration-Proxy Mode
- Example for Multicast Service Configuration-Controllable Mode
- Configure Multicast VLAN 1:2 Conversion
- Example for SSM Group Multicast Configuration
- Optional Function

7.1 Example for Multicast Service Configuration-Proxy-Snooping Mode

7.1.1 Configuration Rules

- Below are three multicast modes:
  - Under the proxy mode, the core switch card and GPON interface card are both in proxy mode; the system proactively manages the statuses of multicast group members, effectively reducing the protocol load on the uplink equipment.
  - Under the snooping mode, the core switch card and EPON interface card are both in snooping mode; the system only snoops and forwards IGMP messages passively, which causes a relatively low impact on the system load, but greatly increases the protocol process load on the uplink equipment.
  - Under the proxy-snooping mode, the core switch card is in proxy mode, and the GPON interface card is in snooping mode, which is a combination of the proxy mode and the snooping mode.
- During the bandwidth allocation: If the data service is not started up on the ONU port, users should configure one **IPTV** service bandwidth and one **data** bandwidth for the ONU type 1, as well as one **IPTV** service bandwidth and one **Integrated Service** bandwidth for the ONU in type 2. If the data service is started up on the ONU port, users should configure only one **IPTV** service bandwidth for each ONU.
- For ONU type 1, after adding one multicast service to the ONU port, users should add one unicast service which provides channels for the multicast uplink / downlink protocol messages; for ONU in type 2, users need not add the unicast service.
- For ONU in type 1, the VLANs of the multicast uplink and downlink protocols can be configured respectively; for ONU in type 2, the uplink protocol VLAN is translated into the port signal VLAN, and the VLANs of the downlink protocol messages and the downlink multicast flow are processed in the same way.
- The VLAN COS need not be configured in the multicast services. The COS of the downlink multicast flow is carried by the multicast stream and cannot be

configured on the OLT and the ONU. The COS of the uplink / downlink multicast protocol message is 0.

- The VLAN of the multicast group should be within the range of the local VLAN.
- One multicast program only belongs to one multicast VLAN. One multicast VLAN can include one multicast program or a multicast group. The multicast group is a collection of multicast programs with an unified authority.
- The AN5116-06B's uplink ports can not join multiple VLANs in the untag mode.

7.1.2 Networking Diagram

Figure 7-1 shows the networking diagram of the AN5116-06B to provide the multicast services in proxy-snooping mode.

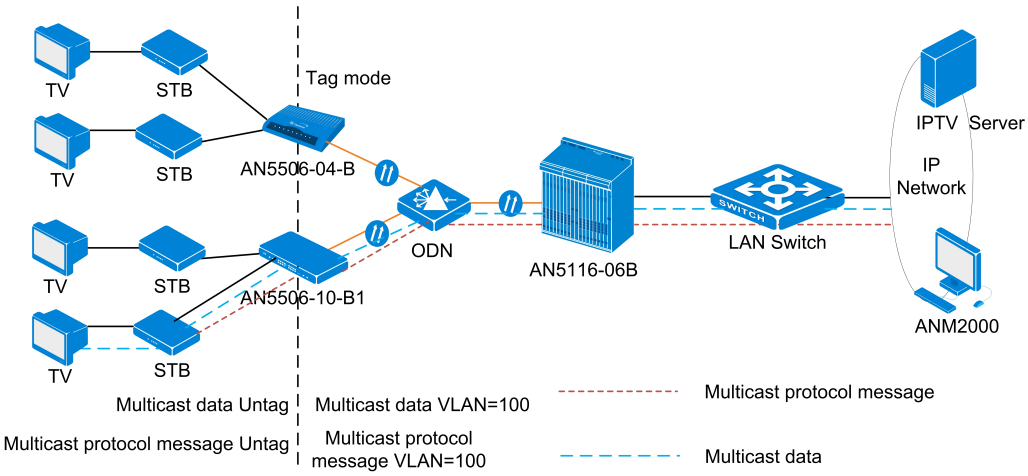


Figure 7-1 The multicast service network connection under the proxy-snooping mode

- Downlink direction: The ONU strips the VLAN Tag=100 from the multicast stream at the AN5116-06B side, then sends the stream to the set top box for forwarding it to the video users.
- Uplink direction: The ONU attaches the join / leave multicast protocol message with the VLAN=100 tag; then sends the messages to the AN5116-06B. The AN5116-06B forwards them to the IPTV server.

The AN5116-06B uses the HU1A and GC8B card as the interface card at the network side and user side respectively. The HSWA card is compulsory. The AN5506-04-B and the AN5506-10-B1 are used as ONUs in this example.

7.1.3 Configuring Multicast Services Respectively (for the ONU in Type 1)

See Table 1-1 for the ONU in type 1.

7.1.3.1 Planning Data

Table 7-1 The planned data of multicast services in the proxy-snooping mode at the OLT side (configured respectively)

Item		Description	Example
ONU information	ONU type	The type of the actually used ONU.	AN5506-04-B
	Slot No.	Configures according to the number of the actually used PON port.	15
	PON No.	Configures according to the number of the actually used PON port.	1
	ONU Authorization No.	Configures according to the network planning of the operator.	1
Data of the service VLAN in the central office end	Service name	Configures according to the network planning of the operator.	iptv1
	Starting VLAN ID	The begin VLAN ID number of the uplink port service. Configures according to the network planning of the operator.	100
	VLAN ID End	The end VLAN ID number of the uplink port service. Configures according to the network planning of the operator.	100
	Uplink port No.	Configures according to the number of the actually used uplink port.	20:SFP1
	TAG/UNTAG	The Tag processing mode of the uplink service VLAN can be set as **Tag** or **Untag**. ◆ Under **UNTAG** mode, the TAGs of the uplink packets will be stripped automatically and the packets will be uplinked in the form of UNTAG when they pass the port, whereas the downlink UNTAG packets will be added with designated TAGs. ◆ Under **TAG** mode, the uplink/downlink data packets will not be processed when they pass the port.	Tag

Table 7-1 The planned data of multicast services in the proxy-snooping mode at the OLT side (configured respectively) (Continued)

Item		Description	Example
	Service Type	Selects IPTV for the multicast service.	IPTV
	Slot Bind Mode	Select Auto for the service VLAN.	Auto Bind
Uplink port packet suppression	Port No.	Selects 20:2, which corresponds to 20:SFP1.	20:2
	Packet type	Selects the multicast packet.	Multicast package
	Enable/disable	Disables the suprresion in this example.	Disable
Multicast mode	Multicast mode	Configures according to the network planning of the operator.	Proxy-snooping mode
Multicast VLAN	Multicast VLAN	Configures according to the network planning of the operator. The multicast VLAN should be in the range of the local VLAN.	100

Table 7-2 The planned data of multicast services in the proxy-snooping mode at the ONU side (configured respectively)

Item		Description	Example
ONU multicast bandwidth config	Service Type	Selects IPTV for the multicast service.	IPTV
	Fixed Bandwidth (kbyte/s)	Configures according to the network planning of the operator. The default value is 16.	16
	Assured Bandwidth (kbyte/s)	Configures according to the network planning of the operator. The default value is 0.	0
	Maximum Bandwidth (kbyte/s)	Configures according to the network planning of the operator. The default value is 64.	64
	Service Type	Select data for the data services.	Broadband services access the Internet.
	Fixed Bandwidth (kbyte/s) for data service	Configures according to the network planning of the operator. The default value is 16.	16
	Assured Bandwidth (kbyte/s) for data service	Configures according to the network planning of the operator. The default value is 0.	0
	Maximum Bandwidth (kbyte/s) for data service	Configures according to the network planning of the operator. The default value is 64.	1280
ONU multicast service config	Port No.	Configures according to the number of the actually used uplink port.	1 to 2

Table 7-2 The planned data of multicast services in the proxy-snooping mode at the ONU side (configured respectively) (Continued)

Item		Description	Example
	Multicast data in VLAN mode	Includes **TAG** and **UNTAG**. **TAG** means that the downlink multicast stream with designated VLAN tags passes the ONU port; **UNTAG** means that the downlink multicast stream without VLAN Tag passes the ONU port. Configures according to the network planning of the operator.	TAG
	Multicast data in VLAN mode	Configures according to the network planning of the operator. The ONU only receives the downlink multicast stream with the designated VLAN tag.	100
	Multicast protocol VLAN mode	Configures according to the network planning of the operator. Includes **TRANSPARENT**, **TAG**, **RETAG** and **REMOVE**. **TRANSPARENT**: Transparently transmits the uplink multicast protocol message; **TAG**: Adds a VLAN tag to the uplink multicast protocol message; **RETAG**: Reset the VLAN tag that the uplink multicast protocol message carries; **REMOVE**: Remove the VLAN tag that the uplink multicast protocol message carries.	RETAG
	Uplink multicst protocol VLAN	Configures according to the network planning of the operator. The uplink multicast protocol should be in the range of the local VLAN.	100
ONU data service configuration	Data port list	Configures according to the number of the actually used ONU port.	LAN1 to LAN2
	Service Type	Unicast	Unicast
	TAG Mode	Configured as Tag or Untag according to the network planning of the operator. In the **Tag** mode the uplink data packets are tagged, whereas in the **Untag** mode the uplink data packets are untagged.	Untag
	CVLAN Mode	Configures according to the network planning of the operator. Selects Tag or Transparent. When the **TAG Mode** is Untag, Tag or transparent transmission can be selected. When the **TAG Mode** is Tag, translation or transparent transmission can be selected.	Tag

Table 7-2 The planned data of multicast services in the proxy-snooping mode at the ONU side (configured respectively) (Continued)

Item		Description	Example
	CVLAN ID	Configures according to the network planning of the operator.	100
	PON priority or COS	Includes 0 to 7. 0 is the lowest and 7 is the highest.	7

7.1.3.2 Configuration Flow Chart

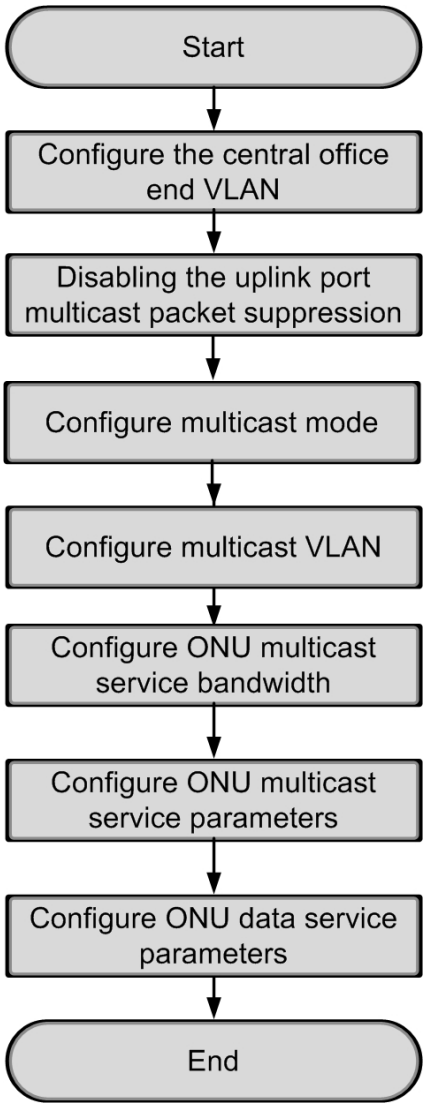


Figure 7-2 The flow of configuring the multicast service under the proxy-snooping mode respectively (for the AN5506-04-B)

7.1.3.3 Configuring the Central Office End Service VLAN

1. Right-click the HSWA[9] card in the **Object Tree** pane and select **VLAN Config →Local VLAN→Local End Service VLAN** to access the **Local End Service VLAN** window.
2. click  in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. Click **OK** to create a central office end VLAN.
3. Configure parameters according to the planned data in Table 7-1.
4. Click  in the toolbar and the configuration is completed, as shown in Figure 7-3.

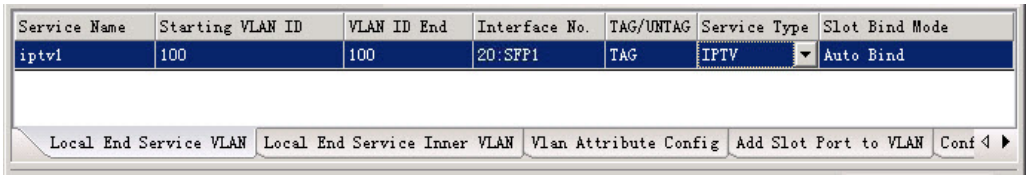


Figure 7-3 The service VLAN local end data configuration-configuring the AN5506-04-B under the proxy mode respectively

7.1.3.4 Disabling the Uplink Port Multicast Packet Suppression

1. Right-click the HSWA[9] card in the **Object Tree** pane and select **Security Config→Upport Packet Rate Control** from the shortcut menu to access the **Uplink Port Packet Suppression** window.
2. According to the planned data in Table 7-1. Select **20:2** in **Port No.** and clear the **Enable/Disable** check box of the corresponding multicast packet.
3. Click  in the toolbar and the configuration is completed, as shown in Figure 7-4.

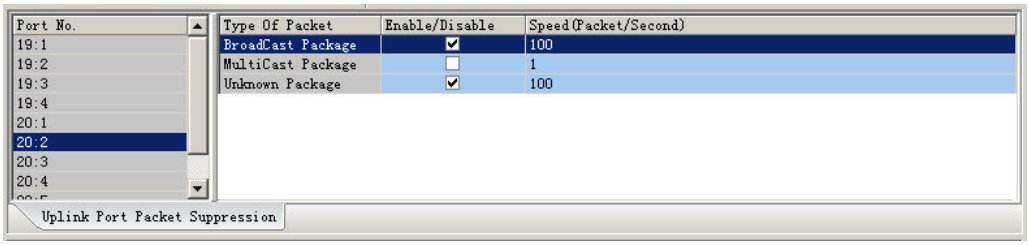


Figure 7-4 The designated uplink port packet suppression-configuring the AN5506-04-B under the proxy mode respectively

7.1.3.5 Configuring Multicast Mode

1. Right-click the active HSWA[9] card in the **Object Tree** pane, and select **IGMP Config→IGMP Mode** from the shortcut menu to access the **IGMP Mode** window.
2. According to the planned data in Table 7-1, select **Proxy-snooping Mode** in the pulldown list of the **IGMP Mode** item.
3. Click in the toolbar and the configuration is completed, as shown in Figure 7-5.

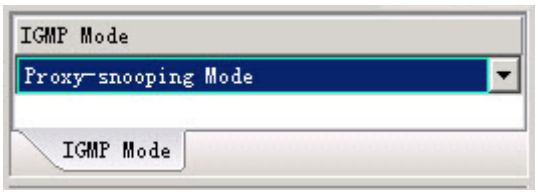


Figure 7-5 Multicast mode-configuring the AN5506-04-B under the proxy-snooping mode respectively

7.1.3.6 Configuring Multicast VLAN

1. Right-click the active HSWA[9] card in the **Object Tree** pane, and select **IGMP Config→Multicast VLAN** from the shortcut menu to access the **Multicast VLAN** window.
2. According to the planned data in Table 7-1, double-click the **VLAN** column and input **100**.
3. Click in the toolbar and the configuration is completed, as shown in Figure 7-6.

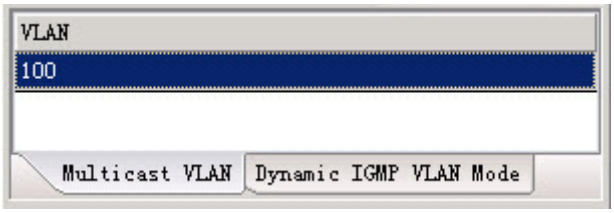


Figure 7-6 Multicast VLAN-configuring the AN5506-04-B under the proxy-snooping mode respectively

7.1.3.7 Configuring ONU Multicast Service Bandwidth

1. Click the GC8B[15] card in the **Object Tree** pane and information of all ONUs listed under the GC8B card will be shown in the right pane. Right-click the **PON1-AN5506-04-B[1]** ONU and select **Config→Bandwidth** from the shortcut menu to access the **Bandwidth Allocation Configuration** window.
2. Click the pane on right side and click in the toolbar to input **2** in the **Please Input The Rows For Add:** dialog box. Click **OK** to add two services.
3. Configure according to the planned data in Table 7-2.
4. Click in the toolbar and the configuration is completed, as shown in Figure 7-7.

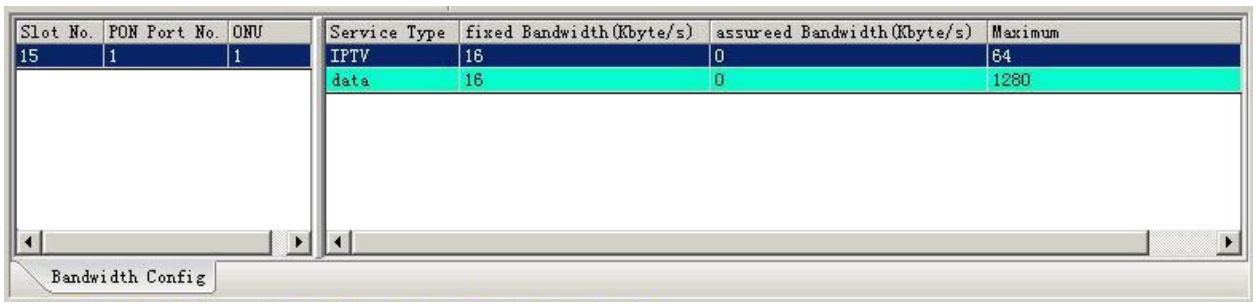


Figure 7-7 Multicast bandwidth allocation-configuring the AN5506-04-B under the proxy-snooping mode respectively

7.1.3.8 Configuring ONU Multicast Service Parameters

1. Click the GC8B[15] card in the **Object Tree** pane and information of all ONUs listed under the GC8B card will be shown in the right pane. Right-click the **PON1-AN5506-04-B[1]** ONU and select **Config→ONU IGMP service config** from the shortcut menu to access the **ONU IGMP service config** window.
2. Click the pane on right side and click in the toolbar to input **2** in the **Please Input The Rows For Add:** dialog box. Click **OK** to add two services.
3. Configure according to the planned data in Table 7-1.
4. Click in the toolbar and the configuration is completed, as shown in Figure 7-8.

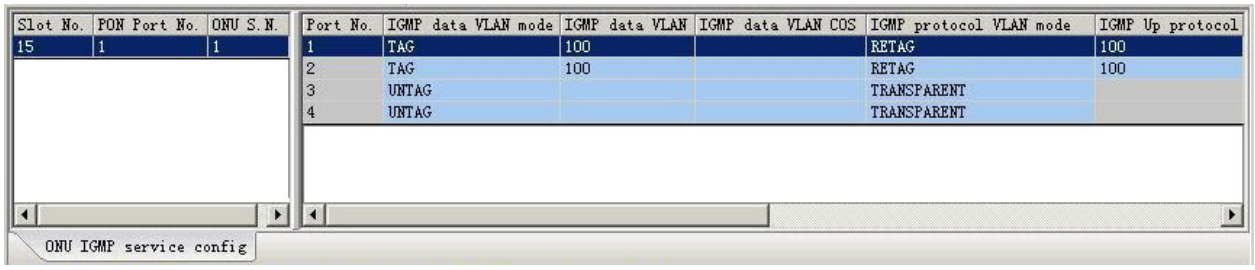


Figure 7-8 ONU multicast service-configuring the AN5506-04-B under the proxy-snooping mode respectively

7.1.3.9 Configuring ONU Data Service Parameters

1. Click the GC8B[15] card in the **Object Tree** pane and information of all ONUs listed under the GC8B card will be shown in the right pane. Right-click the **PON1-AN5506-04-B[1]** ONU and select **Config→Service Config** from the shortcut menu to access the **Data Port Config** window.
2. Select **LAN1** in the **Data Port List** pane, and click the **Add** button to bring up the **Services Configuration** dialog box. Configure parameters in the dialog box according to the planned data in Table 7-2, as shown in Figure 7-9.

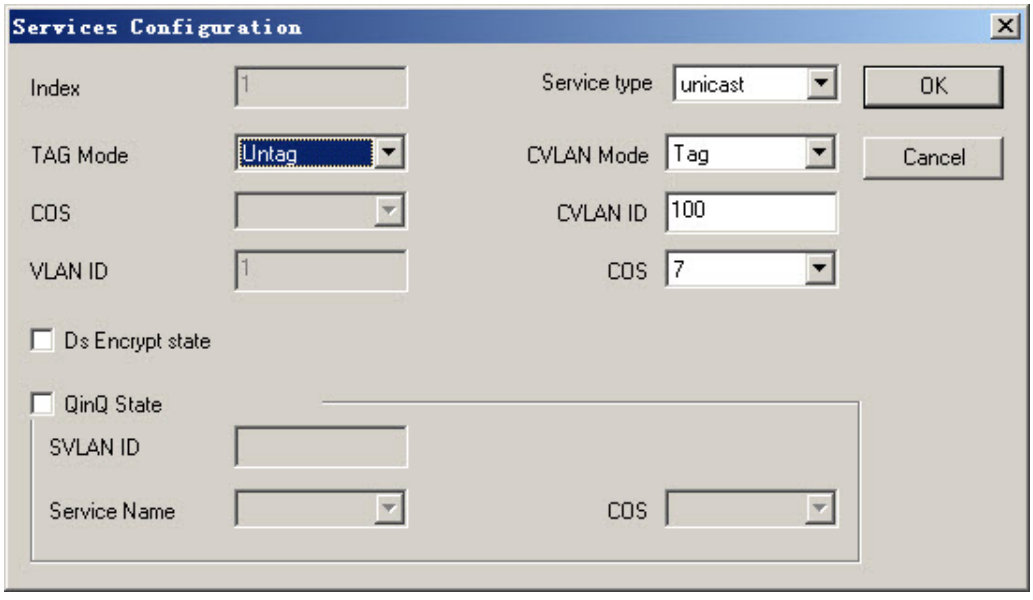


Figure 7-9 Service configuation-configuring the AN5506-04-B under the proxy-snooping mode respectively

3. Click **OK** to return to **Data Port Config** tab.

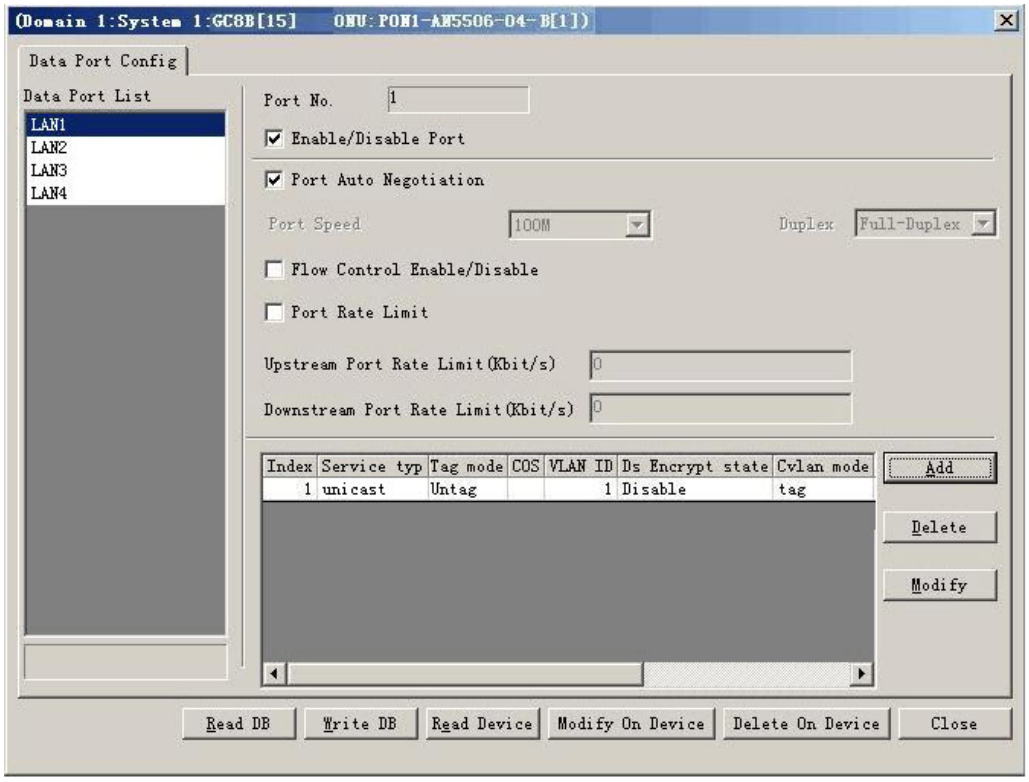


Figure 7-10 Data port configuration-configuring the AN5506-04-B under the proxy-snooping mode respectively

4. Select **LAN2** in the **Data Port List** pane, then implement the same configuration on the LAN1 port.
5. Return to **Data port Config** tab and click **Modify On Device**. The data service configuration of the AN5506-04-B ports is completed.

7.1.3.10 Configuration Result

The multicast services on the FE1 and FE2 ports that belong to the AN5506-04-B is started up; and the users can watch the video programs whose multicast VLAN is 100 normally.

7.1.4 Configuring Data Services in a Batch Manner (for the ONU in type 1)

See Table 1-1 for the ONU in type 1.

7.1.4.1 Planning Data

Table 7-3 The planned data of multicast services in the proxy-snooping mode at the OLT side (configured in a batch manner)

Item		Description	Example
ONU information	ONU type	The type of the actually used ONU.	AN5506-04-B
	Slot No.	Configures according to the number of the actually used PON port.	15
	PON No.	Configures according to the number of the actually used PON port.	1
	ONU Authorization No.	Configures according to the network planning of the operator.	1
Central office end VLAN	Service name	Configures according to the network planning of the operator.	iptv1
	Starting VLAN ID	The begin VLAN ID number of the uplink port service. Configures according to the network planning of the operator.	100
	VLAN ID End	The end VLAN ID number of the uplink port service. Configures according to the network planning of the operator.	100
	Uplink port No.	Configures according to the number of the actually used uplink port.	20:SFP1
	TAG/UNTAG	The Tag processing mode of the uplink service VLAN can be set as **Tag** or **Untag**. ◆ Under **UNTAG** mode, the TAGs of the uplink packets will be stripped automatically and the packets will be uplinked in the form of UNTAG when they pass the port, whereas the downlink UNTAG packets will be added with designated TAGs. ◆ Under **TAG** mode, the uplink/downlink data packets will not be processed when they pass the port.	Tag
	Service Type	Selects IPTV for the multicast service.	IPTV
	Slot Bind Mode	Select Auto for the service VLAN.	Auto Bind
Uplink port packet suppression	Port No.	Selects 20:2, which corresponds to 20:SFP1.	20:2
	Packet type	Selects the multicast packet.	Multicast package
	Enable/disable	Disables the suprresion in this example.	Disable

Table 7-3 The planned data of multicast services in the proxy-snooping mode at the OLT side (configured in a batch manner) (Continued)

Item		Description	Example
Multicast mode	Multicast mode	Configures according to the network planning of the operator.	Proxy-snooping mode
Multicast VLAN	Multicast VLAN	Configures according to the network planning of the operator. The multicast VLAN should be in the range of the local VLAN.	100

Table 7-4 The planned data of multicast services for the AN5506-04-B in the proxy-snooping mode at the ONU side (configured in a batch manner)

Item		Description	Example
ONU Bandwidth allocation profile	Profile name	Configures according to the network planning of the operator.	a
	Service Type	Selects IPTV for the multicast service.	IPTV
	Fixed Bandwidth (kbyte/s)	Configures according to the network planning of the operator. The default value is 16.	16
	Assured Bandwidth (kbyte/s)	Configures according to the network planning of the operator. The default value is 0.	0
	Maximum Bandwidth (kbyte/s)	Configures according to the network planning of the operator. The default value is 64.	64
	Service Type	Select data for the data services.	Broadband services access the Internet.
	Fixed Bandwidth (kbyte/s) for data service	Configures according to the network planning of the operator. The default value is 16.	16
	Assured Bandwidth (kbyte/s) for data service	Configures according to the network planning of the operator. The default value is 0.	0
	Maximum Bandwidth (kbyte/s) for data service	Configures according to the network planning of the operator. The default value is 64.	1280
ONU multicast service config	Profile name	Configures according to the network planning of the operator.	b
	Multicast data in VLAN mode	Includes **TAG** and **UNTAG**. **TAG** means that the downlink multicast stream with designated VLAN tags passes the ONU port; **UNTAG** means that the downlink multicast stream without VLAN Tag passes the ONU port. Configures according to the network planning of the operator.	Tag

Table 7-4 The planned data of multicast services for the AN5506-04-B in the proxy-snooping mode at the ONU side (configured in a batch manner) (Continued)

Item		Description	Example
	Multicast data in VLAN mode	Configures according to the network planning of the operator. The ONU only receives the downlink multicast stream with the designated VLAN tag.	100
	Multicast protocol VLAN mode	Configures according to the network planning of the operator. Includes **TRANSPARENT**, **TAG**, **RETAG** and **REMOVE**. **TRANSPARENT**: Transparently transmits the uplink multicast protocol message; **TAG**: Adds a VLAN tag to the uplink multicast protocol message; **RETAG**: Reset the VLAN tag that the uplink multicast protocol message carries; **REMOVE**: Remove the VLAN tag that the uplink multicast protocol message carries.	RETAG
	Uplink multicst protocol VLAN	Configures according to the network planning of the operator. The uplink multicast protocol should be in the range of the local VLAN.	100
Service profile	Profile name	Configures according to the network planning of the operator.	c
	ONU type	The type of the actually used ONU.	AN5506-04-B
	Sub-profile configuration in ONU level	ONU Bandwidth allocation profile	a
	Port type	Designated ONU port type	LAN port
	Port No.	Selects the actually used ONU port No.	1 to 2
	Sub-profile configuration in the port level	Selects ONU multicast service profile	b
Service profile bind	Profile ID	Selects the service profile name which the ONU binds	c
	Bind/unbind	Bind	Bind
	Slot No.	Configures according to the number of the actually used PON port.	15
	PON No.	Configures according to the number of the actually used PON port.	1
	ONU number	Selects according to the ONU authorization number to be bound to the service profile.	1

7.1.4.2 Configuration Flow Chart

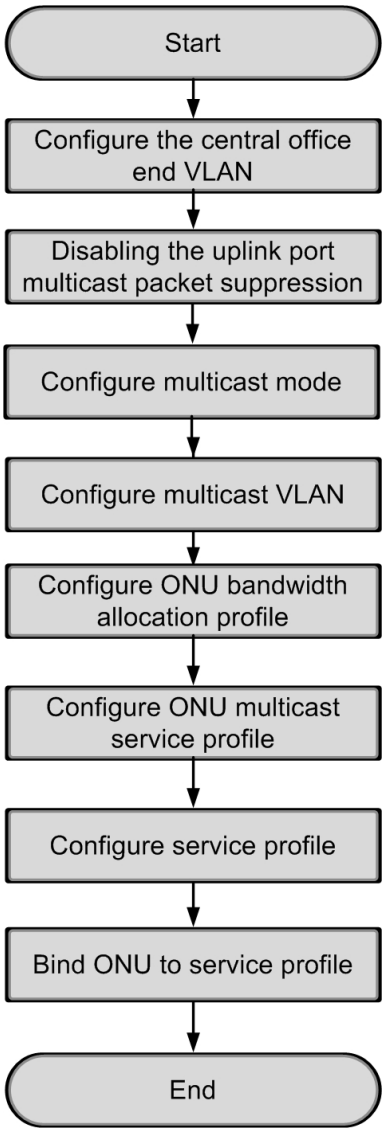


Figure 7-11 The flow of multicast service configuration under the proxy-snooping mode in a batch manner (for the AN5506-04-B)

7.1.4.3 Configuring the Central Office End Service VLAN

See Configuring the Central Office End Service VLAN for the configuration method.

7.1.4.4 Disabling the Uplink Port Multicast Packet Suppression

See Disabling the Uplink Port Multicast Packet Suppression for the configuration method.

7.1.4.5 Configuring Multicast Mode

See Configuring Multicast Mode for the configuration method.

7.1.4.6 Configuring Multicast VLAN

See Configuring Multicast VLAN for the configuration method.

7.1.4.7 Configuring ONU Bandwidth Allocation Profile

1. Right-click the active HSWA[9] card in the **Object Tree** pane and select **Service Config Relevance→GPON Service Bandwidth Config Profile** from the shortcut menu to access the **Bandwidth Config Profile** window.
2. Click the pane on left side and click  in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. After clicking **OK**, you should double-click in a blank area of the **Profile Name** and input **a** to create a bandwidth allocation profile.
3. Click the pane on right side and click  in the toolbar to input **2** in the **Please Input The Rows For Add:** dialog box. Click **OK** to add two services.
4. Configure according to the planned data in Table 7-4.
5. Click  in the toolbar and the configuration is completed, as shown in Figure 7-12.

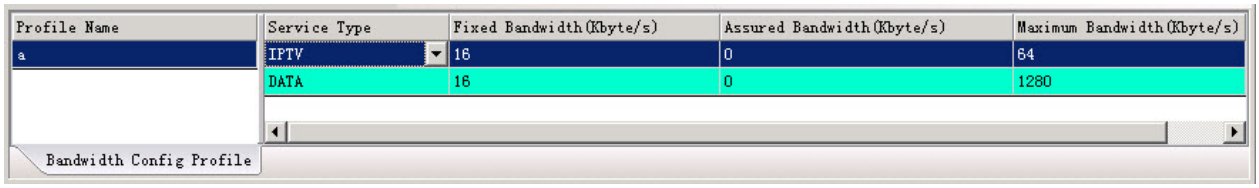


Figure 7-12 The GPON service bandwidth profile-configuring the AN5506-04-B under the proxy-snooping mode in a batch manner

7.1.4.8 Configuring ONU Multicast Service Profile

1. Right-click the HSWA[9] card in the **Object Tree** pane and select **Service Config Relevance→Service Profile Config** from the shortcut menu and select the **IGMP Service Profile** tab.
2. click in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. Click **OK** to create a multicast service profile.
3. Configure according to the planned data in Table 7-4.
4. Click in the toolbar and the configuration is completed, as shown in Figure 7-13.

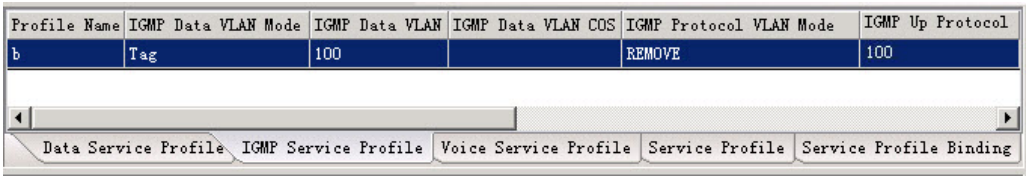


Figure 7-13 Multicast service profile-configuring the AN5506-04-B under the proxy-snooping mode in a batch manner

7.1.4.9 Configuring Service Profile

1. Right-click the HSWA[9] card in the **Object Tree** pane and select **Service Config Relevance→Service Profile Config** from the shortcut menu and select the **Service Profile** tab.
2. Click the pane on left side and click in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. Click **OK** to add a service profile.
3. Double click the bland field of the **Profile Name** and input **c** and select **AN5506-04-B** from the drop-down list of the **ONU Type**. Double-click the blank area of the **ONU Subprofile Config** to access the **ONU Subprofile Config** dialog box.
4. In the **ONU Subprofile Config** dialog box, click **Add** to add a new profile configuration. Click the **Profile type** drop-down list to select **Bandwidth Config Profile**. Double-click the blank area below the **Profile Name** to input **a**, as shown in Figure 7-14.

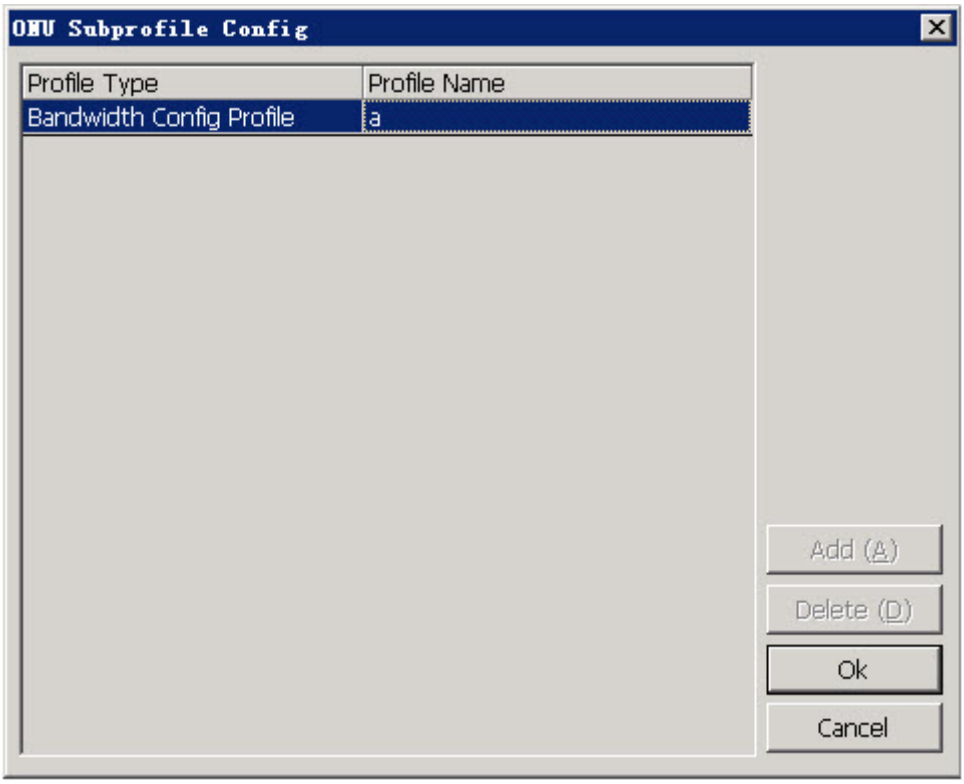


Figure 7-14 ONU subprofile-configuring the AN5506-04-B under the proxy-snooping mode in a batch manner

5. Click **OK** to return to **Service Profile** window.
6. Click the pane on right side and click in the toolbar to input **2** in the **Please Input The Rows For Add:** dialog box. Click **OK**.
7. Click the **Port Type** drop-down list to select **LAN Port**. Double-click the blank area of the **Port No.** and input **1**. Double-click the blank area of the **ONU Port Profile Config** to access the **ONU Port Profile Config** dialog box.
8. In the **ONU Port Profile Config** dialog box, click **Add** to add a new profile configuration. Click the drop-down list of the **Profile Type** to select **IGMP Service Profile**. Double-click the blank area below the **Profile Name** to input **b**, as shown in Figure 7-15.

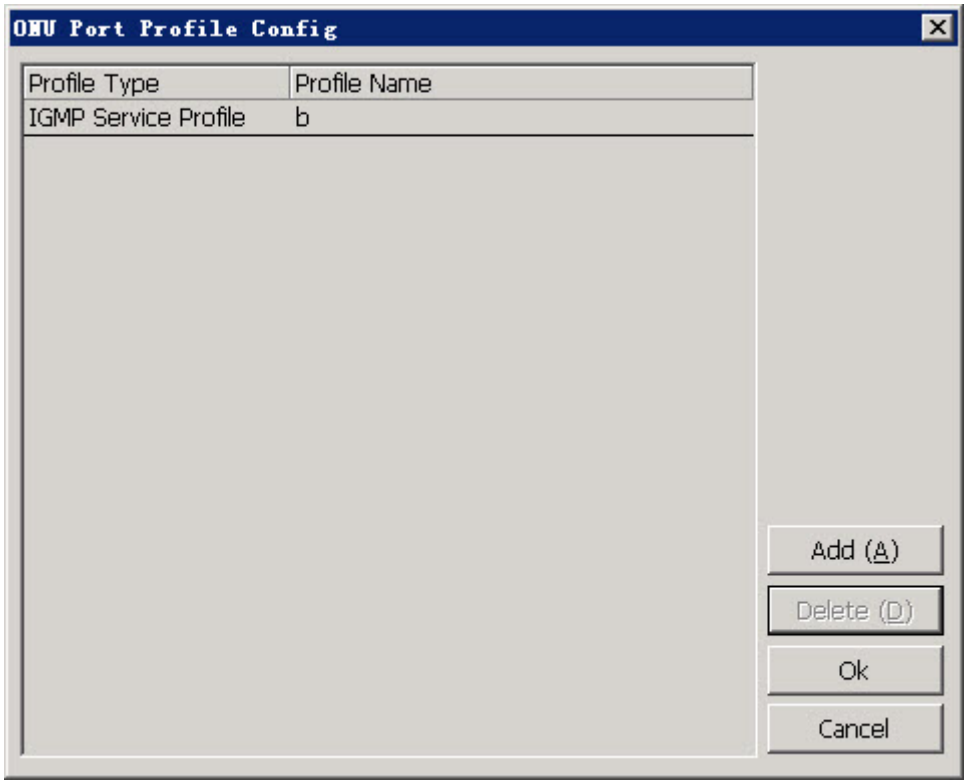


Figure 7-15 Port subprofile-configuring for the AN5506-04-B under the proxy-snooping mode in a batch manner

9. Click **OK** to return to **Service Profile** window.
10. Repeat step 7 to step 9 for the multicast service profile configuration of Port 2.
11. Click in the toolbar and the configuration is completed, as shown in Figure 7-16.

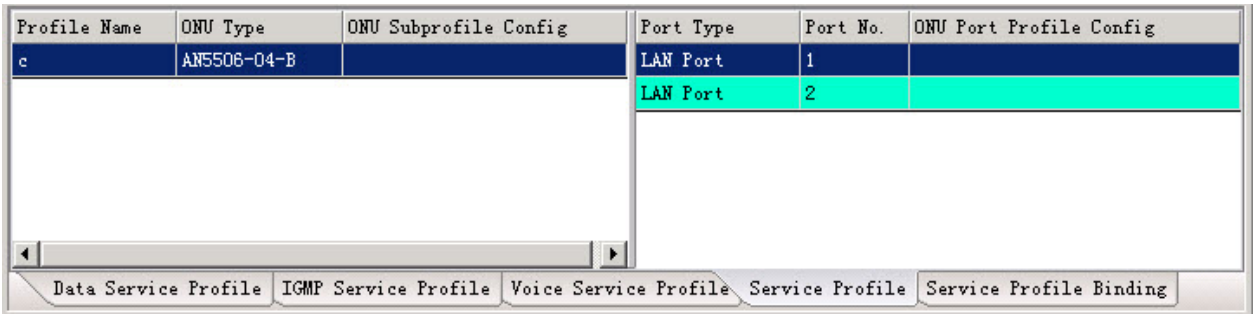


Figure 7-16 Service profile-configuring the AN5506-04-B under the proxy-snooping mode in a batch manner

7.1.4.10 Binding ONU to Service Profile

1. Right-click the HSWA[9] card in the **Object Tree** pane and select **Service Config Relevance→Service Profile Config** from the shortcut menu and select the **Service Profile Binding** tab.
2. Click the pane on left side and click in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. Click **OK** to add a service profile.
3. Select **c** from the drop-down list of **Profile ID** and select **Attach** from the drop-down list of **Action**.
4. Click the pane on right side and click in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. Click **OK**.
5. Double-click a blank area under the **ONU No.** item to select the designated ONU in the **Select Objects** dialog box, as shown in Figure 7-17.

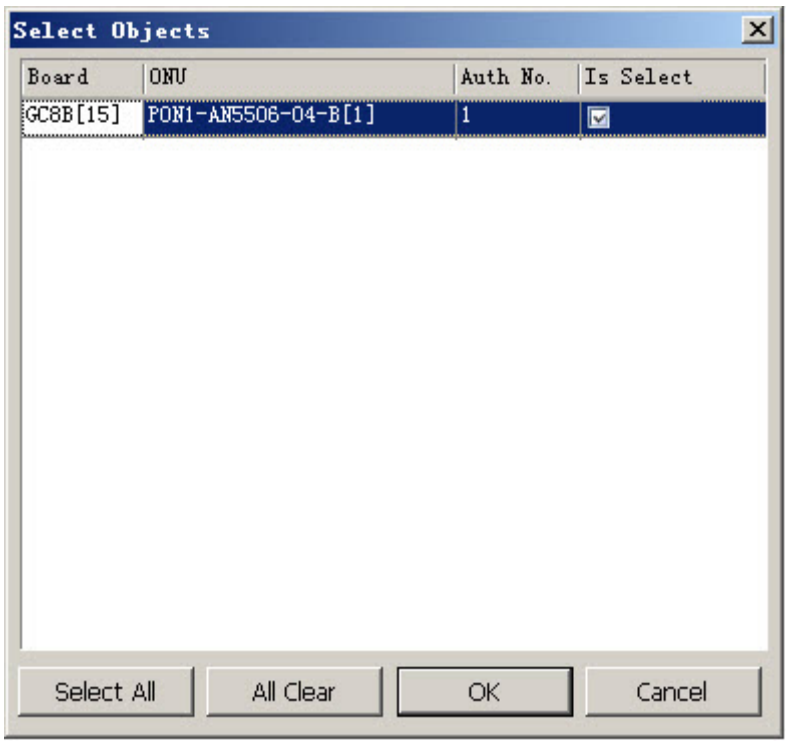


Figure 7-17 Selecting object-configuring the AN5506-04-B under the proxy-snooping mode in a batch manner

6. Click **OK** to return to **Service Profile Binding** window.
7. Click in the toolbar and click **OK** in the alert box that appears to complete the configuration, as shown in Figure 7-18.

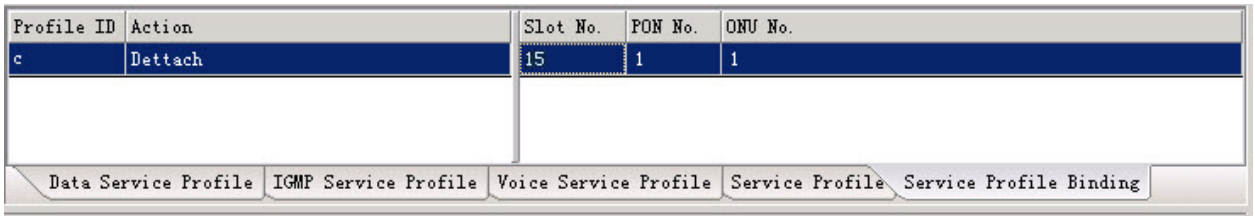


Figure 7-18 Service profile binding-configuring the AN5506-04-B under the proxy-snooping mode in a batch manner

7.1.4.11 Configuration Result

The multicast services on the FE1 and FE2 ports that belong to the AN5506-04-B is started up; and the users can watch the video programs whose multicast VLAN is 100 normally.

7.1.5 Configuring Multicast Services Respectively (for the ONU in Type 1)

See Table 1-1 for the ONU in type 1.

7.1.5.1 Planning Data

Table 7-5 The planned data of multicast services for the AN5506-10-B1 in the proxy-snooping mode at the OLT side (configured respectively)

Item		Description	Example
ONU information	ONU type	The type of the actually used ONU.	AN5506-10-B1
	Slot No.	Configures according to the number of the actually used PON port.	15
	PON No.	Configures according to the number of the actually used PON port.	1
	ONU Authorization No.	Configures according to the network planning of the operator.	2
Central office end VLAN	Service name	Configures according to the network planning of the operator.	iptv1

Table 7-5 The planned data of multicast services for the AN5506-10-B1 in the proxy-snooping mode at the OLT side (configured respectively) (Continued)

Item		Description	Example
	Starting VLAN ID	The begin VLAN ID number of the uplink port service. Configures according to the network planning of the operator.	100
	VLAN ID End	The end VLAN ID number of the uplink port service. Configures according to the network planning of the operator.	100
	Uplink port No.	Configures according to the number of the actually used uplink port.	20:SFP1
	TAG/UNTAG	The Tag processing mode of the uplink service VLAN can be set as **Tag** or **Untag**. ◆ Under **UNTAG** mode, the TAGs of the uplink packets will be stripped automatically and the packets will be uplinked in the form of UNTAG when they pass the port, whereas the downlink UNTAG packets will be added with designated TAGs. ◆ Under **TAG** mode, the uplink/downlink data packets will not be processed when they pass the port.	Tag
	Service Type	Selects IPTV for the multicast service.	IPTV
	Slot Bind Mode	Auto Bind	Auto Bind
Uplink port packet suppression	Port No.	Selects 20:2, which corresponds to 20:SFP1.	20:2
	Packet type	Selects the multicast packet.	Multicast package
	Enable/disable	Disables the suprresion in this example.	Disable
Multicast mode	Multicast mode	Configures according to the network planning of the operator.	Proxy-snooping mode
Multicast VLAN	Multicast VLAN	Configures according to the network planning of the operator. The multicast VLAN should be in the range of the local VLAN.	100

Table 7-6 The planned data of multicast services for the AN5506-10-B1 in the proxy-snooping mode at the ONU side (configured respectively)

Item		Description	Example
ONU multicast bandwidth config	Service Type	Selects IPTV for the multicast service.	IPTV
	Fixed Bandwidth (kbyte/s)	Configures according to the network planning of the operator. The default value is 16.	16

Table 7-6 The planned data of multicast services for the AN5506-10-B1 in the proxy-snooping mode at the ONU side (configured respectively) (Continued)

Item		Description	Example
	Assured Bandwidth (kbyte/s)	Configures according to the network planning of the operator. The default value is 0.	0
	Maximum Bandwidth (kbyte/s)	Configures according to the network planning of the operator. The default value is 64.	64
	Service Type	Select data for the data services.	Integrate service
	Fixed Bandwidth (kbyte/s) for data service	Configures according to the network planning of the operator. The default value is 16.	16
	Assured Bandwidth (kbyte/s) for data service	Configures according to the network planning of the operator. The default value is 0.	0
	Maximum Bandwidth (kbyte/s) for data service	Configures according to the network planning of the operator. The default value is 64.	1280
ONU multicast service config	Data port list	Configures according to the number of the actually used ONU port.	LAN1 to LAN2
	Service Type	Selects multicast for the multicast service.	Multicast
	VLAN Mode	Configures according to the network planning of the operator. Includes **tag** and **transparent**. **tag** is to strip the VLAN Tag from the downlink multicast stream that passes the ONU port. **transparent** is to transparently transmit the downlink multicast stream.	Tag
	CVLAN ID	The VLAN ID that the downlink multicast stream carries. Configures according to the network planning of the operator.	100

7.1.5.2 Configuration Flow Chart

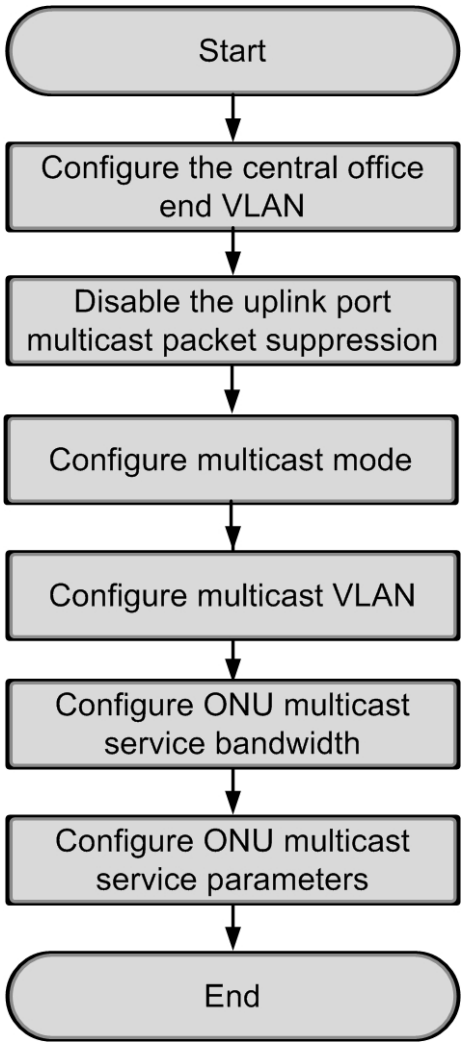


Figure 7-19 The flow of configuring the multicast service under the proxy-snooping mode respectively (for the AN5506-10-B1)

7.1.5.3 Configuring the Central Office End Service VLAN

See Configuring the Central Office End Service VLAN for the configuration method.

7.1.5.4 Disabling the Uplink Port Multicast Packet Suppression

See Disabling the Uplink Port Multicast Packet Suppression for the configuration method.

7.1.5.5 Configuring Multicast Mode

See Configuring Multicast Mode for the configuration method.

7.1.5.6 Configuring Multicast VLAN

See Configuring Multicast VLAN for the configuration method.

7.1.5.7 Configuring ONU Multicast Service Bandwidth

1. Click the GC8B[15] card in the **Object Tree** pane and information of all ONUs listed under the GC8B card will be shown in the right pane. Right-click the **AN5506-10-B1[2]** ONU and select **Config→Bandwidth Config** from the shortcut menu to access the **Bandwidth Config** window.
2. Click the pane on right side and click  in the toolbar to input **2** in the **Please Input The Rows For Add:** dialog box. Click **OK**.
3. Configure according to the planned data in Table 7-6.
4. Click  in the toolbar and the configuration is completed, as shown in Figure 7-20.

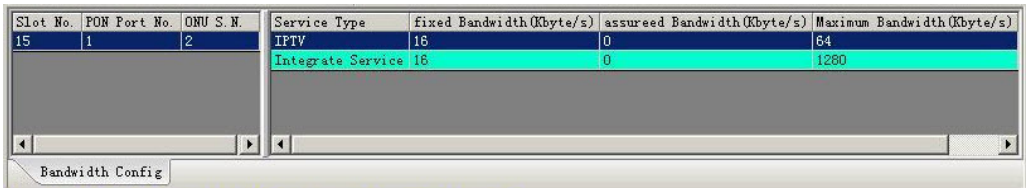


Figure 7-20 Multicast bandwidth allocation-configuring the AN5506-10-B1 under the proxy-snooping mode respectively

7.1.5.8 Configuring ONU Multicast Service Parameters

1. Click the GC8B[15] card in the **Object Tree** pane and information of all ONUs listed under the GC8B card will be shown in the right pane. Right-click the **AN5506-10-B1[2]** ONU and select **Config→Service Config** from the shortcut menu to access the **Data Port Config** window.

2. Select **LAN1** in the **Data Port List** pane, and click the **Add** button to bring up the **Services Configuration** dialog box. Configure parameters in the dialog box according to the planned data in Table 7-6, as shown in Figure 7-21.

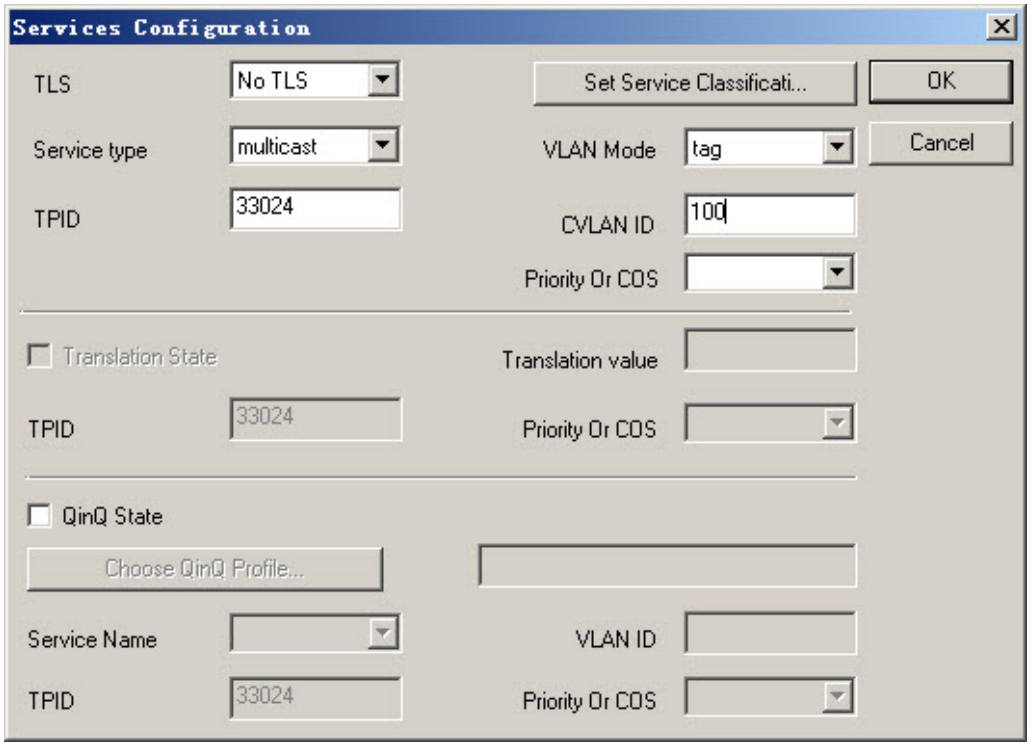


Figure 7-21 Service configuration-configuring the AN5506-10-B1 under the proxy-snooping mode respectively

3. Click **OK** to return to **Data Port Config** tab.

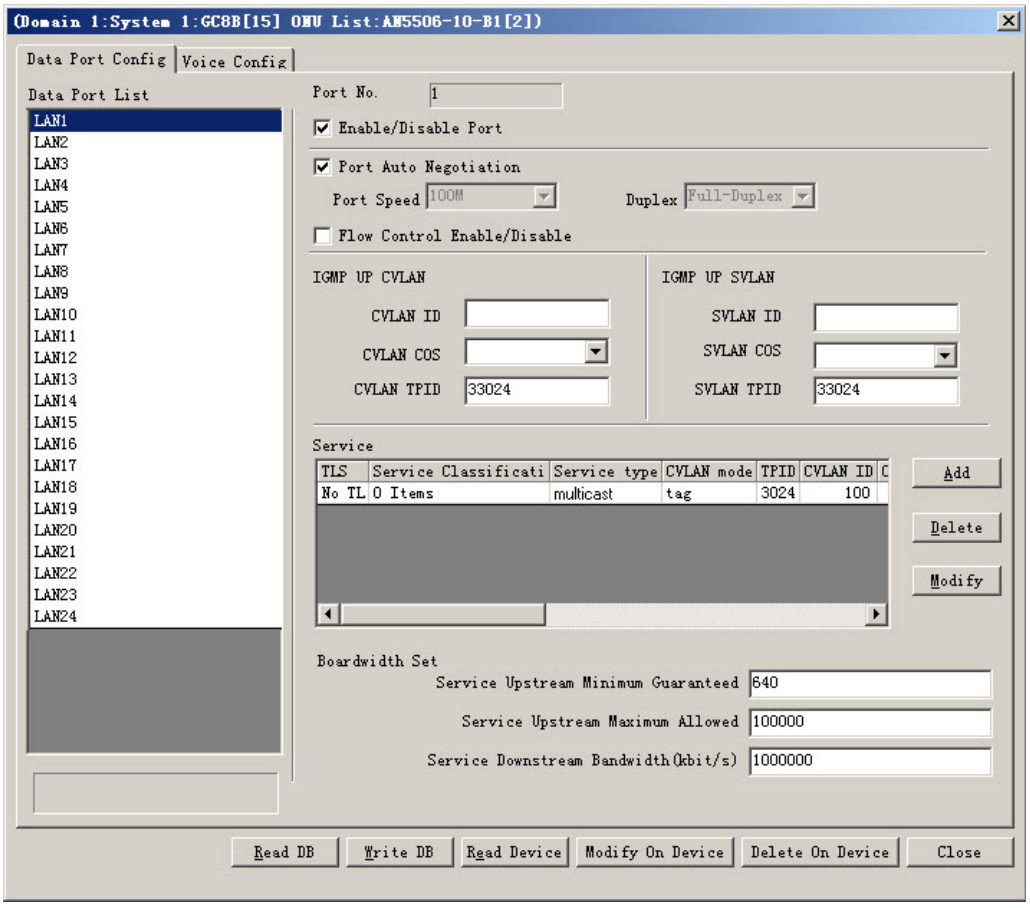


Figure 7-22 Data port configuration-configuring the AN5506-10-B1 under the proxy-snooping mode respectively

4. Select **LAN2** in the **Data Port List** pane, then implement the same configuration on the LAN1 port.
5. Click **OK** to return to **Data Port Config** tab.
6. Click **Modify On Device** to complete the data service configuration of the AN5506-10-B1 ports.

7.1.5.9 Configuration Result

The multicast services on the LAN1 and LAN2 ports that belong to the AN5506-10-B1 is started up; and the users can watch the video programs whose multicast VLAN is 100 normally.

7.1.6 Configuring Data Services in a Batch Manner (for the ONU in type 2)

See Table 1-2 for the ONU in type 2.

7.1.6.1 Planning Data

Table 7-7 The planned data of multicast services for the AN5506-10-B1 in the proxy-snooping mode at the OLT side (configured in a batch manner)

Item		Description	Example
ONU information	ONU type	The type of the actually used ONU.	AN5506-10-B1
	Slot No.	Configures according to the number of the actually used PON port.	15
	PON No.	Configures according to the number of the actually used PON port.	1
	ONU Authorization No.	Configures according to the network planning of the operator.	2
Central office end VLAN	Service name	Configures according to the network planning of the operator.	iptv1
	Starting VLAN ID	The begin VLAN ID number of the uplink port service. Configures according to the network planning of the operator.	100
	VLAN ID End	The end VLAN ID number of the uplink port service. Configures according to the network planning of the operator.	100
	Uplink port No.	Configures according to the number of the actually used uplink port.	20:SFP1
	TAG/UNTAG	The Tag processing mode of the uplink service VLAN can be set as **Tag** or **Untag**. ◆ Under **UNTAG** mode, the TAGs of the uplink packets will be stripped automatically and the packets will be uplinked in the form of UNTAG when they pass the port, whereas the downlink UNTAG packets will be added with designated TAGs. ◆ Under **TAG** mode, the uplink/downlink data packets will not be processed when they pass the port.	Tag
	Service Type	Selects IPTV for the multicast service.	IPTV

Table 7-7 The planned data of multicast services for the AN5506-10-B1 in the proxy-snooping mode at the OLT side (configured in a batch manner) (Continued)

Item		Description	Example
	Slot Bind Mode	Auto Bind	Auto Bind
Uplink port packet suppression	Port No.	Selects 20:2, which corresponds to 20:SFP1.	20:2
	Packet type	Selects the multicast packet.	Multicast package
	Enable/disable	Disables the suprresion in this example.	Disable
Multicast mode	Multicast mode	Configures according to the network planning of the operator.	Proxy-snooping mode
Multicast VLAN	Multicast VLAN	Configures according to the network planning of the operator. The multicast VLAN should be in the range of the local VLAN.	100

Table 7-8 The planned data of multicast services for the AN5506-10-B1 in the proxy-snooping mode at the ONU side (configured in a batch manner)

Item		Description	Example
ONU Bandwidth allocation profile	Profile name	Configures according to the network planning of the operator.	d
	Service Type	Selects IPTV for the multicast service.	IPTV
	Fixed Bandwidth (kbyte/s)	Configures according to the network planning of the operator. The default value is 16.	16
	Assured Bandwidth (kbyte/s)	Configures according to the network planning of the operator. The default value is 0.	0
	Maximum Bandwidth (kbyte/s)	Configures according to the network planning of the operator. The default value is 64.	64
	Service Type	Select integrate for the data services.	Integrate service
	Fixed Bandwidth (kbyte/s) for data service	Configures according to the network planning of the operator. The default value is 16.	16
	Assured Bandwidth (kbyte/s) for data service	Configures according to the network planning of the operator. The default value is 0.	0
	Maximum Bandwidth (kbyte/s) for data service	Configures according to the network planning of the operator. The default value is 64.	1280
ONU configuration	Slot No.	Configures according to the number of the actually used PON port.	15
	PON No.	Configures according to the number of the actually used PON port.	1
	ONU number	Selects the authorization No. of the ONU to be configured.	2

Table 7-8 The planned data of multicast services for the AN5506-10-B1 in the proxy-snooping mode at the ONU side (configured in a batch manner) (Continued)

Item		Description	Example
	GPON bandwidth profile	Selects the bandwidth profile name which the ONU binds to.	d
Multicast service model profile	Profile name	Configures according to the network planning of the operator.	e
	Service type	Selects multicast for the multicast service.	Multicast
	CVLAN Mode	Configures according to the network planning of the operator. Includes **tag** and **transparent**. **tag** is to strip the VLAN Tag from the downlink multicast stream that passes the ONU port. **transparent** is to transparently transmit the downlink multicast stream.	Tag
ONU data service configuration	Slot No.	Configures according to the number of the actually used PON port.	15
	PON No.	Configures according to the number of the actually used PON port.	1
	ONU number	Selects the authorization No. of the ONU to be configured.	2
	Port No.	Selects the authorization No. of the ONU to be configured.	1, 2
	Port add traffic	Selects the service stream sequence number.	1
	CVLAN ID	The VLAN ID that the downlink multicast stream carries.	100
	Service model profile	Selects the multicast service model profile which the ONU ports binds to.	e

7.1.6.2 Configuration Flow Chart

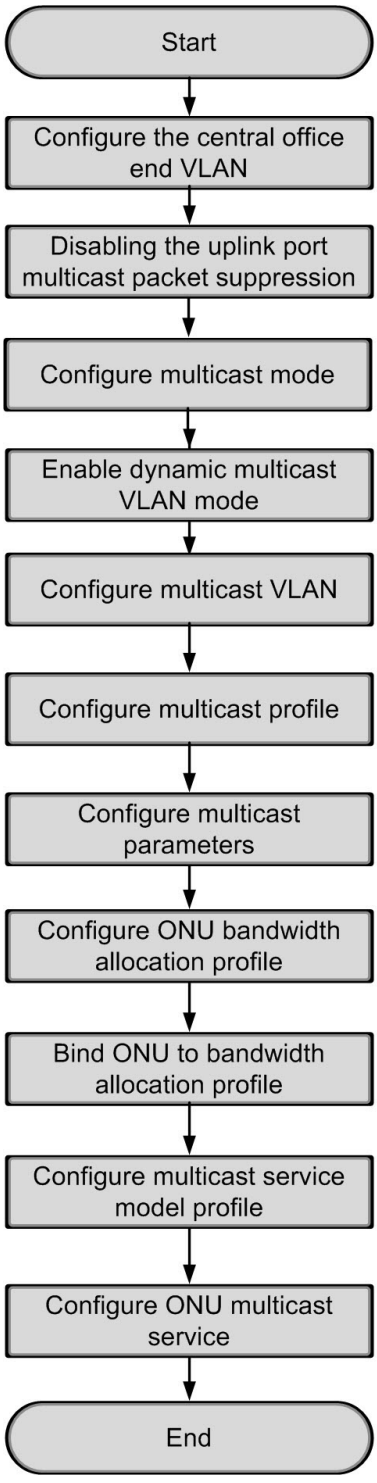


Figure 7-23 The flow of multicast service configuration under the proxy-snooping mode in a batch manner (for the AN5506-10-B1)

7.1.6.3 Configuring Central Office End Service VLAN

See Configuring the Central Office End Service VLAN for the configuration method.

7.1.6.4 Disabling the Uplink Port Multicast Packet Suppression

See Disabling the Uplink Port Multicast Packet Suppression for the configuration method.

7.1.6.5 Configuring Multicast Mode

See Configuring Multicast Mode for the configuration method.

7.1.6.6 Configuring Multicast VLAN

See Configuring Multicast VLAN for the configuration method.

7.1.6.7 Configuring ONU Bandwidth Allocation Profile

1. Right-click the HSWA[9] card in the **Object Tree** pane and select **Service Config Relevance→GPON Service Bandwidth Config Profile** from the shortcut menu to access the **Bandwidth Config Profile** window.
2. Click the pane on left side and click  in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. After clicking **OK**, you should double-click in a blank area of the **Profile Name** and input **a** to create a bandwidth allocation profile.
3. Click the pane on right side and click  in the toolbar to input **2** in the **Please Input The Rows For Add:** dialog box. Click **OK** to add two services.
4. Configure according to the planned data in Table 7-8.
5. Click  in the toolbar and the configuration is completed, as shown in Figure 7-24.

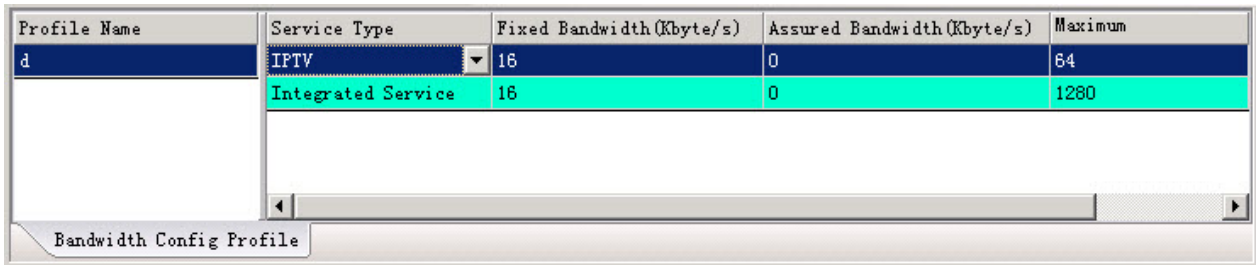


Figure 7-24 The GPON service bandwidth profile-configuring the AN5506-10-B1 under the proxy-snooping mode in a batch manner

7.1.6.8 Binding the ONU to the Bandwidth Allocation Profile

1. Right-click the designated system in the **Object Tree**, select **Config→Batch Configure→ONU Config** to access the **Config Object** window.
2. Click **Set Object as Condition**. Select the AN5506-10-B1[2] under the PON port 1 in Slot 15 and click **OK**.
3. The specific information of the configuration object is displayed in the right pane. Select **d** in the pulldown list of the **GPON Bandwidth Profile** item.
4. Click  in the toolbar and the configuration is completed, as shown in Figure 7-25.

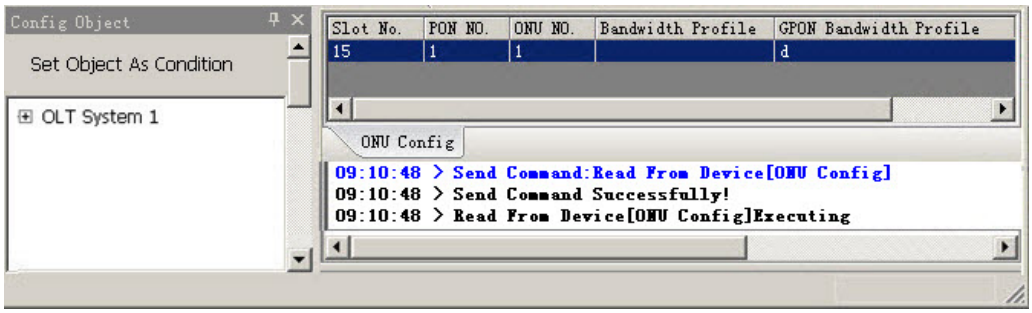


Figure 7-25 ONU configuration-configuring the AN5506-10-B1 under the proxy-snooping mode in a batch manner

7.1.6.9 Configuring Multicast Service Model Profile

1. Right-click the designated system in the **Object Tree**, select **Config→Profile Definition→Service Model Profile** to access the **Service Model Profile** window.
2. Click in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. Click **OK** to create a service model profile.
3. Configure according to the planned data in Table 7-8.
4. Click in the toolbar and the configuration is completed, as shown in Figure 7-26.

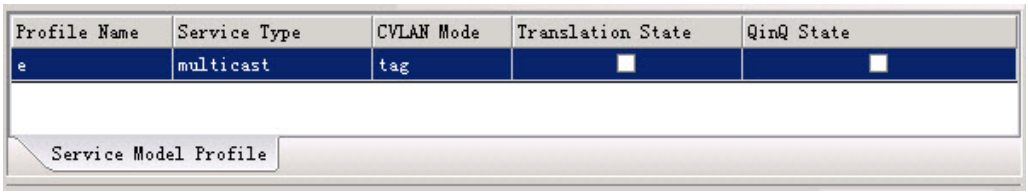


Figure 7-26 The service model profile-configuring the AN5506-10-B1 under the proxy-snooping mode in a batch manner

7.1.6.10 Configuring ONU Multicast Service Parameters

1. Right-click the designated system in the **Object Tree**, select **Config→Batch Configure→ONU Data Service Configure** from the shortcut menu to access the **ONU Data Service Configure** window.
2. Click in the toolbar and the **Add Item number** dialog box appears. Selects LAN1 and LAN2 of the ONU in the left pane and click **OK** to return to the **ONU Data Service Configure** window.

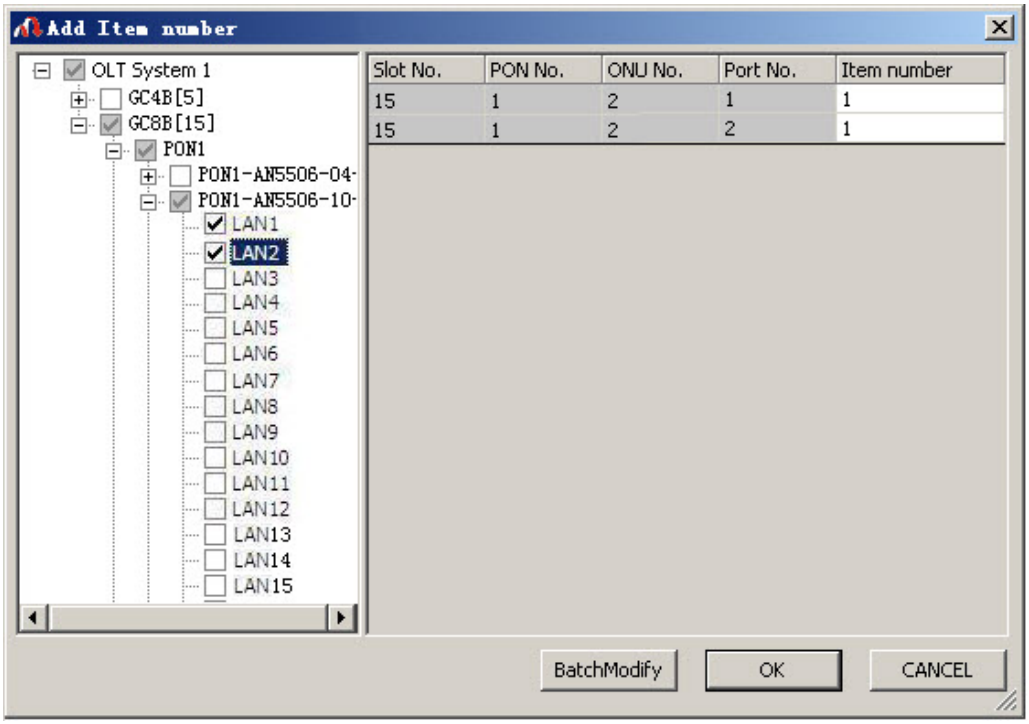


Figure 7-27 Adding entry number - configuring the AN5506-10-B1 under the proxy-snooping mode in a batch manner

3. The specific configuration information of the objects will appear in the right pane. Configure according to the planned data in Table 7-8.
4. Click in the toolbar and the configuration is completed, as shown in Figure 7-28.

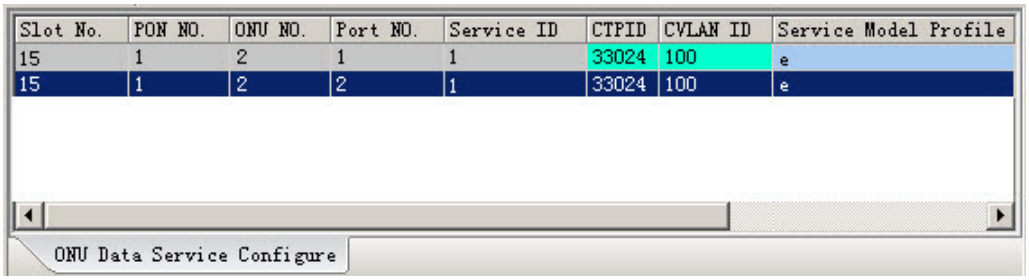


Figure 7-28 ONU data service configuration-configuring the AN5506–10–B1 under the proxy-snooping mode

7.1.6.11 Configuration Result

The multicast services on the LAN1 and LAN2 ports that belong to the AN5506-10-B1 is started up; and the users can watch the video programs whose multicast VLAN is 100 normally.

