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**AN5116-06B**

**Optical Line Terminal Equipment**

**GPON Configuration Guide**

**Version: B**

**Code: MN000000520**

**FiberHome Telecommunication Technologies Co., Ltd.**

**May 2011**



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# Preface

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## Related Documentation

Document	Description
<i>AN5116-06B Optical Line Terminal Equipment Documentation Guide</i>	Introduces the retrieval method, contents, releasing, reading approach, and suggestion feedback method for the complete manual set for the AN5116-06B.
<i>AN5116-06B Optical Line Terminal Equipment Product Description</i>	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. The other manuals extend and enrich the concepts introduced in the <i>Product Description</i> .
<i>AN5116-06B Optical Line Terminal Equipment Feature Description</i>	Introduces the key features supported by the AN5116-06B, including GPON / EPON access, GPON / EPON terminal management, VLAN, broadcast, voice and safety; and introduces these functions in details in terms of definition, characteristic, specification, principle description, references and so on.
<i>AN5116-06B Optical Line Terminal Equipment EPON Configuration Guide</i>	Introduces the method for configuring the EPON services supported by the equipment via ANM2000 Network Management System, 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.
<i>AN5116-06B Optical Line Terminal Equipment GPON Configuration Guide</i>	Introduces the method for configuring the GPON services supported by the equipment via ANM2000 Network Management System, 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.

<b>Document</b>	<b>Description</b>
<i>AN5116-06B Optical Line Terminal Equipment Hardware Description</i>	Introduces the appearance, structure, functions, technical specifications, and usage method for the AN5116-06B's cabinet, PDP, subrack, cards, cables and wires, facilitating users' mastery of the hardware features of the equipment.
<i>AN5116-06B Optical Line Terminal Equipment Installation Guide</i>	Introduces the overall installation and verifying procedure 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 a variety of interfaces) to guide users to install the equipment.
<i>AN5116-06B Optical Line Terminal Equipment GUI Reference</i>	Introduces the shortcut menu for every card of the AN5116-06B inside ANM2000 Network Management System, 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 inside ANM2000.
<i>AN5116-06B Optical Line Terminal Equipment Component Replacement</i>	Introduces the operation procedures of replacing the AN5116-06B's components, including preparations, precautions, early operations, operation process and subsequent operations, so as to guide users with the completion of component replacement on the hardware.
<i>AN5116-06B Optical Line Terminal Equipment Routine Maintenance</i>	Introduces the remote and on-site routine maintenance operations of the AN5116-06B. Users are able to eliminate the potential risks in the equipment operation process as early as possible via implementing routine maintenance.
<i>AN5116-06B Optical Line Terminal Equipment Alarm and Event Reference</i>	Introduces the AN5116-06B's alarm information, including alarm names, alarm levels, possible reasons, effects on the system, and processing procedure, to guide users on effective alarm processing.
<i>AN5116-06B Optical Line Terminal Equipment EPON Troubleshooting Guide</i>	Introduces the fault processing principles and methods of fault diagnosis and locating for the AN5116-06B. Also discusses the typical fault cases of various EPON services. If the trouble is too complicated to process, users can refer to FiberHome for technical support according to the instructions in this document.

Document	Description
<i>AN5116-06B Optical Line Terminal Equipment GPON Troubleshooting Guide</i>	Introduces the fault processing principles and methods of fault diagnosis and locating for the AN5116-06B. Also discusses the typical fault cases of various GPON services. If the trouble is too complicated to process, users can refer to FiberHome for technical support according to the instructions in this document.

## Version

Version	Description
A	Initial version. The corresponding version of the AN5116-06B: GPON V2.0 The corresponding version of the ANM2000: <ul style="list-style-type: none"><li>▶ Version No.: V3.0T1</li><li>▶ Build: 05.07.05.04SP1</li></ul>
B	The corresponding version of the AN5116-06B: GPON V2.1 The corresponding version of the ANM2000: <ul style="list-style-type: none"><li>▶ Version No.: V3.0T1</li><li>▶ Build: 05.07.05.08SP1</li></ul>

This manual mainly introduces the basic configuration and service start-up of the AN5116-06B's network management system. It aims to help users in understanding the equipment's technologies, functions and practical application capacity and to provide technical support for the users.

## Intended Readers

This manual is intended for the following readers:

- ◆ Commissioning engineers
- ◆ Operation and maintenance engineers

To utilize this manual, these prerequisite skills are necessary:

- ◆ Access network technology
- ◆ GPON principles
- ◆ Ethernet switch technology
- ◆ Computer network technology
- ◆ ANM2000 network management system basic operations

# Conventions

## Terminology Conventions

Terminology	Convention
AN5116-06B	AN5116-06B Optical Line Terminal Equipment
ANM2000	FiberHome e-Fim ANM2000 Broadband Access Network Management System
EC4B	4×EPON-C Interface Card (type B)
EC8B	8×EPON-C Interface Card (type B)
GC4B	4×GPON-B Interface Card (type B)
GC8B	8×GPON-C Interface Card (type B)
C155A	1×STM-1 Optical Interface Card (CES mode)
CE1B	32×E1 Optical Interface Card (CES mode) (type B)
PUBA	Public Card (type A)
HSPA	Core Switch Card (type A) (code:2.115.331)
	Core Switch Card (EPON) (Code:2.115.334)
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.



# Operation Safety Rules

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Network management computer should be placed away from direct sunlight, electromagnetic interference, heat source, humidity and dust, and with at least 8cm distance from other objects in order to keep good ventilation.



Use UPS power supply to avoid loss of network management data caused by accidental power failure.



The computer case, UPS power supply and switch (or hub) should be connected to protection earth ground.



To shut down the network management computer, first exit the operation system normally and then shut off the power supply.



Do not exit the network management system when it is working normally. Exiting the network management system does not interrupt traffic in the network, but precludes centralized control of the networked equipment.



The network management computer cannot be used for purposes other than network management. Use of unidentified memory devices should be prohibited so as to avoid computer viruses.



Do not delete any file in the network management system randomly or copy any irrelevant file into the network management computer.



Do not visit Internet via the network management computer. Doing so may increase data flow in the net card and hence affects normal network management data transmission or results in other accidents.

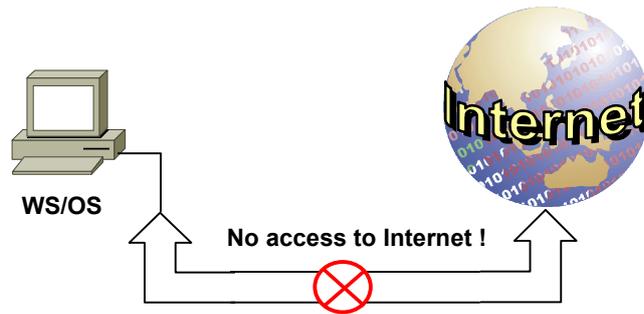


Figure 1 No access to Internet



Do not perform service configuration or expansion during service busy hours via the network management system.



Do not modify the network management computer's protocol settings, computer name or LAN settings. Doing so may result in abnormal operation of network management system.

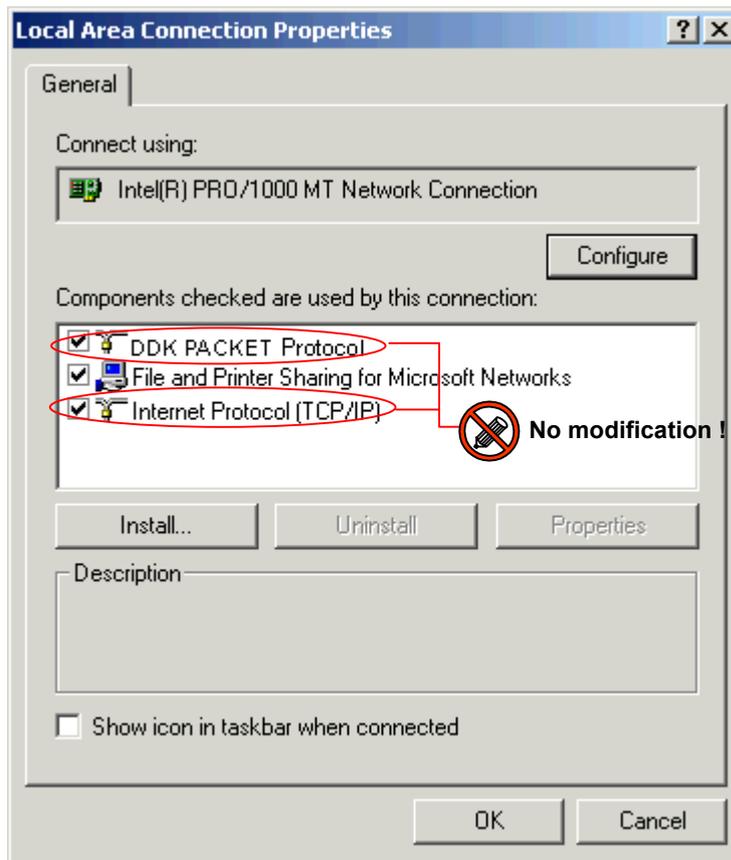


Figure 2 Do not modify protocol settings (1)

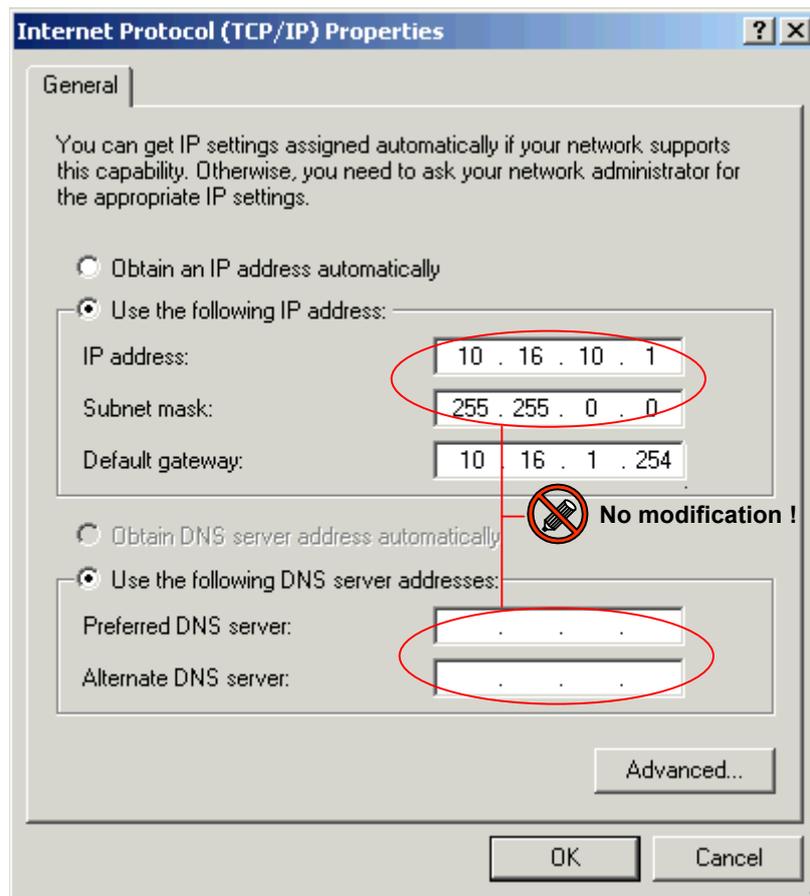


Figure 3 Do not modify protocol settings (2)

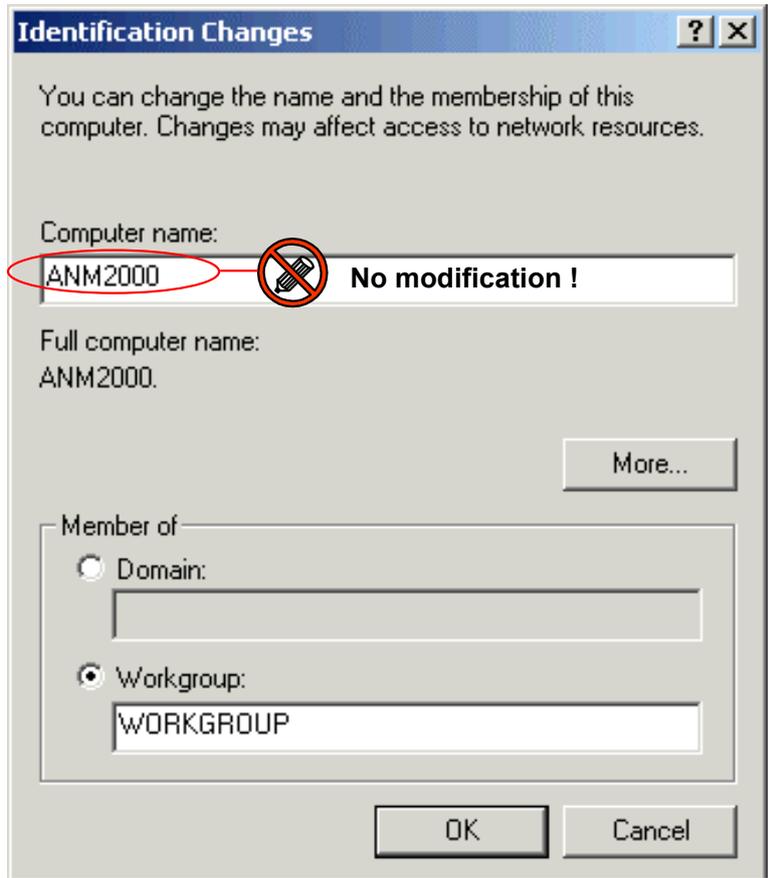


Figure 4 Do not modify computer name

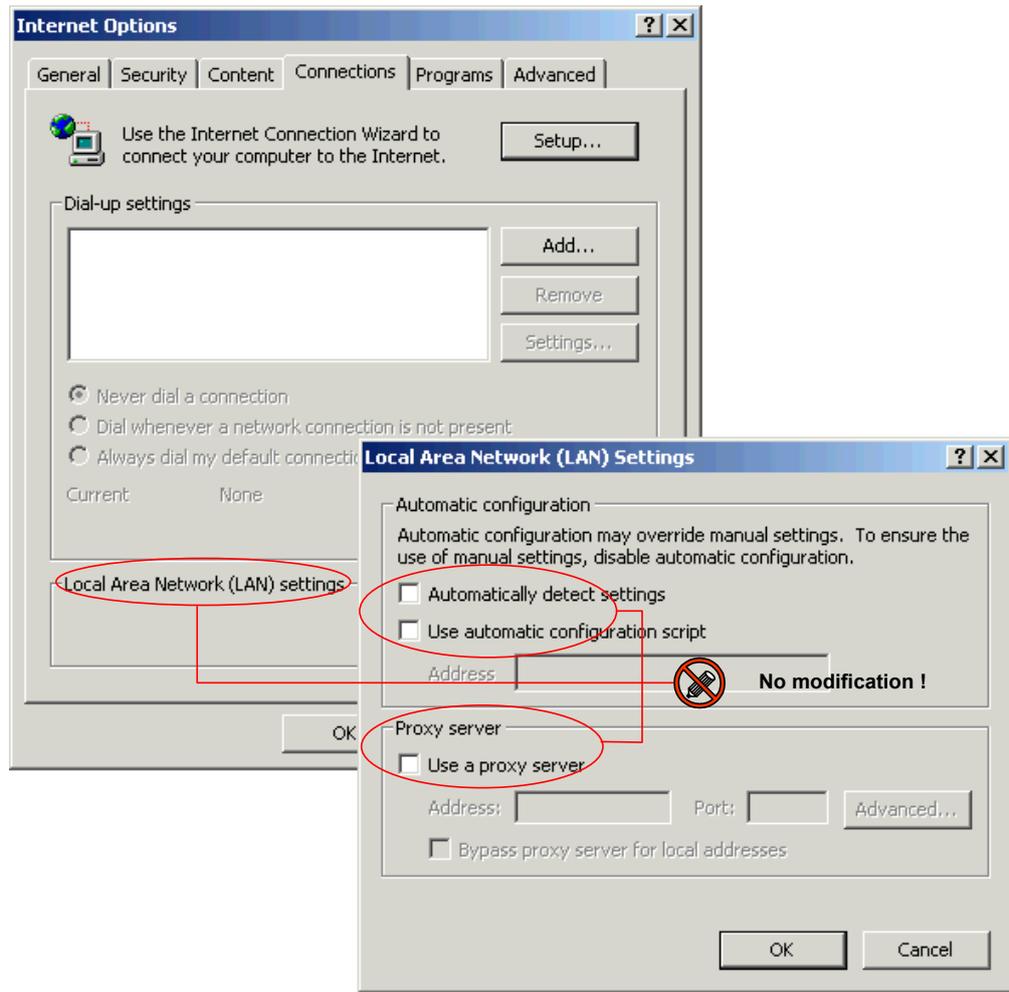


Figure 5 Do not modify LAN settings

# Contents

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Preface .....	I
Related Documentation.....	I
Version .....	IV
Intended Readers .....	IV
Conventions .....	V
Operation Safety Rules .....	VII
<b>1</b> Configuring the ANM2000 Management Path .....	1-1
<b>1.1</b> Configuring the Console.....	1-2
<b>1.1.1</b> Configuration Preparation .....	1-2
<b>1.1.2</b> Connecting with the Network Management Computer .	1-3
<b>1.1.3</b> Logging into the Console .....	1-4
<b>1.2</b> Configuring the ANM2000 Management Path.....	1-9
<b>1.2.1</b> Configuring the Management VLAN.....	1-12
<b>1.2.2</b> Configuring the Static Routing.....	1-13
<b>1.2.3</b> Configuring the SNMP .....	1-13
<b>1.2.4</b> End of Configuration .....	1-16
<b>1.3</b> Logging into the ANM2000.....	1-17
<b>2</b> Adding Device .....	2-1
<b>2.1</b> Configuration Rules .....	2-2
<b>2.2</b> Configuration Flow Chart .....	2-3
<b>2.3</b> Adding a Management Domain.....	2-4
<b>2.4</b> Adding a System.....	2-6
<b>2.5</b> Adding a Module .....	2-8
<b>2.6</b> Adding a card.....	2-10
<b>2.6.1</b> Adding a Card Automatically .....	2-10
<b>2.6.2</b> Adding a Card Manually .....	2-12
<b>2.7</b> Authorizing a Card .....	2-15
<b>2.7.1</b> Authorizing a card which is present.....	2-15

	<b>2.7.2</b>	Pre-authorizing a Card Which is not Present .....	2-17
<b>2.8</b>		Synchronizing Time.....	2-21
<b>3</b>		ONU Authentication and Authorization .....	3-1
	<b>3.1</b>	Configuration Principles .....	3-2
	<b>3.2</b>	Example for Authorization without Authentication .....	3-4
	<b>3.2.1</b>	Example Introduction .....	3-4
	<b>3.2.2</b>	Configuration Flow Chart .....	3-4
	<b>3.2.3</b>	Configuring PON Port Authentication Mode .....	3-4
	<b>3.2.4</b>	End of Configuration .....	3-6
	<b>3.3</b>	Example for Authentication and Authorization Based on Physical Identifier .....	3-7
	<b>3.3.1</b>	Example Introduction .....	3-7
	<b>3.3.2</b>	Planning Data.....	3-7
	<b>3.3.3</b>	Configuration Flow Chart .....	3-8
	<b>3.3.4</b>	Configuring PON Port Authentication Mode .....	3-8
	<b>3.3.5</b>	Configuring the ONU Physical Address Whitelist .....	3-10
	<b>3.3.6</b>	End of Configuration .....	3-14
	<b>3.4</b>	Example for Authentication and Authorization Based on Password .....	3-16
	<b>3.4.1</b>	Example Introduction .....	3-16
	<b>3.4.2</b>	Planning Data.....	3-16
	<b>3.4.3</b>	Configuration Flow Chart .....	3-17
	<b>3.4.4</b>	Configuring PON Port Authentication Mode .....	3-18
	<b>3.4.5</b>	Configuring the ONU Password Whitelist.....	3-19
	<b>3.4.6</b>	End of Configuration .....	3-23
	<b>3.5</b>	Example for Authentication and Authorization Based on Physical Identifier + Password .....	3-25
	<b>3.5.1</b>	Example Introduction .....	3-25
	<b>3.5.2</b>	Planning Data.....	3-25
	<b>3.5.3</b>	Configuration Flow Chart .....	3-26
	<b>3.5.4</b>	Configuring PON Port Authentication Mode .....	3-27
	<b>3.5.5</b>	Configuring the ONU Physical Identifier Whitelist .....	3-28
	<b>3.5.6</b>	End of Configuration .....	3-32

<b>3.6</b>	Example for Authentication Mode Switching with Maintaining Original ONU Authorization and Configuration .....	3-34
<b>3.6.1</b>	Example Introduction .....	3-34
<b>3.6.2</b>	Configuration Flow Chart .....	3-34
<b>3.6.3</b>	Switching PON Port Authentication Mode .....	3-35
<b>3.6.4</b>	Configuring the ONU Password Whitelist.....	3-36
<b>3.6.5</b>	End of Configuration .....	3-38
<b>3.7</b>	Example for Authentication Mode Switching Without Maintaining Original ONU Authorization and Configuration.....	3-40
<b>3.7.1</b>	Example Introduction .....	3-40
<b>3.7.2</b>	Configuration Flow Chart .....	3-40
<b>3.7.3</b>	Deleting ONU from Physical Address Whitelist .....	3-41
<b>3.7.4</b>	Switching PON Port Authentication Mode .....	3-42
<b>3.7.5</b>	Configuring the ONU Password Whitelist.....	3-44
<b>3.7.6</b>	End of Configuration .....	3-46
<b>3.8</b>	Example for ONU Deauthorization .....	3-48
<b>3.8.1</b>	Example Introduction .....	3-48
<b>3.8.2</b>	Configuration Flow Chart .....	3-48
<b>3.8.3</b>	Deleting the ONU from the Physical Identifier Whitelist ....	3-48
<b>3.8.4</b>	End of Configuration .....	3-50
<b>4</b>	Configuring Voice Services .....	4-1
<b>4.1</b>	Configuring the VoIP Services – H.248 Example .....	4-2
<b>4.1.1</b>	Configuring Rules.....	4-2
<b>4.1.2</b>	Service Network .....	4-2
<b>4.1.3</b>	Configuring the Services Respectively .....	4-3
<b>4.1.4</b>	Configuring the Services in a Batch Manner .....	4-19
<b>4.2</b>	Configuring the VoIP Service – MGCP Example.....	4-33
<b>4.2.1</b>	Configuration Rules.....	4-33
<b>4.2.2</b>	Service Network .....	4-33
<b>4.2.3</b>	Configuring the Services Respectively.....	4-34
<b>4.2.4</b>	Configuring the Services in a Batch Manner .....	4-49
<b>4.3</b>	Configuring the VoIP Services – SIP Example .....	4-63

	<b>4.3.1</b>	Configuring Rules.....	4-63
	<b>4.3.2</b>	Service Network .....	4-63
	<b>4.3.3</b>	Configuring the Services Respectively.....	4-64
	<b>4.3.4</b>	Configuring the Services in a Batch Manner .....	4-79
<b>4.4</b>		Configuring the DHCP Function for the NGN Uplink.....	4-93
<b>4.5</b>		Configuring the Advanced Profile Parameters for the Softswitch .	4-95
	<b>4.5.1</b>	Configuring the Softswitch Intercommunication Profiles....	
		.....	4-95
	<b>4.5.2</b>	Binding Softswitch Intercommunication Profiles.....	4-99
<b>4.6</b>		Configuring the NGN Heartbeat Parameters.....	4-102
<b>4.7</b>		Configuring the IAD MD5 Authentication.....	4-104
<b>4.8</b>		Registering / Unregistering the NGN User .....	4-106
<b>4.9</b>		Configuring the Digitmap.....	4-108
<b>4.10</b>		Displaying the Status Information.....	4-110
	<b>4.10.1</b>	Viewing the MGC Register Server's Status .....	4-110
	<b>4.10.2</b>	Viewing the NGN User Port's Status .....	4-111
	<b>4.10.3</b>	Viewing the IAD IP Information .....	4-112
<b>5</b>		Configuring Data Services.....	5-1
	<b>5.1</b>	Example for Data Service Configuration – in the VLAN Transparent Transmission Mode.....	5-2
	<b>5.1.1</b>	Configuration Rules.....	5-2
	<b>5.1.2</b>	Service Network .....	5-3
	<b>5.1.3</b>	Configuring Data Services Respectively (for the AN5506-04-B) .....	5-4
	<b>5.1.4</b>	Configuring Data Services in a Batch Manner (for the AN5506-04-B) .....	5-12
	<b>5.1.5</b>	Configuring Data Services Respectively (for the AN5506-10-B1) .....	5-23
	<b>5.1.6</b>	Configuring Data Services in a Batch Manner (for the AN5506-10-B1) .....	5-30
	<b>5.1.7</b>	End of Configuration .....	5-41
<b>5.2</b>		Example for Data Service Configuration – in the Tag Mode.....	5-42
	<b>5.2.1</b>	Configuration Rules.....	5-42

	<b>5.2.2</b>	Service Network .....	5-43
	<b>5.2.3</b>	Configuring Data Services Respectively (for the AN5506-04-B) .....	5-44
	<b>5.2.4</b>	Configuring Data Services in a Batch Manner (for the AN5506-04-B) .....	5-52
	<b>5.2.5</b>	Configuring Data Services Respectively (for the AN5506-10-B1) .....	5-63
	<b>5.2.6</b>	Configuring Data Services in a Batch Manner (for the AN5506-10-B1) .....	5-71
	<b>5.2.7</b>	End of Configuration .....	5-82
<b>5.3</b>		Example for Data Service Configuration – in the VLAN 1:1 Translation Mode .....	5-83
	<b>5.3.1</b>	Configuration Rules.....	5-83
	<b>5.3.2</b>	Service Network .....	5-84
	<b>5.3.3</b>	Configuring Data Services Respectively (for the AN5506-04-B) .....	5-85
	<b>5.3.4</b>	Configuring Data Services in a Batch Manner (for the AN5506-04-B) .....	5-96
	<b>5.3.5</b>	Configuring Data Services Respectively (for the AN5506-10-B1) .....	5-110
	<b>5.3.6</b>	Configuring Data Services in a Batch Manner (for the AN5506-10-B1) .....	5-120
	<b>5.3.7</b>	End of Configuration .....	5-133
<b>5.4</b>		Example for Data Service Configuration – in the VLAN N:1 Translation Mode .....	5-134
	<b>5.4.1</b>	Configuration Rules.....	5-134
	<b>5.4.2</b>	Service Network .....	5-135
	<b>5.4.3</b>	Configuring Data Services Respectively (for the AN5506-04-B) .....	5-136
	<b>5.4.4</b>	Configuring Data Services in a Batch Manner (for the AN5506-04-B) .....	5-148
	<b>5.4.5</b>	Configuring Data Services Respectively (for the AN5506-10-B1) .....	5-163

	<b>5.4.6</b>	Configuring Data Services in a Batch Manner (for the AN5506-10-B1) .....	5-173
	<b>5.4.7</b>	End of Configuration .....	5-187
<b>5.5</b>		Example for Data Service Configuration – in the Flexible QinQ mode .....	5-188
	<b>5.5.1</b>	Configuration Rules.....	5-188
	<b>5.5.2</b>	Service Network .....	5-188
	<b>5.5.3</b>	Configuring Data Services in the Flexible QinQ Mode (for the AN5506-04-B) .....	5-189
	<b>5.5.4</b>	Configuring Data Services in the Flexible QinQ Mode (for the AN5506-10-B1) .....	5-201
	<b>5.5.5</b>	End of Configuration .....	5-210
<b>6</b>		Configuring Multicast Services .....	6-1
	<b>6.1</b>	Example for Multicast Service Configuration – Proxy Mode.....	6-2
	<b>6.1.1</b>	Configuration Rules.....	6-2
	<b>6.1.2</b>	Service Network .....	6-3
	<b>6.1.3</b>	Configuring Multicast Services Respectively (for the AN5506-04-B) .....	6-4
	<b>6.1.4</b>	Configuring Multicast Services Respectively (for the AN5506-10-B1) .....	6-20
	<b>6.1.5</b>	Configuring Multicast Services in a Batch Manner (for the AN5506-04-B) .....	6-30
	<b>6.1.6</b>	Configuring Multicast Services in a Batch Manner (for the AN5506-10-B1) .....	6-43
	<b>6.1.7</b>	Viewing Operations .....	6-55
<b>6.2</b>		Example for Multicast Service Configuration – Controllable Mode .....	6-58
	<b>6.2.1</b>	Configuration Rules.....	6-58
	<b>6.2.2</b>	Service Network .....	6-59
	<b>6.2.3</b>	Configuring Multicast Services Respectively.....	6-59
	<b>6.2.4</b>	Configuring Multicast Services in a Batch Manner .....	6-80
	<b>6.2.5</b>	Viewing Operations .....	6-91
<b>6.3</b>		Configuring the Multicast Concatenation .....	6-96

	<b>6.3.1</b>	Configuring the Multicast Cascade Port .....	6-96
	<b>6.3.2</b>	Viewing the Uplink Port Information .....	6-97
<b>6.4</b>		Configuring the Maximum Multicast Bandwidth for Uplink Ports ..	6-99
<b>6.5</b>		Configuring OLT Multicast Protocol Parameters .....	6-101
<b>6.6</b>		Configuring ONU Multicast Parameters .....	6-103
<b>6.7</b>		Configuring the Prejoin Groups .....	6-105
<b>6.8</b>		Configuring Multicast Default Preview Parameters .....	6-107
<b>6.9</b>		Configuring Multicast Logs .....	6-109
	<b>6.9.1</b>	Configuring the Multicast Log Time .....	6-109
	<b>6.9.2</b>	Configuring the Automatic Uploading of the Multicast Logs .....	6-110
	<b>6.9.3</b>	Configuring the Uploading of the Multicast Logs to the FTP .....	6-112
	<b>6.9.4</b>	Viewing the Multicast Logs.....	6-113
	<b>6.9.5</b>	Clearing the Logs .....	6-114
<b>6.10</b>		Viewing the Multicast Statistical Information .....	6-116
	<b>6.10.1</b>	Viewing the Statistical Information of the Multicast Groups .....	6-116
	<b>6.10.2</b>	Viewing the Statistical Information of the ONU Port .	6-117
<b>6.11</b>		Forcing the Users to Leave .....	6-118
<b>6.12</b>		Refreshing the Multicast Configuration Information .....	6-120
<b>6.13</b>		Querying the Fast Leave Capability of the ONU .....	6-121
<b>7</b>		Configuring the TDM Services.....	7-1
	<b>7.1</b>	Configuration Rules .....	7-2
	<b>7.2</b>	Service Network.....	7-2
	<b>7.3</b>	Planning Data .....	7-3
	<b>7.4</b>	Configuration Flow .....	7-4
	<b>7.5</b>	Configuring the System Clock.....	7-5
	<b>7.6</b>	Configuring the Clock Recovery.....	7-6
	<b>7.7</b>	Configuring the Bandwidth Allocation.....	7-7
	<b>7.8</b>	Configuring the E1 Parameters for ONU Subscribers.....	7-8
	<b>7.9</b>	End of Configuration .....	7-9

<b>8</b>	Configuring the Wi-Fi Service.....	8-1
<b>8.1</b>	Configuration Rules .....	8-2
<b>8.2</b>	Configuration Example of the Wi-Fi Service.....	8-3
<b>8.2.1</b>	Service Network .....	8-3
<b>8.2.2</b>	Planning Data.....	8-4
<b>8.2.3</b>	Configuration Flow .....	8-6
<b>8.2.4</b>	Configuring the Local Service VLAN .....	8-7
<b>8.2.5</b>	Configuring the GPON Service Bandwidth.....	8-8
<b>8.2.6</b>	Configuring the WAN Connection Service of the TL1 Interface .....	8-9
<b>8.2.7</b>	Configuring the Wi-Fi Service.....	8-10
<b>8.2.8</b>	End of Configuration .....	8-11
<b>9</b>	Configuring the CATV Service.....	9-1
<b>9.1</b>	Configuration Rules .....	9-2
<b>9.2</b>	An Example for the CATV Service Configuration .....	9-2
<b>9.2.1</b>	Service Network .....	9-2
<b>9.2.2</b>	Planning Data.....	9-2
<b>9.2.3</b>	Configuring the CATV Service.....	9-3
<b>10</b>	Upgrading the Software.....	10-1
<b>10.1</b>	Important Notice.....	10-2
<b>10.2</b>	Upgrading the Core Switch Card .....	10-3
<b>10.2.1</b>	Upgrading Rules .....	10-3
<b>10.2.2</b>	Prerequisites .....	10-3
<b>10.2.3</b>	Planning Data.....	10-4
<b>10.2.4</b>	Upgrading Flow Chart .....	10-5
<b>10.2.5</b>	Saving the Current Configuration into the Flash.....	10-5
<b>10.2.6</b>	Backing Up the Current Configuration File.....	10-6
<b>10.2.7</b>	Backing Up the System Software.....	10-7
<b>10.2.8</b>	Upgrading the Original Standby Core Switch Card Software .....	10-8
<b>10.2.9</b>	Rebooting the Original Standby Core Switch Card...	10-11
<b>10.2.10</b>	Forcing the Active-standby Switchover .....	10-12

	<b>10.2.11</b>	Upgrading the Current Standby Core Switch Card Software .....	10-13
	<b>10.2.12</b>	Rebooting the Current Standby Core Switch Card ...	10-16
	<b>10.2.13</b>	Checking the Software Version of the Core Switch Card .....	10-17
<b>10.3</b>		Upgrading the GPON Interface Card / TDM Interface Card / Public Card .....	10-19
	<b>10.3.1</b>	Upgrading Rules .....	10-19
	<b>10.3.2</b>	Prerequisites .....	10-19
	<b>10.3.3</b>	Planning Data.....	10-20
	<b>10.3.4</b>	Upgrading Flow Chart .....	10-20
	<b>10.3.5</b>	Upgrading the GPON Interface Card .....	10-21
	<b>10.3.6</b>	Checking the Software Version of the GPON Interface Card .....	10-22
<b>10.4</b>		Upgrading the GPON Interface Card in a Batch Manner .....	10-24
	<b>10.4.1</b>	Upgrading Rules .....	10-24
	<b>10.4.2</b>	Prerequisites .....	10-24
	<b>10.4.3</b>	Planning Data.....	10-25
	<b>10.4.4</b>	Upgrading Flow Chart .....	10-25
	<b>10.4.5</b>	Upgrading the GPON Interface Card in a Batch Manner ..	10-26
	<b>10.4.6</b>	Checking the Software Version of the GPON Interface Card .....	10-27
<b>10.5</b>		Upgrading the ONU Manually .....	10-29
	<b>10.5.1</b>	Upgrading Rules .....	10-29
	<b>10.5.2</b>	Prerequisites .....	10-29
	<b>10.5.3</b>	Planning Data.....	10-30
	<b>10.5.4</b>	Upgrading Flow Chart .....	10-30
	<b>10.5.5</b>	Upgrading the ONU Software Manually .....	10-31
	<b>10.5.6</b>	Rebooting the ONU.....	10-32
	<b>10.5.7</b>	Checking the ONU Software Version .....	10-34
<b>10.6</b>		Upgrading the ONU Automatically .....	10-36
	<b>10.6.1</b>	Upgrade Rules .....	10-36

	<b>10.6.2</b>	Planning Data.....	10-36
	<b>10.6.3</b>	Upgrade Flow Chart.....	10-37
	<b>10.6.4</b>	Upgrading the ONU Software Automatically.....	10-37
	<b>10.6.5</b>	Checking the ONU Software Version .....	10-39
<b>11</b>		Configuring the Signal Tracing .....	11-1
	<b>11.1</b>	Configuration Rules .....	11-2
	<b>11.2</b>	Network diagram.....	11-3
	<b>11.3</b>	Planning Data .....	11-4
	<b>11.4</b>	Configuration Flow Chart .....	11-4
	<b>11.5</b>	Configuring the Signal Tracing Parameters.....	11-5
	<b>11.6</b>	Checking the Signal Tracing Result .....	11-7
	<b>11.7</b>	End of Configuration .....	11-9
<b>12</b>		Flow Classification Configuration .....	12-1
	<b>12.1</b>	Configuration Rules .....	12-2
	<b>12.2</b>	Configuration Flow Chart .....	12-2
	<b>12.3</b>	Flow Classification Configuration Example – Based on MAC Address .....	12-3
	<b>12.3.1</b>	Planning Data.....	12-3
	<b>12.3.2</b>	Configuring the Flow Classification Rules .....	12-4
	<b>12.3.3</b>	Configuring the Flow Policy.....	12-6
	<b>12.3.4</b>	Binding the ONU Port with the Flow Policy .....	12-7
	<b>12.3.5</b>	End of Configuration .....	12-8
	<b>12.4</b>	Flow Classification Configuration Example – Based on IP Address .....	12-9
	<b>12.4.1</b>	Planning Data.....	12-9
	<b>12.4.2</b>	Configuring the Flow Classification Rules .....	12-10
	<b>12.4.3</b>	Configuring the Flow Policy.....	12-11
	<b>12.4.4</b>	Binding the ONU Port with the Flow Policy .....	12-12
	<b>12.4.5</b>	End of Configuration .....	12-14
<b>13</b>		Configuring the QoS.....	13-1
	<b>13.1</b>	Configuration Rules .....	13-2
	<b>13.2</b>	QoS Start-up Example – Based on VLAN Mode .....	13-3

	<b>13.2.1</b>	Planning Data.....	13-3
	<b>13.2.2</b>	Configuration Flow Chart .....	13-4
	<b>13.2.3</b>	Configuring QoS Profiles.....	13-4
	<b>13.2.4</b>	Binding the Slot and the QoS Profile.....	13-5
	<b>13.2.5</b>	End of Configuration .....	13-6
<b>13.3</b>		QoS Start-up Example – Based on MAC Address .....	13-7
	<b>13.3.1</b>	Planning Data.....	13-7
	<b>13.3.2</b>	Configuration Flow Chart .....	13-8
	<b>13.3.3</b>	Configuring the QoS Profiles.....	13-8
	<b>13.3.4</b>	Binding the Uplink Port and the QoS Profile .....	13-9
	<b>13.3.5</b>	End of Configuration .....	13-10
<b>13.4</b>		Unbinding the Object and the QoS Profile .....	13-11
	<b>13.4.1</b>	Unbinding the Slot and the QoS Profile.....	13-11
	<b>13.4.2</b>	Unbinding the Uplink Port and the QoS Profile .....	13-12
<b>14</b>		Configuring the PON Protection .....	14-1
	<b>14.1</b>	Background Information .....	14-2
	<b>14.2</b>	Configuration Rules .....	14-3
	<b>14.3</b>	PON Protection Configuration Example.....	14-4
	<b>14.3.1</b>	Prerequisites .....	14-4
	<b>14.3.2</b>	Planning Data.....	14-4
	<b>14.3.3</b>	Configuring the PON Port Protection Groups.....	14-4
	<b>14.3.4</b>	Configuring PON Port Protection Group Mode.....	14-7
	<b>14.3.5</b>	End of Configuration .....	14-8
<b>15</b>		Detecting the Optical Power .....	15-1
	<b>15.1</b>	Viewing the Optical Module Parameter Information of the GC4B / GC8B Card .....	15-2
	<b>15.2</b>	Viewing Optical Module Parameter Information of the ONU .....	15-4
<b>16</b>		Configuring Line Identifier Management.....	16-1
	<b>16.1</b>	Background Knowledge .....	16-2
	<b>16.2</b>	Configuration Rules .....	16-3
	<b>16.3</b>	Line Identifier Management Example.....	16-4
	<b>16.3.1</b>	Planning Data.....	16-4

<b>16.3.2</b>	Configuration Flow Chart .....	16-5
<b>16.3.3</b>	Line Identifier Management.....	16-5
<b>16.3.4</b>	Circuit ID Format .....	16-6
<b>16.3.5</b>	End of Configuration .....	16-7
<b>17</b>	POTS Internal Line and External Line Test .....	17-1
<b>17.1</b>	POTS Internal Line Test.....	17-2
<b>17.1.1</b>	Test Rules .....	17-2
<b>17.1.2</b>	Planning Data.....	17-2
<b>17.1.3</b>	Internal Line Test Example .....	17-2
<b>17.2</b>	POTS External Line Test.....	17-4
<b>17.2.1</b>	Test Rules .....	17-4
<b>17.2.2</b>	Planning Data.....	17-4
<b>17.2.3</b>	External Line Test Example.....	17-4
Appendix A	FTP Operation Guide.....	A-1
<b>A.1</b>	Overview of the FTP .....	A-1
<b>A.2</b>	Configuration Steps.....	A-1

# Figures

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Figure 1-1	Connection with the CLI network management system .....	1-3
Figure 1-2	Network diagram of the ANM2000 .....	1-10
Figure 1-3	Flow chart of configuring the ANM2000 management path.....	1-11
Figure 1-4	The <b>ANM2000 user login</b> dialog box .....	1-17
Figure 2-1	Basic configuration flow chart.....	2-3
Figure 2-2	The <b>Add Domain</b> dialog box.....	2-4
Figure 2-3	The object tree management domain.....	2-5
Figure 2-4	Adding the AN5116-06B system .....	2-7
Figure 2-5	The system in the <b>Object Tree</b> pane.....	2-7
Figure 2-6	Adding a module .....	2-8
Figure 2-7	The module in the <b>Object Tree</b> pane .....	2-9
Figure 2-8	Detecting the physical configuration automatically.....	2-11
Figure 2-9	Detecting the results of the physical configurations .....	2-11
Figure 2-10	The AN5116-06B subrack view .....	2-12
Figure 2-11	The AN5116-06B subrack view .....	2-12
Figure 2-12	Adding a card .....	2-13
Figure 2-13	Adding a card to the AN5116-06B subrack.....	2-14
Figure 2-14	The dialog box for setting card authorization.....	2-16
Figure 2-15	Configuring card authorization .....	2-17
Figure 2-16	Configuring card authorization .....	2-18
Figure 2-17	Confirming card pre-authorization .....	2-19
Figure 2-18	Completing card pre-authorization .....	2-20
Figure 2-19	Synchronizing the time of the system.....	2-21
Figure 2-20	The successful time synchronization of the system .....	2-22
Figure 3-1	Configuration flow chart for the non-authentication mode .....	3-4
Figure 3-2	The <b>PON Authentication Mode</b> window -- in non-authentication mode .....	3-5
Figure 3-3	Configuring the non-authentication mode.....	3-6

Figure 3-4	Configuration flow chart for the physical identifier authentication mode .....	3-8
Figure 3-5	The <b>PON Authentication Mode</b> window -- in the physical identifier authentication mode .....	3-9
Figure 3-6	Configuring the physical identifier authentication mode .....	3-10
Figure 3-7	Pre-authentication configuration based on physical identifier.....	3-11
Figure 3-8	Successful pre-authentication configuration based on physical identifier.....	3-12
Figure 3-9	The <b>Get Unauthorized ONU</b> dialog box -- based on physical identifier.....	3-13
Figure 3-10	The <b>Physical Address White List Setting</b> window -- based on physical identifier.....	3-13
Figure 3-11	Successful automatic authorization -- based on physical identifier .....	3-14
Figure 3-12	The ONU list -- based on physical identifier .....	3-14
Figure 3-15	Configuration flow chart for the password authentication mode .	3-17
Figure 3-14	The <b>PON Authentication Mode</b> window – based on password	3-18
Figure 3-15	Configuring the password authentication mode – based on password.....	3-19
Figure 3-16	Pre-authentication configuration – based on password.....	3-20
Figure 3-17	Successful pre-authentication configuration -- based on password .....	3-21
Figure 3-18	The <b>Get Unauthorized ONU</b> dialog box – based on password .	3-22
Figure 3-19	The <b>Password White List Setting</b> window – based on password .....	3-23
Figure 3-20	Successful automatic authorization – based on password .....	3-23
Figure 3-21	The ONU list – based on password.....	3-24
Figure 3-22	Configuration flow chart for the physical identifier + password authentication mode .....	3-26
Figure 3-23	The <b>PON Authentication Mode</b> window – based on physical identifier + password .....	3-27
Figure 3-24	Configuring the physical identifier + password authentication mode .....	3-28

Figure 3-25	Pre-authentication configuration – based on physical identifier + password.....	3-29
Figure 3-26	Successful pre-authentication configuration – based on physical identifier + password .....	3-30
Figure 3-27	The <b>Get Unauthorized ONU</b> dialog box – based on physical identifier + password .....	3-31
Figure 3-28	The <b>Physical Address White List Setting</b> window – based on physical identifier + password .....	3-32
Figure 3-29	Successful automatic authorization – based on physical identifier + password.....	3-32
Figure 3-30	The ONU list – based on physical identifier + password .....	3-33
Figure 3-31	Configuration flow chart for authentication mode switching with maintaining the original ONU configuration .....	3-34
Figure 3-32	The <b>PON Authentication Mode</b> window -- maintaining the original ONU authorization and configuration .....	3-35
Figure 3-33	Configuring mode switching -- maintaining the original ONU authorization and configuration .....	3-36
Figure 3-34	The <b>Get Unauthorized ONU</b> dialog box -- maintaining the original ONU authorization and configuration .....	3-37
Figure 3-35	The <b>Password White List Setting</b> window -- maintaining the original ONU authorization and configuration.....	3-38
Figure 3-36	Successful password whitelist authorization -- maintaining the original ONU authorization and configuration.....	3-38
Figure 3-37	The physical address whitelist after the switching -- maintaining the original ONU authorization and configuration.....	3-39
Figure 3-38	The ONU list -- maintaining the original ONU authorization and configuration.....	3-39
Figure 3-39	Configuration flow chart for authentication mode switching without maintaining the original ONU configuration .....	3-40
Figure 3-40	The <b>Physical Address White List Setting</b> window .....	3-41
Figure 3-41	Deleting the ONU authorization information.....	3-42
Figure 3-42	The <b>PON Authentication Mode</b> window – without maintaining original ONU authorization and configuration.....	3-43

Figure 3-43	Switching the authentication mode – without maintaining original ONU authorization and configuration .....	3-44
Figure 3-44	The <b>Get Unauthorized ONU</b> dialog box – without maintaining original ONU authorization and configuration.....	3-45
Figure 3-45	The <b>Password White List Setting</b> window – without maintaining original ONU authorization and configuration.....	3-46
Figure 3-46	Successful password whitelist authorization – without maintaining original ONU authorization and configuration.....	3-46
Figure 3-47	The ONU list – without maintaining original ONU authorization and configuration.....	3-47
Figure 3-48	Configuration flow chart for ONU deauthorization under the authentication mode based on physical identifier.....	3-48
Figure 3-49	The <b>Physical Address White List Setting</b> window – ONU deauthorization.....	3-49
Figure 3-50	Deleting ONU authorization information.....	3-50
Figure 4-1	The VoIP service network based on the H.248 protocol.....	4-2
Figure 4-2	Flow chart for configuring the VoIP services respectively -- H.248 .....	4-9
Figure 4-3	Configuring the local end service VLAN - H.248 example.....	4-10
Figure 4-4	Configuring the NGN uplink interface - H.248 example.....	4-11
Figure 4-5	Configuring the NGN uplink subscriber data - H.248 example ...	4-12
Figure 4-6	AN5506-04-B bandwidth configuration – H.248 example.....	4-13
Figure 4-7	AN5506-10-B1 bandwidth configuration – H.248 example.....	4-14
Figure 4-8	FXS1 voice configuration of the AN5506-04-B – H.248 example	4-15
Figure 4-9	FXS2 voice configuration of the AN5506-04-B – H.248 example	4-16
Figure 4-10	FXS1 voice configuration of the AN5506-10-B1 – H.248 example .....	4-17
Figure 4-11	FXS2 voice configuration of the AN5506-10-B1 – H.248 example .....	4-18
Figure 4-12	Flow chart for configuring the VoIP services in a batch manner - H.248 .....	4-24
Figure 4-13	Configuring the local end service VLAN - H.248 example.....	4-25
Figure 4-14	Configuring the NGN uplink interface - H.248 example.....	4-26

Figure 4-15	The ONU bandwidth configuration profile – H.248 example.....	4-28
Figure 4-16	ONU configuration – H.248 example.....	4-29
Figure 4-17	ONU voice port advanced configuration profile – H.248 example .....	4-30
Figure 4-18	Basic voice configuration for the ONU – H.248 example .....	4-31
Figure 4-19	ONU voice port configuration – H.248 example .....	4-32
Figure 4-20	The VoIP service network based on the MGCP protocol.....	4-33
Figure 4-21	Flow chart for configuring the VoIP services respectively - MGCP .....	4-39
Figure 4-22	Configuring the local end service VLAN - MGCP example.....	4-40
Figure 4-23	Configuring the NGN uplink port - MGCP example .....	4-41
Figure 4-24	Configuring the NGN uplink subscriber data - MGCP example..	4-42
Figure 4-25	AN5506-04-B bandwidth configuration – MGCP example.....	4-43
Figure 4-26	AN5506-10-B1 bandwidth configuration – MGCP example.....	4-44
Figure 4-27	FXS1 voice configuration of the AN5506-04-B – MGCP example .....	4-45
Figure 4-28	FXS2 voice configuration of the AN5506-04-B – MGCP example .....	4-46
Figure 4-29	FXS1 voice configuration of the AN5506-10-B1 -- MGCP example .....	4-47
Figure 4-30	FXS2 voice configuration of the AN5506-10-B1 – MGCP example .....	4-48
Figure 4-31	Flow chart for configuring VoIP services in a batch manner - MGCP .....	4-54
Figure 4-32	Configuring the local end service VLAN - MGCP example.....	4-55
Figure 4-33	Configuring the NGN uplink interface - MGCP example.....	4-56
Figure 4-34	The ONU bandwidth configuration profile.....	4-57
Figure 4-35	ONU configuration.....	4-59
Figure 4-36	ONU voice port advanced configuration profile .....	4-60
Figure 4-37	Basic voice configuration for the ONU .....	4-61
Figure 4-38	ONU voice port configuration .....	4-62
Figure 4-39	The VoIP service network based on the SIP protocol.....	4-63

Figure 4-40	Flow chart for configuring the VoIP services respectively – SIP example.....	4-69
Figure 4-41	Configuring the local end service VLAN - SIP example.....	4-70
Figure 4-42	Configuring the NGN uplink interface - SIP example.....	4-71
Figure 4-43	Configuring the NGN uplink subscriber data - SIP example.....	4-72
Figure 4-44	AN5506-04-B bandwidth configuration – SIP example.....	4-73
Figure 4-45	AN5506-10-B1 bandwidth configuration – SIP example.....	4-74
Figure 4-46	FXS1 voice configuration of the AN5506-04-B – SIP example...	4-75
Figure 4-47	FXS2 voice configuration of the AN5506-04-B – SIP example...	4-76
Figure 4-48	FXS1 voice configuration of the AN5506-10-B1 – SIP example.	4-77
Figure 4-49	FXS2 voice configuration of the AN5506-10-B1 – SIP example.	4-78
Figure 4-50	Flow chart for configuring VoIP services in a batch manner - SIP .....	4-84
Figure 4-51	Configuring the local end service VLAN - SIP example.....	4-85
Figure 4-52	Configuring the NGN uplink interface - SIP example.....	4-86
Figure 4-53	The ONU bandwidth configuration profile – SIP example .....	4-88
Figure 4-54	ONU configuration – SIP example .....	4-89
Figure 4-55	ONU voice port advanced configuration profile .....	4-90
Figure 4-56	Basic voice configuration for the ONU – SIP example .....	4-91
Figure 4-57	ONU voice port configuration – SIP example .....	4-92
Figure 4-58	Configuring the parameters of the DHCP of the NGN uplink interface .....	4-94
Figure 4-59	Configuring softswitch intercommunication profiles.....	4-99
Figure 4-60	Binding the softswitch intercommunication profiles .....	4-101
Figure 4-61	Configuring the NGN heartbeat parameters.....	4-103
Figure 4-62	Configuring the IAD MD5 authentication .....	4-105
Figure 4-63	Registering / unregistering NGN users.....	4-107
Figure 4-64	Configuring the digitmap .....	4-109
Figure 4-65	5Displaying the MGC register server's status .....	4-111
Figure 4-66	Displaying the NGN user port's status.....	4-112
Figure 4-67	Displaying the IAD IP information.....	4-113
Figure 5-1	The data service network in the VLAN transparent transmission mode .....	5-3

Figure 5-2	Flow chart for provisioning data services respectively in the transparent transmission mode (for the AN5506-04-B) .....	5-7
Figure 5-3	The <b>Local End Service VLAN</b> window - completed.....	5-8
Figure 5-4	The <b>Bandwidth Config</b> window - completed.....	5-9
Figure 5-5	The ONU port service configuration .....	5-10
Figure 5-6	The <b>Services Configuration</b> dialog box .....	5-10
Figure 5-7	The port service configuration completed .....	5-11
Figure 5-8	The batch configuration flow chart of data service provisioning in the transparent transmission mode (for the AN5506-04-B) .....	5-15
Figure 5-9	The <b>Bandwidth Config Profile</b> window -completed.....	5-17
Figure 5-10	The <b>Data Service Profile</b> window - completed.....	5-18
Figure 5-11	The <b>ONU Subprofile Config</b> dialog box.....	5-19
Figure 5-12	The <b>Service Profile</b> window .....	5-19
Figure 5-13	The <b>ONU Port Profile Config</b> dialog box .....	5-20
Figure 5-14	The <b>Service Profile</b> window - completed .....	5-21
Figure 5-15	The <b>Select Objects</b> dialog box for the ONU number configuration .....	5-22
Figure 5-16	The <b>Service Profile Binding</b> window for the AN5506-04-B - completed.....	5-22
Figure 5-17	Flow chart for provisioning data services respectively in the transparent transmission mode (for the AN5506-10-B1) .....	5-25
Figure 5-18	The <b>Bandwidth Config</b> window - completed.....	5-26
Figure 5-19	The ONU port service configuration .....	5-27
Figure 5-20	The <b>Services Configuration</b> dialog box.....	5-28
Figure 5-21	The port service configuration completed.....	5-29
Figure 5-22	The batch configuration flow chart of data service provisioning in the transparent transmission mode (for the AN5506-10-B1) .....	5-32
Figure 5-23	The <b>Bandwidth Config Profile</b> window - completed.....	5-34
Figure 5-24	Set configuration objects .....	5-35
Figure 5-25	Binding the bandwidth allocation profile .....	5-35
Figure 5-26	The <b>Service Model Profile</b> window .....	5-36
Figure 5-27	The <b>SVLAN Profile</b> window .....	5-37
Figure 5-28	Set configuration objects .....	5-38

Figure 5-29	The <b>ONU Data Port Configure</b> window .....	5-39
Figure 5-30	Set the configuration objects .....	5-40
Figure 5-31	The <b>ONU Data Service Configure</b> window.....	5-40
Figure 5-32	The data service network diagram (in the Tag mode).....	5-43
Figure 5-33	Flow chart for provisioning data services respectively in the Tag mode (for the AN5506-04-B) .....	5-47
Figure 5-34	The <b>Local End Service VLAN</b> window - completed .....	5-48
Figure 5-35	The <b>Bandwidth Config</b> window - completed.....	5-49
Figure 5-36	The ONU port service configuration .....	5-50
Figure 5-37	The <b>Services Configuration</b> dialog box.....	5-50
Figure 5-38	The port service configuration completed.....	5-51
Figure 5-39	The batch configuration flow chart of data service provisioning in the Tag mode (for the AN5506-04-B) .....	5-55
Figure 5-40	The <b>Bandwidth Config Profile</b> window - completed.....	5-57
Figure 5-41	The <b>Data Service Profile</b> window - completed.....	5-58
Figure 5-42	The <b>ONU Subprofile Config</b> dialog box.....	5-59
Figure 5-43	The <b>Service Profile</b> window .....	5-59
Figure 5-44	The <b>ONU Port Profile Config</b> dialog box .....	5-60
Figure 5-45	The <b>Service Profile</b> window - completed .....	5-61
Figure 5-46	The <b>Select Objects</b> dialog box .....	5-62
Figure 5-47	The <b>Service Profile Binding</b> window.....	5-63
Figure 5-48	Flow chart for provisioning data services respectively in the Tag mode (for the AN5506-10-B1) .....	5-66
Figure 5-49	The <b>Bandwidth Config</b> window - completed.....	5-67
Figure 5-50	The ONU port service configuration .....	5-68
Figure 5-51	The <b>Services Configuration</b> dialog box.....	5-69
Figure 5-52	The ONU port service configuration completed.....	5-70
Figure 5-53	The batch configuration flow chart of data service provisioning in the Tag mode (for the AN5506-10-B1) .....	5-73
Figure 5-54	The <b>Bandwidth Config Profile</b> window - completed.....	5-75
Figure 5-55	Set the configuration objects .....	5-76
Figure 5-56	The <b>ONU Config</b> window - completed .....	5-76
Figure 5-57	The <b>Service Model Profile</b> window - completed .....	5-77

Figure 5-58	The <b>SVLAN Profile</b> window - completed .....	5-78
Figure 5-59	Set the configuration objects .....	5-79
Figure 5-60	The <b>ONU Data Port Configure</b> window .....	5-80
Figure 5-61	The <b>Add Item Number</b> dialog box.....	5-81
Figure 5-62	The <b>ONU Data Service Configure</b> window.....	5-81
Figure 5-63	The data service network diagram (in the VLAN 1:1 translation mode).....	5-84
Figure 5-64	Flow chart for provisioning data services respectively in the VLAN 1:1 translation mode (for the AN5506-04-B).....	5-88
Figure 5-65	The <b>Local End Service VLAN</b> window - completed.....	5-89
Figure 5-66	The <b>Bandwidth Config</b> window.....	5-90
Figure 5-67	The ONU port service configuration .....	5-91
Figure 5-68	The <b>Services Configuration</b> dialog box.....	5-92
Figure 5-69	The port service configuration completed.....	5-93
Figure 5-70	The <b>GPON OLT VLAN Operation Table</b> window - completed ..	5-94
Figure 5-71	The <b>PON attach / detach VLAN Table</b> window.....	5-95
Figure 5-72	The batch configuration flow chart of data service provisioning in the VLAN 1:1 translation mode (for the AN5506-04-B) .....	5-100
Figure 5-73	The <b>Bandwidth Config Profile</b> window - completed.....	5-102
Figure 5-74	The <b>Data Service Profile</b> window - completed.....	5-103
Figure 5-75	The <b>ONU Subprofile Config</b> dialog box.....	5-104
Figure 5-76	The <b>Service Profile</b> window .....	5-104
Figure 5-77	The <b>ONU Port Profile Config</b> dialog box .....	5-105
Figure 5-78	The <b>Service Profile</b> window - completed .....	5-106
Figure 5-79	The <b>Select Objects</b> dialog box .....	5-107
Figure 5-80	The <b>Service Profile Binding</b> window.....	5-108
Figure 5-81	The <b>GPON OLT VLAN Operation Table</b> window - completed	5-109
Figure 5-82	The <b>PON attach / detach VLAN Table</b> window - completed...	5-110
Figure 5-83	Flow chart for provisioning data services respectively in the VLAN 1:1 translation mode (for the AN5506-10-B1).....	5-113
Figure 5-84	The <b>Bandwidth Config</b> window.....	5-114
Figure 5-85	The ONU port data service configuration .....	5-115
Figure 5-86	The <b>Services Configuration</b> dialog box.....	5-116

Figure 5-87	The port service configuration completed.....	5-117
Figure 5-88	The <b>GPON OLT VLAN Operation Table</b> window - completed	5-118
Figure 5-89	The <b>PON attach / detach VLAN table</b> window - completed....	5-119
Figure 5-90	The batch configuration flow chart of data service provisioning in the VLAN 1:1 translation mode (for the AN5506-10-B1) .....	5-123
Figure 5-91	The <b>Bandwidth Config Profile</b> window - completed.....	5-125
Figure 5-92	Set the configuration object.....	5-126
Figure 5-93	Binding the bandwidth allocation profile .....	5-126
Figure 5-94	The <b>Service Model Profile</b> window - completed .....	5-127
Figure 5-95	Set configuration objects .....	5-128
Figure 5-96	The <b>ONU Data Port Configure</b> window - completed.....	5-129
Figure 5-97	Set configuration objects .....	5-130
Figure 5-98	The <b>ONU Data Service Configure</b> window - completed .....	5-130
Figure 5-99	The <b>GPON OLT VLAN Operation Table</b> window - completed	5-131
Figure 5-100	The <b>PON attach / detach VLAN Table</b> window - completed ...	5-133
Figure 5-101	The data service network diagram (in the VLAN N:1 translation mode).....	5-135
Figure 5-102	Flow chart for provisioning data services respectively in the VLAN N:1 translation mode (for the AN5506-04-B) .....	5-140
Figure 5-103	The <b>Local End Service VLAN</b> window – completed .....	5-141
Figure 5-104	The <b>Bandwidth Config</b> window - completed.....	5-142
Figure 5-105	The ONU port service configuration .....	5-143
Figure 5-106	The <b>Services Configuration</b> dialog box (1) .....	5-143
Figure 5-107	The <b>Services Configuration</b> dialog box (2) .....	5-144
Figure 5-108	The port service configuration completed.....	5-145
Figure 5-109	The <b>GPON OLT VLAN Operation Table</b> window - completed	5-146
Figure 5-110	The <b>PON attach / detach VLAN Table</b> window - completed ...	5-147
Figure 5-111	The batch configuration flow chart of data service provisioning in the VLAN N:1 translation mode (for the AN5506-04-B).....	5-152
Figure 5-112	The <b>Bandwidth Config Profile</b> window - completed.....	5-153
Figure 5-113	The <b>Data Service Profile</b> window - completed .....	5-155
Figure 5-114	The <b>ONU Subprofile Config</b> dialog box.....	5-156
Figure 5-115	The <b>Service Profile</b> window .....	5-156

Figure 5-116	The <b>ONU Port Profile Config</b> dialog box .....	5-157
Figure 5-117	The <b>Service Profile</b> window - completed .....	5-158
Figure 5-118	The <b>Select Objects</b> dialog box .....	5-159
Figure 5-119	The <b>Service Profile Binding</b> window - completed .....	5-160
Figure 5-120	The <b>GPON OLT VLAN Operation Table</b> window - completed .....	5-161
Figure 5-121	The <b>PON attach / detach VLAN Table</b> window - completed ...	5-162
Figure 5-122	Flow chart for provisioning data services respectively in the VLAN N:1 translation mode (for the AN5506-10-B1) .....	5-166
Figure 5-123	The <b>Bandwidth Config</b> window.....	5-167
Figure 5-124	The ONU port service configuration .....	5-168
Figure 5-125	The service configuration (1).....	5-169
Figure 5-126	The services configuration (2) .....	5-169
Figure 5-127	The port service configuration - completed .....	5-170
Figure 5-128	The <b>GPON OLT VLAN Operation Table</b> window - completed .....	5-171
Figure 5-129	The <b>PON attach / detach VLAN Table</b> window - completed ...	5-172
Figure 5-130	The batch configuration flow chart of data service provisioning in the VLAN N:1 translation mode (for the AN5506-10-B1).....	5-176
Figure 5-131	The <b>Bandwidth Config Profile</b> window - completed.....	5-177
Figure 5-132	Set configuration objects .....	5-178
Figure 5-133	Binding the bandwidth allocation profile .....	5-179
Figure 5-134	The <b>Service Model Profile</b> window - completed .....	5-180
Figure 5-135	Set configuration objects .....	5-181
Figure 5-136	The <b>ONU Data Port Configure</b> window - completed.....	5-181
Figure 5-137	Set configuration objects (1).....	5-182
Figure 5-138	The <b>Batch Modify</b> dialog box .....	5-183
Figure 5-139	Set configuration objects (2).....	5-184
Figure 5-140	The <b>ONU Data Service Configure</b> window - completed .....	5-184
Figure 5-141	The <b>GPON OLT VLAN Operation Table</b> window - completed .....	5-185
Figure 5-142	The <b>PON attach / detach VLAN Table</b> window - completed ...	5-187
Figure 5-143	The data service network diagram (in the flexible QinQ mode) .....	5-188
Figure 5-144	The configuration flow chart of the data service provisioning in the flexible QinQ mode (for AN5506-04-B).....	5-193
Figure 5-145	The <b>Local End Service VLAN</b> window - completed.....	5-194

Figure 5-146	The <b>Bandwidth Config</b> window - completed .....	5-195
Figure 5-147	The ONU port service configuration .....	5-196
Figure 5-148	The <b>Services Configuration</b> dialog box.....	5-197
Figure 5-149	The port service configuration - completed .....	5-198
Figure 5-150	The <b>OLT QinQ Domain</b> window - completed.....	5-199
Figure 5-151	The <b>PON attach / detach VLAN Table</b> window - completed ...	5-200
Figure 5-152	The configuration flow chart of the data service provisioning in the flexible QinQ mode (for the AN5506-10-B1).....	5-204
Figure 5-153	The <b>Bandwidth Config</b> window – completed ONU .....	5-205
Figure 5-154	The ONU port service configuration .....	5-206
Figure 5-155	The <b>Services Configuration</b> dialog box.....	5-207
Figure 5-156	The port service configuration completed.....	5-208
Figure 5-157	The <b>OLT QinQ Domain</b> window – completed.....	5-209
Figure 5-158	The <b>PON attach / detach VLAN Table</b> window - completed ...	5-210
Figure 6-1	Network diagram of multicast services (proxy mode).....	6-3
Figure 6-2	Configuration flow chart of starting up the multicast services in proxy mode by configuring the ports respectively (on the AN5506-04-B) .....	6-8
Figure 6-3	Configuring the local end service data .....	6-9
Figure 6-4	Disabling the suppression of the designated packet on the uplink port.....	6-10
Figure 6-5	Configuring the multicast protocol version.....	6-11
Figure 6-6	Configuring the multicast mode .....	6-12
Figure 6-7	Configuring the multicast proxy IP.....	6-13
Figure 6-8	Configuring the multicast VLAN .....	6-15
Figure 6-9	Allocating the multicast bandwidth .....	6-16
Figure 6-10	Configuring the ONU multicast services.....	6-17
Figure 6-11	Service configuration of the AN5506-04-B (1).....	6-18
Figure 6-12	Service configuration of the AN5506-04-B (2).....	6-19
Figure 6-13	Service configuration of the AN5506-04-B (3).....	6-19
Figure 6-14	Configuration flow chart of starting up the multicast services in proxy mode by configuring the ports respectively (on the AN5506-10-B1) .....	6-24

Figure 6-15	Allocating the multicast bandwidth .....	6-25
Figure 6-16	Service configuration of the AN5506-10-B1 (1).....	6-26
Figure 6-17	Service configuration of the AN5506-10-B1 (2).....	6-27
Figure 6-18	Service configuration of the AN5506-10-B1 (3).....	6-28
Figure 6-19	Configuring the ONU port parameters.....	6-29
Figure 6-20	Configuration flow chart of starting up the multicast services in proxy mode by configuring the ports in a batch manner (on the AN5506-04-B) .....	6-35
Figure 6-21	Configuring the ONU bandwidth allocation profile.....	6-37
Figure 6-22	Configuring the multicast service profile.....	6-38
Figure 6-23	Configuring the ONU sub-profile .....	6-39
Figure 6-24	Configuring the ONU port sub-profile .....	6-40
Figure 6-25	Configuring the service profile.....	6-40
Figure 6-26	Selecting the object.....	6-42
Figure 6-27	Binding the ONU to the service profile .....	6-42
Figure 6-28	Configuration flow chart of starting up the multicast services in proxy mode by configuring the ports in a batch manner (on the AN5506-10-B1) .....	6-47
Figure 6-29	Configuring the ONU bandwidth allocation profile.....	6-49
Figure 6-30	Binding the ONU to the bandwidth allocation profile .....	6-50
Figure 6-31	Configuring the service model profile .....	6-51
Figure 6-32	Adding two items.....	6-52
Figure 6-33	Configuring the ONU muticast services.....	6-53
Figure 6-34	Configuring the port parameters.....	6-54
Figure 6-35	Viewing the multicast address table of the core switch card .....	6-55
Figure 6-36	Viewing the ONU multicast address table .....	6-56
Figure 6-37	Viewing the multicast address table of the line card.....	6-57
Figure 6-38	Network diagram of multicast services (controllable mode) .....	6-59
Figure 6-39	Configuration flow chart of starting up the the multicast services in controllable mode by configuring the ports respectively (on the AN5506-10-B1) .....	6-64
Figure 6-40	Configuring the local end service data .....	6-65

Figure 6-41	Disabling the suppression of the designated packet on the uplink port.....	6-66
Figure 6-42	Configuring the multicast protocol version.....	6-67
Figure 6-43	Configuring the multicast mode.....	6-68
Figure 6-44	Configuring the multicast proxy IP.....	6-69
Figure 6-45	Configuring the multicast VLAN .....	6-71
Figure 6-46	Configuring the multicast profile .....	6-72
Figure 6-47	Configuring the multicast group parameters.....	6-73
Figure 6-48	Configuring the port parameters.....	6-74
Figure 6-49	Allocating the multicast bandwidth .....	6-76
Figure 6-50	Service configuration of the AN5506-10-B1 (1).....	6-77
Figure 6-51	Service configuration of the AN5506-10-B1 (2).....	6-78
Figure 6-52	Service configuration of the AN5506-10-B1 (3).....	6-79
Figure 6-53	Configuration flow chart of starting up the the multicast services in controllable mode by configuring the ports in a batch manner (on the AN5506-10-B1) .....	6-85
Figure 6-54	Configuring the ONU bandwidth allocation profile.....	6-87
Figure 6-55	Binding the ONU to the bandwidth allocation profile .....	6-88
Figure 6-56	Configuring the service model profile .....	6-89
Figure 6-57	Adding the item number .....	6-90
Figure 6-58	Configuring the ONU muticast services.....	6-90
Figure 6-59	Viewing the online multicast group information .....	6-92
Figure 6-60	Viewing the online multicast group information of the specified ONU port.....	6-93
Figure 6-61	Viewing the multicast address table of the core switch card .....	6-94
Figure 6-62	Viewing the multicast address table of the line card.....	6-95
Figure 6-63	Configuring the multicast cascade port .....	6-97
Figure 6-64	Viewing the uplink port information.....	6-98
Figure 6-65	Configuring the uplink port's maximum multicast bandwidth ....	6-100
Figure 6-66	Configuring the multicast protocol parameters.....	6-102
Figure 6-67	Configuring the ONU parameters.....	6-104
Figure 6-68	Configuring the prejoin group .....	6-106
Figure 6-69	Configuring the multicast default preview parameters.....	6-108

Figure 6-70	Configuring the multicast log time parameters .....	6-110
Figure 6-71	Configuring the automatic uploading of the multicast logs .....	6-111
Figure 6-72	Uploading the multicast logs to the FTP .....	6-113
Figure 6-73	Viewing the log information .....	6-114
Figure 6-74	Clearing the logs .....	6-115
Figure 6-75	Viewing the statistical information of the multicast groups .....	6-116
Figure 6-76	Viewing the multicast statistical information of the ONU port ...	6-117
Figure 6-77	Forcing the users to leave .....	6-119
Figure 6-78	Refreshing the multicast configuration information.....	6-120
Figure 6-79	Querying the fast leave capability of the ONU.....	6-121
Figure 7-1	TDM service network diagram.....	7-2
Figure 7-2	Flow chart for configuring the TDM services .....	7-4
Figure 7-3	Completing the system clock configuration .....	7-5
Figure 7-4	Completing the clock recovery mode configuration.....	7-6
Figure 7-5	Completing the ONU bandwidth allocation configuration .....	7-7
Figure 7-6	Completing the E1 parameter configuration .....	7-9
Figure 8-1	Wi-Fi service network.....	8-3
Figure 8-2	Flow chart for configuring the Wi-Fi service .....	8-6
Figure 8-3	Configuring the local end service VLAN.....	8-7
Figure 8-4	GPON service bandwidth .....	8-8
Figure 8-5	Configuring the WAN connection service of the TL1 interface .....	8-9
Figure 8-6	WiFi service configuration .....	8-10
Figure 9-1	The CATV service network.....	9-2
Figure 9-2	The CATV service configuration .....	9-4
Figure 9-3	CATV service configuration – completed.....	9-5
Figure 10-1	Flow chart for upgrading the core control card software.....	10-5
Figure 10-2	Saving the current configuration into the flash .....	10-6
Figure 10-3	Backing up the current configuration.....	10-7
Figure 10-4	Backing up the current configuration.....	10-8
Figure 10-5	Upgrading the original standby core switch card software .....	10-9
Figure 10-6	Ftp – upgrading the core switch card .....	10-10
Figure 10-7	Upgrading the core switch card successfully.....	10-11

Figure 10-8	Reset the standby card – the <b>Sending Commands</b> dialog box	10-12
Figure 10-9	Forcing the active-standby switchover - the <b>Sending Commands</b> dialog box	10-13
Figure 10-10	Upgrading the standby core switch card software	10-14
Figure 10-11	Ftp – upgrading the core switch card	10-15
Figure 10-12	Upgrading the core switch card successfully	10-16
Figure 10-13	Reset the standby card	10-17
Figure 10-14	Check the card software version	10-18
Figure 10-15	Flow chart for upgrading flow chart for the GPON interface card software	10-20
Figure 10-16	Upgrading the GPON interface card software	10-21
Figure 10-17	Ftp – upgrading an individual card	10-22
Figure 10-18	Check the card software version	10-23
Figure 10-19	Flow chart for upgrading flow chart for the GPON interface card software	10-25
Figure 10-20	Ftp – upgrading the cards in a batch manner	10-26
Figure 10-21	Upgrading the GPON interface card software in a batch manner	10-27
Figure 10-22	Check the card software version	10-28
Figure 10-23	Flow chart for batch upgrading the ONU manually	10-30
Figure 10-24	Ftp – upgrading the ONU	10-31
Figure 10-25	Batch upgrading the ONU manually	10-32
Figure 10-26	<b>Please Select ONU No.</b>	10-33
Figure 10-27	Rebooting the specified ONUs	10-34
Figure 10-28	Checking the ONU software version	10-35
Figure 10-29	Flow chart for upgrading the ONU automatically	10-37
Figure 10-30	The dialog box for selecting file	10-38
Figure 10-31	Upgrading the ONU automatically	10-38
Figure 10-32	Checking the ONU software version	10-39
Figure 11-1	Signal tracing network diagram	11-3
Figure 11-2	Flow chart of configuring the signal tracing	11-4
Figure 11-3	Configuring the signal tracing	11-6