7.2 Example for Multicast Service Configuration-Proxy Mode

7.2.1 Configuration Rules

- Under the proxy mode, the core switch card and GPON interface card are both in proxy mode; the system proactively manages the statuses of multicast group members, effectively reducing the protocol load on the uplink equipment.
- During the bandwidth allocation: If the data service is not started up on the ONU port, users should configure one **IPTV** service bandwidth and one **data** bandwidth for the ONU in type 1, as well as one **IPTV** service bandwidth and one **Integrated Service** bandwidth for the ONU in type 2. If the data service is started up on the ONU port, users should configure only one **IPTV** service bandwidth for each ONU.
- For ONU type 1, after adding one multicast service to the ONU port, users should add one unicast service; for ONU in type 2, users only need to add one multicast service to the ONU port.
- For ONU in type 1, the VLANs of the multicast uplink and downlink protocols can be configured respectively; for ONU in type 2, the uplink protocol VLAN is translated into the port signal VLAN, and the VLANs of the downlink protocol messages and the downlink multicast stream are processed in the same way.
- The VLAN COS need not be configured in the multicast services. The COS of the downlink multicast flow is carried by the multicast stream and cannot be configured on the OLT and the ONU. The COS of the uplink / downlink multicast protocol message is 0.
- The VLAN of the multicast group should be within the range of the local VLAN.

- One multicast program only belongs to one multicast VLAN. One multicast VLAN can include one multicast program or a multicast group. The multicast group is a collection of multicast programs with an unified authority.
- The AN5116-06B supports multicast VLANs. Different multicast services belong to different multicast VLANs.
- The AN5116-06B's uplink ports can not join multiple VLANs in the untag mode.

7.2.2 Networking Diagram

Figure 7-29 shows the networking diagram of the AN5116-06B to provide the multicast services in proxy mode.

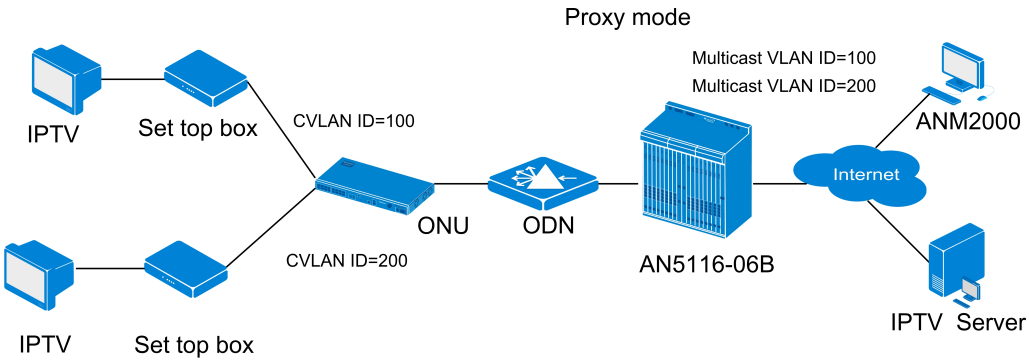


Figure 7-29 The multicast service network connection under the proxy mode

- Downlink direction: The OLT transmits the multicast message with VLAN Tag=100/200 to the ONU via the PON link. The ONU strips Tag from multicast messages then transmits the stream to the set top box for forwarding it to the video users.
- Uplink direction: The ONU attaches the join / leave multicast protocol message with the VLAN ID=100/200 tag transmitted from the set top box ; then transmits the messages to the AN5116-06B. The AN5116-06B forwards them to the IPTV server.

The AN5116-06B uses the HU1A and GC8B card as the interface card at the network side and user side respectively. The HSWA card is compulsory. The AN5506-04-B and the AN5506-10-B1 are used as ONUs in this example.

7.2.3 Configuring Multicast Services Respectively (for the ONU in Type 1)

See Table 1-1 for the ONU in type 1.

7.2.3.1 Planning Data

Table 7-9 The planned data of multicast services for the AN5506-04-B in the proxy mode at the OLT side (configured respectively)

Item		Description	Example
ONU information	ONU type	The type of the actually used ONU.	AN5506-04-B
	Slot No.	Configures according to the number of the actually used PON port.	15
	PON No.	Configures according to the number of the actually used PON port.	1
	ONU Authorization No.	Configures according to the network planning of the operator.	1
Data of the service VLAN in the central office end	Service name	Configures according to the network planning of the operator.	iptv1
	Starting VLAN ID	The begin VLAN ID number of the uplink port service. Configures according to the network planning of the operator.	100
	VLAN ID End	The end VLAN ID number of the uplink port service. Configures according to the network planning of the operator.	200
	Uplink port No.	Configures according to the number of the actually used uplink port.	19:SFP1
	TAG/UNTAG	The Tag processing mode of the uplink service VLAN can be set as **Tag** or **Untag**. ◆ Under **UNTAG** mode, the TAGs of the uplink packets will be stripped automatically and the packets will be uplinked in the form of UNTAG when they pass the port, whereas the downlink UNTAG packets will be added with designated TAGs. ◆ Under **TAG** mode, the uplink/downlink data packets will not be processed when they pass the port.	Tag
	Service Type	Selects IPTV for the multicast service.	IPTV

Table 7-9 The planned data of multicast services for the AN5506-04-B in the proxy mode at the OLT side (configured respectively) (Continued)

Item		Description	Example
Uplink port packet suppression	Port No.	Selects 19:2, which corresponds to 19:SFP1.	19:2
	Packet type	Selects the multicast packet.	Multicast package
	Enable/disable	Disables the supresion in this example.	Disable
Multicast mode	Multicast mode	Configures according to the network planning of the operator.	Proxy mode
Active multicast VLAN mode	Enable/disable	Configures according to the network planning of the operator.	Enable
Multicast VLAN	Multicast VLAN	Configures according to the network planning of the operator. The multicast VLAN should be in the range of the local VLAN.	100
Multicast mode	Profile name	Configures according to the network planning of the operator.	IGMP_Profile
	Configuration group	Configures according to the network planning of the operator.	224.0.1.0
Group parameters	Configuration group	Configures according to the network planning of the operator.	224.0.1.0
	Group VLAN	Configures according to the network planning of the operator. The multicast VLAN should be in the range of the central office end VLAN.	200

Table 7-10 The planned data of multicast services for the AN5506-04-B in the proxy mode at the OLT side (configured respectively)

Item		Description	Example
ONU multicast bandwidth config	Service Type	Selects IPTV for the multicast service.	IPTV
	Fixed Bandwidth (kbyte/s)	Configures according to the network planning of the operator. The default value is 16.	16
	Assured Bandwidth (kbyte/s)	Configures according to the network planning of the operator. The default value is 0.	0
	Maximum Bandwidth (kbyte/s)	Configures according to the network planning of the operator. The default value is 64.	64
	Service Type	Select data for the data services.	Broadband services access the Internet.

Table 7-10 The planned data of multicast services for the AN5506-04-B in the proxy mode at the OLT side (configured respectively) (Continued)

Item		Description	Example	
	Fixed Bandwidth (kbyte/s) for data service	Configures according to the network planning of the operator. The default value is 16.	16	
	Assured Bandwidth (kbyte/s) for data service	Configures according to the network planning of the operator. The default value is 0.	0	
	Maximum Bandwidth (kbyte/s) for data service	Configures according to the network planning of the operator. The default value is 64.	1280	
ONU multicast service config	Port No.	Configures according to the number of the actually used uplink port.	1	2
	Multicast data in VLAN mode	Includes **Tag** and **Untag**. **TAG** means that the downlink multicast stream with designated VLAN tags passes the ONU port; **UNTAG** means that the downlink multicast stream without VLAN Tag passes the ONU port. Configures according to the network planning of the operator.	TAG	
	Multicast data in VLAN mode	Configures according to the network planning of the operator. The ONU only receives the downlink multicast stream with the designated VLAN tag.	100	200
	Multicast protocol VLAN mode	Configures according to the network planning of the operator. Includes **TRANSPARENT**, **TAG**, **RETAG** and **REMOVE**. **TRANSPARENT**: Transparently transmits the uplink multicast protocol message; **TAG**: Adds a VLAN tag to the uplink multicast protocol message; **RETAG**: Reset the VLAN tag that the uplink multicast protocol message carries; **REMOVE**: Remove the VLAN tag that the uplink multicast protocol message carries.	RETAG	

Table 7-10 The planned data of multicast services for the AN5506-04-B in the proxy mode at the OLT side (configured respectively) (Continued)

Item		Description	Example	
	Uplink multicst protocol VLAN	Configures according to the network planning of the operator. The uplink multicast protocol should be in the range of the local VLAN.	100	200
ONU data service configuration	FE port list	Configures according to the number of the actually used ONU port.	LAN1	LAN2
	TAG Mode	Configured as Tag or Untag according to the network planning of the operator. In the **Tag** mode the uplink data packets are tagged, whereas in the **Untag** mode the uplink data packets are untagged.	Untag	
	CVLAN Mode	Configures according to the network planning of the operator. When the **TAG Mode** is Untag, Tag or transparent transmission can be selected. When the **TAG Mode** is Tag, translation or transparent transmission can be selected.	Tag	
	CVLAN ID	Configures according to the network planning of the operator.	100	200
	PON priority or COS	Configures according to the network planning of the operator.	5	5

7.2.3.2 Configuration Flow Chart

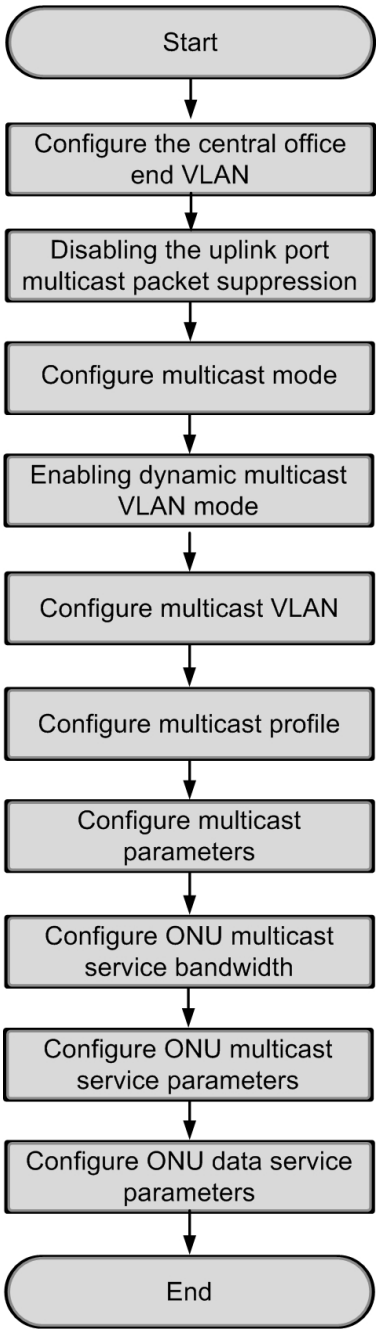


Figure 7-30 The flow of configuring the multicast service under the proxy mode respectively (for the AN5506-04-B)

7.2.3.3 Configuring Central Office End Service VLAN

1. Right-click the HSWA[9] card in the **Object Tree** pane and select **VLAN Config→Local VLAN→Local End Service VLAN** to access the **Local End Service VLAN** tab.
2. click  in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. Click **OK** to create a central office end VLAN.
3. Configure according to the planned data in Table 7-9.
4. Click  in the toolbar and the configuration is completed, as shown in Figure 7-31.

Figure 7-31 Service VLAN local end data-configuring the AN5506-04-B under the proxy mode respectively

7.2.3.4 Disabling the Uplink Port Multicast Packet Suppression

1. Right-click the HSWA[9] card in the **Object Tree** pane and select **Security Config→Upport Packet Rate Control** from the shortcut menu to access the **Uplink Port Packet Suppression** window.
2. According to the planned data in Table 7-9. Select **19:2** in **Port No.** and clear the **Enable/Disable** check box of the corresponding multicast packet.
3. Click  in the toolbar and the configuration is completed, as shown in Figure 7-32.

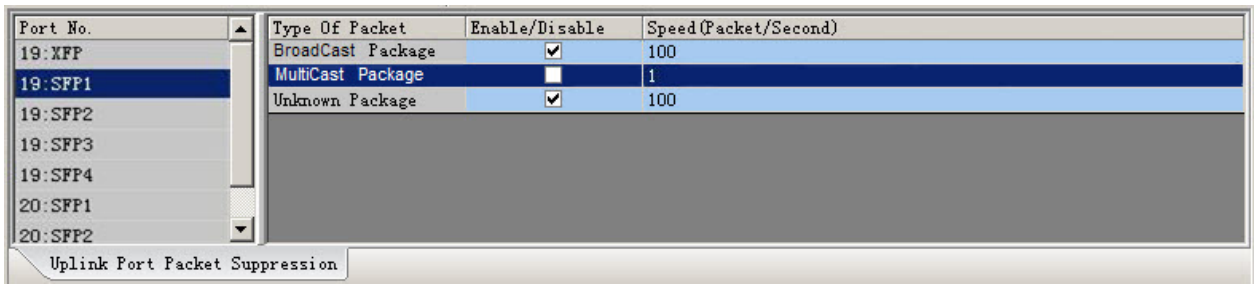


Figure 7-32 The designated uplink port packet suppression-configuring the AN5506-04-B under the proxy mode respectively

7.2.3.5 Configuring Multicast Mode

1. Right-click the HSWA[9] card in the **Object Tree** pane, and select **IGMP Config →IGMP Mode** from the shortcut menu to access the **IGMP Mode** window.
2. According to the planned data in Table 7-9, select **Proxy Mode** in the pulldown list of the **IGMP Mode** item.
3. Click in the toolbar to execute the configuration command, as shown in Figure 7-33.

Figure 7-33 Multicast mode-configuring the AN5506-04-B under the proxy mode respectively

7.2.3.6 Enabling Dynamic Multicast VLAN Mode

1. Right-click the HSWA[9] card in the **Object Tree** pane, and select **IGMP Config →Dynamic IGMP VLAN Mode** from the shortcut menu to access the **Dynamic IGMP VLAN Mode** window.
2. Configure according to the planned data in Table 7-9.
3. Click in the toolbar to execute the configuration command, as shown in Figure 7-34.

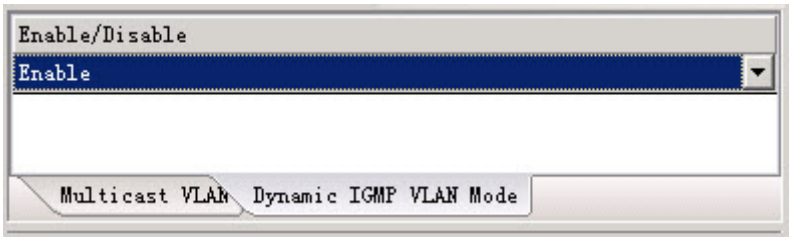


Figure 7-34 Dynamic multicast VLAN mode-configuring the AN5506-04-B under the proxy mode respectively

7.2.3.7 Configuring Multicast VLAN

1. Right-click the HSWA[9] card in the **Object Tree** pane, and select **IGMP Config →Multicast VLAN** from the shortcut menu to access the **Multicast VLAN** window.
2. According to the planned data in Table 7-9, double-click the **VLAN** column and input **100**.
3. Click in the toolbar to execute the configuration command, as shown in Figure 7-35.

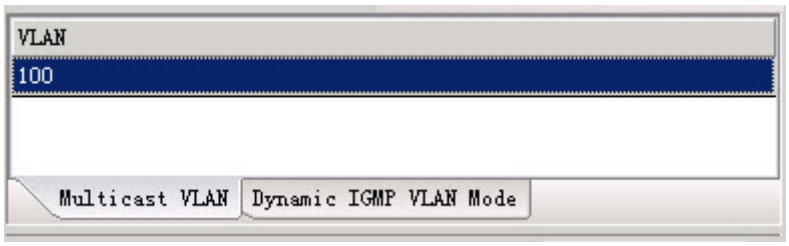


Figure 7-35 Multicast VLAN-configuring the AN5506-04-B under the proxy mode respectively

7.2.3.8 Configuring Multicast Profile

1. Right-click the HSWA[9] card in the **Object Tree** pane, and select **IGMP Config →IGMP Profile and Port** from the shortcut menu to access the **IGMP Profile** window.
2. click in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. Click **OK** to create a multicast profile.
3. Input **IGMP_Profile** in the **Profile Name** colom according to the planned data in Table 7-9.
4. Click the pane on left side and click in the toolbar to input **3** in the **Please Input The Rows For Add:** dialog box. Click **OK** to add a multicast program.
5. Configure according to the planned data in Table 7-9.
6. Click in the toolbar and the configuration is completed, as shown in Figure 7-36.

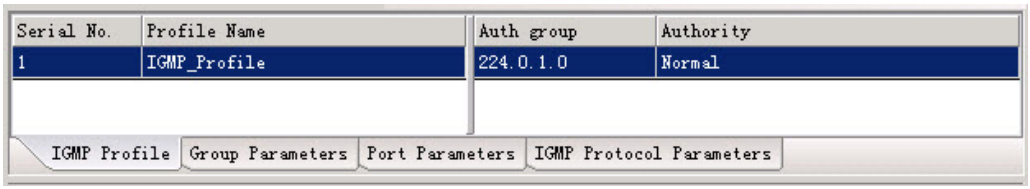


Figure 7-36 Multicast profile-configuring the AN5506-04-B under the proxy mode respectively

7.2.3.9 Configuring Multicast Parameters

Note:

If the **Group VLAN** item is configured for any specific group in this step, the default multicast VLAN becomes no longer valid for the group.

1. Right-click the HSWA[9] card in the **Object Tree** pane, and select **IGMP Config →IGMP Profile and Port** from the shortcut menu to access the **IGMP Profile** window and click **Group Parameters** tab.
2. Click in the toolbar. Input **1** in the **Please Input the Rows for Add:** dialog box that appears. Click **OK** to add one multicast program. The system automatically reads the IP addresses of the multicast programs added to the multicast profile and display them under the **Auth group** item.
3. Configure according to the planned data in Table 7-9.
4. Click in the toolbar and the configuration is completed, as shown in Figure 7-37.

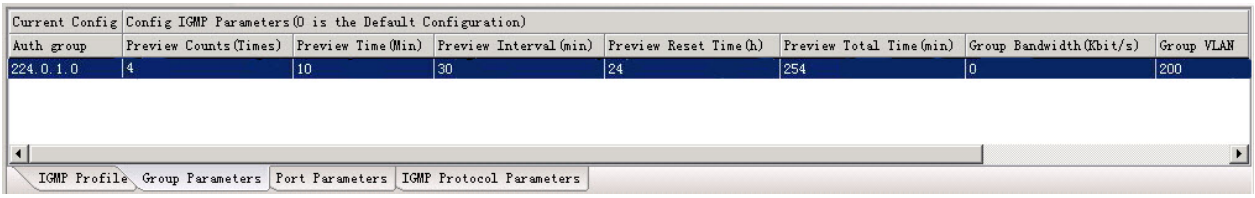


Figure 7-37 Group parameter-configuring the AN5506-04-B under the proxy mode respectively

7.2.3.10 Configuring ONU Multicast Service Bandwidth

1. Click the GC8B[15] card in the **Object Tree** pane and information of all ONUs listed under the GC8B card will be shown in the right pane. Right-click the **PON1-AN5506-04-B[1]** ONU and select **Config→Bandwidth Config** from the shortcut menu to access the **Bandwidth Config** window.
2. Click the pane on right side and click in the toolbar to input **2** in the **Please Input The Rows For Add:** dialog box. Click **OK** to add two services.
3. Configure according to the planned data in Table 7-10.
4. Click in the toolbar and the configuration is completed, as shown in Figure 7-38.

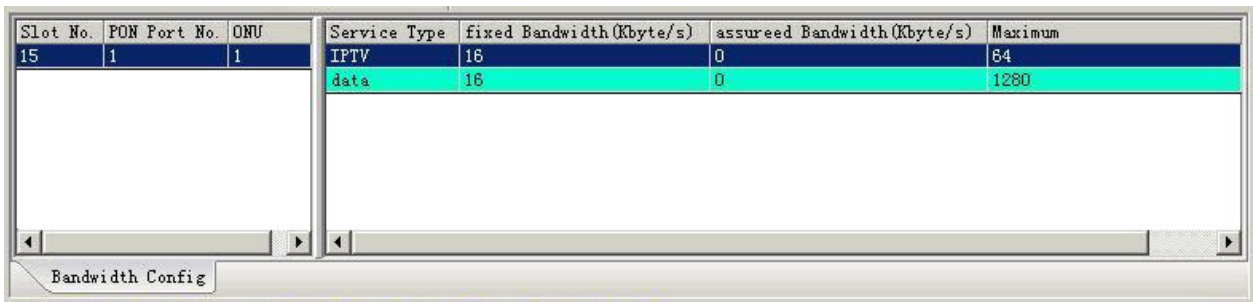


Figure 7-38 Multicast bandwidth allocation-configuring the AN5506-04-B under the proxy mode respectively

7.2.3.11 Configuring ONU Multicast Service Parameters

1. Click the GC8B[15] card in the **Object Tree** pane and information of all ONUs listed under the GC8B card will be shown in the right pane. Right-click the **PON1-AN5506-04-B[1]** ONU and select **Config→ONU IGMP service config** from the shortcut menu to access the **ONU IGMP service config** window.
2. Configure according to the planned data in Table 7-10.
3. Click in the toolbar and the configuration is completed, as shown in Figure 7-39.

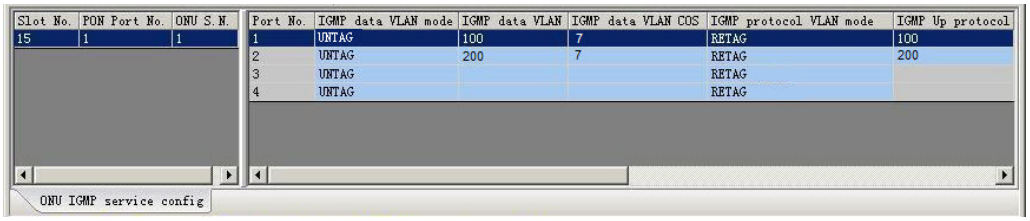


Figure 7-39 ONU multicast service configuration-configuring the AN5506-04-B under the proxy mode respectively

7.2.3.12 Configuring ONU Data Service Parameters

1. Click the GC8B[15] card in the **Object Tree** pane and information of all ONUs listed under the GC8B card will be shown in the right pane. Right-click the **PON1-AN5506-04-B[1]** ONU and select **Config→Service Config** from the shortcut menu to click the **Data Port Config** tab.
2. Select **LAN1** in the **Data Port List** pane, and click the **Add** button to bring up the **Services Configuration** dialog box. Configure parameters in the dialog box according to the planned data in Table 7-10, as shown in Figure 7-40.

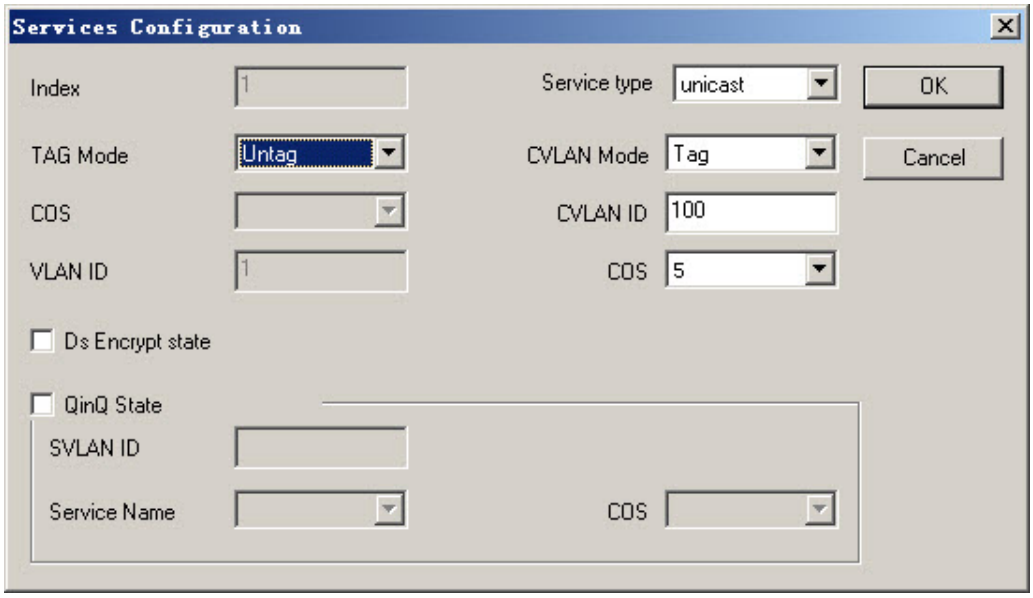


Figure 7-40 Service configuration-configuring the AN5506-04-B under the proxy mode respectively

3. Click **OK** to return to **Data Port Config** tab.

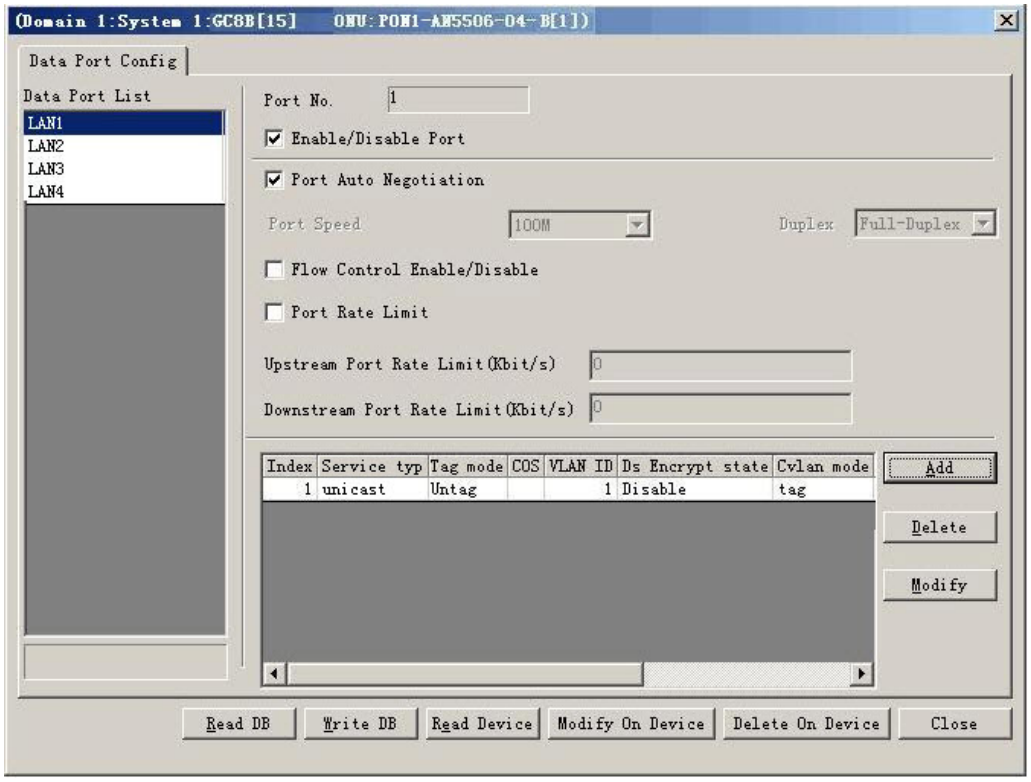


Figure 7-41 Data port configuration-configuring the AN5506-04-B under the proxy mode respectively

4. Select **LAN2** in the **Data Port List** pane, then implement the same configuration on the LAN1 port.
5. Return to **Data port Config** tab and click **Modify On Device**. The data service configuration of the AN5506-04-B ports is completed.

7.2.3.13 Configuration Result

The multicast services on the LAN1 and LAN2 ports that belong to the AN5506-04-B is started up. Users can watch the video programs whose multicast VLAN is 100 normally via the LAN1 port. Users can watch the video programs whose multicast VLAN is 200 normally via the LAN2 port.

7.2.4 Configuring Data Services in a Batch Manner (for the ONU in type 1)

See Table 1-1 for the ONU in type 1.

7.2.4.1 Planning Data

Table 7-11 The planned data of multicast services in the proxy mode at the OLT side (configured in a batch manner)

Item		Description	Example
ONU information	ONU type	The type of the actually used ONU.	AN5506-04-B
	Slot No.	Configures according to the number of the actually used PON port.	15
	PON No.	Configures according to the number of the actually used PON port.	1
	ONU Authorization No.	Configures according to the network planning of the operator.	1
Data of the service VLAN in the central office end	Service name	Configures according to the network planning of the operator.	iptv1
	Starting VLAN ID	The begin VLAN ID number of the uplink port service. Configures according to the network planning of the operator.	100
	VLAN ID End	The end VLAN ID number of the uplink port service. Configures according to the network planning of the operator.	200
	Uplink port No.	Configures according to the number of the actually used uplink port.	19:SFP1
	TAG/UNTAG	The Tag processing mode of the uplink service VLAN can be set as **Tag** or **Untag**. ◆ Under **UNTAG** mode, the TAGs of the uplink packets will be stripped automatically and the packets will be uplinked in the form of UNTAG when they pass the port, whereas the downlink UNTAG packets will be added with designated TAGs. ◆ Under **TAG** mode, the uplink/downlink data packets will not be processed when they pass the port.	Tag
	Service Type	Selects IPTV for the multicast service.	IPTV

Table 7-11 The planned data of multicast services in the proxy mode at the OLT side (configured in a batch manner) (Continued)

Item		Description	Example
Uplink port packet suppression	Port No.	Selects 19:2, which corresponds to 19:SFP1.	19:2
	Packet type	Selects the multicast packet.	Multicast package
	Enable/disable	Disables the suprresion in this example.	Disable
Multicast mode	Multicast mode	Configures according to the network planning of the operator.	Proxy mode
Active multicast VLAN mode	Enable/disable	Configures according to the network planning of the operator.	Enable
Multicast VLAN	Multicast VLAN	Configures according to the network planning of the operator. The multicast VLAN should be in the range of the local VLAN.	100
Multicast mode	Profile name	Configures according to the network planning of the operator.	IGMP_Profile
	Configuration group	Configures according to the network planning of the operator.	224.0.1.0
Group parameters	Configuration group	Configures according to the network planning of the operator.	224.0.1.0
	Group VLAN	Configures according to the network planning of the operator. The multicast VLAN should be in the range of the central office end VLAN.	200

Table 7-12 The planned data of multicast services in the proxy mode at the OLT side (configured in a batch manner)

Item		Description	Example
ONU Bandwidth allocation profile	Profile name	Configures according to the network planning of the operator.	test1
	Service Type	Selects IPTV for the multicast service.	IPTV
	Fixed Bandwidth (kbyte/s)	Configures according to the network planning of the operator. The default value is 16.	16
	Assured Bandwidth (kbyte/s)	Configures according to the network planning of the operator. The default value is 0.	0
	Maximum Bandwidth (kbyte/s)	Configures according to the network planning of the operator. The default value is 64.	64

Table 7-12 The planned data of multicast services in the proxy mode at the OLT side (configured in a batch manner) (Continued)

Item		Description	Example	
	Service Type	Select data for the data services.	Broadband services access the Internet.	
	Fixed Bandwidth (kbyte/s) for data service	Configures according to the network planning of the operator. The default value is 16.	16	
	Assured Bandwidth (kbyte/s) for data service	Configures according to the network planning of the operator. The default value is 0.	0	
	Maximum Bandwidth (kbyte/s) for data service	Configures according to the network planning of the operator. The default value is 64.	1280	
ONU multicast service config	Profile name	Configures according to the network planning of the operator.	a	b
	Multicast data in VLAN mode	Includes **TAG** and **UNTAG**. **TAG** means that the downlink multicast stream with designated VLAN tags passes the ONU port; **UNTAG** means that the downlink multicast stream without VLAN Tag passes the ONU port. Configures according to the network planning of the operator.	TAG	
	Multicast data in VLAN mode	Configures according to the network planning of the operator. The ONU only receives the downlink multicast stream with the designated VLAN tag.	100	200
	Multicast protocol VLAN mode	Configures according to the network planning of the operator. Includes **TRANSPARENT**, **TAG**, **RETAG** and **REMOVE**. **TRANSPARENT**: Transparently transmits the uplink multicast protocol message; **TAG**: Adds a VLAN tag to the uplink multicast protocol message; **RETAG**: Reset the VLAN tag that the uplink multicast protocol message carries; **REMOVE**: Remove the VLAN tag that the uplink multicast protocol message carries.	RETAG	
	Uplink multicst protocol VLAN	Configures according to the network planning of the operator. The uplink multicast protocol should be in the range of the local VLAN.	100	200
Service profile	Profile name	Configures according to the network planning of the operator.	c	
	ONU type	The type of the actually used ONU.	AN5506-04-B	

Table 7-12 The planned data of multicast services in the proxy mode at the OLT side (configured in a batch manner) (Continued)

Item		Description	Example	
	Sub-profile configuration in ONU level	ONU Bandwidth allocation profile	a	
	Port type	Designated ONU port type	LAN port	
	Port No.	Selects the actually used ONU port No.	1	2
	Sub-profile configuration in the port level	Selects ONU multicast service profile	a	b
Service profile bind	Profile ID	Selects the service profile name which the ONU binds	c	
	Bind/unbind	Bind	Bind	
	Slot No.	Configures according to the number of the actually used PON port.	15	
	PON No.	Configures according to the number of the actually used PON port.	1	
	ONU number	Selects according to the ONU authorization number to be bound to the service profile.	1	

7.2.4.2 Configuration Flow Chart

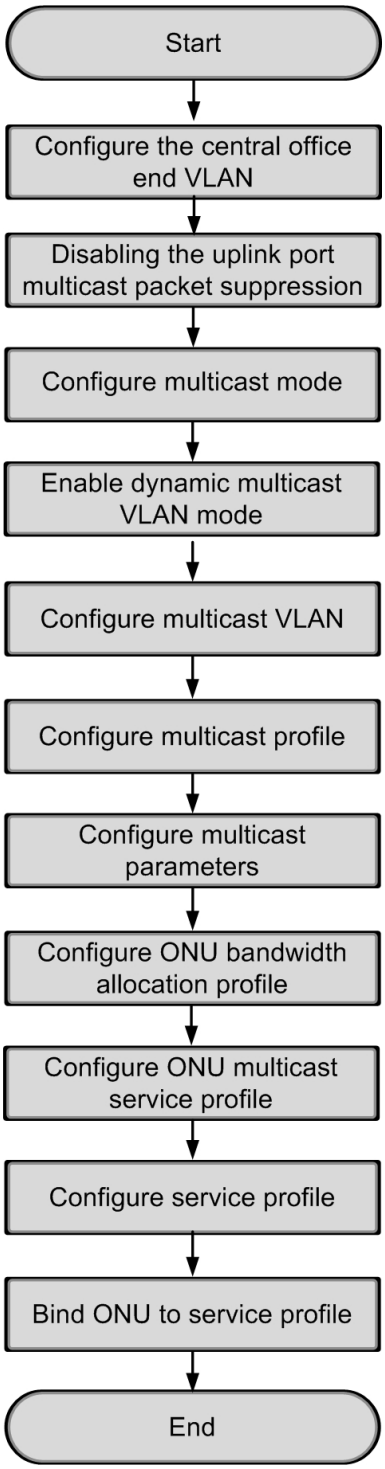


Figure 7-42 Flow of configuring the multicast service under the proxy mode in a batch manner (for the AN5506-04-B)

7.2.4.3 Configuring Central Office End Service VLAN

1. Right-click the HSWA[9] card in the **Object Tree** pane and select **VLAN Config**→**Local VLAN**→**Local End Service VLAN** to access the **Local End Service VLAN** tab.
2. click  in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. Click **OK** to create a central office end VLAN.
3. Configure according to the planned data in Table 7-11.
4. Click  in the toolbar and the configuration is completed, as shown in Figure 7-43.

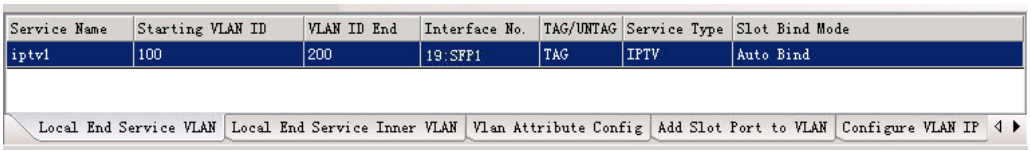


Figure 7-43 Service VLAN local end data-configuring the AN5506-04-B under the proxy mode in a batch manner

7.2.4.4 Disabling the Uplink Port Multicast Packet Suppression

See Disabling the Uplink Port Multicast Packet Suppression for the configuration method.

7.2.4.5 Configuring Multicast Mode

See Configuring Multicast Mode for the configuration method.

7.2.4.6 Enabling Dynamic Multicast VLAN Mode

See Enabling Dynamic Multicast VLAN Mode for the configuration method.

7.2.4.7 Configuring Multicast VLAN

See Configuring Multicast VLAN for the configuration method.

7.2.4.8 Configuring Multicast Profile

See Configuring Multicast Profile for the configuration method.

7.2.4.9 Configuring Multicast Parameters

See Configuring Multicast Parameters for the configuration method.

7.2.4.10 Configuring ONU Bandwidth Allocation Profile

1. Right-click the HSWA[9] card in the **Object Tree** pane and select **Service Config Relevance→GPON Service Bandwidth Config Profile** from the shortcut menu to access the **Bandwidth Config Profile** window.
2. Click in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. After clicking **OK**, you should double-click in a blank area of the **Profile Name** and input **test1** to create a bandwidth allocation profile.
3. Click in the toolbar to input **2** in the **Please Input The Rows For Add:** dialog box. Click **OK** to add two services.
4. Configure according to the planned data in Table 7-11.
5. Click in the toolbar and the configuration is completed, as shown in Figure 7-44.

Profile Name	Service Type	Fixed Bandwidth(Kbyte/s)	Assured Bandwidth(Kbyte/s)	Maximum Bandwidth(Kbyte/s)
test1	IPTV	16	0	84
	DATA	16	0	1280

Bandwidth Config Profile

Figure 7-44 The GPON service bandwidth profile-configuring the AN5506-04-B under the proxy mode in a batch manner

7.2.4.11 Configuring ONU Multicast Service Profile

1. Right-click the HSWA[9] card in the **Object Tree** pane and select **Service Config Relevance→Service Profile Config** from the shortcut menu to access the **Data Service Profile** window and click **IGMP Service Profile** tab.
2. click in the toolbar to input **2** in the **Please Input The Rows For Add:** dialog box. Click **OK** to create two multicast service profiles.
3. Configure according to the planned data in Table 7-11.
4. Click in the toolbar and the configuration is completed, as shown in Figure 7-45.

Profile Name	IGMP Data VLAN Mode	IGMP Data VLAN	IGMP Data VLAN COS	IGMP Protocol VLAN Mode	IGMP Up Protocol VLAN
a	Untag	100	7	RETAG	100
b	Untag	200	7	RETAG	200

Data Service Profile | IGMP Service Profile | Voice Service Profile | Service Profile | Service Profile Binding

Figure 7-45 Multicst service profile-configuring the AN5506-04-B under the proxy mode in a batch manner

7.2.4.12 Configuring Service Profile

1. Right-click the HSWA[9] card in the **Object Tree** pane and select **Service Config Relevance→Service Profile Config** from the shortcut menu to access the **Data Service Profile** window and click **Service Profile** tab.
2. Click in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. Click **OK** to create a service profile.
3. Double click the bland field of the **Profile Name** and input **c** and select **AN5506-04-B** from the drop-down list of the **ONU Type**. Double-click the blank area of the **ONU Subprofile Config** to access the **ONU Subprofile Config** dialog box.
4. In the **ONU Subprofile Config** dialog box, click **Add** to add a new profile configuration. Click the **Profile type** drop-down list to select **Bandwidth Config Profile**. Double-click the blank area below the **Profile Name** to input **test1**, as shown in Figure 7-46.

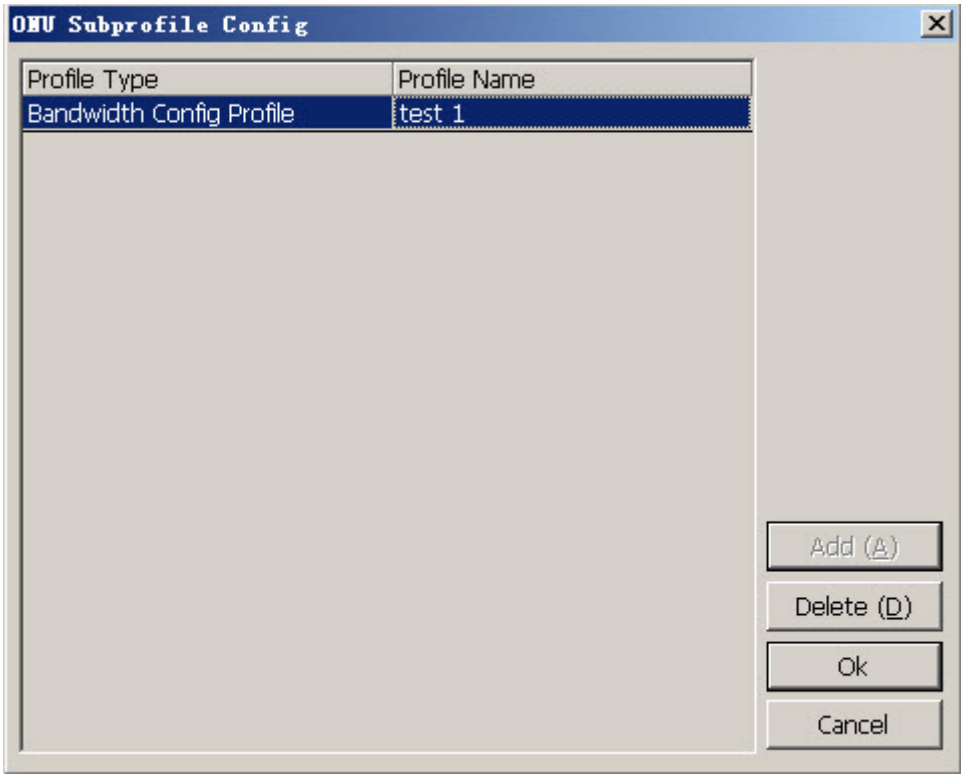


Figure 7-46 ONU subprofile configuration-configuring the AN5506-04-B under the proxy mode in a batch manner

5. Click **OK** to return to **Service Profile** window.
6. Click the pane on right side and click in the toolbar to input **2** in the **Please Input The Rows For Add:** dialog box. Click **OK**.
7. Click the **Port Type** drop-down list to select **LAN port**. Double-click the blank area of the **Port No.** and input **1** and **2**. Double-click the blank area of the **ONU Port Profile Config** to access the **ONU Port Profile Config** dialog box.
8. In the **ONU Port Profile Config** dialog box, click **Add** to add a new profile configuration. Click the drop-down list of the **Profile Type** to select **IGMP Service Profile**. Double-click the blank area below the **Profile Name** to input **a**, as shown in Figure 7-47.

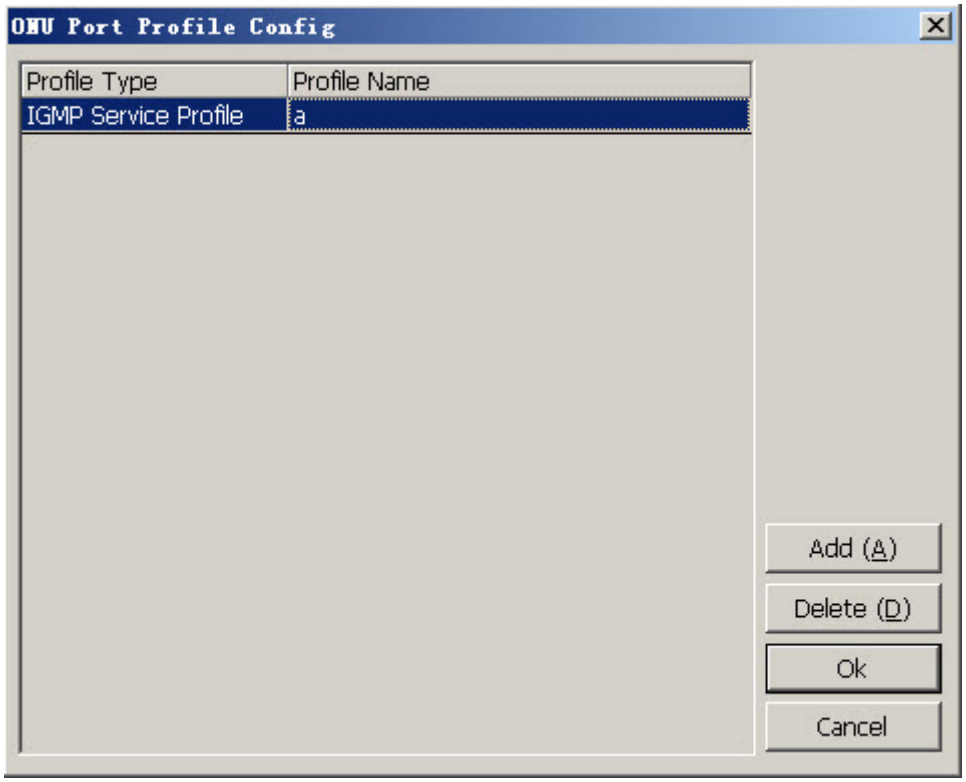


Figure 7-47 Port subprofile configuration-configuring the AN5506-04-B under the proxy mode in a batch manner

9. Double-click the blank area of the **ONU Port Profile Config** to bind the multicast service profile b.
10. Click **OK** to return to **Service Profile** window.
11. Click in the toolbar and the configuration is completed, as shown in Figure 7-48.

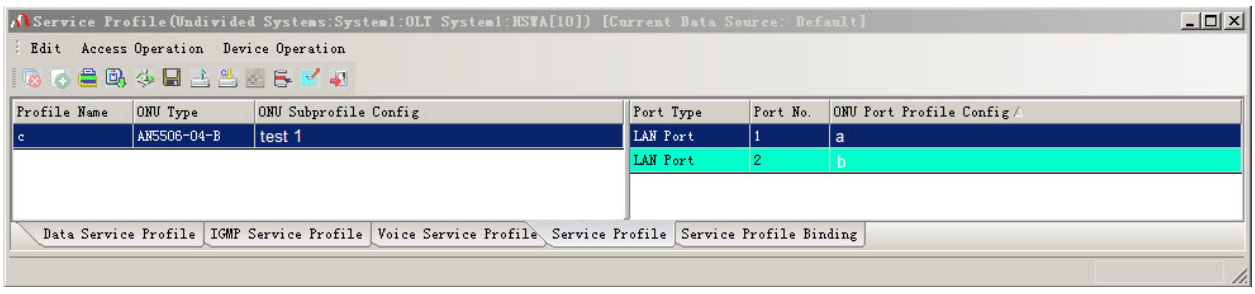


Figure 7-48 Service profile-configuring the AN5506-04-B under the proxy mode in a batch manner

7.2.4.13 Binding ONU to Service Profile

1. Right-click the HSWA[9] card in the **Object Tree** pane and select **Service Config Relevance→Service Profile Config** from the shortcut menu to access the **Data Service Profile** window and click **Service Profile Binding** tab.
2. Click  in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. Click **OK** to create a service profile.
3. Select **c** from the drop-down list of **Profile ID** and select **Attach** from the drop-down list of **Action**.
4. Click the pane on right side and click  in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. Click **OK**.
5. Double-click a blank area under the **ONU No.** item to select the designated ONU in the **Select Objects** dialog box, as shown in Figure 7-49.

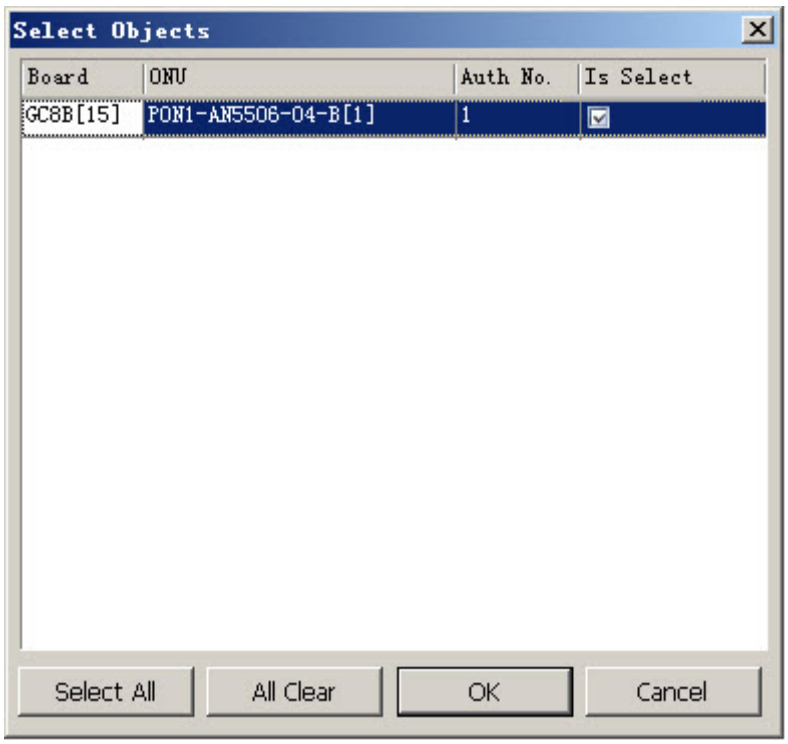


Figure 7-49 Selecting object-configuring the AN5506-04-B under the proxy mode in a batch manner

6. Click **OK** to return to **Service Profile Binding** window.
7. Click  in the toolbar and the configuration is completed, as shown in Figure 7-50.

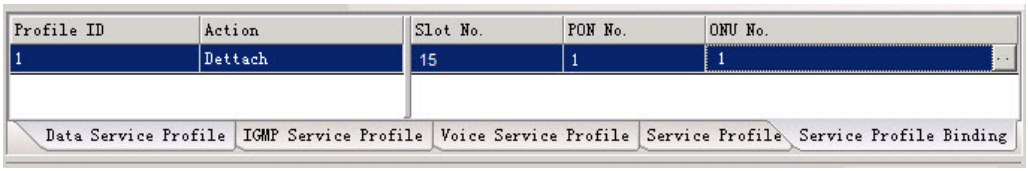


Figure 7-50 Service profile binding-configuring the AN5506-04-B under the proxy mode in a batch manner

7.2.4.14 Configuration Result

The multicast services on the LAN1 and LAN2 ports that belong to the AN5506-04-B are started up. Users can watch the video programs whose multicast VLAN is 100 normally via the LAN1 port. Users can watch the video programs whose multicast VLAN is 200 normally via the LAN2 port.

7.2.5 Configuring Multicast Services Respectively (for the ONU in Type 2)

See Table 1-2 for the ONU in type 2.

7.2.5.1 Planning Data

Table 7-13 The planned data of multicast services for the AN5506-10-B1 in the proxy mode at the OLT side (configured respectively)

Item		Description	Example
ONU information	ONU type	The type of the actually used ONU.	AN5506-10-B1
	Slot No.	Configures according to the number of the actually used PON port.	15
	PON No.	Configures according to the number of the actually used PON port.	1
	ONU Authorization No.	Configures according to the network planning of the operator.	1
Data of the service VLAN in the central office end	Service name	Configures according to the network planning of the operator.	iptv1

Table 7-13 The planned data of multicast services for the AN5506-10-B1 in the proxy mode at the OLT side (configured respectively) (Continued)

Item		Description	Example
	Starting VLAN ID	The begin VLAN ID number of the uplink port service. Configures according to the network planning of the operator.	100
	VLAN ID End	The end VLAN ID number of the uplink port service. Configures according to the network planning of the operator.	200
	Uplink port No.	Configures according to the number of the actually used uplink port.	19:SFP1
	TAG/UNTAG	The Tag processing mode of the uplink service VLAN can be set as **Tag** or **Untag**. ◆ Under **UNTAG** mode, the TAGs of the uplink packets will be stripped automatically and the packets will be uplinked in the form of UNTAG when they pass the port, whereas the downlink UNTAG packets will be added with designated TAGs. ◆ Under **TAG** mode, the uplink/downlink data packets will not be processed when they pass the port.	Tag
	Service Type	Selects IPTV for the multicast service.	IPTV
Uplink port packet suppression	Port No.	Selects 19:2, which corresponds to 19:SFP1.	19:2
	Packet type	Selects the multicast packet.	Multicast package
	Enable/disable	Disables the suprresion in this example.	Disable
Multicast mode	Multicast mode	Configures according to the network planning of the operator.	Proxy mode
Active multicast VLAN mode	Enable/disable	Configures according to the network planning of the operator.	Enable
Multicast VLAN	Multicast VLAN	Configures according to the network planning of the operator. The multicast VLAN should be in the range of the local VLAN.	100
Multicast mode	Profile name	Configures according to the network planning of the operator.	IGMP_Profile
	Configuration group	Configures according to the network planning of the operator.	224.0.1.0
Group parameters	Configuration group	Configures according to the network planning of the operator.	224.0.1.0

Table 7-13 The planned data of multicast services for the AN5506-10-B1 in the proxy mode at the OLT side (configured respectively) (Continued)

Item		Description	Example
	Group VLAN	Configures according to the network planning of the operator. The multicast VLAN should be in the range of the central office end VLAN.	200

Table 7-14 The planned data of multicast services for the AN5506-10-B1 in the proxy mode at the ONU side (configured respectively)

Item		Description	Example	
ONU multicast bandwidth config	Service Type	Selects IPTV for the multicast service.	IPTV	
	Fixed Bandwidth (kbyte/s)	Configures according to the network planning of the operator. The default value is 16.	16	
	Assured Bandwidth (kbyte/s)	Configures according to the network planning of the operator. The default value is 0.	0	
	Maximum Bandwidth (kbyte/s)	Configures according to the network planning of the operator. The default value is 64.	64	
	Service Type	Select **integrated service** for the data services.	Integrate service	
	Fixed Bandwidth (kbyte/s) for data service	Configures according to the network planning of the operator. The default value is 16.	16	
	Assured Bandwidth (kbyte/s) for data service	Configures according to the network planning of the operator. The default value is 0.	0	
	Maximum Bandwidth (kbyte/s) for data service	Configures according to the network planning of the operator. The default value is 64.	1280	
ONU multicast service config	Data port list	Configures according to the number of the actually used ONU port.	LAN1	LAN2
	Service Type	Selects multicast for the multicast service.	Multicast	
	VLAN Mode	Configures according to the network planning of the operator. Includes **tag** and **transparent**. **tag** is to strip the VLAN Tag from the downlink multicast stream that passes the ONU port. **transparent** is to transparently transmit the downlink multicast stream.	Tag	

Table 7-14 The planned data of multicast services for the AN5506-10-B1 in the proxy mode at the ONU side (configured respectively) (Continued)

Item		Description	Example	
	CVLAN ID	The VLAN ID that the downlink multicast stream carries. Configures according to the network planning of the operator.	100	200

7.2.5.2 Configuration Flow Chart

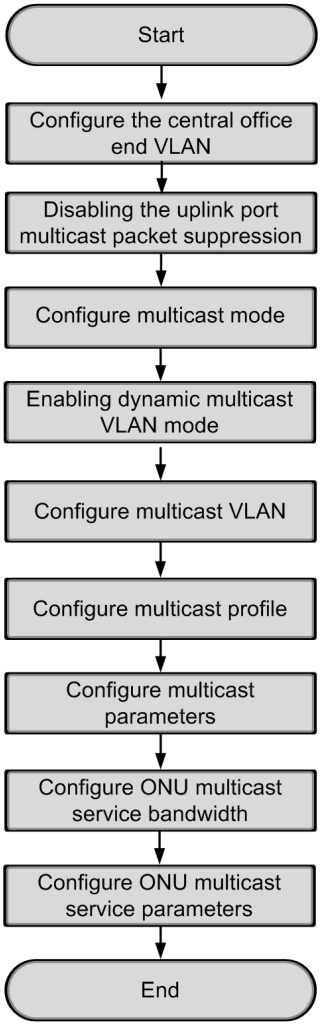


Figure 7-51 Flow of configuring the multicast service under the proxy mode respectively (for the AN5506-10-B1)

7.2.5.3 Configuring Central Office End Service VLAN

See Configuring Central Office End Service VLAN for the configuration method.

7.2.5.4 Disabling the Uplink Port Multicast Packet Suppression

See Disabling the Uplink Port Multicast Packet Suppression for the configuration method.

7.2.5.5 Configuring Multicast Mode

See Configuring Multicast Mode for the configuration method.

7.2.5.6 Enabling Dynamic Multicast VLAN Mode

See Enabling Dynamic Multicast VLAN Mode for the configuration method.

7.2.5.7 Configuring Multicast VLAN

See Configuring Multicast VLAN for the configuration method.

7.2.5.8 Configuring Multicast Profile

See Configuring Multicast Profile for the configuration method.

7.2.5.9 Configuring Multicast Parameters

See Configuring Multicast Parameters for the configuration method.

7.2.5.10 Configuring ONU Multicast Service Bandwidth

1. Click the GC8B[15] card in the **Object Tree** pane and information of all ONUs listed under the GC8B[15] card will be shown in the right pane. Right-click the **PON1-AN5506-10-B1[1]** ONU and select **Config→Bandwidth Config** from the shortcut menu to access the **Bandwidth Config** window.

2. Click the pane on right side and click in the toolbar to input **2** in the **Please Input The Rows For Add:** dialog box. Click **OK** to add two services.
3. Configure according to the planned data in Table 7-14.
4. Click in the toolbar and the configuration is completed, as shown in Figure 7-52.

Figure 7-52 Multicast bandwidth allocation-configuring the AN5506-10-B1 under the proxy mode respectively

7.2.5.11 Configuring ONU Multicast Service Parameters

1. Click the GC8B[15] card in the **Object Tree** pane and information of all ONUs listed under the GC8B[15] card will be shown in the right pane. Right-click the **PON1-AN5506-10-B1[1]** ONU and select **Config→Service Config** from the shortcut menu to click the **Data Port Config** tab.
2. Select **LAN1** in the **Data Port List** pane, and click **Add** to bring up the **Services Configuration** dialog box. Configure parameters in the dialog box according to the planned data in Table 7-14, as shown in Figure 7-53.

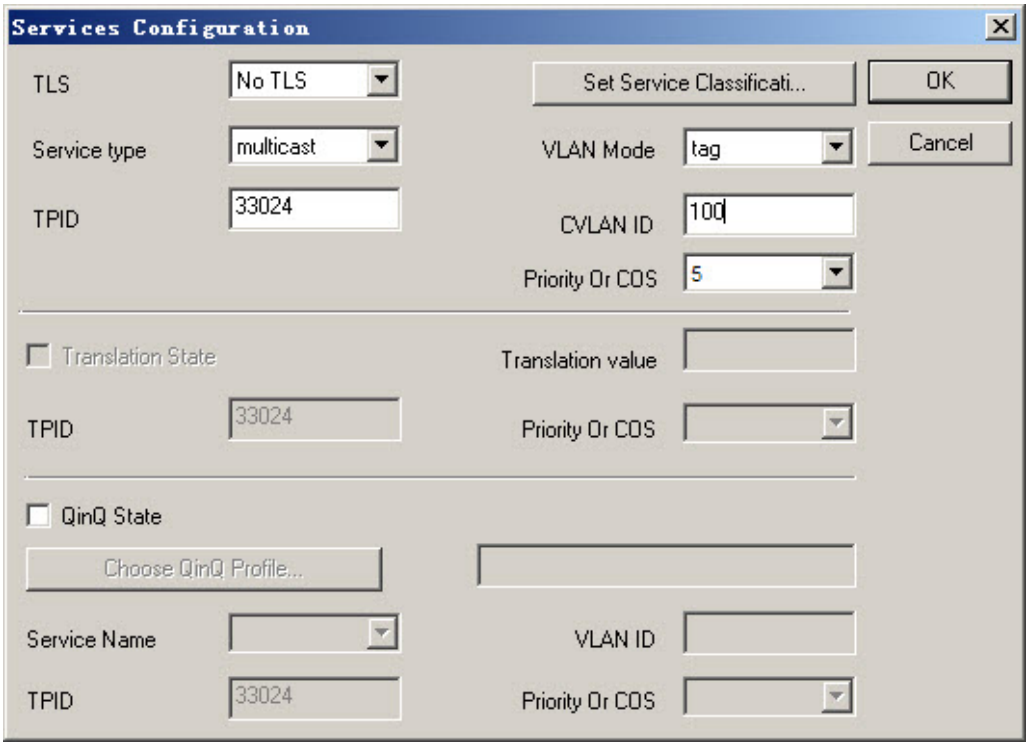


Figure 7-53 Service configuration-configuring the AN5506-10-B1 under the proxy mode respectively (VLAN 100)

3. Click **OK** to return to **Data Port Config** tab.

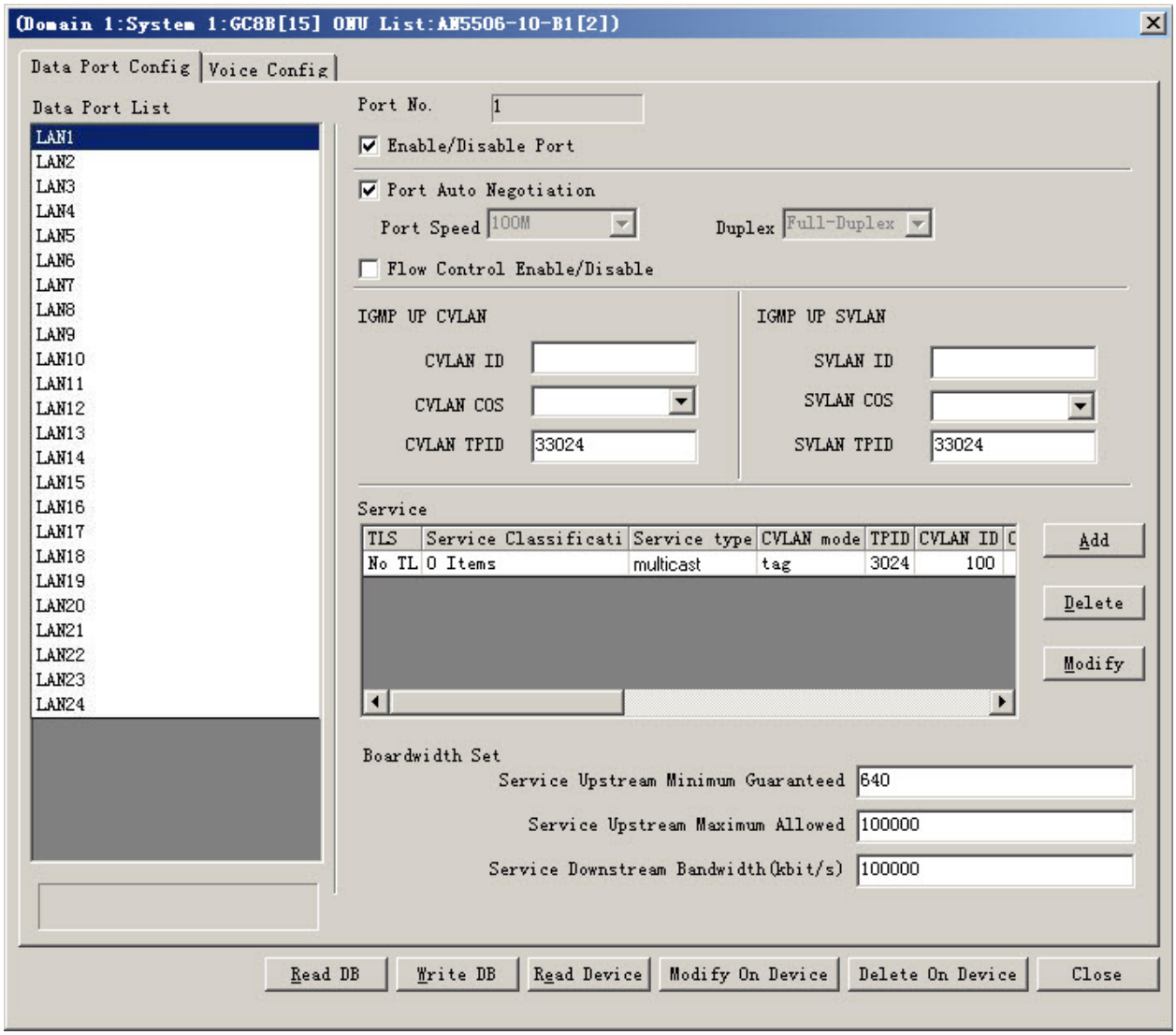


Figure 7-54 Data port configuration-configuring the AN5506-10-B1 under the proxy mode respectively (VLAN 100)

4. Select **LAN2** in the **Data Port List** pane, and click **Add** to bring up the **Services Configuration** dialog box. Configure parameters in the dialog box according to the planned data in Table 7-14, as shown in Figure 7-55.

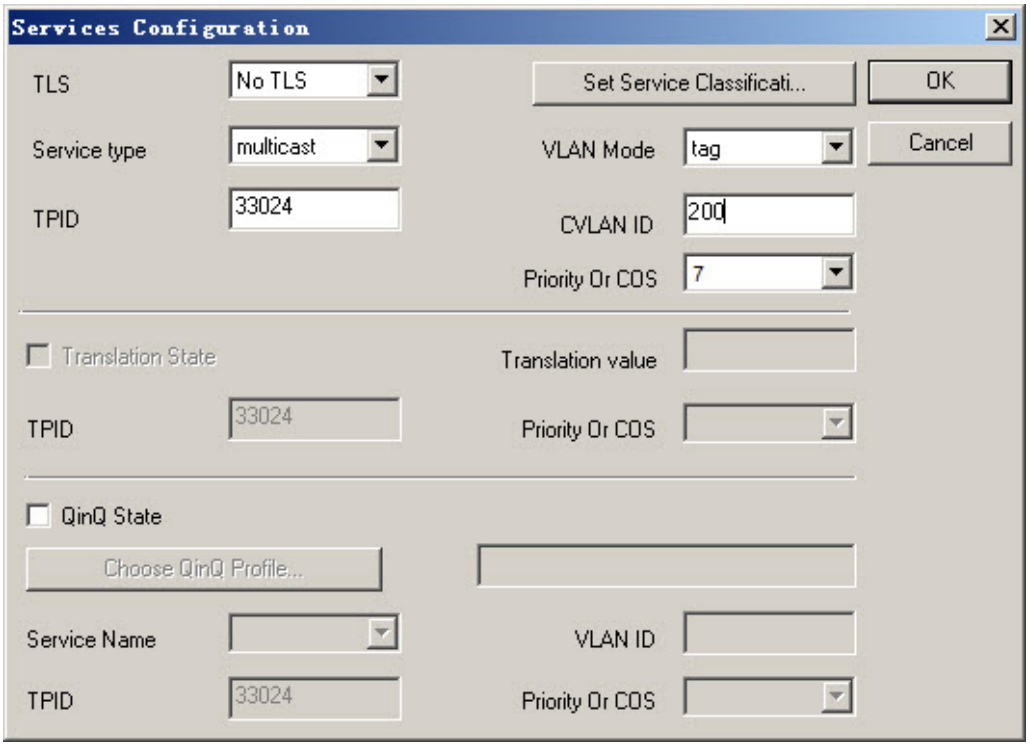


Figure 7-55 Service configuration-configuring the AN5506-10-B1 under the proxy mode respectively (VLAN 200)

5. Click **OK** to return to **Data Port Config** tab.

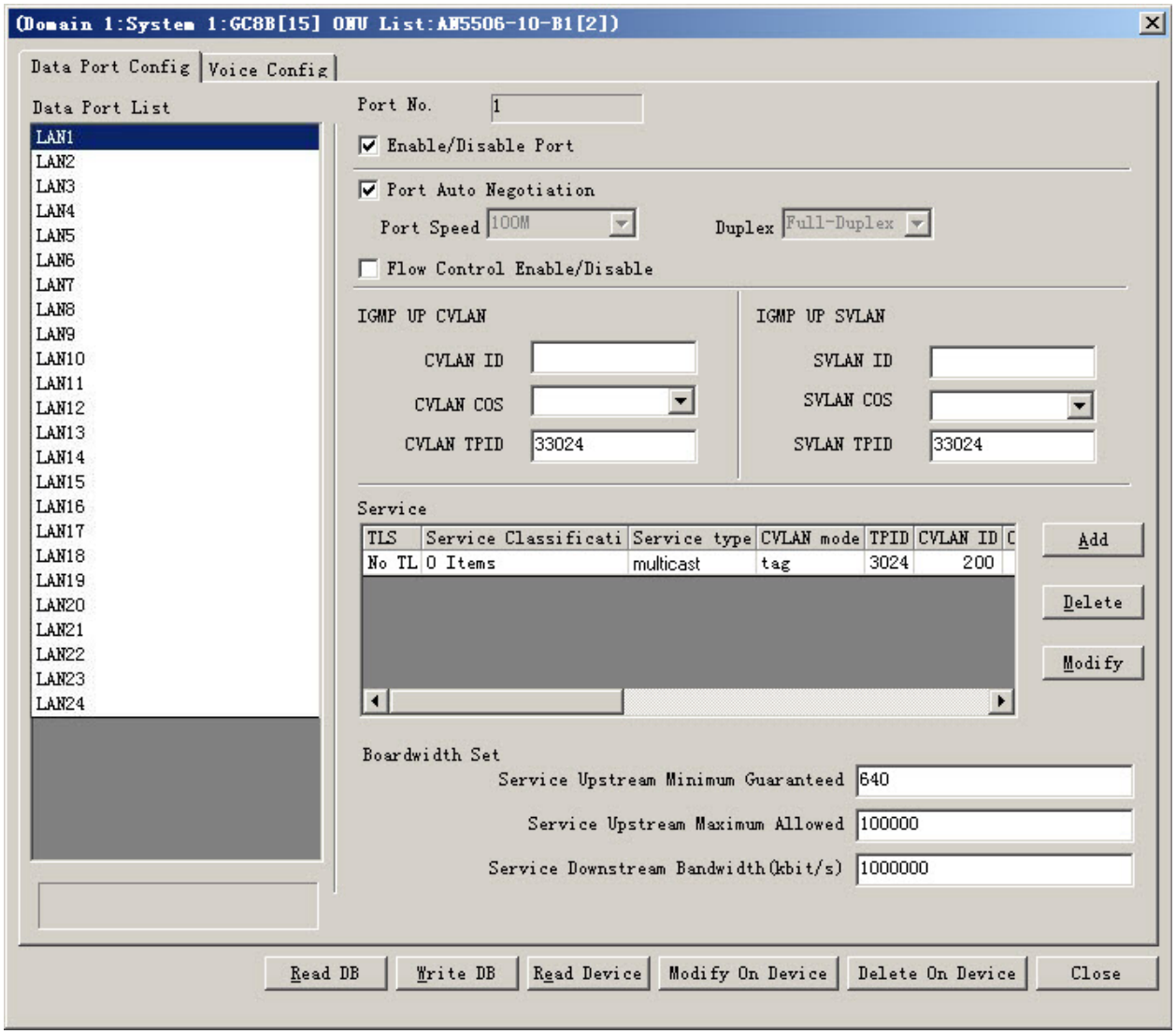


Figure 7-56 Data port configuration-configuring the AN5506-10-B1 under the proxy mode respectively (VLAN 200)

6. Click **Modify On Device** to complete the data service configuration of the AN5506-10-B1 ports.

7.2.5.12 Configuration Result

The multicast services on the LAN1 and LAN2 ports that belong to the AN5506-10-B1 are started up. Users can watch the video programs whose multicast VLAN is 100 normally via the LAN1 port. Users can watch the video programs whose multicast VLAN is 200 normally via the LAN2 port.

7.2.6 Configuring Data Services in a Batch Manner (for the ONU in type 2)

See Table 1-2 for the ONU in type 2.

7.2.6.1 Planning Data

Table 7-15 The planned data of multicast services for the AN5506-10-B1 in the proxy mode at the OLT side (configured in a batch manner)

Item		Description	Example
ONU information	ONU type	The type of the actually used ONU.	AN5506-10-B1
	Slot No.	Configures according to the number of the actually used PON port.	15
	PON No.	Configures according to the number of the actually used PON port.	1
	ONU Authorization No.	Configures according to the network planning of the operator.	1
Data of the service VLAN in the central office end	Service name	Configures according to the network planning of the operator.	iptv1
	Starting VLAN ID	The begin VLAN ID number of the uplink port service. Configures according to the network planning of the operator.	100
	VLAN ID End	The end VLAN ID number of the uplink port service. Configures according to the network planning of the operator.	200
	Uplink port No.	Configures according to the number of the actually used uplink port.	19:SFP1
	TAG/UNTAG	The Tag processing mode of the uplink service VLAN can be set as **Tag** or **Untag**. ◆ Under **UNTAG** mode, the TAGs of the uplink packets will be stripped automatically and the packets will be uplinked in the form of UNTAG when they pass the port, whereas the downlink UNTAG packets will be added with designated TAGs. ◆ Under **TAG** mode, the uplink/downlink data packets will not be processed when they pass the port.	Tag
	Service Type	Selects IPTV for the multicast service.	IPTV

Table 7-15 The planned data of multicast services for the AN5506-10-B1 in the proxy mode at the OLT side (configured in a batch manner) (Continued)

Item		Description	Example
Uplink port packet suppression	Port No.	Selects 19:2, which corresponds to 19:SFP1.	19:2
	Packet type	Selects the multicast packet.	Multicast package
	Enable/disable	Disables the suprresion in this example.	Disable
Multicast mode	Multicast mode	Configures according to the network planning of the operator.	Proxy mode
Active multicast VLAN mode	Enable/disable	Configures according to the network planning of the operator.	Enable
Multicast VLAN	Multicast VLAN	Configures according to the network planning of the operator. The multicast VLAN should be in the range of the local VLAN.	100
Multicast mode	Profile name	Configures according to the network planning of the operator.	IGMP_Profile
	Configuration group	Configures according to the network planning of the operator.	224.0.1.0
Group parameters	Configuration group	Configures according to the network planning of the operator.	224.0.1.0
	Group VLAN	Configures according to the network planning of the operator. The multicast VLAN should be in the range of the central office end VLAN.	200

Table 7-16 The planned data of multicast services for the AN5506-10-B1 in the proxy mode at the ONU side (configured in a batch manner)

Item		Description	Example
ONU Bandwidth allocation profile	Profile name	Configures according to the network planning of the operator.	d
	Service Type	Selects IPTV for the multicast service.	IPTV
	Fixed Bandwidth (kbyte/s)	Configures according to the network planning of the operator. The default value is 16.	16
	Assured Bandwidth (kbyte/s)	Configures according to the network planning of the operator. The default value is 0.	0
	Maximum Bandwidth (kbyte/s)	Configures according to the network planning of the operator. The default value is 64.	64
	Service Type	Select integrate for the data services.	Integrate service

Table 7-16 The planned data of multicast services for the AN5506-10-B1 in the proxy mode at the ONU side (configured in a batch manner) (Continued)

Item		Description	Example	
	Fixed Bandwidth (kbyte/s) for data service	Configures according to the network planning of the operator. The default value is 16.	16	
	Assured Bandwidth (kbyte/s) for data service	Configures according to the network planning of the operator. The default value is 0.	0	
	Maximum Bandwidth (kbyte/s) for data service	Configures according to the network planning of the operator. The default value is 64.	1280	
ONU configuration	Slot No.	Configures according to the number of the actually used PON port.	15	
	PON No.	Configures according to the number of the actually used PON port.	1	
	ONU number	Selects the authorization No. of the ONU to be configured.	1	
	GPON bandwidth profile	Selects the bandwidth profile name which the ONU binds to.	d	
Multicast service model profile	Profile name	Configures according to the network planning of the operator.	e	
	Service type	Selects multicast for the multicast service.	Multicast	
	CVLAN Mode	Configures according to the network planning of the operator. Includes **tag** and **transparent**. **tag** is to strip the VLAN Tag from the downlink multicast stream that passes the ONU port. **transparent** is to transparently transmit the downlink multicast stream.	Tag	
ONU data service configuration	Slot No.	Configures according to the number of the actually used PON port.	15	
	PON No.	Configures according to the number of the actually used PON port.	1	
	ONU number	Selects the authorization No. of the ONU to be configured.	1	
	Port No.	Selects the authorization No. of the ONU to be configured.	1	2
	Port add traffic	Selects the service stream sequence number.	1	
	CVLAN ID	The VLAN ID that the downlink multicast stream carries.	100	200
	Service model profile	Selects the multicast service model profile which the ONU ports binds to.	e	

7.2.6.2 Configuration Flow Chart

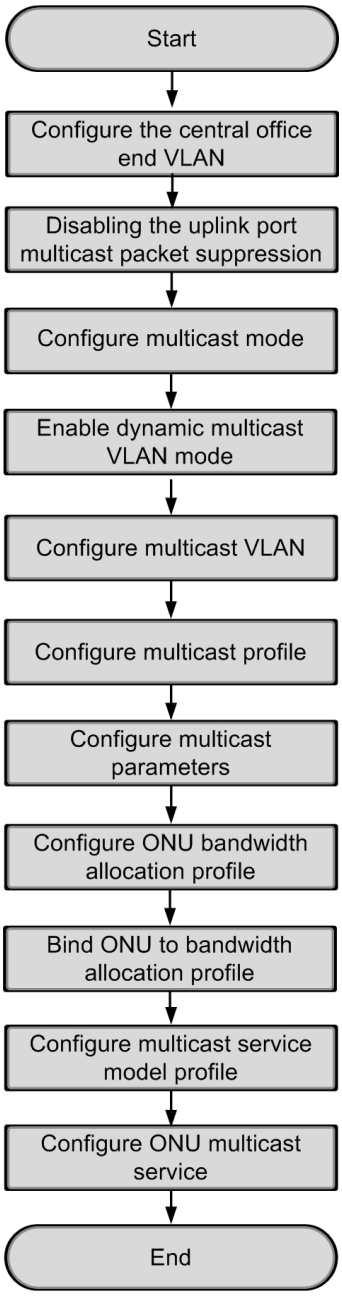


Figure 7-57 Flow of configuring the multicast service under the proxy mode in a batch manner (for the AN5506-10-B1)

7.2.6.3 Configuring Central Office End Service VLAN

See Configuring Central Office End Service VLAN for the configuration method.