Figure 11-4	Signal tracing .....	11-7
Figure 11-5	The <b>Auto Save Option</b> dialog box.....	11-8
Figure 11-6	Viewing the result of signal tracing.....	11-8
Figure 12-1	Flow chart for flow classification rules.....	12-2
Figure 12-2	The <b>Rule Define</b> dialog box.....	12-5
Figure 12-3	Flow classification rule .....	12-5
Figure 12-4	Configuring the flow policy .....	12-6
Figure 12-5	Binding the ONU port with flow policy .....	12-8
Figure 12-6	The <b>Rule Define</b> dialog box.....	12-10
Figure 12-7	Flow classification rule .....	12-11
Figure 12-8	Configuring the flow policy .....	12-12
Figure 12-9	Binding the ONU port with flow policy .....	12-13
Figure 13-1	Configuration flow chart for QoS service - based on VLAN mode .....	13-4
Figure 13-2	QoS profile – based on VLAN .....	13-5
Figure 13-3	Binding slot and the QoS profile.....	13-6
Figure 13-4	Configuration flow chart for QoS service - based on MAC address .....	13-8
Figure 13-5	Configuring the QoS profile – based on MAC address.....	13-9
Figure 13-6	Binding the uplink port and the QoS profile.....	13-10
Figure 13-7	Unbinding the slot and the QoS profile.....	13-11
Figure 13-8	Unbinding the slot and the QoS profile successfully .....	13-12
Figure 13-9	Unbinding the uplink port and the QoS profile.....	13-13
Figure 13-10	Unbinding the uplink port and the QoS profile successfully .....	13-13
Figure 14-1	Schematic diagram of the PON port protection .....	14-2
Figure 14-2	Configuring the main port.....	14-5
Figure 14-3	Configuring the standby port .....	14-6
Figure 14-4	Configuring the PON port protection groups .....	14-7
Figure 14-5	Configuring the PON port protection group mode .....	14-8
Figure 15-1	The optical module parameter information in the PON port of the GC8B card .....	15-2
Figure 15-2	The optical module parameter information of the ONU PON port .....	15-4

Figure 16-1	Configuration flow chart of line identifier management.....	16-5
Figure 16-2	Configuring line identifier management.....	16-6
Figure 16-3	Configuring the circuit ID format.....	16-7
Figure 17-1	The <b>POTS Inline Test</b> window .....	17-3
Figure 17-2	The <b>POTS Outline Test</b> window .....	17-5

# Tables

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Table 1-1	Planned data for configuring the ANM2000 management path ....	1-10
Table 1-2	Command format for configuring the management VLAN .....	1-12
Table 1-3	Command format for configuring the static routing .....	1-13
Table 1-4	Command format for configuring the SNMP .....	1-13
Table 2-1	Card configuration of the AN5116-06B.....	2-13
Table 2-2	The parameters in the card authorization window.....	2-15
Table 2-3	Card authorization window parameters.....	2-18
Table 3-1	Planning data for configuring the physical identifier authentication mode.....	3-7
Table 3-2	Planning data for configuring the password authentication mode	3-16
Table 3-3	Planning data for configuring the physical identifier + password authentication mode.....	3-25
Table 4-1	Planned data on the OLT side of the VoIP service based on the H.248 protocol (configuring respectively) .....	4-3
Table 4-2	Planned data on the ONU side of the VoIP service based on the H.248 protocol (configuring respectively).....	4-7
Table 4-3	Planned data on the OLT side of the VoIP service based on the H.248 protocol (configuring in a batch manner).....	4-19
Table 4-4	Planned data on the ONU side of the VoIP service based on the H.248 protocol (configuring in a batch manner) .....	4-21
Table 4-5	Planned data on the OLT side of the VoIP service based on the MGCP protocol (configuring respectively).....	4-34
Table 4-6	Planned data on the ONU side of the VoIP service based on the MGCP protocol (configuring respectively).....	4-37
Table 4-7	Planned data on the OLT side of the VoIP service based on the MGCP protocol (configuring in a batch manner) .....	4-49
Table 4-8	Planned data on the ONU side of the VoIP service based on the MGCP protocol (configuring in a batch manner) .....	4-51

Table 4-9	Planned data on the OLT side of the VoIP service based on the SIP protocol (configuring respectively) .....	4-64
Table 4-10	Planned data on the ONU side of the VoIP service based on the SIP protocol (configuring respectively) .....	4-67
Table 4-11	Planned data on the OLT side of the VoIP service based on the SIP protocol (configuring in a batch manner).....	4-79
Table 4-12	Planned data on the ONU side of the VoIP service based on the SIP protocol (configuring in a batch manner).....	4-81
Table 4-13	Planned data for configuring the relevant parameters of the DHCP of the NGN uplink interface .....	4-93
Table 4-14	Planning data for configuring softswitch intercommunication profiles .....	4-95
Table 4-15	Planning data for binding the softswitch intercommunication profiles .....	4-99
Table 4-16	Planning data for configuring the NGN heartbeat parameters ...	4-102
Table 4-17	Planning data for configuring the IAD MD5 authentication.....	4-104
Table 4-18	Planning data for registering / unregistering the NGN users .....	4-106
Table 4-19	Planning data for configuring the digitmap .....	4-108
Table 4-20	Planning data for displaying the MGC register server's status...	4-110
Table 4-21	Planning data for displaying the NGN user port's status .....	4-111
Table 4-22	Planning data for displaying the IAD IP information .....	4-112
Table 5-1	The planned data of data service configuration at the OLT side in the transparent transmission mode (configured respectively) .....	5-4
Table 5-2	The planned data of data service configuration at the AN5506-04-B ONU side in the transparent transmission mode (configured respectively).....	5-5
Table 5-3	The planned data of data service configuration at the OLT side in the transparent transmission mode (in a batch manner).....	5-12
Table 5-4	The planned data of data service configuration at the AN5506-04-B ONU side in the transparent transmission mode (in a batch manner) .....	5-13
Table 5-5	The planned data of data service configuration at the OLT side in the transparent transmission mode (configured respectively) .....	5-23

Table 5-6	The planned data of data service configuration at the AN5506-10-B1 ONU side in the transparent transmission mode (configured respectively).....	5-24
Table 5-7	The planned data of data service configuration at the OLT side in the transparent transmission mode (in a batch manner).....	5-30
Table 5-8	The planned data of data service configuration at the AN5506-10-B1 ONU side in the transparent transmission mode (in a batch manner) .....	5-31
Table 5-9	The planned data of data service configuration at the OLT side in the Tag mode (configured respectively) .....	5-44
Table 5-10	The planned data of data service configuration at the AN5506-04-B ONU side in the Tag mode (configured respectively) .....	5-45
Table 5-11	The planned data of data service configuration at the OLT side in the Tag mode (in a batch manner) .....	5-52
Table 5-12	The planned data of data service configuration at the AN5506-04-B ONU side in the Tag mode (in a batch manner) .....	5-53
Table 5-13	The planned data of data service configuration at the OLT side in the Tag mode (configured respectively) .....	5-63
Table 5-14	The planned data of data service configuration at the AN5506-10-B1 ONU side in the Tag mode (configured respectively) .....	5-64
Table 5-15	The planned data of data service configuration at the OLT side in the Tag mode (in a batch manner) .....	5-71
Table 5-16	The planned data of data service configuration at the AN5506-10-B1 ONU side in the Tag mode (in a batch manner) .....	5-72
Table 5-17	The planned data of data service configuration at the OLT side in the VLAN 1:1 translation mode (configured respectively) .....	5-85
Table 5-18	The planned data of data service configuration at the AN5506-04-B ONU side in the VLAN 1:1 translation mode (configured respectively) .....	5-86
Table 5-19	The planned data of data service configuration at the OLT side in the VLAN 1:1 translation mode (in a batch manner) .....	5-96
Table 5-20	The planned data of data service configuration at the AN5506-04-B ONU side in the VLAN 1:1 translation mode (in a batch manner) .....	5-97

Table 5-21	The planned data of data service configuration at the OLT side in the VLAN 1:1 translation mode (configured respectively) .....	5-110
Table 5-22	The planned data of data service configuration at the AN5506-10-B1 ONU side in the VLAN 1:1 translation mode (configured respectively) .....	5-111
Table 5-23	The planned data of data service configuration at the OLT side in the VLAN 1:1 translation mode (in a batch manner) .....	5-120
Table 5-24	The planned data of data service configuration at the AN5506-10-B1 ONU side in the VLAN 1:1 translation mode (in a batch manner) .....	5-121
Table 5-25	The planned data of data service configuration at the OLT side in the VLAN N:1 translation mode (configured respectively).....	5-136
Table 5-26	The planned data of data service configuration at the AN5506-04-B ONU side in the VLAN N:1 translation mode (configured respectively) .....	5-137
Table 5-27	The planned data of data service configuration at the OLT side in the VLAN N:1 translation mode (in a batch manner).....	5-148
Table 5-28	The planned data of data service configuration at the AN5506-04-B ONU side in the VLAN N:1 translation mode (in a batch manner) .....	5-149
Table 5-29	The planned data of data service configuration at the OLT side in the VLAN N:1 translation mode (configured respectively).....	5-163
Table 5-30	The planned data of data service configuration at the AN5506-10-B1 ONU side in the VLAN N:1 translation mode (configured respectively) .....	5-164
Table 5-31	The planned data of data service configuration at the OLT side in the VLAN 1:1 translation mode (in a batch manner) .....	5-173
Table 5-32	The planned data of data service configuration at the AN5506-10-B1 ONU side in the VLAN N:1 translation mode (in a batch manner) .....	5-174
Table 5-33	The planned data of the data service at the OLT side in the flexible QinQ mode.....	5-189

Table 5-34	The planned data of data service configuration at the AN5506-04-B ONU side in the flexible QinQ mode .....	5-190
Table 5-35	The planned data of the data service at the OLT side in the flexible QinQ mode.....	5-201
Table 5-36	The planned data of data service configuration at the AN5506-10-B1 ONU side in the flexible QinQ mode .....	5-202
Table 6-1	The OLT side planning data of the multicast services under the proxy mode (configuring respectively) .....	6-4
Table 6-2	The AN5506-04-B side planning data of the multicast services under the proxy mode (configuring respectively).....	6-6
Table 6-3	The OLT side planning data of the multicast services under the proxy mode (configuring respectively) .....	6-20
Table 6-4	The AN5506-10-B1 side planning data of the multicast services under the proxy mode (configuring respectively).....	6-22
Table 6-5	The OLT side planning data of the multicast services under the proxy mode (configuring in a batch manner) .....	6-30
Table 6-6	The AN5506-04-B side planning data of the multicast services under the proxy mode (configuring in a batch manner).....	6-32
Table 6-7	The OLT side planning data of the multicast services under the proxy mode (configuring in a batch manner) .....	6-43
Table 6-8	The AN5506-10-B1 side planning data of the multicast services under the proxy mode (configuring in a batch manner).....	6-45
Table 6-9	The OLT side planning data of the multicast services under the controllable mode (configuring respectively).....	6-60
Table 6-10	The AN5506-10-B1 side planning data of the multicast services under the controllable mode (configuring respectively) .....	6-63
Table 6-11	The OLT side planning data of the multicast services under the controllable mode (configuring in a batch manner) .....	6-80
Table 6-12	The AN5506-10-B1 side planning data of the multicast services under the controllable mode (configuring in a batch manner) .....	6-83
Table 6-13	Planned data of the multicast cascade port .....	6-96
Table 6-14	Planned data of the uplink port's maximum multicast bandwidth .	6-99
Table 6-15	Planned data of the OLT multicast protocol parameters .....	6-101

Table 6-16	Planned data of the ONU multicast parameter.....	6-103
Table 6-17	Planned data of the projoin groups .....	6-105
Table 6-18	Planned data of the multicast default preview parameters.....	6-107
Table 6-19	Planned data of the multicast log time parameters .....	6-109
Table 6-20	Planned data of the automatic uploading of the multicast logs ..	6-110
Table 6-21	Planned data of uploading the multicast logs to the FTP .....	6-112
Table 6-22	Planned data of forcing users to leave .....	6-118
Table 7-1	Planned data for the OLT side of the TDM service.....	7-3
Table 7-2	Planned data for the ONU (AN5506-06-E type) side of the TDM service.....	7-3
Table 8-1	Planned data for configuring the Wi-Fi service.....	8-4
Table 9-1	The planned data of the CATV service.....	9-3
Table 10-1	Planned data for upgrading the core switch card .....	10-4
Table 10-2	Planned data for upgrading the GPON interface card.....	10-20
Table 10-3	Planned data for upgrading the GPON interface card.....	10-25
Table 10-4	Planned data for upgrading the ONU software manually .....	10-30
Table 10-5	Planned data for upgrading the ONU automatically .....	10-36
Table 11-1	Planned data for signal tracing.....	11-4
Table 12-1	Planned data for flow classification rules – based on MAC address .....	12-3
Table 12-2	Planned data for flow classification rules – based on IP address.	12-9
Table 13-1	Planned data for QoS service—based on VLAN mode.....	13-3
Table 13-2	Planned data for QoS service—based on MAC address .....	13-7
Table 14-1	Planned data for configuring PON port protection.....	14-4
Table 16-1	Custom identifier variables .....	16-3
Table 16-2	Delimiter list .....	16-3
Table 16-3	Planned data for line identifier management.....	16-4
Table 17-1	Planned data for voice internal line test .....	17-2
Table 17-2	Planned data for voice external line test .....	17-4

# 1 Configuring the ANM2000 Management Path

---



## Note:

To avoid the loss of equipment configuration data caused by the power failure, we recommend that users select **Control Command** → **Save configuration to FLASH** from the shortcut menu of the active HSWA card after completing all service provisioning and function configuration.

---

Before using the ANM2000 to manage the equipment, users need to configure the ANM2000 management path using the Console control platform (shortened as Console in the following sections). This chapter introduces methods of ANM2000 management path configuration. It includes the following sections:

- Configuring the Console
- Configuring the ANM2000 management path
- Logging into the ANM2000

## 1.1 Configuring the Console

### 1.1.1 Configuration Preparation

#### Power on

Plan the service data and check the equipment power before powering on the system.

- ◆ Plan data and register management VLAN and IP address.
- ◆ Confirm that DC power has been connected to the equipment and the power supply voltage is standard voltage within -38V to -57V.

#### Observe the indicator LEDs of cards

Confirm whether each card has started up or not by examining its indicator LED after powering on the equipment.

- ◆ Observe the ACT on the card. If the ACT is on, it indicates that the card is working normally.
- ◆ If the link LED of GC4B and GC8B is on, it indicates that the remote device has been connected.

#### Observe the connection status of system

Check whether the cables connection among devices is correct or not according to the network diagram. Check if the following connections work well, including the optical path connection between the PON and the ONU, the connection between the ONU's FE interface and the relay switch, and the uplink connections of the C155A card and the CE1B card.



#### Note:

In order to check whether the ONU and the OLT have been registered successfully or not, you need to check if the ONU REG is always on. If so, the ONU and the OLT have been registered successfully. FiberHome recommends users connect an ONU to the equipment for test use if practical.

---

### Detect optical power

Measure the optical power of the uplink port and the PON port with the optical power meter. The optical path specifications of the OLT side and the ONU side must be in normal range, otherwise the services can't be started up normally.

Specifications:

- ◆ Normal range of the OLT side transmitting optical power: +2 to +7dbm.
- ◆ Normal range of the ONU side receiving optical power: -27 to -6dbm.

## 1.1.2 Connecting with the Network Management Computer

Use the serial port cable attached to this equipment to connect the RS-232 serial port of the network management computer and the Console port of the AN5116-06B's active core switch card. See Figure 1-1.

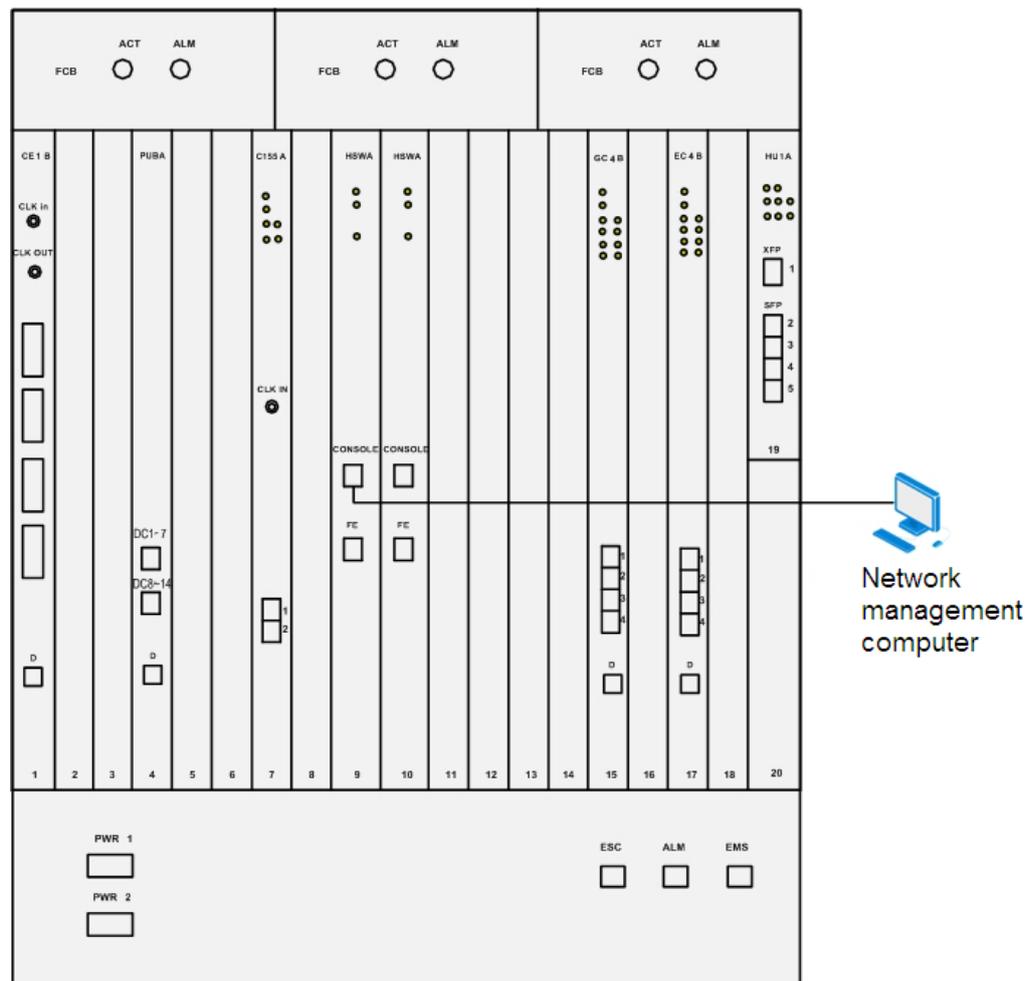


Figure 1-1 Connection with the CLI network management system



**Note:**

The MS LED being on in the core switch card indicates that this card is active. The MS LED being off indicates that this card is standby. By default, the core switch card in Slot 09 is active.

---

### 1.1.3 Logging into the Console

#### Purpose

The ANM2000 management path of the AN5116-06B can be only configured using the CLI on Console. Using the Window's HyperTerminal can access the equipment's CLI network management system.

#### Prerequisites

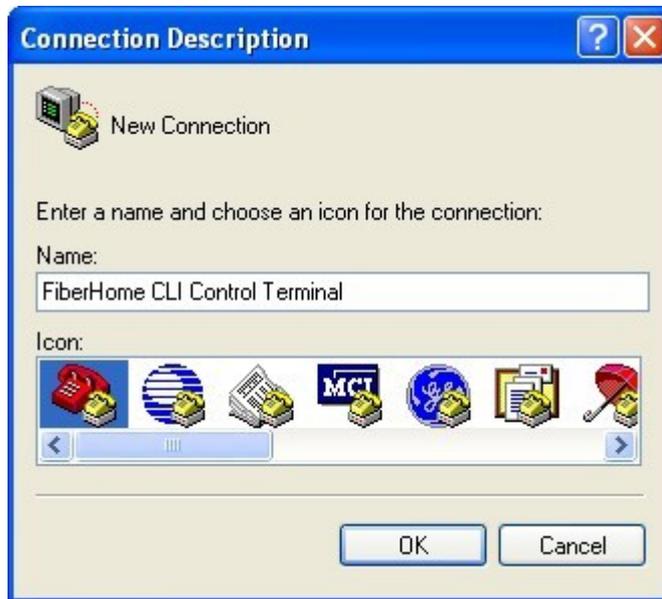
- ◆ The connections with the network management computer are completed.
- ◆ The network management computer is turned on normally.
- ◆ The username and password of the AN5116-06B's CLI network management system are available.
- ◆ The computer has installed the genuine Windows XP SP3 system or newer version system.

#### Operation steps

You should create a connection and configure it if it is your first time to log in the Console. Next time you can directly access the Console. The following presents the instructions for the two situations.

- ◆ Steps for the first-time login
  - 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:

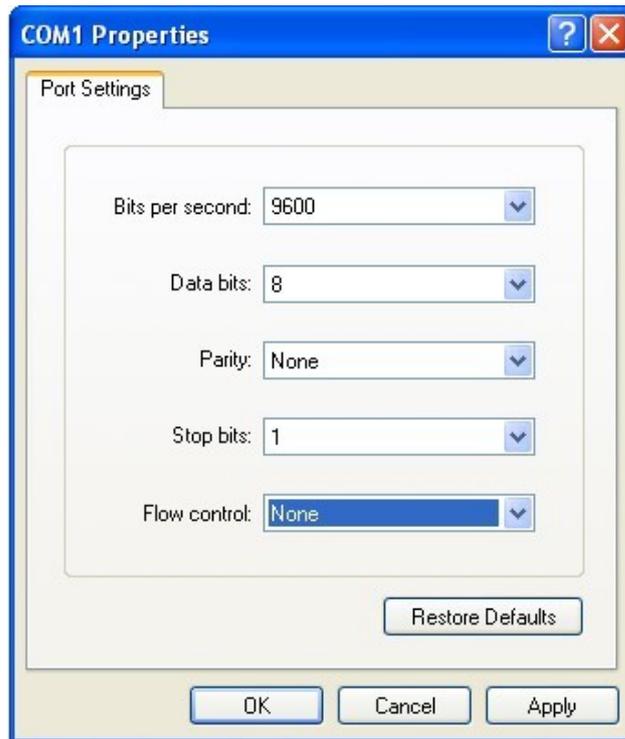
- ▶ **Name:** Fill in the name of a connection object, such as **FiberHome CLI Control Terminal**.
- ▶ **Icon:** Select an icon for this connection.



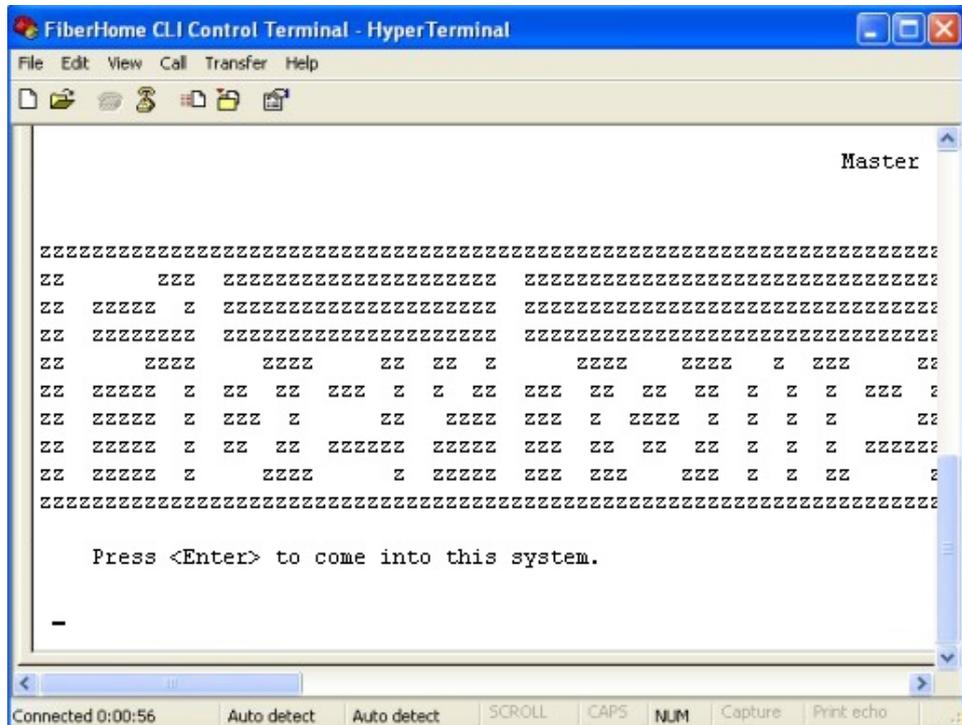
- ▶ Click **OK**, and the **Connect To** dialog box appears.
- 3) In the **Connect To** dialog box, perform the following configurations:
- ▶ **Connect using:** Select the port No. used for the Console port of the core switch card in the drop-down list, such as **COM1**.



- ▶ 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 username is GEPON.

Password:GEPON // The initial password is GEPON.

User>EN //Under common user mode, input the username and the password of the
administrator to enter the administrator mode.

Password:GEPON // 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:**

1. If the command prompt is **User>**, this indicates that the system is in ordinary user mode; if the command prompt is **Admin#**, this indicates that the system is in administrator mode.
2. The password is case sensitive and username not.



**Caution:**

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

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

◆ Step for non-first-time login

Select **Start** → **Program** → **Accessories** → **Telecom** → **HyperTerminal** → **FiberHome CLI Control Terminal** from the desktop to get the **Telnet default?** alert 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.

---

## 1.2 Configuring the ANM2000 Management Path

### Configuration rules

- ◆ If the IP address of network management client and management IP of equipment are not in the same net segment, you should set the static routing to perform routing forwarding.
- ◆ The community name of SNMP and Trap receiver is recommended to use **adsl**, or adopt the default value **public**.
- ◆ If several management VLANs are configured, users need to configure the management VLAN on 2 uplink ports respectively; if the static routing is configured, you should configure the destination net segment IP, mask and the IP address of next-hop routing.

### 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 1-2. The ANM2000 client end manages the equipment through the AN5116-06B's uplink ports. The following are two management ways: management in LAN and through gateway. Client 1 manages the AN5116-06B through LAN, and client 2 manages it through gateway.



#### Note:

When the management is performed using the out-band network management system, it is recommended to use the EMS interfaces at the bottom part of the equipment's subrack preferentially.

---

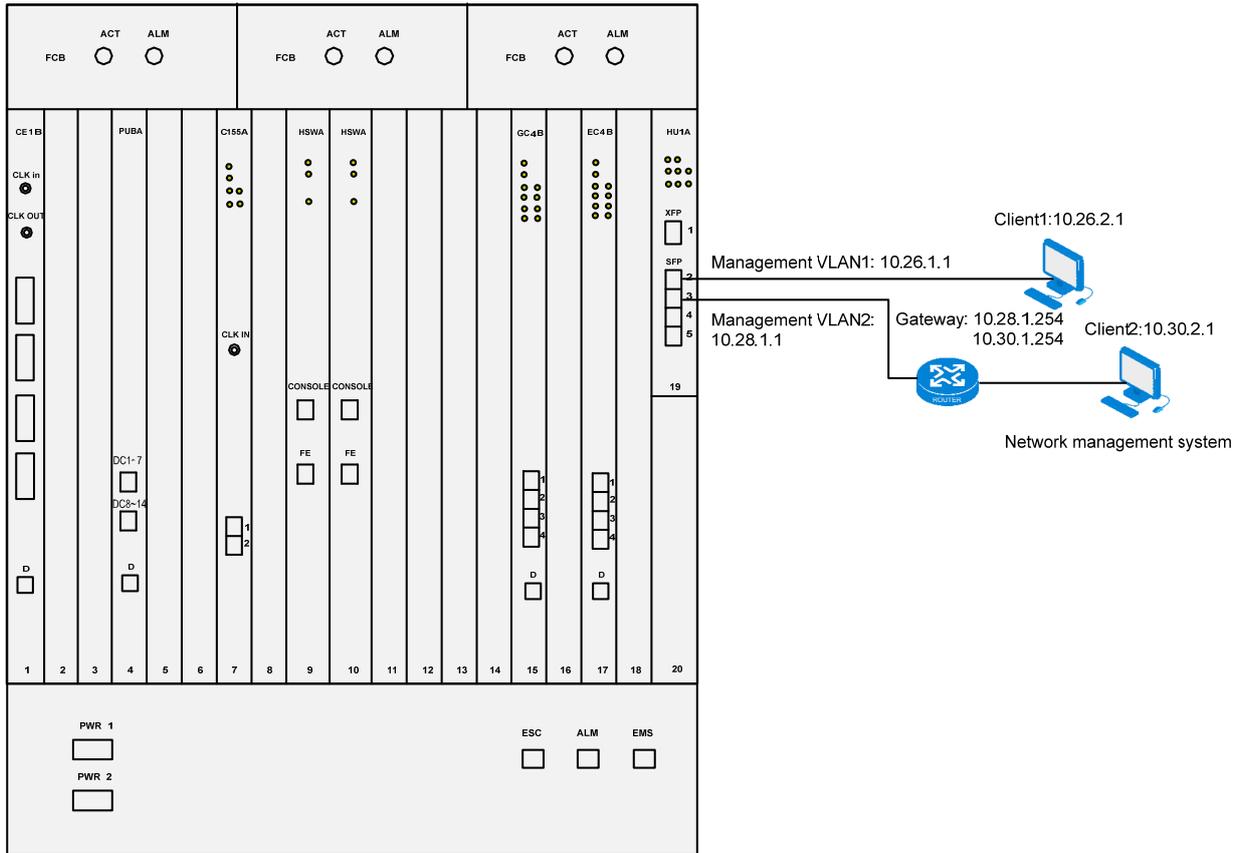


Figure 1-2 Network diagram of the ANM2000

### Planning data

When managing the AN5116-06B in in-band mode, you need to configure the management VLAN, static routing and SNMP first. The configurations are listed in Table 1-1.

Table 1-1 Planned data for configuring the ANM2000 management path

Item	Description	Example	
Configuring the management VLAN	Management VLAN name	a	b
	Management VLAN ID	4000	4001
	In-band network management interface	19:2	19:3

Item		Description	Example	
	Management VLAN tag	Configure it as untagged	untagged	untagged
	Management IP	Configure it according to the network planning of operators	10.26.1.1	10.28.1.1
	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 code	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
Configuring the SNMP	SNMP service function	This function is enabled by default, so users do not need to configure it.	enable	
	SNMP Trap function	This function is enabled by default, so users do not need to configure it.	enable	
	IP address of Trap receiver	The IP address of network management server (with Manager module)	10.26.2.1	10.30.1.1
	SNMP version	Supports v1 and v2c, with v2c recommended	v2c	v2c
	Community name of Trap receiver	It is recommended to set this item to <b>adsl</b> or adopt the default value <b>public</b>	adsl	adsl
	Community type of SNMP	Read and write	readwrite	
	Community name of SNMP	It is recommended to set this item to <b>adsl</b> or adopt the default value <b>public</b> .	adsl	

### Configuration flow chart

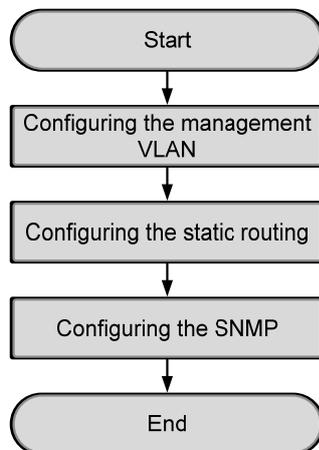


Figure 1-3 Flow chart of configuring the ANM2000 management path

## 1.2.1 Configuring the Management VLAN

### Command format

Table 1-2 Command format for configuring the management VLAN

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

### Configuration examples

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 and the mask code.

```
Admin\service# set manage vlan name a ip 10.26.1.1/16
Admin\service# set manage vlan name b ip 10.28.1.1/16
Admin\service#
```

## 1.2.2 Configuring the Static Routing

### Command format

Table 1-3 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 examples

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#
```

## 1.2.3 Configuring the SNMP

### Command format

Table 1-4 Command format for configuring the SNMP

Command
cd service
service snmp [enable disable]
service snmp trap [enable disable]
set snmp trapreceiver add <A.B.C.D> version [v1c v2c] {community <string>}*1
set snmp community [readonly readwrite] <string>

## Operation steps

1. Enter the **service** directory.

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

2. Enable the SNMP Service function.



### Note:

The SNMP Service function is enabled by default, so users do not need to configure it.

---

```
Admin\service# service snmp enable  
  
Snmp agent service already up.  
  
Admin\service#
```

3. Enable the SNMP Trap function.



### Note:

The SNMP Trap function is enabled by default, so users do not need to configure it.

---

```
Admin\service# service snmp trap enable  
  
Snmp agent trap already supported.  
  
Admin\service#
```

4. Configure the Trap receiver.

The IP address of the network management server will be set as that of the TRAP receiver by the system by default. And it doesn't need reconfiguration. If the TRAP receiver designated officially is not the network management server, configurations should be performed according to Step 4.

```
Admin\service# set snmp trapreceiver add 10.26.2.1 version v2c community
adsl

Successfully added trapreceiver IP address is 10.26.2.1

The trap version is v2c

The trap community is adsl

Admin\service# set snmp trapreceiver add 10.30.1.1 version v2c community
adsl

Successfully added trapreceiver IP address is 10.30.1.1

The trap version is v2c

The trap community is adsl

Admin\service#
```



**Note:**

Under certain circumstances, the equipment may be unable to learn the IP address of the network management server as the number of IP addresses learnt by the equipment exceeds the limit, which results in the fact that the IP address of the network management server cannot be set as the IP of the TRAP receiver. If the network management system cannot receive the alarms correctly, please examine for this reason at first.

If it is confirmed that the IP address of the network management server is not set as the IP of the TRAP receiver automatically, please refer to Step 4 and configure it manually.

---

5. Configure the SNMP community.

```
Admin\service# set snmp community readwrite adsl  
  
Admin\service#
```

## **1.2.4 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.

## 1.3 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 steps



1. Double-click the ANM2000 icon , or select **Start** → **All Programs** → **AnmServer** → **ANM2000**, the ANM2000 will begin accessing the database and the **ANM2000 User Login** dialog box will appear.
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 window of the ANM2000, as shown in the Figure 1-4.



Figure 1-4 The **ANM2000** user login dialog box



## 2 Adding Device

---

After logging into the ANM2000, you need to add the to-be-managed AN5116-06B to a management domain in order to manage and maintain it. This chapter introduces the operation steps of adding device as follows:

- Configuration rules
- Configuration flow chart
- Adding a management domain
- Adding a system
- Adding a module
- Adding a card
- Authorizing a card
- Synchronizing time

## 2.1 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 and that of the in-band management VLAN should be consistent so that the network management server can communicate normally with the AN5116-06B. For example, if the IP address of the network management server of the management VLAN is 10.26.1.x, the IP address of the system should also be set to 10.26.1.x.
- ◆ If the network management server 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 universal gateway. In such case, the IP address of system and that of the gateway of the management VLAN should be in the same net segment so that the network management client can access and manage the AN5116-06B by the gateway. For example, if the IP address of the gateway of management VLAN is 10.28.1.x, the IP address of the system should also be set as 10.28.1.x.

## 2.2 Configuration Flow Chart

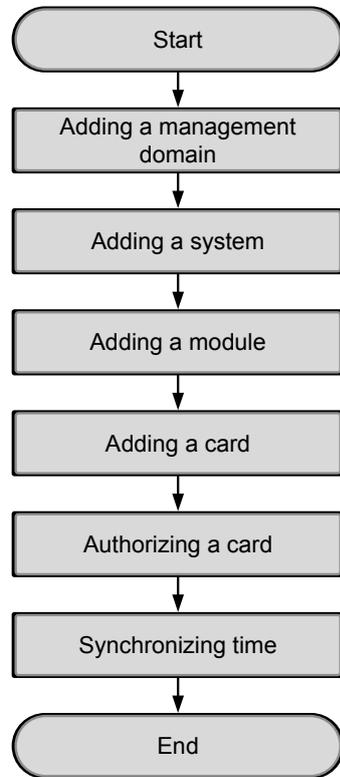


Figure 2-1 Basic configuration flow chart

## 2.3 Adding a Management Domain

### Prerequisites

The network management GUI is in edit mode (click the  button in the toolbar to enter the edit mode).

### Configuration purpose

Divide the management objects by configuring the management domain according to the executive function of the operator.

### Operation steps

Add a management domain 1 and fill in its description according to actual situation. The detailed operation steps are as follows:

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.
2. Configure the parameters in the **Add Domain** dialog box, as shown in Figure 2-2.

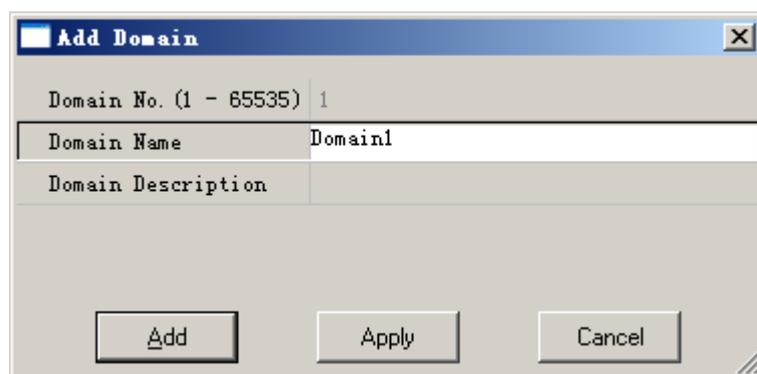


Figure 2-2 The **Add Domain** dialog box

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 2-3.

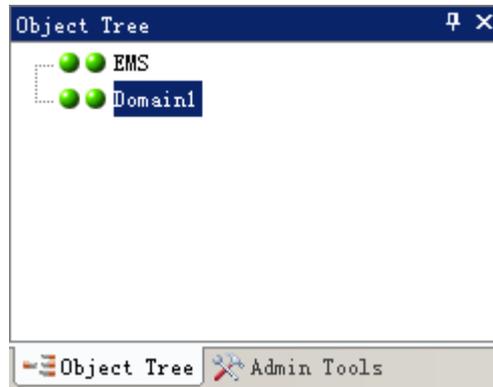


Figure 2-3 The object tree management domain

## 2.4 Adding a System

### Prerequisites

The management domain is successfully created.

### Configuration purpose

Add the AN5116-06B to the ANM2000 according to the IP address, subnet mask and gateway of the AN5116-06B.

### Operation steps

Add the AN5116-06B system whose IP address is 10.92.28.169, subnet mask is 255.255.0.0, and manufacturer name is FiberHome. The detailed operation steps are as follows:

1. Right-click on the management domain object created in the **Object Tree** pane, select **Add Shelf Device** → **GEAPON** → **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 2-4.

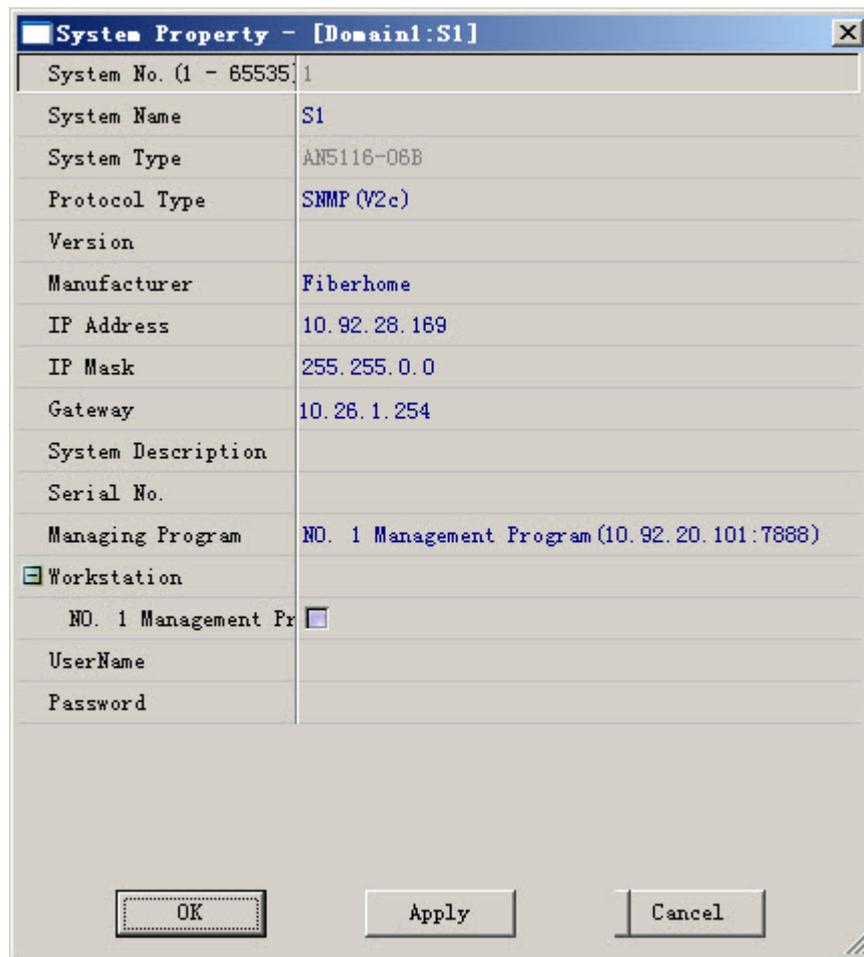
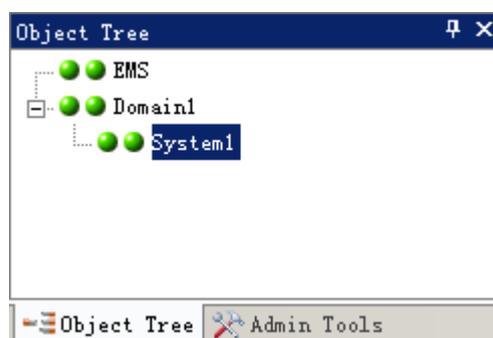


Figure 2-4 Adding the AN5116-06B system

3. After completing the parameters setting, click the **OK** button, and the created system 1 appears in the **Object Tree** pane, as shown in Figure 2-5.

Figure 2-5 The system in the **Object Tree** pane

## 2.5 Adding a Module

### Prerequisites

The AN5116-06B system has been created.

### Configuration purpose

Add the AN5116-06B module to the ANM2000.

### Operation steps

Add a module whose number is 1 and name is **OLT system1**. The detailed operation steps are as follows:

1. Right-click on 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 2-6.

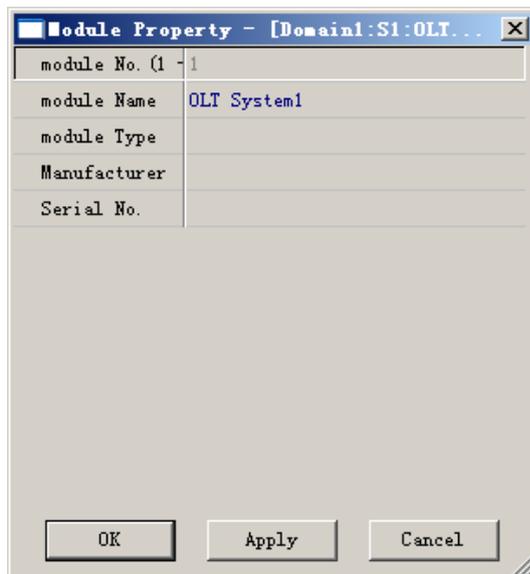


Figure 2-6 Adding a module

3. After completing configuration, click the **OK** button, and the created module appears in the **Object Tree** pane, as shown in Figure 2-7.

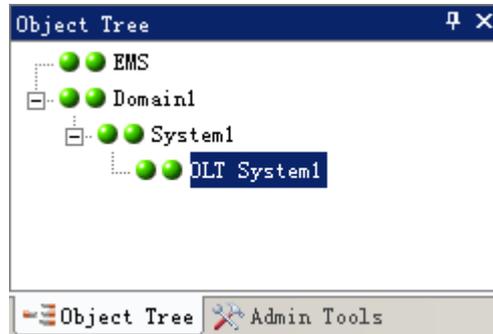


Figure 2-7 The module in the **Object Tree** pane

4. Click the  button in the toolbar or select **File** → **Save** from the main menu to save the current system configurations to the ANM2000 database.

## 2.6 Adding a card

There are two ways of adding a card: automatic adding and manual adding.



Note:

After adding a new object, users should save the configuration first and enter the edit mode again to detect the physical configuration; otherwise, the command parameter error may occur.

---

- ◆ 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.

### 2.6.1 Adding a Card Automatically

#### Prerequisites

- ◆ The AN5116-06B system has been created successfully.
- ◆ The cards have been powered on normally.

#### Operation steps

1. Right-click the AN5116-06B system (or the management domain) in the **Object Tree** pane and select **Detect Physical Configuration** in the shortcut menu. Then the **Detect Physical Configuration** window will appear, as shown in Figure 2-8. By default, **Auto Update Object Tree And Database** is selected. Select the system object to be detected in the object tree on the left of the window.

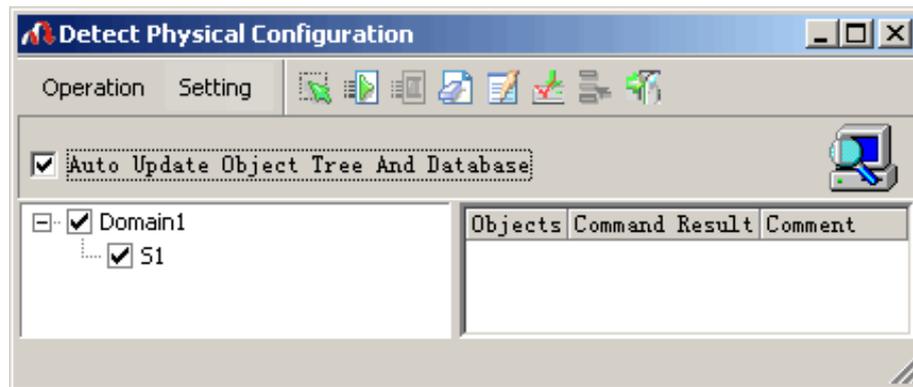


Figure 2-8 Detecting the physical configuration automatically

- When users click  button or select **Operation** → **Detect Physical Configuration** in the menu bar, the ANM2000 will begin to detect the AN5116-06B's configuration. The progress and the result of the detection will be displayed in the lower right part of the window, as shown in Figure 2-9. The service interface cards, core switch card and fan card have been added successfully.

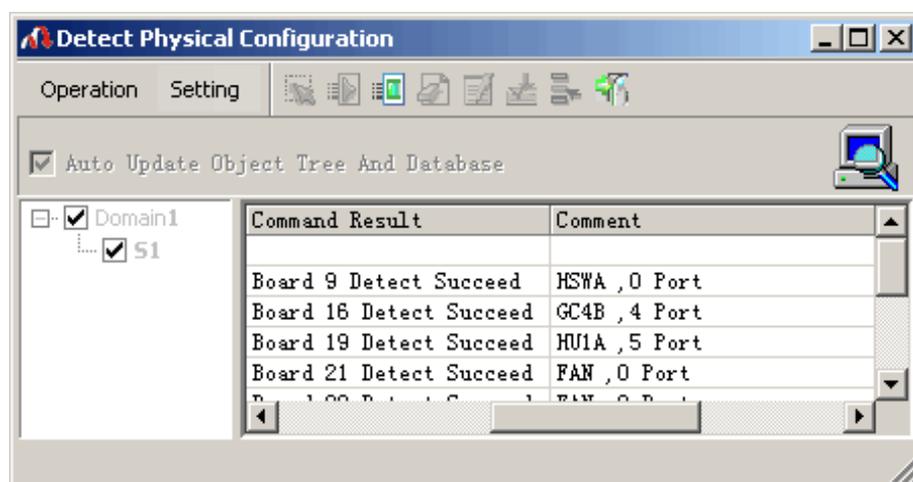


Figure 2-9 Detecting the results of the physical configurations

- Click the AN5116-06B module in the **Object Tree** pane to check if the cards displayed in the subrack view are consistent with all the cards of physical detection; if consistent, it indicates the cards are added successfully.

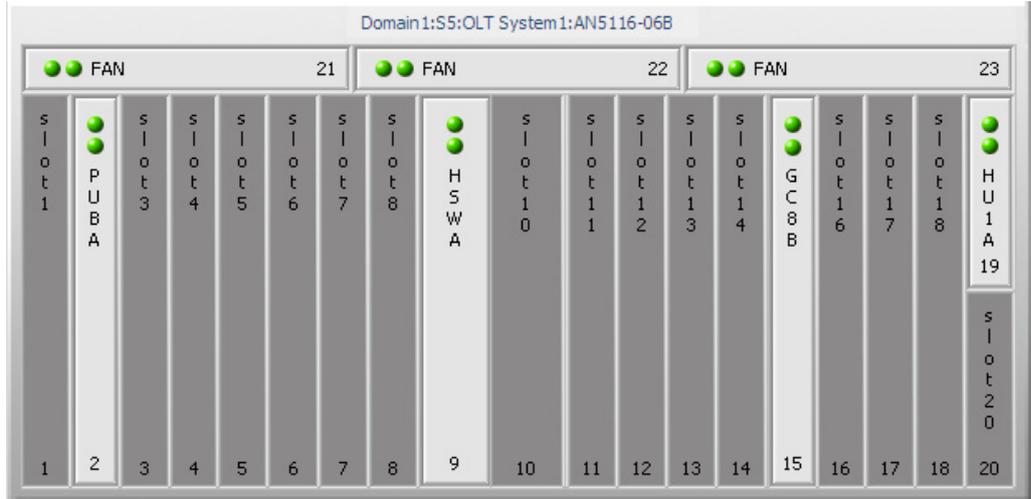


Figure 2-10 The AN5116-06B subrack view

## 2.6.2 Adding a Card Manually

### Prerequisites

The AN5116-06B module has been created.

### Slot distribution

After adding the AN5116-06B module, click this module in **Object Tree** and its subrack view will appear in the view area of the **Device View** tab, as shown in Figure 2-11.

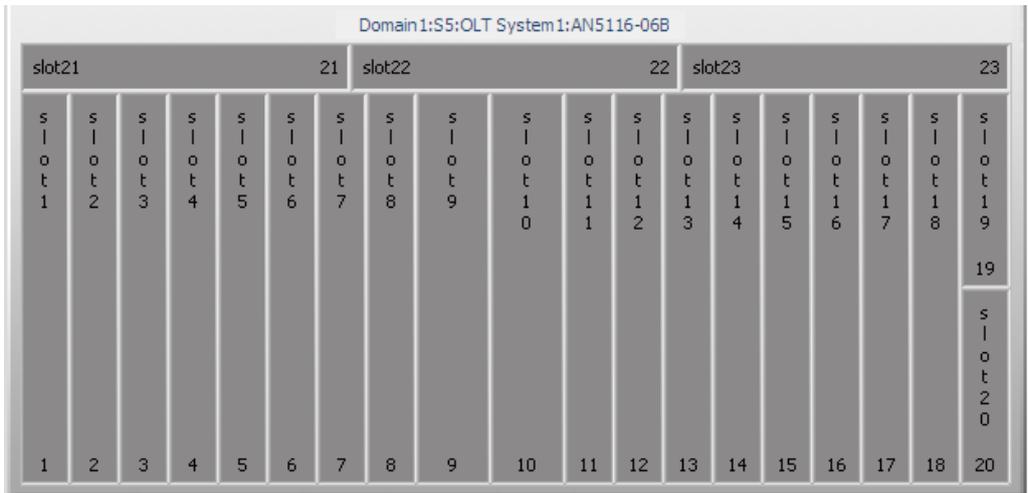


Figure 2-11 The AN5116-06B subrack view

The cards that can be configured in the AN5116-06B subrack view are listed in Table 2-1.

Table 2-1 Card configuration of the AN5116-06B

Card Name Abbreviation	Slot	Quantity
HSWA	9, 10	1 to 2
GC4B/GC8B	1 to 8, 11 to 18	1 to 16
C155A/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

## Operation steps

Add the GC8B card manually at Slot 1 in the subrack view. The detailed operation steps are as follows:

1. Right-click the slot to be added with a card and select **Add Card** in the shortcut menu. Select the desired card type in the submenu that appears subsequently. See Figure 2-12.

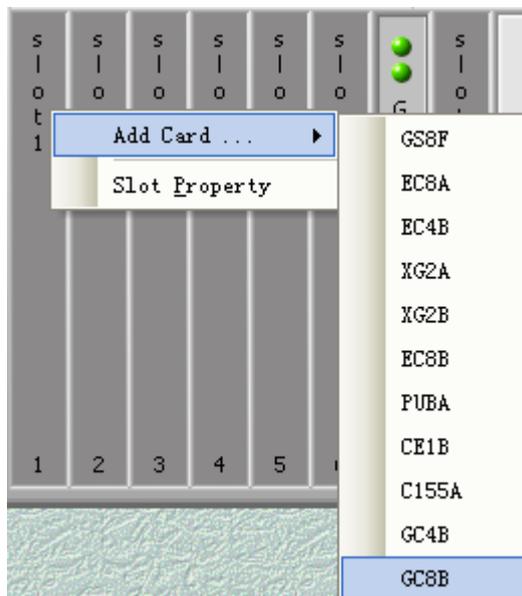


Figure 2-12 Adding a card

2. The **Add Board** dialog box will appear, as shown in Figure 2-13. Use the default values for the card property parameters. Then click the **Add** button.

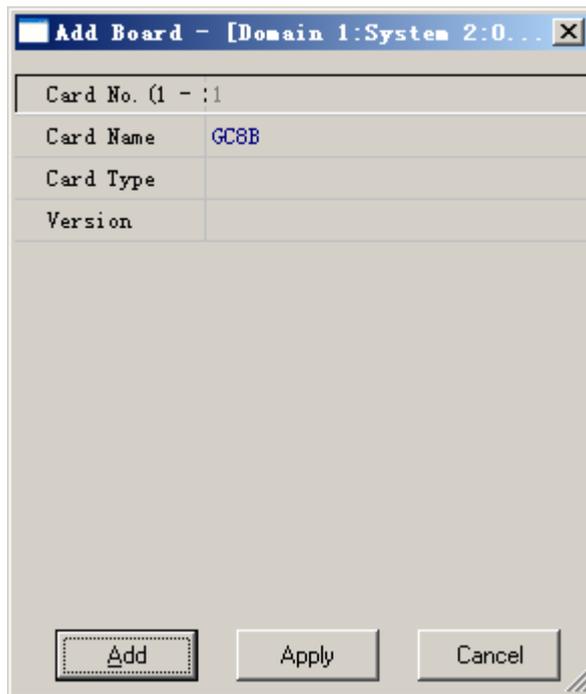


Figure 2-13 Adding a card to the AN5116-06B subrack

## Modifying cards

- ◆ To modify the card properties, right-click the card to be modified in the subrack view and select **Property** in the shortcut menu. Then modify the card properties in the dialog box that appears.
- ◆ To delete a certain card, right-click this card in the subrack view and select **Delete** in the shortcut menu. The card will be deleted then.
- ◆ To change the type of a card, right-click this card in the subrack view and select **Reset To** in the shortcut menu. Then users need to select the new card type in the submenu. After resetting the card type, you need to save first and then configure the card. After replacing the card, reconfigure parameters for the new card or use the system default configurations.

## 2.7 Authorizing a Card

There are two conditions of authorizing a card. Users can configure according to actual situation.

- ◆ 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.

### 2.7.1 Authorizing a card which is present

#### Prerequisites

- ◆ Network management GUI is in edit mode.
- ◆ The cards are added to the subrack and powered up successfully.
- ◆ The operation of detecting physical configuration is completed.

#### Configuration purpose

It is necessary to authorize all the cards in subrack at one time if the equipment is in its first use, and then the card service can be configured.

#### Parameter explanation

Table 2-2 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

## Operation steps

The steps of authorizing cards are listed as follows:

1. Right-click the AN5116-06B system in the **Logical Tree** pane, and select **Card Config** from the shortcut menu. And then the dialog box for setting card authorization appears, as shown in Figure 2-14.

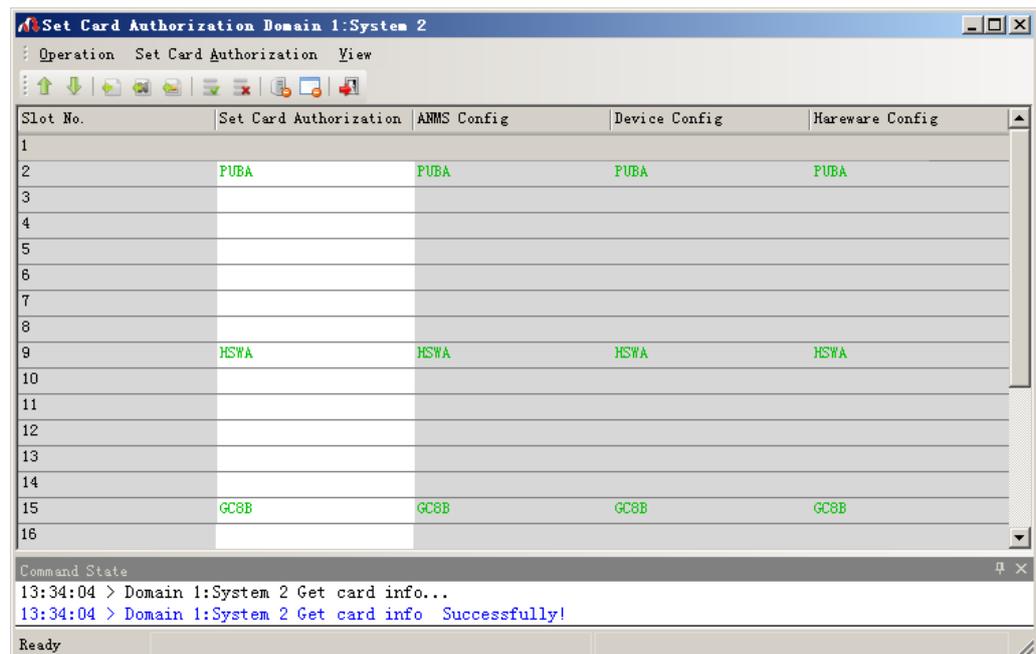


Figure 2-14 The dialog box for setting card authorization

2. Click the  button or select **Operation** → **Write Device** in the menu bar to authorize all the cards which are present.

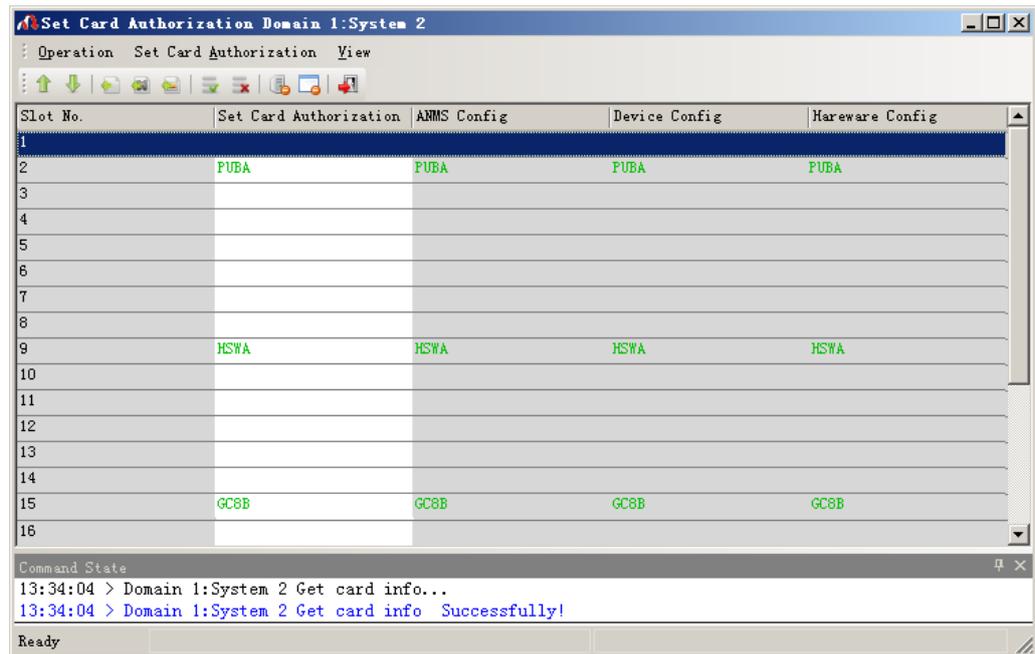


Figure 2-15 Configuring card authorization

**Note:**

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.

## 2.7.2 Pre-authorizing a Card Which is not Present

### Configuration purpose

If the cards are not present, it is necessary to pre-authorize these cards according to configuration requirement and save the configuration to the device. When actually inserting the cards, the device can check the type and operate the service configuration as long as the types match.

## Parameter explanation

Table 2-3 Card authorization window parameters

Parameter	Explanation	Instruction
Slot No.	Card slot number	Read-only item
Set Card Authorization	For selecting the card type to be authorized, on 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

## Operation steps

Take pre-authorizing the **GC4B** card in Slot 1 as an example, the detailed operation steps are as follows:

1. Right-click the AN5116-06B system in the **Logical Tree** pane, and select **Card Config** from the shortcut menu. And then the dialog box for setting card authorization appears, select Slot 1 and click the corresponding blank area under the **Set Card Authorization** item, and choose the GC4B card in the pull-down list, as shown in Figure 2-16.

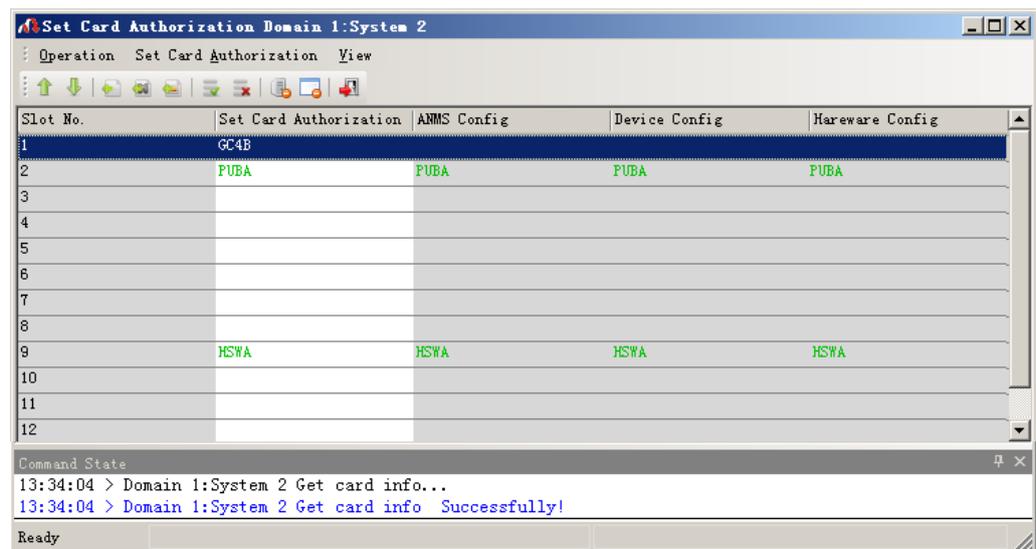


Figure 2-16 Configuring card authorization

- Click the  button or select **Operation** → **Write Device** in the menu bar, and then click **Yes** in the dialog box that appears, so as to complete the operation of pre-authorization, as shown in Figures 2-17 and 2-18.

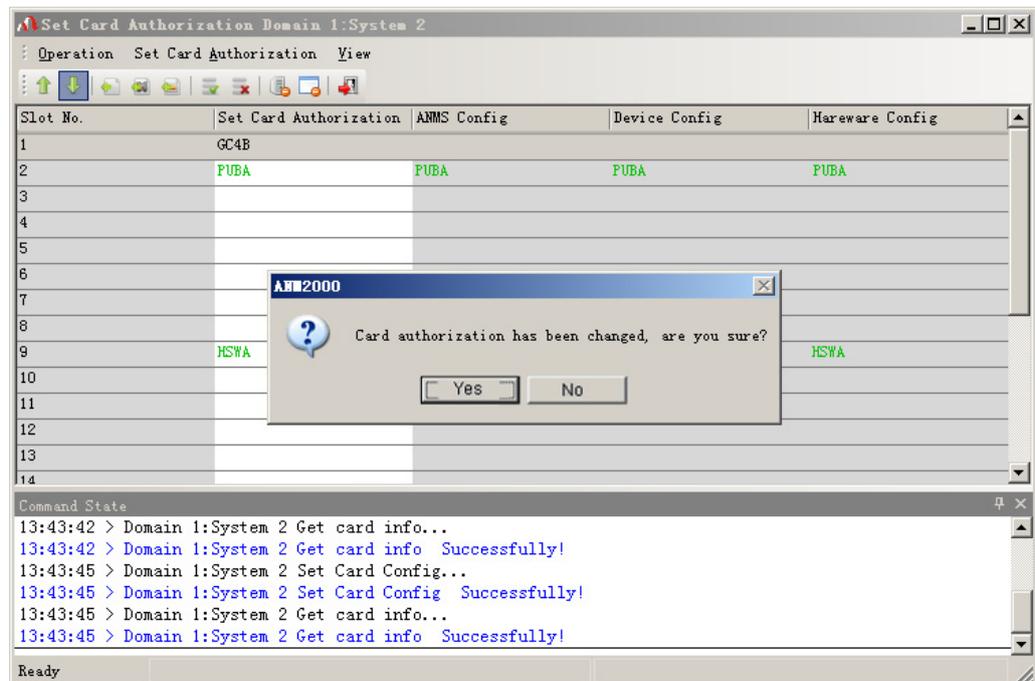


Figure 2-17 Confirming card pre-authorization

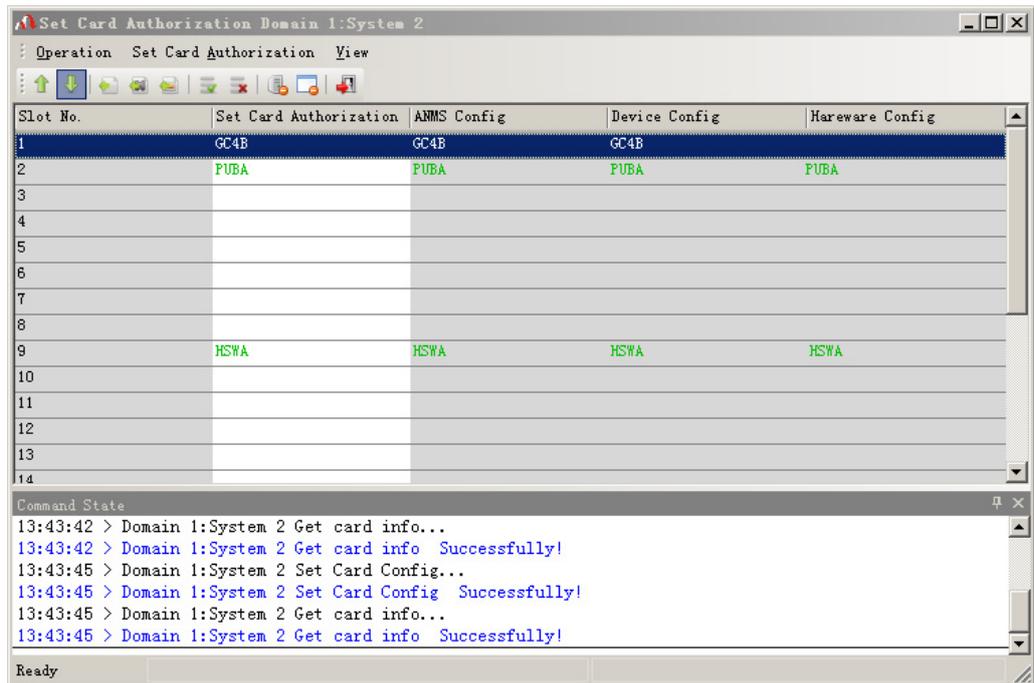


Figure 2-18 Completing card pre-authorization



**Note:**

Because 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. Click the  button in the toolbar or select **File** → **Save** from the main menu to save the current system configurations to the ANM2000 database.

## 2.8 Synchronizing Time

### Prerequisites

- ◆ The card authorization of the AN5116-06B has been completed and the configurations have been saved.
- ◆ The Ping operation of network management server to the AN5116-06B has been successful (right-click on the system object created and select **Ping** in the shortcut menu).

### Configuration purpose

The system time synchronization aims to synchronize the AN5116-06B with the ANM2000 server.

### Operation steps

The detailed operation steps of system time synchronization are as follows:

1. Right-click on the created system and select **Configure and Command** → **Time Synchronization**. A **Sending Commands...** dialog box will appear then, as shown in Figure 2-19: Click **OK** to start executing the time synchronization command.

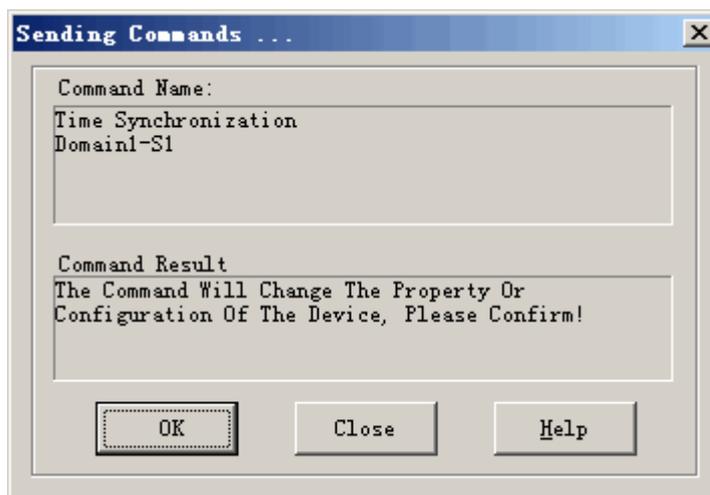


Figure 2-19 Synchronizing the time of the system

2. After the time synchronization is completed successfully, click the **Close** button.

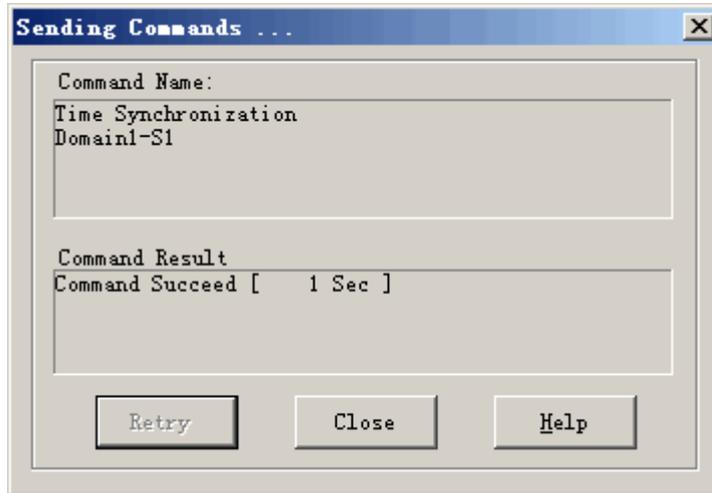


Figure 2-20 The successful time synchronization of the system

3. Click the  button in the toolbar or select **File** → **Save** from the main menu to save the current system configurations to the ANM2000 database.



**Note:**

After the equipment is connected with the network management system, it will initiate a requirement of time synchronization to the network management server. When connecting with multiple network management servers, the equipment will turn to the first network management server connected for time synchronization. If users want to change a network management server to implement the time synchronization, they must set it on the network management system manually.

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# 3 ONU Authentication and Authorization

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Before starting up the services of the AN5116-06B equipment, the users must implement the authentication and authorization for the ONU of the service interface card. This chapter introduces the operation method of authenticating and authorizing the ONU. It includes the following sections:

- Configuration principles
- 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 physical identifier + password
- Example for authentication mode switching with maintaining original ONU authorization and configuration
- Example for authentication mode switching without maintaining original ONU authorization and configuration
- Example for ONU deauthorization

## 3.1 Configuration Principles

- ◆ There are four ONU authentication modes for the AN5116-06B equipment to configure, which are: non-authentication, authentication based on physical identifier, authentication based on password, and authentication based on physical identifier + password.
- ◆ The AN5116-06B equipment 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 mode based on simple password and physical identifier (with or without 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 in the corresponding whitelist.
- ◆ In the authentication mode based on simple password and physical identifier (with or without 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 mode based on physical identifier and physical identifier + password is for authenticating the physical address of the ONU. If the password is contained, then the password needs to be authenticated at the same time.
- ◆ For the non-authentication mode, the ONU can be authorized automatically.
- ◆ For authorizing the ONU in the mode based on physical identifier (with or without password) or based on simple password, you only need to delete the ONU in the current authorization whitelist of this ONU. The following deauthorization example takes ONU deauthorization in the authentication mode based on physical identifier as an example.
- ◆ Users can switch the authentication mode according to the requirement and choose to or not to keep the original ONU authentication information and configuration. If the users select not to keep the ONU authentication information and configuration under the original authentication mode, the related information of the whitelist under the original authentication mode will be deleted before the switching.

- ◆ The ONU can be classified into two groups according to version as follows.

<b>ONU Classification</b>	<b>ONU Type</b>