7.2.6.4 Disabling the Uplink Port Multicast Packet Suppression

See Disabling the Uplink Port Multicast Packet Suppression for the configuration method.

7.2.6.5 Configuring Multicast Mode

See Configuring Multicast Mode for the configuration method.

7.2.6.6 Enabling Dynamic Multicast VLAN Mode

See Enabling Dynamic Multicast VLAN Mode for the configuration method.

7.2.6.7 Configuring Multicast VLAN

See Configuring Multicast VLAN for the configuration method.

7.2.6.8 Configuring Multicast Profile

See Configuring Multicast Profile for the configuration method.

7.2.6.9 Configuring Multicast Parameters

See Configuring Multicast Parameters for the configuration method.

7.2.6.10 Configuring ONU Bandwidth Allocation Profile

1. Right-click the HSWA[9] card in the **Object Tree** pane and select **Service Config Relevance→GPON Service Bandwidth Config Profile** from the shortcut menu to access the **Bandwidth Config Profile** window.
2. Click the pane on left side and click  in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. After clicking **OK**, you should double-click in a blank area of the **Profile Name** and input **d** to create a bandwidth allocation profile.

3. Click the pane on right side and click in the toolbar to input **2** in the **Please Input The Rows For Add:** dialog box. Click **OK** to add two services.
4. Configure according to the planned data in Table 7-16.
5. Click in the toolbar and the configuration is completed, as shown in Figure 7-58.

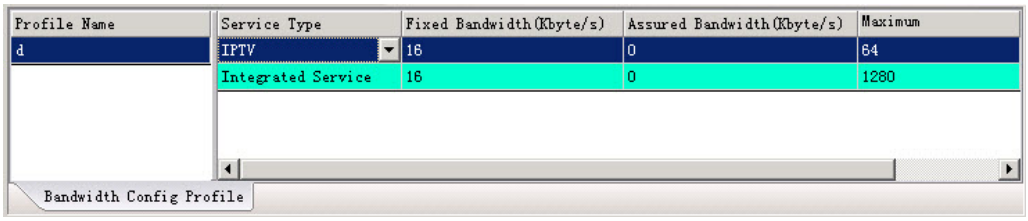


Figure 7-58 The GPON service bandwidth profile-configuring the AN5506-10-B1 under the proxy mode in a batch manner

7.2.6.11 Binding the ONU to the Bandwidth Allocation Profile

1. Right-click the designated system in the **Object Tree**, select **Config→Batch Configure→ONU Config** to access the **Config Object** window.
2. Click **Set Object as Condition**. Select the AN5506-10-B1[1] under the PON port 1 in Slot 15 and click **OK**.
3. The specific information of the configuration object is displayed in the right pane. Select **d** in the pulldown list of the **GPON Bandwidth Profile** item.
4. Click in the toolbar and the configuration is completed, as shown in Figure 7-59.

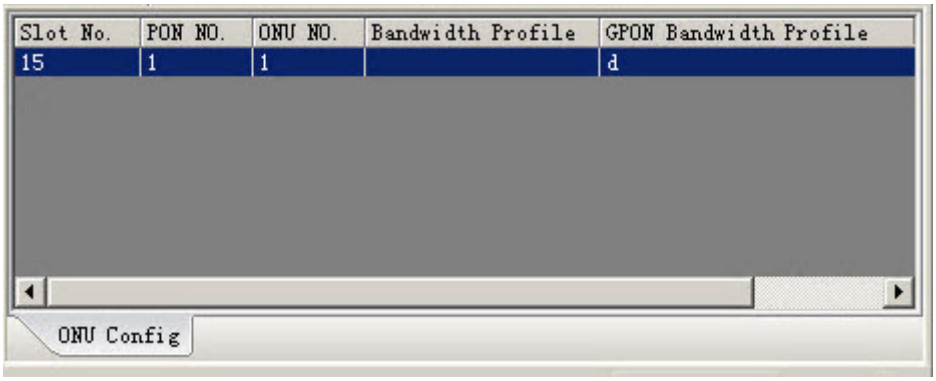


Figure 7-59 ONU configuration-configuring the AN5506-10-B1 under the proxy mode in a batch manner

7.2.6.12 Configuring Multicast Service Model Profile

1. Right-click the designated system in the **Object Tree**, select **Config→Profile Definition→Service Model Profile** to access the **Service Model Profile** window.
2. Click  in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. Click **OK** to create a service model profile.
3. Configure according to the planned data in Table 7-16.
4. Click  in the toolbar and the configuration is completed, as shown in Figure 7-60.

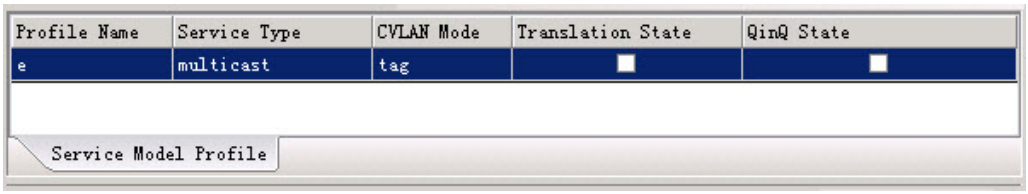


Figure 7-60 Service model profile-configuring the AN5506-10-B1 under the proxy mode in a batch manner

7.2.6.13 Configuring ONU Multicast Services

1. Right-click the designated system in the **Object Tree**, select **Config→Batch Configure→ONU Data Service Configure** from the shortcut menu to access the **ONU Data Service Configure** window.
2. Click  in the toolbar and the **Add Item number** dialog box appears. Selects LAN1 and LAN2 of the ONU in the left pane and click **OK** to return to the **ONU Data Service Configure** window.

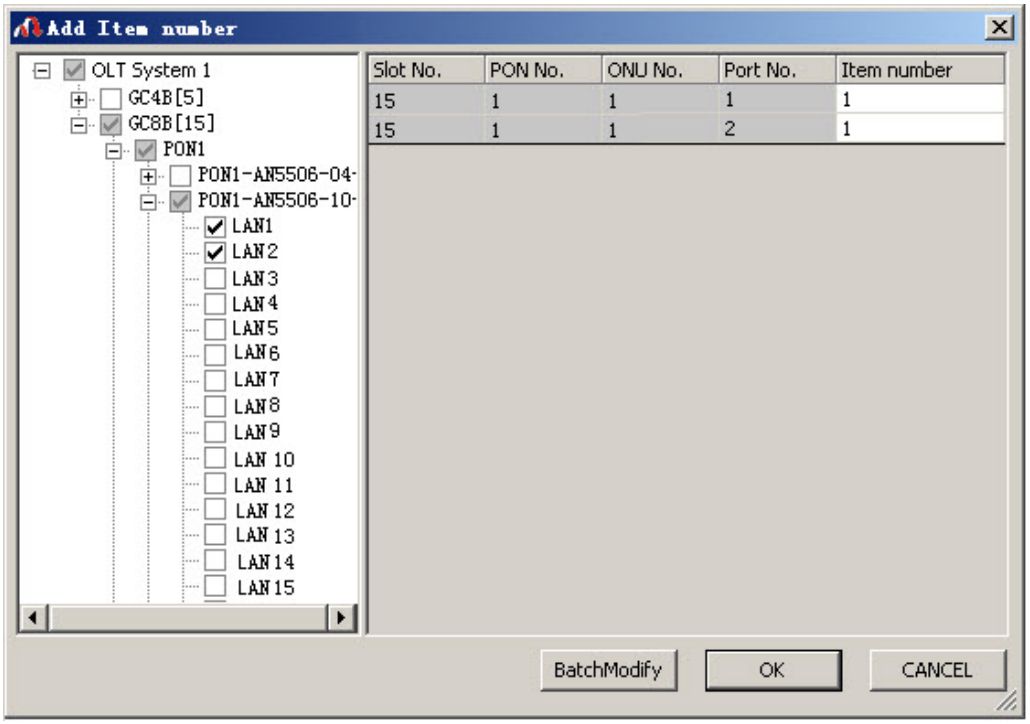


Figure 7-61 Adding entry number - configuring the AN5506-10-B1 under the proxy mode in a batch manner

3. The specific configuration information of the objects will appear in the right pane. Configure according to the planned data in Table 7-16.
4. Click  in the toolbar and the configuration is completed, as shown in Figure 7-62.

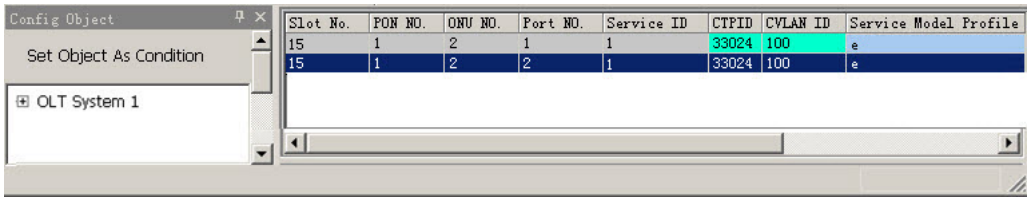


Figure 7-62 ONU data service configuration-configuring the AN5506-10-B1 under the proxy mode in a batch manner

7.2.6.14 Configuration Result

The multicast services on the LAN1 and LAN2 ports that belong to the AN5506-10-B1 are started up. Users can watch the video programs whose multicast VLAN is 100 normally via the LAN1 port. Users can watch the video programs whose multicast VLAN is 200 normally via the LAN2 port.

7.3 Example for Multicast Service Configuration-Controllable Mode

7.3.1 Configuration Rules

- Under the controllable mode, users are able to configure the authority for each subscriber to access each channel. The authority can be normal view or preview with preview counts, time, and time interval.
- Each ONU user port supports up to 32 multicast VLANs, i.e., each port may exist in 32 multicast groups; so each subscriber can view up to 32 multicast programs simultaneously.
- During the bandwidth allocation: If the data service is not started up on the ONU port, users should configure one **IPTV** service bandwidth and one **data** bandwidth for the ONU in type 1, as well as one **IPTV** service bandwidth and one **Integrated Service** bandwidth for the ONU in type 2. If the data service is started up on the ONU port, users should configure only one **IPTV** service bandwidth for each ONU.
- For ONU type 1, after adding one multicast service to the ONU port, users should add one unicast service; for ONU in type 2, users only need to add one multicast service to the ONU port.
- For ONU in type 1, the VLANs of the multicast uplink and downlink protocols can be configured respectively; for ONU in type 2, the uplink protocol VLAN is translated into the port signal VLAN, and the VLANs of the downlink protocol messages and the downlink multicast stream are processed in the same way.
- The VLAN COS need not be configured in the multicast services. The COS of the downlink multicast flow is carried by the multicast stream and cannot be configured on the OLT and the ONU. The COS of the uplink / downlink multicast protocol message is 0 by default.
- The VLAN of the multicast group should be within the range of the local VLAN.
- One multicast program only belongs to one multicast VLAN. One multicast VLAN can include one multicast program or a multicast group. The multicast group is a collection of multicast programs with an unified authority.
- The AN5116-06B's uplink ports can not join multiple VLANs in the untag mode at the same time.

7.3.2 Networking Diagram

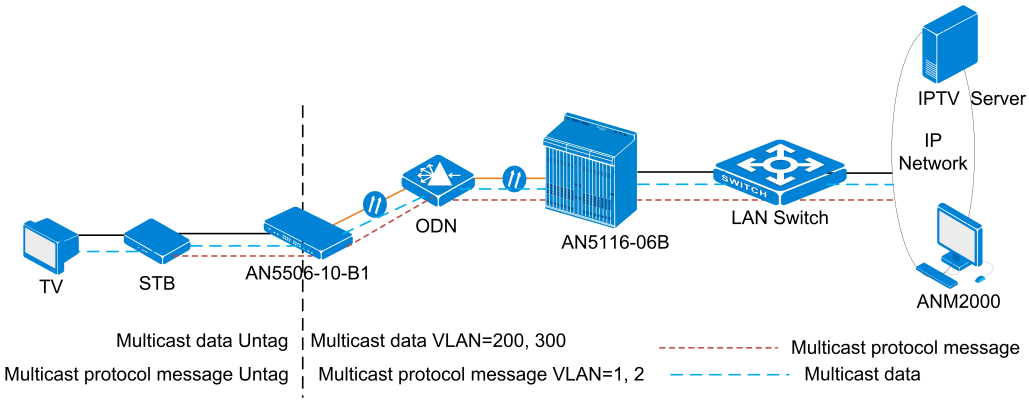


Figure 7-63 The multicast service network connection under the controllable mode

- Downlink direction: The ONU strips the VLAN Tag=200/300 from the multicast streams at the AN5116-06B side, then sends the stream to the set top box for forwarding it to the video users.
- Uplink direction: The ONU attaches the join / leave multicast protocol message with the VLAN ID=1/2 tag transmitted from the set top box ; then transmits the messages to the AN5116-06B. The AN5116-06B forwards them to the IPTV server.

The AN5116-06B uses the HU1A and GC8B card as the interface card at the network side and user side respectively. The HSWA card is compulsory. The AN5506-10-B1 is used as the ONU in this example.

7.3.3 Configuring Multicast Services Respectively

7.3.3.1 Planning Data

Table 7-17 The OLT side planning data of the multicast services under the controllable mode (configured respectively)

Item		Description	Example
ONU information	ONU type	The type of the actually used ONU.	AN5506-10-B1
	Slot No.	Configures according to the number of the actually used PON port.	15
	PON No.	Configures according to the number of the actually used PON port.	1

Table 7-17 The OLT side planning data of the multicast services under the controllable mode (configured respectively) (Continued)

Item		Description	Example
	ONU Authorization No.	Configures according to the network planning of the operator.	2
Central office end VLAN	Service name	Configures according to the network planning of the operator.	iptv2
	Starting VLAN ID	The begin VLAN ID number of the uplink port service. Configures according to the network planning of the operator.	200
	VLAN ID End	The end VLAN ID number of the uplink port service. Configures according to the network planning of the operator.	300
	Uplink port No.	Configures according to the number of the actually used uplink port.	20:SFP1
	TAG/UNTAG	The Tag processing mode of the uplink service VLAN can be set as **Tag** or **Untag**. ◆ Under **UNTAG** mode, the TAGs of the uplink packets will be stripped automatically and the packets will be uplinked in the form of UNTAG when they pass the port, whereas the downlink UNTAG packets will be added with designated TAGs. ◆ Under **TAG** mode, the uplink/ downlink data packets will not be processed when they pass the port.	Tag
	Service Type	Selects IPTV for the multicast service.	IPTV
Uplink port packet suppression	Port No.	Selects 20:2, which corresponds to 20: SFP1.	20:2
	Packet type	Selects the multicast packet.	Multicast package
	Enable/disable	Disables the suprresion in this example.	Disable
Multicast mode	Multicast mode	Configures according to the network planning of the operator.	Controllable mode

Table 7-17 The OLT side planning data of the multicast services under the controllable mode (configured respectively) (Continued)

Item		Description	Example		
Multicast VLAN	Multicast VLAN	Configures according to the network planning of the operator. The multicast VLAN should be in the range of the local VLAN.	200		
Multicast mode	Profile name	Configures according to the network planning of the operator.	igmp1		
	Configura-tion group	The IP address of multicast programs. Configures according to the network planning of the operator.	225.0.1.1	225.0.1.2	225.0.1.3
	Authority	The authority of the users to watch the multicast programs. The options include **Normal** and **Preview**. Configures according to the network planning of the operator.	Normal	Normal	Preview
Group parameters	Preview Number	The times a subscriber can preview a given program. Configures according to the network planning of the operator.	-	-	4
	Preview duration	The duration for subscribers to preview multicast programs each time. Configures according to the network planning of the operator.	-	-	10
	Preview Interval	The interval for subscribers to preview multicast programs each time. Configures according to the network planning of the operator.	-	-	30
	Preview Reset	The reset period of subscriber preview authority. If exceeding the preview reset time, subscribers can preview again. Configures according to the network planning of the operator.	-	-	24
	Preview Total Time	The total duration for the subscribers to preview the multicast programs. Configures according to the network planning of the operator.	-	-	254
	Group VLAN	The VLAN ID of the multicast group. Configures according to the network planning of the operator.	200	200	300

Table 7-17 The OLT side planning data of the multicast services under the controllable mode (configured respectively) (Continued)

Item		Description	Example
Port Parameters	ONU port No.	Selects the port number of the ONU to be configured.	1 to 2
	Control switch	Configures according to the network planning of the operator. Includes **Controlled** and **Uncontrolled**.	Controlled
	Profile name	The profile name which the multicast port binds to.	igmp1
	Signal VLAN	The VLAN ID of the multicast uplink protocol message VLAN, which should be consistent with the ONU port number.	1 to 2

Table 7-18 The ONU side planning data of the multicast services under the controllable mode (configured respectively)

Item		Description	Example
ONU multicast bandwidth config	Service Type	Selects IPTV for the multicast service.	IPTV
	Fixed Bandwidth (kbyte/s)	Configures according to the network planning of the operator. The default value is 16.	16
	Assured Bandwidth (kbyte/s)	Configures according to the network planning of the operator. The default value is 0.	0
	Maximum Bandwidth (kbyte/s)	Configures according to the network planning of the operator. The default value is 64.	64
	Service Type	Select **integrated service** for the data services.	Integrate service
	Fixed Bandwidth (kbyte/s) for data service	Configures according to the network planning of the operator. The default value is 16.	16
	Assured Bandwidth (kbyte/s) for data service	Configures according to the network planning of the operator. The default value is 0.	0
	Maximum Bandwidth (kbyte/s) for data service	Configures according to the network planning of the operator. The default value is 64.	1280
ONU multicast service config	Data port list	Selects the authorization No. of the ONU to be configured.	LAN1 to LAN2
	Service Type	Selects **multicast** for the multicast service.	Multicast

Table 7-18 The ONU side planning data of the multicast services under the controllable mode (configured respectively) (Continued)

Item		Description	Example
	VLAN Mode	Configures according to the network planning of the operator. Includes **tag** and **transparent**. **tag** is to strip the VLAN Tag from the downlink multicast stream that passes the ONU port. **transparent** is to transparently transmit the downlink multicast stream.	Tag
	CVLAN ID	The VLAN ID that the downlink multicast stream carries. Configures according to the network planning of the operator.	200 to 300

7.3.3.2 Configuration Flow Chart

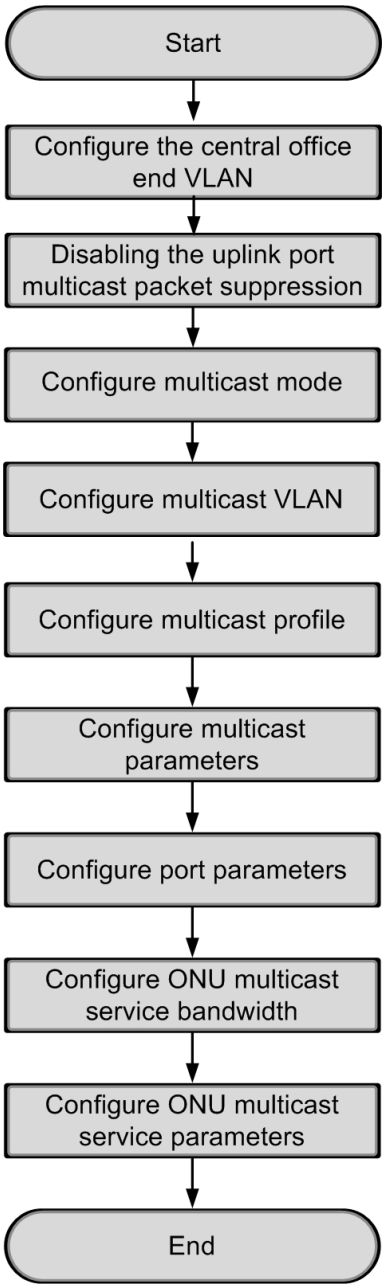


Figure 7-64 Flow of configuring the multicast service under the controllable mode respectively (for the AN5506-10-B1)

7.3.3.3 Configuring Central Office End Service VLAN

1. Right-click the HSWA[9] card in the **Object Tree** pane and select **VLAN Config →Local VLAN→Local End Service VLAN**.

2. Click in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. Click **OK** to create a central office end VLAN.
3. Configure according to the planning data in Table 7-17.
4. Click in the toolbar and the configuration is completed, as shown in Figure 7-65.

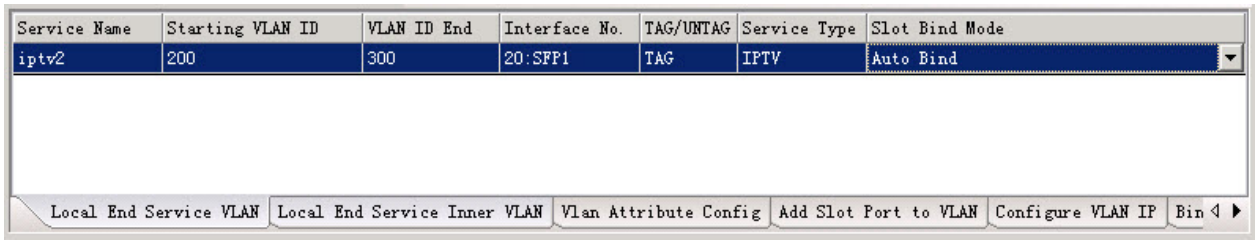


Figure 7-65 Service VLAN local end data-configuring the AN5506-10-B1 under the controllable mode respectively

7.3.3.4 Disabling the Uplink Port Multicast Packet Suppression

Disable the suppression on the uplink port multicast streams.

1. Right-click the active HSWA[9] card in the **Object Tree** pane and select **Security Config→Upport Packet Rate Control** from the shortcut menu to access the **Uplink Port Packet Suppression** window.
2. According to the planned data in Table 7-17. Select **20:2** in **Port No.** and clear the **Enable/Disable** check box of the corresponding multicast packet.
3. Click in the toolbar and the configuration is completed, as shown in Figure 7-66.

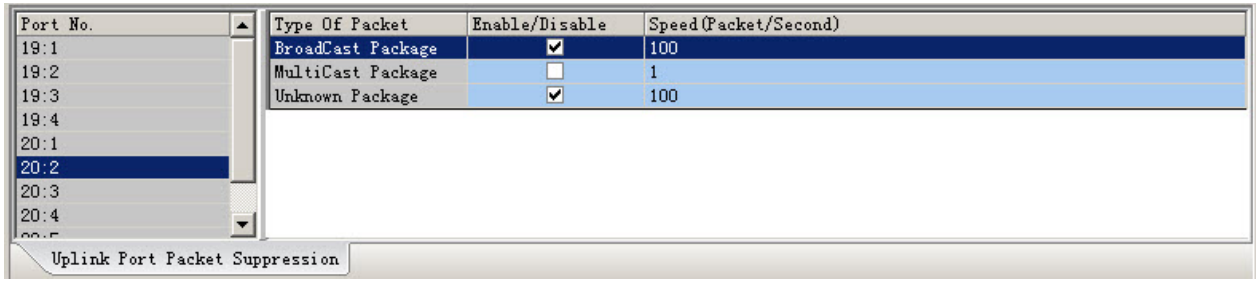


Figure 7-66 Designated uplink port packet suppression-configuring the AN5506-10-B1 under the controllable mode respectively

7.3.3.5 Configuring Multicast Mode

1. Right-click the active HSWA[9] card in the **Object Tree** pane, and select **IGMP Config→IGMP Mode** from the shortcut menu to access the **IGMP Mode** window.
2. According to the planned data in Table 7-17, select **Controlled Mode** in the pulldown list of the **IGMP Mode** item.
3. Click in the toolbar to execute the configuration command, as shown in Figure 7-67.

Figure 7-67 Multicast mode-configuring the AN5506-10-B1 under the controllable mode respectively

7.3.3.6 Configuring Multicast VLAN

1. Right-click the active HSWA[9] card in the **Object Tree** pane, and select **IGMP Config→Multicast VLAN** from the shortcut menu to access the **Multicast VLAN** window.
2. According to the planned data in Table 7-17, double-click the **VLAN** column and input **200**.
3. Click in the toolbar to execute the configuration command, as shown in Figure 7-68.

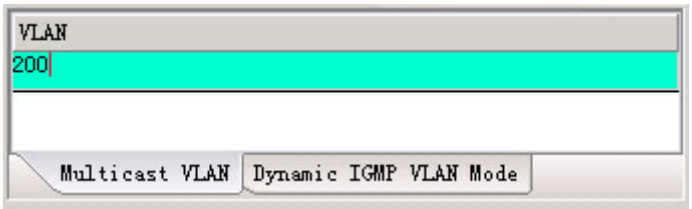


Figure 7-68 Multicast VLAN-configuring the AN5506-10-B1 under the controllable mode respectively

7.3.3.7 Configuring Multicast Profile

1. Right-click the HSWA[9] card in the **Object Tree** pane, and select **IGMP Config →IGMP Profile and Port** from the shortcut menu to access the **IGMP Profile** tab.
2. click  in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. Click **OK** to create a multicast profile.
3. Input **igmp1** in the **Profile Name** colom according to the planned data in Table 7-17.
4. Click the pane on left side and click  in the toolbar to input **3** in the **Please Input The Rows For Add:** dialog box. Click **OK** to add three multicast programs.
5. Configure according to the planning data in Table 7-17.
6. Click  in the toolbar and the configuration is completed, as shown in Figure 7-69.

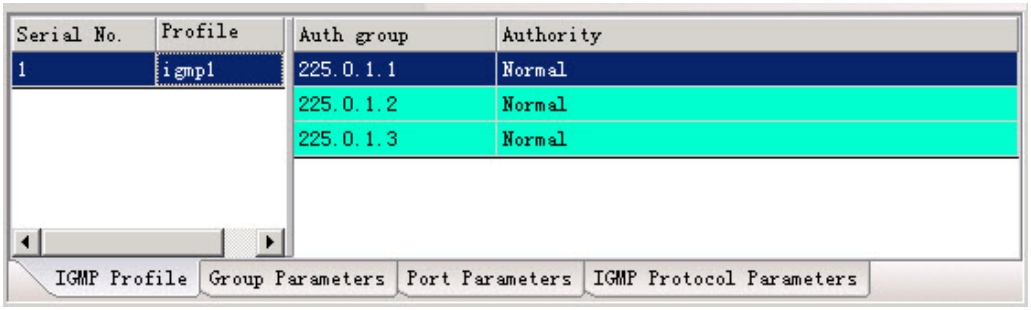


Figure 7-69 Multicast mode-configuring the AN5506-10-B1 under the controllable mode respectively

7.3.3.8 Configuring Multicast Parameters

 Note:

If the **Group VLAN** item is configured for any specific group in this step, the default multicast VLAN becomes no longer valid for the group.

1. Right-click the HSWA[9] card in the **Object Tree** pane, and select **IGMP Config →IGMP Profile and Port** from the shortcut menu to access the **Group Parameter** tab.
2. Click in the toolbar. Input **3** in the **Please Input the Rows for Add:** dialog box that appears. Click **OK** to add three multicast programs. The system automatically reads the IP addresses of the multicast programs added to the multicast profile and display them under the **Auth group** item.
3. Configure according to the planning data in Table 7-17.
4. Click in the toolbar and the configuration is completed, as shown in Figure 7-70.

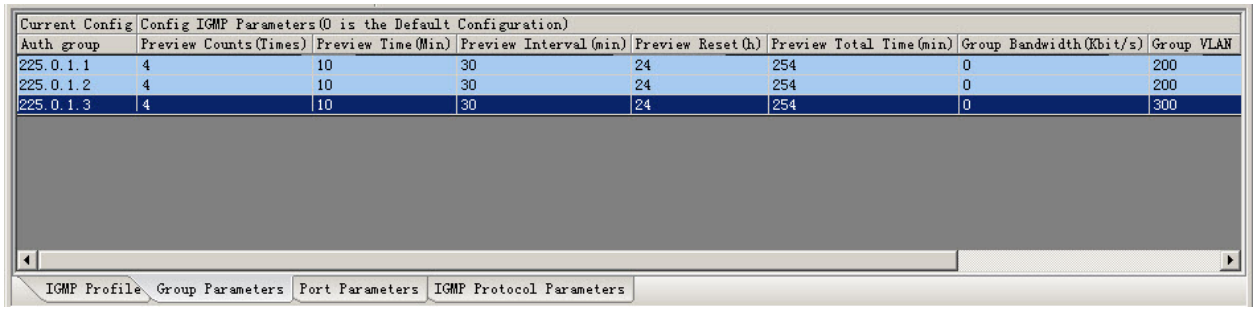


Figure 7-70 Group parameter-configuring the AN5506-10-B1 under the controllable mode respectively

7.3.3.9 Configuring Port Parameters

1. Right-click the HSWA[9] card in the **Object Tree** pane, and select **IGMP Config →IGMP Profile and Port** from the shortcut menu to access the **Port Parameter** tab.
2. Click in the toolbar to input **2** in the **Please Input The Rows For Add:** dialog box. Click **OK** to add two ONU ports.
3. Configure according to the planning data in Table 7-17.
4. Click in the toolbar and the configuration is completed, as shown in Figure 7-71.

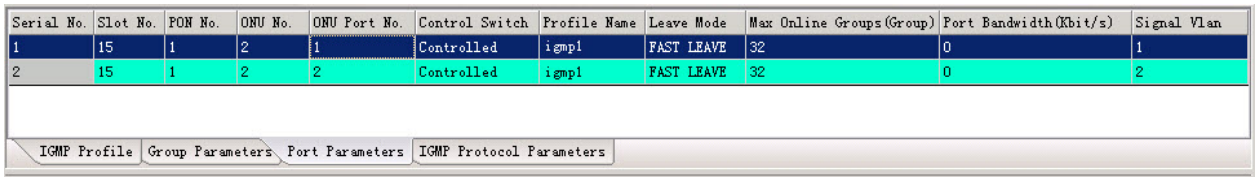


Figure 7-71 Port parameter-configuring the AN5506-10-B1 under the controllable mode respectively

7.3.3.10 Configuring ONU Multicast Service Bandwidth

1. Click the GC8B[15] card in the **Object Tree** pane and information of all ONUs listed under the GC8B[15] card will be shown in the right pane. Right-click the **PON1-AN5506-10-B1[2]** ONU and select **Config→Bandwidth Config** from the shortcut menu to access the **Bandwidth Config** window.
2. Click the pane on right side and click  in the toolbar to input **2** in the **Please Input The Rows For Add:** dialog box. Click **OK** to add two services.
3. Configure according to the planned data in Table 7-17.
4. Click  in the toolbar and the configuration is completed, as shown in Figure 7-72.

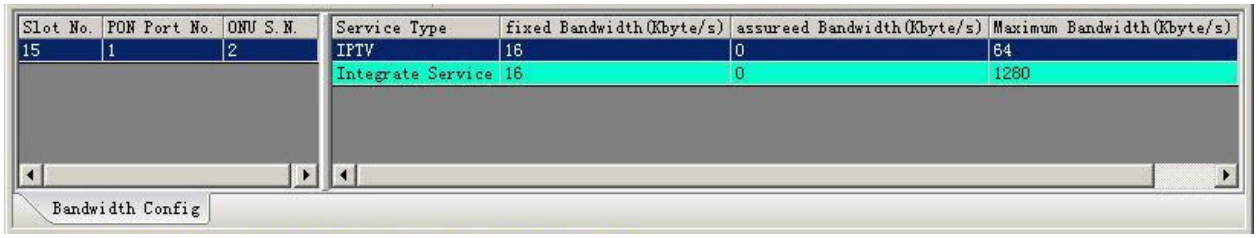


Figure 7-72 Multicast bandwidth allocation-configuring the AN5506-10-B1 under the controllable mode respectively

7.3.3.11 Configuring ONU Multicast Service Parameters

1. Click the GC8B[15] card in the **Object Tree** pane and information of all ONUs listed under the GC8B[15] card will be shown in the right pane. Right-click the **PON1-AN5506-10-B1[2]** ONU and select **Config→Service Config** from the shortcut menu to click the **Data Port Config** tab.

2. Select **LAN1** in the **Data Port List** pane, and click **Add** to bring up the **Services Configuration** dialog box. Configure parameters in the dialog box according to the planned data in Table 7-18, as shown in Figure 7-73.

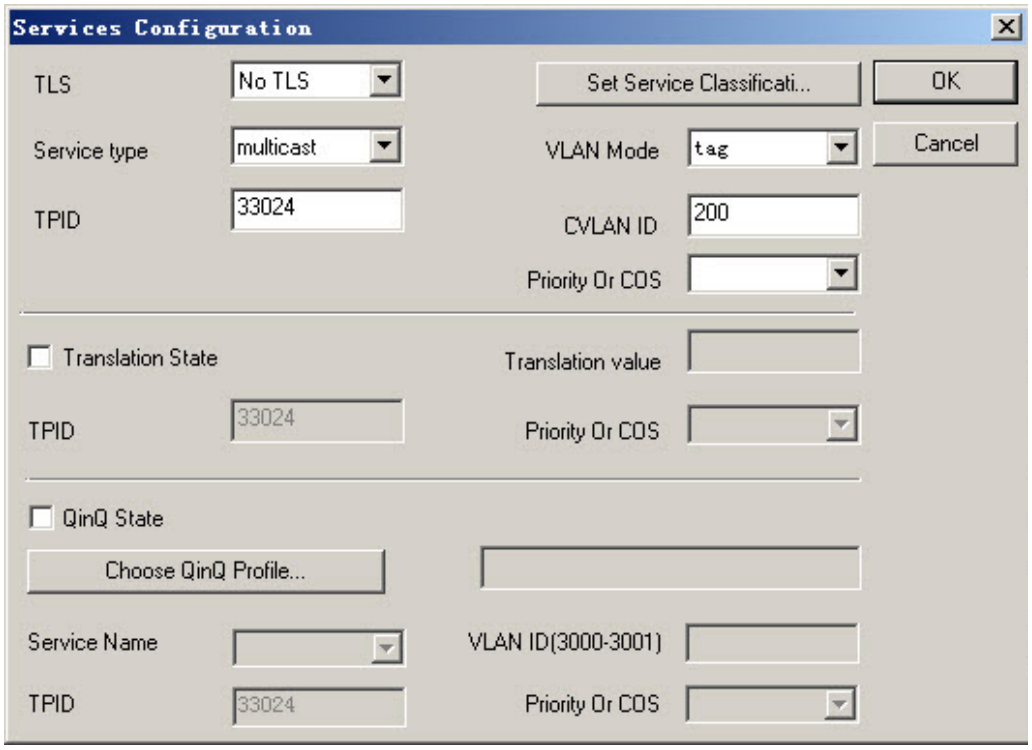


Figure 7-73 Service configuration-configuring the AN5506-10-B1 under the controllable mode respectively

3. Click **OK** to return to **Data Port Config** tab.

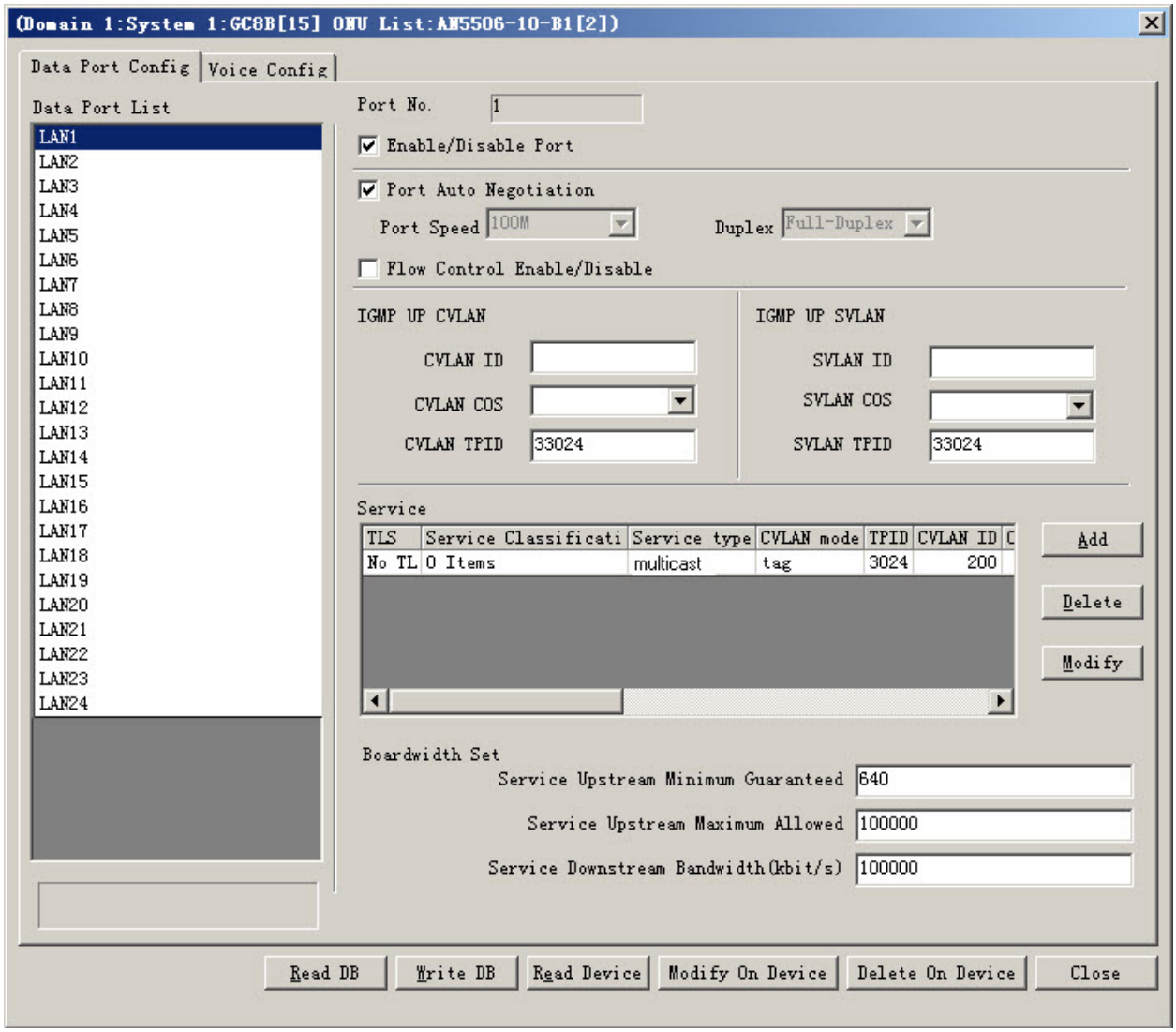


Figure 7-74 Data port configuration-configuring the AN5506-10-B1 under the controllable mode respectively

4. Add one more multicast service with the **VLAN Mode** as **tag** and the **CVLAN ID** as **300**.
5. Select **LAN2** in the **Data Port List** pane, then implement the same configuration on the LAN1 port.
6. Click **OK** to return to **Data Port Config** tab.
7. Click **Modify On Device** to complete the data service configuration of the AN5506-10-B1 ports.

7.3.3.12 Configuration Result

The multicast services on the LAN1 and LAN2 ports that belong to the AN5506-10-B1 is started up; and the users can watch the video programs 225.0.1.1 and 225.0.1.2 whose multicast VLAN is 200 normally, and can preview the multicast program 225.0.1.3 whose VLAN is 300.

7.3.4 Configuring Multicast Services in a Batch Manner

7.3.4.1 Planning Data

Table 7-19 The OLT side planning data of the multicast services in the controllable mode (configured in a batch manner)

Item		Description	Example
ONU information	ONU type	The type of the actually used ONU.	AN5506-10-B1
	Slot No.	Configures according to the number of the actually used PON port.	15
	PON No.	Configures according to the number of the actually used PON port.	1
	ONU Authorization No.	Configures according to the network planning of the operator.	2
Central office end VLAN	Service name	Configures according to the network planning of the operator.	iptv2
	Starting VLAN ID	The begin VLAN ID number of the uplink port service. Configures according to the network planning of the operator.	200
	VLAN ID End	The end VLAN ID number of the uplink port service. Configures according to the network planning of the operator.	300
	Uplink port No.	Configures according to the number of the actually used uplink port.	20:SFP1

Table 7-19 The OLT side planning data of the multicast services in the controllable mode (configured in a batch manner) (Continued)

Item		Description	Example		
	TAG/UNTAG	The Tag processing mode of the uplink service VLAN can be set as **Tag** or **Untag**. ◆ Under **UNTAG** mode, the TAGs of the uplink packets will be stripped automatically and the packets will be uplinked in the form of UNTAG when they pass the port, whereas the downlink UNTAG packets will be added with designated TAGs. ◆ Under **TAG** mode, the uplink/ downlink data packets will not be processed when they pass the port.	Tag		
	Service Type	Selects IPTV for the multicast service.	IPTV		
Uplink port packet suppression	Port No.	Selects 20:2, which corresponds to 20: SFP1.	20:2		
	Packet type	Selects the multicast packet.	Multicast package		
	Enable / disable	Disables the suprresion in this example.	Disable		
Multicast mode	Multicast mode	Configures according to the network planning of the operator.	Controllable mode		
Multicast VLAN	Multicast VLAN	Configures according to the network planning of the operator. The multicast VLAN should be in the range of the local VLAN.	200		
Multicast mode	Profile name	Configures according to the network planning of the operator.	igmp1		
	Configuration group	The IP address of multicast programs. Configures according to the network planning of the operator.	225.0.1.1	225.0.1.2	225.0.1.3
	Authority	The authority of the users to watch the multicast programs. The options include **Normal** and **Preview**. Configures according to the network planning of the operator.	Normal	Normal	Preview
Group parameters	Preview Number	The times a subscriber can preview a given program. Configures according to the network planning of the operator.	-	-	4

Table 7-19 The OLT side planning data of the multicast services in the controllable mode (configured in a batch manner) (Continued)

Item		Description	Example		
	Preview duration	The duration for subscribers to preview multicast programs each time. Configures according to the network planning of the operator.	-	-	10
	Preview Interval	The interval for subscribers to preview multicast programs each time. Configures according to the network planning of the operator.	-	-	30
	Preview Reset	The reset period of subscriber preview authority. If exceeding the preview reset time, subscribers can preview again. Configures according to the network planning of the operator.	-	-	24
	Preview Total Time	The total duration for the subscribers to preview the multicast programs. Configures according to the network planning of the operator.	-	-	254
	Group VLAN	The VLAN ID of the multicast group. Configures according to the network planning of the operator.	200	200	300
Port Parameters	ONU port No.	The port number of the ONU to be configured.	1 to 2		
	Control switch	Configures according to the network planning of the operator. Includes **Controlled** and **Uncontrolled**.	Controlled		
	Profile name	The profile name which the multicast port binds to.	igmp1		
	Signal VLAN	The VLAN ID of the multicast uplink protocol message VLAN, which should be consistent with the ONU port number.	1 to 2		

Table 7-20 The ONU side planning data of the multicast services in the controllable mode (configured in a batch manner)

Item		Description	Example
ONU Bandwidth allocation profile	Profile name	Configures according to the network planning of the operator.	a
	Service Type	Selects IPTV for the multicast service.	IPTV

Table 7-20 The ONU side planning data of the multicast services in the controllable mode (configured in a batch manner) (Continued)

Item		Description	Example
	Fixed Bandwidth (kbyte/s)	Configures according to the network planning of the operator. The default value is 16.	16
	Assured Bandwidth (kbyte/s)	Configures according to the network planning of the operator. The default value is 0.	0
	Maximum Bandwidth (kbyte/s)	Configures according to the network planning of the operator. The default value is 64.	64
	Service Type	Select integrated service for the data services.	Integrate service
	Fixed Bandwidth (kbyte/s) for data service	Configures according to the network planning of the operator. The default value is 16.	16
	Assured Bandwidth (kbyte/s) for data service	Configures according to the network planning of the operator. The default value is 0.	0
	Maximum Bandwidth (kbyte/s) for data service	Configures according to the network planning of the operator. The default value is 64.	1280
ONU configuration	Slot No.	Configures according to the number of the actually used PON port.	15
	PON No.	Configures according to the number of the actually used PON port.	1
	ONU number	Selects the authorization No. of the ONU to be configured.	2
	GPON bandwidth profile	Selects the bandwidth profile name which the ONU binds to.	a
Multicast service model profile	Profile name	Configures according to the network planning of the operator.	b
	Service type	Selects multicast for the multicast service.	Multicast
	CVLAN Mode	Configures according to the network planning of the operator. Includes **tag** and **transparent**. **tag** is to strip the VLAN Tag from the downlink multicast stream that passes the ONU port. **transparent** is to transparently transmit the downlink multicast stream.	Tag

Table 7-20 The ONU side planning data of the multicast services in the controllable mode (configured in a batch manner) (Continued)

Item		Description	Example
ONU data service configuration	Slot No.	Configures according to the number of the actually used PON port.	15
	PON No.	Configures according to the number of the actually used PON port.	1
	ONU number	Selects the authorization No. of the ONU to be configured.	2
	Port No.	Selects the authorization No. of the ONU to be configured.	1 to 2
	Port add traffic	Selects the service stream sequence number.	1 to 2
	CVLAN ID	The VLAN ID that the downlink multicast stream carries.	200, 300
	Service model profile	Selects the multicast service model profile which the ONU ports binds to.	b

7.3.4.2 Configuration Flow Chart

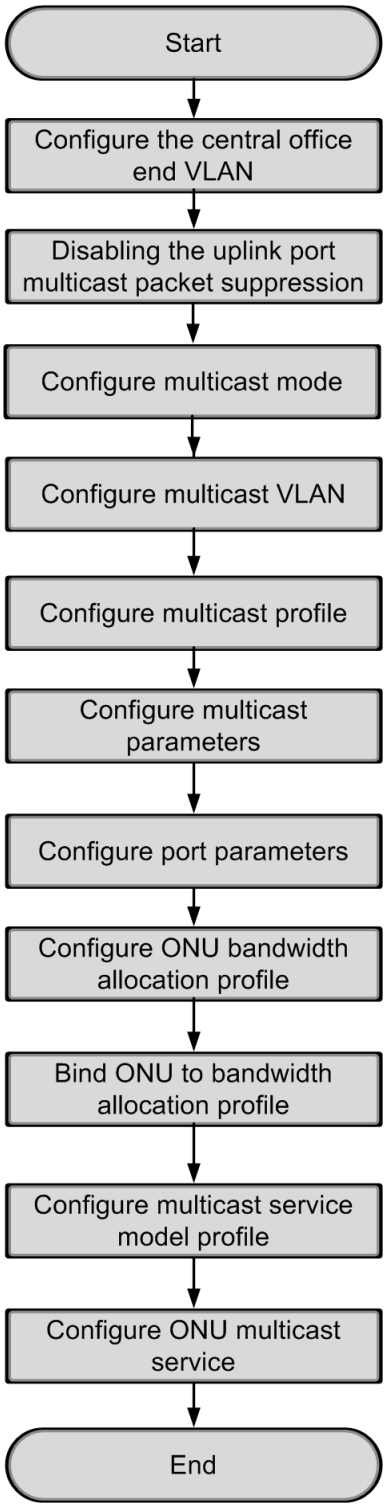


Figure 7-75 The flow of the multicast service configuration in a batch manner under the controllable mode

7.3.4.3 Configuring Central Office End Service VLAN

See Configuring Central Office End Service VLAN for the configuration method.

7.3.4.4 Disabling the Uplink Port Multicast Packet Suppression

See Disabling the Uplink Port Multicast Packet Suppression for the configuration method.

7.3.4.5 Configuring Multicast Mode

See Configuring Multicast Mode for the configuration method.

7.3.4.6 Configuring Multicast VLAN

See Configuring Multicast Parameters for the configuration method.

7.3.4.7 Configuring Multicast Profile

See Configuring Multicast Profile for the configuration method.

7.3.4.8 Configuring Multicast Parameters

See Configuring Multicast Parameters for the configuration method.

7.3.4.9 Configuring Port Parameters

See Configuring Port Parameters for the configuration method.

7.3.4.10 Configuring ONU Bandwidth Allocation Profile

1. Right-click the active HSWA[9] card in the **Object Tree** pane and select **Service Config Relevance→GPON Service Bandwidth Config Profile** from the shortcut menu to access the **Bandwidth Config Profile** window.

2. Click in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. After clicking **OK**, you should double-click in a blank area of the **Profile Name** and input **a** to create a bandwidth allocation profile.
3. Click the pane on right side and click in the toolbar to input **2** in the **Please Input The Rows For Add:** dialog box. Click **OK** to add two services.
4. Configure according to the planned data in Table 7-20.
5. Click in the toolbar and the configuration is completed, as shown in Figure 7-76.

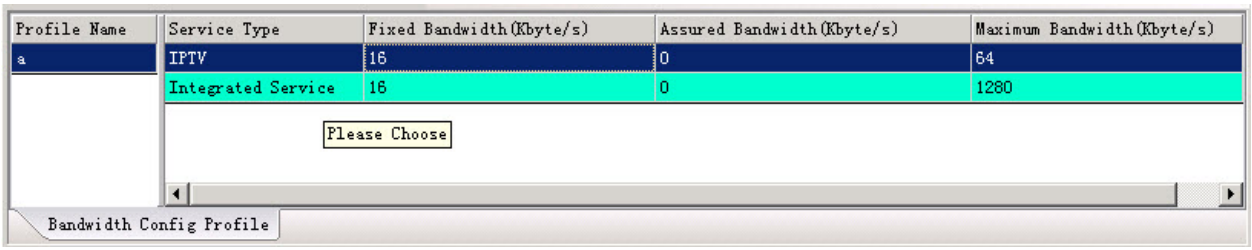


Figure 7-76 The GPON service bandwidth profile-configuring the AN5506-10-B1 under the controllable mode in a batch manner

7.3.4.11 Binding the ONU to the Bandwidth Allocation Profile

1. Right-click the designated system in the **Object Tree**, select **Config→Batch Configure→ONU Config** to access the **Config Object** window.
2. Click **Set Object as Condition**. Select the AN5506-10-B1[1] under the PON port 1 in Slot 15 and click **OK**.
3. The specific information of the configuration object is displayed in the right pane. Select **a** in the pulldown list of the **GPON Bandwidth Profile** item.
4. Click in the toolbar and the configuration is completed, as shown in Figure 7-77.

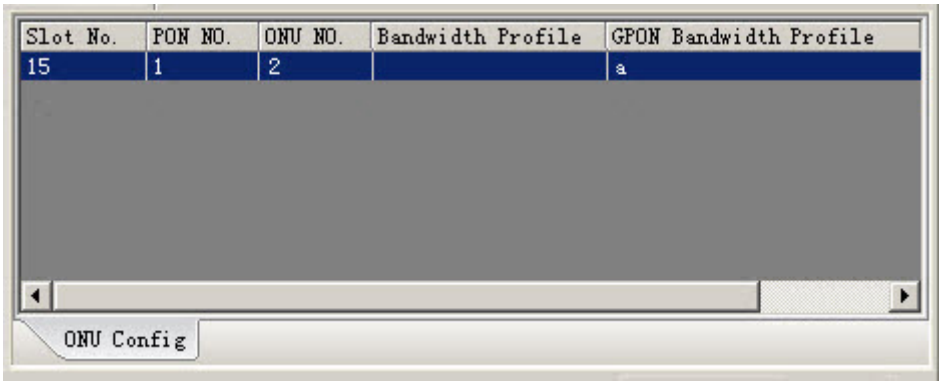


Figure 7-77 ONU configuration-configuring the AN5506-10-B1 under the controllable mode in a batch manner

7.3.4.12 Configuring Multicast Service Model Profile

1. Right-click the designated system in the **Object Tree**, select **Config→Profile Definition→Service Model Profile** to access the **Service Model Profile** window.
2. Click  in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. Click **OK** to create a service model profile.
3. Configure according to the planned data in Table 7-20.
4. Click  in the toolbar and the configuration is completed, as shown in Figure 7-78.

Figure 7-78 Service model profile-configuring the AN5506-10-B1 under the controllable mode in a batch manner

7.3.4.13 Configuring ONU Multicast Services

1. Right-click the designated system in the **Object Tree**, select **Config→Batch Configure→ONU Data Service Configure** to access the **ONU Data Service Configure** window.

2. Click in the toolbar to bring up the **Add Item number** dialog box. Select the FE1 and FE2 ports in the left pane and set **Item number** as **2**, click **OK**, as shown in Figure 7-79.

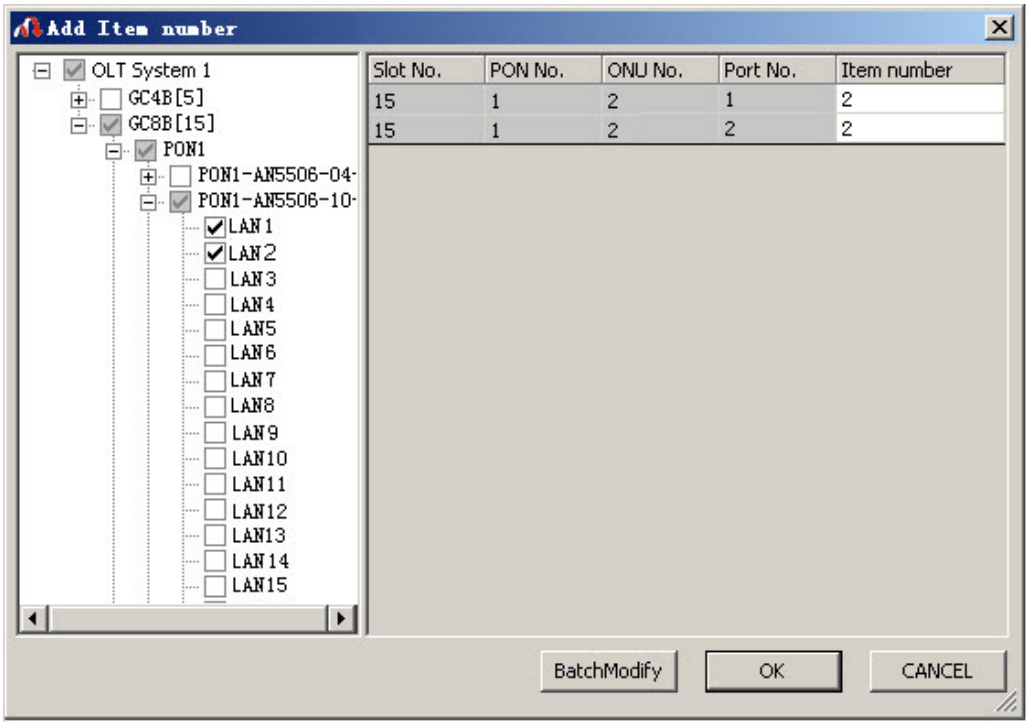


Figure 7-79 Adding entry number - configuring the AN5506-10-B1 under the controllable mode in a batch manner

3. The specific configuration information of the objects will appear in the right pane. Configure according to the planning data in Table 7-20.

4. Click in the toolbar and the configuration is completed, as shown in Figure 7-80.

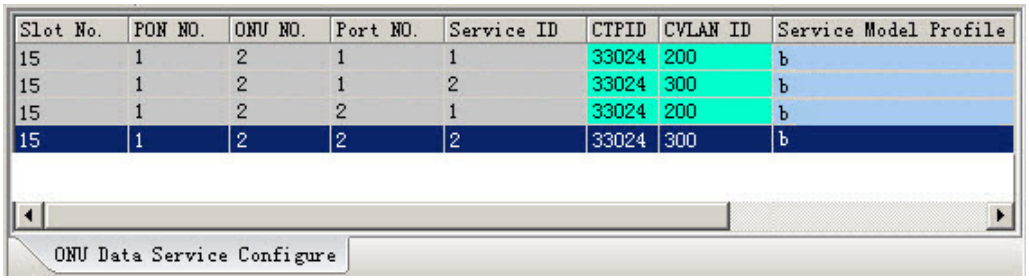


Figure 7-80 ONU data service configuration-configuring the AN5506-10-B1 under the controllable mode in a batch manner

7.3.4.14 Configuration Result

The multicast services on the LAN1 and LAN2 ports that belong to the AN5506-10-B1 is started up; and the users can watch the video programs 225.0.1.1 and 225.0.1.2 whose multicast VLAN is 200 normally, and can preview the multicast program 225.0.1.3 whose VLAN is 300.

7.4 Configure Multicast VLAN 1:2 Conversion

7.4.1 Configuration Rules

- When users watch the IPTV service and the video telephone service, the VLAN 1:2 conversion is needed. Translate the multicast VLAN into the IPTV service VLAN and the video telephone service VLAN at the same time.
- The AN5116-06B only supports the VLAN 1:2 conversion of the multicast service.
- The multicast 1:2 conversion is supported in the proxy mode, proxy-snooping mode and snooping mode.
- During the bandwidth allocation: If the data service is not started up on the ONU port, users should configure one **IPTV** service bandwidth and one **data** bandwidth for the ONU in type 1, as well as one **IPTV** service bandwidth and one **Integrated Service** bandwidth for the ONU in type 2. If the data service is started up on the ONU port, users should configure only one **IPTV** service bandwidth for each ONU.
- For ONU in type 1, after adding one multicast service to the ONU port, users should add one unicast service; for ONU in type 2, users only need to add one multicast service to the ONU port.
- The VLAN COS need not be configured in the multicast services. The COS of the downlink multicast flow is carried by the multicast stream and cannot be configured on the OLT and the ONU. The COS of the uplink / downlink multicast protocol message is 0 by default.
- The VLAN of the multicast group should be within the range of the local VLAN.

- One multicast program only belongs to one multicast VLAN. One multicast VLAN can include one multicast program or a multicast group. The multicast group is a collection of multicast programs with an unified authority.
- The AN5116-06B's uplink ports can not join multiple VLANs in the untag mode at the same time.

7.4.2 Networking Diagram

The AN5116-06B uses the HU1A and GC8B card as the interface card at the network side and user side respectively. The HSWA card is compulsory. The AN5506-10-B1 is used as the ONU in this example.

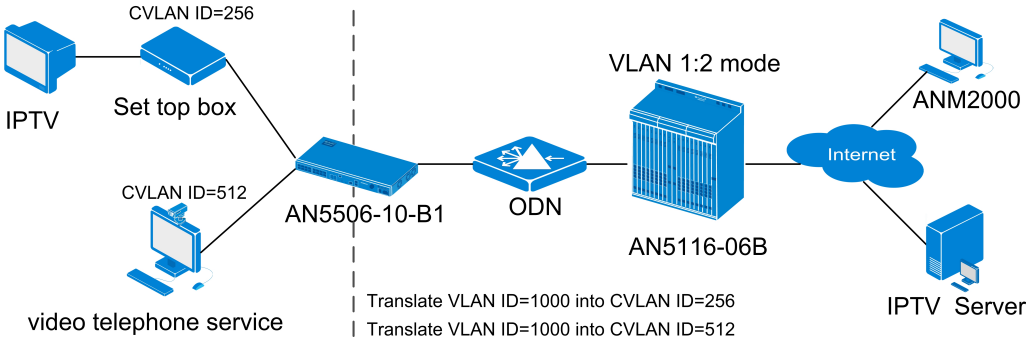


Figure 7-81 Multicast VLAN 1:2 transforming mode service network connection

- Downlink direction: The ONU translates the multicast stream with VLAN ID=1000 at the AN5116-06B side into the IPTV service with CVLAN ID=256 and the video telephone service with CVLAN ID=512 respectively.
- Uplink direction: The ONU attaches the join / leave multicast protocol message with the VLAN ID=1000 tag transmitted from the set top box ; then transmits the messages to the AN5116-06B. The AN5116-06B forwards them to the IPTV server.

7.4.3 Planning Data

Table 7-21 The OLT side planning data of the multicast VLAN 1:2 conversion

Item		Description	Example
ONU information	ONU type	The type of the actually used ONU.	AN5506-10-B1

Table 7-21 The OLT side planning data of the multicast VLAN 1:2 conversion (Continued)

Item		Description	Example
	Slot No.	Configures according to the number of the actually used PON port.	15
	PON No.	Configures according to the number of the actually used PON port.	1
	ONU Authorization No.	Configures according to the network planning of the operator.	1
Data of the service VLAN in the central office end	Service name	Configures according to the network planning of the operator.	iptv1
	Starting VLAN ID	The begin VLAN ID number of the uplink port service. Configures according to the network planning of the operator.	1000
	VLAN ID End	The end VLAN ID number of the uplink port service. Configures according to the network planning of the operator.	1000
	Uplink port No.	Configures according to the number of the actually used uplink port.	19:SFP1
	TAG/UNTAG	The Tag processing mode of the uplink service VLAN can be set as **Tag** or **Untag**. ◆ Under **UNTAG** mode, the TAGs of the uplink packets will be stripped automatically and the packets will be uplinked in the form of UNTAG when they pass the port, whereas the downlink UNTAG packets will be added with designated TAGs. ◆ Under **TAG** mode, the uplink/downlink data packets will not be processed when they pass the port.	Tag
	Service Type	Selects IPTV for the multicast service.	IPTV
Uplink port packet suppression	Port No.	Selects 19:2, which corresponds to 19:SFP1.	19:2
	Packet type	Selects the multicast packet.	Multicast package
	Enable/disable	Disables the suprresion in this example.	Disable
Multicast mode	Multicast mode	Configures according to the network planning of the operator.	Proxy mode
Multicast VLAN	Multicast VLAN	Configures according to the network planning of the operator. The multicast VLAN should be in the range of the local VLAN.	1000

Table 7-22 The ONU side planning data of the multicast VLAN 1:2 conversion

Item		Description	Example
ONU multicast bandwidth config	Service Type	Selects IPTV for the multicast service.	IPTV
	Fixed Bandwidth (kbyte/s)	Configures according to the network planning of the operator. The default value is 16.	16
	Assured Bandwidth (kbyte/s)	Configures according to the network planning of the operator. The default value is 0.	0
	Maximum Bandwidth (kbyte/s)	Configures according to the network planning of the operator. The default value is 64.	64
	Service Type	Select **integrated service** for the data services.	Integrate service
	Fixed Bandwidth (kbyte/s) for data service	Configures according to the network planning of the operator. The default value is 16.	16
	Assured Bandwidth (kbyte/s) for data service	Configures according to the network planning of the operator. The default value is 0.	0
	Maximum Bandwidth (kbyte/s) for data service	Configures according to the network planning of the operator. The default value is 64.	1280
ONU multicast service config (IPTV service)	Port No.	Configures according to the network planning of the operator.	LAN1
	Service Type	Selects **Multicast**.	Multicast
	VLAN Mode	Configures according to the network planning of the operator.	Transparent transmission
	CVLAN ID	When the translation function is enabled, this item is the VLAN ID before the translation. Unconfigurable When the TAG Mode is Untag. The value range is from 1 to 4085.	1000
	Priority or COS	The VLAN priority before translation; the value range is from 0 to 7. 7 is the highest priority while 0 is the lowest priority.	5
	Translation enable status	Translation enable switch Parameters are valid in the transparent mode.	Select
	Translation VID	The VLAN ID after translation and the value range is from 1 to 4085.	256
	Priority or COS	The VLAN priority after translation; the value range is from 0 to 7. 7 is the highest priority while 0 is the lowest priority.	5
	QinQ enable status	Enables / disables the QinQ configuration.	-
	SVLAN ID	Unconfigurable when the QinQ enable status is disable. The value range is from 1 to 4085.	-

Table 7-22 The ONU side planning data of the multicast VLAN 1:2 conversion (Continued)

Item		Description	Example
	Service name	Selects the service name configured in the central office VLAN. Unconfigurable when the **QinQ enable status** is disable.	-
ONU multicast service config (video telephone service)	Port No.	Configures according to the network planning of the operator.	LAN1
	Service Type	Selects **Multicast**.	Multicast
	VLAN Mode	Configures according to the network planning of the operator.	Transparent transmission
	CVLAN ID	When the translation function is enabled, this item is the VLAN ID before the translation. Unconfigurable When the TAG Mode is Untag. The value range is from 1 to 4085.	1000
	Priority or COS	The VLAN priority before translation; the value range is from 0 to 7. 7 is the highest priority while 0 is the lowest priority.	5
	Translation enable status	Translation enable switch Parameters are valid in the transparent mode.	Select
	Translation VID	The VLAN ID after translation and the value range is from 1 to 4085.	512
	Priority or COS	The VLAN priority after translation; the value range is from 0 to 7. 7 is the highest priority while 0 is the lowest priority.	5
	QinQ enable status	Enables / disables the QinQ configuration.	-
	SVLAN ID	Unconfigurable when the QinQ enable status is disable. The value range is from 1 to 4085.	-
	Service name	Selects the service name configured in the central office VLAN. Unconfigurable when the **QinQ enable status** is disable.	-

7.4.4 Configuration Flow Chart

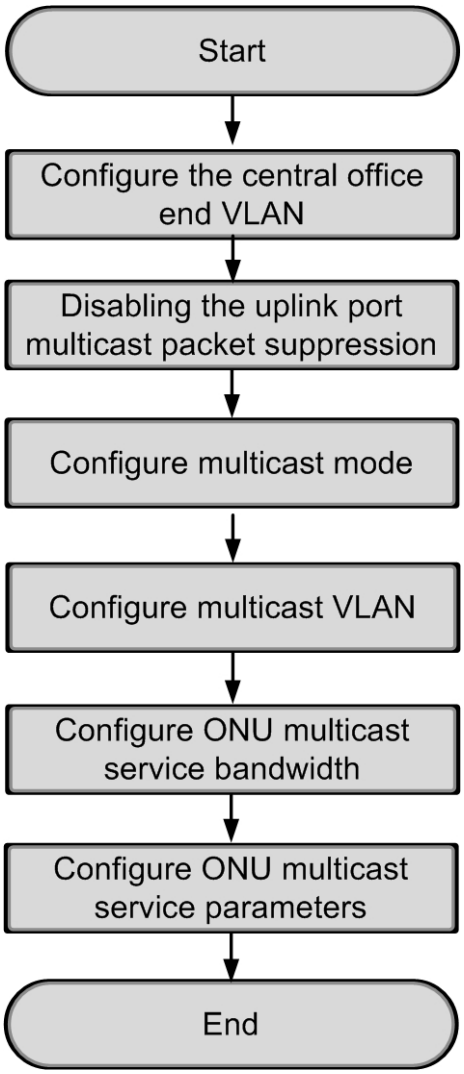


Figure 7-82 Multicast VLAN 1:2 transforming mode service configuration flow

7.4.5 Configuring Central Office End Service VLAN

1. Right-click the HSWA[9] card in the **Object Tree** pane and select **VLAN Config →Local VLAN→Local End Service VLAN** to access the **Local End Service VLAN** tab.
2. Click  in the toolbar to input **1** in the **Please Input The Rows For Add:** dialog box. Click **OK** to create a central office end VLAN.
3. Configure according to the planning data in Table 7-21.

4. Click in the toolbar and the configuration is completed, as shown in Figure 7-83.

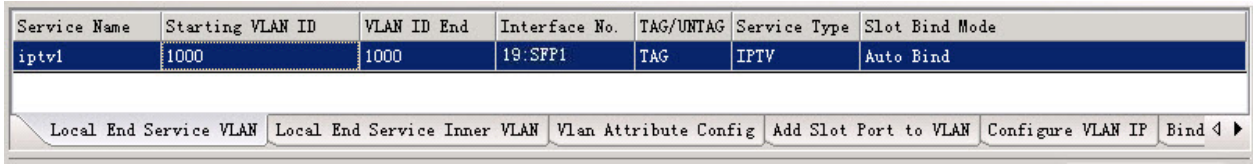


Figure 7-83 Service VLAN local end data-VLAN 1:2 conversion mode

7.4.6 Disabling the Uplink Port Multicast Packet Suppression

1. Right-click the HSWA[9] card in the **Object Tree** pane and select **Security Config→Upport Packet Rate Control** from the shortcut menu to access the **Uplink Port Packet Suppression** window.
2. According to the planned data in Table 7-21. Select **19:2** in **Port No.** and clear the **Enable/Disable** check box of the corresponding multicast packet.
3. Click in the toolbar and the configuration is completed, as shown in Figure 7-84.

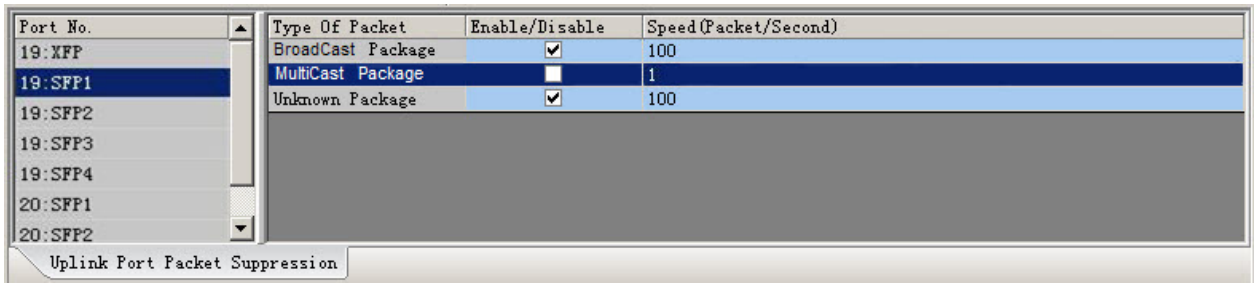


Figure 7-84 Configuring packet suppression at designated uplink port-VLAN 1:2 conversion mode

7.4.7 Configuring Multicast Mode

1. Right-click the HSWA[9] card in the **Object Tree** pane, and select **IGMP Config →IGMP Mode** from the shortcut menu to access the **IGMP Mode** window.
2. According to the planned data in Table 7-21, select **Proxy Mode** in the pulldown list of the **IGMP Mode** item.

3. Click in the toolbar to execute the configuration command, as shown in Figure 7-85.

Figure 7-85 Multicast mode-VLAN 1:2 conversion mode

7.4.8 Configuring Multicast VLAN

1. Right-click the HSWA[9] card in the **Object Tree** pane, and select **IGMP Config**→**Multicast VLAN** from the shortcut menu to access the **Multicast VLAN** window.
2. According to the planned data in Table 7-21, double-click the **VLAN** column and input **1000**.
3. Click in the toolbar to execute the configuration command, as shown in Figure 7-86.

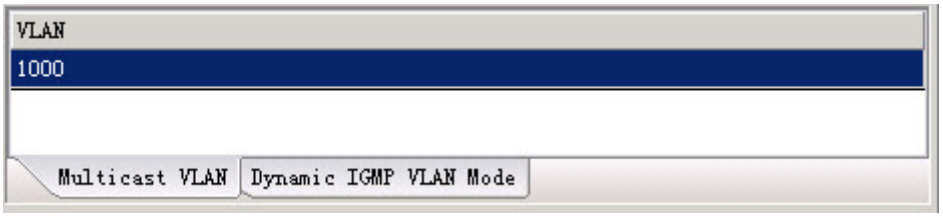


Figure 7-86 Multicast VLAN-VLAN 1:2 conversion mode

7.4.9 Configuring the ONU Multicast Service Bandwidth

Configure the bandwidth of the ONU downlink multicast stream and the uplink / downlink multicast protocol.

1. Click the GC8B[15] card in the **Object Tree** pane and information of all ONUs listed under the GC8B[15] card will be shown in the right pane. Right-click the **PON1-AN5506-10-B1[1]** ONU and select **Config**→**Bandwidth Config** from the shortcut menu to access the **Bandwidth Config** window.

2. Click the pane on right side and click in the toolbar to input **2** in the **Please Input The Rows For Add:** dialog box. Click **OK** to add two services.
3. Configure according to the planning data in Table 7-22.
4. Click in the toolbar and the configuration is completed, as shown in Figure 7-87.

Figure 7-87 Multicast bandwidth allocation-VLAN 1:2 conversion mode

7.4.10 Configuring ONU Multicast Service Parameters

Configure the VLAN of the multicast data stream and the VLAN of the uplink / downlink multicast protocol message.

1. Click the GC8B[15] card in the **Object Tree** pane and information of all ONUs listed under the GC8B[15] card will be shown in the right pane. Right-click the **PON1-AN5506-10-B1[1]** ONU and select **Config→Service Config** from the shortcut menu to click the **Data Port Config** tab.
2. Select **LAN1** in the **Data Port List** pane, and click **Add** to bring up the **Services Configuration** dialog box. Configure parameters in the dialog box according to the planned data in Table 7-22, as shown in Figure 7-88.

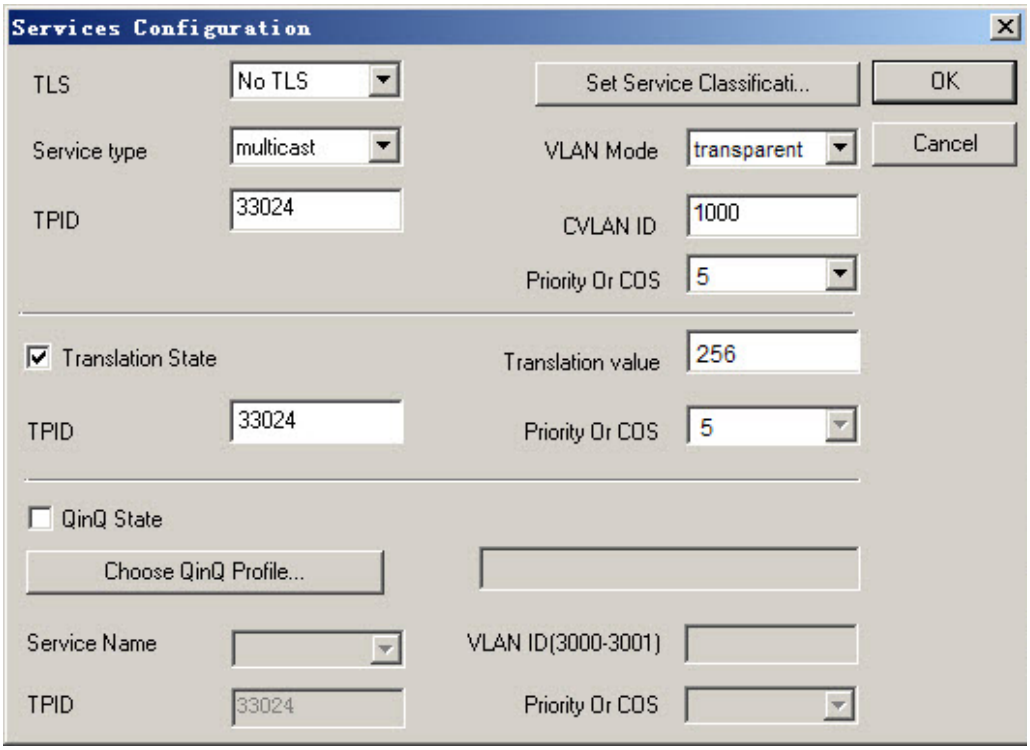


Figure 7-88 Service configuration-VLAN 1:2 conversion mode (IPTV service)

3. Select **LAN1** in the **Data Port List** pane, and click **Add** to bring up the **Services Configuration** dialog box. Configure parameters in the dialog box according to the planned data in Table 7-22, as shown in Figure 7-89.