Class 1	AN5506-04-A, AN5506-04-B, AN5506-06-E, AN5506-07-A2, AN5506-07-B
Class 2	AN5506-04-A1, AN5506-04-B2, AN5506-04-C1, AN5506-07-A1, AN5506-07-B1, AN5506-09-A1, AN5506-09-B1, AN5506-10-A1, AN5506-10-B1

## 3.2 Example for Authorization without Authentication

### 3.2.1 Example Introduction

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

### 3.2.2 Configuration Flow Chart

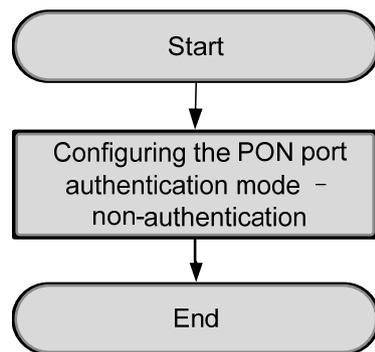


Figure 3-1 Configuration flow chart for the non-authentication mode

### 3.2.3 Configuring PON Port Authentication Mode

#### Prerequisites

The authorization for the GC4B card and the HSWA card has been completed.

#### Configuration purpose

Configure the authentication mode for the PON port.

## Operation steps

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

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, and select **Config** → **ONU Authentication** → **PON Authentication Mode** from the shortcut menu that appears to bring up the **PON Authentication Mode** window.



Note:

The authorization mode of the PON port is physical identifier mode by default.

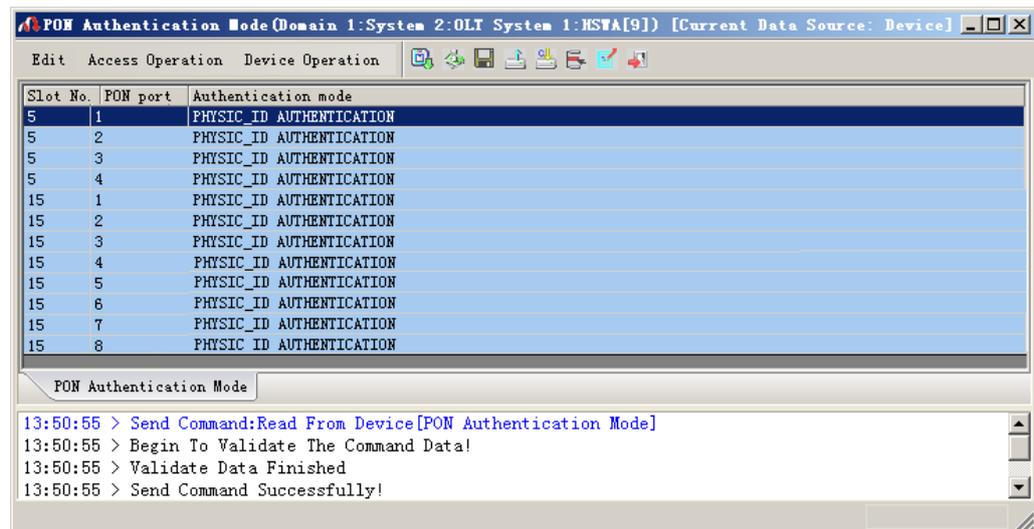


Figure 3-2 The **PON Authentication Mode** window -- in non-authentication mode

2. Double-click the item **Authentication mode** following **Slot No.:****Port No.** (5:2), and then select **NO Authentication** in the pull-down list.
3. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the PON port authentication mode configuration is completed. See Figure 3-3.

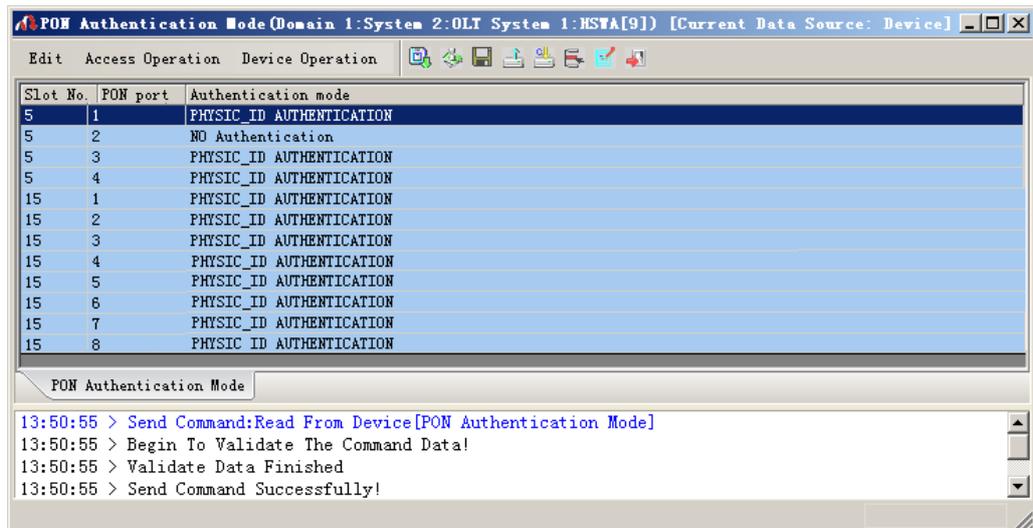


Figure 3-3 Configuring the non-authentication mode

## 3.2.4 End of Configuration

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

## 3.3 Example for Authentication and Authorization Based on Physical Identifier

### 3.3.1 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 automatically.

- ◆ 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.

This example introduces these two ways respectively.

### 3.3.2 Planning Data

This example introduces the operation methods of manual and automatic authentication and authorization for the ONU respectively. The planned data for these two methods are as follows.

Table 3-1 Planning data for configuring the physical identifier authentication mode

Command		Configuration Instruction	Configuration Step (Manual Authentication and Authorization)	Configuration Step (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	Physical identifier authentication	Physical identifier authentication

Command		Configuration Instruction	Configuration Step (Manual Authentication and Authorization)	Configuration Step (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	—

### 3.3.3 Configuration Flow Chart

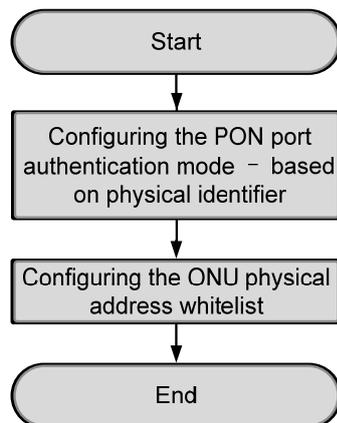


Figure 3-4 Configuration flow chart for the physical identifier authentication mode

### 3.3.4 Configuring PON Port Authentication Mode

#### Prerequisites

The authorization for the GC4B card and the HSWA card has been completed.

## Configuration purpose

Configure the authentication mode for the PON port.

## Operation steps

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

1. Right-click the **HWSA[9]** card in the **Object Tree** pane, and select **Config** → **ONU Authentication** → **PON Authentication Mode** from the shortcut menu that appears to bring up the **PON Authentication Mode** window.



Note:

The authorization mode of the PON port is physical identifier mode by default.

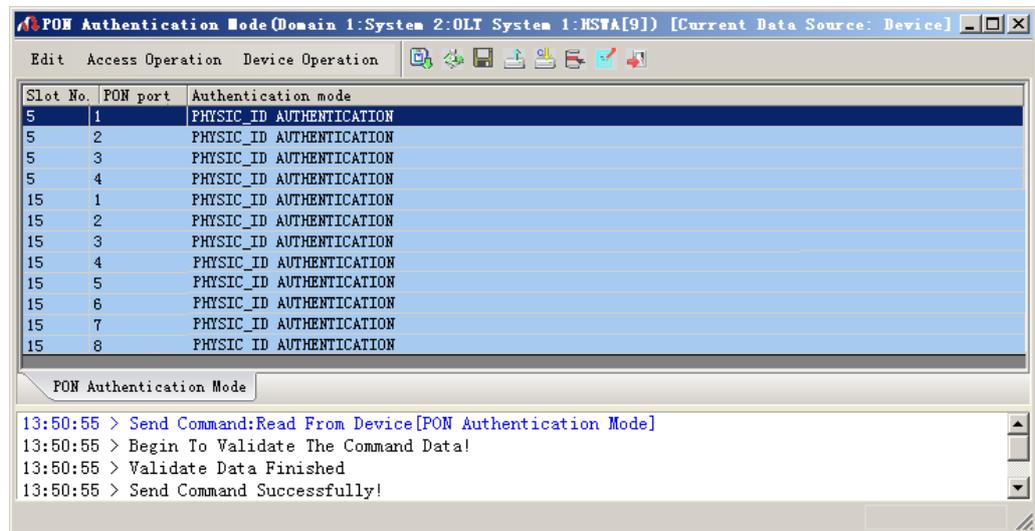


Figure 3-5 The **PON Authentication Mode** window -- in the physical identifier authentication mode

2. Double-click the item **Authentication mode** following **Slot No.:Port No.** (5:2), and then select **PHYSIC\_ID AUTHENTICATION** in the pull-down list.

- When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the PON port authentication mode configuration is completed. See Figure 3-6.

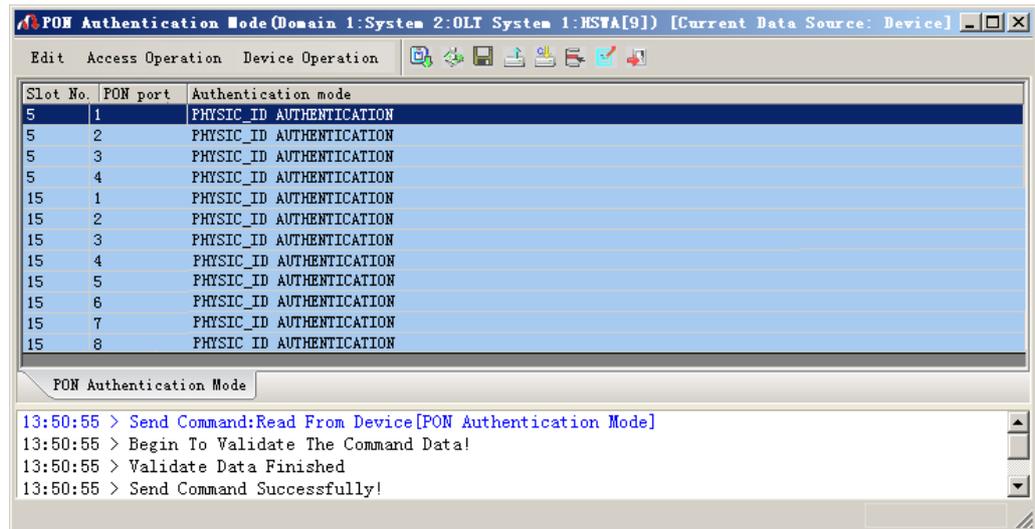


Figure 3-6 Configuring the physical identifier authentication mode

## 3.3.5 Configuring the ONU Physical Address Whitelist

### 3.3.5.1 Authenticating and authorizing the ONU manually

#### Prerequisites

The authentication mode for the PON port must be based on physical identifier.

#### Configuration purpose

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

## Operation steps

Pre-configure the physical address whitelist manually, and authenticate and authorize the ONU whose physical address is FHTT0024010d manually.

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, and select **Config** → **ONU Authentication** → **ONU Physic\_ID Address Whitelist** from the shortcut menu that appears to access 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 1 physical identifier whitelist, and configure according to the planned data in Table 3-1.



### Note:

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

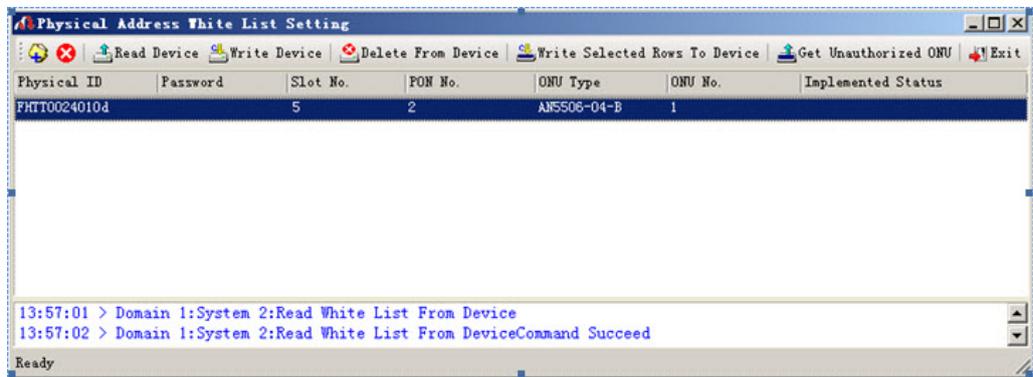


Figure 3-7 Pre-authentication configuration based on physical identifier

3. After completing the configuration, 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 3-8.

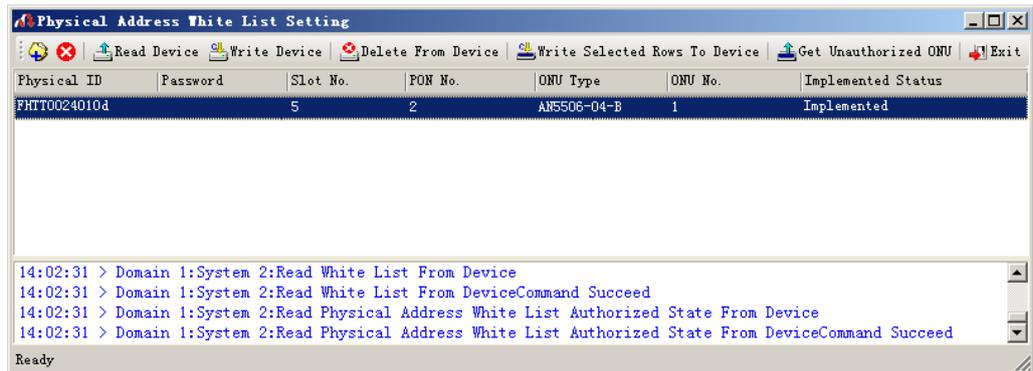


Figure 3-8 Successful pre-authentication configuration based on physical identifier

### 3.3.5.2 Authenticating and authorizing the ONU automatically

#### Prerequisites

The authentication mode for the PON port must be based on physical identifier.

#### Configuration purpose

Authenticate and authorize the ONU automatically using the way of getting unauthorized ONU automatically.

#### Operation steps

Authenticate and authorize the ONU whose physical address is FHTT0024010d automatically using the way of getting unauthorized ONU automatically.

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, and select **Config** → **ONU Authentication** → **ONU Physic\_ID Address Whitelist** from the shortcut menu that appears to access the **Physical Address White List Setting** window.
2. Right-click a blank area of the whitelist, and select unauthorized ONU from the menu that appears or directly click the  button in the tool bar to bring up the **Get Unauthorized ONU** dialog box.

- 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 physical address FHTT0024010d.

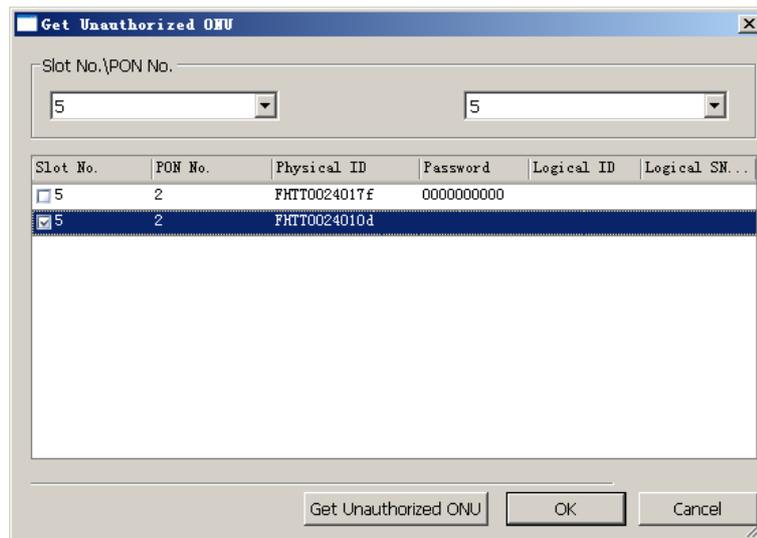


Figure 3-9 The **Get Unauthorized ONU** dialog box -- based on physical identifier

- Click **OK** and return to the **Physical Address White List Setting** window, as shown in Figure 3-10.

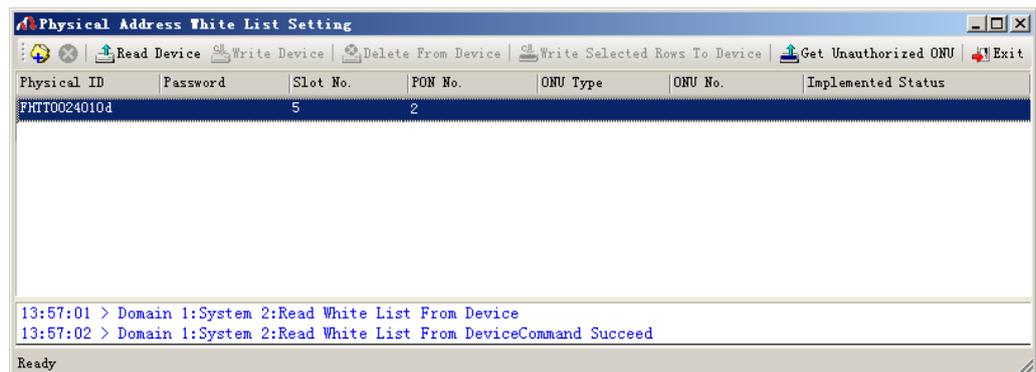


Figure 3-10 The **Physical Address White List Setting** window -- based on physical identifier

- After completing the configuration, 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 3-11.

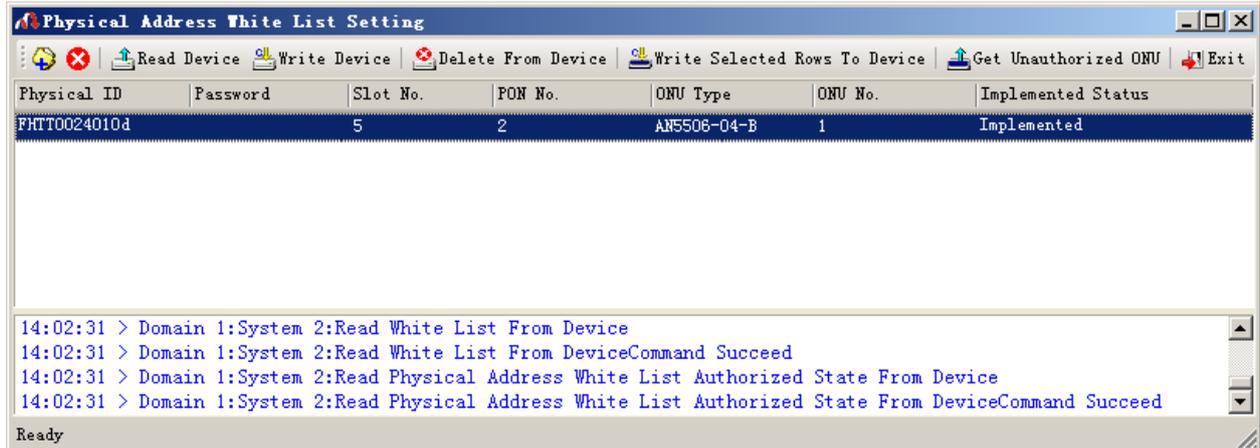


Figure 3-11 Successful automatic authorization -- based on physical identifier

### 3.3.6 End of Configuration

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

Check the ONU list under the PON port No.2 in Slot No.5, as shown in Figure 3-12.

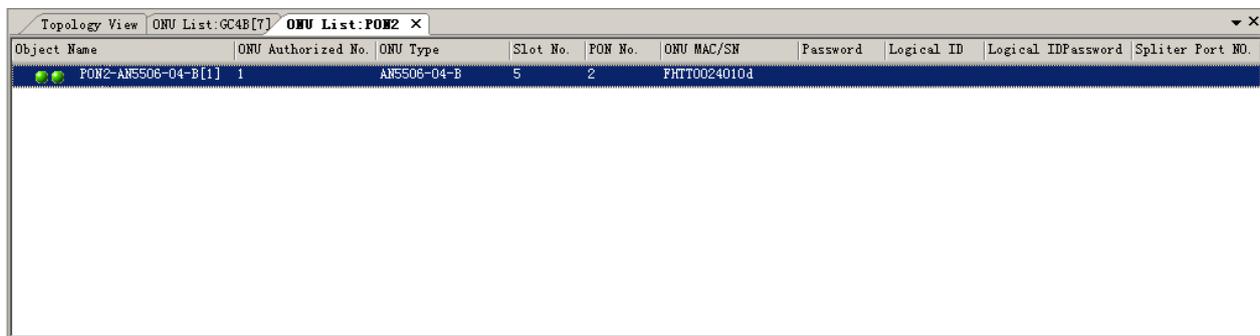


Figure 3-12 The ONU list -- based on physical identifier



**Note:**

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

---

## 3.4 Example for Authentication and Authorization Based on Password

### 3.4.1 Example Introduction

In the practical example for the authentication and authorization based on password, the ONU is authorized in two ways: authenticating and authorizing manually, authenticating and authorizing automatically.

- ◆ 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.

This example introduces these two ways respectively.

### 3.4.2 Planning Data

This example introduces the operation methods of manual and automatic authentication and authorization for the ONU respectively. The planned data for these two methods are as follows.

Table 3-2 Planning data for configuring the password authentication mode

Command		Configuration Instruction	Configuration Step (Manual Authentication and Authorization)	Configuration Step (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

Command		Configuration Instruction	Configuration Step (Manual Authentication and Authorization)	Configuration Step (Automatic Authentication and Authorization)
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	—

### 3.4.3 Configuration Flow Chart

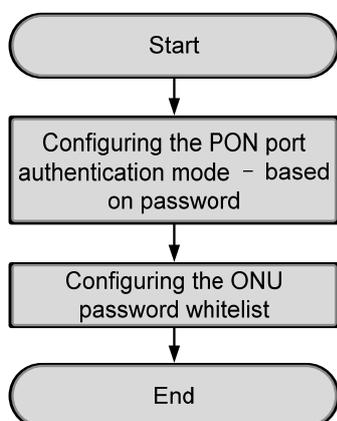


Figure 3-13 Configuration flow chart for the password authentication mode

### 3.4.4 Configuring PON Port Authentication Mode

#### Prerequisites

The authorization for the GC4B card and the HSWA card has been completed.

#### Configuration purpose

Configure the authentication mode for the PON port.

#### Operation steps

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

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, and select **Config** → **ONU Authentication** → **PON Authentication Mode** from the shortcut menu that appears to bring up the **PON Authentication Mode** window.



Note:

The authorization mode of the PON port is physical identifier mode by default.

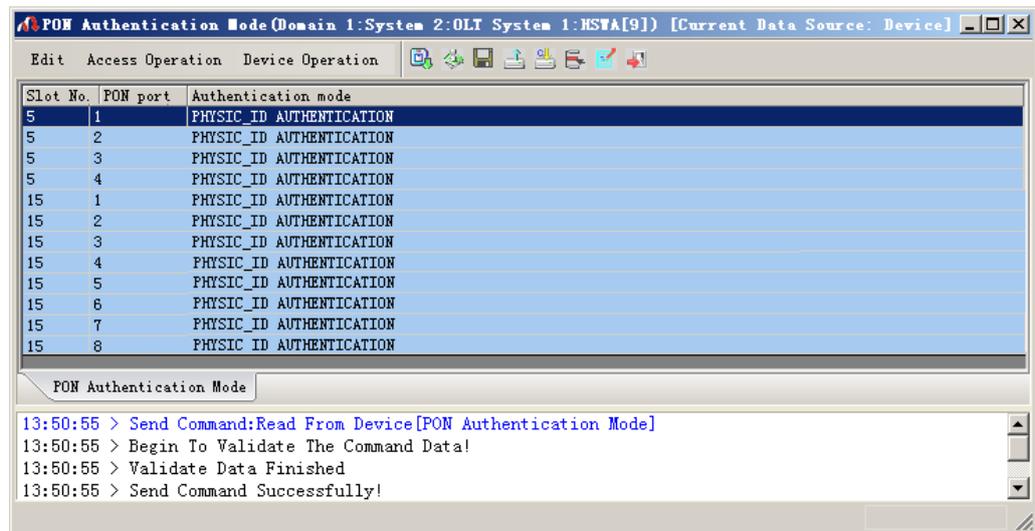


Figure 3-14 The **PON Authentication Mode** window – based on password

2. Double-click the item **Authentication mode** following **Slot No.:Port No.** (5:2), and then select **PASSWORD AUTHENTICATION** in the pull-down list.
3. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the PON port authentication mode configuration is completed, as shown in Figure 3-15.

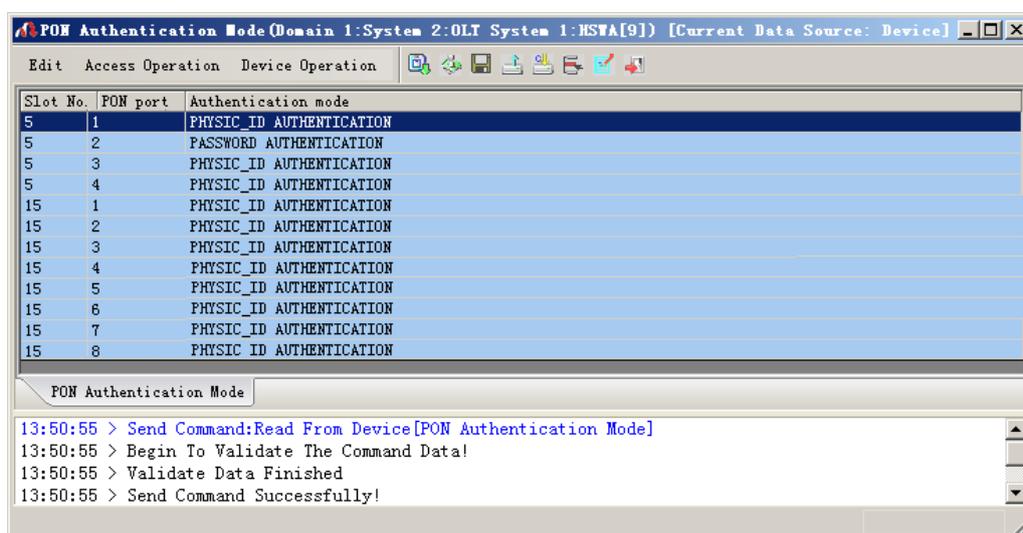


Figure 3-15 Configuring the password authentication mode – based on password

## 3.4.5 Configuring the ONU Password Whitelist

### 3.4.5.1 Authenticating and authorizing the ONU manually

#### Prerequisites

- ◆ The authentication mode for the PON port must be based on password.
- ◆ The ONU must be equipped with a password.

## Configuration purpose

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

## Operation steps

Pre-configure the password whitelist, and authenticate and authorize the ONU whose password is 12345 manually.

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, and select **Config** → **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 1 password whitelist, and configure according to the planned data in Table 3-2.

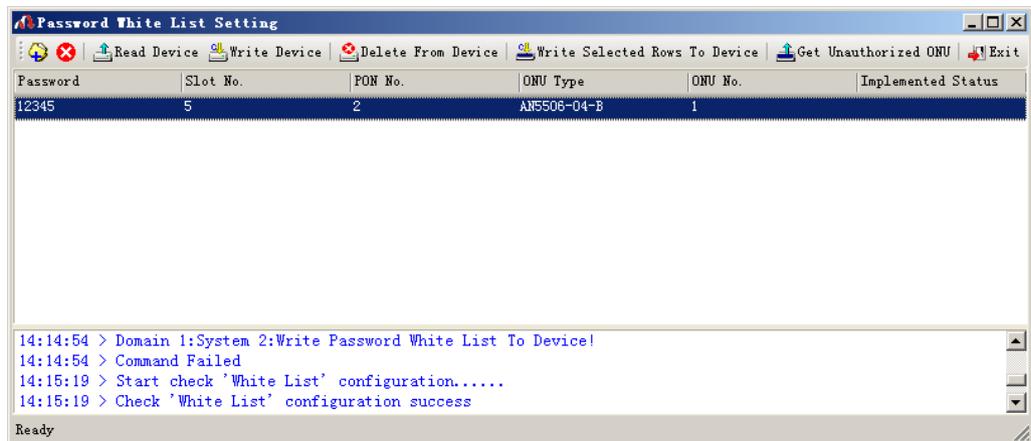


Figure 3-16 Pre-authentication configuration – based on password

3. After completing the configuration, 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 3-17.

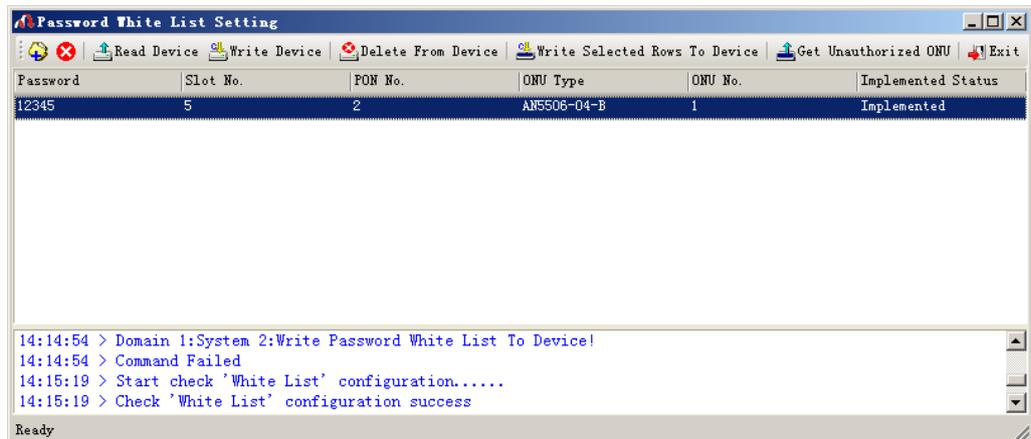


Figure 3-17 Successful pre-authentication configuration -- based on password

### 3.4.5.2 Authenticating and authorizing the ONU automatically

#### Prerequisites

- ◆ The authentication mode for the PON port must be based on password.
- ◆ The ONU must be equipped with password.

#### Configuration purpose

Authenticate and authorize the ONU automatically using the way of getting unauthorized ONU automatically.

#### Operation steps

Authenticate and authorize the ONU whose password is 12345 automatically by getting unauthorized ONU.

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, and select **Config** → **ONU Authentication** → **ONU Password Whitelist** from the shortcut menu that appears to bring up the **Password White List Setting** window.

- Right-click a blank area of the whitelist, and select unauthorized ONU from the menu that appears or directly click the  button in the tool bar to bring up the **Get Unauthorized ONU** dialog box.
- 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.

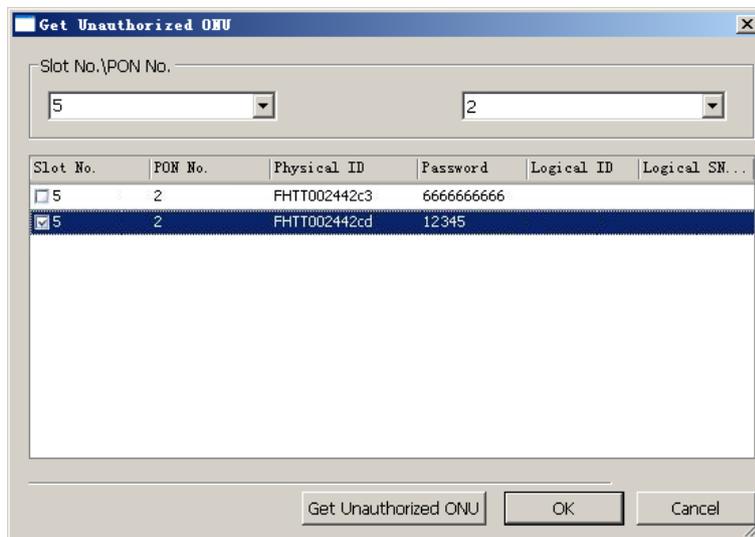


Figure 3-18 The **Get Unauthorized ONU** dialog box – based on password

- Click **OK** and return to the **Password White List Setting** window, as shown in Figure 3-19.

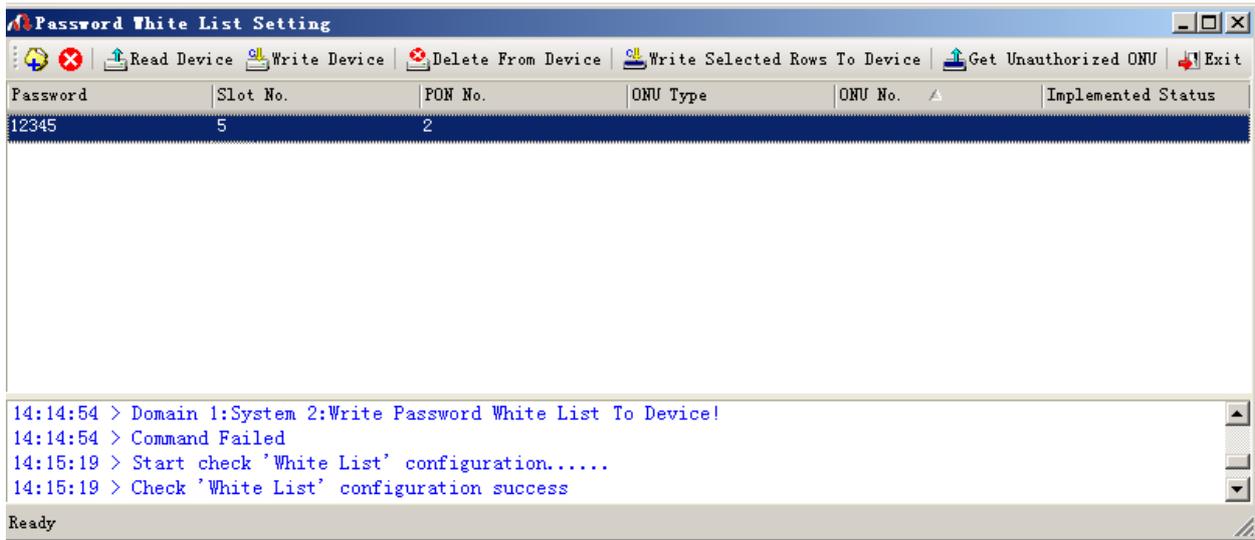


Figure 3-19 The **Password White List Setting** window – based on password

- After completing the configuration, 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 3-20.

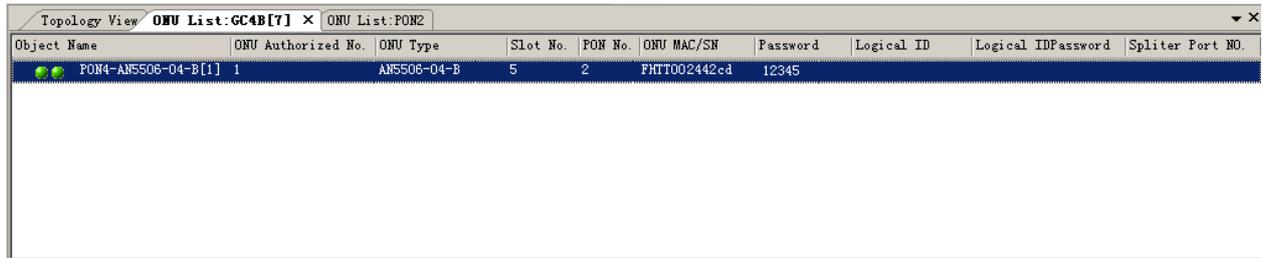


Figure 3-20 Successful automatic authorization – based on password

### 3.4.6 End of Configuration

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

Check the ONU list under the PON port No.2 in Slot No.5, as shown in Figure 3-21.



The screenshot shows a window titled 'ONU List:GC4B[7]' with a sub-tab 'ONU List:PON2'. It displays a table with the following data:

Object Name	ONU Authorized No.	ONU Type	Slot No.	PON No.	ONU MAC/SN	Password	Logical ID	Logical IDPassword	Splitter Port NO.
PON4-AN5506-04-B[1]	1	AN5506-04-B	5	2	FHTT002442cd	12345			

Figure 3-21 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 indicator LED of the ONU on the ONU list is grey, and the column **ONU MAC/SN** is blank.

---

## 3.5 Example for Authentication and Authorization Based on Physical Identifier + Password

### 3.5.1 Example Introduction

In the practical example for the authentication and authorization based on physical identifier + password, the ONU is authorized in two ways: authenticating and authorizing manually, authenticating and authorizing automatically.

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

This example introduces these two ways respectively.

### 3.5.2 Planning Data

This example introduces the operation methods of manual and automatic authentication and authorization for the ONU respectively. The planned data for these two methods are as follows.

Table 3-3 Planning data for configuring the physical identifier + password authentication mode

Command		Configuration Instruction	Configuration Step Manual Authentication and Authorization)	Configuration Step (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

Command		Configuration Instruction	Configuration Step Manual Authentication and Authorization)	Configuration Step (Automatic Authentication and Authorization)
	Authentication mode	Configure according to the network planning of the operator	Physical identifier + password authentication	Physical identifier + password authentication
Configuring ONU physical identifier whitelist	Physical identifier	Configure according to the actual status of the ONU	FHTT00244221	—
	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	—

### 3.5.3 Configuration Flow Chart

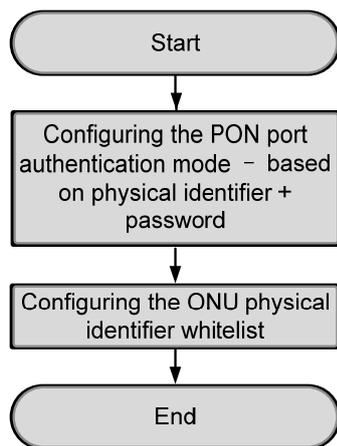


Figure 3-22 Configuration flow chart for the physical identifier + password authentication mode

### 3.5.4 Configuring PON Port Authentication Mode

#### Prerequisites

The authorization for the GC4B card and the HSWA card has been completed.

#### Configuration purpose

Configure the authentication mode for the PON port.

#### Operation steps

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

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, and select **Config** → **ONU Authentication** → **PON Authentication Mode** from the shortcut menu that appears to bring up the **PON Authentication Mode** window.



Note:

The authorization mode of the PON port is physical identifier mode by default.

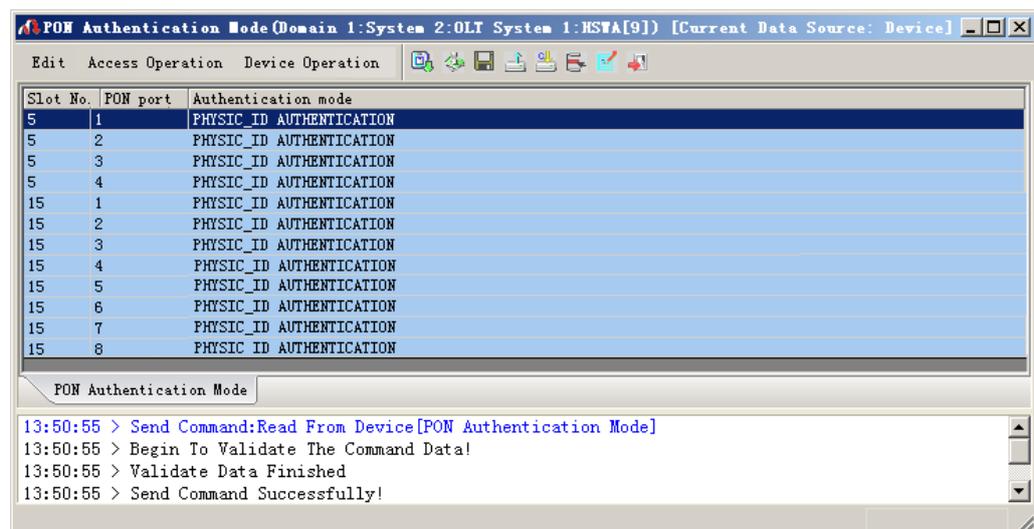


Figure 3-23 The **PON Authentication Mode** window – based on physical identifier + password

2. Double-click the item **Authentication mode** following **Slot No.:Port No.** (5:2), and then select **PHYSIC\_ID+PASSWORD AUTHENTICATION** in the pull-down list.
3. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the PON port authentication mode configuration is completed. See Figure 3-24.

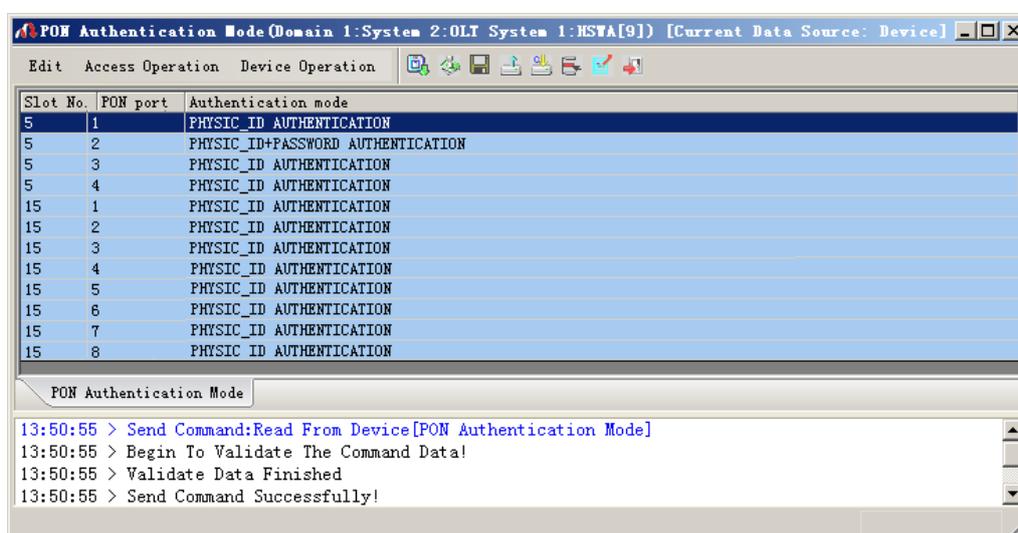


Figure 3-24 Configuring the physical identifier + password authentication mode

## 3.5.5 Configuring the ONU Physical Identifier Whitelist

### 3.5.5.1 Authenticating and authorizing the ONU manually

#### Prerequisites

- ◆ The authentication mode for the PON port must be based on physical identifier + password.
- ◆ The ONU must be equipped with password.

## Configuration purpose

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

## Operation steps

Pre-configure the physical address whitelist manually, and authenticate and authorize the ONU whose physical address is FHTT00244221 and password is 12345 manually.

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, and select **Config** → **ONU Authentication** → **ONU Physic\_ID Address Whitelist** from the shortcut menu that appears to access 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 1 physical identifier whitelist, and configure according to the planned data in Table 3-3.



### Note:

The ONU authentication based on physical identifier + password needs the ONU password, so that it is necessary to fill in the password.

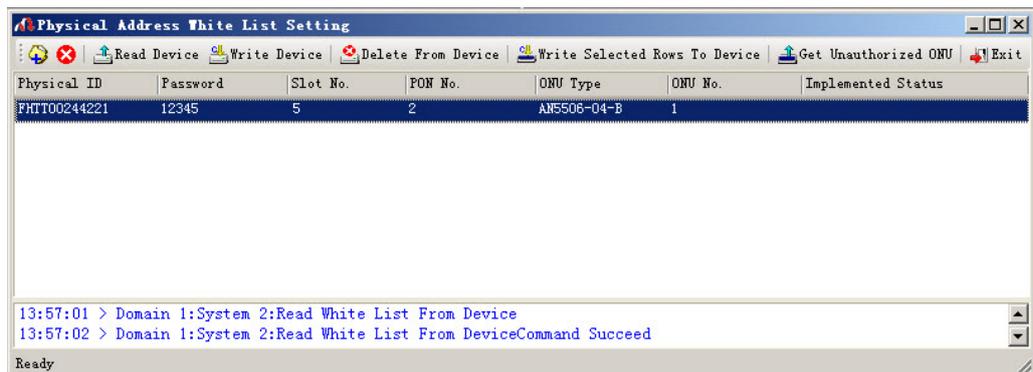


Figure 3-25 Pre-authentication configuration – based on physical identifier + password

3. After completing the configuration, 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 3-26.

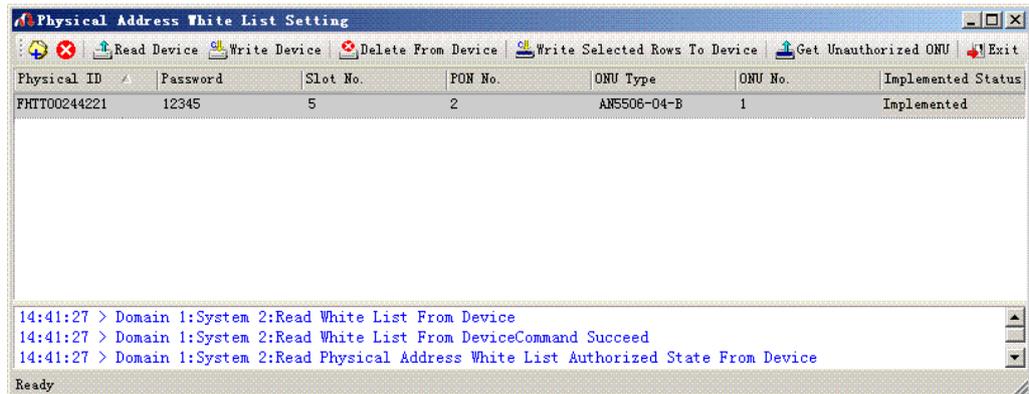


Figure 3-26 Successful pre-authentication configuration – based on physical identifier + password

### 3.5.5.2 Authenticating and authorizing the ONU automatically

#### Prerequisites

- ◆ The authentication mode for the PON port must be based on physical identifier + password.
- ◆ The ONU must be equipped with password.

#### Configuration purpose

Authenticate and authorize the ONU automatically using the way of getting unauthorized ONU automatically.

#### Operation steps

Authenticate and authorize the ONU whose physical address is FHTT00244221 and password is 12345 automatically by getting unauthorized ONU.

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, and select **Config** → **ONU Authentication** → **ONU Physic\_ID Address Whitelist** from the shortcut menu that appears to access the **Physical Address White List Setting** window.
2. Right-click a blank area of the whitelist, and select unauthorized ONUs in the menu that appears or directly 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 physical address FHTT00244221 and password 12345.

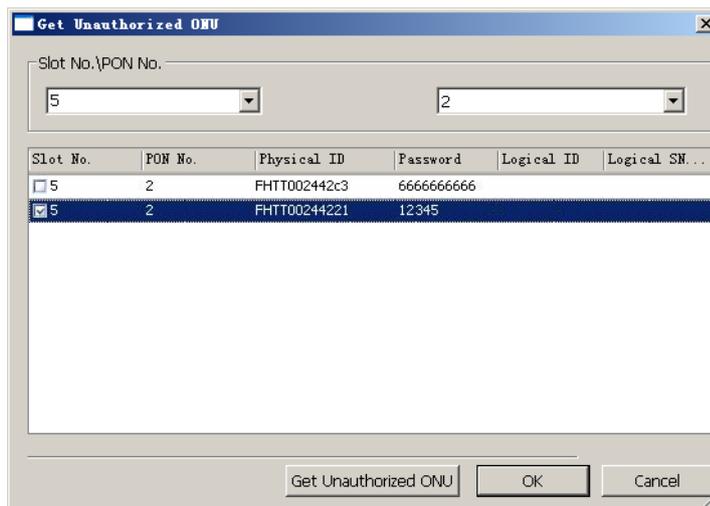


Figure 3-27 The **Get Unauthorized ONU** dialog box – based on physical identifier + password

4. Click **OK** and return to the **Physical Address White List Setting** window, as shown in Figure 3-28.

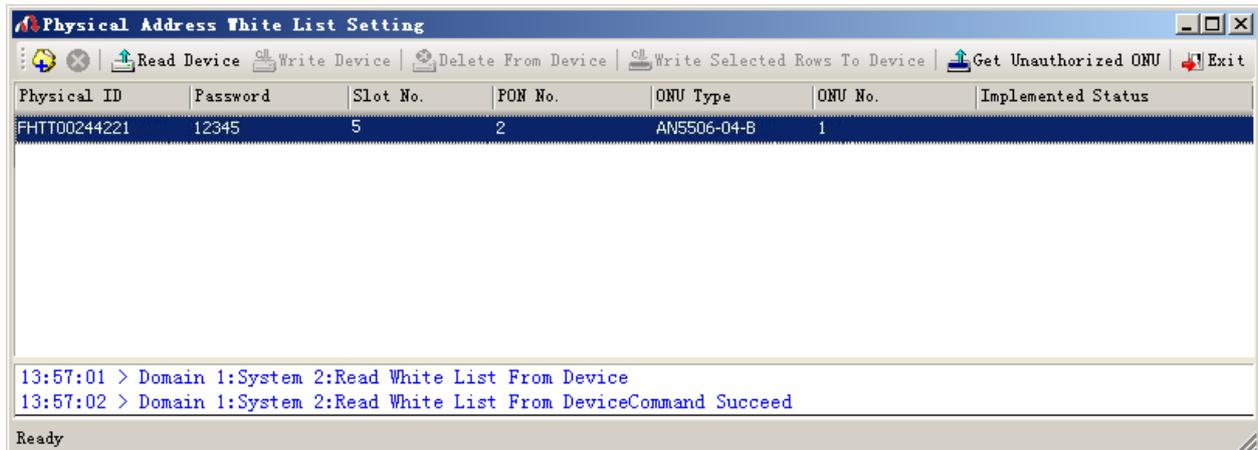


Figure 3-28 The **Physical Address White List Setting** window – based on physical identifier + password

- After completing the configuration, 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 3-29.

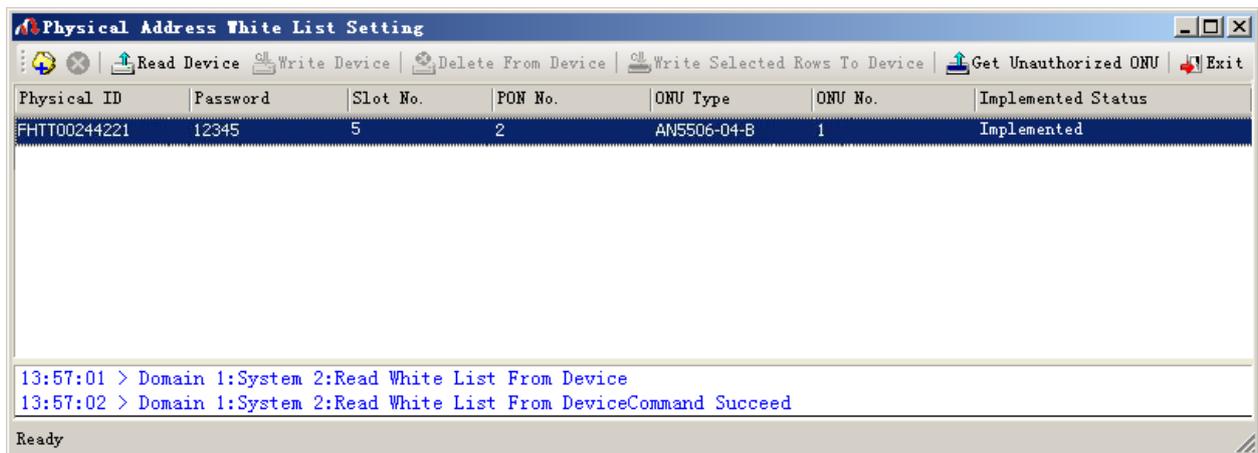
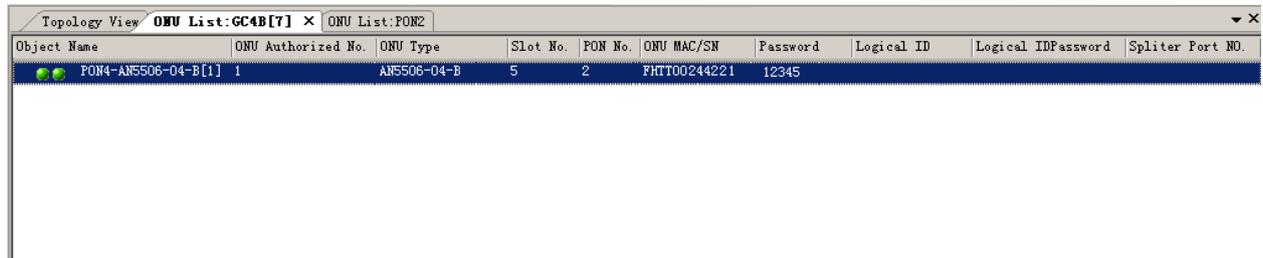


Figure 3-29 Successful automatic authorization – based on physical identifier + password

### 3.5.6 End of Configuration

After the configuration is successful, the OLT has authenticated and authorized the ONU whose physical address is FHTT00244221 and password is 12345, and the users will be able to implement service configurations for this ONU.

Check the ONU list under the PON port No.2 in Slot No.5, as shown in Figure 3-30.



Object Name	ONU Authorized No.	ONU Type	Slot No.	PON No.	ONU MAC/SN	Password	Logical ID	Logical IDPassword	Splitter Port NO.
PON4-AN5506-04-B[1]	1	AN5506-04-B	5	2	PHTT00244221	12345			

Figure 3-30 The ONU list – based on physical identifier + password



**Note:**

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

## 3.6 Example for Authentication Mode Switching with Maintaining Original ONU Authorization and Configuration

### 3.6.1 Example Introduction

The authentication mode switching with maintaining the original ONU configurations 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 without manual reconfiguration.

This example shows how to switch the physical identifier authentication mode to the password authentication mode. It must be guaranteed that the ONU is equipped with password.

### 3.6.2 Configuration Flow Chart

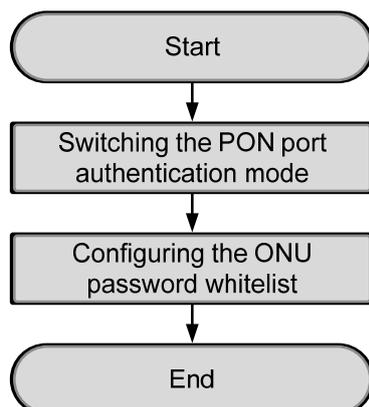


Figure 3-31 Configuration flow chart for authentication mode switching with maintaining the original ONU configuration

### 3.6.3 Switching PON Port Authentication Mode

#### Prerequisites

- ◆ The authorization for the GC4B card and the HSWA card has been completed.
- ◆ The original authentication mode of the ONU is physical identifier mode and the ONU authorization is completed before the switching.
- ◆ The ONU must be equipped with password.

#### Configuration purpose

Configure the switching of the authentication mode of the PON port.

#### Operation steps

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

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, and select **Config** → **ONU Authentication** → **PON Authentication Mode** from the shortcut menu that appears to bring up the **PON Authentication Mode** window.

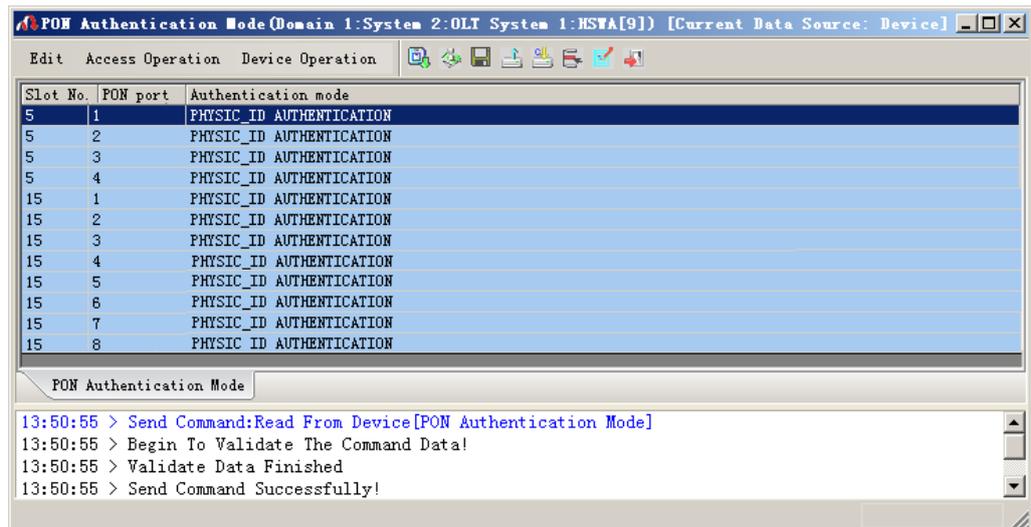


Figure 3-32 The **PON Authentication Mode** window -- maintaining the original ONU authorization and configuration

2. Double-click the item **Authentication mode** following **Slot No.:Port No.** (5:2), and then select **PASSWORD AUTHENTICATION** in the pull-down list.
3. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the PON port authentication mode configuration is completed. See Figure 3-33.

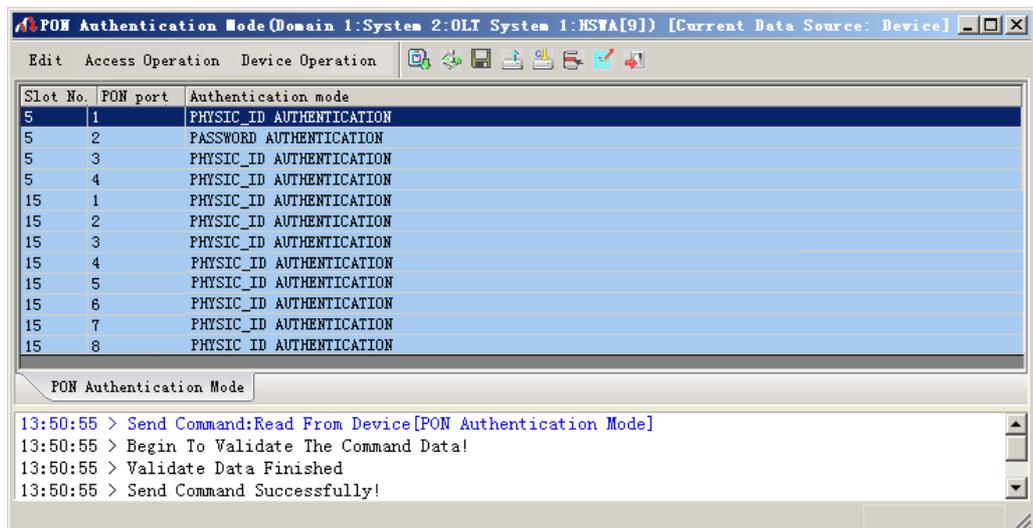


Figure 3-33 Configuring mode switching -- maintaining the original ONU authorization and configuration

### 3.6.4 Configuring the ONU Password Whitelist

#### Prerequisites

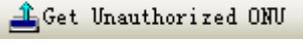
- ◆ The authentication mode for the PON port must be switched to be based on password.
- ◆ The ONU must be equipped with password.

#### Configuration purpose

Configure the ONU password whitelist, and authenticate and authorize the ONU.

## Configuration steps

Reauthorize the ONU (AN5506-04-B) connected to the No.2 PON port on the Slot 5 in the password whitelist. The operation steps are as follows:

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, and select **Config** → **ONU Authentication** → **ONU Password Whitelist** from the shortcut menu that appears to bring up the **Password White List Setting** window.
2. Right-click a blank area of the whitelist, and select unauthorized ONUs from the menu that appears or directly 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 physical address FHTT0024010d.

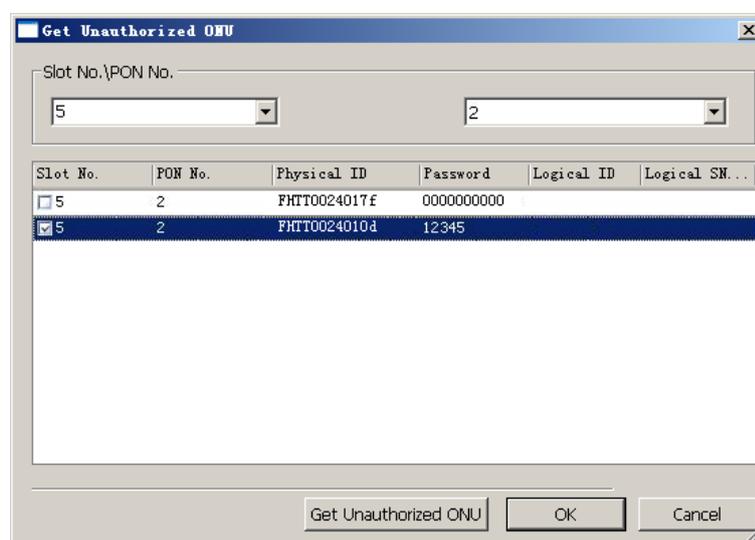


Figure 3-34 The **Get Unauthorized ONU** dialog box -- maintaining the original ONU authorization and configuration

4. Click **OK** and return to the **Password White List Setting** window, as shown in Figure 3-35.

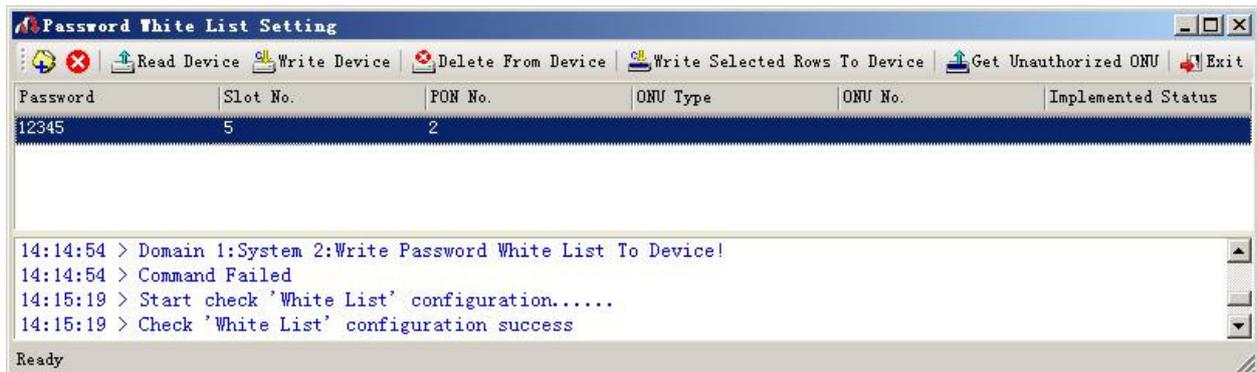


Figure 3-35 The **Password White List Setting** window -- maintaining the original ONU authorization and configuration

- After completing the configuration, 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 3-36.

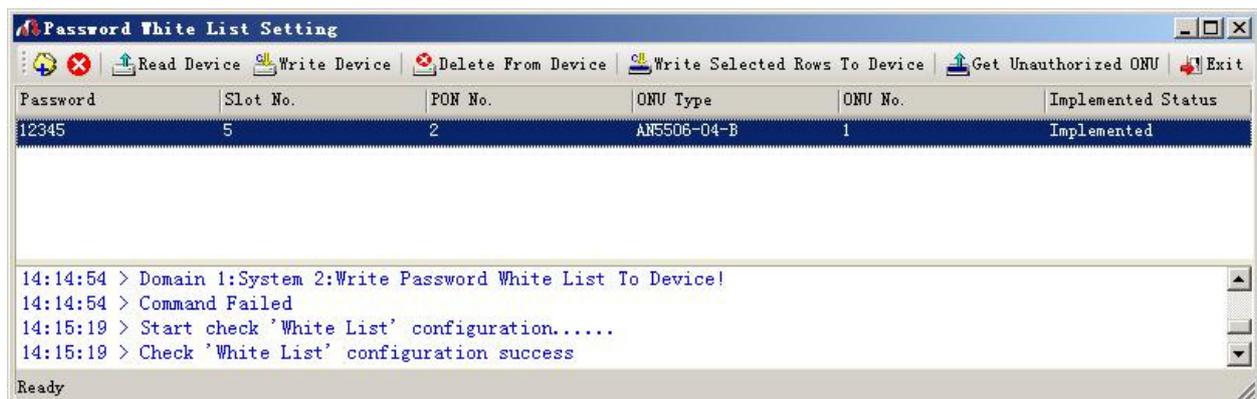


Figure 3-36 Successful password whitelist authorization -- maintaining the original ONU authorization and configuration

### 3.6.5 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 3-37.

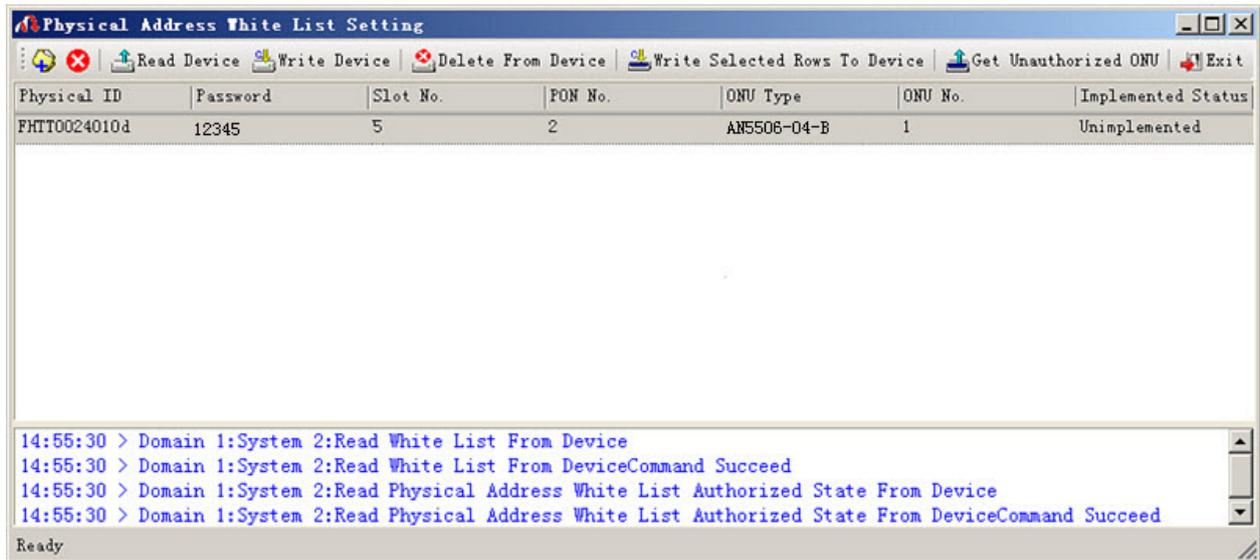


Figure 3-37 The physical address whitelist after the switching -- maintaining the original ONU authorization and configuration

Check the ONU list under the PON port No.2 in Slot No.5. The information of this ONU has not changed after the switching, as shown in Figure 3-38.

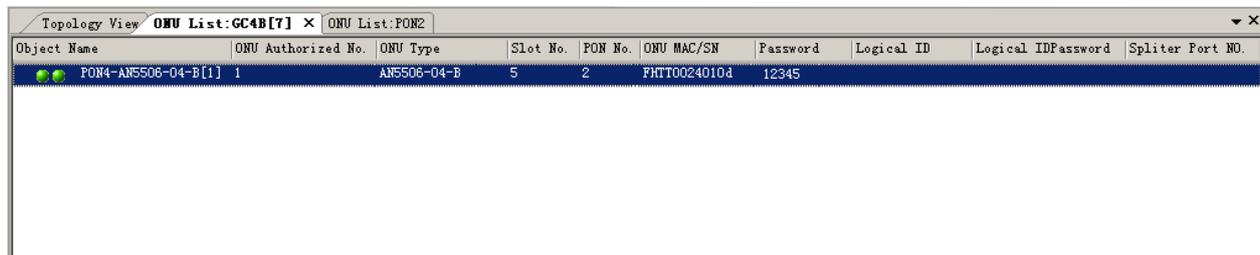


Figure 3-38 The ONU list -- maintaining the original ONU authorization and configuration

## 3.7 Example for Authentication Mode Switching Without Maintaining Original ONU Authorization and Configuration

### 3.7.1 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; otherwise the original ONU configuration will be maintained in the system. 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. It must be guaranteed that the ONU is equipped with password.

### 3.7.2 Configuration Flow Chart

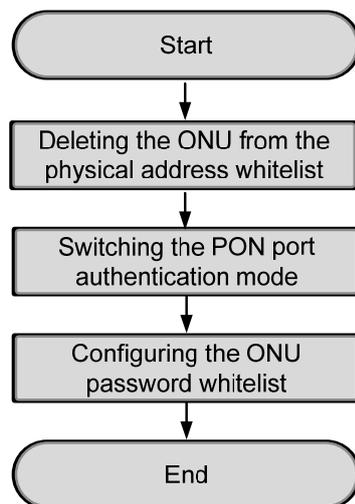


Figure 3-39 Configuration flow chart for authentication mode switching without maintaining the original ONU configuration

### 3.7.3 Deleting ONU from Physical Address Whitelist

#### Prerequisites

- ◆ The authorization for the GC4B card and the HSWA card has been completed.
- ◆ The original authentication mode of the ONU is physical identifier mode and the ONU authorization is completed before the switching.
- ◆ The ONU must be equipped with password.
- ◆ The current PON port authentication mode is the mode based on physical address identifier.

#### Configuration purpose

Delete the ONU information from the physical address whitelist.

#### Operation steps

Delete the information of the ONU (AN5506-04-B) that is authorized in the physical address whitelist from the equipment. The procedures are as follows:

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, and select **Config** → **ONU Authentication** → **ONU Physic\_ID Address Whitelist** from the shortcut menu that appears to bring up the **Physical Address White List Setting** window, as shown in Figure 3-40.

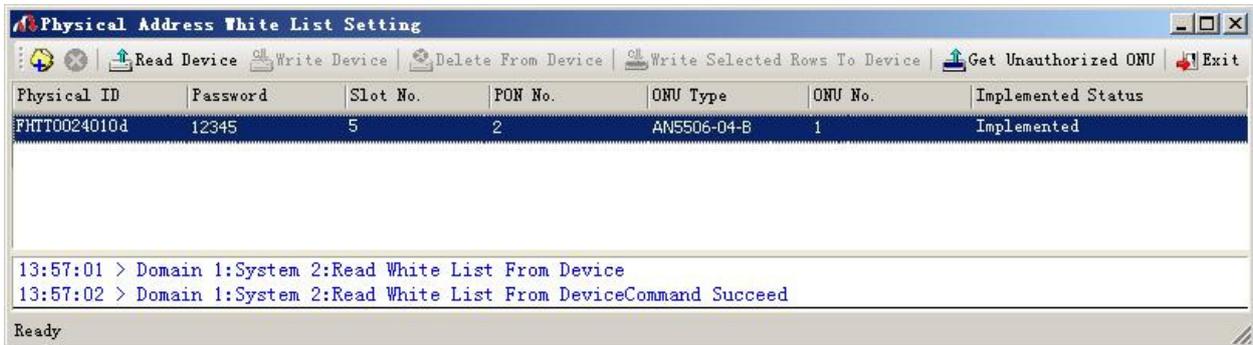


Figure 3-40 The Physical Address White List Setting window

2. Select the ONU whose physical address is FHTT0024010d and then click the  button. In the dialog box that appears, click OK to delete the authorization information of the ONU from the whitelist, as shown in Figure 3-41.

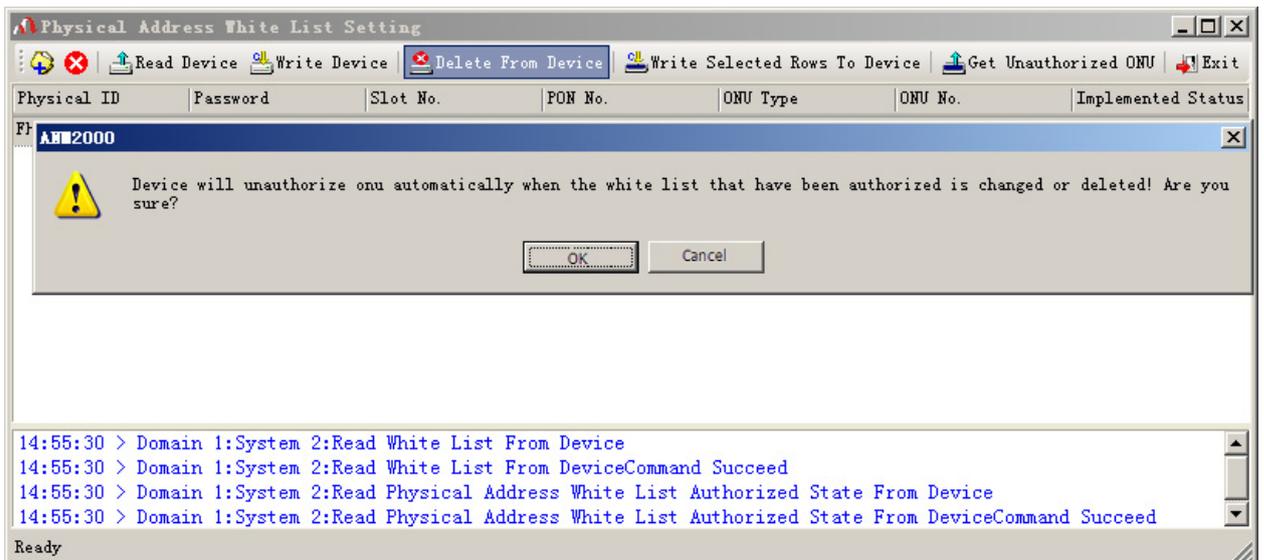


Figure 3-41 Deleting the ONU authorization information

## 3.7.4 Switching PON Port Authentication Mode

### Prerequisites

The relevant authorization information of the ONU has been deleted from the physical address whitelist.

### Configuration purpose

Configure the authentication mode switching of the PON port.

### Operation steps

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

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, and select **Config** → **ONU Authentication** → **PON Authentication Mode** from the shortcut menu that appears to bring up the **PON Authentication Mode** window.

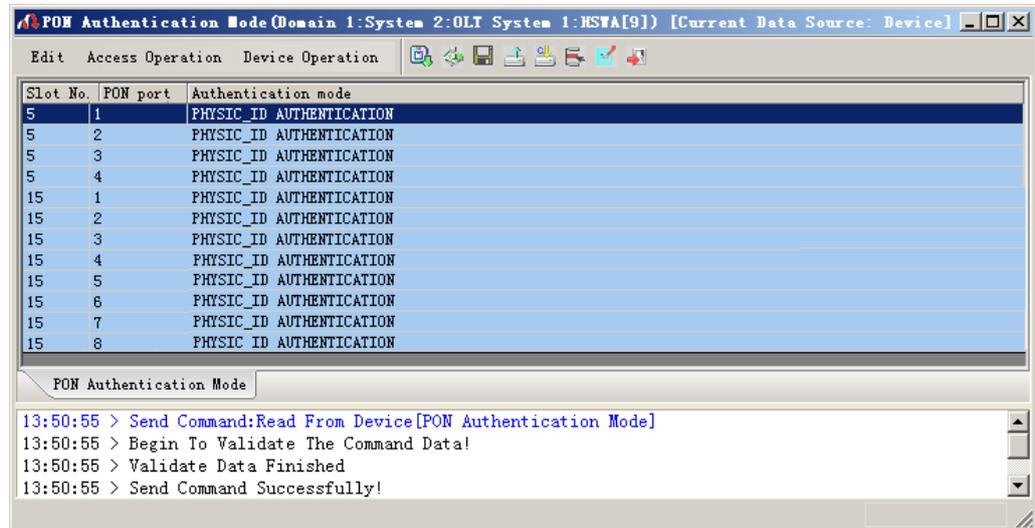


Figure 3-42 The **PON Authentication Mode** window – without maintaining original ONU authorization and configuration

2. Double-click the **Slot No.:Port No.** (5:2)'s corresponding blank area under the item **Authentication mode**, and then select **Password AUTHENTICATION** in the pull-down list.
3. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the PON port authentication mode configuration is completed. See Figure 3-43.

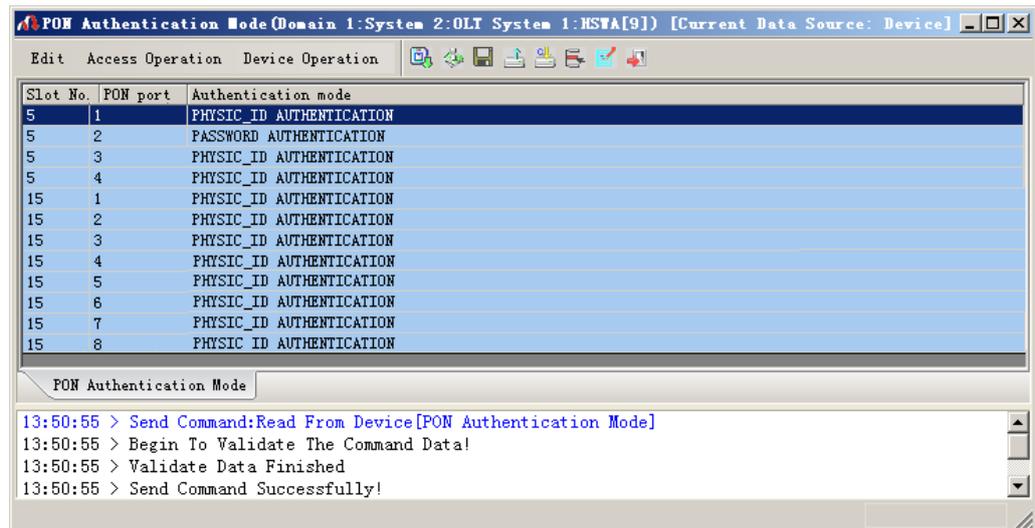


Figure 3-43 Switching the authentication mode – without maintaining original ONU authorization and configuration

### 3.7.5 Configuring the ONU Password Whitelist

#### Prerequisites

- ◆ The authentication mode for the PON port must be switched to password-based.
- ◆ The ONU must be equipped with password.

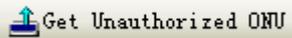
#### Configuration purpose

Configure the ONU password whitelist, and authenticate and authorize the ONU.

#### Configuration steps

Reauthorize the ONU (AN5506-04-B) connected to the No.2 PON port on the Slot 5 in the password whitelist. The operation steps are as follows:

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, and select **Config** → **ONU Authentication** → **ONU Password Whitelist** from the shortcut menu that appears to bring up the **Password White List Setting** window.

2. Right-click a blank area of the whitelist, and select unauthorized ONUs from the menu that appears or directly 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 physical address FHTT0024010d.

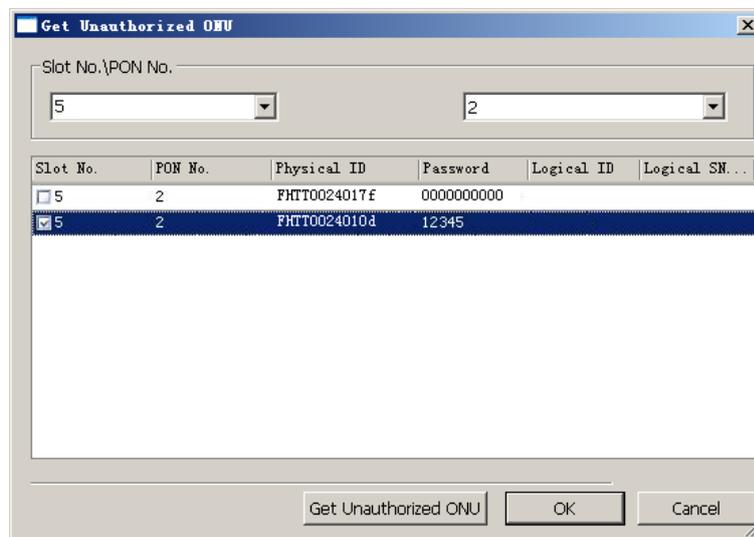


Figure 3-44 The **Get Unauthorized ONU** dialog box – without maintaining original ONU authorization and configuration

4. Click **OK** and return to the **Password White List Setting** window, as shown in Figure 3-45.

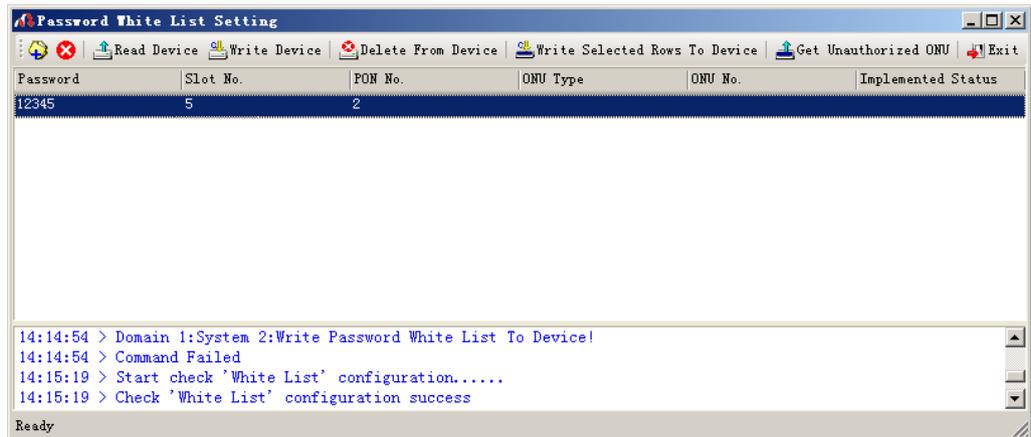


Figure 3-45 The **Password White List Setting** window – without maintaining original ONU authorization and configuration

5. After completing the configuration, 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 3-46.

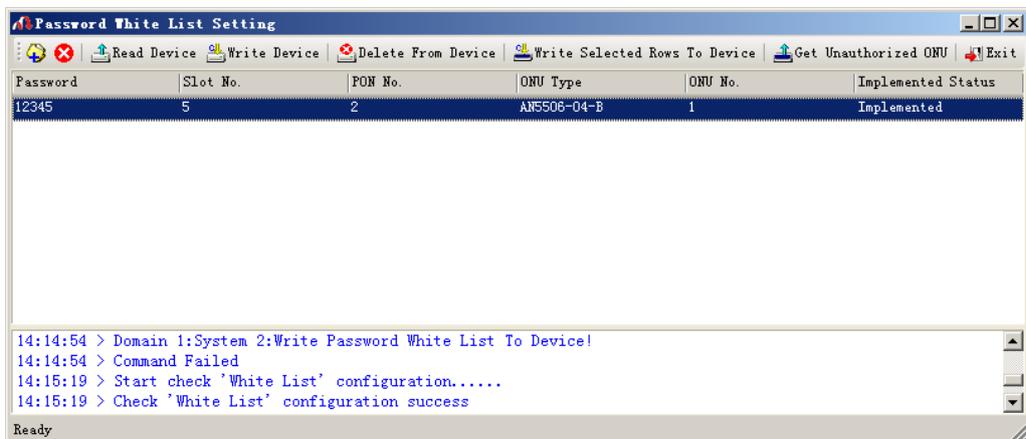
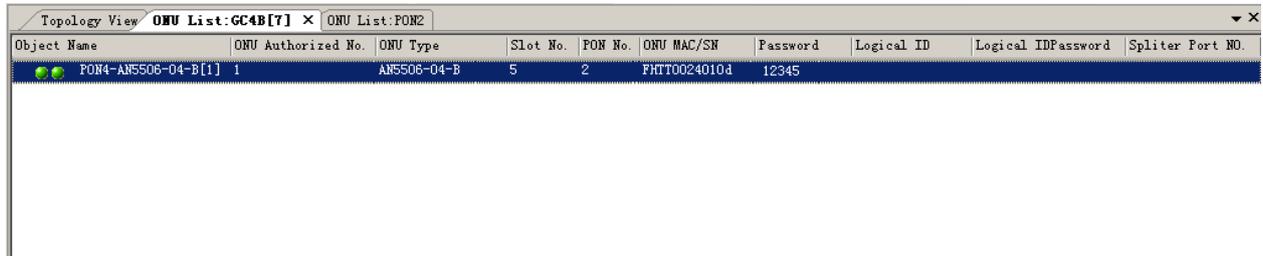


Figure 3-46 Successful password whitelist authorization – without maintaining original ONU authorization and configuration

### 3.7.6 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 No.2 in Slot No.5, as shown in Figure 3-47.



Object Name	ONU Authorized No.	ONU Type	Slot No.	PON No.	ONU MAC/SN	Password	Logical ID	Logical IDPassword	Splitter Port NO.
PON4-AN5506-04-B[1]	1	AN5506-04-B	5	2	FHTT0024010d	12345			

Figure 3-47 The ONU list – without maintaining original ONU authorization and configuration

## 3.8 Example for ONU Deauthorization

### 3.8.1 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 of 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.

### 3.8.2 Configuration Flow Chart

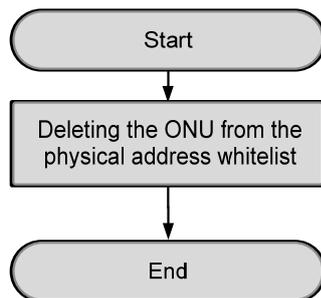


Figure 3-48 Configuration flow chart for ONU deauthorization under the authentication mode based on physical identifier

### 3.8.3 Deleting the ONU from the Physical Identifier Whitelist

#### Prerequisites

- ◆ The authorization for the GC4B card and the HSWA card has been completed.
- ◆ The original authentication mode of the ONU is physical identifier mode and the ONU authorization is completed.
- ◆ The current PON port authentication mode is based on physical identifier.

## Configuration purpose

Delete the ONU information from the physical address whitelist.

## Configuration steps

Delete the ONU (AN5506-04-B) information authorized in physical identifier whitelist from the device. The procedures are as follows:

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, and select **Config** → **ONU Authentication** → **ONU Physic\_ID Address Whitelist** from the shortcut menu that appears to access the **Physical Address White List Setting** window as shown in Figure 3-49.

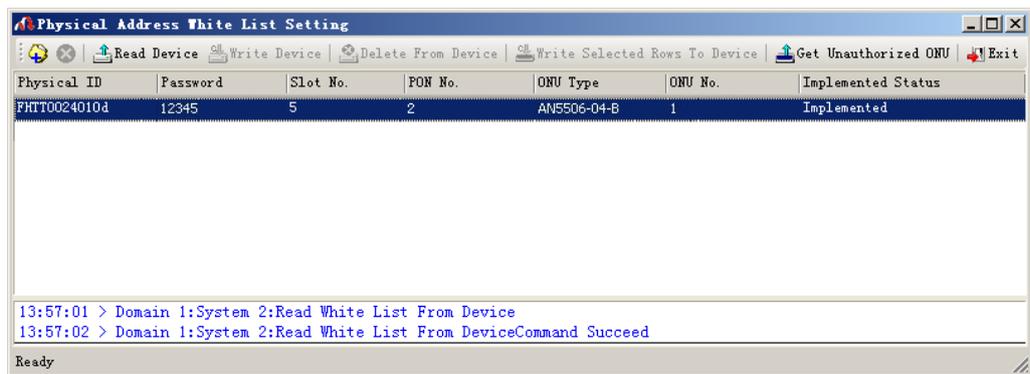


Figure 3-49 The **Physical Address White List Setting** window – ONU deauthorization

2. Select the ONU whose physical address is FHTT0024010d and then click the  button. In the dialog box that appears, click **OK** to delete the authorization information of the ONU from the whitelist, as shown in Figure 3-50.

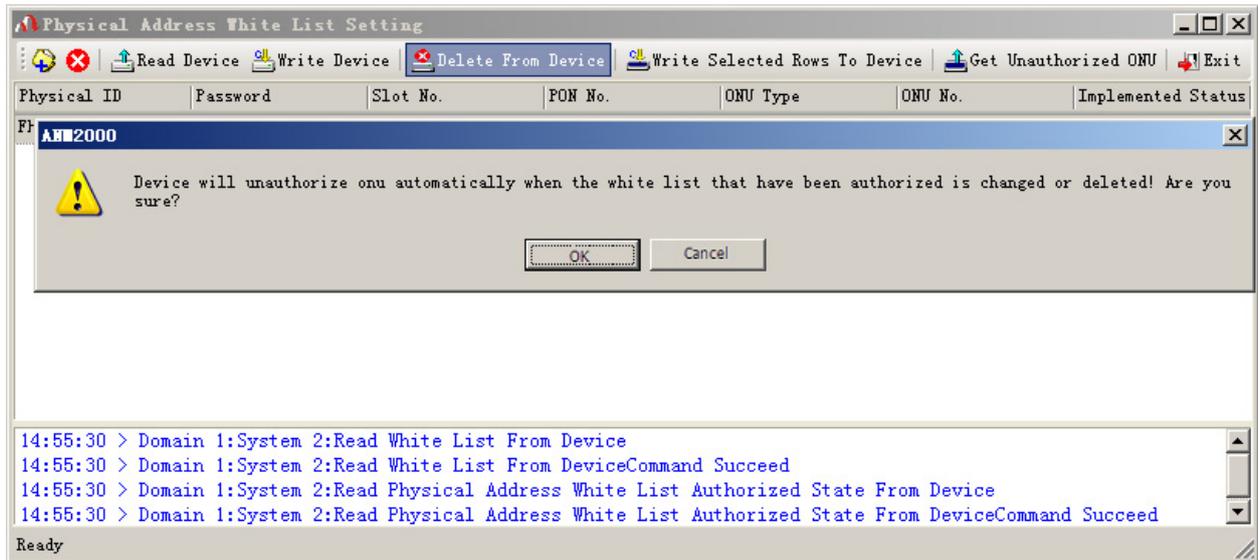


Figure 3-50 Deleting ONU authorization information

### 3.8.4 End of Configuration

After the ONU in the physical address whitelist is deauthorized, the information of this ONU will not be in the ONU list.

# 4 Configuring Voice Services

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This chapter introduces how to start up voice services for the AN5116-06B in details. It includes the following sections:

- ☑ Configuring the VoIP services – H.248 example
- ☑ Configuring the VoIP services – MGCP example
- ☑ Configuring the VoIP services – SIP example
- ☑ Configuring the DHCP function of the NGN uplink
- ☑ Configuring the advanced profile parameters for the softswitch
- ☑ Configuring the NGN heartbeat parameters
- ☑ Configuring the IAD MD5 authentication
- ☑ Registering / unregistering the NGN user
- ☑ Configuring the digitmap
- ☑ Displaying the status information

## 4.1 Configuring the VoIP Services – H.248 Example

### 4.1.1 Configuring 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 signaling VLAN IDs as needed.

### 4.1.2 Service Network

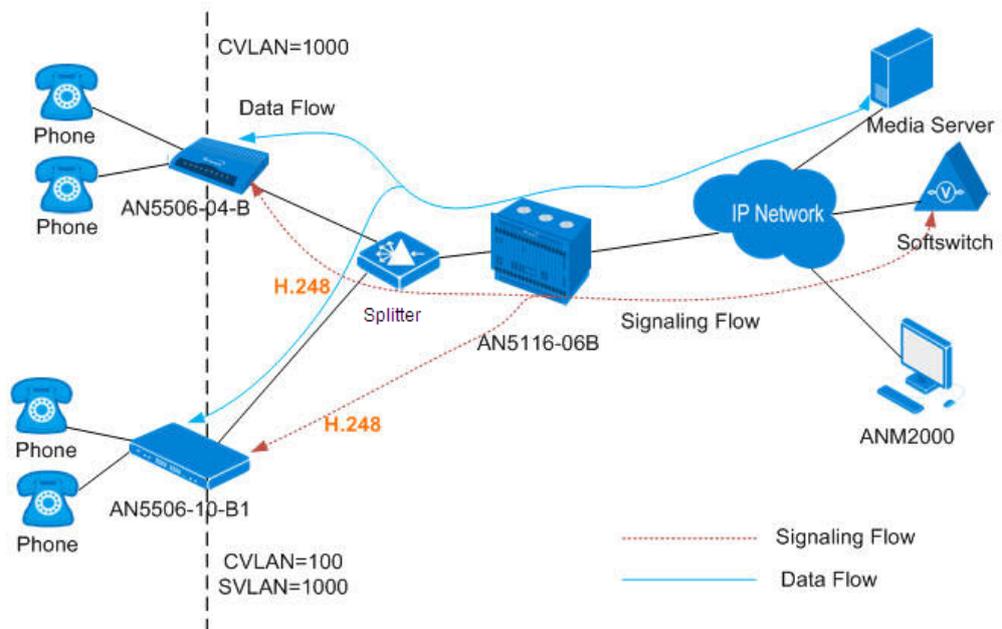


Figure 4-1 The VoIP service network based on the H.248 protocol

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 adopts 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.

The following takes the network with the AN5116-06B, the AN5506-04-B and the AN5506-10-B1 as an example to introduce the start-up process of the VoIP service based on the H.248 protocol. The AN5116-06B chose the HU1A card and the GC8B card as the interface cards on the network side and the client end respectively, and the HSWA card and the PUBA card are required.