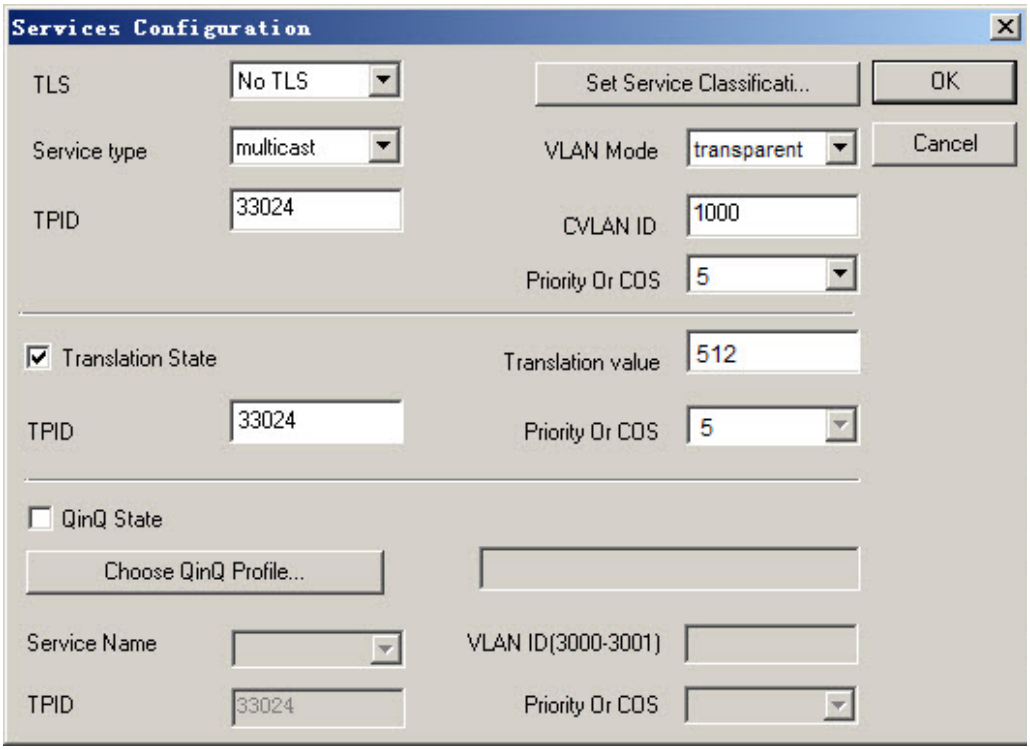


Figure 7-89 Service configuration-VLAN 1:2 conversion mode (video telephone)

4. Click **OK** to return to **Data Port Config** tab.

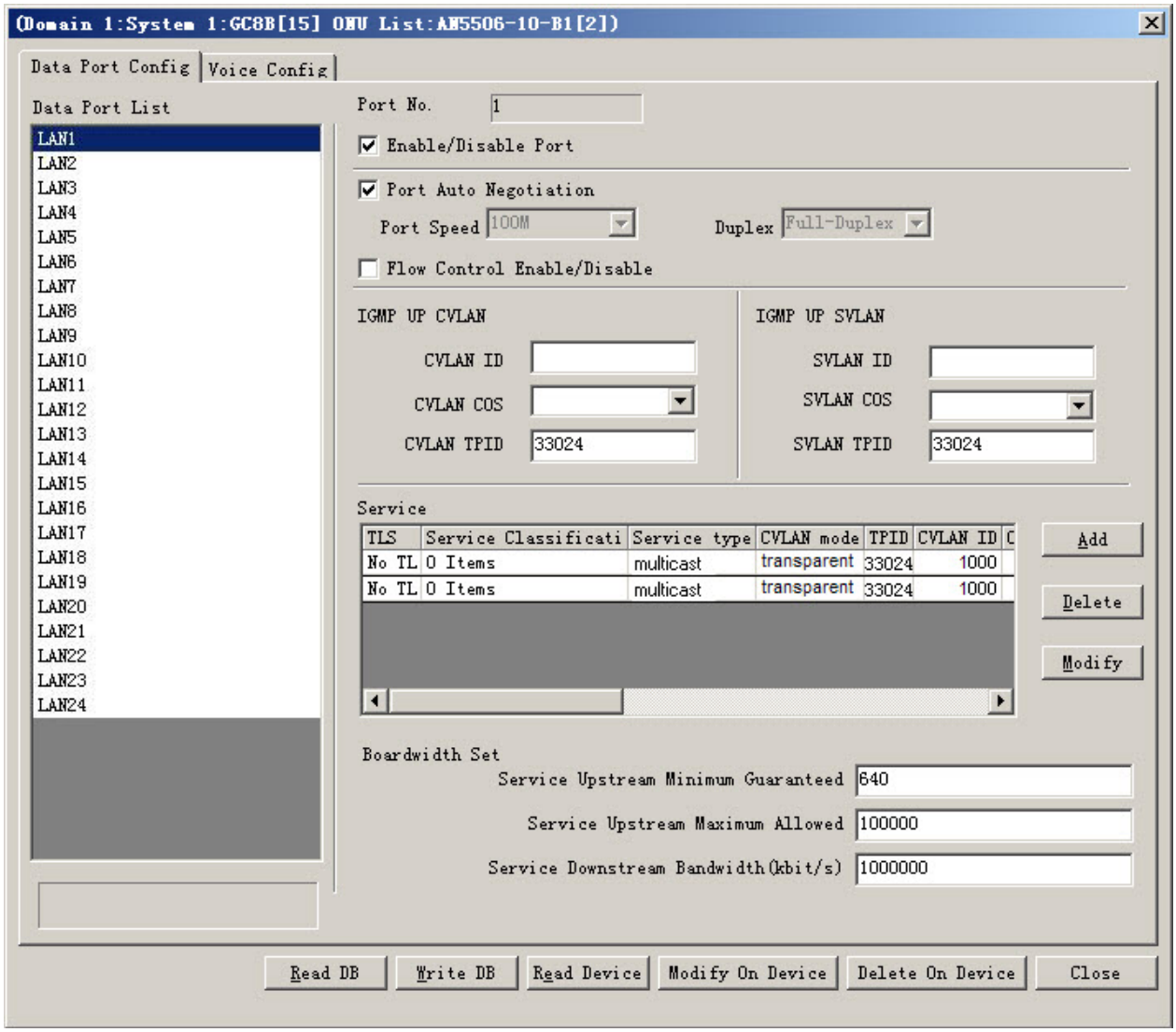


Figure 7-90 Data port configuration-VLAN 1:2 conversion mode

5. Click **Modify On Device** to complete the data service configuration of the AN5506-10-B1 ports.

7.4.11 Configuration Result

The multicast services on the LAN1 port that belong to the AN5506-10-B1 is started up; and the users can watch the video programs with multicast VLAN=1000 normally.

7.5 Example for SSM Group Multicast Configuration

7.5.1 Configuration Rule

- During the bandwidth allocation: if the data service is not started on the ONU, users should configure one **iptv** service bandwidth and one **data** bandwidth for the ONU type 1, as well as one **iptv** service bandwidth and one **integrated service** bandwidth for the ONU type 2. If the data service is started on the ONU, users should configure only one **iptv** service bandwidth for every ONU.
- For ONU type 1, after adding one multicast service to the ONU port, users should add one unicast service; for ONU type 2, users need not add the unicast service after adding one multicast service.
- For ONU type 1, the VLANs of the multicast uplink and downlink protocols can be configured respectively; for ONU type 2, the uplink protocol VLAN is transformed to the port signal VLAN, and the VLANs of the downlink protocol messages and the downlink multicast stream are processed in the same way.
- The VLAN CoS need not be configured in the multicast services. The CoS of the downlink multicast stream is carried by the multicast stream and cannot be configured on the OLT and the ONU. The CoS of the uplink / downlink multicast protocol message is 0.
- The VLAN of the multicast group should be within the range of the local VLAN.
- One multicast program can belong to only one multicast VLAN; one multicast VLAN can include one multicast program or one multicast program group (which refers to the combination of the multicast programs with integrated authority management).
- The uplink ports on the AN5116-06B cannot join multiple VLANs in the untag mode.
- When configuring the souce IP address of the multicast SSM-Mapping, the IP address is the unicast IP address; when configuring the multicast SSM destination IP address range, the IP address is the multicast IP address.
- When configuring the multicast SSM, select IGMP V3 as the IGMP version.

7.5.2 Network Diagram

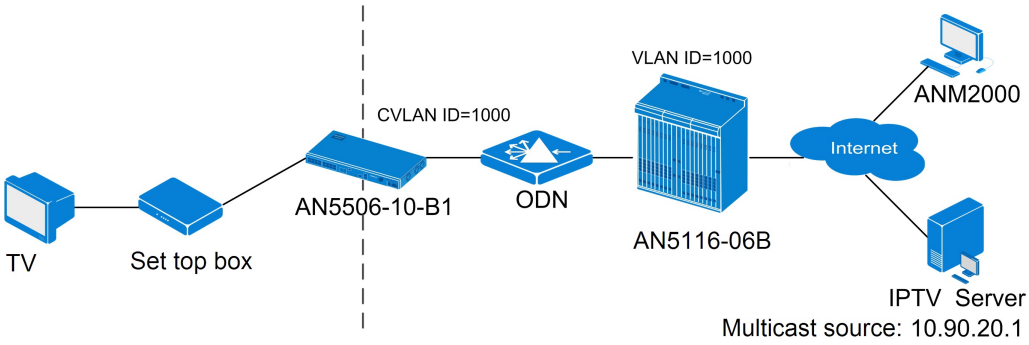


Figure 7-91 Configuring SSM multicast service network connection

- Downlink direction: The SPT (Shortest Path Tree) is established between the multicast source and the AN5116-06B equipment. The multicast source 10.90.20.1 provides special multicast service for the AN5116-06B's users. The ONU strips the VLAN tag of the multicast message and forwards it to the set top box at the client side.
- Uplink direction: The ONU adds the tag for the joining / leaving multicast protocol message transmitted from the set top box, and sends it to the AN5116-06B. Then the AN5116-06B forwards the protocol message to the IPTV server.

The AN5116-06B selects the HU1A card and the GC8B card as the interface card at the network side and client side respectively. The HSWA card is essential. The ONU is the AN5506-10-B1 in this example.

7.5.3 Planning Data

Table 7-23 Planning data of the SSM multicast-OLT side configuration

Configuration Item		Configuration Description	Configuration Example
ONU information	ONU type	Configure according to the type of the ONU that is actually used.	AN5506-10-B1
	Slot number	Configure according to the slot number of the PON interface card that is actually used.	15
	PON port number	Configure according to the number of the PON port that is actually used.	1

Table 7-23 Planning data of the SSM multicast-OLT side configuration (Continued)

Configuration Item		Configuration Description	Configuration Example
	ONU authorization number	Configure according to the network planning of the operator.	1
Local end data of service VLAN	Service name	Configure according to the network planning of the operator.	iptv1
	Starting VLAN ID	The starting VLAN ID of the uplink port services. Configure according to the network planning of the operator.	1000
	Ending VLAN ID	The ending VLAN ID of the uplink port services. Configure according to the network planning of the operator.	1000
	Uplink port number	Configure according to the number of the uplink port that is actually used.	19:SFP1
	Tag / untag property	Configures the tag processing mode for the uplink service VLAN. There are two options: **TAG** and **UNTAG**. ◆ Under the **UNTAG** mode, the tags of the uplink packets will be stripped automatically when they pass the port and the packets will be uplinked in the untag form, while the downlink untag packets will be added with designated tags when they pass the port. ◆ Under the **TAG** mode, the tags of the uplink / downlink data packets will not be processed when they pass the port.	UNTAG
	Service type	Select iptv for the multicast services.	iptv
Uplink port packet suppression	Port number	Select 19:2, which is corresponding to 19: SFP1.	19:2
	Packet type	Select multicast packet for this example.	Multicast packet
	Enable / disable	Select to disable the suppression in this example.	Disable
Multicast protocol version	Multicast protocol version	Configure according to the network planning of the operator.	IGMP Version 3
Multicast mode	Multicast mode	Configure according to the network planning of the operator.	Proxy mode

Table 7-23 Planning data of the SSM multicast-OLT side configuration (Continued)

Configuration Item		Configuration Description	Configuration Example
Multicast VLAN	Multicast VLAN	Configure according to the network planning of the operator. The multicast VLAN should be within range of the local end VLAN.	1000
SSM IP address range	SSM IP	Configure according to the network planning of the operator.	IPv4: 225.0.0.1 / 255.255.0.0
Multicast SSM-Mapping source IP address	SSM-Mapping IP address	Configure according to the network planning of the operator.	IPv4: 10.90.20.1

Table 7-24 Planning data of the SSM multicast-ONU side configuration

Configuration Item		Configuration Description	Configuration Example
ONU multicast bandwidth configuration	Service type	◆ Select **iptv** for the multicast service. ◆ Select **integrated service** for the data service.	iptv Integrated service
	Fixed multicast bandwidth (Kbyte/s)	Configure according to the network planning of the operator. The default value is 16.	16
	Assured multicast bandwidth (Kbyte/s)	Configure according to the network planning of the operator. The default value is 0.	0
	Maximum multicast bandwidth (Kbyte/s)	Configure according to the network planning of the operator. The default value is 64.	64
	Fixed data bandwidth (Kbyte/s)	Configure according to the network planning of the operator. The default value is 16.	16
	Assured data bandwidth (Kbyte/s)	Configure according to the network planning of the operator. The default value is 0.	0
	Maximum data bandwidth (Kbyte/s)	Configure according to the network planning of the operator. The default value is 64.	1280
ONU multicast service configuration	Port number	Configure according to the network planning of the operator.	LAN1
	Service type	Select **multicast**.	Multicast
	VLAN mode	Configure according to the network planning of the operator.	tag
	CVLAN ID	When the translation function is enabled, this item is configured as the VLAN ID before translation. When the tag mode is untag, this item cannot be configured. The value ranges from 1 to 4085.	1000

Table 7-24 Planning data of the SSM multicast-ONU side configuration (Continued)

Configuration Item		Configuration Description	Configuration Example
	Priority level or COS	The VLAN priority level before translation. The value ranges from 0 to 7. 7 refers to the highest priority level, 0 refers to the lowest priority level.	5
	Translation enabling status.	The translation enabling / disabling switch. Under the transparent transmission mode, the parameter is valid.	—
	Translated VID	The VLAN ID after translation. The value ranges from 1 to 4085.	—
	Priority level or COS	The VLAN priority level after translation. The value ranges from 0 to 7. 7 refers to the highest priority level, 0 refers to the lowest priority level.	—
	QinQ enabling status	Select to enable or disable the QinQ configuration.	—
	SVLAN ID	When the QinQ enabling status is **disable**, this item cannot be configured. The value ranges from 1 to 4085.	—
	Service name	Select the configured service name in the local end VLAN. When the QinQ enabling status is **disable**, this item cannot be configured.	—

7.5.4 Configuration Flow

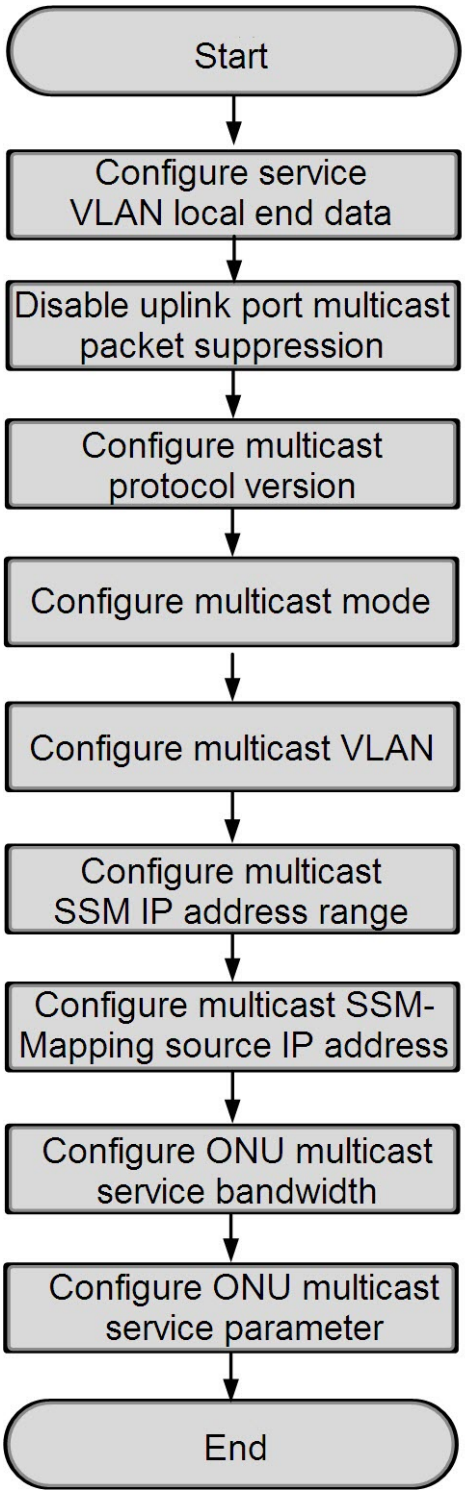


Figure 7-92 Configuration flow of SSM multicast

7.5.5 Configuring Local End Data of Service VLAN

1. Right-click the HSWA[9] card in the **Object Tree** pane, select **VLAN Config→Local VLAN→Local End Service VLAN** from the shortcut menu, and then click the **Local End Service VLAN** tab from the window that appears.
2. Click  in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to create a new entry of the service VLAN local end data.
3. Configure the parameters according to the planning data in Table 7-23.
4. Click  in the toolbar to complete the configuration. See Figure 7-93.

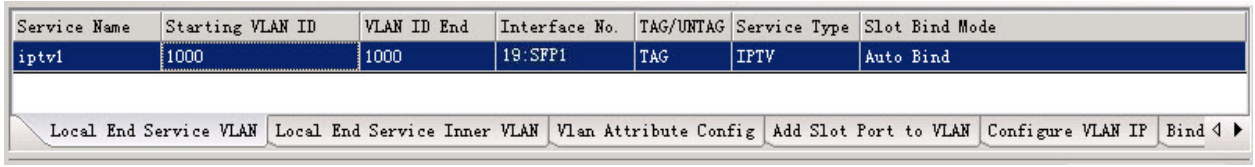


Figure 7-93 Local end data of service VLAN-configuring SSM multicast

7.5.6 Disabling Uplink Port Multicast Packet Suppression

1. Right-click the HSWA[9] card in the **Object Tree** pane, and select **Security Config→Upport Packet Rate Control** from the shortcut menu to open the **Uplink Port Packet Suppression** window.
2. According to the planning data in Table 7-23, select **19:2** in the **Port No.** pane and cancel the selection in the **Enable / Disable** check box corresponding to the multicast packet.
3. Click  in the toolbar to complete the configuration. See Figure 7-94.

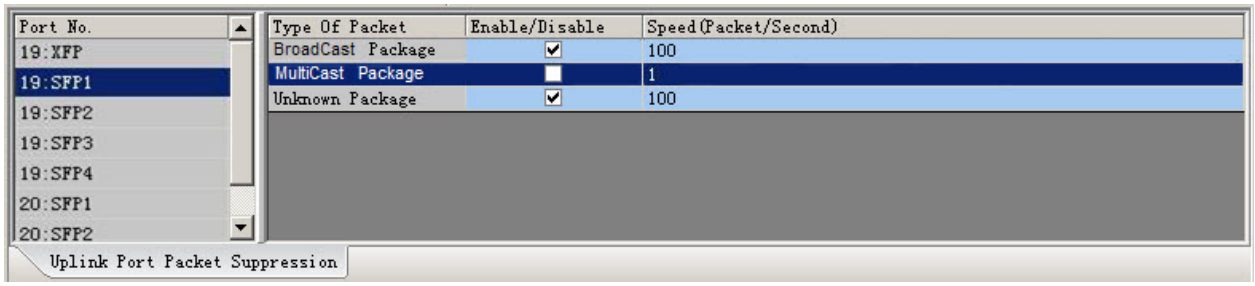


Figure 7-94 Designating uplink port packet suppression-configuring SSM multicast

7.5.7 Configuring Multicast Protocol Version

1. Right-click the HSWA[9] card in the **Object Tree** pane, and select **IGMP Config →IGMP Task** from the shortcut menu to open the **IGMP Task** window.
2. According to the planning data in Table 7-23, select **IGMP V3** from the **Igmp version** drop-down list.
3. Click in the toolbar to execute the configuration command, as shown in Figure 7-95.

Figure 7-95 Multicast protocol version-configuring SSM multicast

7.5.8 Configuring Multicast Mode

1. Right-click the HSWA[9] card in the **Object Tree** pane, and select **IGMP Config →IGMP Mode** from the shortcut menu to open the **IGMP Mode** window.
2. According to the planning data in Table 7-23, select **Proxy Mode** from the **IGMP Mode** drop-down list.
3. Click in the toolbar to execute the configuration command, as shown in Figure 7-96.

Figure 7-96 Multicast mode-configuring SSM multicast

7.5.9 Configuring Multicast VLAN

1. Right-click the HSWA[9] card in the **Object Tree** pane, and select **IGMP Config →Multicast VLAN** from the shortcut menu to open the **Multicast VLAN** window.
2. According to the planning data in Table 7-23, double-click **VLAN** column and enter **1000**.
3. Click in the toolbar to execute the configuration command, as shown in Figure 7-97.

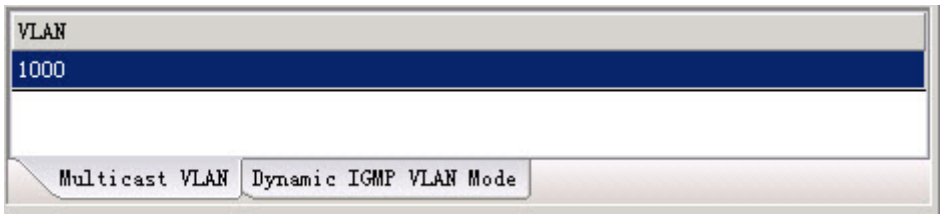


Figure 7-97 Multicast VLAN-configuring SSM multicast

7.5.10 Configuring Multicast SSM IP Address Range

1. Right-click the HSWA[9] card in the **Object Tree** pane, and select **IGMP Config →IGMP SSM IP Address Range** from the shortcut menu to open the **IGMP SSM IP Address Range** window.
2. Configure the parameters according to the planning data in Table 7-23.
3. Click in the toolbar to execute the configuration command, as shown in Figure 7-98.

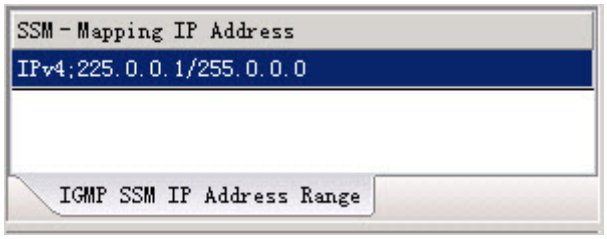


Figure 7-98 Multicast SSM IP address range-configuring SSM multicast

7.5.11 Configuring Multicast SSM-Mapping Source IP Address

1. Right-click the HSWA[9] card in the **Object Tree** pane, and select **IGMP Config →IGMP SSM-Mapping Source Ip Address** from the shortcut menu to open the **IGMP SSM-Mapping Source IP Address** window.
2. Configure the parameters according to the planning data in Table 7-23.
3. Click in the toolbar to execute the configuration command, as shown in Figure 7-99.

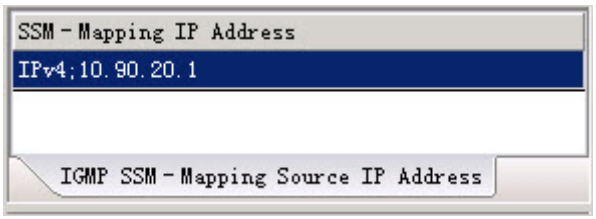


Figure 7-99 Multicast SSM-Mapping source IP address-configuring SSM multicast

7.5.12 Configuring ONU Multicast Service Bandwidth

1. Click the GC8B[15] card in the **Object Tree** pane, the right pane displays all ONUs under the GC8B[15] card. Right-click the ONU **PON1-AN5506-10-B1[1]** and select **Config→Bandwidth config** to open the **Bandwidth Config** window.
2. Click the right pane, and click in the toolbar, and enter **2** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to add two entries of services.
3. Configure the parameters according to the planning data in Table 7-24.
4. Click in the toolbar to complete the configuration. See Figure 7-100.

Figure 7-100 Multicast bandwidth allocation-configuring SSM multicast

7.5.13 Configuring ONU Multicast Service Parameters

1. Click the GC8B[15] card in the **Object Tree** pane, the right pane displays all ONUs under the GC8B[15] card. Right-click the ONU **PON1-AN5506-10-B1[1]** and select **Config→Service Config**. In the dialog box that appears, select the **Data Port Config** tab.
2. Select **LAN1** in the **Data Port List** pane, and click the **Add** button to bring up the **Services Configuration** dialog box. Configure the parameters in the dialog box according to the planning data in Table 7-24.

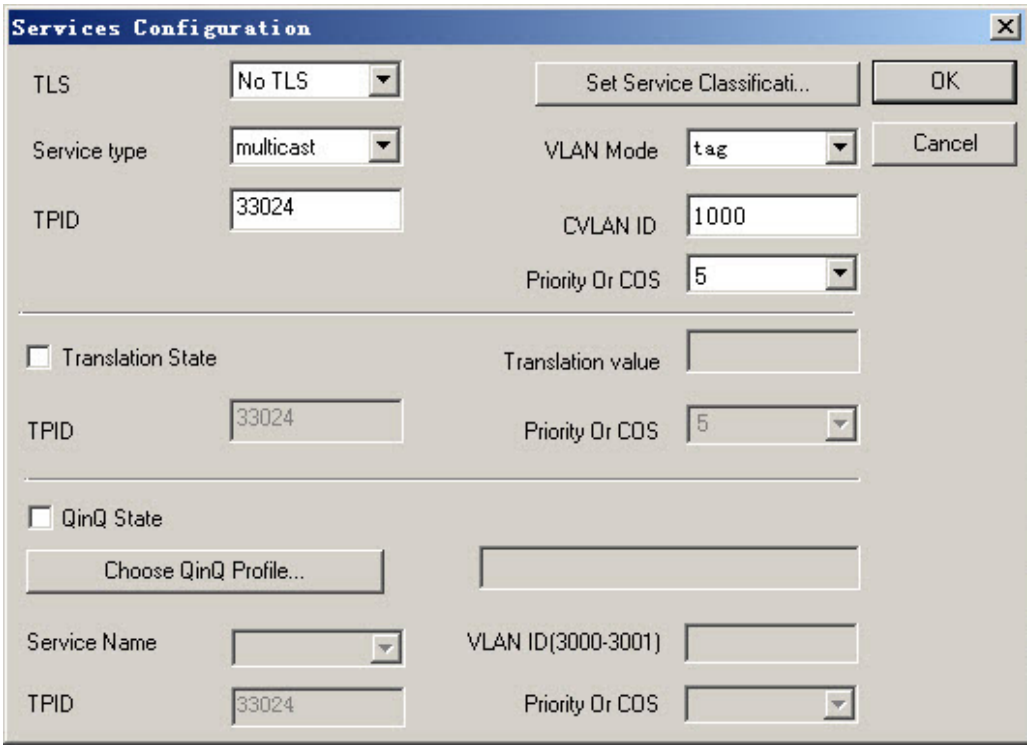


Figure 7-101 Service configuration-configuring SSM multicast

3. Click **OK** to return to the **Data Port Config** tab.

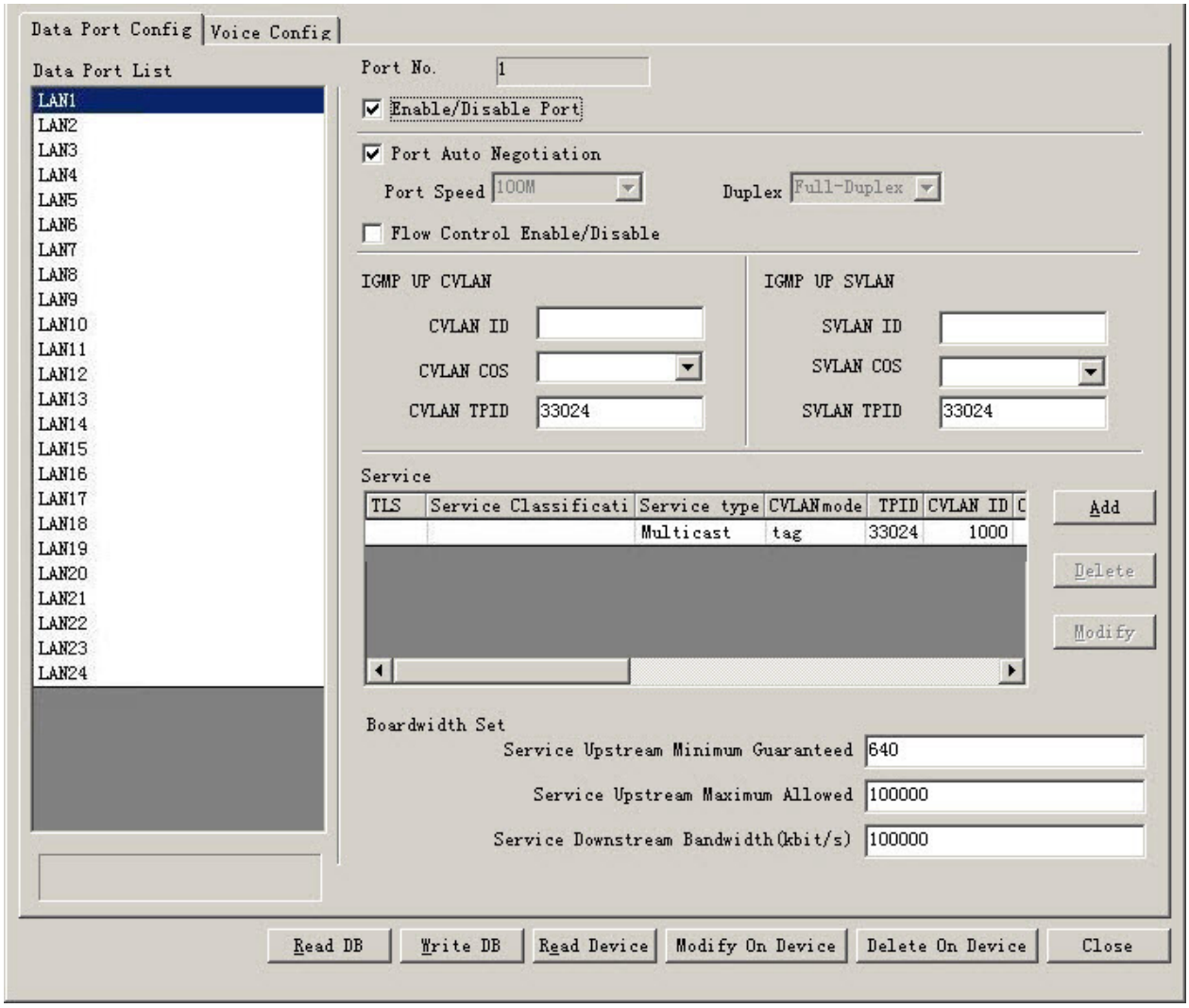


Figure 7-102 Data port configuration-configuring SSM multicast

4. Click **Modify On Device** to complete the port data service configuration of the AN5506-10-B1.

7.5.14 Configuration Result

The multicast services on the LAN1 port that belong to the AN5506-10-B1 is started up; and the users can watch the video programs whose multicast VLAN is 1000 normally via the set top box.

7.6 Optional Function

7.6.1 Configuring Multicast Cascade Port

Planning data

Table 7-25 Planning data of the multicast cascade port

Configuration Item	Configuration Description	Configuration Example
Cascade Port Number	Configure according to the network planning of the operator.	20:SFP1

Configuration procedure

1. Right-click the active HSWA card in the **Object Tree** pane, and select **IGMP Config→IGMP Cascade Ports** from the shortcut menu. In the window that appears, select the **IGMP Cascade Ports** tab.
2. Click  in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok**.
3. Configure the parameters according to the planning data in Table 7-25.
4. Click  in the toolbar to complete the configuration. See Figure 7-103.

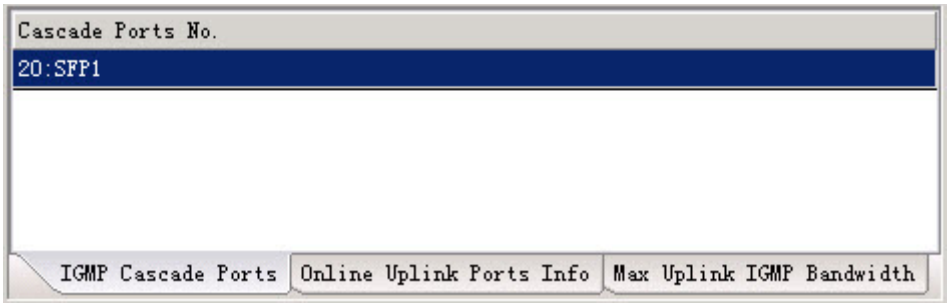


Figure 7-103 Configuring the multicast concatenation port

7.6.2 Configuring Maximum Multicast Bandwidth for Uplink Ports

Planning data

Table 7-26 Planning data of the uplink port's maximum bandwidth for multicast services

Configuration Item	Configuration Description	Configuration Example
Total bandwidth of the uplink ports (Kbit/s)	Configure according to the network planning of the operator. The default value is 0.	60000

Configuration procedure

1. Right-click the active HSWA card in the **Object Tree** pane, and select **IGMP Config→IGMP Cascade Ports** from the shortcut menu. In the window that appears, select the **Max Uplink IGMP Bandwidth** tab.
2. Configure the parameters according to the planning data in Table 7-26.
3. Click  in the toolbar to complete the configuration. See Figure 7-104.

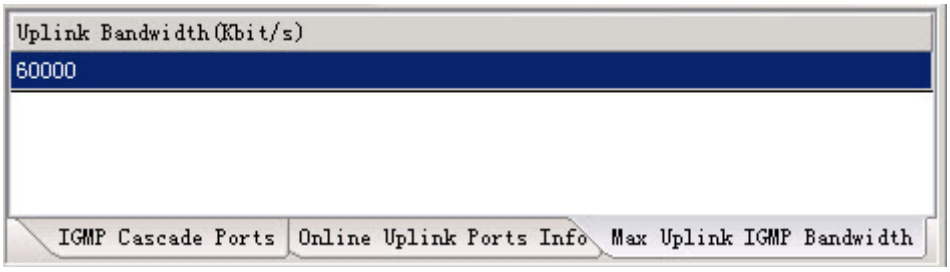


Figure 7-104 Configuring the uplink port's maximum bandwidth for multicast services

7.6.3 Configuring OLT Multicast Protocol Parameters

Planning data

Table 7-27 Planning data of the OLT multicast protocol parameters

Configuration Item	Configuration Description	Configuration Example
Robustness variable	Configure according to the network planning of the operator. The default value is 2.	2
General query response interval (second)	Configure according to the network planning of the operator. The default value is 10.	10
Last group member query interval (second)	Configure according to the network planning of the operator. The default value is 1.	1
Last group member query count	Configure according to the network planning of the operator. The default value is 2.	2
General query interval (second)	Configure according to the network planning of the operator. The default value is 125.	125
Group member aging time (second)	Configure according to the network planning of the operator. The default value is 260.	260

Configuration procedure

1. Right-click the active HSWA card in the **Object Tree** pane, and select **IGMP Config→IGMP Profile and Port** from the shortcut menu. In the window that appears, select the **IGMP Protocol Parameters** tab.
2. Configure the parameters according to the planning data in Table 7-27.
3. Click  in the toolbar to complete the configuration. See Figure 7-105.

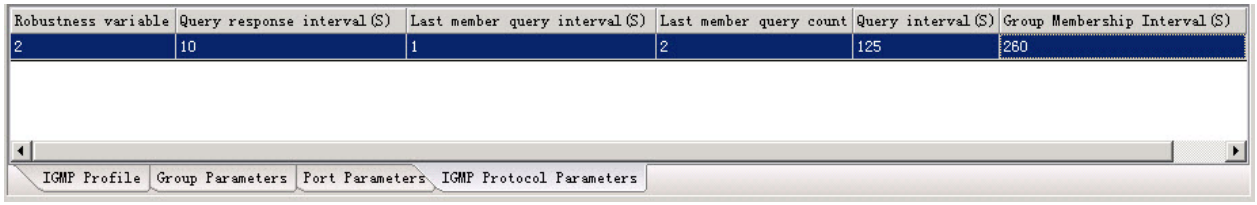


Figure 7-105 Configuring multicast protocol parameters

7.6.4 Configuring ONU Multicast Parameters

Planning data

Table 7-28 Planning data of the ONU multicast parameters

Configuration Item	Configuration Description	Configuration Example
Slot number	Slot number of the PON interface card that connects to the ONU.	5
PON port number	Number of the PON port that connects to the ONU.	1
ONU authorization number	The authorization number of the ONU.	1
Fast leave	Configure the way the users under the ONU port leave the multicast group according to the network planning of the operator. The options include **NON FAST LEAVE** and **FAST LEAVE**.	NON FAST LEAVE
Robustness count	Number of times that the ONU sends the multicast downlink query messages. The value ranges from 0 to 12. The default value is 2.	2
Last query count	Number of times that the ONU sends the special group query. The value ranges from 0 to 12. The default value is 2.	2
Multicast mode	The multicast mode of the ONU. The options include: snooping mode, proxy mode and controlled mode.	Proxy mode

Configuration procedure

1. Right-click the active HSWA card in the **Object Tree** pane, and select **IGMP Config→ONU Configuration** to open the **ONU Configuration** window.

2. Click in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok**.
3. Configure the parameters according to the planning data in Table 7-28.
4. Click in the toolbar to complete the configuration. See Figure 7-106.

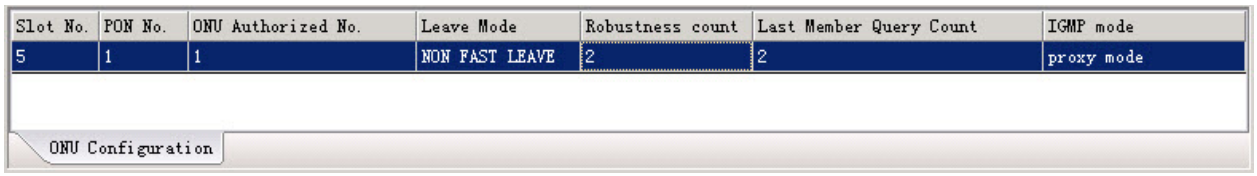


Figure 7-106 Configuring ONU parameters

7.6.5 Configuring Prejoin Groups

Planning data

Table 7-29 Planning data of prejoin groups

Configuration Item	Configuration Description	Configuration Example
Prejoin group	Configure according to the network planning of the operator.	224.0.1.1

Configuration procedure

1. Right-click the active HSWA card in the **Object Tree** pane, and select **IGMP Config→Prejoin Groups** from the shortcut menu to open the **Pre-join Groups** window.
2. Click in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to add one prejoin group.
3. Configure the parameters according to the planning data in Table 7-29.
4. Click in the toolbar to complete the configuration. See Figure 7-107.

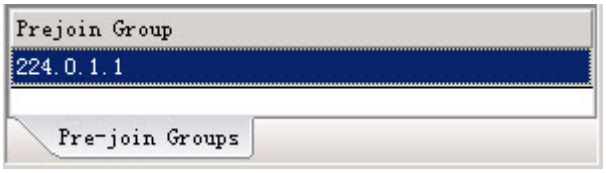


Figure 7-107 Configuring the prejoin group

7.6.6 Configuring Multicast Default Preview Parameters

Planning data

Table 7-30 Planning data of the multicast preview parameters

Configuration Item	Configuration Description	Configuration Example
Preview counts	The maximum number of times a subscriber can preview a given program. This parameter is valid only under the controllable mode when the authority of this multicast group is **Preview**. The value range is 1 to 16; and the default value is 4.	4
Preview time	The maximum viewing time for each preview. This parameter is valid only under the controllable mode when the authority of this multicast group is **Preview**. The value range is 1 to 254; the unit is minute; and the default value is 10.	10
Preview interval	The interval limit of the users to preview the multicast programs. This parameter is valid only under the controllable mode when the authority of this multicast group is **Preview**. The value range is 1 to 254; the unit is minute; and the default value is 30.	30
Preview reset time	The reset period of subscriber preview authority. This parameter is valid only under the controllable mode when the authority of this multicast group is **Preview**. The value range is 1 to 254; the unit is hour; and the default value is 24.	24
Preview total time	The total duration limit of the users to preview the multicast programs. This parameter is valid only under the controllable mode when the authority of this multicast group is **Preview**. The value range is 1 to 254; the unit is minute; and the default value is 254.	254

Configuration procedure

1. Right-click the active HSWA card in the **Object Tree** pane, and select **IGMP Config→Default Preview Parameters** from the shortcut menu to open the **Default Preview Parameters** window.
2. Configure the parameters according to the planning data in Table 7-30.
3. Click in the toolbar to complete the configuration. See Figure 7-108.

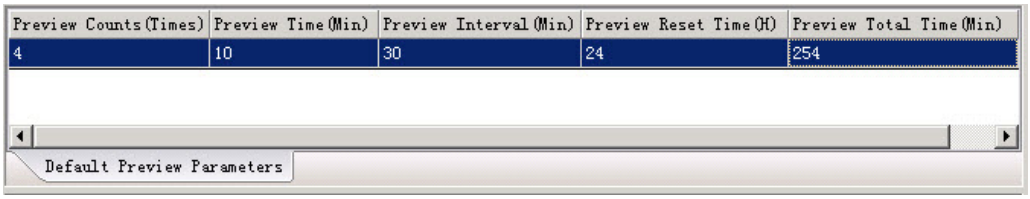


Figure 7-108 Configuring the default preview parameters

7.6.7 Configuring Multicast Log Time

Planning data

Table 7-31 Planning data of the multicast log time

Configuration Item	Configuration Description	Configuration Example
Log ignoring time	When the duration of the users to watch the program is lower than this ignoring time, the operation of joining and leaving the multicast group will not be recorded in the multicast log. The value range is 1 to 60; the unit is second. The default value is 0, which means that all the operations of the users joining or leaving the multicast groups will be recorded in the multicast log.	0
Automatic log generation interval time	When the duration of a user to continuously watch the multicast program is longer than this interval time, one item of multicast log indicating that the user is online will be generated. The value range is 1 to 60; the unit is minute; and the default value is 60.	60

Configuration procedure

1. Right-click the active HSWA card in the **Object Tree** pane, and select **IGMP Config→Log Management** from the shortcut menu. In the window that appears, select the **Log Parameters** tab.
2. Configure the parameters according to the planning data in Table 7-31.
3. Click in the toolbar to complete the configuration. See Figure 7-109.

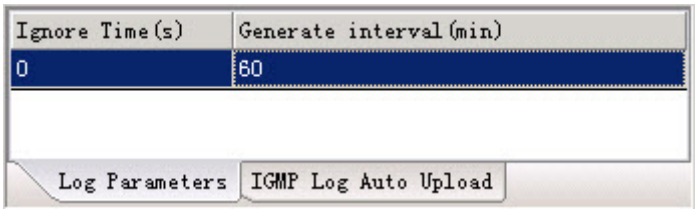


Figure 7-109 Configuring the multicast log time

7.6.8 Configuring Automatic Uploading of Multicast Logs

Planning data

Table 7-32 Planning data of the automatic multicast log uploading

Configuration Item	Configuration Description	Configuration Example
Enable	Select to enable / disable the function of automatic uploading the multicast logs to the server. Select **Enable**, users should configure the related parameters. Select **Disable**, users need not configure the related parameters.	Enable
Uploading interval (minute)	The interval time to automatically upload the multicast logs to the server. The value ranges between 1 and 1440, and the unit is second.	30
Server IP	IP address of the server that the multicast logs are uploaded to.	192.168.1.1

Table 7-32 Planning data of the automatic multicast log uploading (Continued)

Configuration Item	Configuration Description	Configuration Example
User name	The user name used to log in the server that the multicast logs are uploaded to. The maximum length is 20 characters.	1
Password	The password used to log in the server that the multicast logs are uploaded to. The maximum length is 20 characters.	1

Configuration procedure

1. Right-click the active HSWA card in the **Object Tree** pane, and select **IGMP Config→Log Management** from the shortcut menu. In the window that appears, select the **IGMP Log Auto Upload** tab.
2. Configure the parameters according to the planning data in Table 7-32.
3. Click  in the toolbar to complete the configuration. See Figure 7-110.

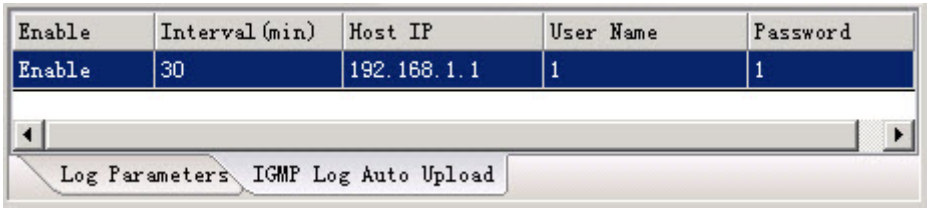


Figure 7-110 Configuring automatic uploading of multicast logs

7.6.9 Configuring Uploading of Multicast Logs to FTP

Planning data

Table 7-33 Planning data of the multicast log uploading to the FTP

Configuration Item	Configuration Description	Configuration Example
Server IP	IP address of the server that the multicast logs are uploaded to.	192.168.1.188
User name	The user name used to log in the server that the multicast logs are uploaded to.	1

Table 7-33 Planning data of the multicast log uploading to the FTP (Continued)

Configuration Item	Configuration Description	Configuration Example
Password	The password used to log in the server that the multicast logs are uploaded to.	1
File name	The name of the file that saves the multicast logs.	igmp.txt

Configuration procedure

1. Right-click the active HSWA card in the **Object Tree** pane, and select **IGMP Config→IGMP Log Upload**.
2. Configure the parameters according to the planning data in Table 7-33.
3. Click in the toolbar to execute the configuration command, as shown in Figure 7-111.

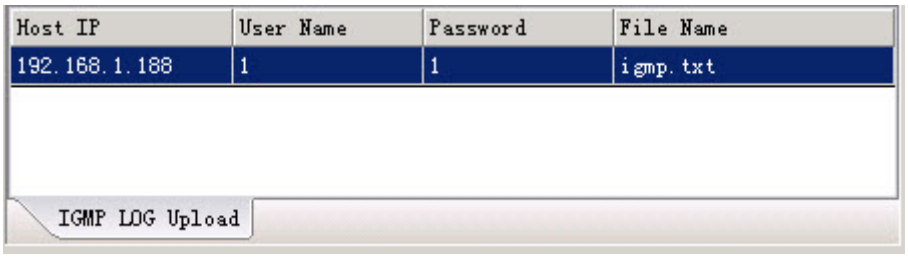


Figure 7-111 Configuring uploading of multicast logs to FTP

7.6.10 Clearing Logs

Configuration procedure

1. Right-click the active HSWA card in the **Object Tree** pane, and select **IGMP Config→Clear IGMP Record**.
2. Click in the toolbar to execute the configuration command, as shown in Figure 7-112.

Figure 7-112 Clearing logs

7.6.11 Forcing Users to Leave

Planning data

Table 7-34 Planning data of forcing users to leave

Configuration Item	Configuration Description	Configuration Example
Slot number	The slot number of the PON interface card that is connected to the ONU.	15
PON port number.	The number of the PON port.	1
ONU number	The ONU authorization number.	1
ONU port number	The number of the ONU port.	1
Multicast group address	The IP address of the multicast program.	224.0.1.1

Configuration procedure

1. Right-click the active HSWA card in the **Object Tree** pane, and select **IGMP Config→Force Leave**.
2. Configure the parameters according to the planning data in Table 7-34.
3. Click  in the toolbar to execute the configuration command, as shown in Figure 7-113.

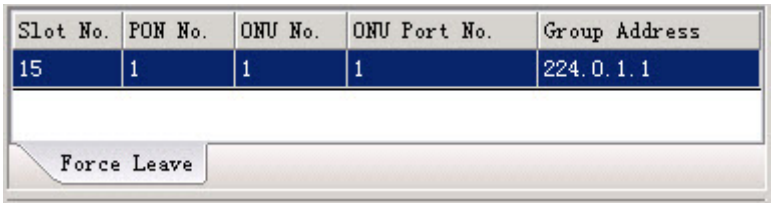


Figure 7-113 Configuration of forcing users to leave

7.6.12 Refreshing Multicast Configuration Information

Configuration procedure

1. Right-click the active HSWA card in the **Object Tree** pane, and select **IGMP Config→Flush Igmp Configuration**.
2. Click in the toolbar to execute the configuration command, as shown in Figure 7-114.

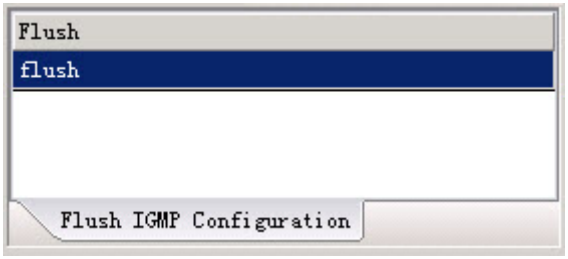


Figure 7-114 Refreshing multicast configuration information

8 Configuring TDM Services

- Configuration Rule
- Network Diagram
- TDM Service Configuration Example

8.1 Configuration Rule

The E1 ports of the ONU must be one-to-one corresponding to the E1 sequence numbers of the TDM card.

8.2 Network Diagram

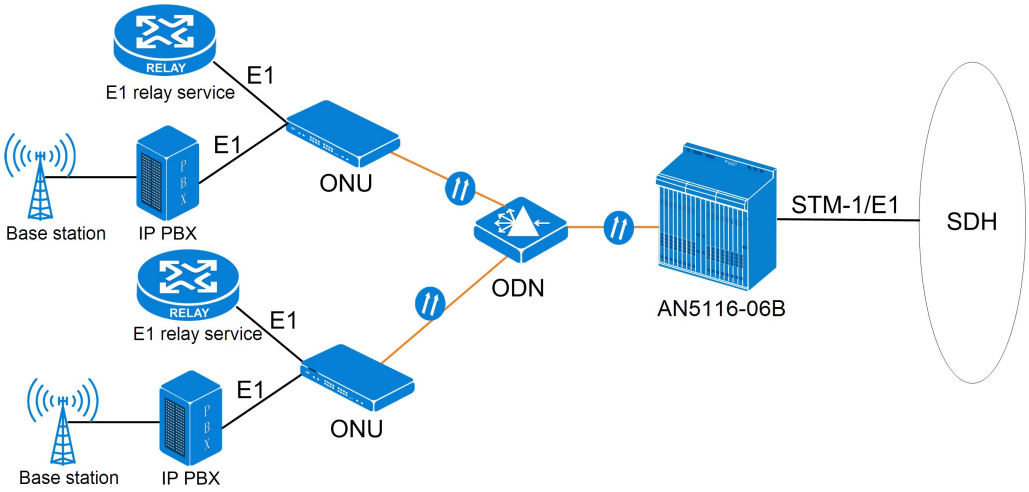


Figure 8-1 TDM service network connection

The E1 private line users and mobile subscribers can access the TDM service using the E1 port of the ONU. The ONU sends the TDM service to the OLT side, and then the OLT side identifies and forwards the TDM service, and sends to the higher layer SDH network.

The AN5116-06B selects the CE1B card and the GC8B card as the interface card at the network side and client side respectively. The HSWA card is essential. The ONU that provides the TDM services is the AN5506-06-E.

8.3 TDM Service Configuration Example

8.3.1 Planning Data

Table 8-1 The OLT side planning data of the TDM services

Configuration Item		Configuration Description	Configuration Example
ONU information	Slot number	The slot number of the GC8B card that is connected to the ONU.	15
	PON port number	The number of the PON port that connects to the ONU.	1
	ONU authorization number	Configure according to the network planning of the operator.	3
	ONU type	The ONU type.	AN5506-06-E
Configuring system clock mode	Slot number	The slot number of the TDM card that is actually used.	1
	Synchroniza-tion reference source	The ways that the AN5116-06B gets the clock, including: internal, external clock 1. External clock 2, and E1 extraction. The default setting is internal.	Internal
Configuring clock recovery mode	Slot number	The slot number of the TDM card that is actually used.	1
	Clock recovery mode	The clock recovery mode between the ONU and the OLT, including adaptive clock, loopback clock, differential clock and enhanced adaptive clock. The default setting is adaptive clock.	Adaptive clock

Table 8-2 The ONU side planning data of the TDM services

Configuration Item		Configuration Description	Configura-tion Example
Bandwidth allocation	Service type	Select TDM service.	TDM
	Fixed bandwidth (Kbyte/s)	The fixed bandwidth of an ONU's uplink service. Even if the service does not use the bandwidth resource, other services cannot occupy the resource. The default value is 16.	16

Table 8-2 The ONU side planning data of the TDM services (Continued)

Configuration Item		Configuration Description	Configuration Example
	Assured bandwidth (Kbyte/s)	The minimum bandwidth for provisioning an ONU's uplink service. If the bandwidth resource is not used by this service, then the resource may be released for other services. The default value is 0.	0
	Maximum bandwidth (Kbyte/s)	The maximum bandwidth of an ONU's uplink service. The sum of the fixed bandwidth value and the assured bandwidth value should not be larger than the maximum bandwidth value. The default value is 64.	1280
ONU user E1 configuration	Port number	The number of the E1 port that is actually used on the ONU.	1
	TDM card slot number	The slot number of the TDM card that is actually used.	1
	Local end TDM E1 number	The E1 number of the TDM card that is actually used.	8
	Remote end jitter buffer	The maximum space for saving the E1 packets received by the TDM card. The default setting is 32 E1 packets of 125us.	32
	Local end jitter buffer	The maximum space for saving the E1 packets received by the ONU card. The default setting is 32 E1 packets of 125us.	32

8.3.2 Configuration Flow

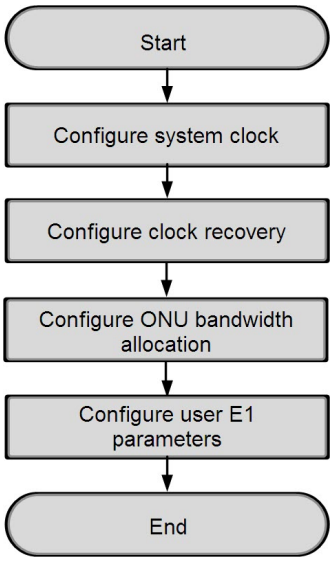


Figure 8-2 TDM service configuration flow

8.3.3 Configuring System Clock

1. Right-click the CE1B[1] card in the **Object Tree** pane, and select **Config→ system clock mode** from the shortcut menu to open the **system clock mode** window.
2. Click the **Clock source** option and select **internal** from the drop-down list.
3. Click  in the toolbar to complete the configuration. See Figure 8-3.

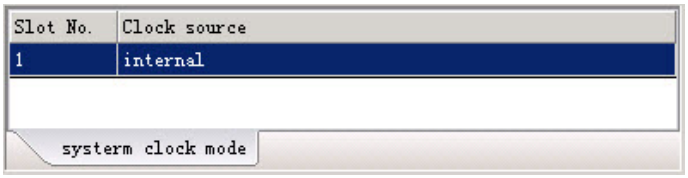


Figure 8-3 System clock configuration

8.3.4 Configuring Clock Recovery

1. Right-click the CE1B[1] card in the **Object Tree** pane, and select **Config→ Clock Recovery Mode** from the shortcut menu to open the **clock recovery mode** window.

2. Click the **mode** option and select **adaptive clock** from the pull-down list.
3. Click in the toolbar to complete the configuration. See Figure 8-4.

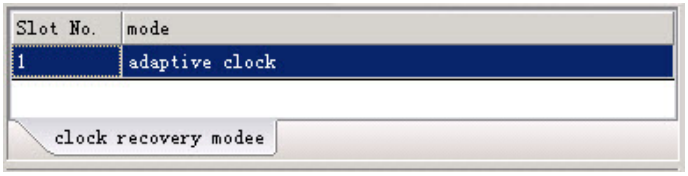


Figure 8-4 Clock recovery configuration

8.3.5 Configuring Bandwidth Allocation

1. Click the GC8B[15] card in the **Object Tree** pane, the right pane displays all ONUs under the GC8B[15] card. Right-click the ONU **AN5506-06-E[3]** and select **Config→Bandwidth config** to open the **Bandwidth Config** window.
2. Click in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok**.
3. Configure the parameters according to the planning data in Table 8-1.
4. Click in the toolbar to complete the configuration. See Figure 8-5.

Figure 8-5 Bandwidth allocation of TDM service

8.3.6 Configuring E1 Parameters for ONU Subscribers

1. Click the GC8B[15] card in the **Object Tree** pane, the right pane displays all ONUs under the GC8B[15] card. Right-click the ONU **AN5506-06-E[3]** and select **ConfigService Config**. Select the **E1 Config** tab in the window that appears.
2. Configure the parameters according to the planning data in Table 8-1.

3. Click the **Modify On Device** button to complete the configuration. See Figure 8-6.

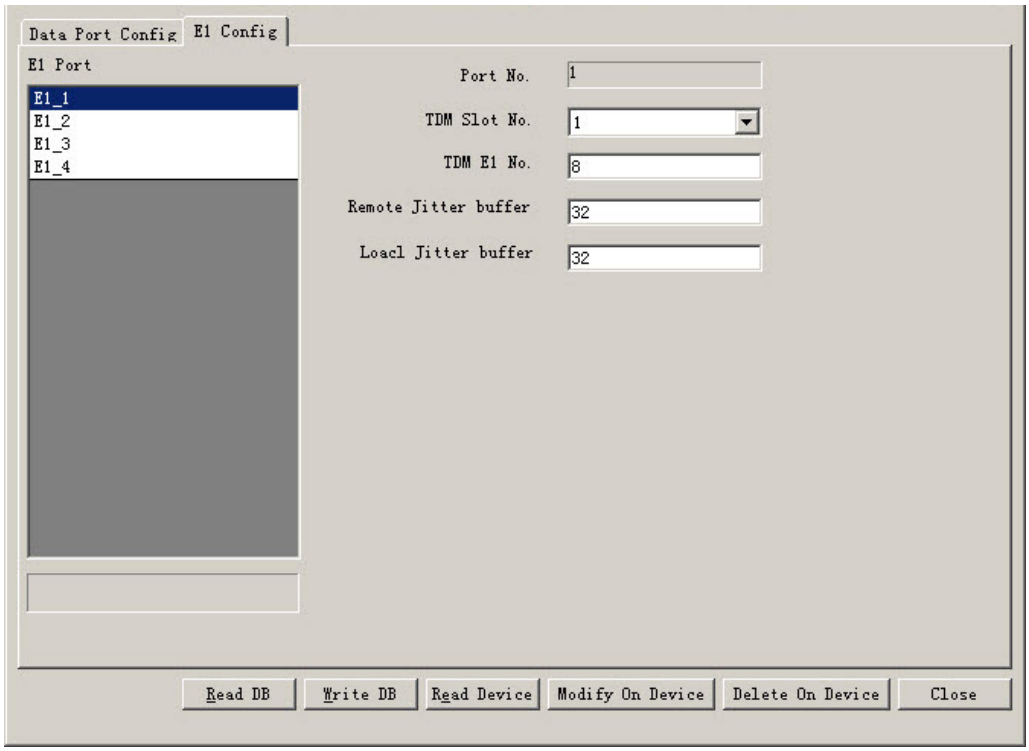


Figure 8-6 User E1 parameter configuration

8.3.7 Configuration Result

Users can use the TDM services.

9 Configuring Wi-Fi Service

- Configuration Rule
- Network Diagram
- Wi-Fi Service Configuration Example

9.1 Configuration Rule

- Only the ONU with the Wi-Fi function can provide the Wi-Fi service.
- The VLAN ID connected with the WAN should be within the local VLAN ID range of the Wi-Fi service on the OLT side.
- The password configuration rules are as follows:
  - When the WLAN authentication mode is **OPEN** and the encryption type is **NONE**, you do not need to configure the password.
  - When the WLAN authentication mode is one of **OPEN**, **SHARED** and **WEPAUTO**, you need to configure WEP key 1 to WEP key 4, and the key index will determine the valid password.
  - In other cases, you should configure the WPA pre-shared key.

9.2 Network Diagram

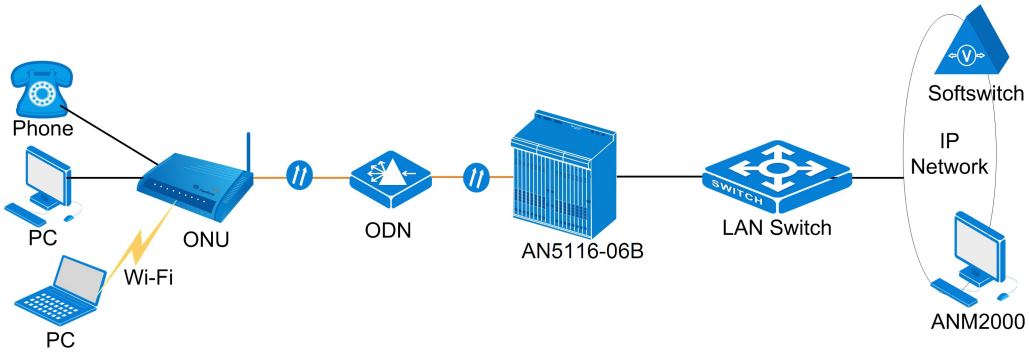


Figure 9-1 Wi-Fi service network connection

As shown in Figure 9-1, the mobile terminal equipment can access network using the Wi-Fi interface of the ONU. The network instruction is as follows:

- Uplink direction

  The ONU provides the integrated access service by connecting with the OLT equipment using the GPON interface.

- Downlink direction
  - The ONU can perform the data service accessing by connecting with PC using Ethernet interface.

- The ONU can perform the VoIP service accessing by connecting with telephone using VoIP interface.
- The ONU can perform the WLAN service accessing by connecting with wireless equipment using Wi-Fi interface.

The AN5116-06B selects the HU1A card and the GC8B card as the interface card at the network side and client side respectively. The HSWA card is essential. The ONU that provides the Wi-Fi services is the AN5506-04-G1.

9.3 Wi-Fi Service Configuration Example

9.3.1 Planning Data

Table 9-1 Planning data of the Wi-Fi service

Configuration Item		Configuration Description	Configuration Example
ONU information	Slot number	The slot number of the GC8B card that is connected to the ONU.	6
	PON port number	The number of the PON port that connects to the ONU.	1
	ONU authorization number	Configure according to the network planning of the operator.	1
	ONU type	The ONU type.	AN5506-04-G1
Configuring Local End Data of Service VLAN	Service name	Configure according to the network planning of the operator.	data
	Starting VLAN ID	The starting VLAN ID of the uplink port services. Configure according to the network planning of the operator.	200
	Ending VLAN ID	The ending VLAN ID of the uplink port services. Configure according to the network planning of the operator.	200
	Uplink interface number or TRUNK group number	Configure according to the number of the uplink port that is actually used.	19:SFP2

Table 9-1 Planning data of the Wi-Fi service (Continued)

Configuration Item		Configuration Description	Configuration Example
	Tag / untag property	Configures the tag processing mode for the uplink service VLAN. There are two options: **TAG** and **UNTAG**. Under the **UNTAG** mode, the tags of the uplink packets will be stripped automatically when they pass the port and the packets will be uplinked in the untag form, while the downlink untag packets will be added with designated tags when they pass the port. Under the **TAG** mode, the tags of the uplink / downlink data packets will not be processed when they pass the port.	UNTAG
	Service type	Select **Data** for the Wi-Fi service.	Data
Configuring the GPON service bandwidth	Service type	Select **Data** for the Wi-Fi service.	Data
	Fixed bandwidth	The fixed bandwidth of an ONU's uplink service. Even if the service does not use the bandwidth resource, other services cannot occupy the resource. The default value is 16.	16
	Assured bandwidth	The minimum bandwidth for provisioning an ONU's uplink service. If the bandwidth resource is not used by this service, then the resource may be released for other services. The default value is 0.	0
	Maximum bandwidth	The maximum bandwidth of an ONU's uplink service. The sum of the fixed bandwidth value and the assured bandwidth value should not be larger than the maximum bandwidth value. The default value is 64.	1280
Configuring the WAN connection service of the TL1 interface	WAN connection mode	Select INTERNET or the mode with INTERNET for the Wi-Fi service.	INTERNET

Table 9-1 Planning data of the Wi-Fi service (Continued)

Configuration Item		Configuration Description	Configuration Example
	WAN connection type	Select Bridge or Route according to the ISP requirement. Bridge refers to the two-layer bridge connection mode; route refers to the three-layer route connection mode.	Route
	VLAN ID the WAN connects to	Set the VLAN ID of the WAN connection according to the ISP requirement within the value range 1 to 4085. The VLAN ID should not be occupied by other connections, and should be within the local VLAN ID range of the Wi-Fi service on the OLT side.	200
	Priority level of the 802.1p connected with this WAN	The priority level of the 802.1p connected with this WAN. The value range is 1 to 7. 7 refers to the highest priority level, 0 refers to the lowest priority level.	1
	Whether the WAN enables the NAT	Select enabling or disabling the network address conversion function according to the ISP requirement, in order to change the private network IP to public network IP.	Disable
Configuring the Wi-Fi service	WiFi enabling / disabling	Select to enable the Wi-Fi.	Enable
	WLAN area	The WLAN channel range.	ETSI
	WLAN channel number	The serial number of the WLAN channel.	0
	WLAN standard	The WLAN specification supported by the equipment. Configure according to the operator’s network planning.	802.11bgn
	SSID	The WLAN identifier. Configure according to the operator’s network planning.	abc
	SSID enabling / disabling	Select to enable the function.	Enable

Table 9-1 Planning data of the Wi-Fi service (Continued)

Configuration Item		Configuration Description	Configuration Example
	SSID displaying / hiding	Select whether to hide the SSID.	Displaying
	WLAN authentication mode	Configure according to the network planning of the operator.	WPAPSK
	WLAN encryption type	Configure according to the network planning of the operator.	TKIP
	WPA pre-shared key	The WPA pre-shared key with an upper limit of 64 characters.	12345678
	WPA key refreshing interval	The WPA key refreshing interval; the unit is second.	86400

9.3.2 Configuration Flow

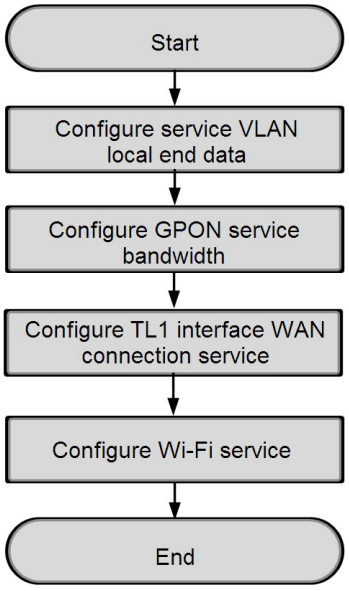


Figure 9-2 Wi-Fi service configuration flow

9.3.3 Configuring Local End Data of Service VLAN

1. Right-click the active HSWA card in the **Object Tree** pane, select **VLAN Config →Local VLAN→Local End Service VLAN** from the shortcut menu.
2. Click  in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to add one local end VLAN.
3. Configure the parameters according to the planning data in Table 9-1.
4. Click  in the toolbar to complete the configuration. See Figure 9-3.

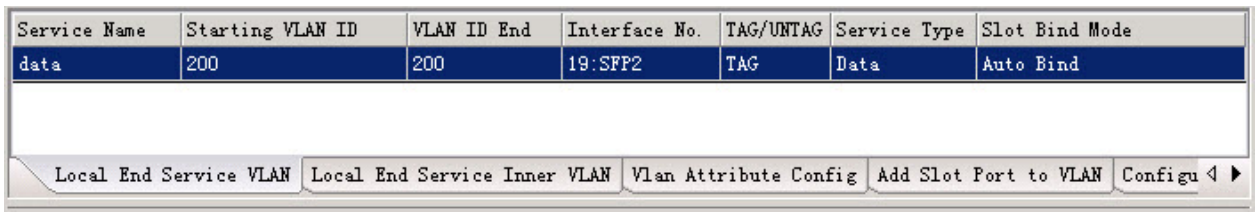


Figure 9-3 Local end VLAN data of Wi-Fi service

9.3.4 Configuring Bandwidth Allocation

1. Click the GC8B[6] card in the **Object Tree** pane, the right pane displays all ONUs under the GC8B[6] card. Right-click the ONU **AN5506-04-G1** and select **Config→Bandwidth config** to open the **Bandwidth Config** window.
2. Click the right pane. Click  in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok**.
3. Configure the parameters according to the planning data in Table 9-1.
4. Click  in the toolbar to complete the configuration. See Figure 9-4.

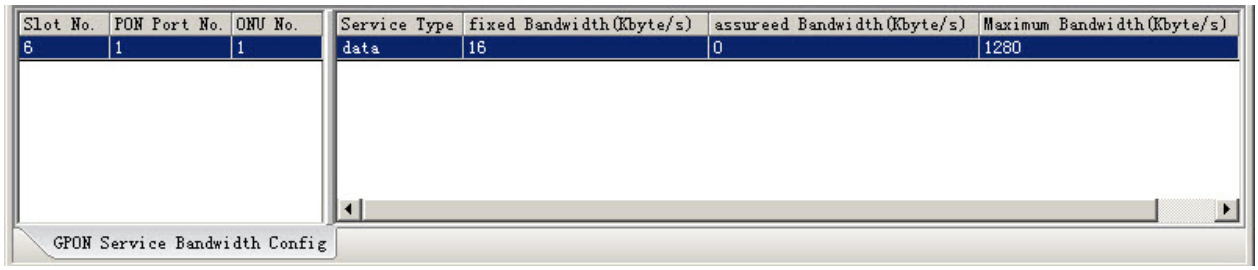


Figure 9-4 Bandwidth allocation of Wi-Fi service

9.3.5 Configuring WAN Connection Service of TL1 Interface

1. Click the GC8B[13] card in the **Object Tree** pane, the right pane displays all ONUs under the GC8B[13] card. Right-click the ONU **AN5506-04-G1** and select **Config→WAN Service** to open the **WAN Service** window.
2. Click the right pane. Click in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok**.
3. Configure the parameters according to the planning data in Table 9-1.
4. Click in the toolbar to complete the configuration. See Figure 9-5.

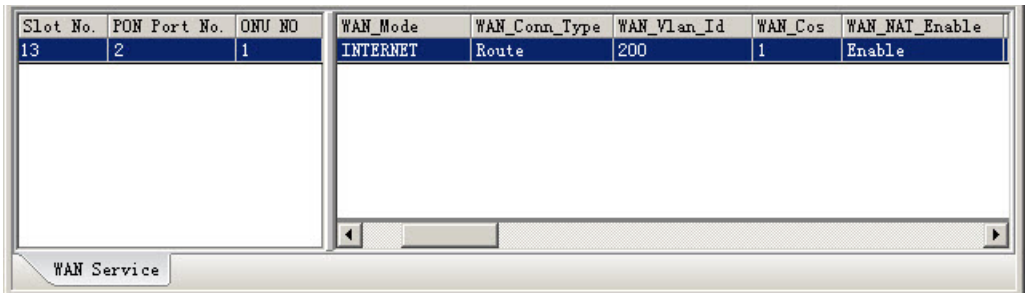


Figure 9-5 WAN connection service of TL1 interface

9.3.6 Configuring Wi-Fi Service

1. Click the GC8B[6] card in the **Object Tree** pane, the right pane displays all ONUs under the GC8B[6] card. Right-click the ONU **AN5506-04-G1** and select **Config→WiFi Service Config** to open the **WiFi Service Config** window.
2. Click the left pane, configure the parameters according to the planning data in Table 9-1.
3. Click the right pane. Click in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok**.
4. Configure the parameters according to the planning data in Table 9-1.
5. Click in the toolbar to complete the configuration. See Figure 9-6.

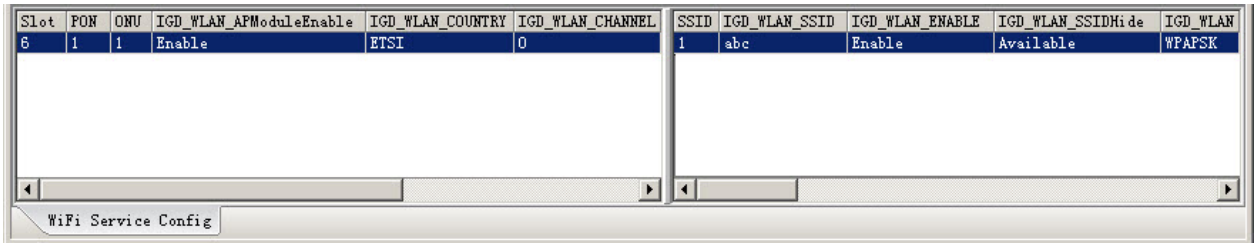


Figure 9-6 Configuring Wi-Fi service

9.3.7 Configuration Result

The mobile terminal can perform wireless connection with this ONU, and can access the Internet using the ONU AN5506-04-G1.

10 Configuring CATV Service

- Configuration Rule
- Network Diagram
- CATV Service Configuration Example

10.1 Configuration Rule

- Only the ONU with the CATV optical module can provide the CATV service.
- The CATV services are provided by configuring the ONU.

10.2 Network Diagram

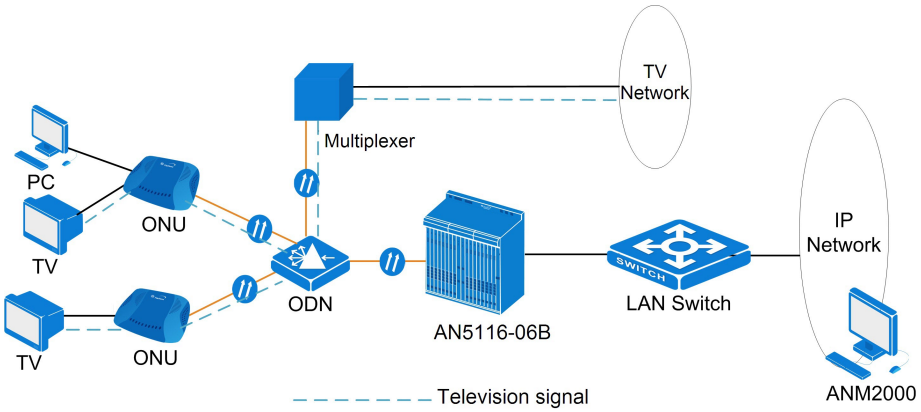


Figure 10-1 Network connection of CATV service

The CATV service uses the WDM technology. Via the multiplexer, the TV signal is multiplexed with the data signal and voice signal. The downlink data wavelength is 1490 nm, the uplink data wavelength is 1310 nm and the CATV signal wavelength is 1550 nm.

The AN5116-06B selects the HU1A card and the GC8B card as the interface card at the network side and client side respectively. The HSWA card is essential. The ONU is the AN5506-04-G1 with the CATV optical module.

10.3 CATV Service Configuration Example

10.3.1 Planning Data

Table 10-1 Planning data of the CATV service

Configuration Item		Configuration Description	Configuration Example
ONU information	Slot number	The slot number of the GC8B card that is connected to the ONU.	6

Table 10-1 Planning data of the CATV service (Continued)

Configuration Item		Configuration Description	Configuration Example
	PON port number	The number of the PON port that connects to the ONU.	1
	ONU authorization number	Configure according to the network planning of the operator.	1
	ONU type	The ONU type.	AN5506-04-G1
CATV configuration	CATV enabling / disabling	Select whether to enable the CATV service.	Enbale

10.3.2 Configuration Flow

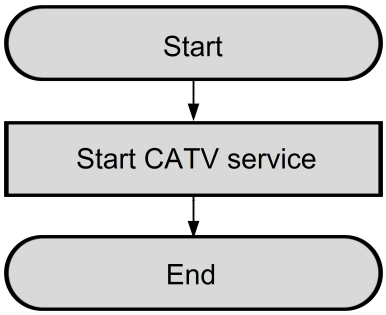


Figure 10-2 CATV service configuration flow

10.3.3 Enabling CATV Service

1. Click the GC8B[6] card in the **Object Tree** pane, the right pane displays all ONUs under the GC8B[6] card. Right-click the ONU **AN5506-04-G1** and select **Service Config→User Service Config**. Select the **CATV Config** tab in the window that appears.
2. Select the **CATV Enable / Disable** check box.
3. Click the **Modify On Device** button to complete the configuration. See Figure 10-3.

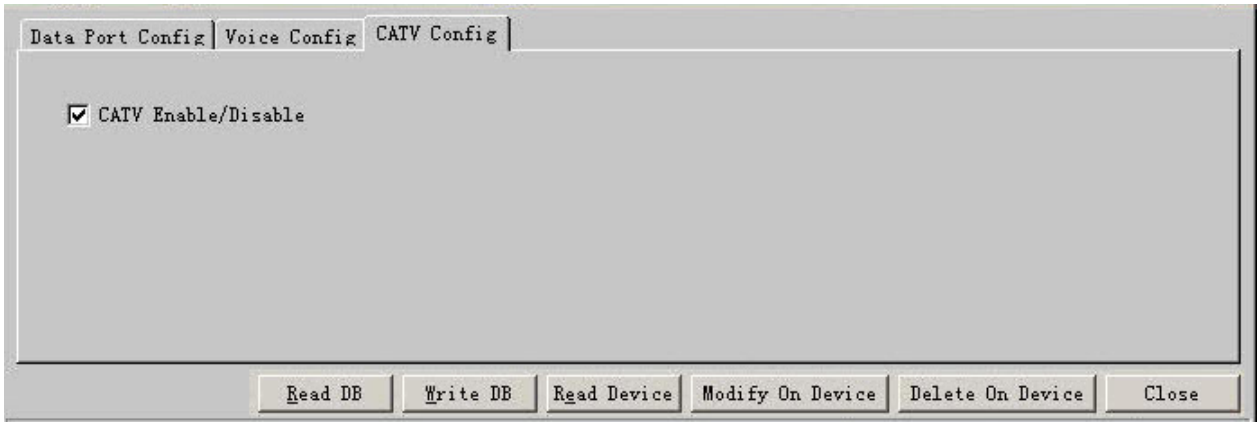


Figure 10-3 Configuring CATV service

10.3.4 Configuration Result

Users can use the CATV service.

11 Configuring Layer 3 Function

- ☑ Configuring ARP Proxy
- ☑ Configuring Routing Protocol OSPF
- ☑ Configuring RIP Routing Protocol
- ☑ DHCP Configuration

11.1 Configuring ARP Proxy

11.1.1 Configuration Rule

- When the AN5116-06B serves as the ARP proxy, it can either be the ARP proxy only or be both the ARP proxy and the gateway. Under both conditions, the Super VLAN interface should be added as the layer 3 interface, so as to achieve the service interconnection between the subscribers that access the same OLT.
  - Super VLAN: a virtual route interfadce, which can be also called VLAN aggregation. One Super VLAN contains multiple Sub VLANs.
  - Sub VLAN: The secondary VLAN of the Super VLAN, which is in primary-secondary relationship with the Super VLAN.
- The AN5116-06B can configure up to 16 Super VLANs. Each Super VLAN can be added with 4 Sub VLANs at most.
- The IP address that binds to the downlink Super VLAN should be in the same network segment as the IP address that is interconnected with the ARP proxy function of this Super VLAN.
- The VLAN ID configuration value of the Super VLANs and Sub VLANs range from 1 to 4085.
- The types of the ARP proxy switches under the VLAN includes the route, inside VLAN and between VLAN. To enable the ARP proxy function of the OLT, users need only select any of these three types.
- When the subscribers that access the same OLT need communicate via the ARP proxy function, the IP addresses of the subscribers should be added onto the ACL white list. Add the slot numbers of the subscribers to the slot interconnection configuration and enable the white list.

11.1.2 ARP Proxy Configuration Example-OLT as Proxy

11.1.2.1 Network Diagram

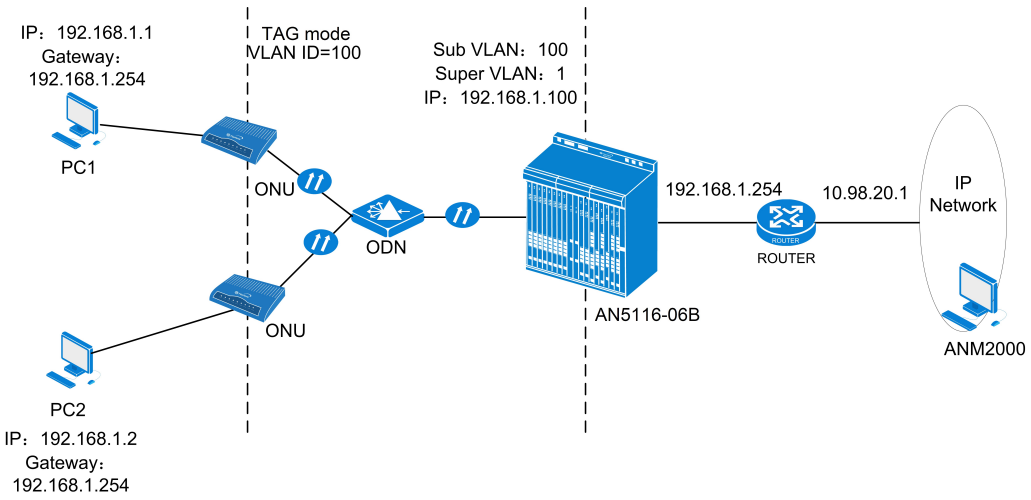


Figure 11-1 Network connection when the OLT serves as the ARP proxy only

PC1 and PC2 are in layer 2 isolation and cannot communicate with each other directly. As the ARP proxy, the OLT processes the ARP request message via configuring the Super VLAN as the layer 3 interface. When the ONU adds VLAN IDs different from the Sub VLAN for the data services uploaded by PC1 and PC2, the service interconnection between different Sub VLAN subscribers can be achieved.

11.1.2.2 Planning Data

Table 11-1 Configuration when the OLT serves as the ARP proxy only

Configuration Item		Configuration Description	Configuration Example
Local end data of service VLAN	Service name	Configure according to the network planning of the operator.	uplink
	Starting VLAN ID	The starting sub VLAN ID. The value ranges from 1 to 4085.	100
	Ending VLAN ID	The ending sub VLAN ID. The value ranges from 1 to 4085.	100
	Uplink interface number or TRUNK group number	Configure according to the number of the uplink port that is actually used.	19:SFP2

Table 11-1 Configuration when the OLT serves as the ARP proxy only (Continued)

Configuration Item		Configuration Description	Configuration Example
	Tag / untag property	Configures the tag processing mode for the uplink service VLAN. There are two options: **TAG** and **UNTAG**. ◆ Under the **UNTAG** mode, the tags of the uplink packets will be stripped automatically when they pass the port and the packets will be uplinked in the untag form, while the downlink untag packets will be added with designated tags when they pass the port. ◆ Under the **TAG** mode, the tags of the uplink / downlink data packets will not be processed when they pass the port.	UNTAG
	Service type	The equipment default type is NGN.	NGN
	Slot adding mode	The options include **Auto Bind** and **Manually Bind**. If users need to add the designated uplink port and the interface card PON port to the Sub VLAN, select **Manually Bind** and configure in the **Add Slot Port to VLAN** window; if users need to add only the designated uplink port to the Sub VLAN, select **Manually Bind** and do not configure in the **Add Slot Port to VLAN** window; if users need to add all line card PON ports to the Sub VLAN, select **Auto Bind** and the **Interface No.** should be blank.	Manually Bind
Adding VLAN at Slot Port	Slot number	The slot number of the interface card that joins the Sub VLAN.	15
	Card port number	The corresponding PON port of the ONU that the user who needs the ARP proxy function connects to.	1
	Starting VLAN ID	The joined starting Sub VLAN ID.	100
	Ending VLAN ID	The joined ending Sub VLAN ID.	100
	Tag / untag property	Configures the tag processing mode of the interface card PON port for the service	UNTAG

Table 11-1 Configuration when the OLT serves as the ARP proxy only (Continued)

Configuration Item		Configuration Description	Configuration Example
		VLAN. There are two options: **TAG** and **UNTAG**. ◆ Under the **UNTAG** mode, the tags of the uplink packets will be stripped automatically when they pass the port and the packets will be uplinked in the untag form, while the downlink untag packets will be added with designated tags when they pass the port. ◆ Under the **TAG** mode, the tags of the uplink / downlink data packets will not be processed when they pass the port.	
Configuring VLAN property	VLAN ID	The created Super VLAN ID value, which ranges from 1 to 4085.	1
	VLAN type	According to the service virtual port quantity, the VLANs are divided into two types: ◆ SIN VLAN: has only one service virtual port; ◆ MUL VLAN: has multiple service virtual ports.	SIN
	Service type	Select the type **Data**.	Data
	VLAN role	Select **Super VLAN**.	Super VLAN
Binding service VLAN to Super VLAN	Super VLAN ID	Select the created Super VLAN ID value.	1
	Service VLAN ID	The Sub VLAN value that is binding to the Super VLAN.	100
Configuring VLAN IP	VLAN ID	The Super VLAN ID value.	1
	Main IP address	The added IP address of Super VLAN.	192.168.1.100 / 255.255.255.0
Enabling ARP proxy switch under VLAN	VLAN ID	The Super VLAN ID value.	1
	ARP proxy switch (inside VLAN)	Select to enable the ARP proxy function switch.	Enable
Disabling slot isolation of PON interface card	Slot number	The number of the slot that is actually used.	15
Creating layer 3 ACL	Access control list name	Configure according to the network planning of the operator.	a

Table 11-1 Configuration when the OLT serves as the ARP proxy only (Continued)

Configuration Item		Configuration Description	Configuration Example	
	Matching sequence	Configure according to the network planning of the operator.	Auto	
Configuring layer 3 ACL	Access control list name	Select the name of the created access control list.	a	
	Operation type	Add the IP matching rule.	set	
	IP / subnet address	IP address of the data message in the ACL rule.	192.168.1.1 / 255. 255.255.0	192.168.1.2 / 255. 255.255.0
	Permit / deny	The options include permitting and denying. Permit: allows the data packets that meet the requirements to pass. Deny: discards the data packets that meet the requirement	Permit	
	Type	The options include normal condition and exact matching. Normal condition: As long as the subnet mask of the data message and the subnet mask of the IP matching rule are in the same network segment, the data message conforms to this rule. Exact matching: Only when the subnet mask of the data message and the subnet mask of the IP matching rule are completely the same, does the data message conform to this rule.	Normal	
Configuring ARP proxy range	Access control list name	Select the name of the created access control list.	a	

11.1.2.3 Configuration Flow

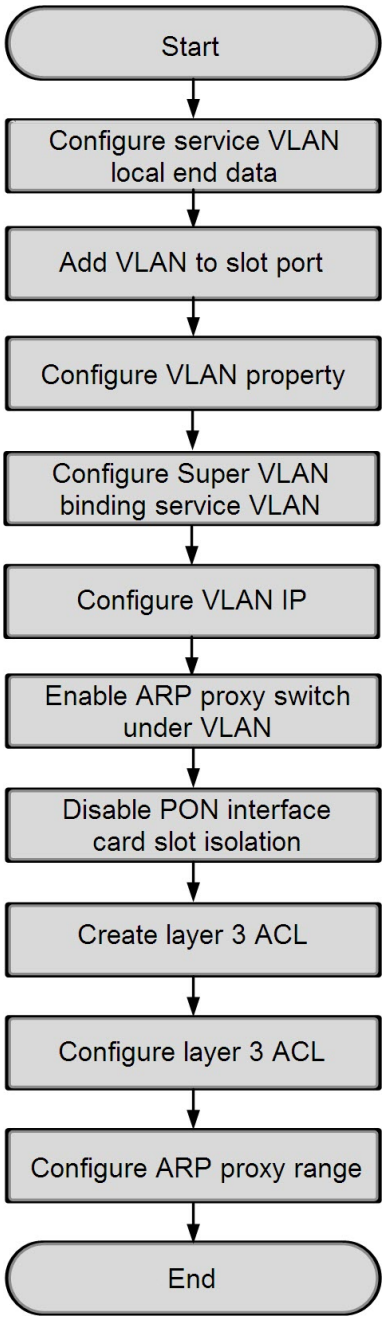


Figure 11-2 Configuration flow when the OLT serves as the ARP proxy only

11.1.2.4 Configuring Service VLAN

1. Right-click the active HSWA[9] card in the **Object Tree** pane, select **VLAN Config→Local VLAN→Local End Service VLAN** from the shortcut menu, and then click the **Local End Service VLAN** tab from the window that appears.
2. Click  in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to add one Sub VLAN.
3. Configure the parameters according to the planning data in Table 11-1.
4. Click  in the toolbar to complete the configuration. See Figure 11-3.

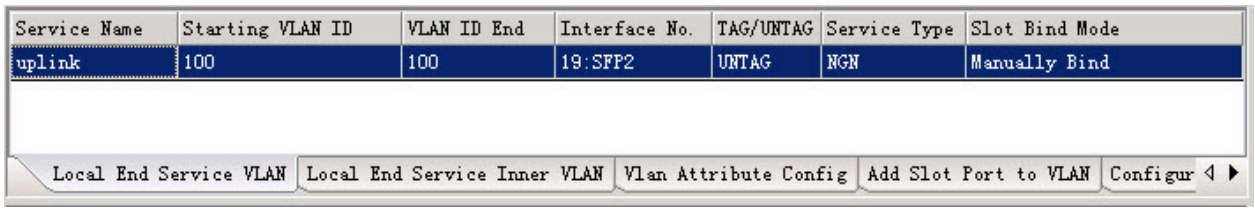


Figure 11-3 Local end VLAN configuration-OLT as the ARP proxy only

11.1.2.5 Adding VLAN at Slot Port

1. Right-click the active HSWA[9] card in the **Object Tree** pane, select **VLAN Config→Local VLAN→Add Slot Port to VLAN** from the shortcut menu, and then click the **Add Slot Port to VLAN** tab from the window that appears.
2. Click the left pane. Click  in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to add the slot port information.
3. Click the **Slot No.** item, select **15** from the drop-down list. Click the **Port No.** item, select **1** from the drop-down list.
4. Click the right pane. Click  in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to configure the information of the binding Sub VLAN.
5. Configure the parameters according to the planning data in Table 11-1.
6. Click  in the toolbar to complete the configuration. See Figure 11-4.

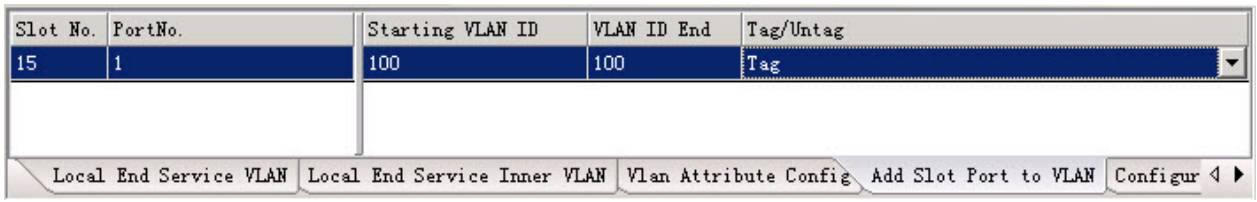


Figure 11-4 Adding VLAN to slot port-OLT as the ARP proxy only

11.1.2.6 Configuring VLAN Property

1. Right-click the active HSWA[9] card in the **Object Tree** pane, select **VLAN Config→Local VLAN→Vlan Attribute Config** from the shortcut menu, and then click the **Vlan Attribute Config** tab from the window that appears.
2. Click in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to add one Super VLAN.
3. Configure the parameters according to the planning data in Table 11-1.
4. Click in the toolbar to complete the configuration. See Figure 11-5.

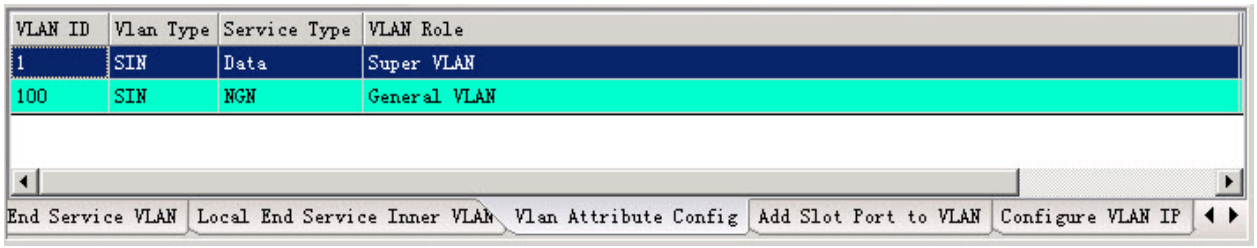


Figure 11-5 Configuring VLAN properties-OLT as the ARP proxy only

11.1.2.7 Binding Service VLAN to Super VLAN

1. Right-click the active HSWA[9] card in the **Object Tree** pane, select **VLAN Config→Local VLAN→Bind Service VLAN to Super VLAN** from the shortcut menu, and then click the **Bind Service VLAN to Super VLAN** tab from the window that appears.
2. Click the left pane. Click in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to select the Super VLAN ID value to be bound.

3. Click the right pane. Click in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to select the Sub VLAN ID value to be bound.
4. Configure the parameters according to the planning data in Table 11-1.
5. Click in the toolbar to complete the configuration. See Figure 11-6.

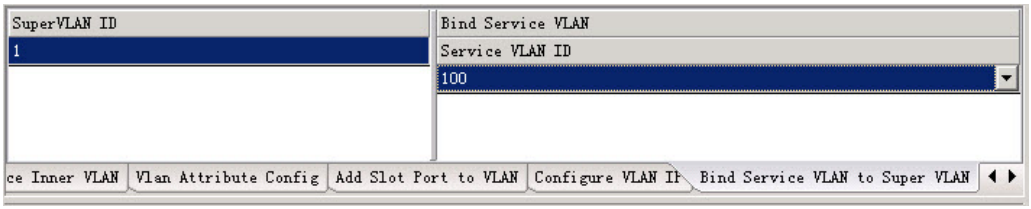


Figure 11-6 Configuring Super VLAN binding service VLAN-OLT as the ARP proxy only

11.1.2.8 Configuring VLAN IP

1. Right-click the active HSWA[9] card in the **Object Tree** pane, select **VLAN Config→Local VLAN→Configure VLAN IP** from the shortcut menu, and then click the **Configure VLAN IP** tab from the window that appears.
2. Click the left pane. Click in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to create a new VLAN IP.
3. Configure the parameters according to the planning data in Table 11-1.
4. Click in the toolbar to complete the configuration. See Figure 11-7.

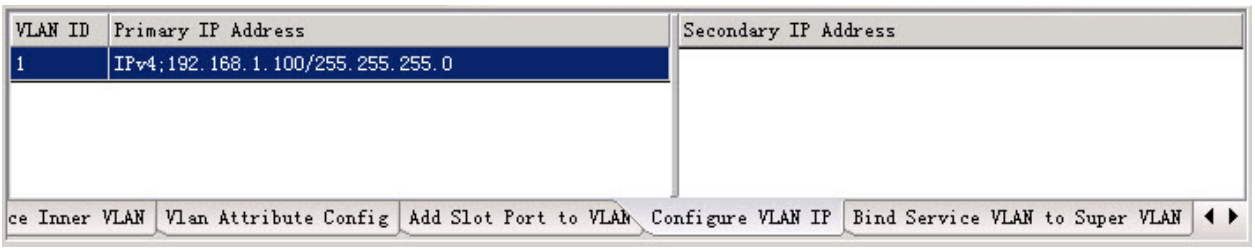


Figure 11-7 Configuring VLAN IP-OLT as the ARP proxy only

11.1.2.9 Enabling ARP Proxy Switch under VLAN

1. Right-click the active HSWA[9] card in the **Object Tree** pane, select **Ethernet Config→ARP Proxy Manage→ARP Proxy Switch On VLAN** from the shortcut menu to open the **ARP Proxy Switch On VLAN** window.
2. Configure the parameters according to the planning data in Table 11-1.
3. Click in the toolbar to complete the configuration. See Figure 11-8.

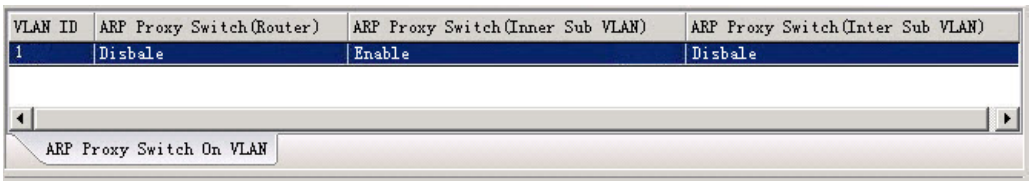


Figure 11-8 Configuring ARP proxy switch under VLAN-OLT as the ARP proxy only

11.1.2.10 Disabling Slot Isolation of PON Interface Card

1. Right-click the active HSWA[9] card in the **Object Tree** pane, select **Ethernet Config→ARP Proxy Manage→Slot Interworking Config** from the shortcut menu to open the **Slot Interworking Config** window.
2. Click in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok**.
3. Configure the parameters according to the planning data in Table 11-1.
4. Click in the toolbar to complete the configuration. See Figure 11-9.

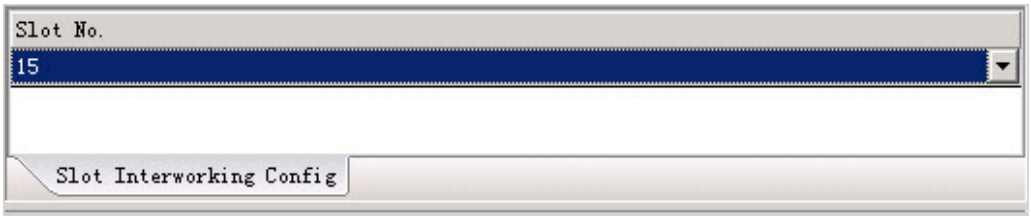


Figure 11-9 Slot intercommunication configuration-OLT as the ARP proxy only

11.1.2.11 Creating Layer 3 ACL

1. Right-click the designated system name in the **Object Tree** pane, select **Config→L3 Config→Three-layer ACL Configure→Create L3 ACL** from the shortcut menu to open the **Create L3 ACL** tab in the window that appears.
2. Click  in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to add a new access control list.
3. Configure the parameters according to the planning data in Table 11-1.
4. Click  in the toolbar to complete the configuration. See Figure 11-10.

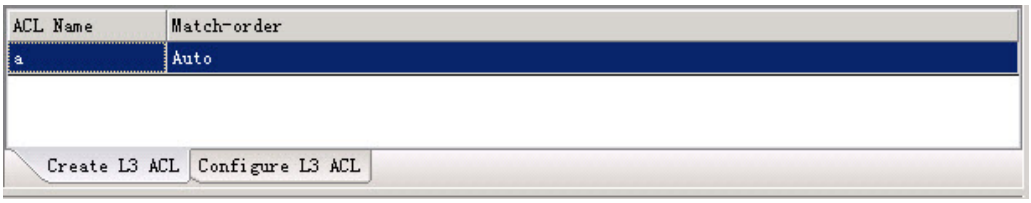


Figure 11-10 Creating layer 3 ACL-OLT as the ARP proxy only

11.1.2.12 Configuring Layer 3 ACL

1. Right-click the designated system name in the **Object Tree** pane, select **Config→L3 Config→Three-layer ACL Configure→Configure L3 ACL** from the shortcut menu to open the **Configure L3 ACL** tab in the window that appears.
2. Click the left pane. Click  in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to select the newly-created ACL name.
3. Click the right pane. Click  in the toolbar, and enter **2** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok**.
4. Configure the parameters according to the planning data in Table 11-1.
5. Click  in the toolbar to complete the configuration. See Figure 11-11.

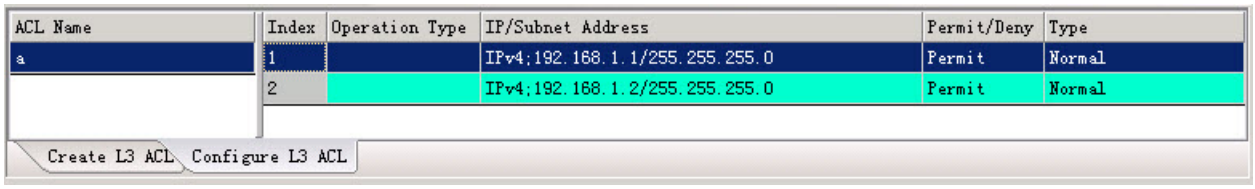


Figure 11-11 Configuring layer 3 ACL-OLT as the ARP proxy only

11.1.2.13 Configuring ARP Proxy Range

1. Right-click the HSWA[9] card in the **Object Tree** pane, select **Ethernet Config →ARP Proxy Manage→ARP Proxy Range** from the shortcut menu to open the **ARP Proxy Range** window.
2. Click  in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to add a new ARP proxy range.
3. Configure the parameters according to the planning data in Table 11-1.
4. Click  in the toolbar to complete the configuration. See Figure 11-12.

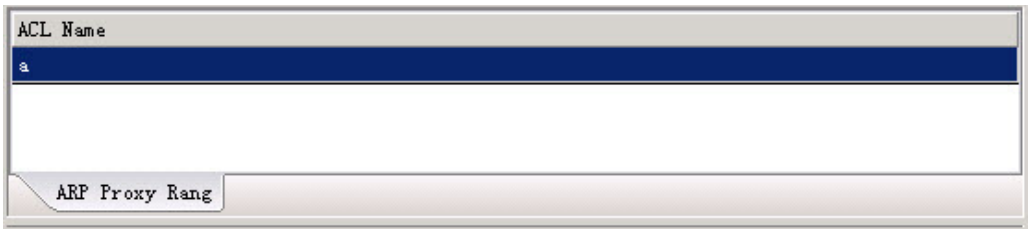


Figure 11-12 Configuring ARP proxy range-OLT as the ARP proxy only

11.1.2.14 Configuration Result

PC1 and PC2 can both access the external network and communicate with each other via the OLT simultaneously.

11.1.3 ARP Proxy Configuration Example-OLT as both Proxy and Gateway

11.1.3.1 Network Diagram

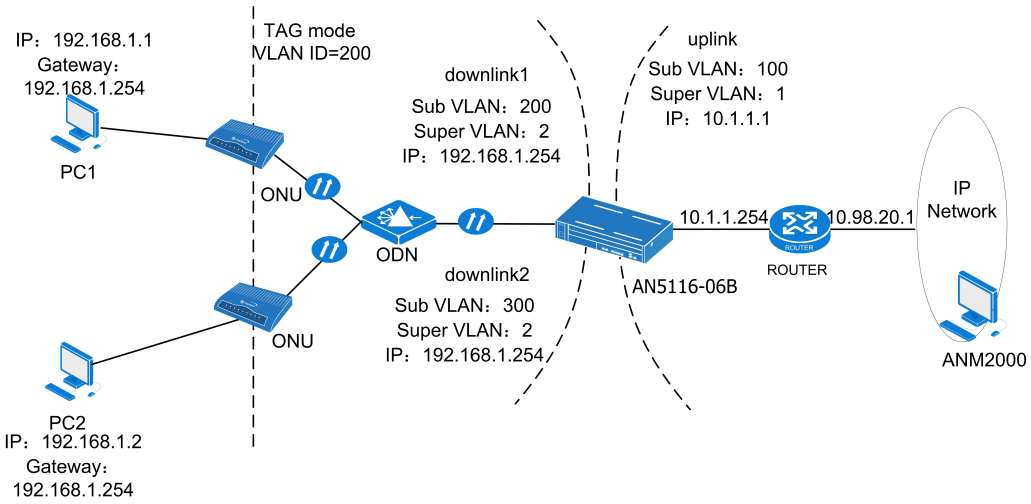


Figure 11-13 Network connection when the OLT serves as both the ARP proxy and gateway

PC1 and PC2 are in layer 2 isolation and cannot communicate with each other directly. As the ARP proxy, the OLT processes the ARP request message via configuring the Super VLAN as the layer 3 interface. When the ONU adds VLAN IDs different from the Sub VLAN for the data services uploaded by PC1 and PC2, the service interconnection between different Sub VLAN subscribers can be achieved. At the same time, the OLT serves as the gateway. It achieves the gateway function via configuring the IP address of the Super VLAN, so as to enable the access that crosses the network segments for the users.

11.1.3.2 Planning Data

Table 11-2 Configuration when the OLT serves as both the ARP proxy and gateway

Configuration Item		Configuration Description	Configuration Example		
Local end data of service VLAN	Service name	Configure according to the network planning of the operator.	uplink	downlink1	downlink2

Table 11-2 Configuration when the OLT serves as both the ARP proxy and gateway (Continued)

Configuration Item		Configuration Description	Configuration Example		
	Starting VLAN ID	The Sub VLAN ID value. The value ranges from 1 to 4085.	100	200	300
	Ending VLAN ID	The Sub VLAN ID value. The value ranges from 1 to 4085.	100	200	300
	Uplink interface number or TRUNK group number	Configure according to the number of the uplink port that is actually used.	19:SFP2	—	—
	Tag / untag property	Configures the tag processing mode for the uplink service VLAN. There are two options: **TAG** and **UNTAG**. ◆ Under the **UNTAG** mode, the tags of the uplink packets will be stripped automatically when they pass the port and the packets will be uplinked in the untag form, while the downlink untag packets will be added with designated tags when they pass the port. ◆ Under the **TAG** mode, the tags of the uplink / downlink data packets will not be processed when they pass the port.	UNTAG	UNTAG	UNTAG
	Service type	The equipment default type is NGN.	NGN		

Table 11-2 Configuration when the OLT serves as both the ARP proxy and gateway (Continued)

Configuration Item		Configuration Description	Configuration Example		
	Slot adding mode	The options include **Auto Bind** and **Manually Bind**. If users need to add the designated uplink port and the interface card PON port to the Sub VLAN, select **Manually Bind** and configure in the **Add Slot Port to VLAN** window; if users need to add only the designated uplink port to the Sub VLAN, select **Manually Bind** and do not configure in the **Add Slot Port to VLAN** window; if users need to add all interface card PON ports to the Sub VLAN, select **Auto Bind** and the **Interface No.** should be blank.	Manually Bind	Auto Bind	Auto Bind
Configuring VLAN property	VLAN ID	The created Super VLAN ID value, which ranges from 1 to 4085.	1	2	2
	VLAN type	According to the service virtual port quantity, the VLANs are divided into two types: ◆ SIN VLAN: has only one service virtual port; ◆ MUL VLAN: has multiple service virtual ports.	SIN		
	Service type	Select the type **Data**.	Data		
	VLAN role	Select **Super VLAN**.	Super VLAN		

Table 11-2 Configuration when the OLT serves as both the ARP proxy and gateway (Continued)

Configuration Item		Configuration Description	Configuration Example		
Binding Service VLAN to Super VLAN	Super VLAN ID	Select the created Super VLAN ID value.	1	2	2
	Service VLAN ID	The Sub VLAN value that is binding to the Super VLAN.	100	200	300
Configuring VLAN IP	VLAN ID	The Super VLAN ID value.	1	2	
	Main IP address	The added IP address of Super VLAN.	10.1.1.1 / 255.25.5.0.0	192.168.1.254 / 255.2.55.255.0	
Enabling ARP Proxy Switch under VLAN	VLAN ID	The Super VLAN ID value for downlink.	2		
	ARP proxy switch (inside VLAN)	Select to enable the ARP proxy function switch.	Enable		
Disabling Slot Isolation of PON Interface Card	Slot number	The number of the slot that is actually used.	15		
Creating Layer 3 ACL	Access control list name	Configure according to the network planning of the operator.	a		
	Matching sequence	Configure according to the network planning of the operator.	Auto		
Configuring Layer 3 ACL	Access control list name	Select the name of the created access control list.	a		
	Operation type	Add the IP matching rule.	set		
	IP / subnet address	IP address of the data message in the ACL rule.	—	192.168.1.1 / 255.255.255.0	192.168.1.2 / 255.255.255.0
	Permit / deny	The options include permitting and denying. Permit: allows the data packets that meet the requirements to pass. Deny: discards the data packets that meet the requirement	—	Permit	Permit

Table 11-2 Configuration when the OLT serves as both the ARP proxy and gateway (Continued)

Configuration Item		Configuration Description	Configuration Example		
	Type	The options include normal condition and exact matching. Normal condition: As long as the subnet mask of the data message and the subnet mask of the IP matching rule are in the same network segment, the data message conforms to this rule. Exact matching: Only when the subnet mask of the data message and the subnet mask of the IP matching rule are completely the same, does the data message conform to this rule.	—	Normal	Normal
Configuring ARP Proxy Range	Access control list name	Select the name of the created access control list.	a		

11.1.3.3 Configuration Flow

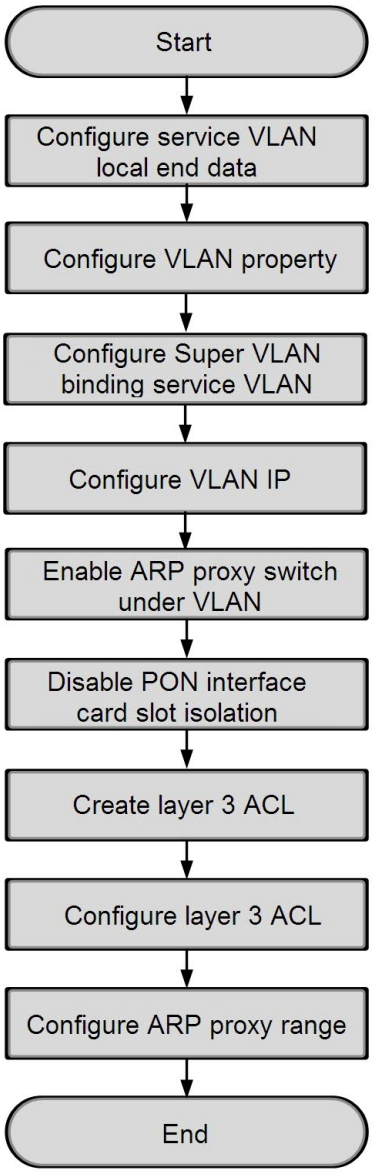


Figure 11-14 Configuration flow when the OLT serves as both the ARP proxy and gateway

11.1.3.4 Configuring Service VLAN

1. Right-click the active HSWA[9] card in the **Object Tree** pane, select **VLAN Config→Local VLAN→Local End Service VLAN** from the shortcut menu, and then click the **Local End Service VLAN** tab from the window that appears.

2. Click in the toolbar, and enter **3** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to add 3 Sub VLANs.
3. Configure the parameters according to the planning data in Table 11-2.
4. Click in the toolbar to complete the configuration. See Figure 11-15.

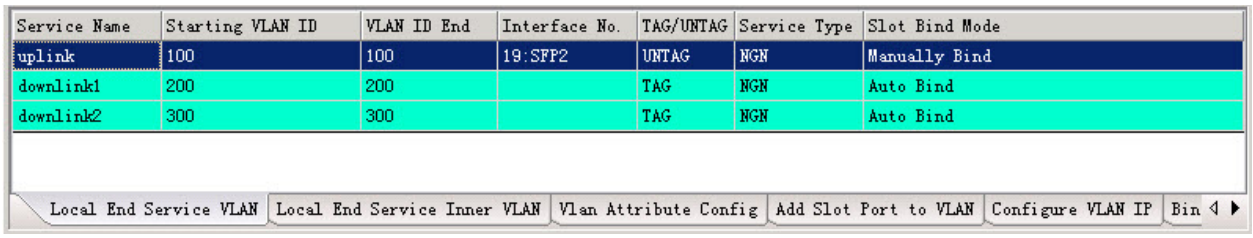


Figure 11-15 Local end VLAN configuration-OLT as both the ARP proxy and gateway

11.1.3.5 Configuring VLAN Property

1. Right-click the active HSWA[9] card in the **Object Tree** pane, select **VLAN Config→Local VLAN→Vlan Attribute Config** from the shortcut menu, and then click the **Vlan Attribute Config** tab from the window that appears.
2. Click in the toolbar, and enter **2** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to add 2 Super VLANs.
3. Configure the parameters according to the planning data in Table 11-2.
4. Click in the toolbar to complete the configuration. See Figure 11-16.

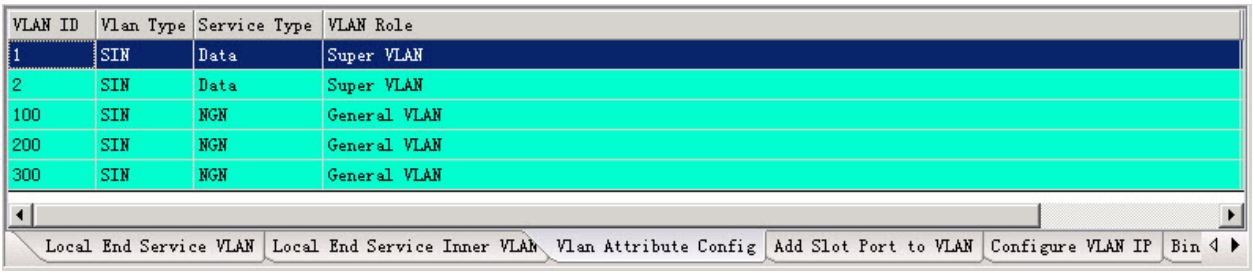


Figure 11-16 Configuring VLAN properties-OLT as the ARP proxy and gateway

11.1.3.6 Binding Service VLAN to Super VLAN

1. Right-click the active HSWA[9] card in the **Object Tree** pane, select **VLAN Config→Local VLAN→Bind Service VLAN to Super VLAN** from the shortcut

menu, and then click the **Bind Service VLAN to Super VLAN** tab from the window that appears.

2. Click the left pane. Click in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to select the Super VLAN ID value to be bound. Click the right pane. Click in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to select the Sub VLAN ID value to be bound.
3. Click the left pane. Click in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to select the Super VLAN ID value to be bound. Click the right pane. Click in the toolbar, and enter **2** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to select the Sub VLAN ID value to be bound.
4. Configure the parameters according to the planning data in Table 11-2.
5. Click in the toolbar to complete the configuration. See Figure 11-17.

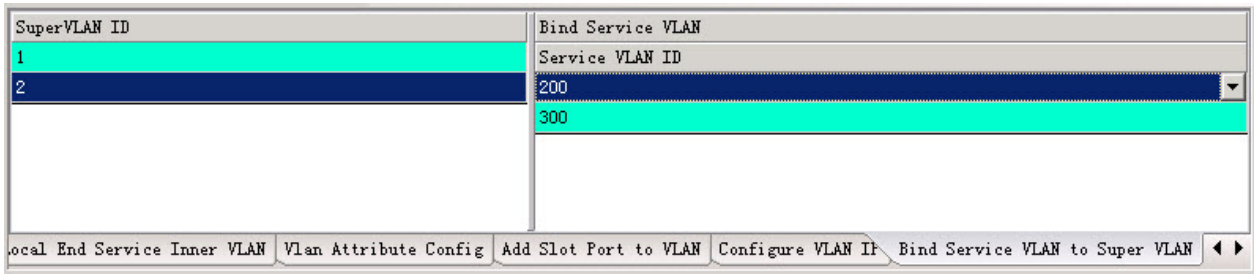


Figure 11-17 Configuring Super VLAN binding service VLAN-OLT as the ARP proxy and gateway

11.1.3.7 Configuring VLAN IP

1. Right-click the active HSWA[9] card in the **Object Tree** pane, select **VLAN Config→Local VLAN→Configure VLAN IP** from the shortcut menu, and then click the **Configure VLAN IP** tab from the window that appears.
2. Click the left pane. Click in the toolbar, and enter **2** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to create 2 new VLAN IPs.
3. Configure the parameters according to the planning data in Table 11-2.
4. Click in the toolbar to complete the configuration. See Figure 11-18.

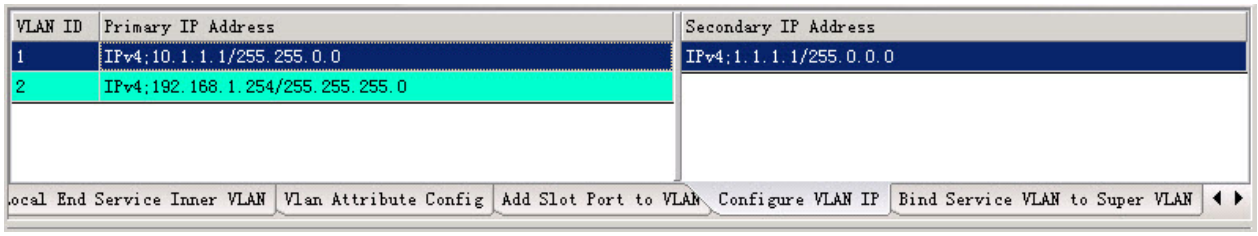


Figure 11-18 Configuring VLAN IP-OLT as the ARP proxy and gateway

11.1.3.8 Enabling ARP Proxy Switch under VLAN

1. Right-click the active HSWA[9] card in the **Object Tree** pane, select **Ethernet Config→ARP Proxy Manage→ARP Proxy Switch On VLAN** from the shortcut menu to open the **ARP Proxy Switch On VLAN** window.
2. Configure the parameters according to the planning data in Table 11-2.
3. Click in the toolbar to complete the configuration. See Figure 11-19.

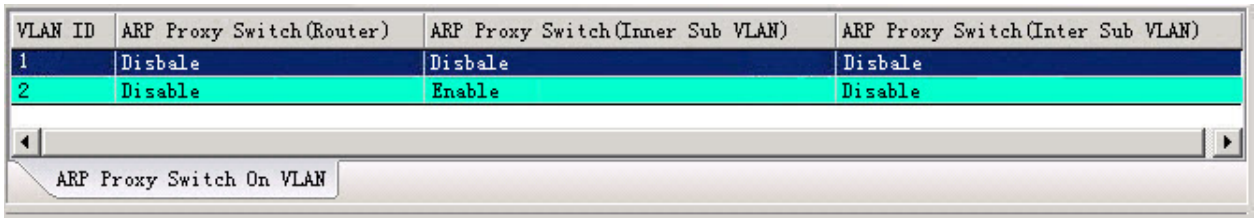


Figure 11-19 Configuring ARP proxy switch under VLAN-OLT as both the ARP proxy and gateway

11.1.3.9 Disabling Slot Isolation of PON Interface Card

1. Right-click the active HSWA[9] card in the **Object Tree** pane, select **Ethernet Config→ARP Proxy Manage→Slot Interworking Config** from the shortcut menu to open the **Slot Interworking Config** window.
2. Click in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok**.
3. Configure the parameters according to the planning data in Table 11-2.
4. Click in the toolbar to complete the configuration. See Figure 11-20.

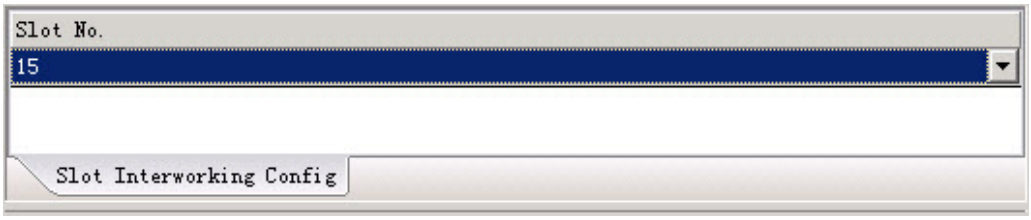


Figure 11-20 Slot intercommunication configuration-OLT as both the ARP proxy and gateway

11.1.3.10 Creating Layer 3 ACL

1. Right-click the designated system name in the **Object Tree** pane, select **Config→L3 Config→Three-layer ACL Configure→Create L3 ACL** from the shortcut menu to open the **Create L3 ACL** tab in the window that appears.
2. Click in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to add a new access control list.
3. Configure the parameters according to the planning data in Table 11-2.
4. Click in the toolbar to complete the configuration. See Figure 11-21.

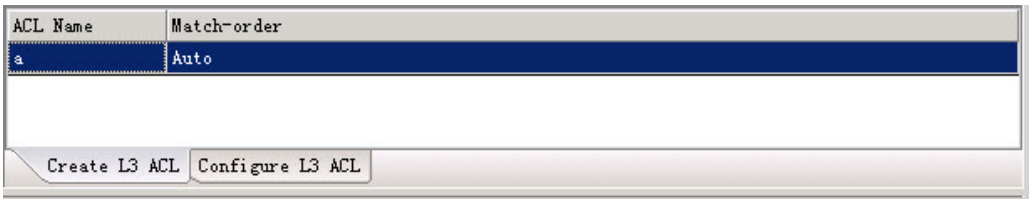


Figure 11-21 Creating layer 3 ACL-OLT as both the ARP proxy and gateway

11.1.3.11 Configuring Layer 3 ACL

1. Right-click the designated system name in the **Object Tree** pane, select **Config→L3 Config→Three-layer ACL Configure→Configure L3 ACL** from the shortcut menu to open the **Configure L3 ACL** tab in the window that appears.
2. Click the left pane. Click in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to select the newly-created ACL name.

3. Click the right pane. Click in the toolbar, and enter **2** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok**.
4. Configure the parameters according to the planning data in Table 11-2.
5. Click in the toolbar to complete the configuration. See Figure 11-22.

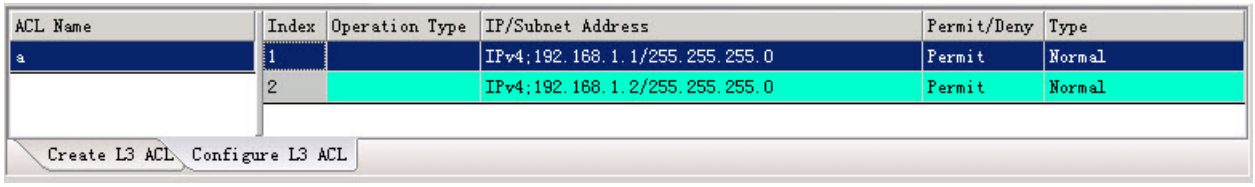


Figure 11-22 Configuring layer 3 ACL-OLT as both the ARP proxy and gateway

11.1.3.12 Configuring ARP Proxy Range

1. Right-click the HSWA[9] card in the **Object Tree** pane, select **Ethernet Config**→**ARP Proxy Manage**→**ARP Proxy Range** from the shortcut menu to open the **ARP Proxy Range** window.
2. Click in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to add a new ARP proxy range.
3. Configure the parameters according to the planning data in Table 11-2.
4. Click in the toolbar to complete the configuration. See Figure 11-23.

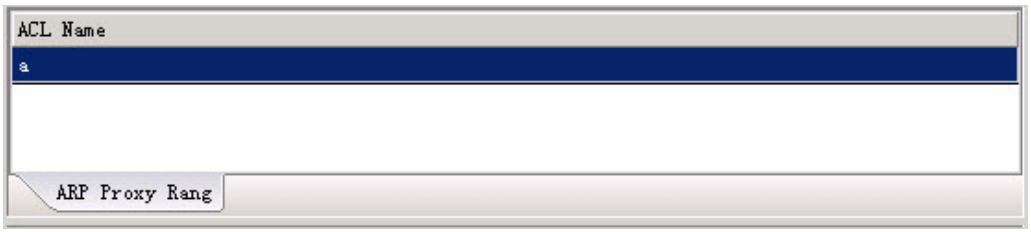


Figure 11-23 Configuring ARP proxy range-OLT as both the ARP proxy and gateway

11.1.3.13 Configuration Result

PC1 and PC2 can both access the external network and communicate with each other via the OLT simultaneously.

11.2 Configuring Routing Protocol OSPF

11.2.1 Configuration Rule

Via running the OSPF protocol, the AN5116-06B performs the routing forward with the adjacent router that runs the OSPF protocol.

- The configured Super VLAN and Sub VLAN on the AN5116-06B are in the primary-secondary relationship. One Super VLAN contains multiple Sub VLANs.
- The IP address that binds to the downlink Super VLAN should be in the same network segment as the IP address of the succeeding equipment.
- The IP address that binds to the uplink Super VLAN should be in the same network segment as the IP address of the previous equipment that runs the OSPF protocol such as the router.
- The VLAN ID configuration value of the Super VLANs and Sub VLANs range from 1 to 4085.

11.2.2 OSPF Routing Protocol Configuration Example

11.2.2.1 Network Diagram

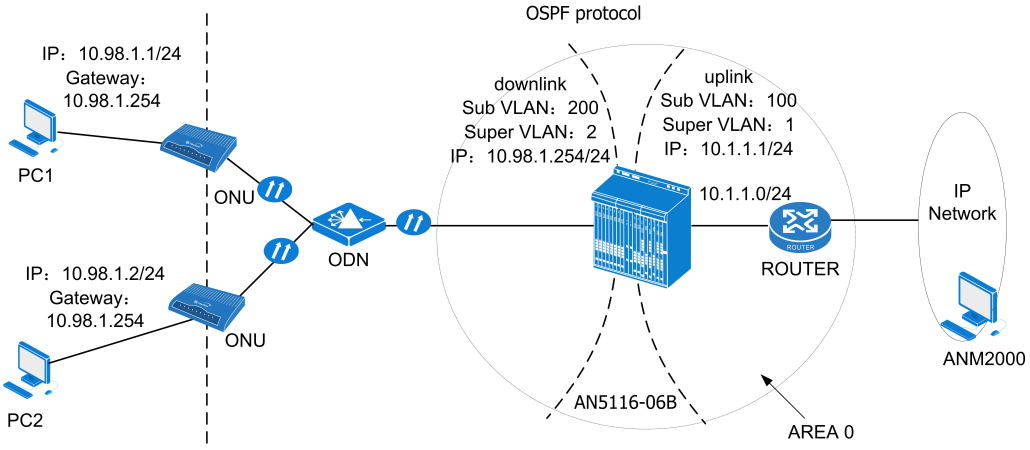


Figure 11-24 Network connection of the OSPF routing protocol

The OLT serves as the router via configuring the Super VLAN and Sub VLANs of the uplink type and and downlink type. When running the OSPF protocol, the OSPF routing function is achieved. When the address of the user is different fron the pre-access address, the routing forward is performed via the OLT, so as to enable users to complete the access that crosses the network segments.

11.2.2.2 Planning Data

Table 11-3 Routing protocol OSPF configuration

Configuration Item		Configuration Description	Configuration Example	
Local end data of service VLAN	Service name	Configure according to the network planning of the operator.	uplink	downlink
	Starting VLAN ID	The Sub VLAN ID value. The value ranges from 1 to 4085.	100	200
	Ending VLAN ID	The Sub VLAN ID value. The value ranges from 1 to 4085.	100	200
	Uplink interface number or TRUNK group number	Configure according to the number of the uplink port that is actually used.	19:SFP2	—
	Tag / untag property	Configures the tag processing mode for the uplink service VLAN. There are two options: **TAG** and **UNTAG**. ◆ Under the **UNTAG** mode, the tags of the uplink packets will be stripped automatically when they pass the port and the packets will be uplinked in the untag form, while the downlink untag packets will be added with designated tags when they pass the port. ◆ Under the **TAG** mode, the tags of the uplink / downlink data packets will not be processed when they pass the port.	UNTAG	UNTAG
	Service type	The equipment default type is NGN.	NGN	

Table 11-3 Routing protocol OSPF configuration (Continued)

Configuration Item		Configuration Description	Configuration Example	
	Slot adding mode	The options include **Auto Bind** and **Manually Bind**. If users need to add the designated uplink port and the ; line card PON port to the Sub VLAN, select **Manually Bind** and configure in the **Add Slot Port to VLAN** window; if users need to add only the designated uplink port to the Sub VLAN, select **Manually Bind** and do not configure in the **Add Slot Port to VLAN** window; if users need to add all line card PON ports to the Sub VLAN, select **Auto Bind** and the **Interface No.** should be blank.	Manually Bind	Auto Bind
Configuring VLAN property	VLAN ID	The created Super VLAN ID value, which ranges from 1 to 4085.	1	2
	VLAN type	According to the service virtual port quantity, the VLANs are divided into two types: ◆ SIN VLAN: has only one service virtual port; ◆ MUL VLAN: has multiple service virtual ports.	SIN	
	Service type	Select the type **Data**.	Data	
	VLAN role	Select **Super VLAN**.	Super VLAN	
Binding Service VLAN to Super VLAN	Super VLAN ID	Select the created Super VLAN ID value.	1	2
	Service VLAN ID	The Sub VLAN value that is binding to the Super VLAN.	100	200
Configuring VLAN IP	VLAN ID	The Super VLAN ID value.	1	2
	Main IP address	The added IP address of Super VLAN.	10.1.1.1 / 255.255.255.0	10.98.1.254 / 255.255.255.0
Enabling OSPF	Enable / disable	Run the OSPF protocol.	Enable	
Configuring OSPF router ID	IP Address	Configure according to the network planning of the operator.	10.12.1.3	
Configuring OSPF network announcement	IP Address	The network segment of the OSPF network announcement.	10.1.1.0 / 255.255.255.0	10.98.1.0 / 255.255.255.0
	Domain ID	Configure according to the network planning of the operator.	1.0.0.1	

Table 11-3 Routing protocol OSPF configuration (Continued)

Configuration Item		Configuration Description	Configuration Example	
Configuring OSPF domain	Domain ID	Configure according to the network planning of the operator.	1.0.0.1	
	Domain type	Configure according to the network planning of the operator.	STUB	
Configuring OSPF basic parameters	VLAN ID	The Super VLAN ID value.	1	2
	Invalid interval	Configure according to the network planning of the operator.	40	
	Hello message interval	Configure according to the network planning of the operator.	10	
	Re-transmitting LSA interval	Configure according to the network planning of the operator.	5	
	Refreshing message time	Configure according to the network planning of the operator.	1	
	Network type	Configure according to the network planning of the operator.	Broadcast	
	Cost value	Configure according to the network planning of the operator.	10	
	MTU value	Configure according to the network planning of the operator.	1500	
	Priority	Configure according to the network planning of the operator.	1	
Configuring OSPF authentication	VLAN ID	Configure according to the network planning of the operator.	1	2
	Authentication mode	Configure according to the network planning of the operator.	Simple password authentication	No authentication
	Key / key chain	Configure according to the network planning of the operator.	test	—

11.2.2.3 Configuration Flow

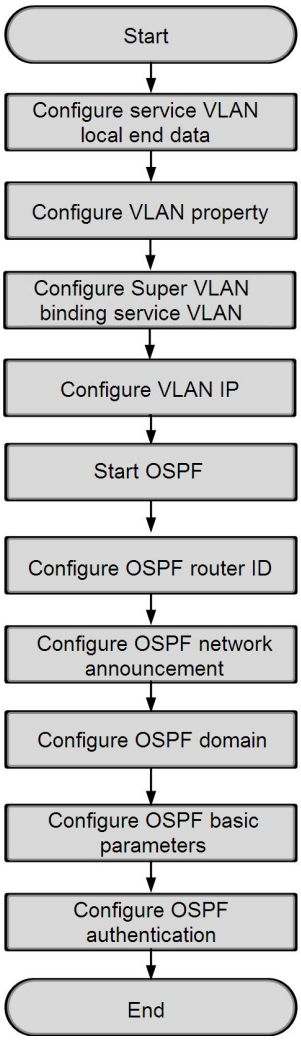


Figure 11-25 Configuration flow of the OSPF routing protocol

11.2.2.4 Configuring Service VLAN

1. Right-click the active HSWA[9] card in the **Object Tree** pane, select **VLAN Config→Local VLAN→Local End Service VLAN** from the shortcut menu, and then click the **Local End Service VLAN** tab from the window that appears.
2. Click  in the toolbar, and enter **2** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to add 2 Sub VLANs.
3. Configure the parameters according to the planning data in Table 11-3.
4. Click  in the toolbar to complete the configuration. See Figure 11-26.

Figure 11-26 Local end VLAN configuration-OSPF protocol

11.2.2.5 Configuring VLAN Property

1. Right-click the active HSWA[9] card in the **Object Tree** pane, select **VLAN Config→Local VLAN→Vlan Attribute Config** from the shortcut menu, and then click the **Vlan Attribute Config** tab from the window that appears.
2. Click in the toolbar, and enter **2** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to add 2 Super VLANs.
3. Configure the parameters according to the planning data in Table 11-3.
4. Click in the toolbar to complete the configuration. See Figure 11-27.

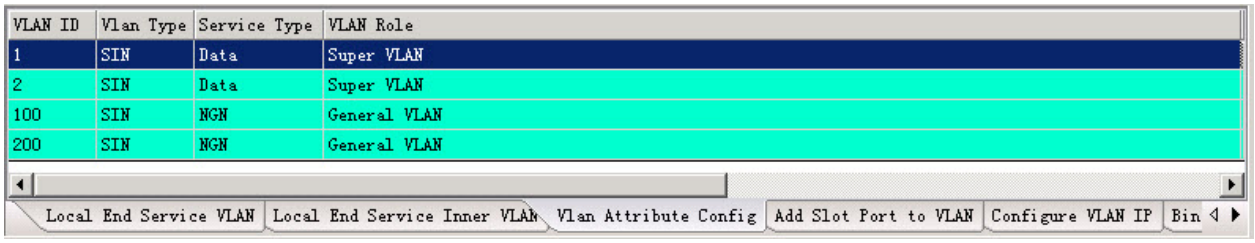


Figure 11-27 Configuring VLAN properties-OSPF protocol

11.2.2.6 Binding Service VLAN to Super VLAN

1. Right-click the active HSWA[9] card in the **Object Tree** pane, select **VLAN Config→Local VLAN→Bind Service VLAN to Super VLAN** from the shortcut menu, and then click the **Bind Service VLAN to Super VLAN** tab from the window that appears.
2. Click the left pane. Click in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to select the Super VLAN ID value to be bound. Click the right pane. Click in the toolbar, and enter **1** in

the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to select the Sub VLAN ID value to be bound.

3. Repeat step 2 to bind the second Super VLAN with the second Sub VLAN.
4. Configure the parameters according to the planning data in Table 11-3.
5. Click in the toolbar to complete the configuration. See Figure 11-28.

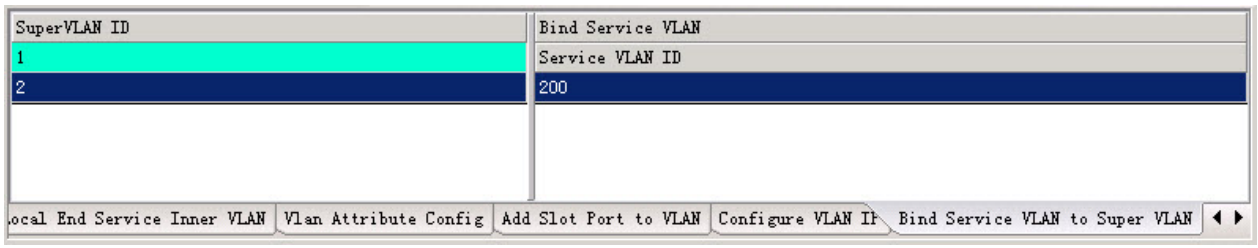


Figure 11-28 Configuring Super VLAN binding service VLAN-OSPF protocol

11.2.2.7 Configuring VLAN IP

1. Right-click the active HSWA[9] card in the **Object Tree** pane, select **VLAN Config→Local VLAN→Configure VLAN IP** from the shortcut menu, and then click the **Configure VLAN IP** tab from the window that appears.
2. Click the left pane. Click in the toolbar, and enter **2** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to create 2 new VLAN IPs.
3. Configure the parameters according to the planning data in Table 11-3.
4. Click in the toolbar to complete the configuration. See Figure 11-29.

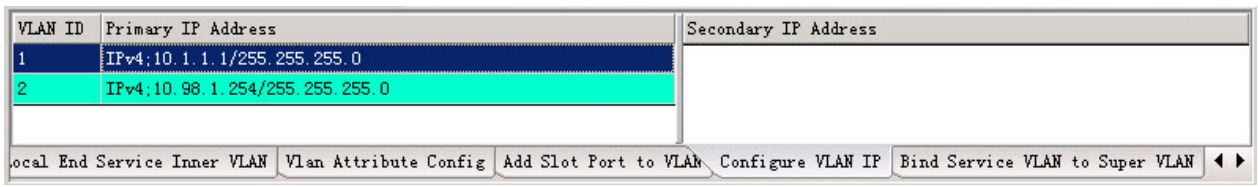


Figure 11-29 Configuring VLAN IP-OSPF protocol

11.2.2.8 Enabling OSPF

1. Right-click the designated system name in the **Object Tree** pane, select **Config→L3 Config→OSPF→Router OSPF** from the shortcut menu to open the **Router OSPF** tab in the window that appears.

2. Configure the parameters according to the planning data in Table 11-3.
3. Click in the toolbar to complete the configuration. See Figure 11-30.

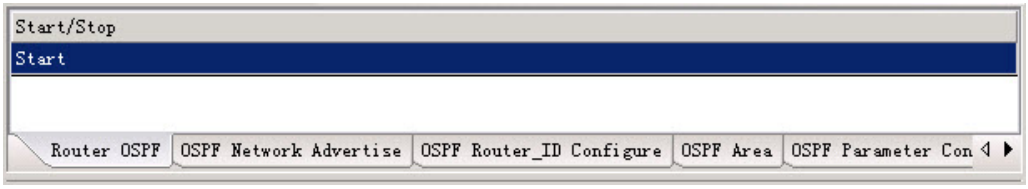


Figure 11-30 Starting OSPF

11.2.2.9 Configuring OSPF Router ID

1. Right-click the designated system name in the **Object Tree** pane, select **Config→L3 Config→OSPF→OSPF Router_ID Configure** from the shortcut menu to open the **OSPF Router_ID Configure** tab in the window that appears.
2. Configure the parameters according to the planning data in Table 11-3.
3. Click in the toolbar to complete the configuration. See Figure 11-31.

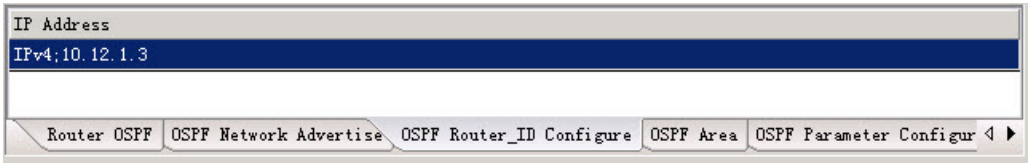


Figure 11-31 Configuring ID of the OSPF router

11.2.2.10 Configuring OSPF Network Announcement

1. Right-click the designated system name in the **Object Tree** pane, select **Config→L3 Config→OSPF→OSPF Network Advertise** from the shortcut menu to open the **OSPF Network Advertise** tab in the window that appears.
2. Click in the toolbar, and enter **2** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to create 2 OSPF network announcements.
3. Configure the parameters according to the planning data in Table 11-3.
4. Click in the toolbar to complete the configuration. See Figure 11-32.

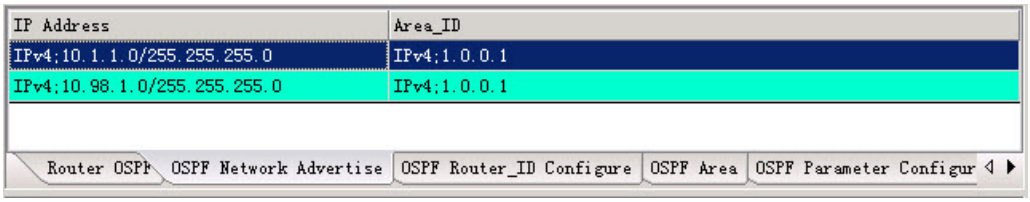


Figure 11-32 OSPF network announcement

11.2.2.11 Configuring OSPF Domain

1. Right-click the designated system name in the **Object Tree** pane, select **Config→L3 Config→OSPF→OSPF Area** from the shortcut menu to open the **OSPF Area** tab in the window that appears.
2. Configure the parameters according to the planning data in Table 11-3.
3. Click in the toolbar to complete the configuration. See Figure 11-33.

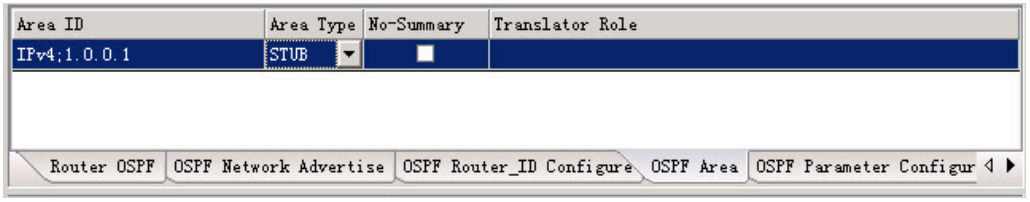


Figure 11-33 Configuring OSPF domain

11.2.2.12 Configuring OSPF Basic Parameters

1. Right-click the designated system name in the **Object Tree** pane, select **Config→L3 Config→OSPF→OSPF Parameter Configure** from the shortcut menu to open the **OSPF Parameter Configure** tab in the window that appears.
2. Configure the parameters according to the planning data in Table 11-3.
3. Click in the toolbar to complete the configuration. See Figure 11-34.

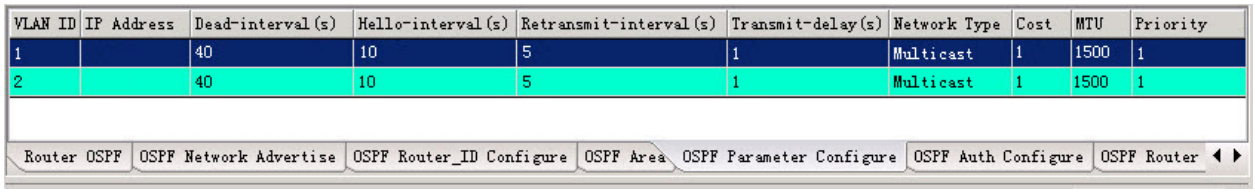


Figure 11-34 Configuring OSPF basic parameters

11.2.2.13 Configuring OSPF Authentication

1. Right-click the designated system name in the **Object Tree** pane, select **Config→L3 Config→OSPF→OSPF Auth Configure** from the shortcut menu to open the **OSPF Auth Configure** tab in the window that appears.
2. Configure the parameters according to the planning data in Table 11-3.
3. Click in the toolbar to complete the configuration. See Figure 11-35.

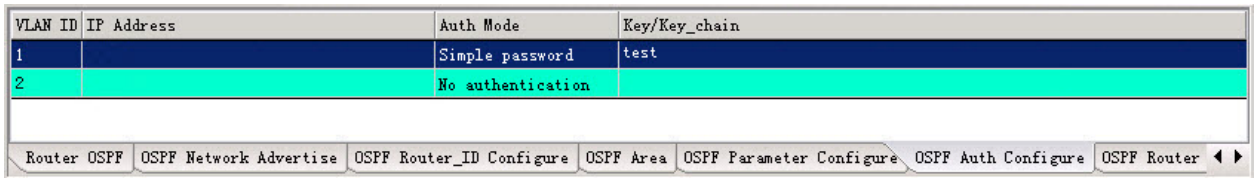


Figure 11-35 Configuring the OSPF authentication

11.2.2.14 Configuration Result

As the OSPF router, the OLT establishes the link state database via transmitting the LSA within the announced domain. Taking itself as the root node, the OLT calculates the shortest path tree, so as to achieve the cross-segment network access via this path tree for the users under it.

11.3 Configuring RIP Routing Protocol

11.3.1 Configuration Rule

Via running the RIP protocol, the AN5116-06B performs the routing forward with the adjacent router that runs the RIP protocol.

- The configured Super VLAN and Sub VLAN on the AN5116-06B are in the primary-secondary relationship. One Super VLAN contains multiple Sub VLANs.
- The IP address that binds to the downlink Super VLAN should be in the same network segment as the IP address of the succeeding equipment.
- The IP address that binds to the uplink Super VLAN should be in the same network segment as the IP address of the previous equipment that runs the RIP protocol such as the router.
- The VLAN ID configuration value of the Super VLANs and Sub VLANs range from 1 to 4085.

11.3.2 RIP Routing Protocol Configuration Example

11.3.2.1 Network Diagram

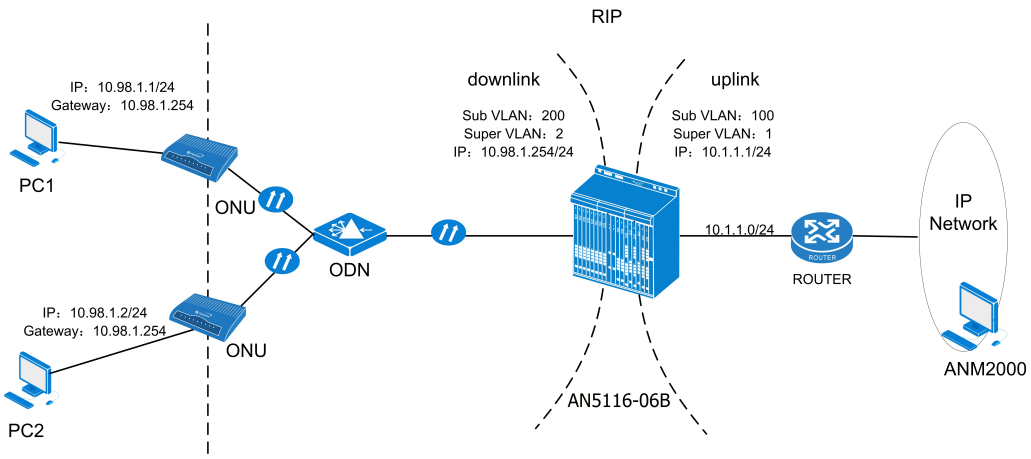


Figure 11-36 Network connection of the RIP routing protocol

The OLT serves as the router via configuring the Super VLAN and Sub VLANs of the uplink type and and downlink type. When running the RIP protocol, the RIP routing function is achieved. When the address of the user is different fron the pre-access address, the routing forward is performed via the OLT, so as to enable users to complete the access that crosses the network segments.

11.3.2.2 Planning Data

Table 11-4 Configuring RIP Routing Protocol

Configuration Item		Configuration Description	Configuration Example	
Local end data of service VLAN	Service name	Configure according to the network planning of the operator.	uplink	downlink
	Starting VLAN ID	The Sub VLAN ID value. The value ranges from 1 to 4085.	100	200
	Ending VLAN ID	The Sub VLAN ID value. The value ranges from 1 to 4085.	100	200
	Uplink interface number or TRUNK group number	Configure according to the number of the uplink port that is actually used.	19:SFP2	—
	Tag / untag property	Configures the tag processing mode for the uplink service VLAN. There are two options: **TAG** and **UNTAG**. ◆ Under the **UNTAG** mode, the tags of the uplink packets will be stripped automatically when they pass the port and the packets will be uplinked in the untag form, while the downlink untag packets will be added with designated tags when they pass the port. ◆ Under the **TAG** mode, the tags of the uplink / downlink data packets will not be processed when they pass the port.	UNTAG	UNTAG
	Service type	The equipment default type is NGN.	NGN	

Table 11-4 Configuring RIP Routing Protocol (Continued)

Configuration Item		Configuration Description	Configuration Example	
	Slot adding mode	The options include **Auto Bind** and **Manually Bind**. If users need to add the designated uplink port and the ; line card PON port to the Sub VLAN, select **Manually Bind** and configure in the **Add Slot Port to VLAN** window; if users need to add only the designated uplink port to the Sub VLAN, select **Manually Bind** and do not configure in the **Add Slot Port to VLAN** window; if users need to add all line card PON ports to the Sub VLAN, select **Auto Bind** and the **Interface No.** should be blank.	Manually Bind	Auto Bind
Configuring VLAN property	VLAN ID	The created Super VLAN ID value, which ranges from 1 to 4085.	1	2
	VLAN type	According to the service virtual port quantity, the VLANs are divided into two types: ◆ SIN VLAN: has only one service virtual port; ◆ MUL VLAN: has multiple service virtual ports.	SIN	
	Service type	Select the type **Data**.	Data	
	VLAN role	Select **Super VLAN**.	Super VLAN	
Binding Service VLAN to Super VLAN	Super VLAN ID	Select the created Super VLAN ID value.	1	2
	Service VLAN ID	The Sub VLAN value that is binding to the Super VLAN.	100	200
Configuring VLAN IP	VLAN ID	The Super VLAN ID value.	1	2
	Main IP address	The added IP address of Super VLAN.	10.1.1.1 / 255.255.255.0	10.98.1.254 / 255.255.255.0
Enabling RIP	Enable / disable	Run the RIP protocol.	Enable	
Configuring RIP network announcement	IP Address	The network segment of the RIP network announcement.	10.1.1.0 / 255.255.255.0	10.98.1.0 / 255.255.255.0
Configuring RIP timer	Refreshing timer	Configure according to the network planning of the operator.	40	

Table 11-4 Configuring RIP Routing Protocol (Continued)

Configuration Item		Configuration Description	Configuration Example	
	Invalid timer	Configure according to the network planning of the operator.	170	
	Deleting timer	Configure according to the network planning of the operator.	100	
Configuring RIP interface version	VLAN ID	Configure according to the network planning of the operator.	1	2
	Receiving version	Configure according to the network planning of the operator.	RIP version 2	RIP version 2
	Transmitting version	Configure according to the network planning of the operator.	RIP version 2	RIP version 2
Configuring RIP authentication	VLAN ID	Configure according to the network planning of the operator.	1	2
	Authentication mode	Configure according to the network planning of the operator.	Simple password authentication	No authentication
	Key / key chain	Configure according to the network planning of the operator.	test	—

11.3.2.3 Configuration Flow

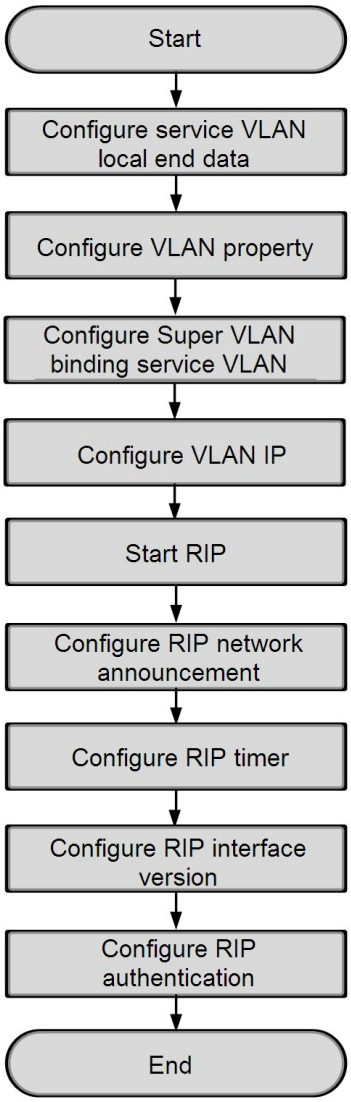


Figure 11-37 Configuration flow of the RIP routing protocol

11.3.2.4 Configuring Service VLAN

1. Right-click the active HSWA[9] card in the **Object Tree** pane, select **VLAN Config→Local VLAN→Local End Service VLAN** from the shortcut menu, and then click the **Local End Service VLAN** tab from the window that appears.
2. Click  in the toolbar, and enter **2** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to add 2 Sub VLANs.
3. Configure the parameters according to the planning data in Table 11-4.

4. Click in the toolbar to complete the configuration. See Figure 11-38.

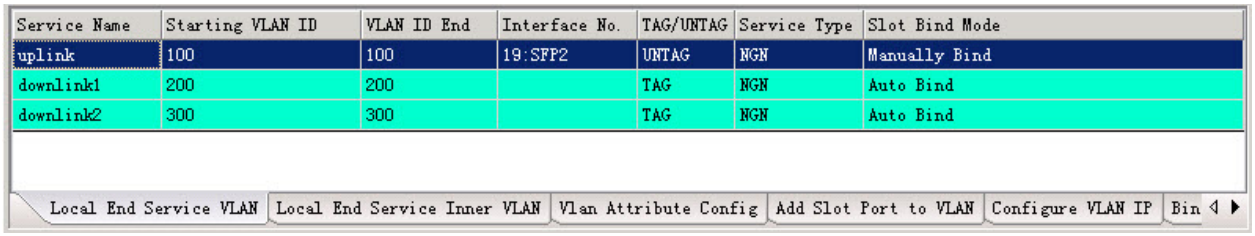


Figure 11-38 Local end VLAN configuration-RIP

11.3.2.5 Configuring VLAN Property

1. Right-click the active HSWA[9] card in the **Object Tree** pane, select **VLAN Config→Local VLAN→Vlan Attribute Config** from the shortcut menu, and then click the **Vlan Attribute Config** tab from the window that appears.
2. Click in the toolbar, and enter **2** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to add 2 Super VLANs.
3. Configure the parameters according to the planning data in Table 11-4.
4. Click in the toolbar to complete the configuration. See Figure 11-39.

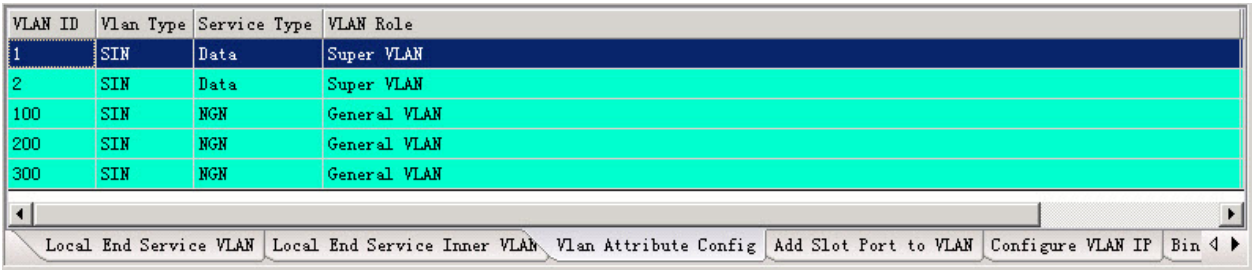


Figure 11-39 Configuring VLAN properties-RIP

11.3.2.6 Binding Service VLAN to Super VLAN

1. Right-click the active HSWA[9] card in the **Object Tree** pane, select **VLAN Config→Local VLAN→Bind Service VLAN to Super VLAN** from the shortcut menu, and then click the **Bind Service VLAN to Super VLAN** tab from the window that appears.