## 4.1.3 Configuring the Services Respectively

### 4.1.3.1 Planning Data

The following introduces the VoIP service start-up by configuring the ONU ports respectively. The planned data is shown in Table 4-1 and 4-2.

Table 4-1 Planned data on the OLT side of the VoIP service based on the H.248 protocol (configuring respectively)

Item		Description	Example	
ONU Information	ONU Type	Configure this item according to the actual ONU type.	AN5506-04-B	AN5506-10-B1
	Slot No.	Configure this item according to the PON interface card slot number actually used.	15	
	PON port No.	Configure this item according to the PON port number actually used.	1	
	ONU Auth No.	Configure this item according to the operator's network planning.	1	2

Item		Description	Example
Local End Service VLAN	Service Name	Configure this item according to the operator's network planning.	ngn1
	Starting VLAN ID	The start service VLAN ID of the uplink interface. Configure this item according to the operator's network planning.	1000
	VLAN ID End	The end service VLAN ID of the uplink interface. Configure this item according to the operator's network planning.	1000
	Interface No.	Configure this item according to the uplink interface No. actually used.	20:SFP1
	TAG / UNTAG	The TAG processing mode of the uplink service VLAN. There are two options: <b>TAG</b> and <b>UNTAG</b> . <b>TAG</b> means that when the uplink data packet passes the port, its tag will not be stripped and it keeps going in the tagged mode. And for the downlink data packet, only the data packet in tagged mode will be accepted, and it keeps going in the tagged mode. <b>UNTAG</b> 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
	Service Type	Select <b>ngn</b> for VoIP services.	ngn
	Slot Bind Mode	Select <b>Auto Bind</b> or <b>Manually Bind</b> .	Auto Bind
NGN Uplink Interface	Signaling Service Name	This item should be consistent with the <b>Service Name</b> set in the <b>Local End Service VLAN</b> configuration.	ngn1

Item		Description	Example			
	Protocol Type	Select <b>H.248</b> .	H.248			
	MGC1 IP 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 is <b>2944</b> .	2944			
	Keep-alive	Whether the ONU regularly sends keep-alive messages to the softswitch platform MGC. <b>Enable</b> (default) or <b>Disable</b> .	Enable			
	Master / Slave DNS Server	The master / slave DNS IP address. You configure the DNS server when the MGC3 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 <b>Disable</b> .	Disable			
NGN Configuration	Signaling Service Name	This item should be consistent with the <b>Service Name</b> set in the <b>Local End Service VLAN</b> 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 <b>1 to 99999999</b> .	88880001	88880002	88880003	88880004
	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. You should configure this item according to the operator's network planning.	10.90.60.1		10.90.60.2	

Item		Description	Example			
	ONU Public IP Subnet Mask	Configure this item according to the operator's network planning.	255.255.0.0		255.255.0.0	
	ONU Public IP Gateway	Configure this item according to the operator's network planning.	10.90.1.254		10.90.1.254	
	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 <b>2944</b> .	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 4-2 Planned data 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 <b>voip</b>	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 <b>Telephone Number</b> in the <b>NGN Configuration</b> .	88880001	88880002	88880003	88880004
	Signal VLAN ID	The voice service VLAN ID; it is the C-VLAN ID when the <b>QinQ State</b> is set to <b>Enable</b> .	1000	1000	100	100
	Voice Codec Mode	Configure this item according to the operator's network planning; the default setting is <b>G.711A</b> .	G.711A	G.711A	G.711A	G.711A
	Fax Model	Configure this item according to the operator's network planning; the default setting is <b>Transparent</b> .	Transparent	Transparent	Transparent	Transparent
	DTMF Mode	Configure this item according to the operator's network planning; the default setting is <b>Transparent</b> .	Transparent	Transparent	Transparent	Transparent

Item		Description	Example (AN5506-04-B)		Example (AN5506-10-B1)	
	Fax Control Mode	Configure this item according to the operator's network planning; the default setting is <b>Passthrough</b> .	Passthrough	Passthrough	Passthrough	Passthrough
	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 <b>0</b> .	0	0	0	0
	Output Gain	Configure this item according to the operator's network planning; the default setting is <b>0</b> .	0	0	0	0
	QinQ State	Configure this item according to the operator's network planning; the default setting is <b>Disable</b> .	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.	—	—	1000	1000
	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

### 4.1.3.2 Configuration Flow Chart

The flow chart for starting up the H.248 protocol based voice services respectively is illustrated in the Figure 4-2.

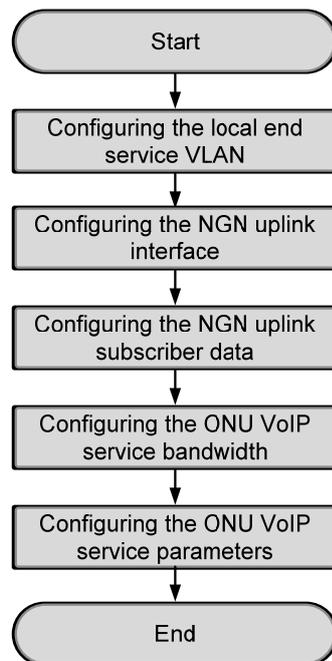


Figure 4-2 Flow chart for configuring the VoIP services respectively -- H.248

### 4.1.3.3 Configuring the Local End Service VLAN

Configuration purpose

Configure the service VLAN of the uplink port, limit the VLAN ID range of the service passing the uplink port and process the VLAN Tag.

Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane and select **Config** → **Local VLAN** from the shortcut menu to bring up the configuration window. Then click the **Local End Service VLAN** tab to access the **Local End Service VLAN** window.

2. Select **Edit** → **Append** on the menu bar or directly click the  button. Either operation brings up the **Please Input the Rows for Add:** dialog box. Type **1** and click **OK** to add one local VLAN.
3. Configure the parameters according to the planned data in Table 4-1.
4. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the local end service VLAN configuration is completed. See Figure 4-3.

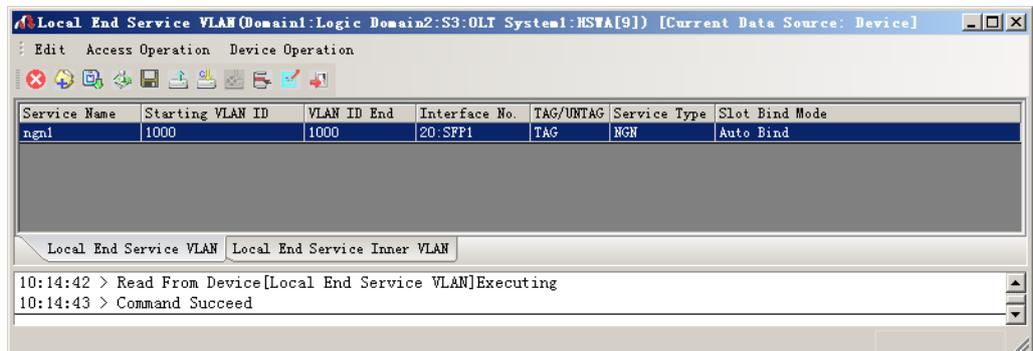


Figure 4-3 Configuring the local end service VLAN - H.248 example

### 4.1.3.4 Configuring the NGN Uplink Interface

#### Configuration purpose

Configure the relevant parameters of the media gateway controller, including: the IP address of the MGC, the protocol port No. of the NGN, etc.

#### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane and select **Config** → **Voice Config** → **NGN Interface** from the shortcut menu to access the **NGN Interface** window.
2. Select **Edit** → **Append** on the menu bar or directly click the  button. Either operation brings up the **Please Input the Rows for Add:** dialog box. Type **1** and click **OK** to add one NGN uplink interface.
3. Configure the parameters according to the planned data in Table 4-1.
4. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the NGN uplink interface configuration is completed. See Figure 4-4.

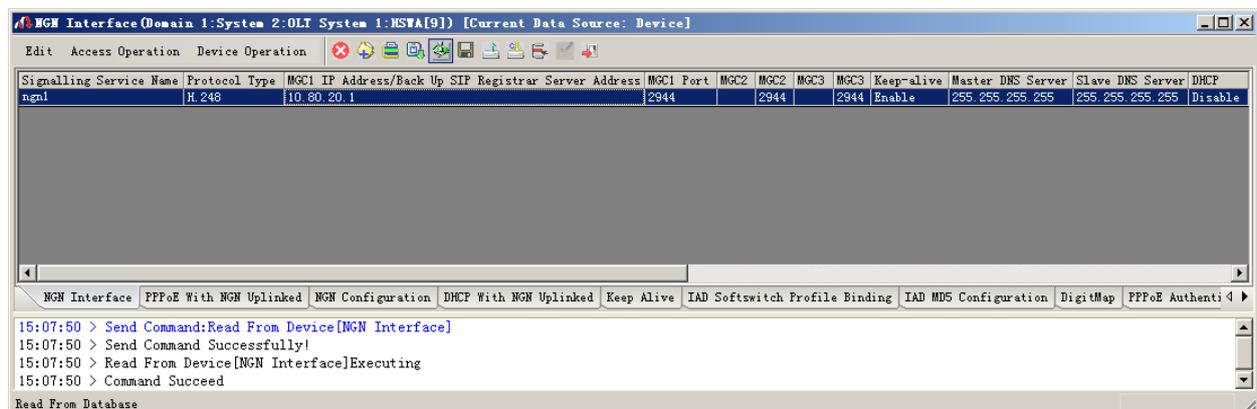


Figure 4-4 Configuring the NGN uplink interface - H.248 example

### 4.1.3.5 Configuring the NGN Uplink Subscriber Data

#### Configuration purpose

Configure the public network IP of the ONU, the endpoint domain name and the endpoint user name corresponding to the ONU, etc.

#### Operation steps

1. In the **NGN Interface** window, click the **NGN Configuration** tab to access the **NGN Configuration** window.
2. Select **Edit** → **Append** on the menu bar or directly click the  button. Either operation brings up the **Please Input the Rows for Add:** dialog box. Type **4** and click **OK** to add four NGN uplink subscriber information entries.
3. Configure the parameters according to the planned data in Table 4-1.
4. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the configuration of the NGN uplink subscriber information is completed. See Figure 4-5.

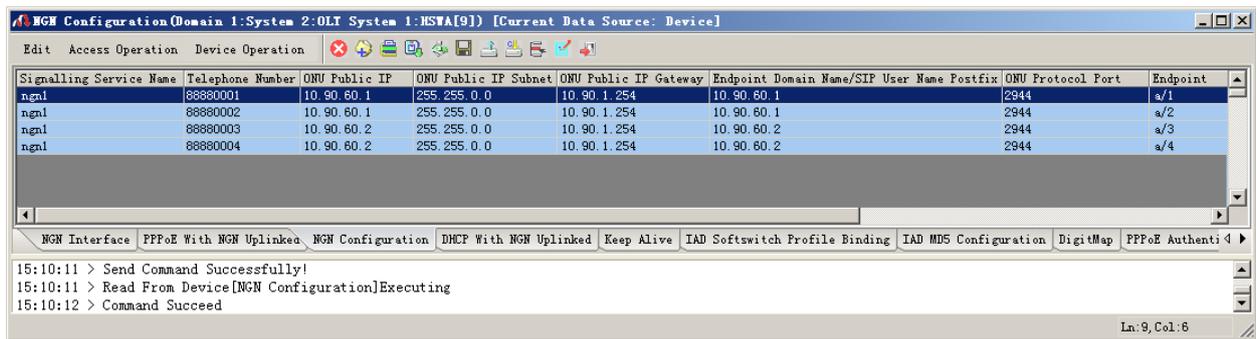


Figure 4-5 Configuring the NGN uplink subscriber data - H.248 example

### 4.1.3.6 Configuring the VoIP Service Bandwidth of the ONU

#### Configuration purpose

Configure the VoIP service bandwidth of the ONU.

#### Operation steps

1. Click the **GC8B[15]** card in the **Object Tree** pane to display all ONUs 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. Select **Edit** → **Append** on the menu bar or directly click the  button. Either operation brings up the **Please Input the Rows for Add:** dialog box. Type **1** and click **OK** to add 1 VoIP service.
3. Configure the parameters according to the planned data in Table 4-2.
4. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the configuration of PON1-AN5506-04-B[1] VoIP service bandwidth is completed. See Figure 4-6.

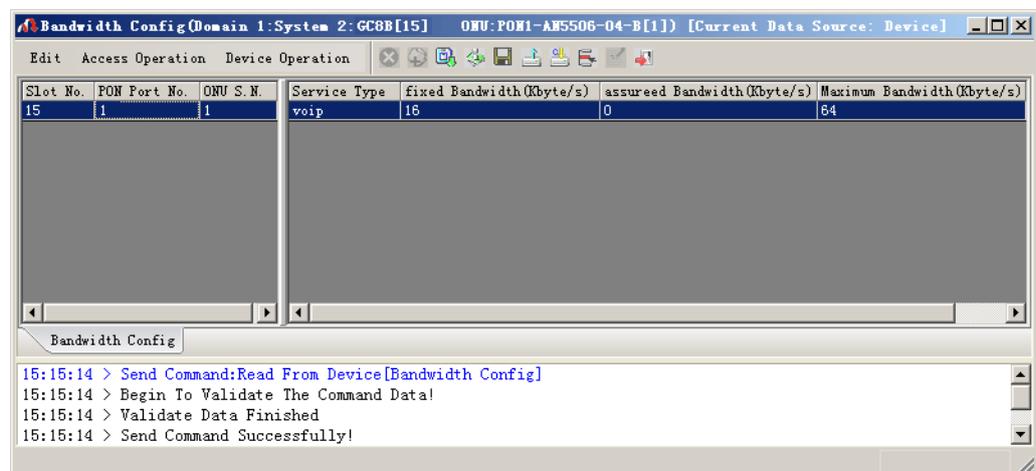


Figure 4-6 AN5506-04-B bandwidth configuration – H.248 example

- Configure the bandwidth in the same way for the PON1-AN5506-10-B1[2] of the GC8B[15] card, as shown in Figure 4-7.

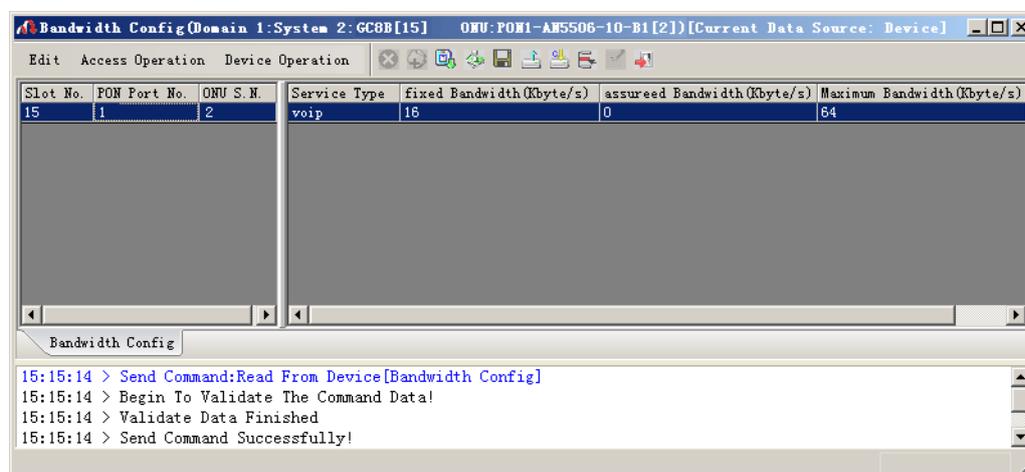


Figure 4-7 AN5506-10-B1 bandwidth configuration – H.248 example

### 4.1.3.7 Configuring the VoIP Service Parameters of the ONU

#### Configuration purpose

Configure the VoIP service parameters of the ONU, including VoIP service VLAN, voice codec, fax mode, silence switch, echo cancel, input / output gain, DTMF mode, etc.

#### Operation steps

- Click the **GC8B[15]** card in the **Object Tree** pane to display all ONUs 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.
- Select **FXS1** in **Voice Port List** and configure the parameters according to the planned data in Table 4-2, as shown in Figure 4-8.

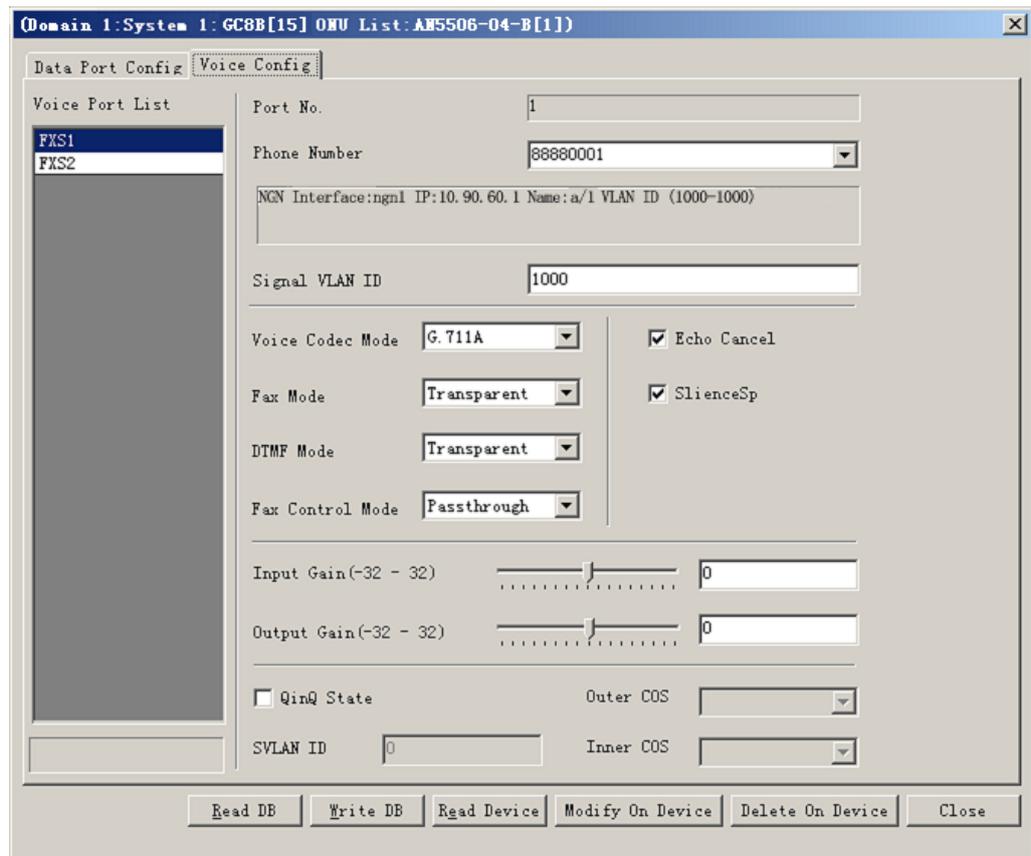


Figure 4-8 FXS1 voice configuration of the AN5506-04-B – H.248 example

3. Select **FXS2** in **Voice Port List** and configure the parameters according to the planned data in Table 4-2, as shown in Figure 4-9.

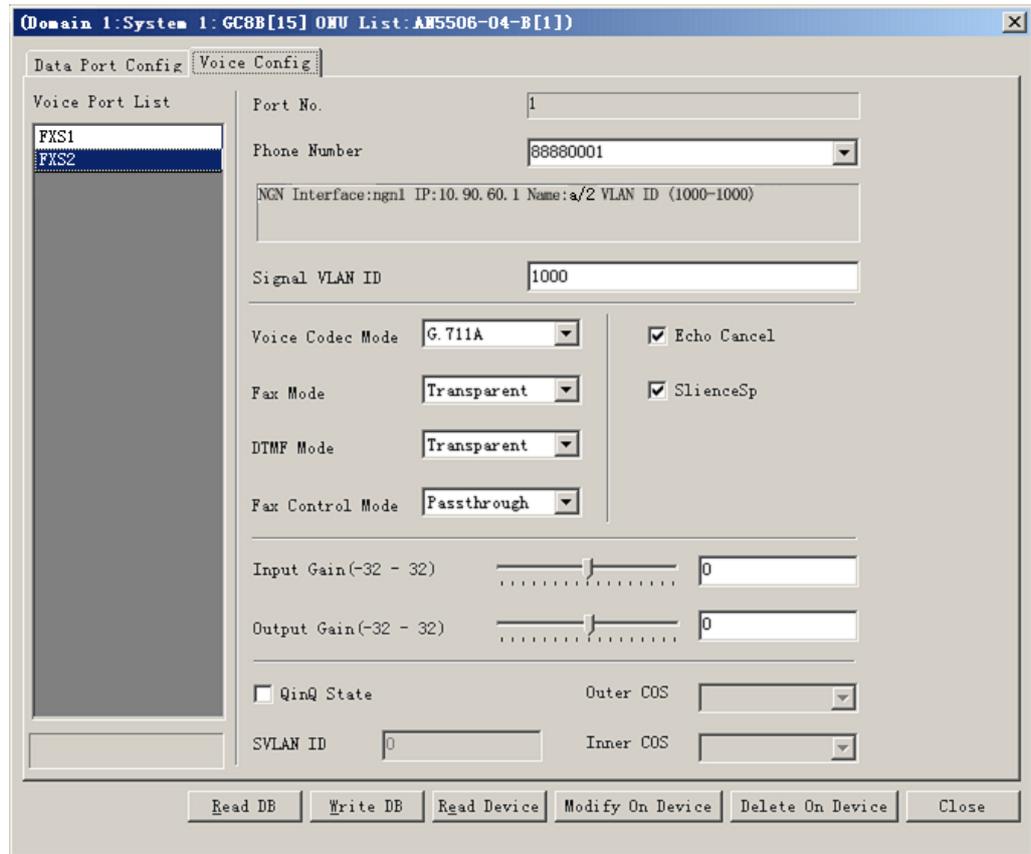


Figure 4-9 FXS2 voice configuration of the AN5506-04-B – H.248 example

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[15]** 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 access the **Voice Config** dialog box.
6. Select **FXS1** in **Voice Port List** and configure the parameters according to the planned data in Table 4-2, as shown in Figure 4-10.

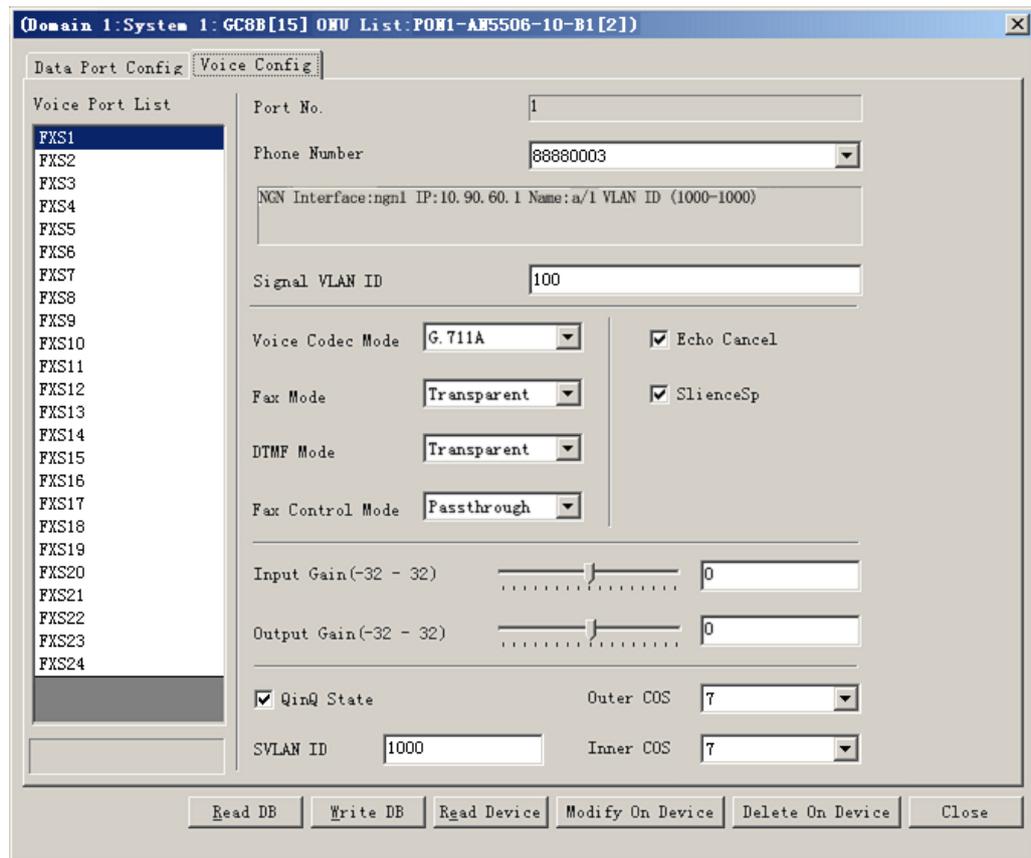


Figure 4-10 FXS1 voice configuration of the AN5506-10-B1 – H.248 example

7. Select **FXS2** in **Voice Port List** and configure the parameters according to the planned data in Table 4-2, as shown in Figure 4-11.

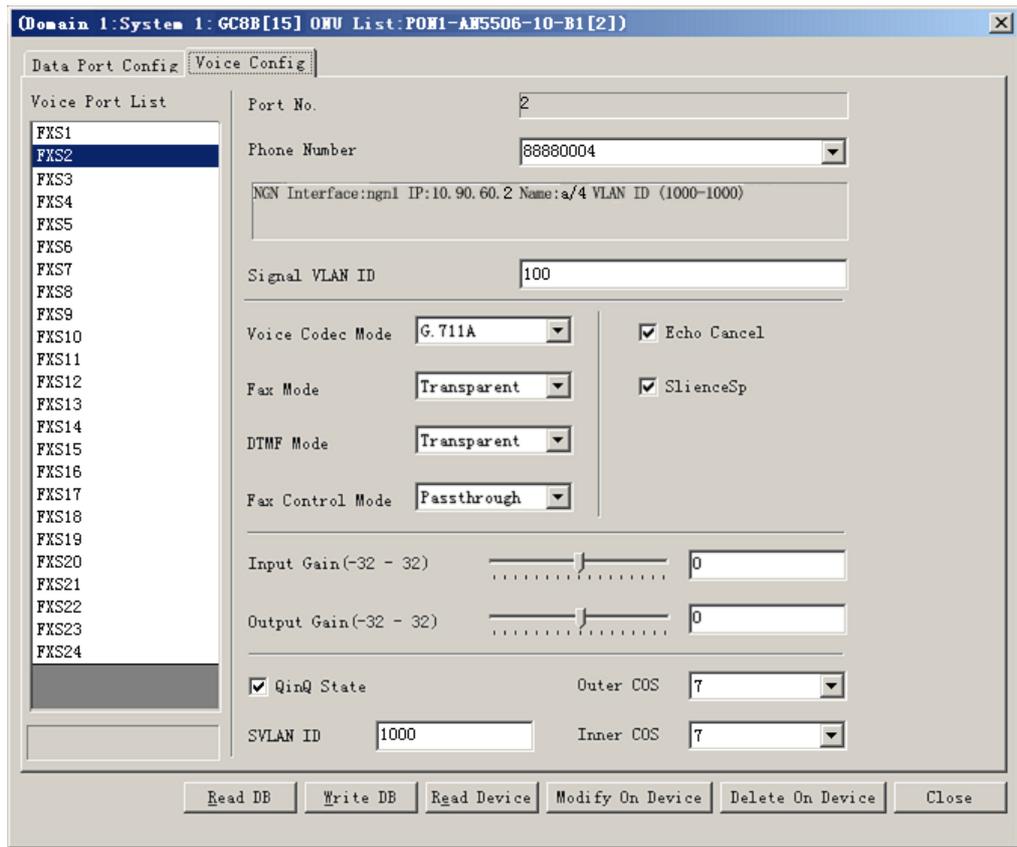


Figure 4-11 FXS2 voice configuration of the AN5506-10-B1 – H.248 example

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

### 4.1.3.8 End of Configuration

The subscribers under the FXS1 and FXS2 port 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 No.1 of the GC8B card in Slot 15 can access the voice service. Subscribers can call each other normally.

## 4.1.4 Configuring the Services in a Batch Manner

### 4.1.4.1 Planning Data

The following introduces how to start up the voice service by configuring the ONU ports in a batch manner. The planned data is shown in Table 4-3 and 4-4.

Table 4-3 Planned 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	Configure this item according to the actual ONU type.	AN5506-04-B	AN5506-10-B1
	Slot No.	Configure this item according to the PON interface card slot number actually used.	15	
	PON port No.	Configure this item according to the PON port number actually used.	1	
	ONU Auth No.	Configure this item according to the operator's network planning.	1	2
Local End Service VLAN	Service Name	Configure this item according to the operator's network planning.	ngn1	
	Starting VLAN ID	The start service VLAN ID of the uplink interface. Configure this item according to the operator's network planning.	1000	
	VLAN ID End	The end service VLAN ID of the uplink interface. Configure this item according to the operator's network planning.	1000	
	Interface No.	Configure this item according to the uplink interface No. actually used.	20:SFP1	

Item	Description	Example	
TAG / UNTAG	The TAG processing mode of the uplink service VLAN. There are two options: <b>TAG</b> and <b>UNTAG</b> . <b>TAG</b> means that when the uplink data packet passes the port, its tag will not be stripped and it keeps going in the tagged mode. And for the downlink data packet, only the data packet in tagged mode will be accepted, and it keeps going in the tagged mode. <b>UNTAG</b> 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	
	Service Type	Select <b>ngn</b> for VoIP services.	ngn
	Slot Bind Mode	Select <b>Auto Bind</b> or <b>Manually Bind</b> .	Auto Bind
NGN Uplink Interface	Signaling Service Name	This item should be consistent with the <b>Service Name</b> set in the <b>Local End Service VLAN</b> configuration.	ngn1
	Protocol Type	Select <b>H.248</b> .	H.248
	MGC1 IP 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 is <b>2944</b> .	2944
	Keep-alive	Whether the ONU regularly sends keep-alive messages to the softswitch platform MGC. <b>Enable</b> (default) or <b>Disable</b> .	Enable
	Master / Slave DNS Server	The master / slave DNS IP address. You configure the DNS server when the MGC3 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 <b>Disable</b> .	Disable

Table 4-4 Planned 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 this item according to the operator's network planning.	
	Service Type	Select <b>VOIP</b>	
	Fixed Bandwidth (Kbyte/s)	Configure this item according to the operator's network planning. The default setting is 16.	
	Assured Bandwidth (Kbyte/s)	Configure this item according to the operator's network planning. The default setting is 0.	
	Maximum Bandwidth (Kbyte/s)	Configure this item according to the operator's network planning. The default setting is 64.	
ONU Configuration	Slot No.	15	15
	PON No.	1	1
	ONU No.	1	2
	Bandwidth Profile	a	a
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 ( <b>0 to 9</b> ), letters ( <b>a to z</b> and <b>A to Z</b> ), and underlines. Configure this item according to the operator's network planning.	
	Voice Code Mode	Configure this item according to the operator's network planning; the default setting is <b>G.711A</b> .	
	Fax Mode	Configure this item according to the operator's network planning; the default setting is <b>Transparent</b> .	

Item	Description	Example	
	Silence Switch	Configure this item according to the operator's network planning; the default setting is <b>Enable</b> .	
	Echo Cancel	Configure this item according to the operator's network planning; the default setting is <b>Enable</b> .	
	Input Gain (DB)	Configure this item according to the operator's network planning; the default setting is <b>0</b> .	
	Output Gain (DB)	Configure this item according to the operator's network planning; the default setting is <b>0</b> .	
	DTMF Mode	Configure this item according to the operator's network planning; the default setting is <b>Transparent</b> .	
	Fax Control Mode	Configure this item according to the operator's network planning; the default setting is <b>Passthrough</b> .	
ONU Voice Basic Configure	Slot No.	Configure this item according to the PON interface card slot number actually used.	
	PON No.	The No. of the PON port actually used.	
	ONU No.	1	2
	IP Configuration Mode	static	static
	ONU Static Public IP	10.90.60.1	10.90.60.2
	ONU Static Public IP Mask	255.255.0.0	255.255.0.0

Item		Description	Example			
	ONU Static Public IP Gateway	Configure this item according to the operator's network planning.	10.90.1.254		10.90.1.254	
ONU POTS Configure	Slot No.	Configure this item according to the PON interface card slot number actually used.	15			
	PON No.	The No. of the PON port actually used.	1			
	ONU No.	Select the ONU's authentication No. to be configured.	1		2	
	Port No.	Select the ONU port number actually connected with user telephone.	1	2	1	2
	Port Enable	Select <b>Enable</b> .	Enable	Enable	Enable	Enable
	Signaling Service Name	This item should be consistent with the <b>Service Name</b> in the <b>NGN Configuration</b> .	ngn1	ngn1	ngn1	ngn1