2. Click the left pane. Click in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to select the Super VLAN ID value to be bound. Click the right pane. Click in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to select the Sub VLAN ID value to be bound.
3. Repeat step 2 to bind the second Super VLAN with the second Sub VLAN.
4. Configure the parameters according to the planning data in Table 11-4.
5. Click in the toolbar to complete the configuration. See Figure 11-40.

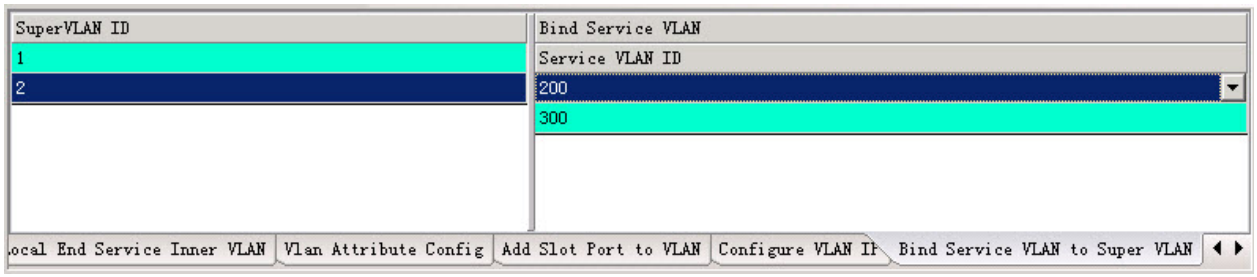


Figure 11-40 Configuring Super VLAN binding service VLAN-RIP

11.3.2.7 Configuring VLAN IP

1. Right-click the active HSWA[9] card in the **Object Tree** pane, select **VLAN Config→Local VLAN→Configure VLAN IP** from the shortcut menu, and then click the **Configure VLAN IP** tab from the window that appears.
2. Click the left pane. Click in the toolbar, and enter **2** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to create 2 new VLAN IPs.
3. Configure the parameters according to the planning data in Table 11-4.
4. Click in the toolbar to complete the configuration. See Figure 11-41.

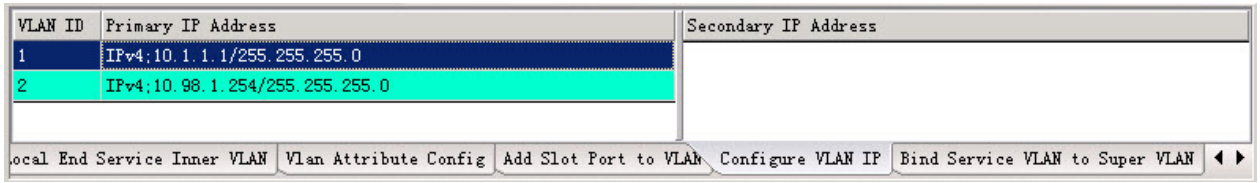


Figure 11-41 Configuring VLAN IP-RIP routing protocol

11.3.2.8 Enabling RIP

1. Right-click the designated system name in the **Object Tree** pane, select **Config→L3 Config→L3 Config→Router RIP** from the shortcut menu to open the **Router RIP** tab in the window that appears.
2. Configure the parameters according to the planning data in Table 11-4.
3. Click in the toolbar to complete the configuration. See Figure 11-42.

Figure 11-42 Starting RIP

11.3.2.9 Configuring RIP Network Announcement

1. Right-click the designated system name in the **Object Tree** pane, select **Config→L3 Config→L3 Config→RIP Network Advertise** from the shortcut menu to open the **RIP Network Advertise** tab in the window that appears.
2. Click in the toolbar, and enter **2** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to create 2 RIP network announcements.
3. Configure the parameters according to the planning data in Table 11-4.
4. Click in the toolbar to complete the configuration. See Figure 11-43.

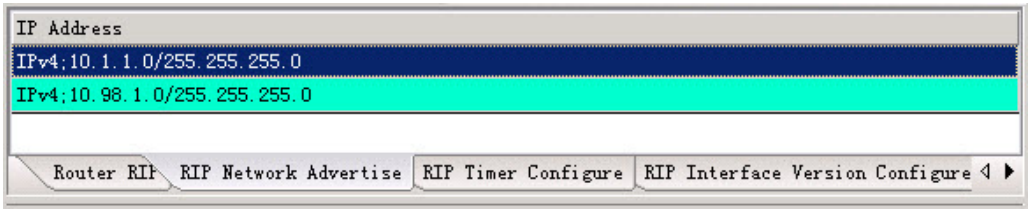


Figure 11-43 RIP network announcement

11.3.2.10 Configuring RIP Timer

1. Right-click the designated system name in the **Object Tree** pane, select **Config→L3 Config→L3 Config→RIP Timer Configure** from the shortcut menu to open the **RIP Timer Configure** tab in the window that appears.
2. Configure the parameters according to the planning data in Table 11-4.
3. Click in the toolbar to complete the configuration. See Figure 11-44.

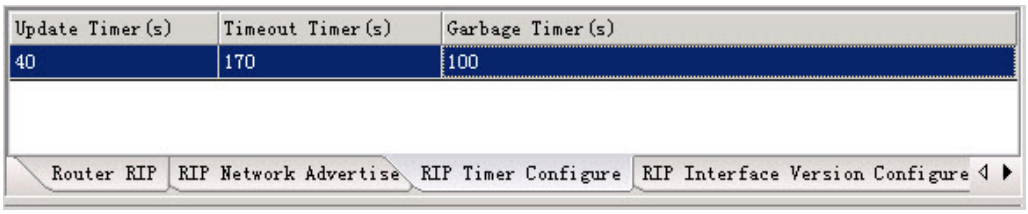


Figure 11-44 Configuring the RIP timer

11.3.2.11 Configuring RIP Interface Version

1. Right-click the designated system name in the **Object Tree** pane, select **Config→L3 Config→L3 Config→RIP Interface Version Configure** from the shortcut menu to open the **RIP Interface Version Configure** tab in the window that appears.
2. Configure the parameters according to the planning data in Table 11-4.
3. Click in the toolbar to complete the configuration. See Figure 11-45.

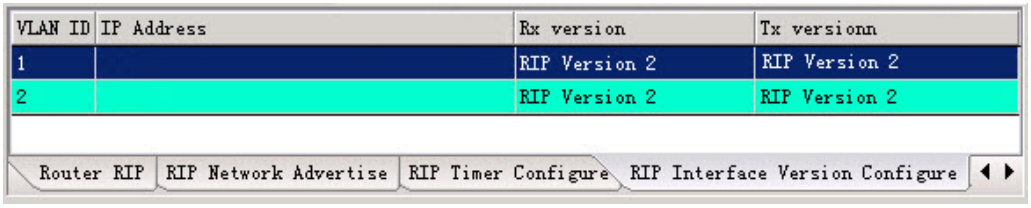


Figure 11-45 Configuring the RIP interface version

11.3.2.12 Configuring RIP Authentication

1. Right-click the designated system name in the **Object Tree** pane, select **Config→L3 Config→L3 Config→RIP Auth Configure** from the shortcut menu to open the **RIP Auth Configure** tab in the window that appears.

2. Configure the parameters according to the planning data in Table 11-4.
3. Click in the toolbar to complete the configuration. See Figure 11-46.

Figure 11-46 Configuring the RIP authentication

11.3.2.13 Configuration Result

The OLT serves as the RIP router. When it receives the routing information from the adjacent routers, the OLT refreshes its local route list and transmits the refreshed table to the adjacent routers. The transmission is performed layer by layer and finally the entire network synchronization is achieved. The users under the OLT can perform the router forward via it and performs the access that crosses the network segment.

11.4 DHCP Configuration

11.4.1 Configuration Rule

- When the AN5116-06B serves as the DHCP Relay, it can either be the DHCP proxy only or be both the DHCP proxy and the gateway. Under both conditions, the Super VLAN interface should be added as the layer 3 interface, so as to convert the users' DHCP broadcast messages to the unicast messages and forward the messages to the designated DHCP server.
  - Super VLAN: a virtual route interfadce, which can be also called VLAN aggregation. One Super VLAN contains multiple Sub VLANs.
  - Sub VLAN: The secondary VLAN of the Super VLAN, which is in primary-secondary relationship with the Super VLAN.
- The AN5116-06B can configure up to 16 Super VLANs. Each Super VLAN can be added with 4 Sub VLANs at most.

- The IP address that binds to the downlink Super VLAN should be in the same network segment as the IP address of DHCP Client that uses the DHCP proxy function of the Super VLAN.
- The VLAN ID configuration value of the Super VLANs and Sub VLANs range from 1 to 4085.
- When the AN5116-06B serves as only the DHCP proxy, it should configure the static routing. The DHCP request is forwarded to the DHCP server via the gateway.
- When the AN5116-06B enables the DHCP Snooping function, it will not process the users' DHCP broadcast messages. Via configuring the DHCP Snooping ports, the equipment filters the DHCP response messages from the untrusted ports and the untrusted DHCP request messages transmitted by the users.
- When the AN5116-06B serves as the DHCP Server, it will search for the undistributed IP addresses from the address pool after it receives the DHCP broadcast messages from the users, and transmits the PING packet to check whether the IP address is occupied by other users. If the IP address is free, it will allocate the IP address to the user.

11.4.2 DHCP Relay Configuration Example-OLT as Proxy

11.4.2.1 Network Diagram

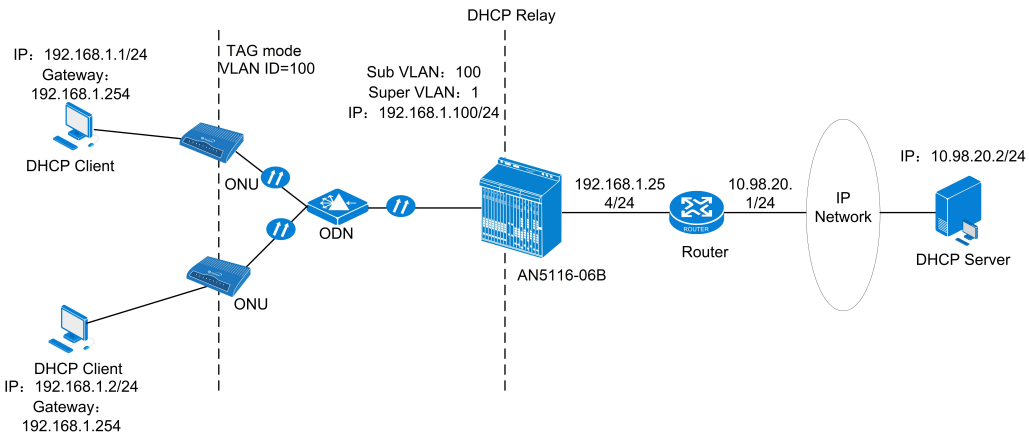


Figure 11-47 Network connection when the OLT serves as the DHCP proxy only

When the OLT serves as the DHCP proxy only, it converts the broadcast DHCP request messages received from the DHCP Client to the unicast messages, modifies parameters of the messages such as the source MAC address, destination MAC address, source IP address and souce IP address, and forwards the messages to the DHCP Server via the external gateway.

11.4.2.2 Planning Data

Table 11-5 Configuration when the OLT serves as the DHCP proxy only

Configuration Item		Configuration Description	Configuration Example
Local end data of service VLAN	Service name	Configure according to the network planning of the operator.	uplink
	Starting VLAN ID	The Sub VLAN ID value. The value ranges from 1 to 4085.	100
	Ending VLAN ID	The Sub VLAN ID value. The value ranges from 1 to 4085.	100
	Uplink interface number or TRUNK group number	Configure according to the number of the uplink port that is actually used.	19:SFP2
	Tag / untag property	Configures the tag processing mode for the uplink service VLAN. There are two options: **TAG** and **UNTAG**. ◆ Under the **UNTAG** mode, the tags of the uplink packets will be stripped automatically when they pass the port and the packets will be uplinked in the untag form, while the downlink untag packets will be added with designated tags when they pass the port. ◆ Under the **TAG** mode, the tags of the uplink / downlink data packets will not be processed when they pass the port.	UNTAG
	Service type	The equipment default type is NGN.	NGN

Table 11-5 Configuration when the OLT serves as the DHCP proxy only (Continued)

Configuration Item		Configuration Description	Configuration Example
	Slot adding mode	The options include **Auto Bind** and **Manually Bind**. If users need to add the designated uplink port and the ;line card PON port to the Sub VLAN, select **Manually Bind** and configure in the **Add Slot Port to VLAN** window; if users need to add only the designated uplink port to the Sub VLAN, select **Manually Bind** and do not configure in the **Add Slot Port to VLAN** window; if users need to add all line card PON ports to the Sub VLAN, select **Auto Bind** and the **Interface No.** should be blank.	Manually Bind
Adding VLAN at Slot Port	Slot number	The slot number of the line card that joins the Sub VLAN.	15
	Card port number	The corresponding PON port of the ONU that the user who needs the DHCP proxy function connects to.	1
	Starting VLAN ID	The joined starting Sub VLAN ID.	100
	Ending VLAN ID	The joined ending Sub VLAN ID.	100
	Tag / untag property	Configures the tag processing mode of the line card PON port for the service VLAN. There are two options: **TAG** and **UNTAG**. ◆ Under the **UNTAG** mode, the tags of the uplink packets will be stripped automatically when they pass the port and the packets will be uplinked in the untag form, while the downlink untag packets will be added with designated tags when they pass the port. ◆ Under the **TAG** mode, the tags of the uplink / downlink data packets will not be processed when they pass the port.	UNTAG

Table 11-5 Configuration when the OLT serves as the DHCP proxy only (Continued)

Configuration Item		Configuration Description	Configuration Example
Configuring VLAN property	VLAN ID	The created Super VLAN ID value, which ranges from 1 to 4085.	1
	VLAN type	According to the service virtual port quantity, the VLANs are divided into two types: ◆ SIN VLAN: has only one service virtual port; ◆ MUL VLAN: has multiple service virtual ports.	SIN
	Service type	Select the type **Data**.	Data
	VLAN role	Select **Super VLAN**.	Super VLAN
Binding Service VLAN to Super VLAN	Super VLAN ID	Select the created Super VLAN ID value.	1
	Service VLAN ID	The Sub VLAN value that is binding to the Super VLAN.	100
Configuring VLAN IP	VLAN ID	The Super VLAN ID value.	1
	Main IP address	The added IP address of Super VLAN.	192.168.1.100 / 255.255.255.0
Configuring static routing	Slot number	The slot number of the core switch card.	9
	Destination network address	The IP address of the DHCP Server.	10.98.20.2
	Gateway	The IP address of the next hop.	192.168.1.254
	Mask	The mask address.	255.255.255.0
Configuring DHCP function global switch	DHCP global switch	Enable the DHCP global switch.	Enable
Configuring DHCP interface mode	Super VLAN ID	The Super VLAN ID value.	1
	DHCP interface mode	Select the **Relay** mode.	Relay
Configuring server address of the interface	Super VLAN ID	The Super VLAN ID value.	1
	Server IP address	The IP address of the DHCP Server.	10.98.20.2

11.4.2.3 Configuration Flow

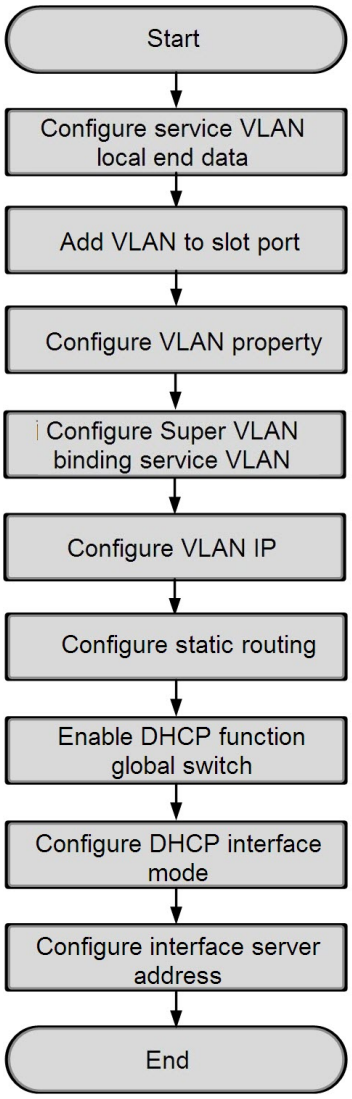


Figure 11-48 Configuration flow when the OLT serves as the DHCP proxy only

11.4.2.4 Configuring Service VLAN

1. Right-click the active HSWA[9] card in the **Object Tree** pane, select **VLAN Config→Local VLAN→Local End Service VLAN** from the shortcut menu, and then click the **Local End Service VLAN** tab from the window that appears.
2. Click  in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to add 1 Sub VLANs.
3. Configure the parameters according to the planning data in Table 11-5.

4. Click in the toolbar to complete the configuration. See Figure 11-49.

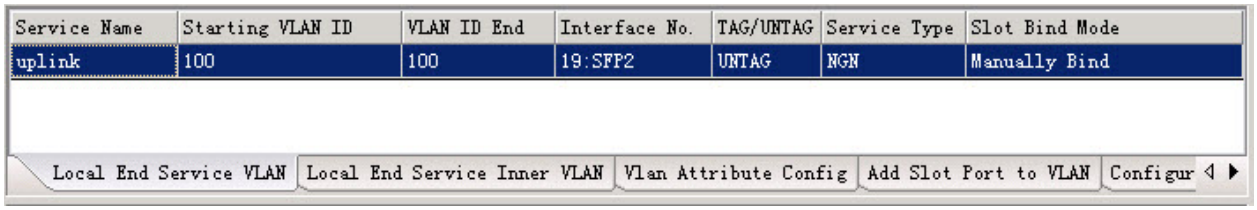


Figure 11-49 Local end VLAN configuration-OLT as the DHCP proxy only

11.4.2.5 Adding VLAN at Slot Port

1. Right-click the active HSWA[9] card in the **Object Tree** pane, select **VLAN Config→Local VLAN→Add Slot Port to VLAN** from the shortcut menu, and then click the **Add Slot Port to VLAN** tab from the window that appears.
2. Click the left pane. Click in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to add the slot port information.
3. Click the **Slot No.** item, select **15** from the drop-down list. Click the **Port No.** item, select **1** from the drop-down list.
4. Click the right pane. Click in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to configure the information of the binding Sub VLAN.
5. Configure the parameters according to the planning data in Table 11-5.
6. Click in the toolbar to complete the configuration. See Figure 11-50.

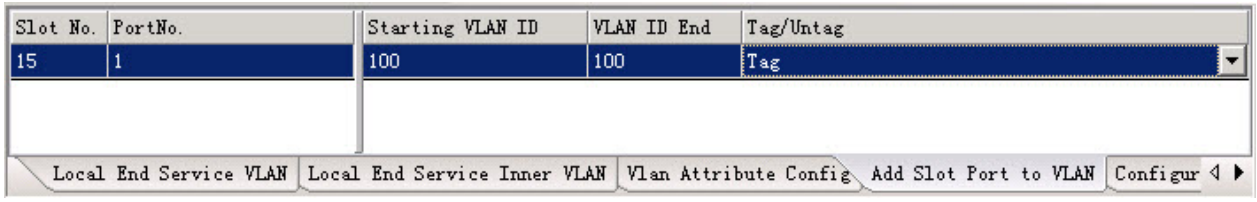


Figure 11-50 Adding VLAN to slot port-OLT as the DHCP proxy only

11.4.2.6 Configuring VLAN Property

1. Right-click the active HSWA[9] card in the **Object Tree** pane, select **VLAN Config→Local VLAN→Vlan Attribute Config** from the shortcut menu, and then click the **Vlan Attribute Config** tab from the window that appears.
2. Click  in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to create one Super VLAN.
3. Configure the parameters according to the planning data in Table 11-5.
4. Click  in the toolbar to complete the configuration. See Figure 11-51.

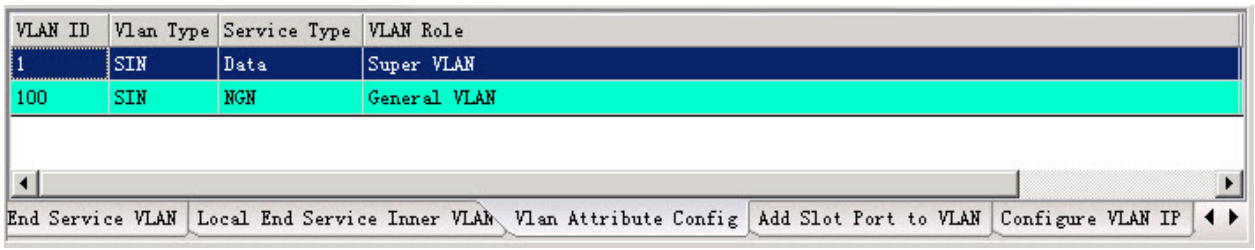


Figure 11-51 Configuring VLAN properties-OLT as the DHCP proxy only

11.4.2.7 Binding Service VLAN to Super VLAN

1. Right-click the active HSWA[9] card in the **Object Tree** pane, select **VLAN Config→Local VLAN→Bind Service VLAN to Super VLAN** from the shortcut menu, and then click the **Bind Service VLAN to Super VLAN** tab from the window that appears.
2. Click the left pane. Click  in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to select the Super VLAN ID value to be bound.
3. Click the right pane. Click  in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to select the Sub VLAN ID value to be bound.
4. Configure the parameters according to the planning data in Table 11-5.
5. Click  in the toolbar to complete the configuration. See Figure 11-52.

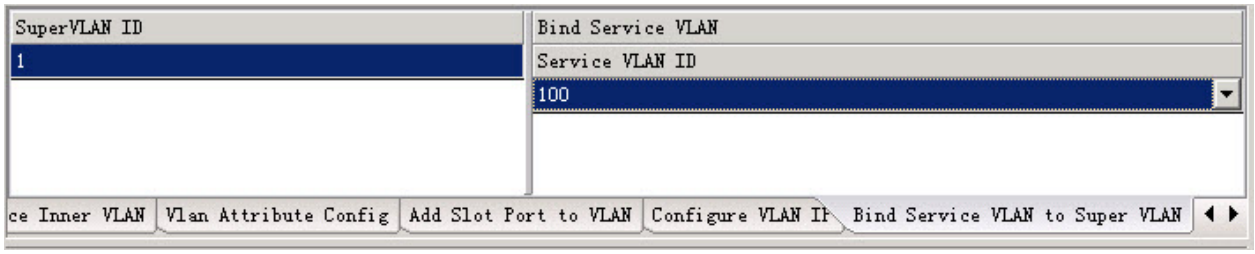


Figure 11-52 Configuring Super VLAN binding service VLAN-OLT as the DHCP proxy only

11.4.2.8 Configuring VLAN IP

1. Right-click the active HSWA[9] card in the **Object Tree** pane, select **VLAN Config→Local VLAN→Configure VLAN IP** from the shortcut menu, and then click the **Configure VLAN IP** tab from the window that appears.
2. Click the left pane. Click  in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to create one new VLAN IP.
3. Configure the parameters according to the planning data in Table 11-5.
4. Click  in the toolbar to complete the configuration. See Figure 11-53.

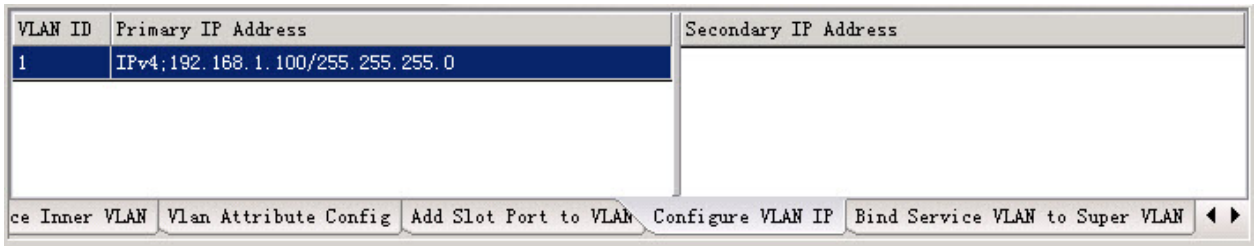


Figure 11-53 Configuring VLAN IP-OLT as the DHCP proxy only

11.4.2.9 Configuring Static Routing

1. Right-click the active HSWA[9] card in the **Object Tree** pane, select **Ethernet Config→Static Routing** from the shortcut menu to open the **static routing** window.
2. Configure the parameters according to the planning data in Table 11-5.
3. Click  in the toolbar to complete the configuration. See Figure 11-54.

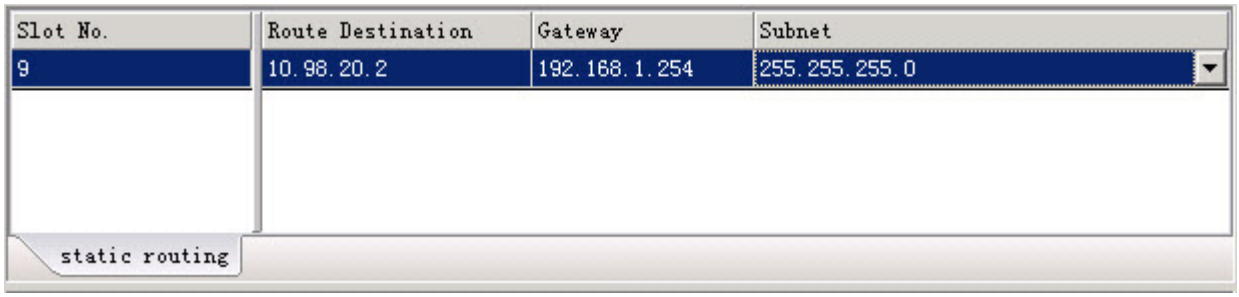


Figure 11-54 Configuring static routing-OLT as the DHCP proxy only

11.4.2.10 Enabling DHCP Function Global Switch

1. Right-click the designated system name in the **Object Tree** pane, select **Config→L3 Config→DHCP Global→DHCP Global Switch** from the shortcut menu to open the **DHCP Global Switch** tab in the window that appears.
2. Configure the parameters according to the planning data in Table 11-5.
3. Click in the toolbar to complete the configuration. See Figure 11-55.

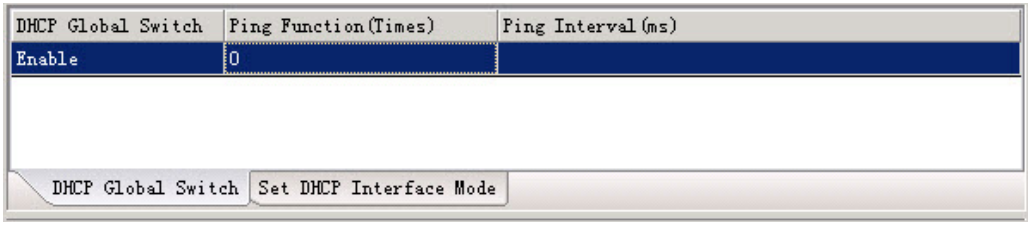


Figure 11-55 Configuring DHCP function global switch-OLT as the DHCP proxy only

11.4.2.11 Configuring DHCP Interface Mode

1. Right-click the designated system name in the **Object Tree** pane, select **Config→L3 Config→DHCP Global→Set DHCP Interface Mode** from the shortcut menu to open the **Set DHCP Interface Mode** tab in the window that appears.
2. Click in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to add a new DHCP interface mode configuration entry.
3. Configure the parameters according to the planning data in Table 11-5.

4. Click in the toolbar to complete the configuration. See Figure 11-56.

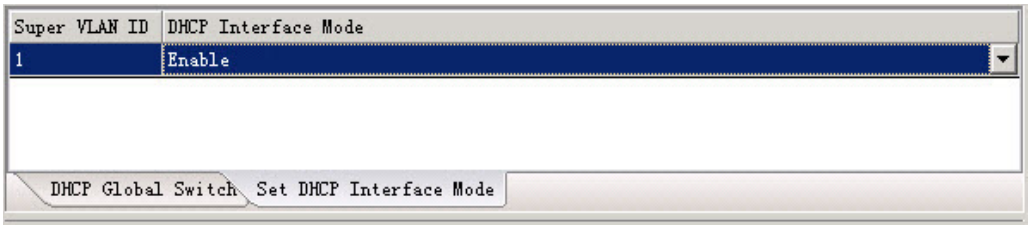


Figure 11-56 Configuring the DHCP interface mode-OLT as the DHCP proxy only

11.4.2.12 Configuring Server Address of Interface

1. Right-click the designated system name in the **Object Tree** pane, select **Config→L3 Config→DHCP RELAY→Set Port's Dhcp Server IP** from the shortcut menu to open the **Set Port's Dhcp Server IP** tab in the window that appears.
2. Click the left pane. Click in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to select the Super VLAN ID value to be configured.
3. Click the left pane. Click in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Enter the server IP address and click **Ok**.
4. Configure the parameters according to the planning data in Table 11-5.
5. Click in the toolbar to complete the configuration. See Figure 11-57.

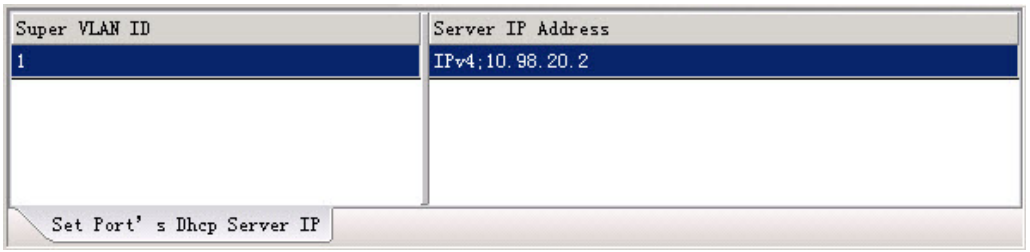


Figure 11-57 Configuring server address of the interface-OLT as the DHCP proxy only

11.4.2.13 Configuration Result

The OLT converts the DHCP broadcast messages of the DHCP Client into the unicast messages and forwards the DHCP request to the designated DHCP server by force.

11.4.3 DHCP Relay Configuration Example-OLT as Proxy and Gateway

11.4.3.1 Network Diagram

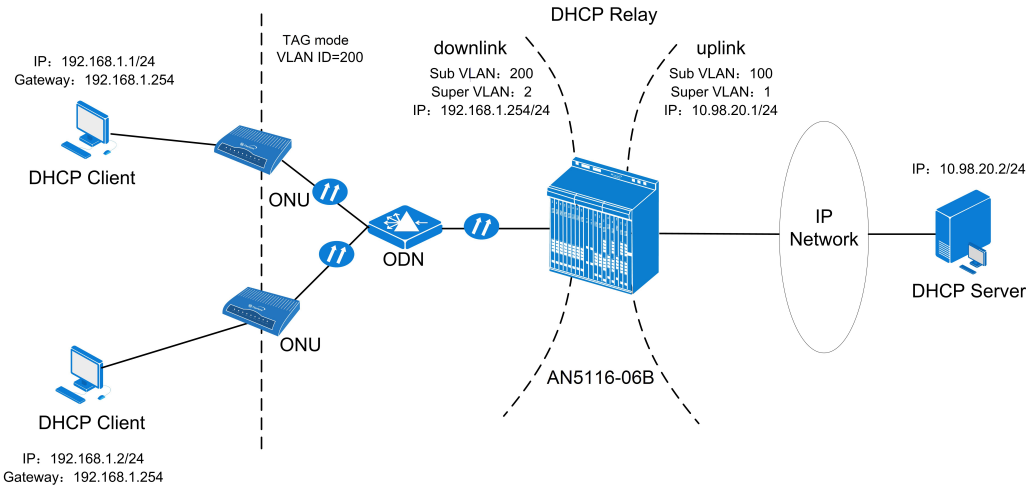


Figure 11-58 Network connection when the OLT serves as both the DHCP proxy and gateway

When the OLT serves as the DHCP proxy, it converts the broadcast DHCP request messages received from the DHCP Client to the unicast messages, and replaces the gateway IP address of the messages with the IP address of the downlink Super VLAN. The OLT also functions as the gateway and forwards the unicast messages to the DHCP Server that is in a different network segment by configuring the IP address of the Super VLAN.

11.4.3.2 Planning Data

Table 11-6 Configuration when the OLT serves as both the DHCP proxy and gateway

Configuration Item		Configuration Description	Configuration Example	
Local end data of service VLAN	Service name	Configure according to the network planning of the operator.	uplink	downlink
	Starting VLAN ID	The Sub VLAN ID value. The value ranges from 1 to 4085.	100	200
	Ending VLAN ID	The Sub VLAN ID value. The value ranges from 1 to 4085.	100	200
	Uplink interface number or TRUNK group number	Configure according to the number of the uplink port that is actually used.	19:SFP2	—
	Tag / untag property	Configures the tag processing mode for the uplink service VLAN. There are two options: **TAG** and **UNTAG**. ◆ Under the **UNTAG** mode, the tags of the uplink packets will be stripped automatically when they pass the port and the packets will be uplinked in the untag form, while the downlink untag packets will be added with designated tags when they pass the port. ◆ Under the **TAG** mode, the tags of the uplink / downlink data packets will not be processed when they pass the port.	UNTAG	UNTAG
	Service type	The equipment default type is NGN.	NGN	

Table 11-6 Configuration when the OLT serves as both the DHCP proxy and gateway (Continued)

Configuration Item		Configuration Description	Configuration Example	
	Slot adding mode	The options include **Auto Bind** and **Manually Bind**. If users need to add the designated uplink port and the ;line card PON port to the Sub VLAN, select **Manually Bind** and configure in the **Add Slot Port to VLAN** window; if users need to add only the designated uplink port to the Sub VLAN, select **Manually Bind** and do not configure in the **Add Slot Port to VLAN** window; if users need to add all line card PON ports to the Sub VLAN, select **Auto Bind** and the **Interface No.** should be blank.	Manually Bind	Auto Bind
Configuring VLAN property	VLAN ID	The created Super VLAN ID value, which ranges from 1 to 4085.	1	2
	VLAN type	According to the service virtual port quantity, the VLANs are divided into two types: ◆ SIN VLAN: has only one service virtual port; ◆ MUL VLAN: has multiple service virtual ports.	SIN	
	Service type	Select the type **Data**.	Data	
	VLAN role	Select **Super VLAN**.	Super VLAN	
Binding Service VLAN to Super VLAN	Super VLAN ID	Select the created Super VLAN ID value.	1	2
	Service VLAN ID	The Sub VLAN value that is binding to the Super VLAN.	100	200
Configuring VLAN IP	VLAN ID	The Super VLAN ID value.	1	2
	Main IP address	The added IP address of Super VLAN.	10.98.20.1 / 255.255.255.0	192.168.1.254 / 255.255.255.0
Configuring DHCP function global switch	DHCP global switch	Enable the DHCP global switch.	Enable	

Table 11-6 Configuration when the OLT serves as both the DHCP proxy and gateway (Continued)

Configuration Item		Configuration Description	Configuration Example
Configuring DHCP Interface Mode	Super VLAN ID	The uplink Super VLAN ID value.	2
	DHCP interface mode	Select the **Relay** mode.	Relay
Configuring Server Address of Interface	Super VLAN ID	The Super VLAN ID value.	2
	Server IP address	The IP address of the DHCP Server.	10.98.20.2

11.4.3.3 Configuration Flow

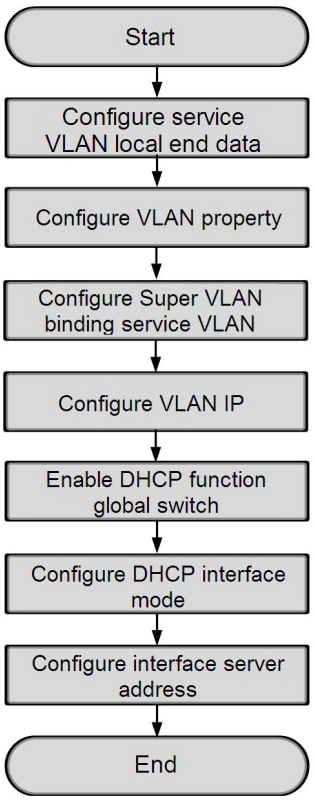


Figure 11-59 Configuration flow when the OLT serves as both the DHCP proxy and gateway

11.4.3.4 Configuring Service VLAN

1. Right-click the active HSWA[9] card in the **Object Tree** pane, select **VLAN Config→Local VLAN→Local End Service VLAN** from the shortcut menu, and then click the **Local End Service VLAN** tab from the window that appears.
2. Click  in the toolbar, and enter **2** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to add 2 Sub VLANs.
3. Configure the parameters according to the planning data in Table 11-6.
4. Click  in the toolbar to complete the configuration. See Figure 11-60.

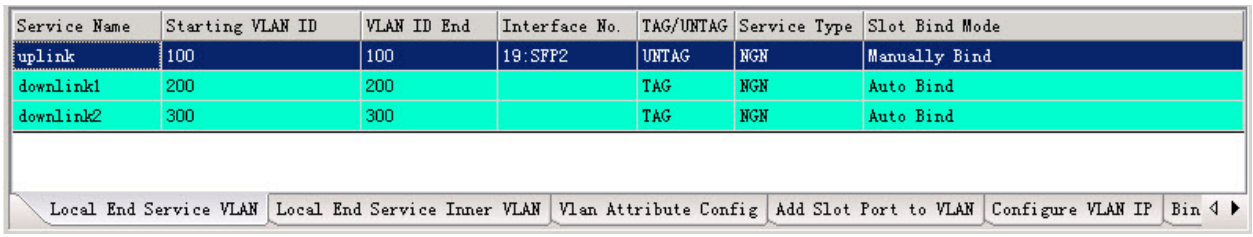


Figure 11-60 Local end VLAN configuration-OLT as both the DHCP proxy and gateway

11.4.3.5 Configuring VLAN Property

1. Right-click the active HSWA[9] card in the **Object Tree** pane, select **VLAN Config→Local VLAN→Vlan Attribute Config** from the shortcut menu, and then click the **Vlan Attribute Config** tab from the window that appears.
2. Click  in the toolbar, and enter **2** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to create 2 Super VLANs.
3. Configure the parameters according to the planning data in Table 11-6.
4. Click  in the toolbar to complete the configuration. See Figure 11-61.

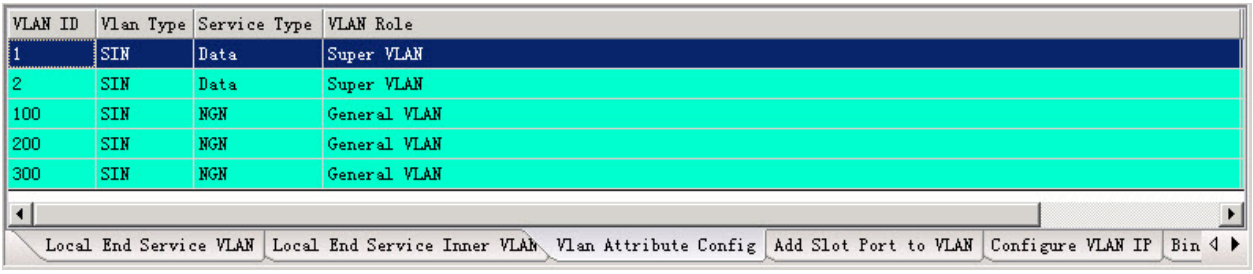


Figure 11-61 Configuring VLAN properties-OLT as the DHCP proxy and gateway

11.4.3.6 Binding Service VLAN to Super VLAN

1. Right-click the active HSWA[9] card in the **Object Tree** pane, select **VLAN Config→Local VLAN→Bind Service VLAN to Super VLAN** from the shortcut menu, and then click the **Bind Service VLAN to Super VLAN** tab from the window that appears.
2. Click the left pane. Click  in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to select the Super VLAN ID value to be bound. Click the right pane. Click  in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to select the Sub VLAN ID value to be bound.
3. Repeat step 2 to bind the second Super VLAN with the second Sub VLAN.
4. Configure the parameters according to the planning data in Table 11-6.
5. Click  in the toolbar to complete the configuration. See Figure 11-62.

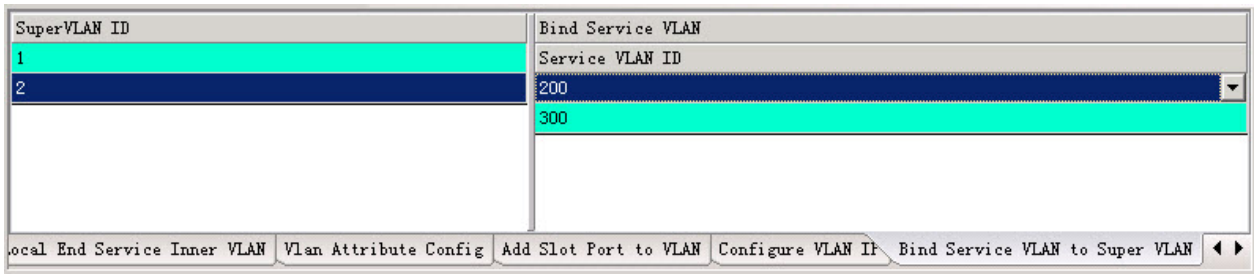


Figure 11-62 Configuring Super VLAN binding service VLAN-OLT as the DHCP proxy and gateway

11.4.3.7 Configuring VLAN IP

1. Right-click the active HSWA[9] card in the **Object Tree** pane, select **VLAN Config→Local VLAN→Configure VLAN IP** from the shortcut menu, and then click the **Configure VLAN IP** tab from the window that appears.
2. Click the left pane. Click  in the toolbar, and enter **2** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to create 2 new VLAN IPs.
3. Configure the parameters according to the planning data in Table 11-6.
4. Click  in the toolbar to complete the configuration. See Figure 11-63.

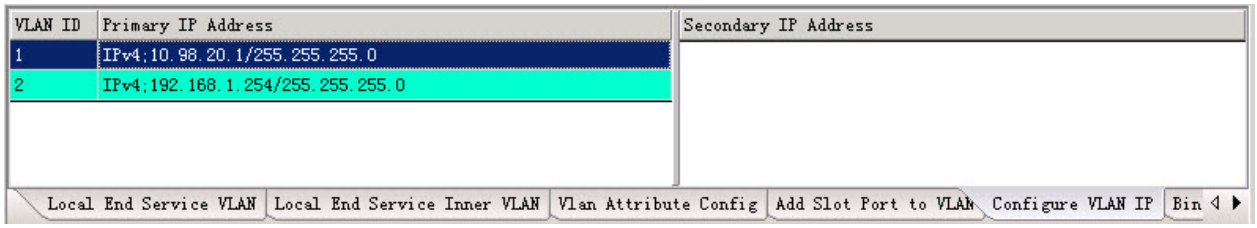


Figure 11-63 Configuring VLAN IP-OLT as the DHCP proxy and gateway

11.4.3.8 Enabling DHCP Function Global Switch

1. Right-click the designated system name in the **Object Tree** pane, select **Config→L3 Config→DHCP Global→DHCP Global Switch** from the shortcut menu to open the **DHCP Global Switch** tab in the window that appears.
2. Configure the parameters according to the planning data in Table 11-6.
3. Click in the toolbar to complete the configuration. See Figure 11-64.

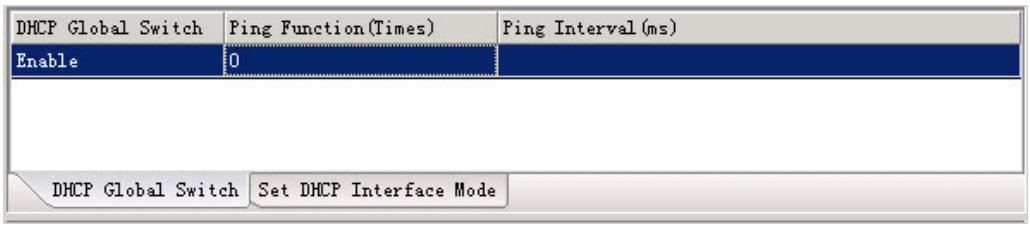


Figure 11-64 Configuring DHCP function global switch-OLT as the DHCP proxy and gateway

11.4.3.9 Configuring DHCP Interface Mode

1. Right-click the designated system name in the **Object Tree** pane, select **Config→L3 Config→DHCP Global→Set DHCP Interface Mode** from the shortcut menu to open the **Set DHCP Interface Mode** tab in the window that appears.
2. Click in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to add a new DHCP interface mode configuration entry.
3. Configure the parameters according to the planning data in Table 11-6.
4. Click in the toolbar to complete the configuration. See Figure 11-65.

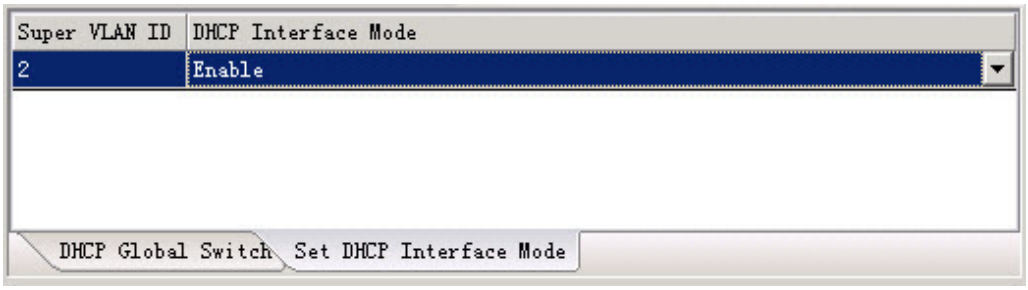


Figure 11-65 Configuring DHCP interface mode-OLT as the DHCP proxy and gateway

11.4.3.10 Configuring Server Address of Interface

1. Right-click the designated system name in the **Object Tree** pane, select **Config→L3 Config→DHCP RELAY→Set Port's Dhcp Server IP** from the shortcut menu to open the **Set Port's Dhcp Server IP** tab in the window that appears.
2. Click the left pane. Click in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to select the Super VLAN ID value to be configured.
3. Click the left pane. Click in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Enter the server IP address and click **Ok**.
4. Configure the parameters according to the planning data in Table 11-6.
5. Click in the toolbar to complete the configuration. See Figure 11-66.

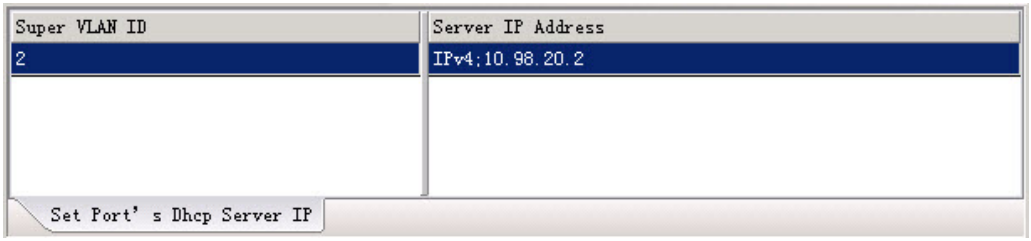


Figure 11-66 Configuring server address of the interface-OLT as the DHCP proxy and gateway

11.4.3.11 Configuration Result

The OLT converts the DHCP broadcast messages of the DHCP Client into the unicast messages and forwards the DHCP request to the designated DHCP server by force.

11.4.4 DHCP Server Configuration Example

11.4.4.1 Network Diagram

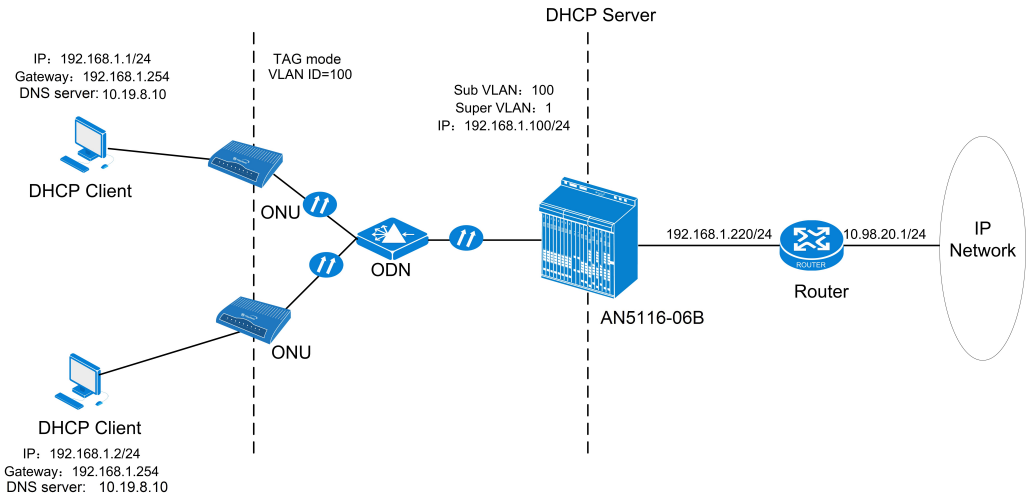


Figure 11-67 Network connection when the OLT serves as the DHCP Server

When the OLT serves as the DHCP Server, after it receives the broadcast DHCP request messages from the DHCP Client, it directly allocates the IP address in the IP address pool to the user.

11.4.4.2 Planning Data

Table 11-7 Configuration when the OLT serves as the DHCP Server

Configuration Item		Configuration Description	Configuration Example
Local end data of service VLAN	Service name	Configure according to the network planning of the operator.	uplink
	Starting VLAN ID	The Sub VLAN ID value. The value ranges from 1 to 4085.	100

Table 11-7 Configuration when the OLT serves as the DHCP Server (Continued)

Configuration Item		Configuration Description	Configuration Example
	Ending VLAN ID	The Sub VLAN ID value. The value ranges from 1 to 4085.	100
	Uplink interface number or TRUNK group number	Configure according to the number of the uplink port that is actually used.	19:SFP2
	Tag / untag property	Configures the tag processing mode for the uplink service VLAN. There are two options: **TAG** and **UNTAG**. ◆ Under the **UNTAG** mode, the tags of the uplink packets will be stripped automatically when they pass the port and the packets will be uplinked in the untag form, while the downlink untag packets will be added with designated tags when they pass the port. ◆ Under the **TAG** mode, the tags of the uplink / downlink data packets will not be processed when they pass the port.	UNTAG
	Service type	The equipment default type is NGN.	NGN
	Slot adding mode	The options include **Auto Bind** and **Manually Bind**. If users need to add the designated uplink port and the ;line card PON port to the Sub VLAN, select **Manually Bind** and configure in the **Add Slot Port to VLAN** window; if users need to add only the designated uplink port to the Sub VLAN, select **Manually Bind** and do not configure in the **Add Slot Port to VLAN** window; if users need to add all line card PON ports to the Sub VLAN, select **Auto Bind** and the **Interface No.** should be blank.	Manually Bind
Adding VLAN at Slot Port	Slot number	The slot number of the line card that joins the Sub VLAN.	15
	Card port number	The number of the PON port that is actually used.	1
	Starting VLAN ID	The joined starting Sub VLAN ID.	100
	Ending VLAN ID	The joined ending Sub VLAN ID.	100
	Tag / untag property	Configures the tag processing mode of the line	UNTAG

Table 11-7 Configuration when the OLT serves as the DHCP Server (Continued)

Configuration Item		Configuration Description	Configuration Example
		card PON port for the service VLAN. There are two options: **TAG** and **UNTAG**. ◆ Under the **UNTAG** mode, the tags of the uplink packets will be stripped automatically when they pass the port and the packets will be uplinked in the untag form, while the downlink untag packets will be added with designated tags when they pass the port. ◆ Under the **TAG** mode, the tags of the uplink / downlink data packets will not be processed when they pass the port.	
Configuring VLAN property	VLAN ID	The created Super VLAN ID value, which ranges from 1 to 4085.	1
	VLAN type	According to the service virtual port quantity, the VLANs are divided into two types: ◆ SIN VLAN: has only one service virtual port; ◆ MUL VLAN: has multiple service virtual ports.	SIN
	Service type	Select the type **Data**.	Data
	VLAN role	Select **Super VLAN**.	Super VLAN
Binding Service VLAN to Super VLAN	Super VLAN ID	Select the created Super VLAN ID value.	1
	Service VLAN ID	The Sub VLAN value that is binding to the Super VLAN.	100
Configuring VLAN IP	VLAN ID	The Super VLAN ID value.	1
	Main IP address	The added IP address of Super VLAN.	192.168.1.100 / 255.255.255.0
Configuring DHCP function global switch	DHCP global switch	Enable the DHCP global switch.	Enable
Configuring DHCP Interface Mode	Super VLAN ID	The Super VLAN ID value.	1
	DHCP interface mode	Select **Server** mode.	Server mode
Configuring IP address pool	Address pool identifier	Configure according to the network planning of the operator.	1
	Starting IP address	The starting IP address that can be allocated to the user.	192.168.1.1 / 255.255.255.0

Table 11-7 Configuration when the OLT serves as the DHCP Server (Continued)

Configuration Item		Configuration Description	Configuration Example
	Ending IP address	The ending IP address that can be allocated to the user.	192.168.1.20 / 255. 255. 255.0
	Default-Gateway	The default gateway corresponding to the IP address.	192.168.1.254
	Lease term	The lease term of the IP address. Configure according to the operator's network planning.	001 00:00:00
Configuring DNS server list	Address pool identifier	Select the address pool identifier to be configured from the **Pool ID** column.	1
	DNS service address	The DNS server address allocated to the user.	10.19.8.10
	Operation type	Select **set**.	set

11.4.4.3 Configuration Flow

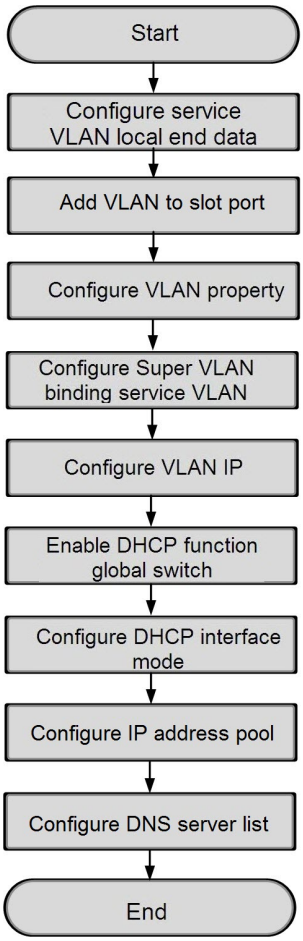


Figure 11-68 Configuration flow when the OLT serves as the DHCP Server

11.4.4.4 Configuring Service VLAN

1. Right-click the active HSWA[9] card in the **Object Tree** pane, select **VLAN Config→Local VLAN→Local End Service VLAN** from the shortcut menu, and then click the **Local End Service VLAN** tab from the window that appears.
2. Click  in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to add 1 Sub VLANs.
3. Configure the parameters according to the planning data in Table 11-7.
4. Click  in the toolbar to complete the configuration. See Figure 11-69.

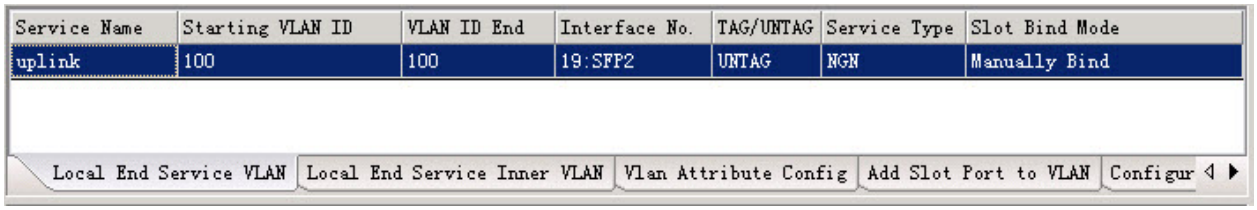


Figure 11-69 Local end VLAN configuration-OLT as the DHCP Server

11.4.4.5 Adding VLAN at Slot Port

1. Right-click the active HSWA[9] card in the **Object Tree** pane, select **VLAN Config→Local VLAN→Add Slot Port to VLAN** from the shortcut menu, and then click the **Add Slot Port to VLAN** tab from the window that appears.
2. Click the left pane. Click in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to add the slot port information.
3. Click the **Slot No.** item, select **15** from the drop-down list. Click the **Port No.** item, select **1** from the drop-down list.
4. Click the right pane. Click in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to configure the information of the binding Sub VLAN.
5. Configure the parameters according to the planning data in Table 11-7.
6. Click in the toolbar to complete the configuration. See Figure 11-70.

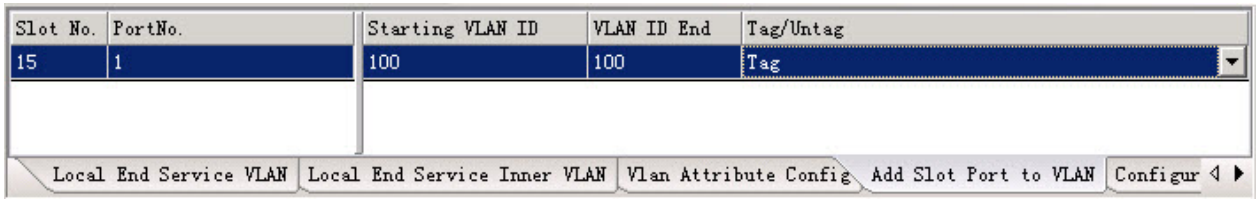


Figure 11-70 Adding VLAN to slot port-OLT as the DHCP Server

11.4.4.6 Configuring VLAN Property

1. Right-click the active HSWA[9] card in the **Object Tree** pane, select **VLAN Config→Local VLAN→Vlan Attribute Config** from the shortcut menu, and then click the **Vlan Attribute Config** tab from the window that appears.
2. Click in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to create one Super VLAN.
3. Configure the parameters according to the planning data in Table 11-7.
4. Click in the toolbar to complete the configuration. See Figure 11-71.

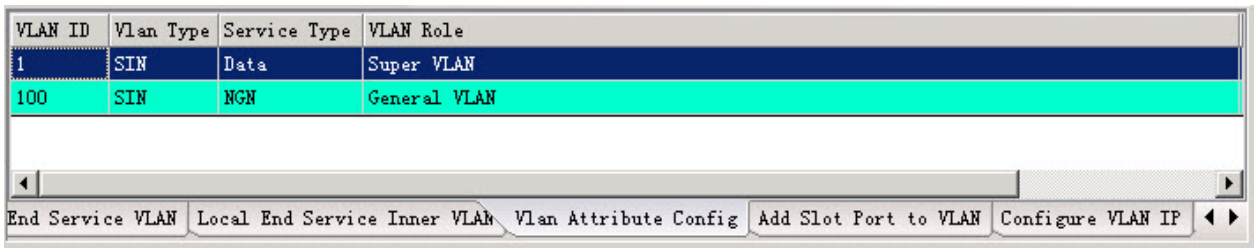


Figure 11-71 Configuring VLAN properties-OLT as the DHCP Server

11.4.4.7 Binding Service VLAN to Super VLAN

1. Right-click the active HSWA[9] card in the **Object Tree** pane, select **VLAN Config→Local VLAN→Bind Service VLAN to Super VLAN** from the shortcut menu, and then click the **Bind Service VLAN to Super VLAN** tab from the window that appears.
2. Click the left pane. Click in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to select the Super VLAN ID value to be bound.
3. Click the right pane. Click in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to select the Sub VLAN ID value to be bound.
4. Configure the parameters according to the planning data in Table 11-7.
5. Click in the toolbar to complete the configuration. See Figure 11-72.

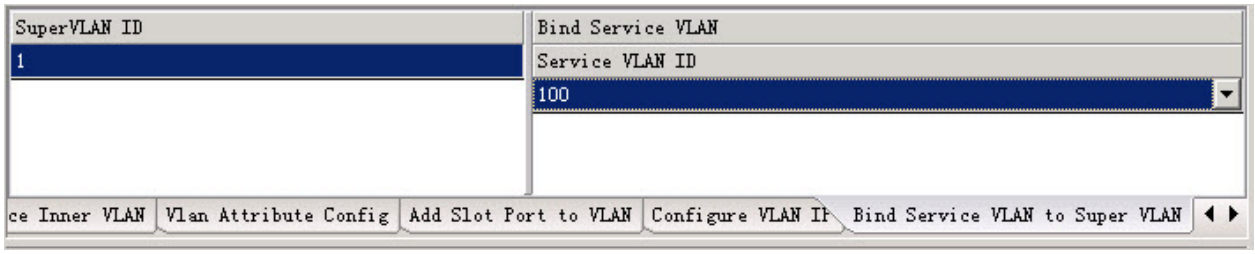


Figure 11-72 Configuring Super VLAN binding service VLAN-OLT as the DHCP Server

11.4.4.8 Configuring VLAN IP

1. Right-click the active HSWA[9] card in the **Object Tree** pane, select **VLAN Config→Local VLAN→Configure VLAN IP** from the shortcut menu, and then click the **Configure VLAN IP** tab from the window that appears.
2. Click the left pane. Click  in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to create one new VLAN IP.
3. Configure the parameters according to the planning data in Table 11-7.
4. Click  in the toolbar to complete the configuration. See Figure 11-73.

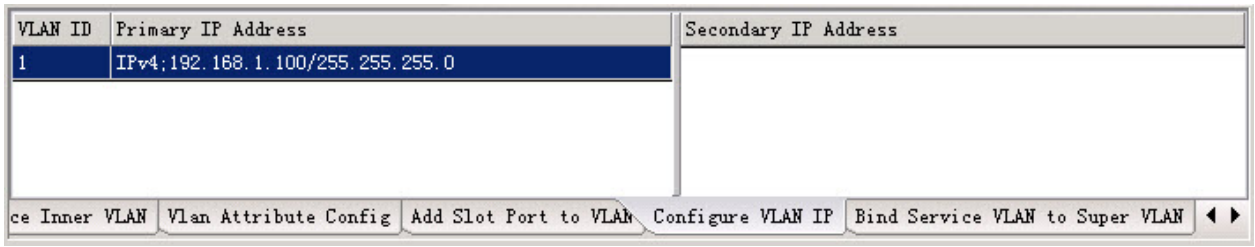


Figure 11-73 Configuring VLAN IP-OLT as the DHCP Server

11.4.4.9 Enabling DHCP Function Global Switch

1. Right-click the designated system name in the **Object Tree** pane, select **Config→L3 Config→DHCP Global→DHCP Global Switch** from the shortcut menu to open the **DHCP Global Switch** tab in the window that appears.
2. Configure the parameters according to the planning data in Table 11-7.
3. Click  in the toolbar to complete the configuration. See Figure 11-74.

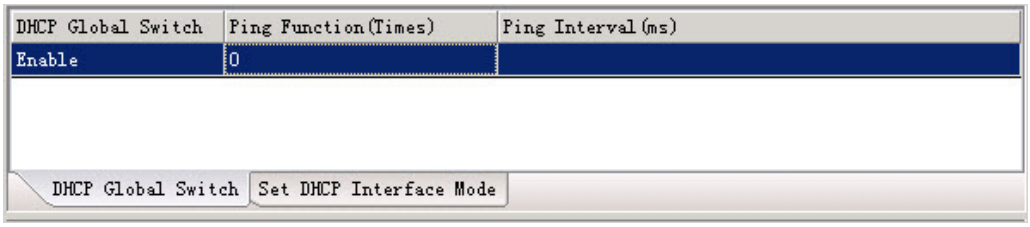


Figure 11-74 Configuring DHCP function global switch-OLT as the DHCP Server

11.4.4.10 Configuring DHCP Interface Mode

1. Right-click the designated system name in the **Object Tree** pane, select **Config→L3 Config→DHCP Global→Set DHCP Interface Mode** from the shortcut menu to open the **Set DHCP Interface Mode** tab in the window that appears.
2. Click in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to add a new DHCP interface mode configuration entry.
3. Configure the parameters according to the planning data in Table 11-7.
4. Click in the toolbar to complete the configuration. See Figure 11-75.

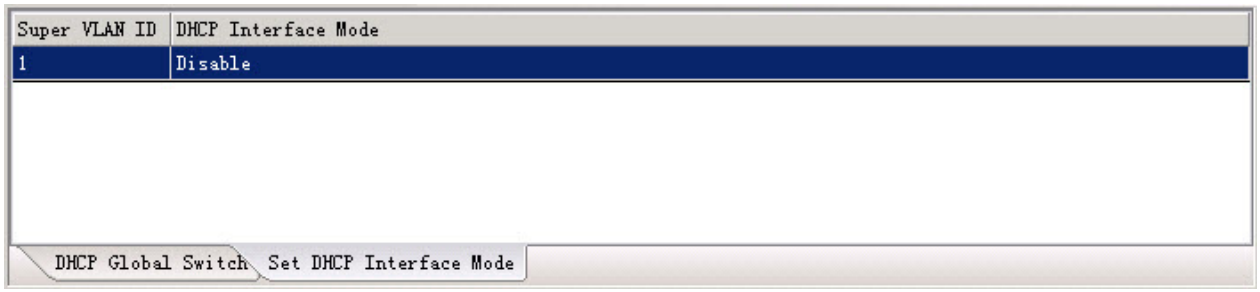


Figure 11-75 Configuring the DHCP interface mode-OLT as the DHCP Server

11.4.4.11 Configuring IP Address Pool

1. Right-click the designated system name in the **Object Tree** pane, select **Config→L3 Config→DHCP SERVER→Set IP Pool** from the shortcut menu to open the **Set IP Pool** tab in the window that appears.

2. Click in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to create one new IP address.
3. Configure the parameters according to the planning data in Table 11-7.
4. Click in the toolbar to complete the configuration. See Figure 11-76.

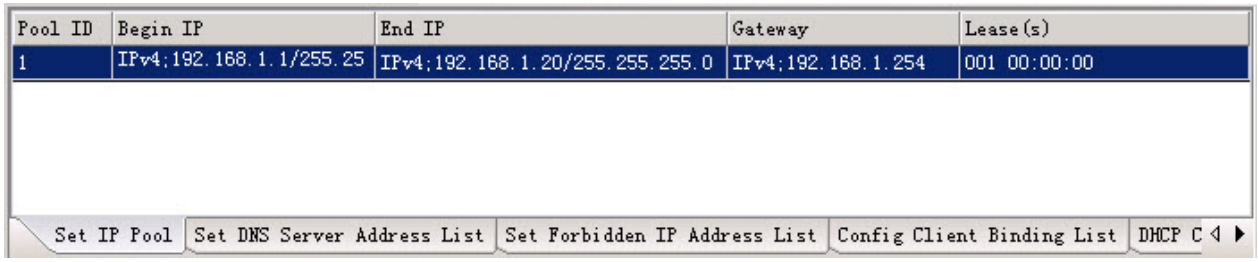


Figure 11-76 Configuring the IP address pool-OLT as the DHCP Server

11.4.4.12 Configuring DNS Server List

1. Right-click the designated system name in the **Object Tree** pane, select **Config→L3 Config→DHCP SERVER→Set DNS Server Address List** from the shortcut menu to open the **Set DNS Server Address List** tab in the window that appears.
2. Click the left pane. Click in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to select the IP address pool identifier.
3. Click the right pane. Click in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to configure the DNS server information.
4. Configure the parameters according to the planning data in Table 11-7.
5. Click in the toolbar to complete the configuration. See Figure 11-77.

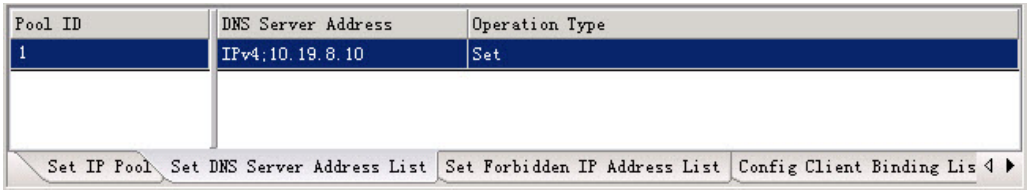


Figure 11-77 Configuring the DNS server list-OLT as the DHCP Server

11.4.4.13 Configuration Result

After the OLT receives the DHCP broadcast messages from the DHCP Client, it serves as the DHCP server and directly allocates the IP address in the IP address pool to the user.

11.4.5 DHCP Snooping Configuration Example

11.4.5.1 Network Diagram

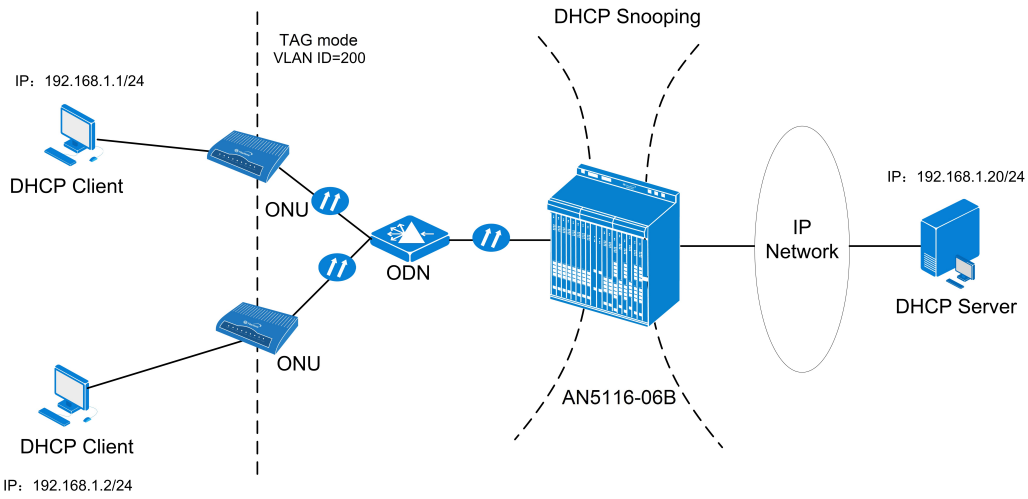


Figure 11-78 Network connection when the OLT serves as the DHCP Snooping

After the OLT enables the DHCP Snooping function, it transmits the broadcast DHCP request message received from the DHCP Client to the DHCP server, and prevents the DHCP server phishing by filtering the response packets transmitted from the DHCP server.

11.4.5.2 Planning Data

Table 11-8 Configuration when the OLT serves as the DHCP Snooping

Configuration Item		Configuration Description	Configuration Example
Local end data of service VLAN	Service name	Configure according to the network planning of the operator.	Data
	Starting VLAN ID	The starting VLAN ID value. The value ranges from 1 to 4085.	300

Table 11-8 Configuration when the OLT serves as the DHCP Snooping (Continued)

Configuration Item		Configuration Description	Configuration Example
	Ending VLAN ID	The ending VLAN ID value. The value ranges from 1 to 4085.	300
	Uplink interface number or TRUNK group number	Configure according to the number of the uplink port that is actually used.	19:SFP2
	Tag / untag property	Configures the tag processing mode for the uplink service VLAN. There are two options: **TAG** and **UNTAG**. ◆ Under the **UNTAG** mode, the tags of the uplink packets will be stripped automatically when they pass the port and the packets will be uplinked in the untag form, while the downlink untag packets will be added with designated tags when they pass the port. ◆ Under the **TAG** mode, the tags of the uplink / downlink data packets will not be processed when they pass the port.	UNTAG
	Service type	Select **data** service.	data
	Slot adding mode	Add the designated uplink port and all PON ports to the local end VLAN.	Auto Bind
Configuring DHCP Snooping switch	Switch	Enable the DHCP Snooping function.	Enable.
Configuring DHCP Snooping trusted port	Uplink port number	Configure according to the number of the uplink port that is actually used.	3

11.4.5.3 Configuration Flow

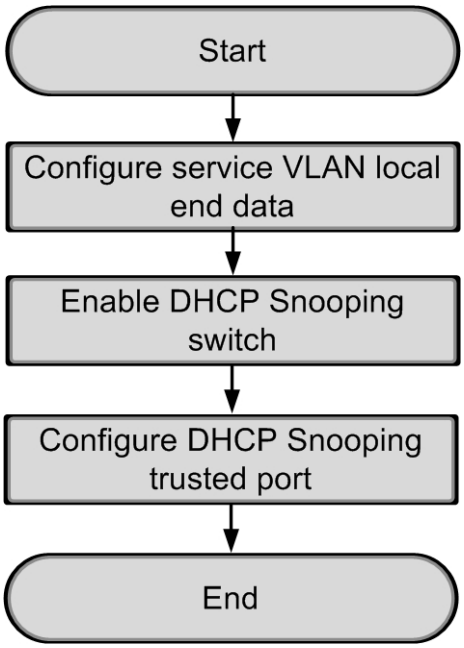


Figure 11-79 Configuration flow when the OLT serves as the DHCP Snooping

11.4.5.4 Configuring Service VLAN

Configures the uplink port 19:SFP2 for the data service. The starting / ending VLAN ID is 300, the tagging property is tag, and the slot adding mode is auto adding.

1. Right-click the active HSWA[9] card in the **Object Tree** pane, select **VLAN Config→Local VLAN→Local End Service VLAN** from the shortcut menu, and then click the **Local End Service VLAN** tab from the window that appears.
2. Click  in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to add one local end VLAN.
3. Configure the parameters according to the planning data in Table 11-8.
4. Click  in the toolbar to complete the configuration. See Figure 11-80.

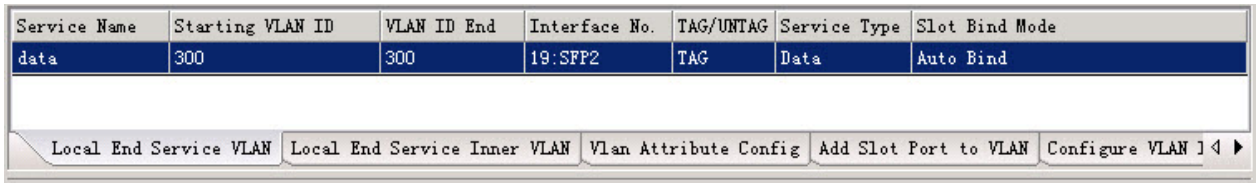


Figure 11-80 Local end VLAN configuration-DHCP Snooping

11.4.5.5 Enabling DHCP Snooping Switch

1. Right-click the active HSWA[9] card in the **Object Tree** pane, select **Ethernet Config→DHCP→DHCP Snooping Switch** from the shortcut menu to open the **DHCP Snooping Switch** tab from the window that appears.
2. Configure the parameters according to the planning data in Table 11-8.
3. Click in the toolbar to complete the configuration. See Figure 11-81.

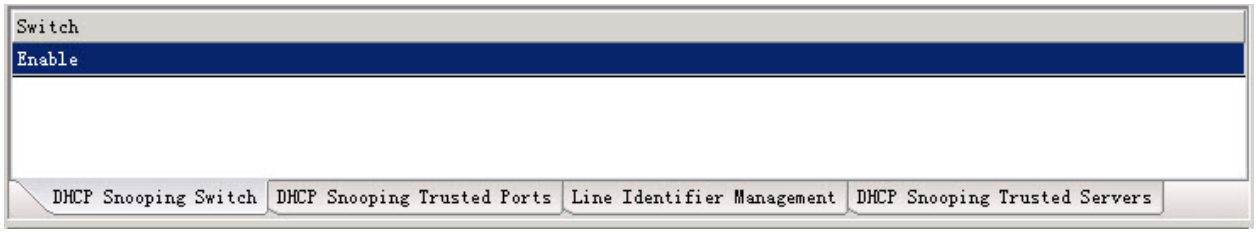


Figure 11-81 Configuring the DHCP Snooping switch

11.4.5.6 Configuring DHCP Snooping Trusted Port

1. Right-click the active HSWA[9] card in the **Object Tree** pane, select **Ethernet Config→DHCP→DHCP Snooping Trusted Ports** from the shortcut menu to open the **DHCP Snooping Trusted Ports** tab from the window that appears.
2. Click in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to add one uplink trusted port.
3. Configure the parameters according to the planning data in Table 11-8.
4. Click in the toolbar to complete the configuration. See Figure 11-82.

Figure 11-82 Configuring DHCP snooping trusted port

11.4.5.7 Configuration Result

The OLT does not process the DHCP broadcast messages of the users. It allocates the IP addresses that are allocated by the DHCP Server connecting to the trusted port to the users.

12 Upgrading Software

- Precaution
- Prerequisite
- Upgrading Core Switch Card
- Upgrading the GPON Interface Card / TDM Interface Card / Public Card
- Upgrading the GPON Interface Cards in a Batch Manner
- Upgrading the ONU Manually
- Upgrading the ONU Automatically

12.1 Precaution

During the upgrading you need to reboot the upgraded card, which will impact the service. To minimize the impact, the following notices should be paid attention to.

- You should upgrade the remote equipment first and then upgrade the local equipment, that is, you should follow the steps of ONU → GC4B / GC8B → PUBA → HSWA to upgrade.
- The replacement operation is recommended to be carried out at night when service traffic is at a relatively low volume.
- The AN5116-06B's management VLAN port should be connected with the FTP server properly; the management VLAN IP address should be within the same subnet as the FTP server IP address. You can run the **Ping** command on the FTP server to check its connectivity to the AN5116-06B.
- You should save the current software version before the upgrading, because you might want to use it for a restore in the case that the upgrading would fail or the new version would have a problem.
- The file type used for the upgrading should match the card type to be upgraded; otherwise the upgrading would fail.

12.2 Prerequisite

Caution:

The wftp software is used in this example. During the upgrading / backup, the wftp program should be running.

Open the wftp software on the ftp server and select a user. If no user exists, you need to create one.

- In the upgrading operation, after selecting a user, you should confirm the path saving the upgrade package on the ftp server and input the path in the wftp software. During the upgrading, the equipment will import the upgrade package from this path.

- In the backing up operation, after selecting a user, you should confirm the path used to save the backup pack on the ftp server and input the path in the wftp software. During the backing up, the equipment will export the backup pack to this path.

For specific operations, refer to Appendix A.

12.3 Upgrading Core Switch Card

12.3.1 Upgrading Rule

- If only one core switch card is configured on the AN5116-06B, you need to reboot the entire system after upgrading the core switch card. System reboot will impact the service. It is recommended to add a standby card first and then to upgrade the core switch card software.
- If the active and the standby core switch cards are configured on the AN5116-06B, you should upgrade the standby card first, execute the active-standby switchover command, and then upgrade the original active card. This operation procedure will minimize the impact on the service.
- The manual and automatic upgrading should not be operated simultaneously on the EPON interface card of one slot.

12.3.2 Planning Data

Table 12-1 shows the data planning for the core switch card software upgrading.

Table 12-1 Data planning for the core switch card upgrading.

Configuration Item	Configuration Description	Configuration Example
Relevant parameters of the cared to be upgraded	Configure according to the slot number of the core switch card that is actually used.	The HSWA card (active) in Slot 9 The HSWA card (standby) in Slot 10
Downloaded file type	Configure according to the type of the file that is actually used.	Core switch card software

Table 12-1 Data planning for the core switch card upgrading. (Continued)

Configuration Item	Configuration Description	Configuration Example
FTP Server IP	Configure according to the IP address of the FTP server that is actually used.	10.92.20.168
FTP server user name	Configure according to the user name of the FTP server that is actually used.	1
FTP server user password	Configure according to the password of the FTP server that is actually used.	1
Exporting configuration file	Configure according to the name of the file that is actually used.	20100618.txt
Backing up system file	Configure according to the name of the file that is actually used.	beifen.bin
File name of the core switch card upgrade software	Configure according to the name of the file that is actually used.	hswa.bin

12.3.3 Upgrading Flow

Below is the upgrading flow.

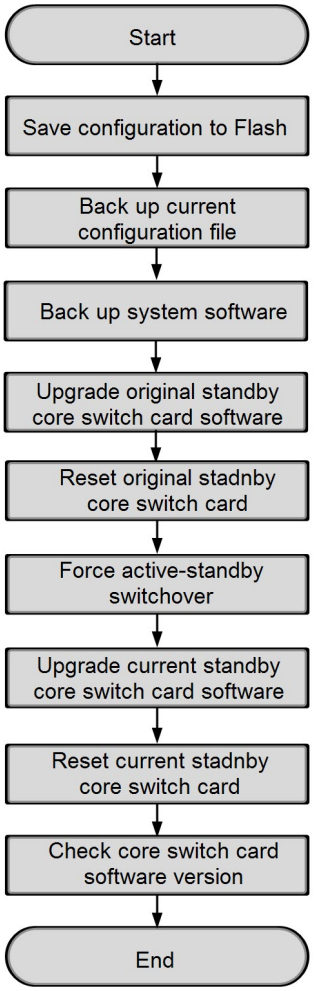


Figure 12-1 Flow chart of upgrading the core switch card software

12.3.4 Saving the Current Configuration into the Flash

1. Right-click the HSWA[9] card in the **Object Tree** pane and select **System Control→Save Config To Flash** from the shortcut menu.
2. In the **Sending Commands** dialog box which appears subsequently, click the **OK** button. Then wait a few seconds, it will show the command of saving configuration succeeds, as shown in Figure 12-2.

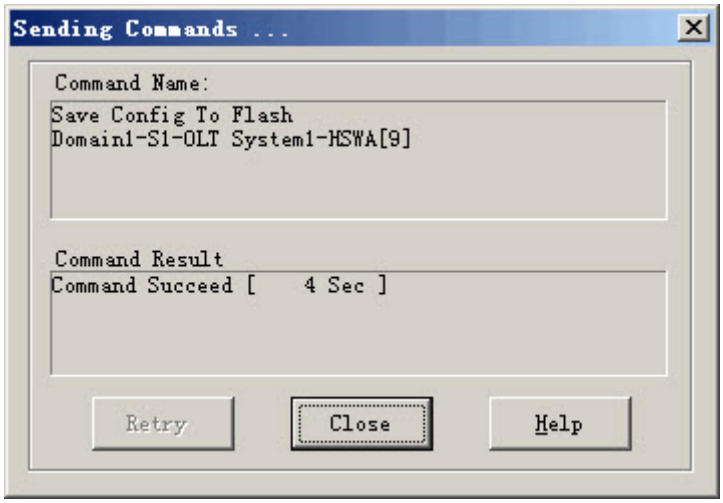


Figure 12-2 Saving the current configuration into the FLASH

12.3.5 Backing Up the Current Configuration File

1. Right-click the HSWA[9] card in the **Object Tree** pane and select **System Maintenance→Export Config** from the shortcut menu.
2. In the **Export Config File** dialog box, configure the parameters as follows.

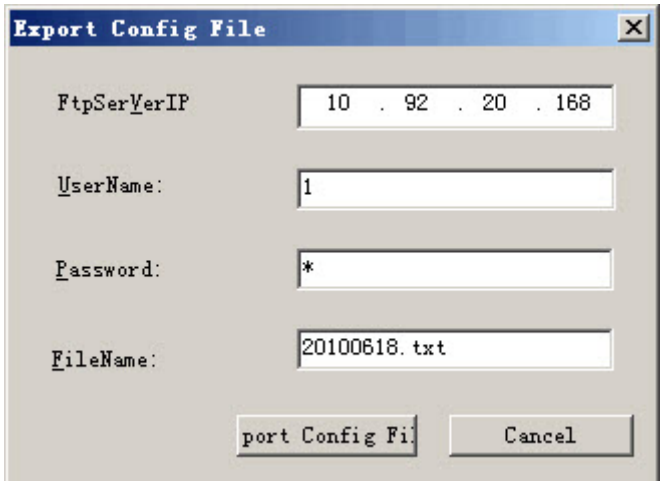


Figure 12-3 Backing up the current configuration

3. Click the **Export Config File** button, the system will prompt **Export Config File Successfully**. Click the **OK** button to complete the file exporting.

12.3.6 Backing Up the System Software

1. Right-click the HSWA[9] card in the **Object Tree** pane and select **System Maintenance→Backup Software** from the shortcut menu.
2. In the **Backup System Software** dialog box, configure the parameters as follows.

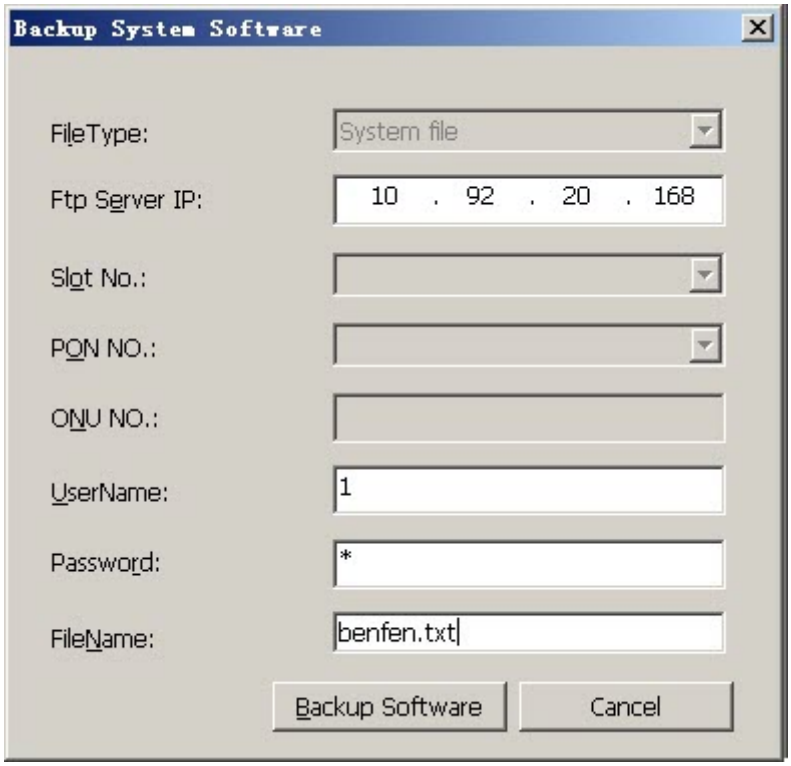


Figure 12-4 Backing up the system software

3. Click the **Backup Software** button to complete the backing up.

12.3.7 Upgrading Software of the Standby Core Switch Card

1. Right-click the HSWA[9] card in the **Object Tree** pane and select **System Maintenance→Upgrade Software** from the shortcut menu.
2. In the **Upgrade System Software** dialog box, configure the parameters as follows.

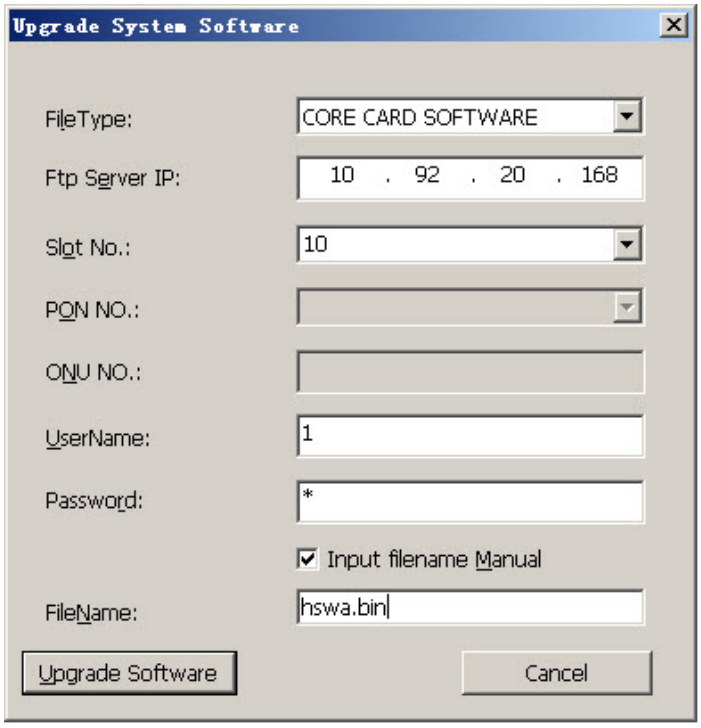


Figure 12-5 Upgrading software of the original standby core switch card

3. After completing the configuration, click the **Upgrade Software** button to start the upgrading.
4. Switch to the wftp window. If the following logs are displayed in the window, it indicates that the equipment obtains the upgrading software package successfully through ftp, as shown in Figure 12-6.

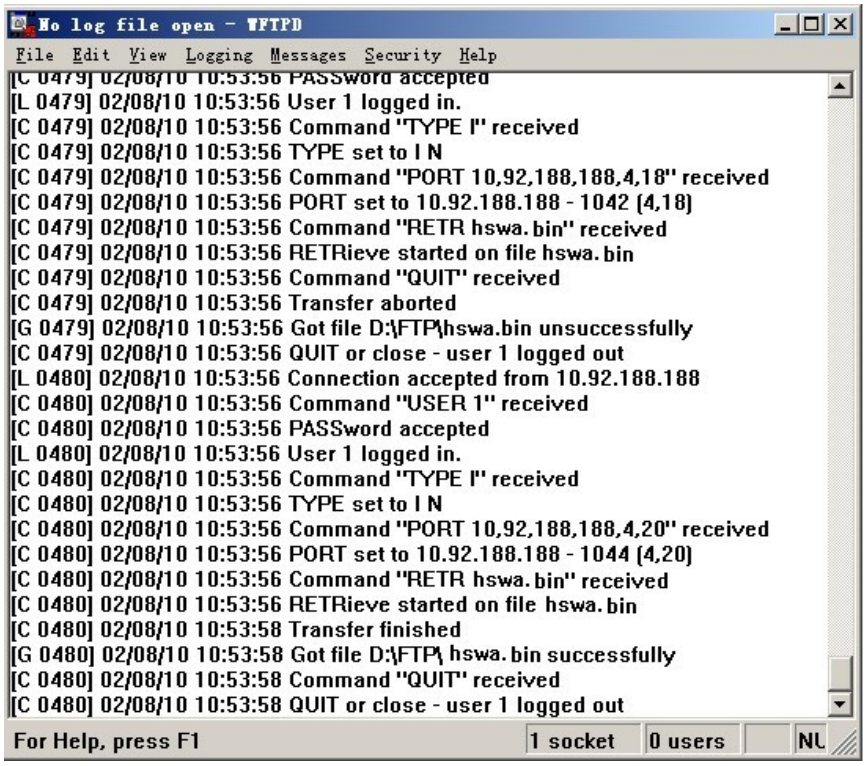


Figure 12-6 ftp-upgrading the core switch card

12.3.8 Rebooting the Original Standby Core Switch Card

1. Right-click the HSWA[9] card in the **Object Tree** pane and select **System Control→Reset Standby HSWA** from the shortcut menu. This operation will bring up the **Sending Commands** dialog box, as shown in Figure 12-7.

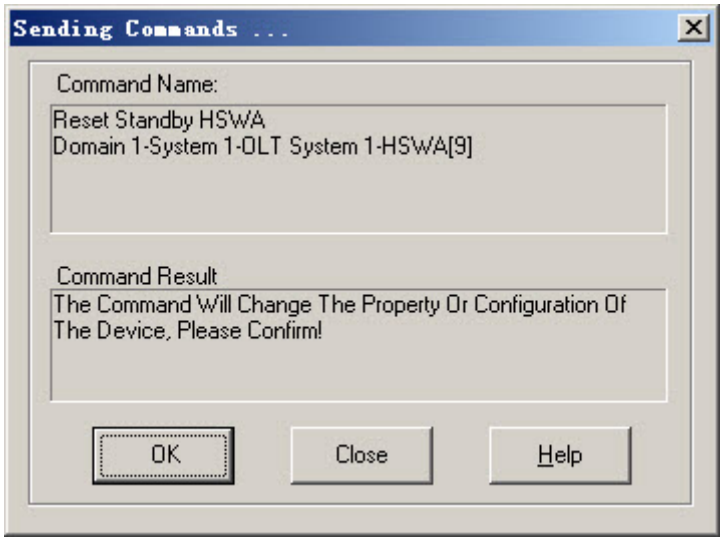


Figure 12-7 Resetting card-the command sending dialog box

2. Click the **OK** button. Then wait a few seconds, it will show the **Command Succeed** of the **Command Result**, indicating that rebooting the standby card is completed.

12.3.9 Forcing the Active-standby Switchover

1. Right-click the HSWA[9] card in the Object Tree pane and select **System Control→Force Switch** from the shortcut menu. This operation will bring up the **Sending Commands** dialog box, as shown in Figure 12-8.

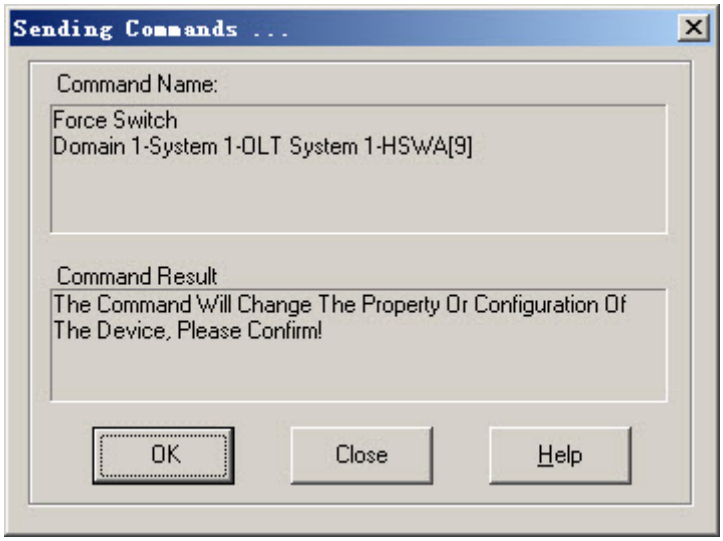


Figure 12-8 Forcing active-standby switchover-the command sending dialog box

2. Click the **OK** button. Then wait a few seconds, it will show the **Command Succeed** of the **Command Result**, indicating that rebooting the standby card is completed. In this case, the HSWA card in Slot 9 is the standby card, and the HSWA card in Slot 10 is the active card.

12.3.10 Upgrading the Current Standby Core Switch Card Software

1. Right-click the HSWA[10] card in the **Object Tree** pane and select **System Maintenance→Upgrade Software** from the shortcut menu.
2. In the **Upgrade System Software** dialog box, configure the parameters as follows.

Note:

The HSWA card in Slot 9 is the standby card, so you should select **9** for the **Slot No.** item.

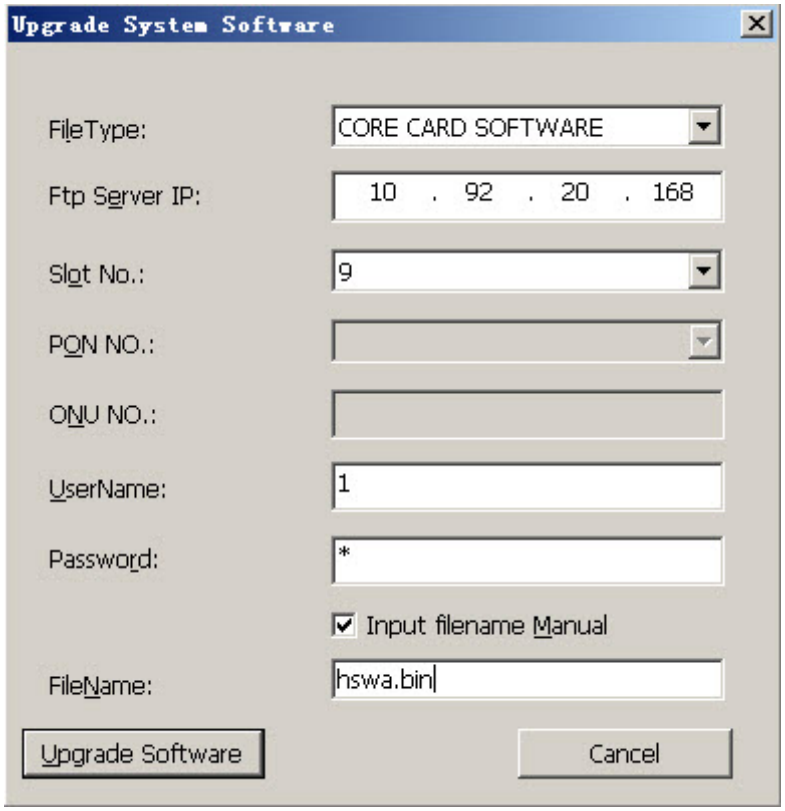


Figure 12-9 Upgrading software of the standby core switch card

3. Click the **Upgrade Software** button to start the upgrading.
4. Switch to the wftp window. If the logs as shown in Figure 12-10 are displayed in the window, it indicates that the equipment obtains the upgrading software package successfully through ftp.

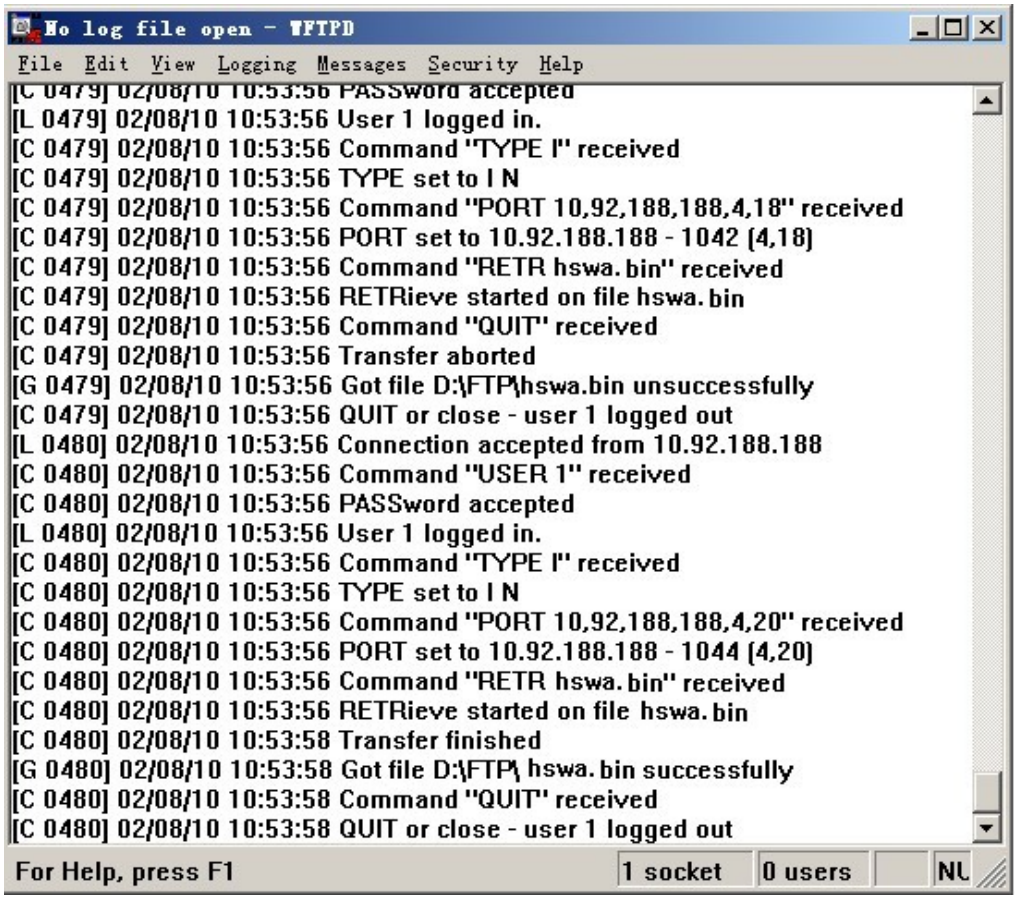


Figure 12-10 ftp-Upgrading the standby core switch card

5. Switch to the **Upgrade System Software** window. If the upgrading succeeds, the system will prompt **Please reboot the object upgraded to make it work**, as shown in Figure 12-11.

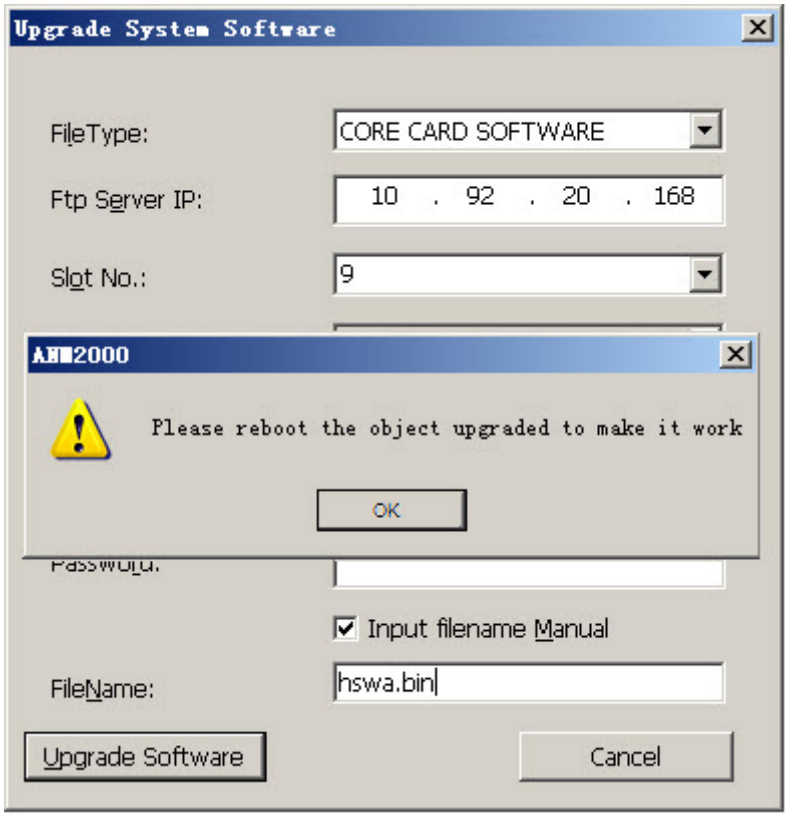


Figure 12-11 Upgrading the core switch card successfully

12.3.11 Rebooting the Current Standby Core Switch Card

1. Right-click the HSWA[10] card in the **Object Tree** pane and select **System Control→Reset Standby HSWA** from the shortcut menu. This operation will bring up the **Sending Commands** dialog box, as shown in Figure 12-12.

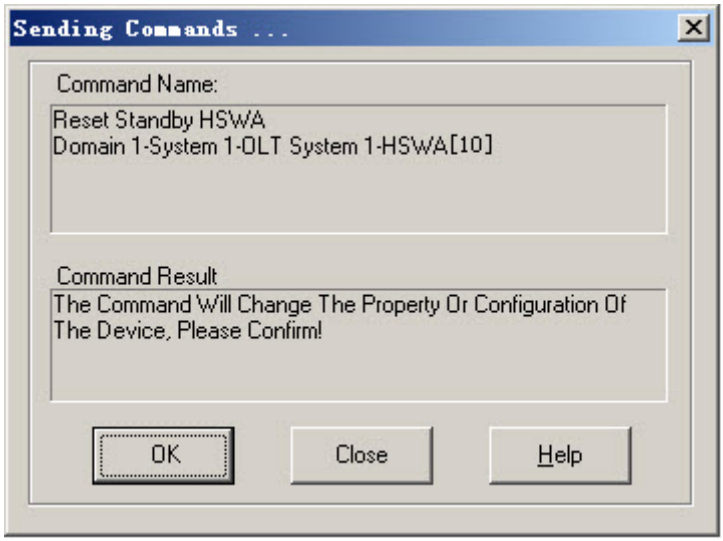


Figure 12-12 Rebooting standby card

2. Click the **OK** button. Then wait a few seconds, it will show the **Command Succeed** of the **Command Result**, indicating that rebooting the standby card is completed.

12.3.12 Checking the Software Version of the GPON Interface Card

1. Right-click the HSWA[10] card in the **Object Tree** pane and select **Get Information→Card Version** from the shortcut menu. This operation will bring up the **Version of Card** window.
2. Check if the software version of the core switch cards in Slots 9 and 10 is correct, as shown in Figure 12-13.

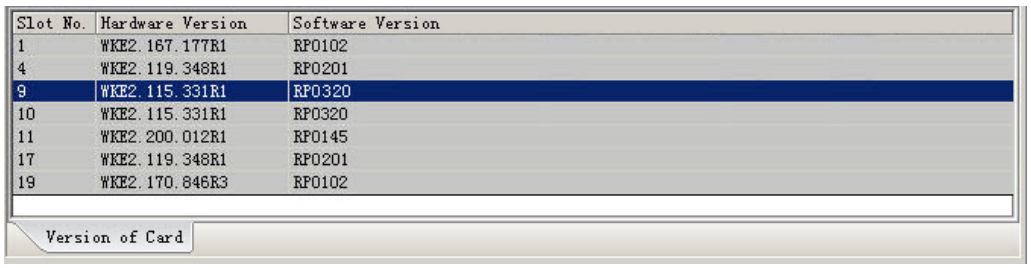


Figure 12-13 Viewing card software version

12.4 Upgrading the GPON Interface Card / TDM Interface Card / Public Card

12.4.1 Upgrading Rule

- If the upgrade object is the GPON interface card, the card will be automatically rebooted after a successful upgrade. The automatic reboot of the card can cause an interruption of services.
- If the upgrade object is the TDM interface card or the PUBA card, the card should be manually rebooted after a successful upgrade. The manual reboot can cause an interruption of services.

Note:

The operation steps to reboot the TDM interface card and the public card manually are as follows:

Right-click the HSWA[9] card in the **Object Tree** pane, and select **System Control→Reboot The Appointed Device**. In the **Reset the Equipment** window, select the card that needs to be rebooted to reboot.

12.4.2 Planning Data

For example, the planning data of upgrading the GPON interface card is as follows.

Table 12-2 Planning data of upgrading the GPON interface card

Configuration Item	Configuration Description	Configuration Example
Relevant parameters of the cared to be upgraded	Configure according to the slot number of the PON interface card that is actually used.	The GC4B card in Slot 15
Downloaded file type	Configure according to the type of the file that is actually used.	PON interface card software
FTP Server IP	Configure according to the IP address of the FTP server that is actually used.	10.92.20.168

Table 12-2 Planning data of upgrading the GPON interface card (Continued)

Configuration Item	Configuration Description	Configuration Example
FTP server user name	Configure according to the user name of the FTP server that is actually used.	1
FTP server user password	Configure according to the password of the FTP server that is actually used.	1
File name	Configure according to the name of the file that is actually used.	gc4c_1221v1.gz

12.4.3 Upgrading Flow

Below is the upgrading flow.

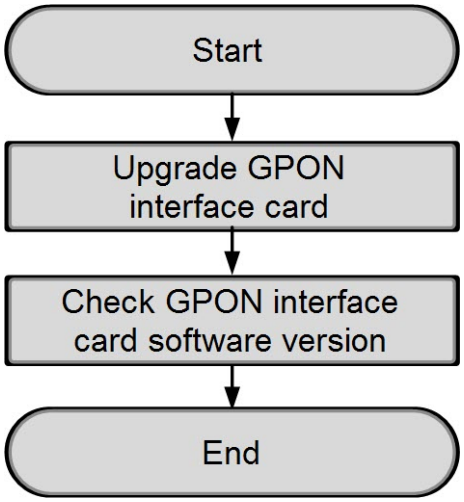


Figure 12-14 Flow chart of upgrading the GPON interface card software

12.4.4 Upgrading the GPON Interface Card

1. Right-click the HSWA[9] card in the **Object Tree** pane and select **System Maintenance→Upgrade Software** from the shortcut menu.
2. In the **Upgrade System Software** dialog box, configure the parameters as follows.

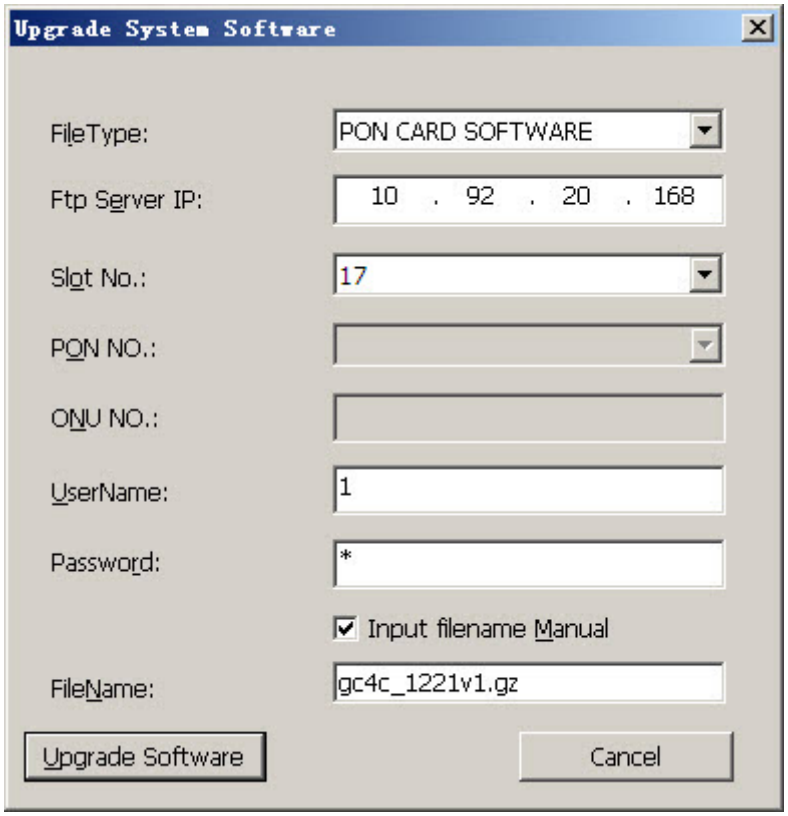


Figure 12-15 Upgrading the GPON interface card software

3. After completing the configuration, click the **Upgrade Software** button to start the upgrading.
4. Switch to the wftp window. If the following logs are displayed in the window, it indicates that the equipment obtains the upgrading software package successfully through ftp, as shown in Figure 12-16.

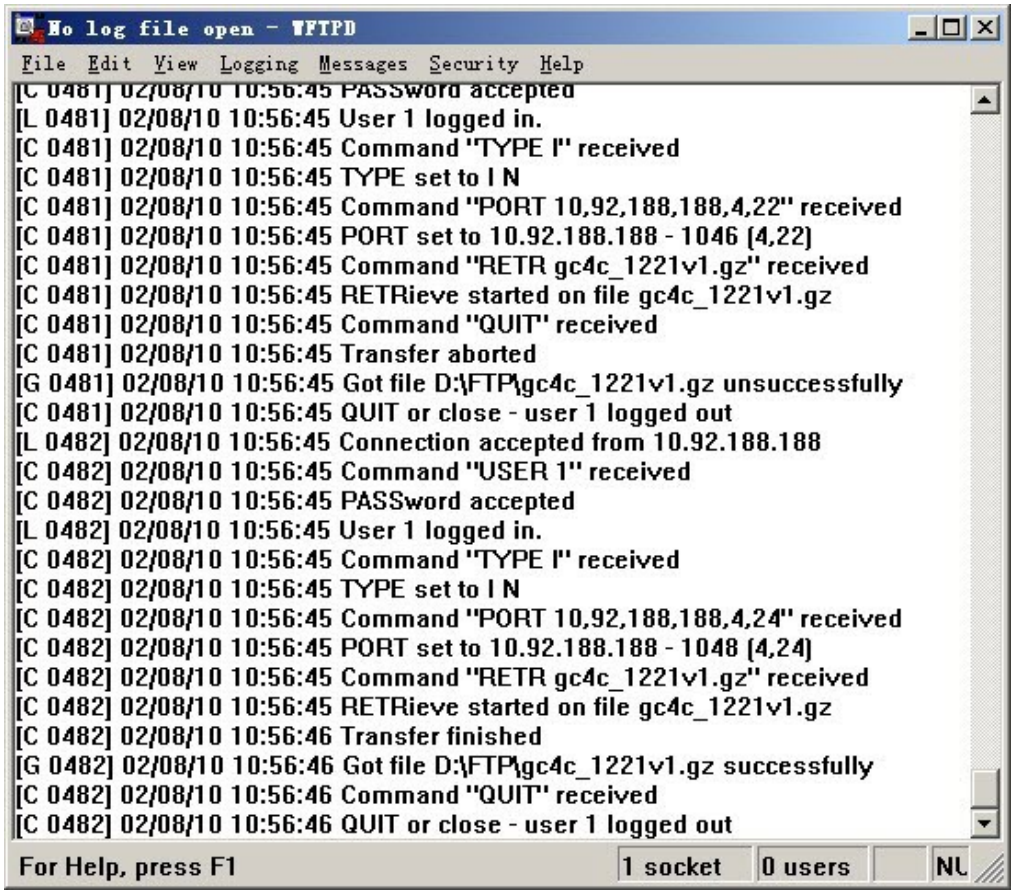


Figure 12-16 ftp-upgrading a single card

12.4.5 Checking the Software Version of the GPON Interface Card

Configuration procedure

1. Right-click the HSWA[9] card in the **Object Tree** pane and select **Get Information→Card Version** from the shortcut menu.
2. In the **Version of Card** window that appears, check the software version of the cards in each slot. See if the software version of the GC4B card in Slot 17 is correct.

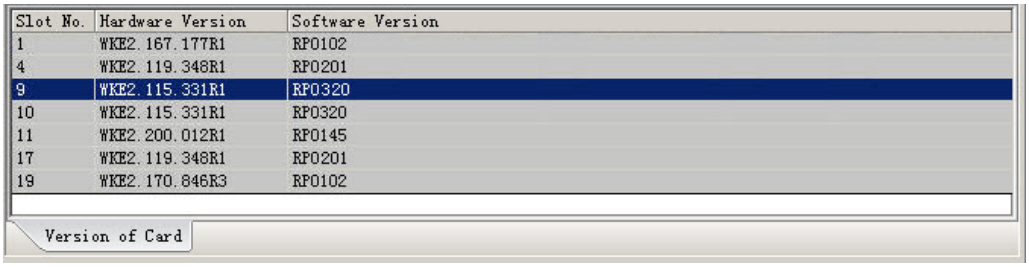


Figure 12-17 Viewing card software version

12.5 Upgrading the GPON Interface Cards in a Batch Manner

12.5.1 Upgrading Rule

After a successful upgrading of the GPON interface cards in a batch manner, all the upgraded cards will be automatically rebooted, which causes an interruption of services.

12.5.2 Planning Data

Planning data of upgrading the GPON interface cards in a batch manner is as follows.

Table 12-3 Planning data of upgrading the GPON interface cards in a batch manner

Configuration Item	Configuration Description	Configuration Example
Relevant parameters of the cared to be upgraded	Configure according to the slot number of the PON interface card that is actually used.	The GC4B card in Slots 4 and 15
Downloaded file type	Configure according to the type of the file that is actually used.	PON interface card software
FTP Server IP	Configure according to the IP address of the FTP server that is actually used.	10.92.20.168

Table 12-3 Planning data of upgrading the GPON interface cards in a batch manner (Continued)

Configuration Item	Configuration Description	Configuration Example
FTP server user name	Configure according to the user name of the FTP server that is actually used.	1
FTP server user password	Configure according to the password of the FTP server that is actually used.	1
File name	Configure according to the name of the file that is actually used.	gc4c_1221v1.gz

12.5.3 Upgrading Flow

Below is the upgrading flow.

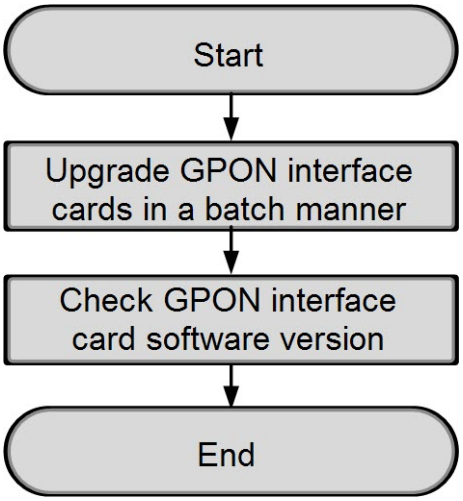


Figure 12-18 Flow chart of upgrading the GPON interface card software in a batch manner

12.5.4 Upgrading the GPON Interface Cards in a Batch Manner

1. Right-click the HSWA[9] card in the **Object Tree** pane and select **System Maintenance→Batch Upgrade Line Card** from the shortcut menu.

2. In the **Batch Upgrade Line Card** window, configure the parameters according to the planned data in Table 12-3. After completing the configuration, click the **Upgrade Software** button to start the upgrading.

3. Switch to the wftp window. If the following logs are displayed in the window, it indicates that the equipment obtains the upgrading software package successfully through ftp, as shown in Figure 12-19.

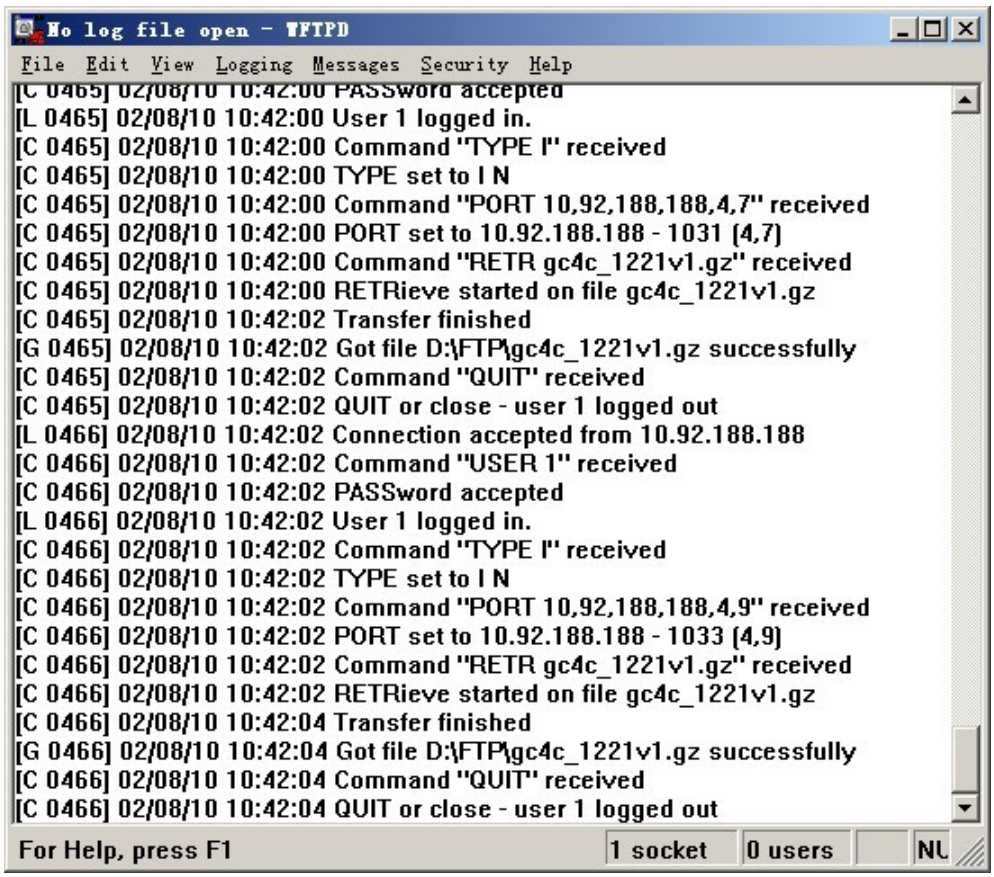


Figure 12-19 ftp-upgrading cards in a batch manner

4. Switch to the **Batch Upgrade Line Card** window, check if the PON interface card is upgraded successfully, as shown in Figure 12-20.

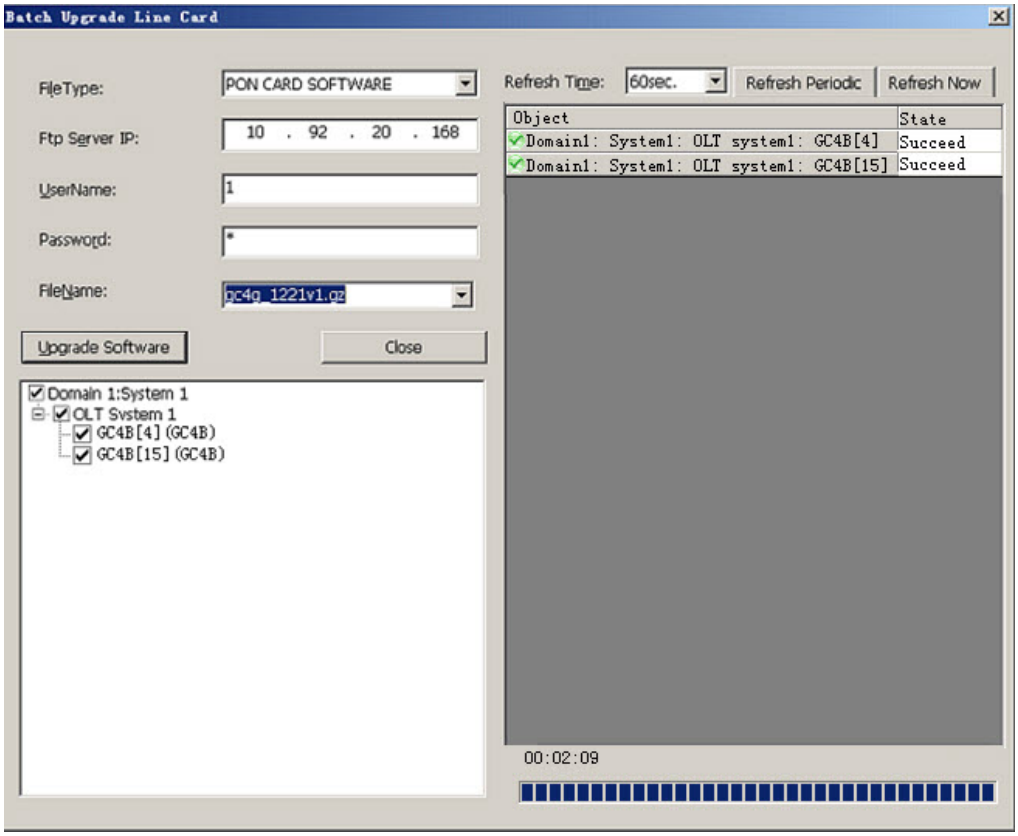


Figure 12-20 Upgrading the GPON interface card software in a batch manner

12.5.5 Checking the Software Version of the GPON Interface Card

1. Right-click the HSWA[9] card in the **Object Tree** pane and select **Get Information→Card Version** from the shortcut menu.
2. In the **Version of Card** window that appears, check if the software version of the GC4B cards in Slots 4 and 15 is correct. See Figure 12-21.

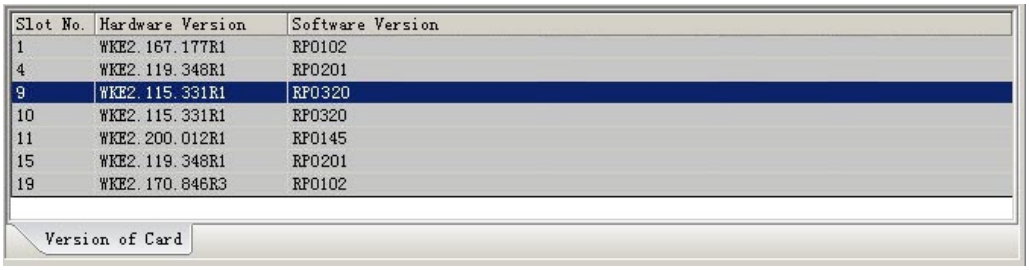


Figure 12-21 Viewing card version

12.6 Upgrading the ONU Manually

12.6.1 Upgrading Rule

- Only the ONUs of the same type under the same PON interface card can be manually upgraded in a batch manner.
- The ONUs under the same PON interface card can either be manually upgraded or automatically upgraded.
- After being successfully upgraded, the ONU should be rebooted. See the following tables for the rebooting rules.

1) For FTTH ONUs

Upgrade Object	Downloaded file type	Reboot Type
ONU firmware	ONU firmware	Manual
ONU built-in IAD	ONU CPU / IAD software	Manual

2) For FTTB ONUs

Upgrade Object	Downloaded file type	Reboot Type
ONU firmware	ONU firmware	Manual
ONU CPU	ONU CPU / IAD software	Manual
ONU built-in IAD	ONU CPU / IAD software	Manual
ONU firmware and CPU merge file	ONU CPU / IAD software	Automatic

12.6.2 Planning Data

The planning data for upgrading the ONUs manually in a batch manner is as follows.

Table 12-4 The planning data for upgrading the ONUs manually in a batch manner

Configuration Item	Configuration Description	Configuration Example
Parameters of the ONU to be upgraded	Configure according to the slot number of the PON interface card and type of the ONU that is actually used.	The AN5506-04-B ONUs whose authorization numbers are 1 and 2 in PON port number 1 of Slot 4.
Downloaded file type	Configure according to the type of the file that is actually used.	ONU CPU / IAD software
FTP Server IP	Configure according to the IP address of the FTP server that is actually used.	10.92.20.168
FTP server user name	Configure according to the user name of the FTP server that is actually used.	1
FTP server user password	Configure according to the password of the FTP server that is actually used.	1
File name	Configure according to the name of the file that is actually used.	onu04_v2.bin

12.6.3 Upgrading Flow

Below is the upgrading flow.

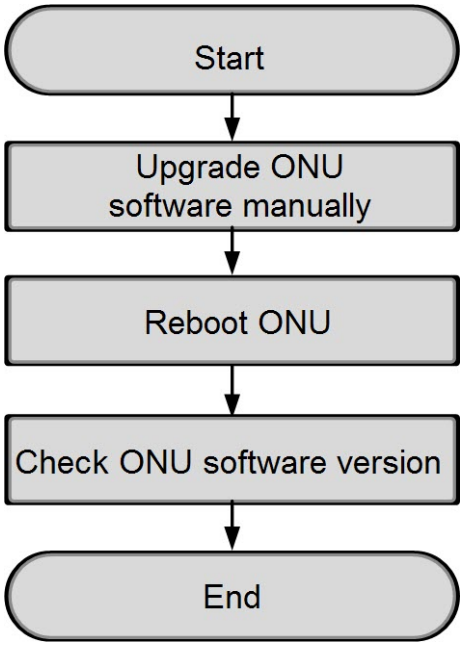


Figure 12-22 Configuration flow of upgrading the ONUs manually in a batch manner

12.6.4 Upgrading the ONU Software Manually

1. Right-click the HSWA[9] card in the **Object Tree** pane and select **System Maintenance→Batch Upgrade ONU** from the shortcut menu.
2. Configure the parameters according to the planning data in Table 12-4.
3. Click the **Upgrade Software** button to start the upgrading.
4. Switch to the wftp window. If the following logs are displayed in the window, it indicates that the equipment obtains the upgrading software package successfully through ftp, as shown in Figure 12-23.

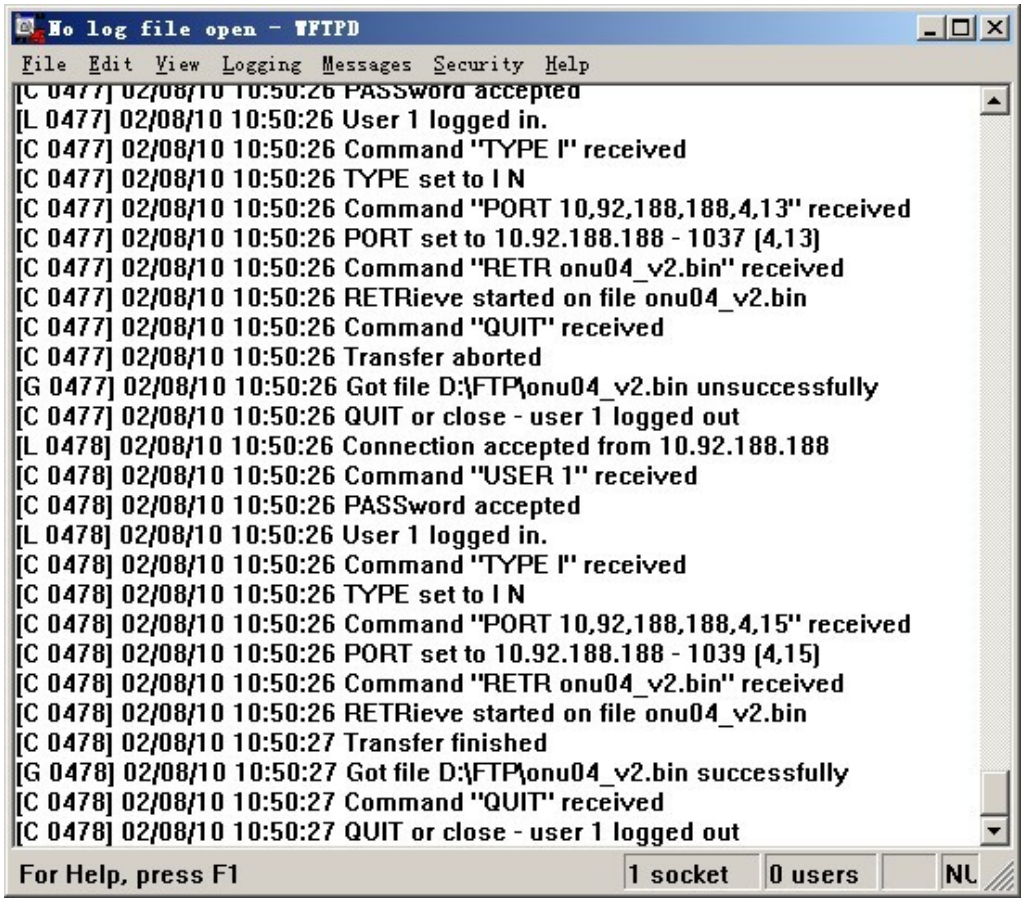


Figure 12-23 ftp-upgrading ONU

5. Switch to the **Batch Upgrade ONU** window, and you can see the ONUs are manually upgraded successfully, as shown in Figure 12-24.

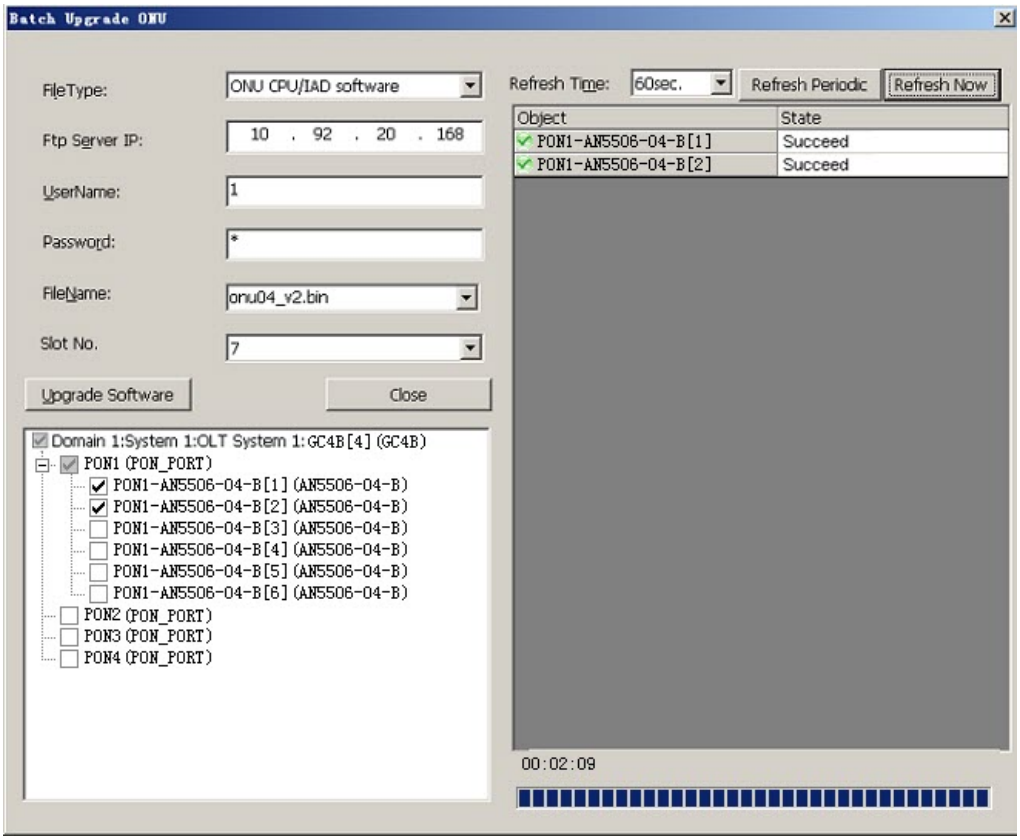


Figure 12-24 Upgrading the ONU software manually in a batch manner

Note:

After the successful manual ONU upgrading, the ONU will be rebooted automatically.

12.6.5 Rebooting the ONU

1. Right-click **GC4B[4]** in the **Object Tree** pane, and select **Control Command→ Reset ONU** from the shortcut menu to open the **Reset ONU** window.
2. Click the drop-down list of **PON Port No.**, and select **1**.
3. Double-click the blank in the **ONU No.** column to bring up the **Please Select ONU No.!** dialog box. Select the ONU number (authorization number) to be rebooted, as shown in Figure 12-25.

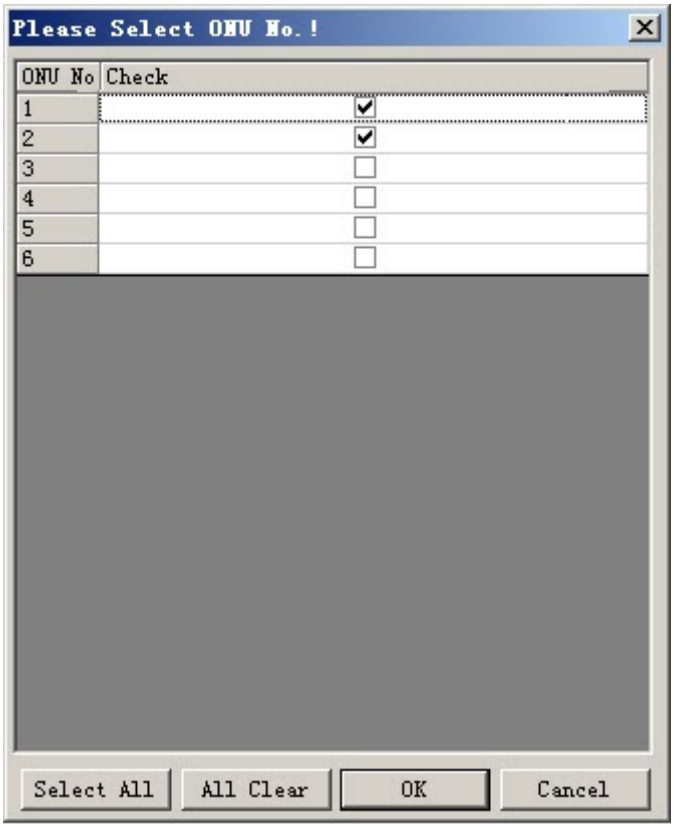


Figure 12-25 Selecting the ONU serial number

4. Click **OK** to return to the **Reset ONU** window. Click from the menu bar and click **OK** in the prompt dialog box that appears. The command pane in the lower part of the window displays **Command Succeed**, indicating that the ONU rebooting is successful.

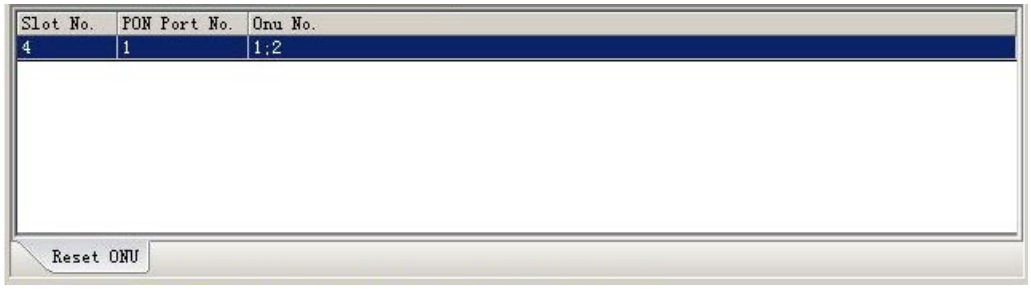


Figure 12-26 Rebooting the ONU

12.6.6 Checking the ONU Software Version

1. Right-click the GC4B[4] card in the **Object Tree** pane and select **Get Information→ONU Information** from the shortcut menu.
2. In the **ONU information** window, check if the **Software Version** of the ONUs whose the authorization numbers are 1 and 2 in PON port number 1 are upgraded, as shown in Figure 12-27.

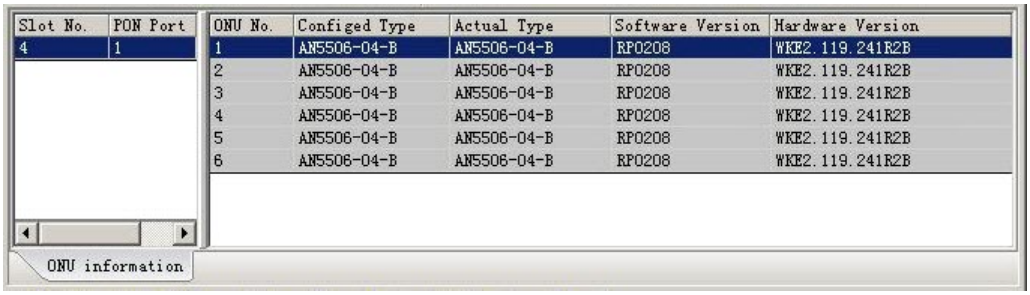


Figure 12-27 Viewing the ONU version

12.7 Upgrading the ONU Automatically

12.7.1 Upgrading Rule

- The file names of the upgrade software should be configured in strict accordance with the specified file name list.
- The ONUs under the same PON interface card can either be manually upgraded or automatically upgraded.

12.7.2 Planning Data

The planning data for upgrading the ONU automatically is as follows.

Table 12-5 The planning data for upgrading the ONU automatically

Configuration Item	Configuration Description	Configuration Example
Parameters of the ONU to be upgraded	Configure according to the slot number of the PON interface card and type of the ONU that is actually used.	The AN5506-04-B ONUs whose authorization numbers are 1 and 2 in PON port number 1 of Slot 4.
Enable/Disable	Configure according to the network planning of the operator.	Enable
FTP Server IP address	Configure according to the IP address of the FTP server that is actually used.	10.92.20.168
FTP user name	Configure according to the user name of the FTP server that is actually used.	1
FTP password	Configure according to the password of the FTP server that is actually used.	1
File name	Configure according to the name of the file that is actually used.	GPON ONU software (FTTH)→GAPP_04B_40.bin

12.7.3 Upgrading Flow

Below is the upgrading flow.

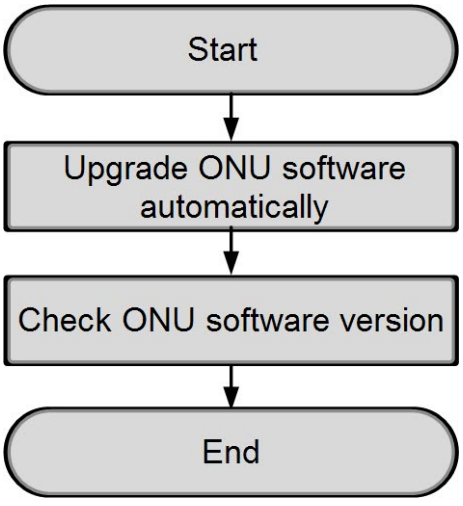


Figure 12-28 Flow of ONU automatic upgrading

12.7.4 Upgrading the ONU Software Automatically

1. Right-click the HSWA[9] card in the **Object Tree** pane and select **Service Config Relevance→ONU Auto Upgrade** from the shortcut menu.
2. In the **ONU Auto Upgrade** window, select the entry whose **Slot No.** is 4 and configure according to the planned data in Table 12-5.
3. Click the **File Name** column and select the **GPON ONU Software (FTTH) → GAPP_04B_40.bin** check box from the **ONU Auto Upgrade** dialog box that appears subsequently, and then click **OK**, as shown in Figure 12-29.

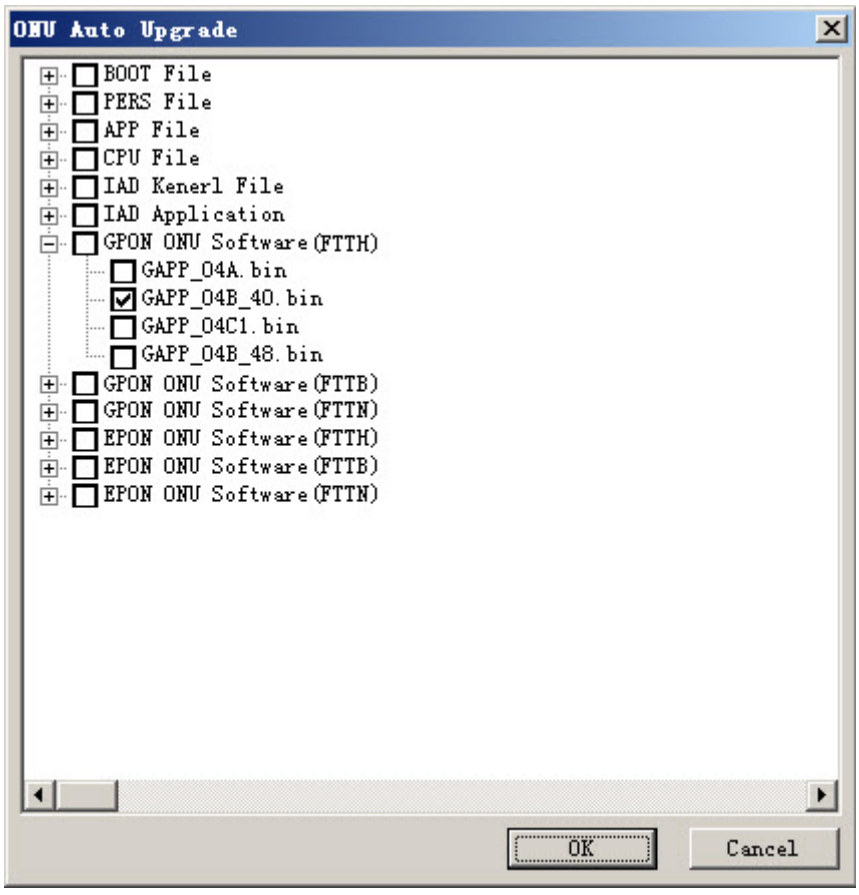


Figure 12-29 File selection

4. Return to the **ONU Auto Upgrade** window. Click  in the toolbar, and the configuration is completed. See Figure 12-30.

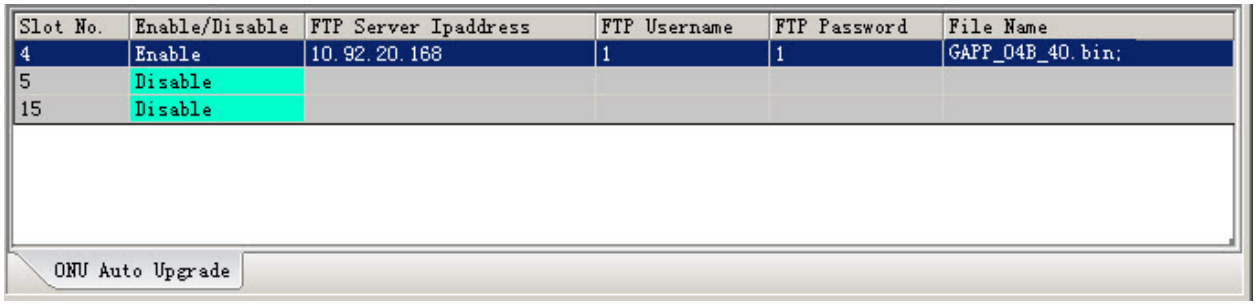


Figure 12-30 The ONU automatic upgrading window

12.7.5 Checking the ONU Automatic Upgrading Log

1. Right-click the GC4B[4] card in the **Object Tree** pane and select **Get Information→ONU Information** from the shortcut menu.
2. In the **ONU information** window, check whether the ONU version number is upgraded. See Figure 12-31.

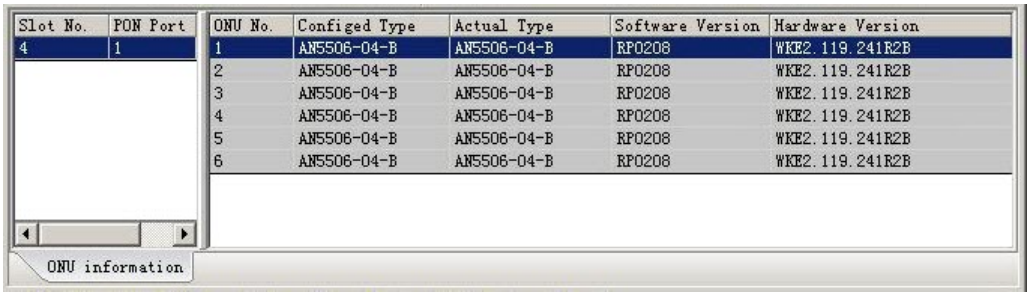


Figure 12-31 Viewing the ONU version

13 Flow Classification Configuration

- Configuration Rule
- Flow Classification Configuration Example – Based on MAC Address
- Flow Classification Configuration Example – Based on IP Address

13.1 Configuration Rule

- The AN5116-06B supports up to 128 flow policies.
- For FTTH ONU, the AN5116-06B supports the flow classification rules based on source/destination MAC address and Ethernet.
- For FTTB ONU, the AN5116-06B supports the flow classification rules based on source/destination MAC address and source/destination IP address, VLAN ID classification, IP protocol classification, Ethernet priority classification, IP TOS/DSCP (IPv4) classification, L4 source / destination PORT classification, life cycle classification. Each FE port of the ONU can bind with up to 8 flow policies.

13.2 Flow Classification Configuration Example – Based on MAC Address

13.2.1 Planning Data

The following takes the ONU under the PON port number 4 of the GC4B card in Slot 5 of the AN5116-06B whose authorization number is 1 as an example, binding a flow policy to FE1 port. The planning data is as follows:

Table 13-1 Planning data for flow classification rules – based on MAC address

Configuration Item		Configuration Description	Configuration Example
Flow classification rules	Rule name	Configure according to the network planning of the operator.	rule123
	Rule type	Configure according to the network planning of the operator.	Service flow rule
	Rule domain type	Configure according to the network planning of the operator.	Based on source MAC address
			=
			12-34-56-78-91-01
Flow policy	Policy ID	Automatically assigned by the system. No configuration is required.	1
	Policy name	Configure according to the network planning of the operator.	Policy123

Table 13-1 Planning data for flow classification rules – based on MAC address (Continued)

Configuration Item		Configuration Description	Configuration Example
	Rule ID	Configure according to the network planning of the operator.	rule123
	Policy priority level	Configure according to the network planning of the operator.	1
	ACL enabling identifier	Configure according to the network planning of the operator.	Enable
	Forwarding identifier	Configure according to the network planning of the operator.	Allowed, only the flows that meet the requirements can pass. The other flows are discarded.
Binding ONU port to flow policy	Slot number	Configure according to the number of the slot that is actually used.	15
	PON port number	Configure according to the number of the PON port that is actually used.	1
	ONU number	Configure according to the number of the ONU authentication number that is actually used.	2
	ONU type	Configure according to the type of the ONU that is actually used.	AN5506-10-B1
	Port number	Configure according to the network planning of the operator.	1
	Uplink flow policy ID	Select the policy ID according to the type of the actual service type at the port.	Policy123
	Downlink flow policy ID	Select the policy ID according to the type of the actual service type at the port.	Policy123

13.2.2 Configuration Flow

Below is the upgrading flow.

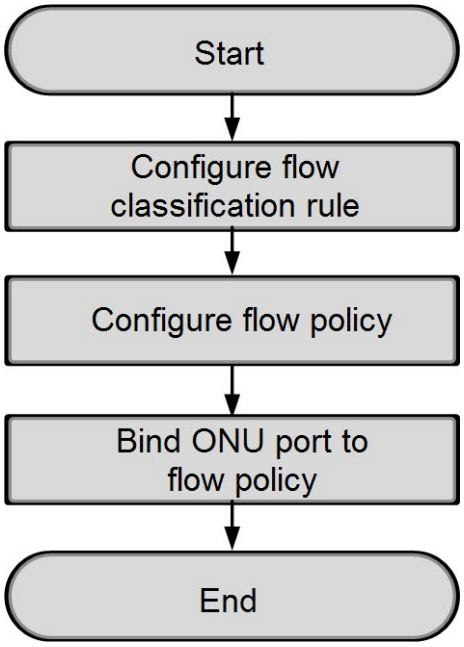


Figure 13-1 Configuration flow for flow classification rules – based on MAC address

13.2.3 Configuring the Flow Classification Rules

1. Right-click the HSWA[9] card in the **Object Tree** pane, select **QoS Config→ Flow Classification Rule** to open the **Flow Classification Rule** window.
2. Click  in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to create one new rule.
3. Double-click the **Rule Name** column and enter **rule123**. Click the **RuleType** drop-down list, select **Service Flow Rule**. Double-click the **Rule Type** column, configure according to the planning data in Table 13-1 in the **Rule Define** dialog box that appears subsequently. After completing the configuration, click **OK** to return to the **Flow Classification Rule** window.

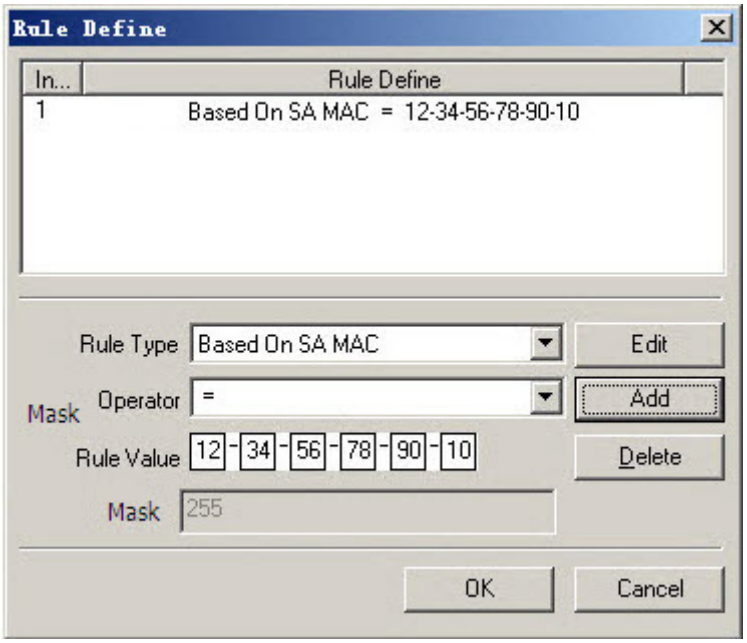


Figure 13-2 The rule defining dialog box

4. Click in the toolbar to complete the configuration. See Figure 13-3.

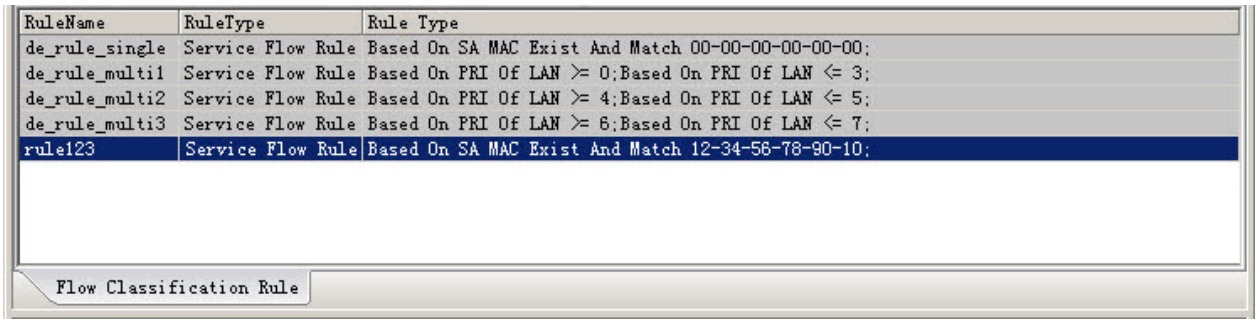


Figure 13-3 The flow classification rules-MAC

Note:

The rules 0 to 3 are the default flow classification rules of the equipment, which cannot be deleted or modified.

13.2.4 Configuring the Flow Policy

1. Right-click the HSWA[9] card in the **Object Tree** pane, select **QoS Config→ Flow Policy** to open the **Flow Policy** window.
2. Click  in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to create one new flow policy.
3. Configure the parameters according to the planning data in Table 13-1.
4. Click  in the toolbar to complete the configuration. See Figure 13-4.

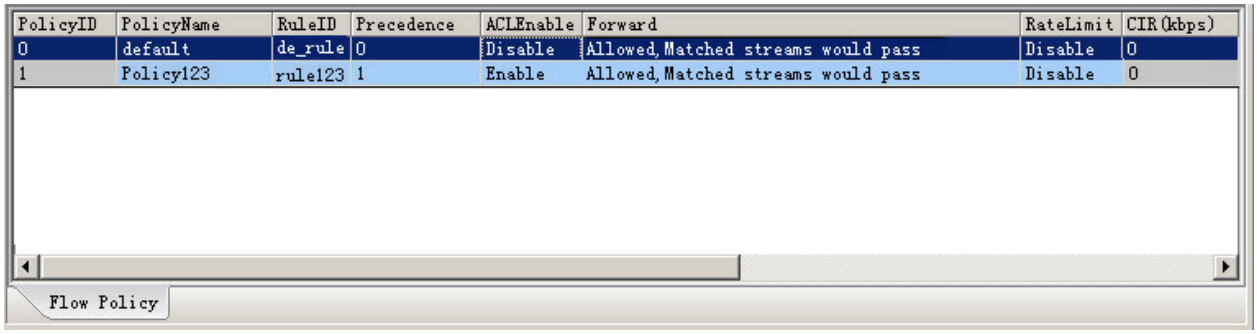


Figure 13-4 Configuring the flow policy-MAC

 Note:

The policy 0 is the default flow policy, which cannot be deleted or modified.

13.2.5 Binding the ONU Port with the Flow Policy

1. Click the GC8B[15] card in the **Object Tree** pane, the right pane displays all ONUs under the GC8B card. Right-click the ONU **PON[1]-AN5506-10-B1[2]** and select **Service Config→Port Binding Flow Policy**.
2. Configure the parameters according to the planning data in Table 13-1.
3. Click  in the toolbar to complete the configuration. See Figure 13-5.

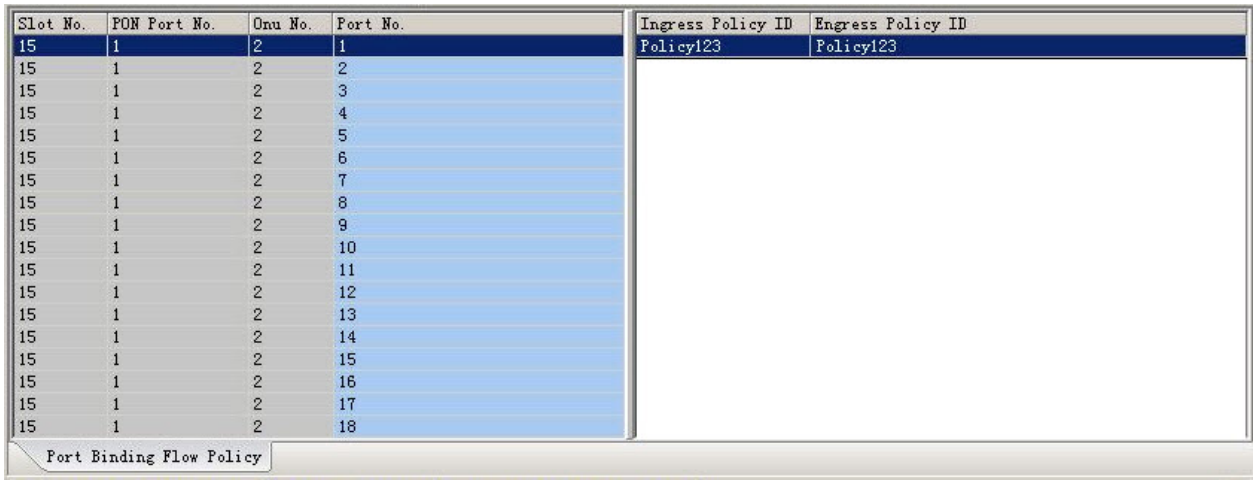


Figure 13-5 Binding ONU port to flow policy-MAC

13.2.6 Configuration Result

After the above configuration, the FE1 port of the AN5506-10-B1 will only forward the data messages whose MAC address is 12-34-56-78-90-10 according to the rule defined in flow policy.

13.3 Flow Classification Configuration Example – Based on IP Address

13.3.1 Planning Data

The following takes the ONU under the PON port number 4 of the GC4B card in Slot 5 of the AN5116-06B whose authorization number is 2 as an example, binding a flow policy to FE1 port. The planning data is as follows:

Table 13-2 Planning data for flow classification rules – based on IP address

Configuration Item		Configuration Description	Configuration Example
Flow classification rules	Rule name	Configure according to the network planning of the operator.	rule456
	Rule type	Configure according to the network planning of the operator.	Service flow rule

Table 13-2 Planning data for flow classification rules – based on IP address (Continued)

Configuration Item		Configuration Description	Configuration Example
	Rule domain type	Configure according to the network planning of the operator.	Classification based on source IP address =10.10.10.10
Flow policy	Policy ID	Automatically assigned by the system. No configuration is required.	1
	Policy name	Configure according to the network planning of the operator.	Policy456
	Rule ID	Configure according to the network planning of the operator.	rule456
	Policy priority level	Configure according to the network planning of the operator.	1
	ACL enabling identifier	Configure according to the network planning of the operator.	Enable
	Forwarding identifier	Configure according to the network planning of the operator.	Disable, the flows that match the rules are discarded and the other flows are forwarded.
Binding ONU port to flow policy	Slot number	Configure according to the number of the slot that is actually used.	15
	PON port number	Configure according to the number of the PON port that is actually used.	1
	ONU number	Configure according to the number of the ONU authentication number that is actually used.	2
	ONU type	Configure according to the type of the ONU that is actually used.	AN5506-10-B1
	Port number	Configure according to the network planning of the operator.	1
	Uplink flow policy ID	Select the policy ID according to the type of the actual service type at the port.	Policy456

Table 13-2 Planning data for flow classification rules – based on IP address (Continued)

Configuration Item		Configuration Description	Configuration Example
	Downlink flow policy ID	Select the policy ID according to the type of the actual service type at the port.	Policy456

13.3.2 Configuration Flow

Below is the upgrading flow.

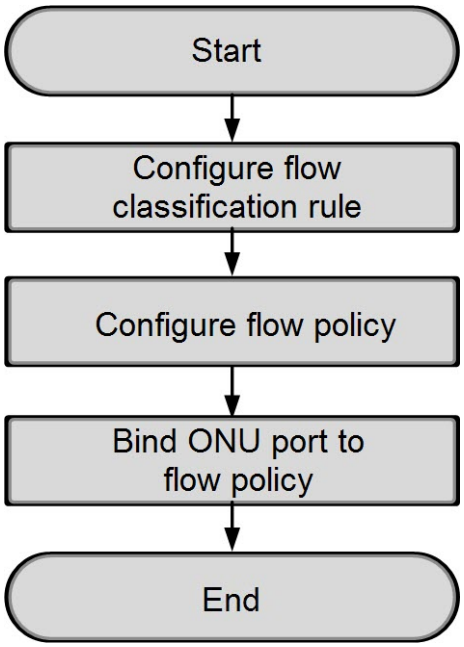


Figure 13-6 Configuration flow for flow classification rules – based on IP address

13.3.3 Configuring the Flow Classification Rules

1. Right-click the HSWA[9] card in the **Object Tree** pane, select **QoS Config→ Flow Classification Rule** to open the **Flow Classification Rule** window.
2. Click  in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to create one new rule.
3. Double-click the **Rule Name** column and enter **rule456**. Click the **RuleType** drop-down list, select **Service Flow Rule**. Double-click the **Rule Type** column,

configure according to the planning data in Table 13-2 in the **Rule Define** dialog box that appears subsequently. After completing the configuration, click **OK** to return to the **Flow Classification Rule** window.

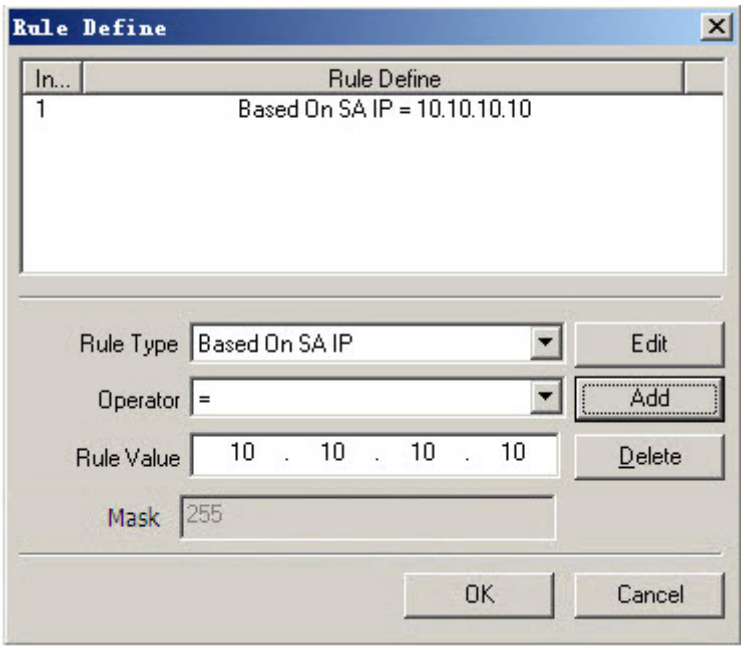


Figure 13-7 The rule defining dialog box-IP

4. Click in the toolbar to complete the configuration. See Figure 13-8.

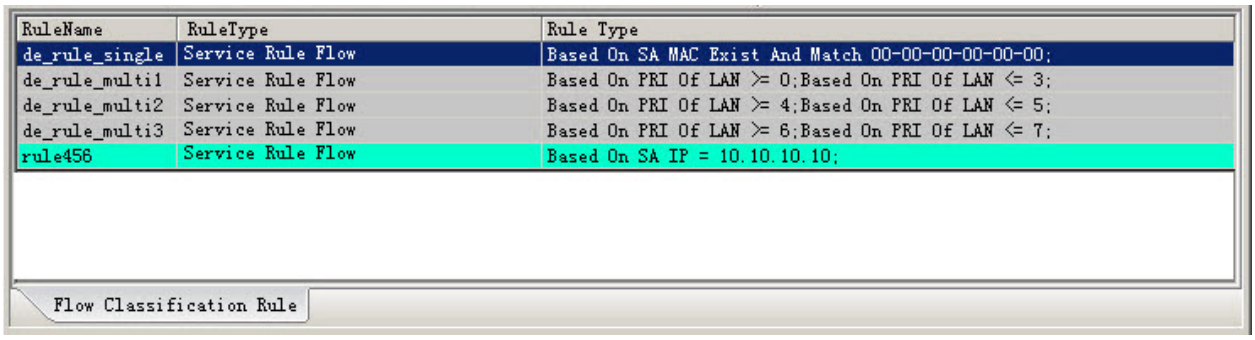


Figure 13-8 The flow classification rules-IP

Note:

The rules 0 to 3 are the default flow classification rules of the equipment, which cannot be deleted or modified.

13.3.4 Configuring the Flow Policy

1. Right-click the HSWA[9] card in the **Object Tree** pane, select **QoS Config→ Flow Policy** to open the **Flow Policy** window.
2. Click  in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to create one new flow policy.
3. Configure the parameters according to the planning data in Table 13-2.
4. Click  in the toolbar to complete the configuration. See Figure 13-9.

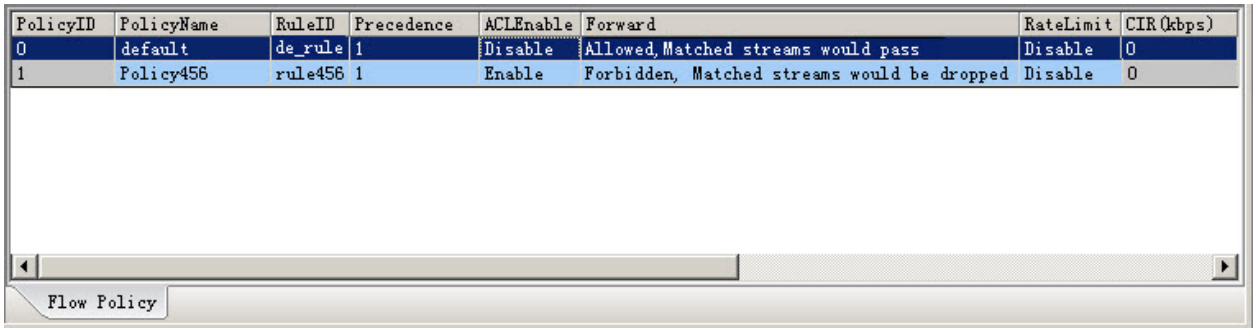


Figure 13-9 Configuring the flow policy-IP

Note:

The policy 0 is the default flow policy, which cannot be deleted or modified.

13.3.5 Binding the ONU Port with the Flow Policy

1. Click the GC8B[15] card in the **Object Tree** pane, the right pane displays all ONUs under the GC8B card. Right-click the ONU **PON[1]-AN5506-10-B1[2]** and select **Service Config→Port Binding Flow Policy**.
2. Configure the parameters according to the planning data in Table 13-2.
3. Click  in the toolbar to complete the configuration. See Figure 13-10.

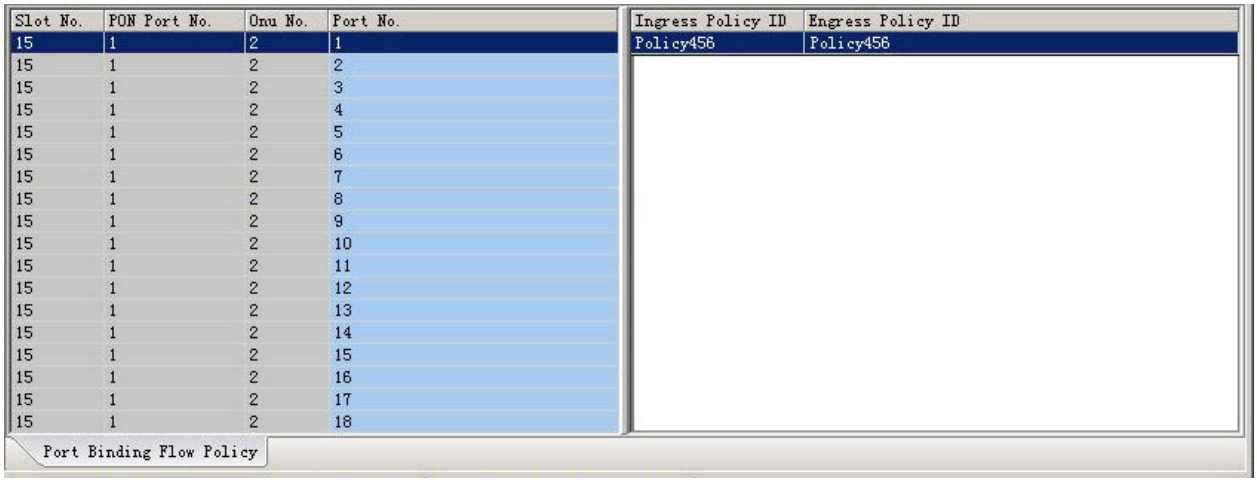


Figure 13-10 Binding ONU port to flow policy-IP

13.3.6 Configuration Result

After the above configuration, the FE1 port of the AN5506-10-B1 will not forward the data messages whose source IP address is 10.10.10.10 according to the rule defined in flow policy.

14 Configuring the QoS

- Configuration Rule
- QoS Configuration Example-Based on VLAN
- QoS Configuration Example-Based on MAC Address
- Unbinding the Object and the QoS Profile

14.1 Configuration Rule

- When configuring the classification parameters of the QoS profile for IP traffic, you can specify combinations of parameters according to the classification rules. Within the following parameter groups, combinations can be made arbitrarily.
  - Source IP, destination IP, protocol type, TCP / UDP source port number, and TCP / UDP destination port number;
  - Source MAC address, destination MAC address, Ethernet type, priority domain, and VLAN ID;
  - Source MAC address, Source IP, Ethernet type, priority domain, and VLAN ID;
  - Destination MAC address, destination IP, Ethernet type, priority domain, and VLAN ID.
- The AN5116-06B supports up to 1024 QoS profiles.
- A single PON interface card or uplink port can be bound with up to 1024 QoS profiles.
- Bind of PON interface card and QoS profile is for binding uplink flow.
- Bind of uplink port and QoS profile is for binding downlink flow.
- The flow mirroring destination port can be configured after the flow mirroring is enabled.
- The unit of rate limiting is 64bit/s. For example, a value of 2 means 2 × 64 kbit/s.
- After the data message is re-directed, the data flow will not pass the source port. Instead, it will be forwarded from the port it is re-directed to.
- Do not bind the QoS profiles that conflicts with each other to the same PON interface card or uplink port, or it will result in flow collision. Examples of wrong binds are:
  - Bind the profile dropping the data packets with VLAN ID 1000 in Slot 5;
  - Bind the profile passing the data packets with VLAN ID 1000 in Slot 5.

14.2 QoS Configuration Example-Based on VLAN

14.2.1 Planning Data

For example, we bind a QoS profile to the PON interface card in Slot 5. After the binding, the PON interface card in Slot 5 will discard the data messages whose VLAN ID is 3000. The planning data is as follows:

Table 14-1 The planning data of QoS configuration-based on VLAN

Configuration Item		Configuration Description	Configuration Example
QoS profile	QoS profile name	Configure according to the network planning of the operator.	QoS1
	VLAN identifier	Configure based on the flow rules of the VLAN ID and according to the planning data of the operator.	3000
	Command code	Configure according to the network planning of the operator.	Discard
Slot binding / unbinding QoS profile	Slot number	Configure according to the network planning of the operator.	5
	Bind / unbind	Configure according to the network planning of the operator.	Bind
	Profile name	Configure according to the QoS profile name that is actually configured.	QoS1

14.2.2 Configuration Flow

The configuration flow of the QoS configuration based on VLAN is as follows.

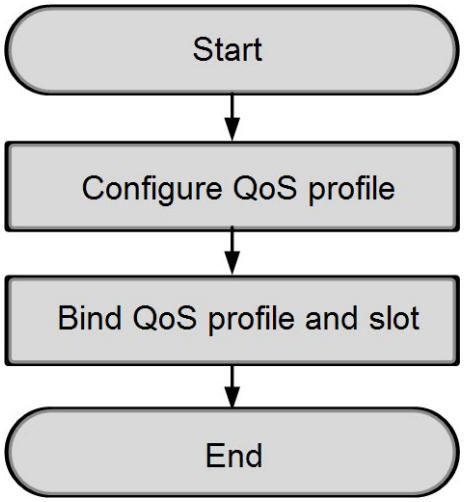


Figure 14-1 QoS configuration flow-based on VLAN

14.2.3 Configuring QoS Profiles

1. Right-click the HSWA[9] card in the **Object Tree** pane, and select **QoS Config →QoS Profiles** from the shortcut menu to open the **QoS Profiles** tab from the window that appears.
2. Click  in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to add 1 QoS profile.
3. Configure the parameters according to the planning data in Table 14-1.
4. Click  in the toolbar to complete the configuration. See Figure 14-2.

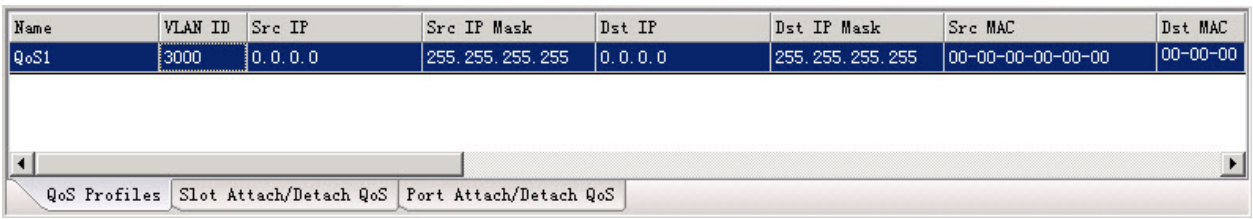


Figure 14-2 QoS profile-based on VLAN

14.2.4 Binding the Line Card and the QoS Profile

1. In the **QoS Profiles** window, select the **Slot Attach / Detach QoS** tab.

2. Click  in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to create one new binding rule.
3. Configure the parameters according to the planning data in Table 14-1.
4. Click  in the toolbar to complete the configuration. See Figure 14-3.

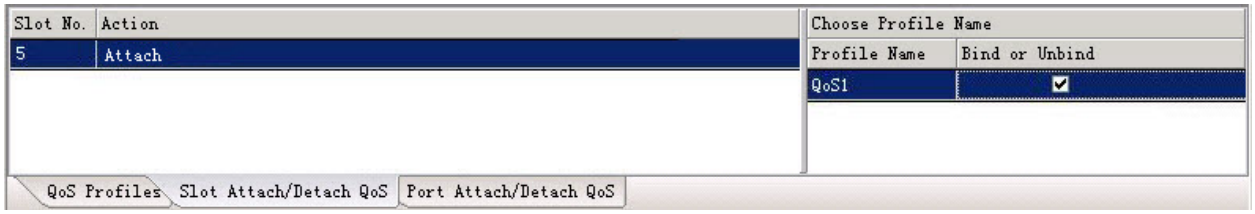


Figure 14-3 Binding slot and QoS profile-VLAN

14.2.5 Configuration Result

After the above configurations, the PON interface card at Slot 5 of the AN5116-06B is bound with a QoS profile. And the PON interface card will discards the data messages whose VLAN ID is 3000.

14.3 QoS Configuration Example-Based on MAC Address

14.3.1 Planning Data

For example, we bind a QoS profile to the uplink port. After the binding, the uplink port will discard the data messages whose source MAC address is 100000000001 and destination MAC address is 200000000001. The planning data is as shown in Table 14-2.

Table 14-2 The planning data of QoS configuration-based on MAC address

Configuration Item		Configuration Description	Configuration Example
Configuring QoS Profiles	QoS profile name	Configure according to the network planning of the operator.	QoS2

Table 14-2 The planning data of QoS configuration-based on MAC address (Continued)

Configuration Item		Configuration Description	Configuration Example
	Source MAC address	Configure according to the network planning of the operator.	10-00-00-00-00-01
	Destination MAC address	Configure according to the network planning of the operator.	20-00-00-00-00-01
	Command code	Configure according to the network planning of the operator.	Discard
Uplink port binding / unbinding QoS profile	Uplink port number	Configure according to the network planning of the operator.	19:SFP1
	Bind / unbind	Configure according to the network planning of the operator.	Bind
	Profile name	Configure according to the QoS profile name that is actually configured.	QoS2

14.3.2 Configuration Flow

The configuration flow of the QoS configuration based on MAC address is as follows.

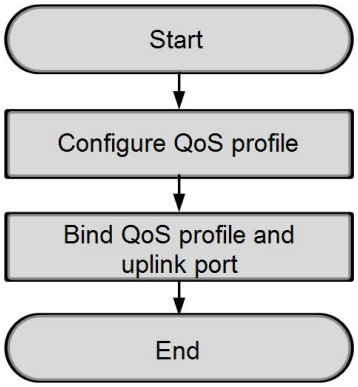


Figure 14-4 QoS configuration flow-based on MAC address

14.3.3 Configuring QoS Profiles

1. Right-click the HSWA[9] card in the **Object Tree** pane, and select **QoS Config →QoS Profiles** from the shortcut menu to open the **QoS Profiles** tab from the window that appears.
2. Click  in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to add 1 QoS profile.
3. Configure the parameters according to the planning data in Table 14-2.
4. Click  in the toolbar to complete the configuration. See Figure 14-5.

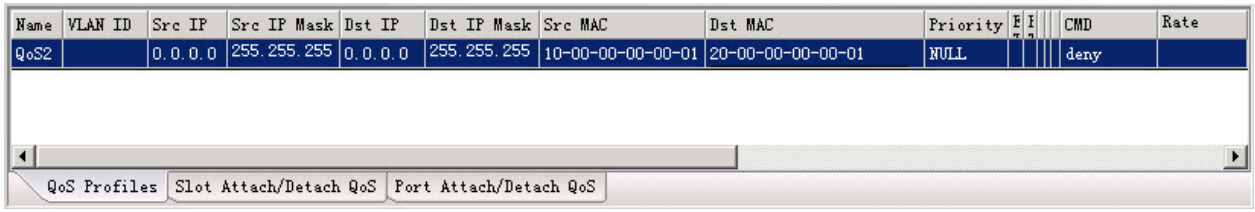


Figure 14-5 Configuring QoS profile-based on MAC address

14.3.4 Binding the Uplink Port and the QoS Profile

1. In the **QoS Profiles** window, select the **Port Attach / Detach QoS** tab.
2. Click  in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to create one new binding rule.
3. Configure the parameters according to the planning data in Table 14-2.
4. Click  in the toolbar to complete the configuration. See Figure 14-6.

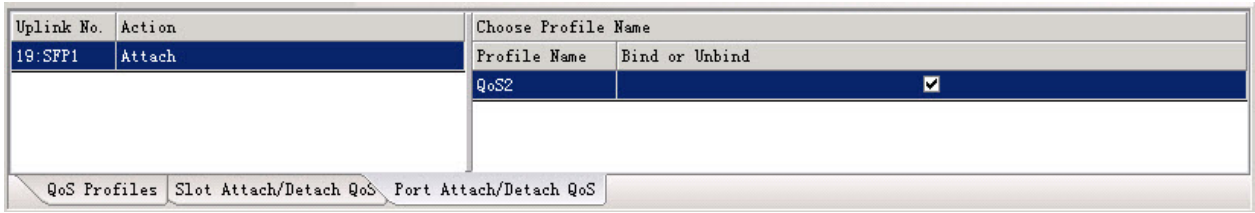


Figure 14-6 Binding the uplink port and the QoS profile

14.3.5 Configuration Result

After the above configurations, the uplink port 19:SFP1 of the AN5116-06B is bound with a QoS profile. And the uplink port will discard the data messages whose source MAC address is 100000000001 and destination MAC address is 200000000001.

14.4 Unbinding the Object and the QoS Profile

14.4.1 Unbinding the Line Card and the QoS Profile

1. Right-click the HSWA[9] card in the **Object Tree** pane, and select **QoS Config →QoS Profiles** from the shortcut menu. Select the **Slot Attach / Detach QoS** tab from the window that appears.
2. Configure the parameters.

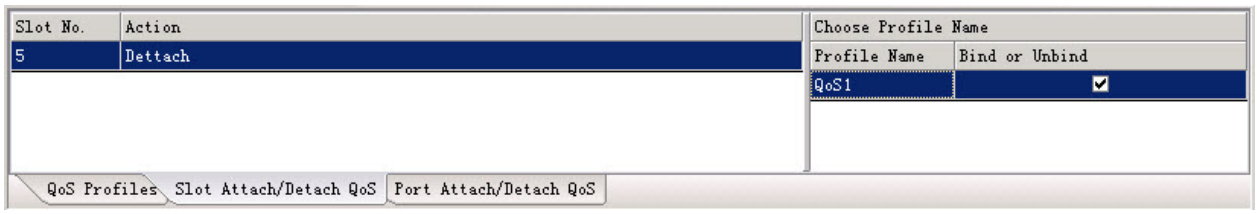


Figure 14-7 Unbinding the QoS profile on the slot

3. Click  in the toolbar to complete the configuration. See Figure 14-8.

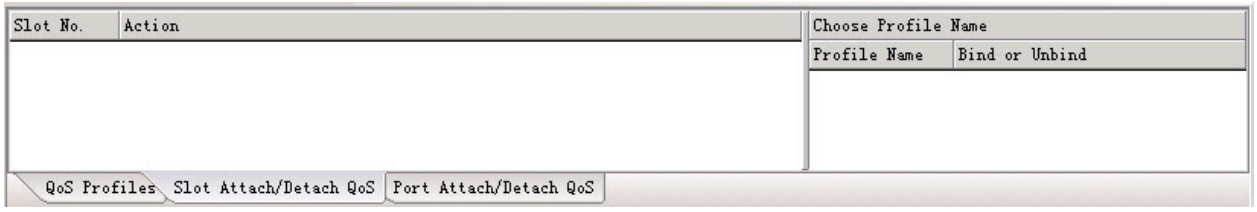


Figure 14-8 Unbinding the QoS profile on the slot successfully

14.4.2 Unbinding the Uplink Port and the QoS Profile

1. Right-click the HSWA[9] card in the **Object Tree** pane, and select **QoS Config →QoS Profiles** from the shortcut menu. Select the **Port Attach / Detach QoS** tab from the window that appears.

2. Configure the parameters.

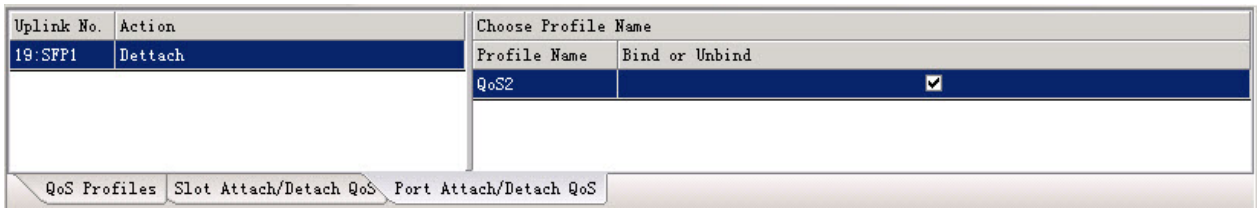


Figure 14-9 Unbinding the QoS profile on the uplink port

3. Click in the toolbar to complete the configuration. See Figure 14-10.

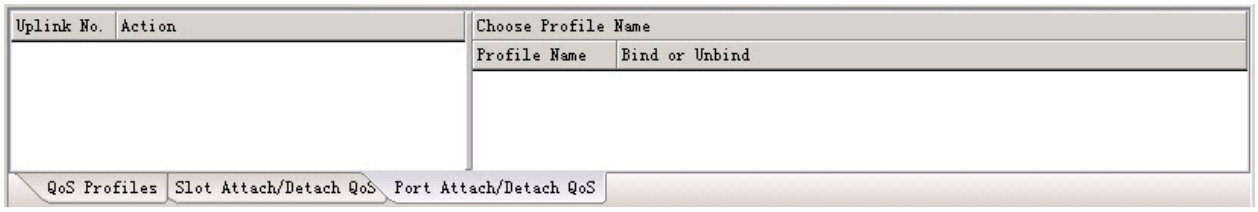


Figure 14-10 Unbinding the QoS profile on the uplink port successfully

15 Configuring the PON Protection

- Background Knowledge
- Configuration Rule
- PON Protection Configuration Example

15.1 Background Knowledge

PON protection: provides redundancy protection for the OLT PON ports and the main fibers. The AN5116-06B can provide PON port protection within an individual PON interface card or between two PON interface cards.

- OLT: the standby PON is in the cold standby state. The OLT detects the status of the line and PON ports, and completes the PON port switch.
- Optical splitter: use the 2:N optical splitter.
- ONU: no requirement.

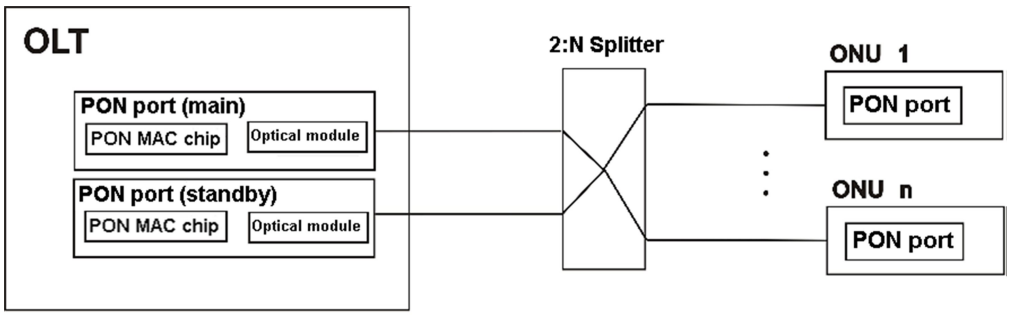


Figure 15-1 PON port protection principle

15.2 Configuration Rule

- When setting the PON port protection group, by default the first port is the main PON port, and the second port is the standby PON port.
- The PON port protection within the card is not restrained. Any two PON ports can be configured as a PON protection group.
- The PON port protection between cards is limited to the cards of two adjacent slots (odd number slot and the following even number slot), such as Slots 1 and 2, Slots 3 and 4, Slots 5 and 6, etc. The cards from slots 2 and 3, 6 and 7 (even number slot and the following odd number slot) cannot be configured with cross-card PON port protection.
- When using PON protection, the two PON ports inside one PON interface card or between two PON interface cards of the AN5116-06B access the 2:N optical splitter via fibers, and then access the ONU.

15.3 PON Protection Configuration Example

15.3.1 Planning Data

The AN5116-06B uses the GC4B card as a subscriber side interface card. Taking the protection within the card as an example, the planning data are listed in the following table.

Table 15-1 The planning data of the PON port protection configuration

Configuration Item		Configuration Description	Configuration Example	
Configuring PON port protection group	Group number	The PON port protection group serial number. Configure according to the operator's network planning.	1	
	Slot number	Configure according to the slot number of the PON interface card that is actually used.	5	5
	PON port number	Configure according to the number of the PON port that is actually used.	1 (active)	3 (standby)
Configuring PON port protection group mode	Group number	The PON port protection group serial number.	1	
	Protection group mode	The protection mode of the PON port protection group. Configure according to the operator's network planning.	Type B	

15.3.2 Configuration Flow

Below is the configuration flow for PON port protection.

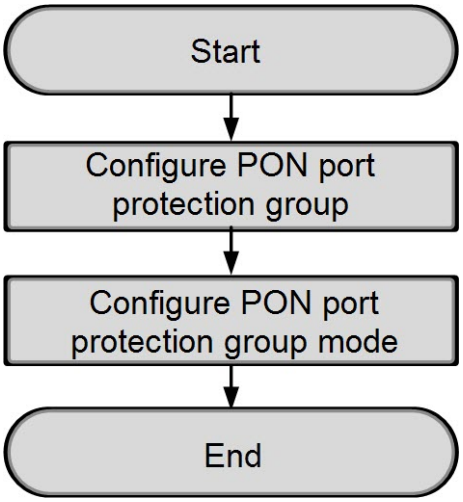


Figure 15-2 PON port protection configuration flow

15.3.3 Configuring PON Port Protection Group

1. Right-click the HSWA[9] card in the **Object Tree** pane, and select **Reliability Config**PON →**Protection Group Config**→**PON Protection Group Config** to open the **PON protection group config** window.
2. Click  in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to create one PON port protection group. Double-click the **Group No.** column and enter **1** to create one PON protection group.
3. In the right pane, double-click the **PON No.** column in the first row to bring up the **Port Configuration** dialog box. Select PON1 of the GC4B card in Slot 5 and click **OK**, as shown in Figure 15-3.

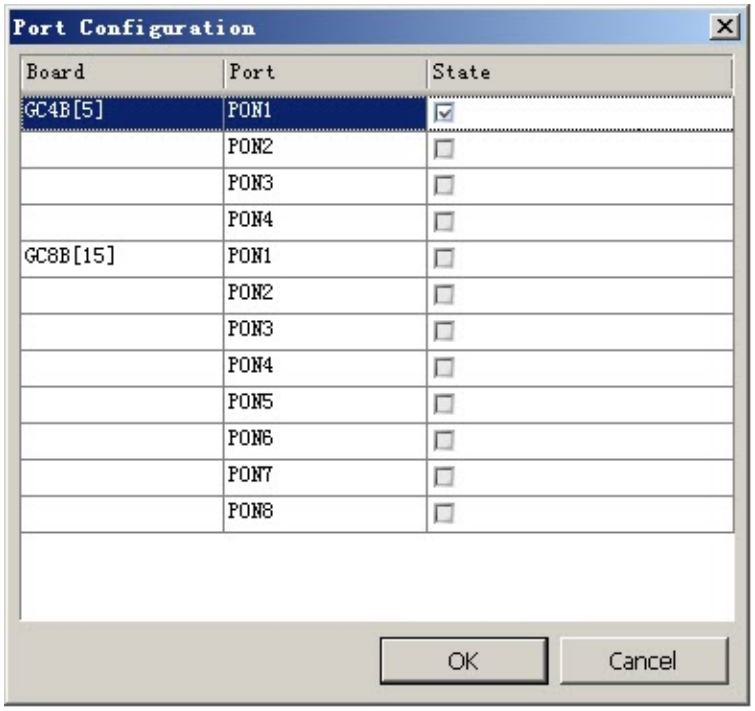


Figure 15-3 Configuring master port

4. Double-click the **PON No.** column in the second row to bring up the **Port Configuration** dialog box. Select PON3 of the GC4B card in Slot 5 and click **OK**, as shown in Figure 15-4.

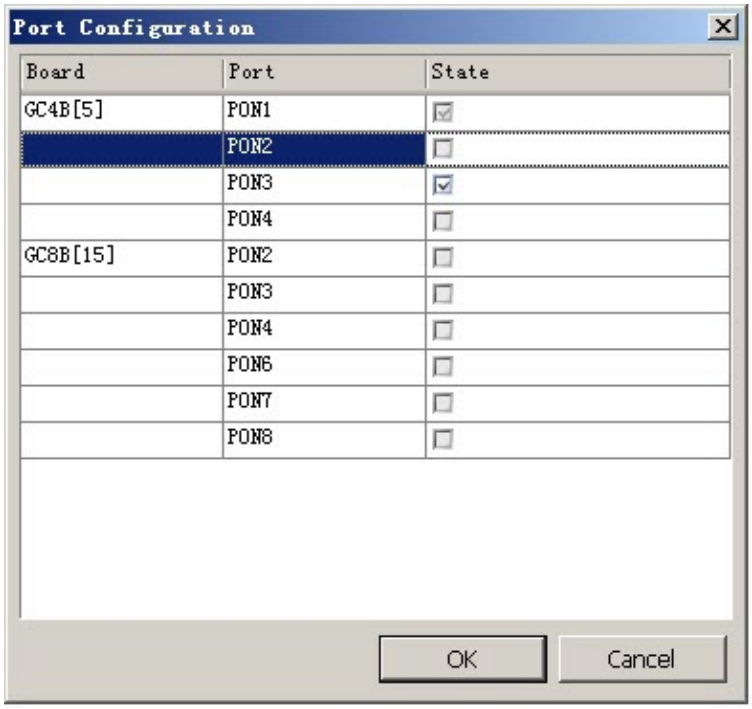


Figure 15-4 Configuring member port

5. Click in the toolbar to complete the configuration. See Figure 15-5.

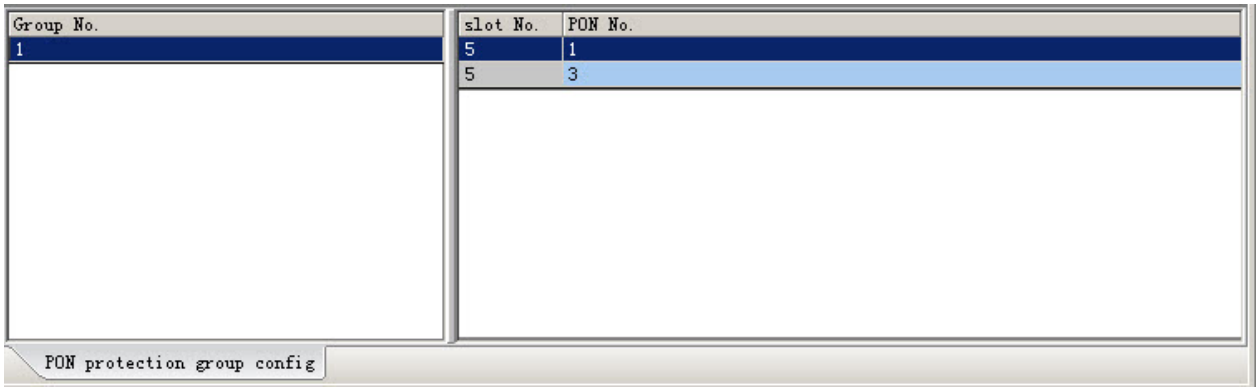


Figure 15-5 Configuring the PON port protection group successfully

15.3.4 Configuring PON Port Protection Group Mode

Note:

The GPON supports the TYPE B protection mode only. The default protection group mode of the equipment is Type B. You need only configure the PON port protection group.

1. Right-click the HSWA[9] card in the **Object Tree** pane, and select **Reliability Config**PON →**Protection Group Config**→**PON Protection Group Mode** to open the **Pon Protection Group Mode** window.
2. Click in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to add one entry.
3. According to the planning data in Table 15-1, configure the parameters of the PON port protection group mode.
4. Click in the toolbar to complete the configuration. See Figure 15-6.

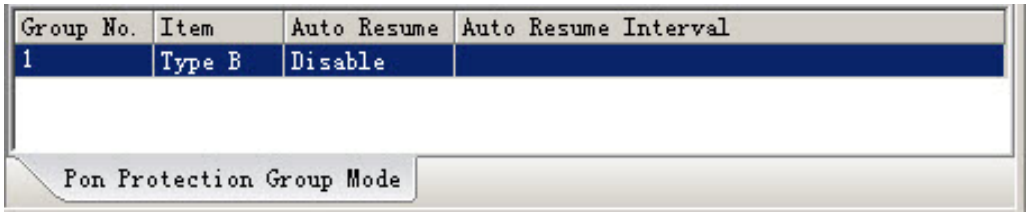


Figure 15-6 Configuring the PON port protection group mode

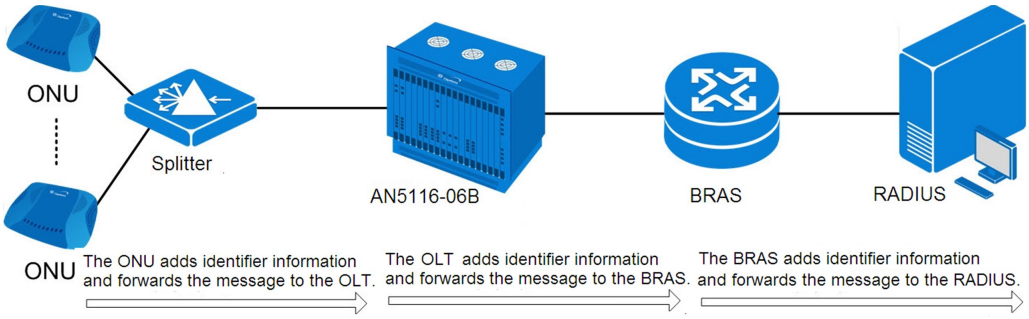
15.3.5 Configuration Result

The configuration of PON port protection is completed. If the link of the PON port 1 on the GC4B card in Slot 5 fails, the services will be switched to the PON port 3 of the GC4B card in Slot 5.

16 Configuring User Line Identifier

- Background Knowledge
- Configuration Rule
- User Line Identifier Configuration Example

16.1 Background Knowledge



1. The AN5116-06B system captures specific message (DHCP DISCOVER, DHCP REQUEST, PADI and PADR) in the uplink direction and adds line identifier information into the message based on the configured circuit ID format. The identifier information is the physical information of the subscriber who sent this message and it includes the ONU port number, ONU number, PON number, card and slot numbers of the OLT.
2. Then the OLT forwards the message added with the identifier information to the BRAS. After receiving the message, the BRAS will then add the corresponding line information and forward the message to the RADIUS.
3. Finally, the RADIUS will perform the AAA (Authentication, Authorization and Accounting) function based on the identifier information.

Note:

The background knowledge is based on the DHCP under the IPv4 condition.

16.2 Configuration Rule

- The AN5116-06B supports identifier modes including the DHCP Option82, DHCP Option18 and PPPoE+ modes.
- The AN5116-06B supports custom identifier formats.
- The custom format defines several identifier variables. The user can combine these variables to increase the flexibility of the identifier function. See Table 16-1 for the custom identifier variables.

Table 16-1 Custom identifier variables

Identifier	Description	Identifier	Description
%s	User outer VLAN	%o	ONU authorization number
%c	User inner VLAN	%n	ONU type
%a	Access node identifier	%T	MDU ONU slot number
%r	Access node rack number	%M	MDU ONU sub-slot number
%f	Access node shelf number	%P	MDU ONU UNI port number
%S	Access node slot number	%t	ONU user port type
%p	Access node PON port number	%X	Port VPI or SVLAN
%m	Access node ONU identifier (MAC)	%x	Port VCI or CVLAN
%u	Uplink port type	%I	IAD IP address
%L	Service unit type	%A	IAD MAC address
%O	OLT management VLAN IP	%B	Access type, OLT, DSL or LAN

- The custom format must comply with the following restrictions and conditions.
  - In a custom format, a delimiter must be used to separate the variable identifier from the succeeding character string or variable. The delimiter must be one of the delimiters presented in Table 16-2.

Table 16-2 The delimiter list

Delimiter	Description
	Space
.	Period
/	Slash
;	Semicolon
:	Colon
{	Open curly bracket
}	Close curly bracket
<	Open angle bracket
>	Close angle bracket

Table 16-2 The delimiter list (Continued)

Delimiter	Description
[	Open bracket
]	Close bracket

- The character string must not have more than 256 characters.
- The variable value must not have any of the delimiters above.

16.3 User Line Identifier Configuration Example

16.3.1 Planning Data

The planning data of the user line identifier management is as follows.

Table 16-3 The planning data of the user line identifier management

Configuration Item		Configuration Description	Configuration Example
Line identifier management	Option82 switch	Configure according to the actual network condition.	Enable.
	Option18 switch	Configure according to the actual network condition.	Enable.
	PPPoE+ switch	Configure according to the actual network condition.	Enable.
	Access node identifier	Configure according to the planning of the operator.	AN5116-06B
	Rack number	Configure according to the planning of the operator.	1
	Shelf number	Configure according to the planning of the operator.	1
Line identifier format	Use CTC format / CNC format / custom format	Configure according to the actual network condition.	Use CTC format
	Customized character string	Configure according to the planning of the operator. Configurable only under the custom format.	-
	Line identifier variable	Configure according to the planning of the operator. Configurable only under the custom format.	User outer VLAN
			User inner VLAN
			Access type

Table 16-3 The planning data of the user line identifier management (Continued)

Configuration Item		Configuration Description	Configuration Example
			Access node identifier
			Access node rack number
			Access node shelf number
			Access node slot number
			Access node PON port number
			Access node ONU identifier (MAC)
			Uplink port type
			ONU authorization number
			ONU type
			MDU ONU UNI port number
	Delimiter	Configure according to the planning of the operator. Configurable only under the custom format.	/

16.3.2 Configuration Flow

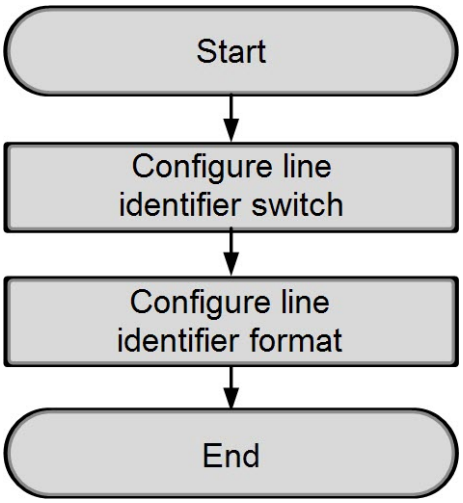


Figure 16-1 Configuration flow chart for user line identifier management

16.3.3 Configuring Line Identifier Switch

Configuration procedure

1. Right-click the HSWA[9] card in the **Object Tree** pane, select **Ethernet Config →DHCP→Line Identifier Management** from the shortcut menu to open the **Line Identifier Management** tab from the window that appears.
2. Configure the parameters according to the planning data in Table 16-3.
3. Click in the toolbar to complete the configuration. See Figure 16-2.

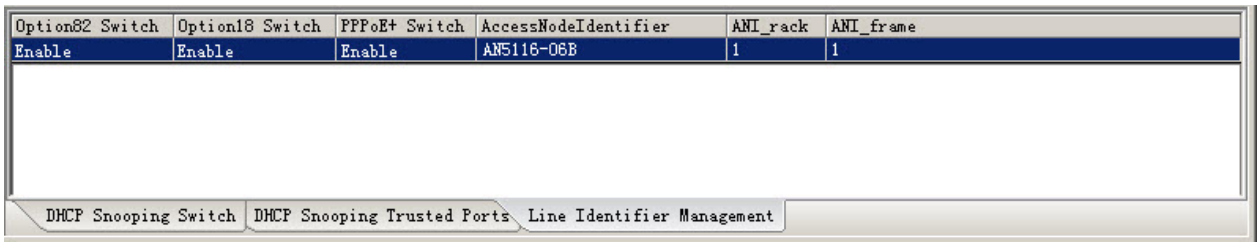


Figure 16-2 Configuring line identifier management

16.3.4 Configuring Line Identifier Format

Configuration procedure

1. Right-click the HSWA[9] card in the **Object Tree** pane, select **Ethernet Config →DHCP→Circuit ID Format** from the shortcut menu to open the **Circuit ID Format** dialog box.
2. Configure the parameters according to the planning data in Table 16-3. See Figure 16-3

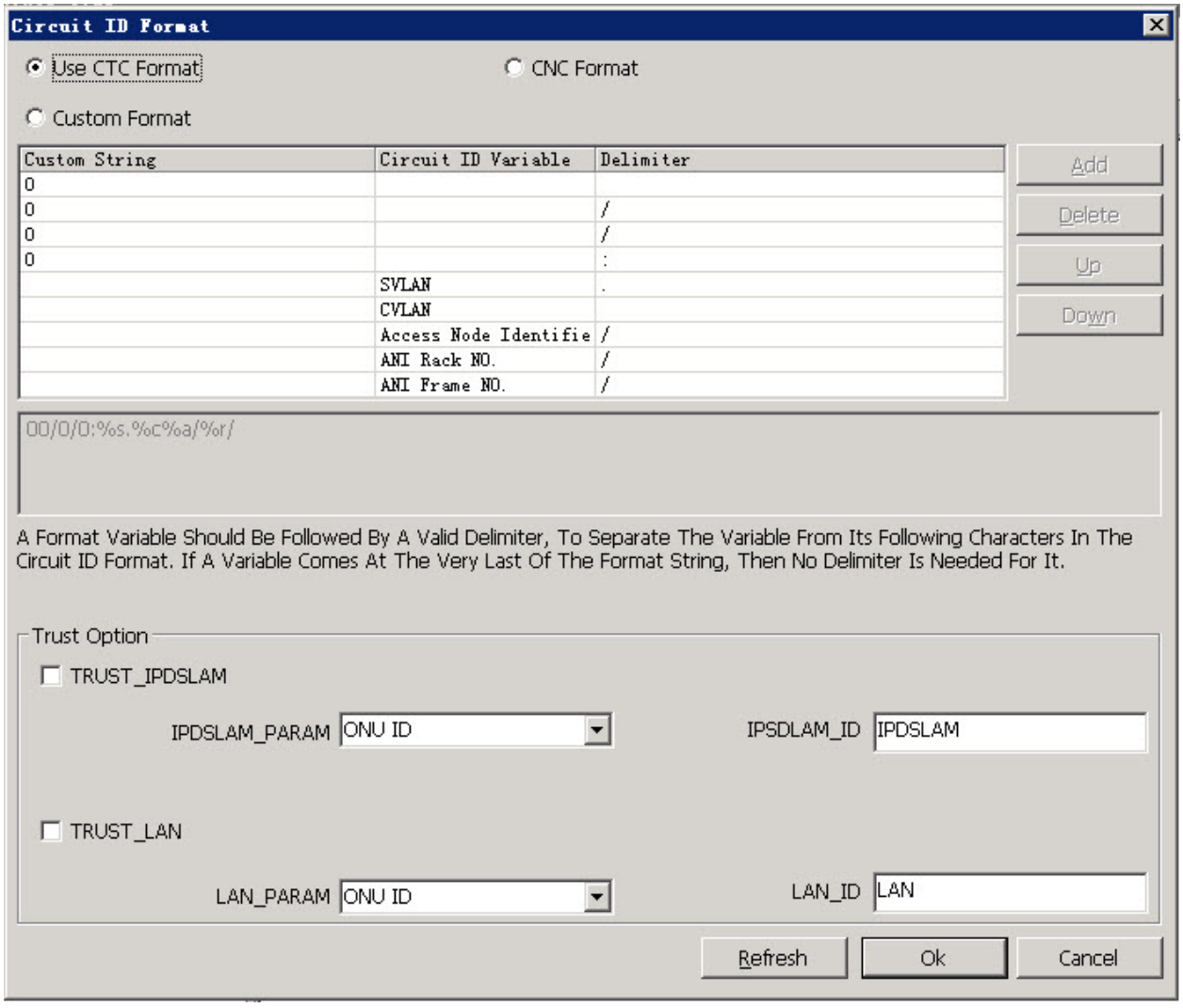


Figure 16-3 Configuring line identifier format

3. Click **OK** to complete the line identifier format configuration.

16.3.5 Configuration Result

The analysis result of the line identifier field using packet capture software is 00/0/0:3000.500 10/1/2/14/0/1/544b70001130 0/0//EP.

17 Configuring the LACP

- Configuration Rule
- LACP Configuration Example

17.1 Configuration Rule

- The AN5116-06B supports up to 6 Trunk aggregate groups.
- For a Trunk aggregate group, you can configure only one master port and multiple member ports.

17.2 LACP Configuration Example

17.2.1 Network Diagram

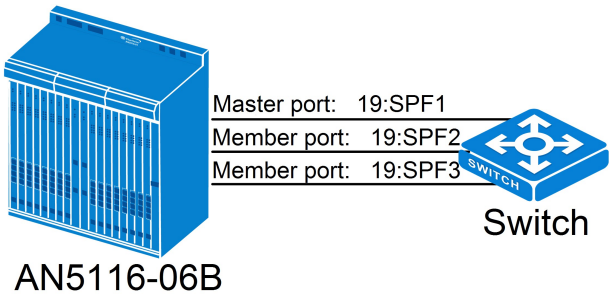


Figure 17-1 Configuring LACP function network connection

17.2.2 Planning Data

Table 17-1 The planning data of the LACP configuring

Configuration Item		Configuration Description	Configuration Example
Configuring trunking mode	Group number	Configure according to the network planning of the operator.	1
	Trunking mode	Configure according to the network planning of the operator.	Static LACP
Configuring TRUNK port link aggregation	TRUNK group serial number	The configured group number in the trunking mode.	1
	Master port of the TRUNK group	Configure according to the network planning of the operator.	19:SPF1
	TRUNK group member	Configure according to the network planning of the operator.	19:SPF2, 19:SPF3

Table 17-1 The planning data of the LACP configuring (Continued)

Configuration Item		Configuration Description	Configuration Example
Configuring LACP	LACP switch	The LACP function enabling / disabling switch. Configure according to the operator's network planning.	Enable
	System priority level	Configure according to the network planning of the operator.	32768

17.2.3 Configuration Flow

Below is the configuration flow.

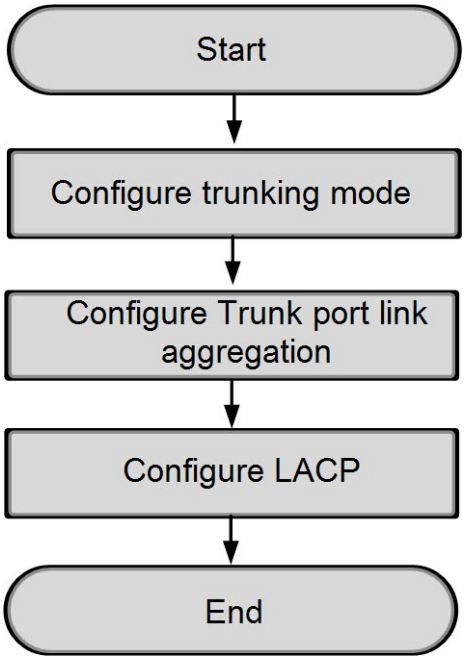


Figure 17-2 LACP configuration flow

17.2.4 Configuring Trunking Mode

1. Right-click the HSWA[9] card in the **Object Tree** pane, select **Ethernet Config →Aggregation Mode Config** from the shortcut menu to open the **Aggregation Mode Config** window.

2. Click in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to create a new entry of the aggregate group mode.
3. Configure the parameters according to the planning data in Table 17-1.
4. Click in the toolbar to complete the configuration. See Figure 17-3.

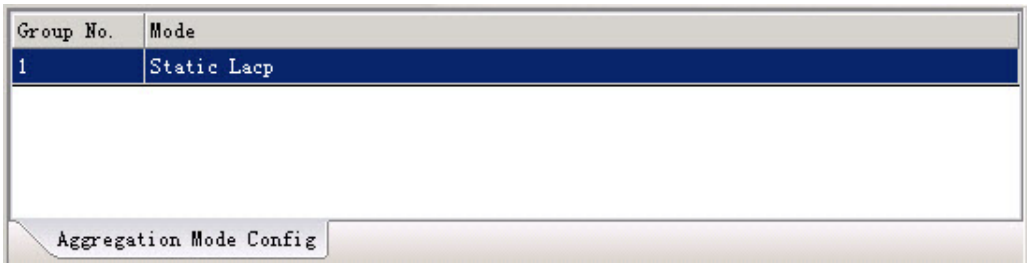


Figure 17-3 Configuring trunking mode

17.2.5 Configuring Trunk Port Link Aggregation

1. Right-click the HSWA[9] card in the **Object Tree** pane, select **Ethernet Config** →**Port Trunking** from the shortcut menu to open the **TRUNK Link Aggregation** window.
2. Click in the toolbar, and enter **1** in the **Please Input The Rows For Add** dialog box that appears. Click **Ok** to create a new aggregate group.
3. Configure the parameters according to the planning data in Table 17-1.
4. Click in the toolbar to complete the configuration. See Figure 17-4.

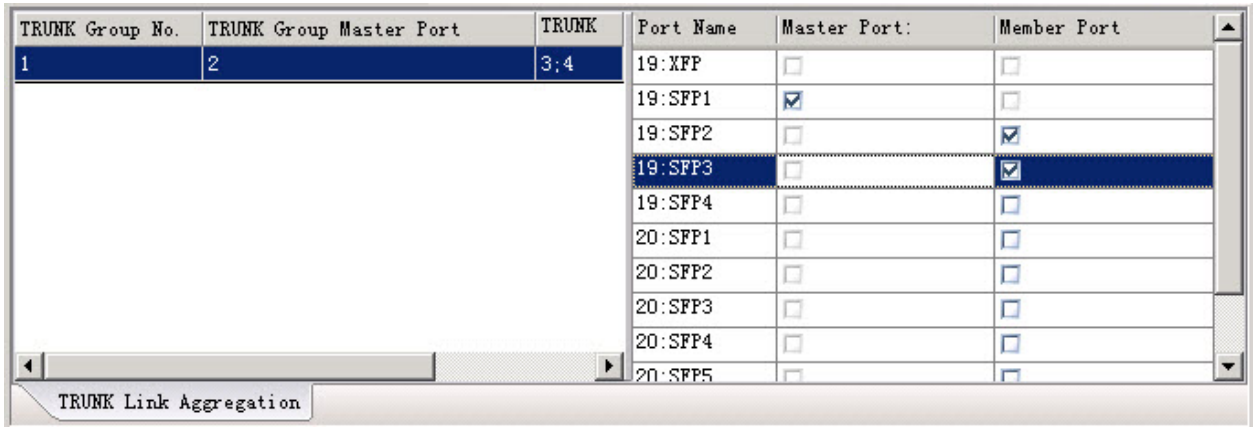


Figure 17-4 Configuring Trunk port link aggregation

17.2.6 Configuring LACP

1. Right-click the HSWA[9] card in the **Object Tree** pane, select **Ethernet Config** →**LACP Config** from the shortcut menu to open the **LACP Config** tab from the window that appears.
2. Configure the parameters according to the planning data in Table 17-1.
3. Click  in the toolbar to complete the configuration. See Figure 17-5.

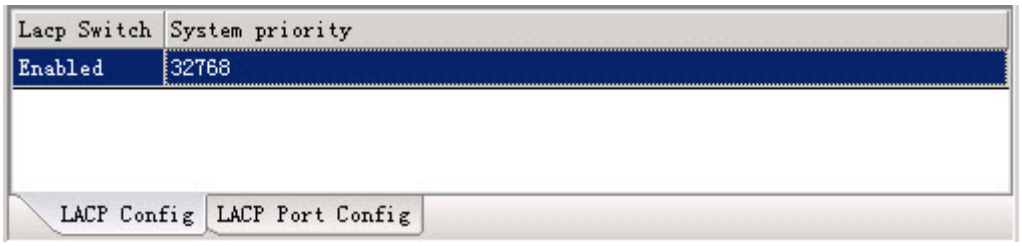


Figure 17-5 Configuring LACP

17.2.7 Configuration Result

The LACP function configuration is completed. The ports 19:SPF1, 19:SPF2 and 19:SPF3 form a static LACP aggregate group, so as to achieve load sharing and provide higher connection reliability for the system.

18 Detecting the Optical Power

- Viewing the Optical Module Parameter Information of the GC4B / GC8B Card
- Viewing Optical Module Parameter Information of the GPON ONU

18.1 Viewing the Optical Module Parameter Information of the GC4B / GC8B Card

1. Right-click the GC8B[15] card in the **Object Tree** pane, and select **Get Information→OptModule Para Information** to open the **OptModule Para Information** window.
2. Enter the number of the PON port to be viewed in the **PON No.** column. In this example, enter **5**.
3. Click **Device Operation→Read From Device** from the menu bar or click the button in the toolbar to read the optical module parameter information of this PON port, as shown in Figure 18-1.

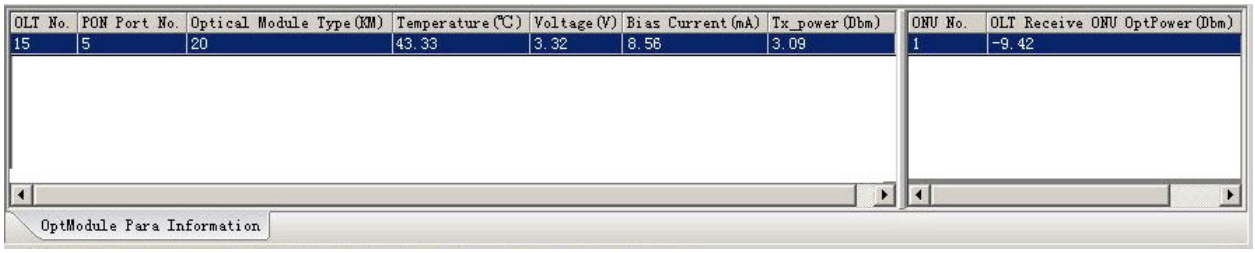


Figure 18-1 Parameter information of the PON port optical module on the GC8B card

Reference standard

Optical Module Parameter	Normal Range	Relevant Alarm
Optical module temperature	-40℃ to 100℃	Optical module temperature threshold crossing
Optical module voltage	3V to 3.6V	Optical module voltage threshold crossing
Transmitting optical power	When using 1000BASE-PX20: +2dBm to +7dBm	Optical module transmitting optical power threshold crossing, overlow optical power
Receiving optical power	Overload optical power When using 1000BASE-PX20: -6dBm	Optical module receiving optical power threshold crossing
Bias current	0mA to 100mA	Optical module bias current threshold crossing

18.2 Viewing Optical Module Parameter Information of the GPON ONU

1. Click the GC8B[15] card in the **Object Tree** pane, the right pane displays all ONUs under the GC8B card. Right-click the ONU **PON5-AN5506-09-A1[1]** and select **Get Information→OptModule Para Information**.
2. View the parameter information of the optical module in this PON port. See Figure 18-2.

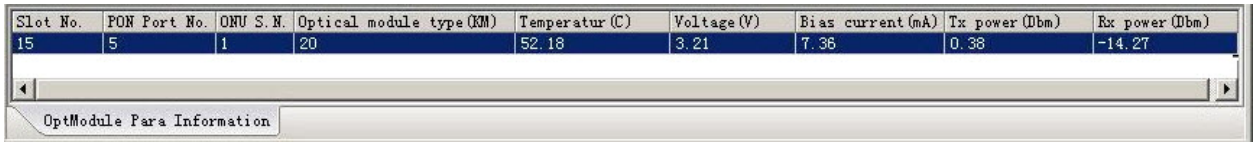


Figure 18-2 Parameter information of the PON port optical module on the ONU

Reference standard

Optical Module Parameter	Normal Range	Relevant Alarm
Optical module temperature	-40℃ to 100℃	Optical module temperature threshold crossing
Optical module voltage	3V to 3.6V	Optical module voltage threshold crossing
Transmitting optical power	ONU side When using 1000BASE-PX20: -1dBm to +4dBm	Optical module transmitting optical power threshold crossing, overlow optical power
Receiving optical power	Overload optical power When using 1000BASE-PX20: -the Overload optical power-3dBm	Optical module receiving optical power threshold crossing
Bias current	0mA to 100mA	Optical module bias current threshold crossing

Note:

PX-10 stands for the 10KM module; PX-20 stands for the 20KM module The 1490 nm power meter is used to test OLT side transmit optical power and ONU side receive optical power. The 1310 nm power meter is used to test OLT side receive and ONU side transmit optical power.

19 POTS Internal Line and External Line Test

- Test Rule
- Internal Line Test Example
- External Line Test Example

19.1 Test Rule

- POTS internal line test: When the voice service is faulty, the user can perform an internal line test to isolate the fault and check whether it is caused by the ONU.
- POTS external line test: When the voice service is faulty, the user can perform an external line test to isolate the fault and check whether it is caused by the ONU.
- The test can be divided into forcible and non-forcible tests. Forcible tests indicate that the test is performed regardless the user is in conversation or not and the conversation will be interrupted. Non-forcible tests indicate that the test will not be performed if the user is in conversation. Usually a non-forcible test is recommended.

19.2 Internal Line Test Example

19.2.1 Planning Data

Table 19-1 The planning data of POTS internal line test

Configuration Item		Configuration Description	Configuration Example
ONU information	Slot number	Configure according to the slot number of the PON interface card that is actually used.	6
	PON port number	Configure according to the number of the PON port that is actually used.	1
	ONU authorization number	Configure according to the network planning of the operator.	1
	ONU type	Configure according to the type of the ONU that is actually used.	AN5506-04-G1
POTS port internal line test	POTS port number	Configure according to the number of the POTS port that is actually used.	1

Table 19-1 The planning data of POTS internal line test (Continued)

Configuration Item		Configuration Description	Configuration Example
	Test type	Select the test type according to the fault type. The non-forcible test is recommended.	Non-forcible test

19.2.2 POTS Port Internal Line Test

1. Click the GC8B[6] card in the **Object Tree** pane, the right pane displays all ONUs under the GC8B card. Right-click the ONU **PON1-AN5506-04-G1[1]** and select **Get Information→Line Test**. In the window that appears, select the **POTS Inline Test** tab.
2. Configure the parameters according to the planning data in Table 19-1. After completing the configuration, click the button on the toolbar to deliver the test command. The internal test result will be displayed after the test is completed. See Figure 19-1.

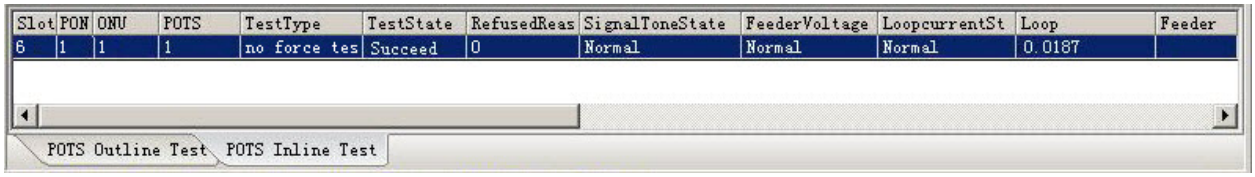


Figure 19-1 Viewing internal line test

19.2.3 Test Result

Check the **Test State** and **Refuse Reason** parameters.

Below are the two test states:

- Succeed: The internal line test is completed successfully.
- Refuse: The internal line test fails.

If the test result is **Refuse**, the **Refuse Reason** column will show the actual reason for the failure, such as **port in test** or **port in use**.

19.3 External Line Test Example

19.3.1 Planning Data

Table 19-2 The planning data of POTS external line test

Configuration Item		Configuration Description	Configuration Example
ONU information	Slot number	Configure according to the slot number of the PON interface card that is actually used.	6
	PON port number	Configure according to the number of the PON port that is actually used.	1
	ONU authorization number	Configure according to the network planning of the operator.	1
	ONU type	Configure according to the type of the ONU that is actually used.	AN5506-04-G1
POTS port external line test	POTS port number	Configure according to the number of the POTS port that is actually used.	1
	Test type	Select the test type according to the fault type. The non-forcible test is recommended.	Non-forcible test

19.3.2 POTS Port External Line Test

1. Click the GC8B[6] card in the **Object Tree** pane, the right pane displays all ONUs under the GC8B card. Right-click the ONU **PON1-AN5506-04-G1[1]** and select **Get Information→Line Test**. In the window that appears, select the **POTS Outline Test** tab.
2. Configure the parameters according to the planning data in Table 19-2. After completing the configuration, click the button on the toolbar to deliver the test command. The internal test result will be displayed after the test is completed. See Figure 19-2.

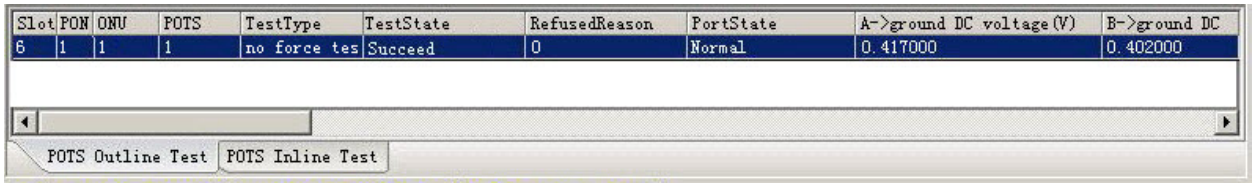


Figure 19-2 Viewing external line test

19.3.3 Test Result

Check the **Test State** and **Refuse Reason** parameters.

Below are the two test states:

- Succeed: The external line test is completed successfully.
- Refuse: The external line test fails.

If the test result is **Refuse**, the **Refuse Reason** column will show the actual reason for the failure, such as **port in test** or **port in use**.

Appendix A FTP Operation Guide

A.1 Overview of the FTP

A computer is connected with the equipment via the network cable. Set up the ftp server end on the computer; that is, install the wftp software.

- When the equipment needs to be upgraded, it needs to get the upgrade package from the ftp server end via the ftp mode.
- When the equipment conducts the backup operation, it needs to export the backup file to the ftp server end via the ftp mode.

A.2 Configuration Procedure

1. At the ftp server end, set the path for saving the upgrade / backup package to d:\ftp.
2. Open the wftp, as shown in the following figure.

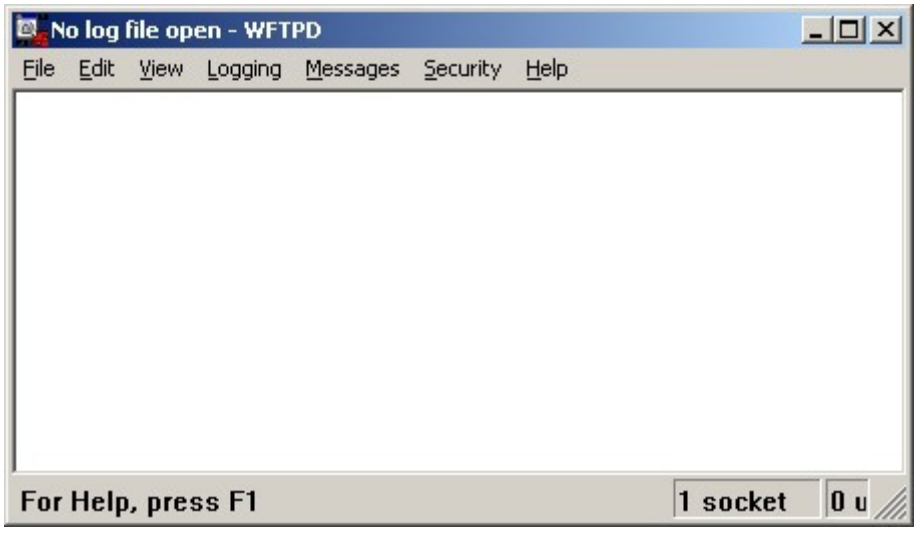


Figure A -1 Opening the wftp

3. Click **Security→Users/Rights** in the menu bar to start user setting, as shown in the following figure.

Figure A -2 The user configuration

4. In the **User/Rights Security Dialog** window that appears subsequently, click the **New User** button to add a new ftp user. This user will be used in the subsequent upgrade and backup operations. Input user name **1**, as shown in the following figure.

Note:

You may click the **Delete** button to delete an existing user, or select an existing user and click the **Change Password** button to change the user's password.

Figure A -3 Creating a new user

5. Click the **OK** button and go on to input **1** for both new password and verify password items. And then, click the **OK** button to complete the new user creation, as shown in the following figure.

Figure A -4 Completing creating the new user account

6. In the **User/Rights Security Dialog** window, input the path in which the upgrade / backup package locates in the **Home Directory** item. According to the setting in the first step, here input **d:\ftp**, as shown in the following figure.

Figure A -5 Configuring path

Click the **Done** button to complete the setting.

7. In the **No log file open** window, click **Logging→Log Options** to set the log function of this wftp, as shown in the following figure.

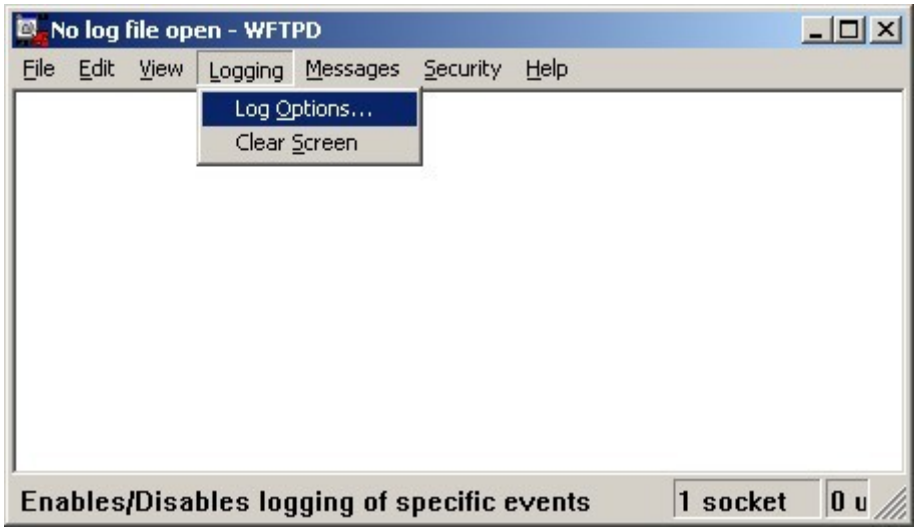


Figure A -6 Configuring log function of the wftp tool

8. In the **Logging Options** window, select the **Enable Logging**, **Gets**, **Logins**, **Commands**, **Warnings**, **Puts**, and **Anon. Logins** check boxes, as shown in the following figure.

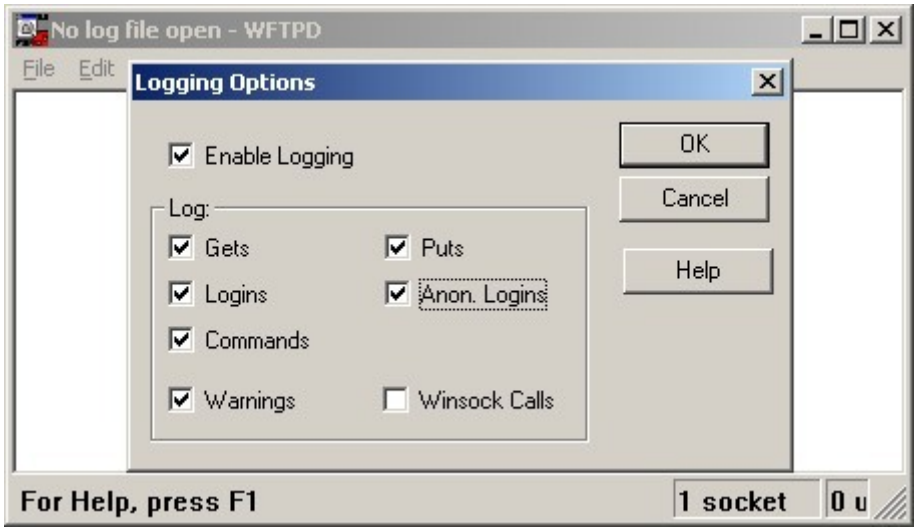


Figure A -7 Log information selection

After selecting these options, click the **OK** button to display the log. Users may use the log information to troubleshoot and confirm whether the Gets or Puts operation is successful.

Here, the wftp configuration is completed.

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