	Signaling VLAN ID	The voice service VLAN ID; it is the C-VLAN ID when the <b>QinQ State</b> is set to <b>Enable</b> .	1000	1000	100	100
	SVLAN State	Configure this item according to the operator's network planning; the default setting is <b>Disable</b> .	Disable	Disable	Disable	Disable
	SVLAN ID	The SVLAN ID should be within the range of the uplink interface VLAN ID when the QinQ is enabled. And it is invalid when the QinQ is disabled.	—	—	1000	1000
	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 gateway's domain name address. 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 <b>2944</b> .	2944	2944	2944	2944

Item	Description	Example			
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

### 4.1.4.2 Configuration Flow Chart

The flow chart for starting up the H.248 protocol based voice services in a batch manner is illustrated in the Figure 4-12.

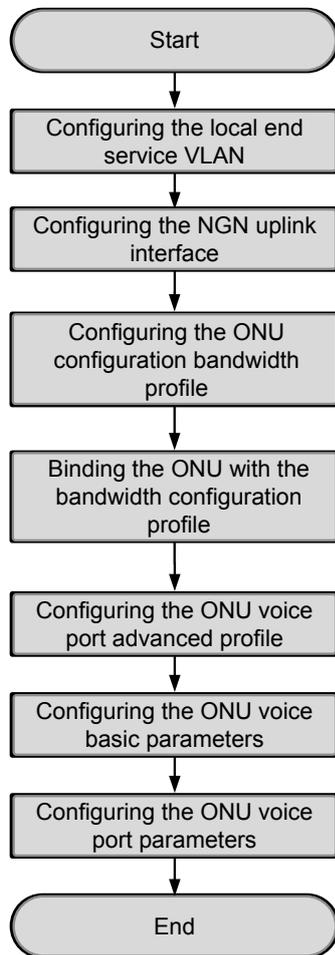


Figure 4-12 Flow chart for configuring the VoIP services in a batch manner - H.248

### 4.1.4.3 Configuring the Local End Service VLAN

#### Configuration purpose

Configure the service VLAN of the uplink port, limit the VLAN ID range of the service passing the uplink port and process the VLAN Tag.

#### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane and select **Config** → **Local VLAN** from the shortcut menu to bring up the configuration window. Then click the **Local End Service VLAN** tab to access the **Local End Service VLAN** window.
2. Select **Edit** → **Append** on the menu bar or directly click the  button. Either operation brings up the **Please Input the Rows for Add:** dialog box. Type **1** and click **OK** to add one local VLAN.
3. Configure the parameters according to the planned data in Table 4-3.
4. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the local end service VLAN configuration is completed. See Figure 4-13.

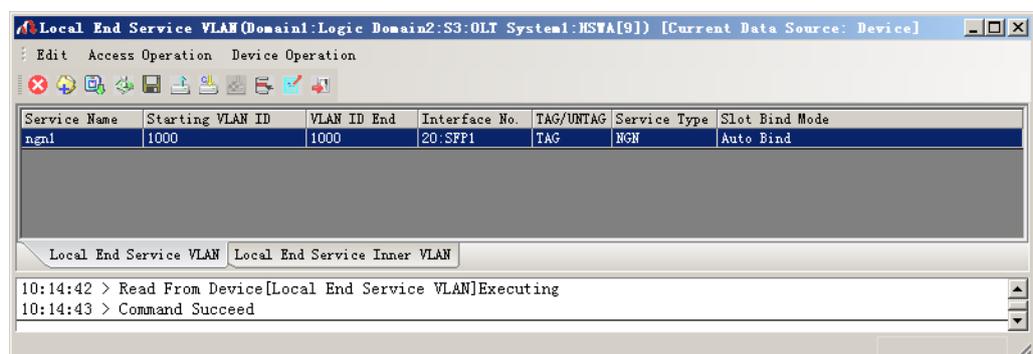


Figure 4-13 Configuring the local end service VLAN - H.248 example

#### 4.1.4.4 Configuring the NGN Uplink Interface

##### Configuration purpose

Configure the relevant parameters of the media gateway controller, including: the IP address of the MGC, the protocol port No. of the NGN, etc.

##### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane and select **Config** → **Voice Config** → **NGN Interface** from the shortcut menu to access the **NGN Interface** window.
2. Select **Edit** → **Append** on the menu bar or directly click the  button. Either operation brings up the **Please Input the Rows for Add:** dialog box. Type **1** and click **OK** to add one NGN uplink interface.
3. Configure the parameters according to the planned data in Table 4-3.
4. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the NGN uplink interface configuration is completed. See Figure 4-14.

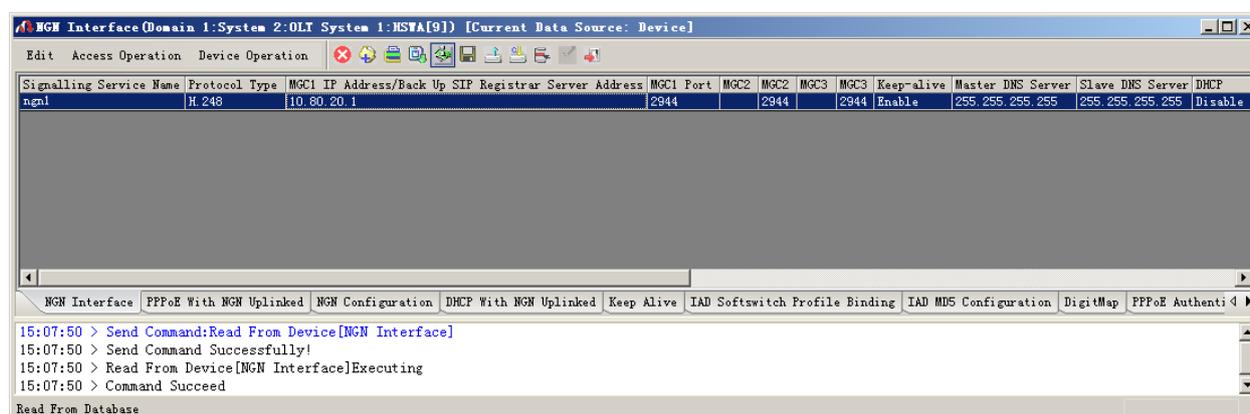


Figure 4-14 Configuring the NGN uplink interface - H.248 example

### 4.1.4.5 Configuring the ONU Bandwidth Configuration Profile

#### Configuration purpose

Configure the VoIP service bandwidth profile of the ONU.

#### Operation steps

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. Select **Edit** → **Append** on the menu bar or directly click the  button. Either operation brings up the **Please Input the Rows for Add:** dialog box. Type **1** and click **OK** to add one bandwidth configuration profile. Input **a** in the **Profile Name** column.
3. Select profile **a**, click a blank area in the right pane, and select **Edit** → **Append** on the menu bar or directly click the  button. Either operation brings up the **Please Input the Rows for Add:** dialog box. Type **1** and click **OK** to add one service. Configure the parameters according to the planned data in Table 4-4.
4. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the VoIP service bandwidth configuration profile is configured. See Figure 4-15.

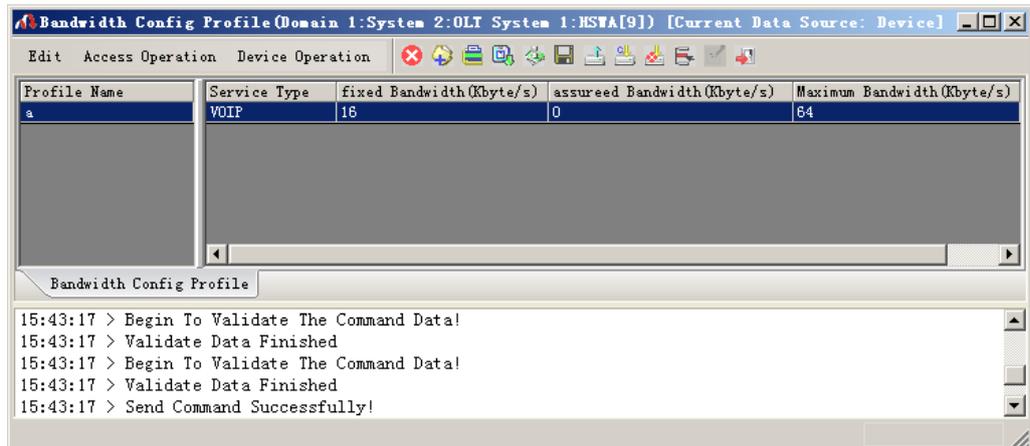


Figure 4-15 The ONU bandwidth configuration profile – H.248 example

## 4.1.4.6 Binding the ONU with the Bandwidth Configuration Profile

### Configuration purpose

Bind the ONU with the bandwidth configuration profile, that is, apply the bandwidth configuration profile to the ONU.

### Operation steps

1. Right-click the system in the **Object Tree** pane, select **Config** → **Batch Configure** → **ONU Config** 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 No.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 display in the right pane. Configure the parameters according to the planned data in Table 4-4, and select **a** in the drop-down lists of **GPON Bandwidth**.

- When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the ONU is bound to the bandwidth configuration profile. See Figure 4-16.

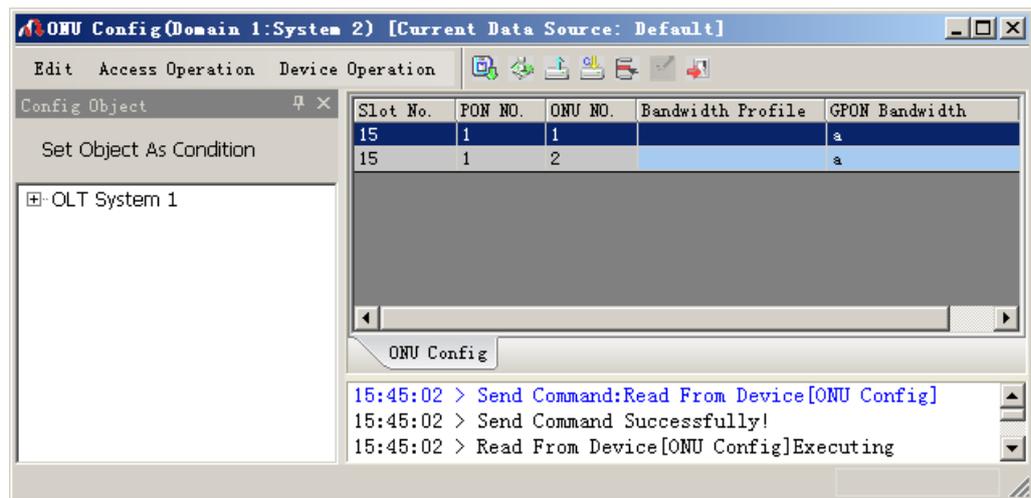


Figure 4-16 ONU configuration – H.248 example

#### 4.1.4.7 Configuring the ONU Voice Port Advanced Profile

##### Configuration purpose

Configure the profile of the ONU voice service parameters, including voice codec, fax mode, silence switch, echo cancel, input / output gain, DTMF mode, etc.

##### Operation steps

- 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.
- Select **Edit** → **Append** on the menu bar or directly click the  button. Either operation brings up the **Please Input the Rows for Add:** dialog box. Type **1** and click **OK** to add one ONU voice port advanced profile.
- Configure the parameters according to the planned data in Table 4-4.

- When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the ONU voice port advanced profile is configured. See Figure 4-17.

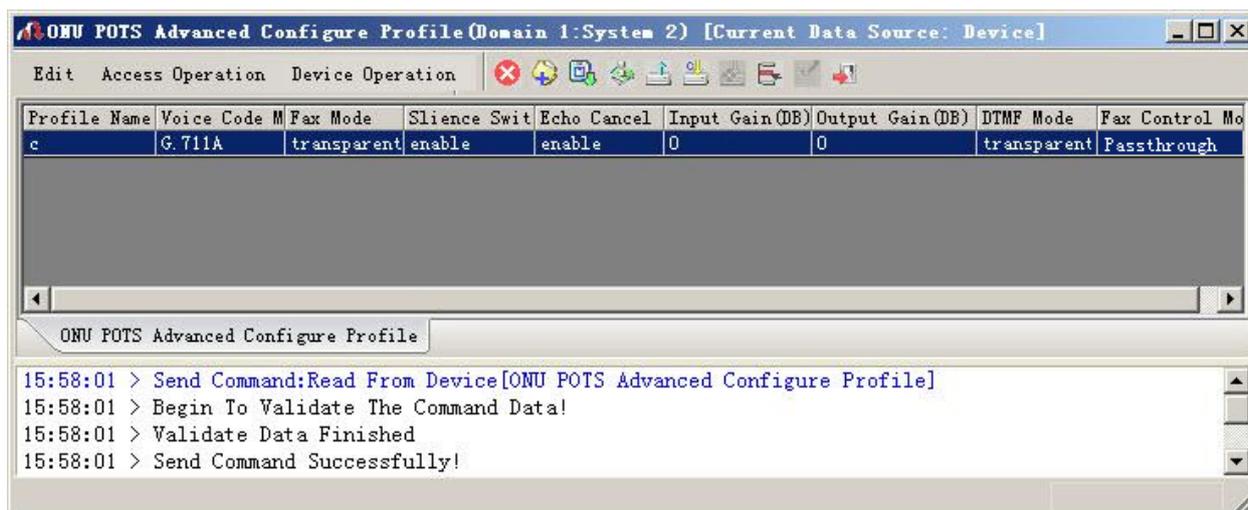


Figure 4-17 ONU voice port advanced configuration profile – H.248 example

#### 4.1.4.8 Configuring the Basic Voice Parameters for the ONU

##### Configuration purpose

Configure the configuration method for the public network IP address and the public network IP information of the ONU voice service.

##### Operation steps

- Right-click the system in the **Object Tree** pane and select **Config** → **Batch Configure** → **ONU Voice Basic Configure** from the shortcut menu to access the **ONU Voice Basic Configure** window.
- Click the **Set Object as Condition** button, select **AN5506-04-B[1]** and **AN5506-10-B1[2]** under the PON port No.1 of the GC8B card in Slot 15 from the drop-down list of the object, and click the **OK** button.

- The detailed information of the object will display in the right pane. Configure the parameters according to the planned data in Table 4-4.
- When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the configuration of the basic voice parameters for the ONU is completed. See Figure 4-18.

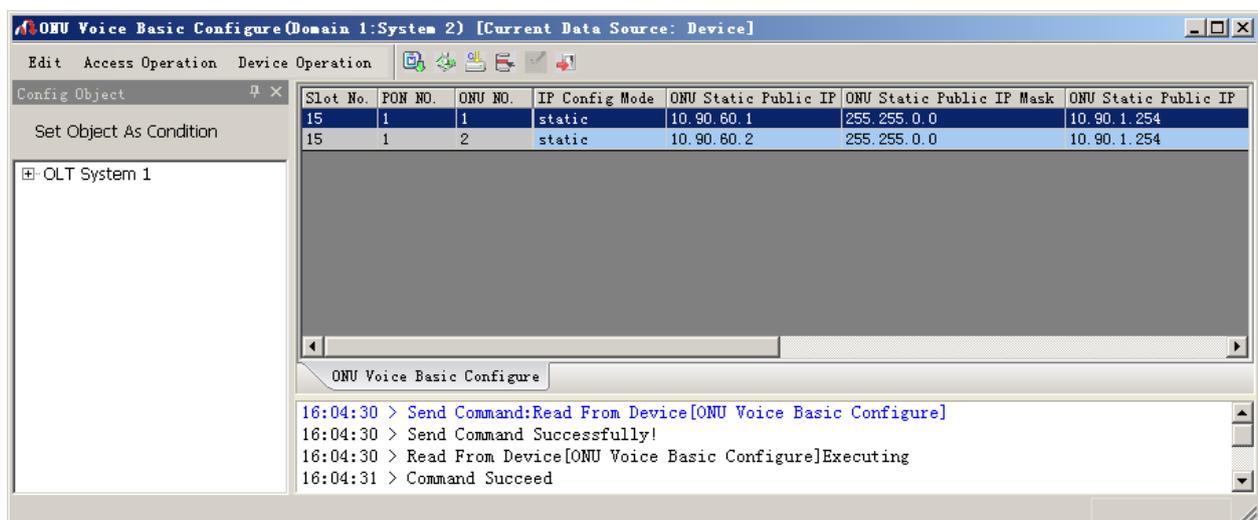


Figure 4-18 Basic voice configuration for the ONU – H.248 example

### 4.1.4.9 Configuring the ONU Voice Port Parameters

#### Configuration purpose

Configure the relevant parameters of the ONU voice port, including: telephone number, voice service VLAN, endpoint domain name, endpoint username, binding the ONU voice port advanced profile, etc.

#### Operation steps

- Right-click the system in the **Object Tree** pane and select **Config** → **Batch Configure** → **ONU POTS Configure** from the shortcut menu to access the **ONU POTS Configure** window.

- Click the **Set Object as Condition** button, select **AN5506-04-B[1]** and **AN5506-10-B1[2]** under the PON port No.1 of the GC8B card in Slot 15, and click the **OK** button.
- The detailed information of the object will display in the right pane. Configure the parameters according to the planned data in Table 4-4.
- When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the ONU voice port parameter configuration is completed. See Figure 4-19.

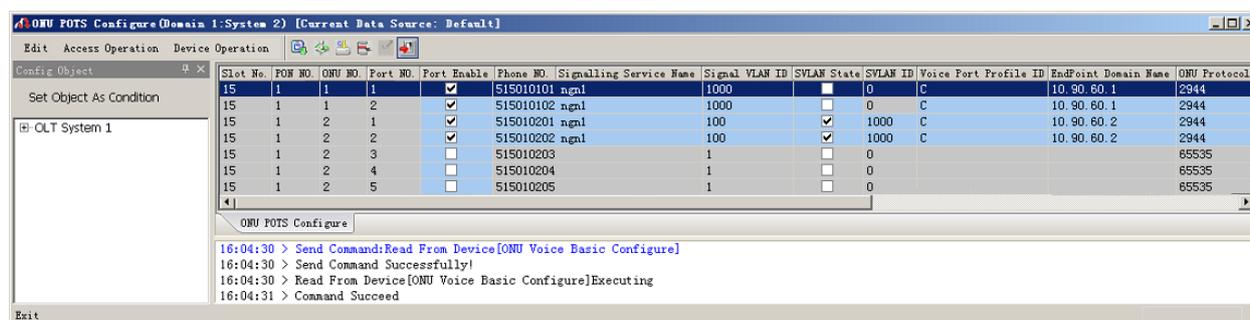


Figure 4-19 ONU voice port configuration – H.248 example

#### 4.1.4.10 End of Configuration

The subscribers under the FXS1 and FXS2 port 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 No.1 of the GC8B card in Slot 15 can access the voice service. Subscribers can call each other normally.

## 4.2 Configuring the VoIP Service – MGCP Example

### 4.2.1 Configuration Rules

- ◆ When the softswitch platform uses the MGCP protocol to control the access terminals, you should set the MGC protocol type to the **MGCP** protocol for VoIP services, set the protocol port No. on the equipment side to **2727**, and the protocol port No. on the ONU side to **2427**.
- ◆ In the configuration of VoIP service VLAN, if you use single VLAN, you should set the VLAN ID within the range of the local end service VLAN ID. If you use QinQ VLANs, you should set the S-VLAN IDs within the range of the local end service VLAN IDs and configure the signaling VLAN IDs as needed.

### 4.2.2 Service Network

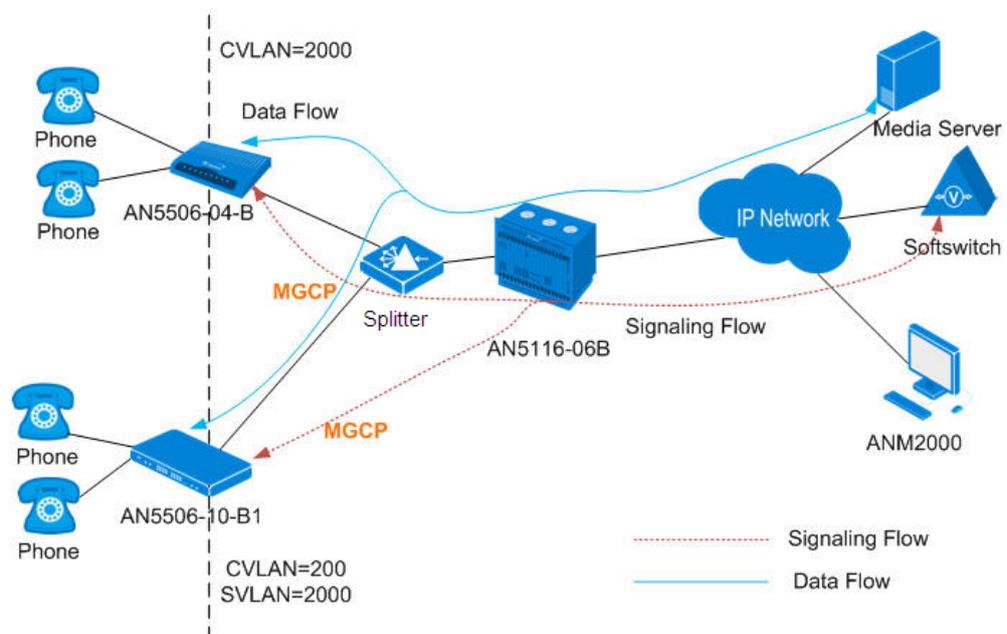


Figure 4-20 The VoIP service network based on the MGCP protocol

As shown in the figure above, the GPON system conducts signaling interaction with the softswitch based on the MGCP protocol to implement call control. The ONU adopts 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.

The following takes the network with the AN5116-06B, the AN5506-04-B and the AN5506-10-B1 as an example to introduce the start-up process of the VoIP service based on the MGCP protocol. The AN5116-06B chose the HU1A card and the GC8B card as the interface cards on the network side and the client end respectively, and the HSWA card and the PUBA card are required.

## 4.2.3 Configuring the Services Respectively

### 4.2.3.1 Planning Data

The following introduces the VoIP service start-up by configuring the ONU ports respectively. The planned data is shown in Table 4-5 and 4-6.

Table 4-5 Planned data on the OLT side of the VoIP service based on the MGCP protocol (configuring respectively)

Item		Description	Example	
ONU Information	ONU Type	Configure this item according to the actual ONU type.	AN5506-04-B	AN5506-10-B1
	Slot No.	Configure this item according to the PON interface card slot number actually used.	15	
	PON port No.	Configure this item according to the PON port number actually used.	1	
	ONU Auth No.	Configure this item according to the operator's network planning.	1	2
Local End Service VLAN	Service Name	Configure this item according to the operator's network planning.	ngn2	
	Starting VLAN ID	The start service VLAN ID of the uplink interface. Configure this item according to the operator's network planning.	2000	
	VLAN ID End	The end service VLAN ID of the uplink interface. Configure this item according to the operator's network planning.	2000	
	Interface No.	Configure this item according to the uplink interface No. actually used.	20:SFP1	

Item	Description	Example
TAG / UNTAG	<p>The TAG processing mode of the uplink service VLAN. There are two options: <b>TAG</b> and <b>UNTAG</b>. <b>TAG</b> means that when the uplink data packet passes the port, its tag will not be stripped and it keeps going in the tagged mode. And for the downlink data packet, only the data packet in tagged mode will be accepted, and it keeps going in the tagged mode. <b>UNTAG</b> 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.</p>	TAG
Service Type	Select <b>ngn</b> for VoIP services.	ngn
Slot Bind Mode	Select <b>Auto Bind</b> or <b>Manually Bind</b> .	Auto Bind
NGN Uplink Interface	Signaling Service Name	This item should be consistent with the <b>Service Name</b> set in the <b>Local End Service VLAN</b> configuration. ngn2
	Protocol Type	Select <b>MGCP</b> . MGCP
	MGC1 IP Address	The IP address or domain name of the primary softswitch platform MGC. 10.80.20.2
	MGC1 Port No.	The communication port number of the primary softswitch platform MGC. The default is <b>2727</b> . 2727
	Keep-alive	Whether the ONU regularly sends keep-alive messages to the softswitch platform MGC. <b>Enable</b> (default) or <b>Disable</b> . Enable
Master / Slave DNS Server	The master / slave DNS IP address. You configure the DNS server when the MGC3 is configured as the domain name. When the MGC is configured as the IP address, this item is invalid. —	

Item		Description	Example			
	DHCP	Enable or disable the DHCP function. The default setting is <b>Disable</b> .	Disable			
NGN Configuration	Signaling Service Name	This item should be consistent with the <b>Service Name</b> set in the <b>Local End Service VLAN</b> configuration.	ngn2			
	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 <b>1</b> to <b>99999999</b> .	88880001	88880002	88880003	88880004
	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. You should configure this item according to the operator's network planning.	10.90.60.1		10.90.60.2	
	ONU Public IP Subnet Mask	Configure this item according to the operator's network planning.	255.255.0.0		255.255.0.0	
	ONU Public IP Gateway	Configure this item according to the operator's network planning.	10.90.1.254		10.90.1.254	
	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 <b>2427</b> .	2427		2427	
	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 4-6 Planned data on the ONU side of the VoIP service based on the MGCP protocol (configuring respectively)

Item	Description	Example (AN5506-04-B)		Example (AN5506-10-B1)		
ONU VoIP Bandwidth Configuration	Service Type	Select <b>voip</b>	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 <b>Telephone Number</b> in the <b>NGN Configuration</b> .	88880001	88880002	88880003	88880004
	Signal VLAN ID	The voice service VLAN ID; it is the C-VLAN ID when the <b>QinQ State</b> is set to <b>Enable</b> .	2000	2000	200	200
	Voice Codec Mode	Configure this item according to the operator's network planning; the default setting is <b>G.711A</b> .	G.711A	G.711A	G.711A	G.711A
	Fax Model	Configure this item according to the operator's network planning; the default setting is <b>Transparent</b> .	Transparent	Transparent	Transparent	Transparent

Item		Description	Example (AN5506-04-B)		Example (AN5506-10-B1)	
	DTMF Mode	Configure this item according to the operator's network planning; the default setting is <b>Transparent</b> .	Transparent	Transparent	Transparent	Transparent
	Fax Control Mode	Configure this item according to the operator's network planning; the default setting is <b>Passthrough</b> .	Passthrough	Passthrough	Passthrough	Passthrough
	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 <b>0</b> .	0	0	0	0
	Output Gain	Configure this item according to the operator's network planning; the default setting is <b>0</b> .	0	0	0	0
	QinQ State	Configure this item according to the operator's network planning; the default setting is <b>Disable</b> .	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 not necessary to configure when QinQ is disabled.	—	—	2000	2000

Item		Description	Example (AN5506-04-B)		Example (AN5506-10-B1)	
	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

### 4.2.3.2 Configuration Flow Chart

The flow chart for starting up the MGCP protocol based voice services respectively is illustrated in the Figure 4-21.

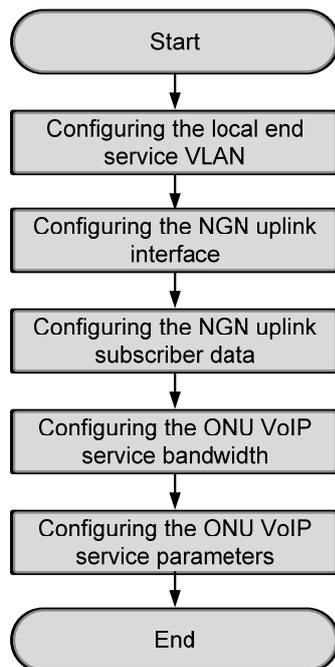


Figure 4-21 Flow chart for configuring the VoIP services respectively - MGCP

### 4.2.3.3 Configuring the Local End Service VLAN

#### Configuration purpose

Configure the service VLAN of the uplink port, limit the VLAN ID range of the service passing the uplink port and process the VLAN Tag.

#### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane and select **Config** → **Local VLAN** from the shortcut menu to bring up the configuration window. Then click the **Local End Service VLAN** tab to access the **Local End Service VLAN** window.
2. Select **Edit** → **Append** on the menu bar or directly click the  button. Either operation brings up the **Please Input the Rows for Add:** dialog box. Type **1** and click **OK** to add one local VLAN.
3. Configure the parameters according to the planned data in Table 4-5.
4. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the local end service VLAN configuration is completed. See Figure 4-22.

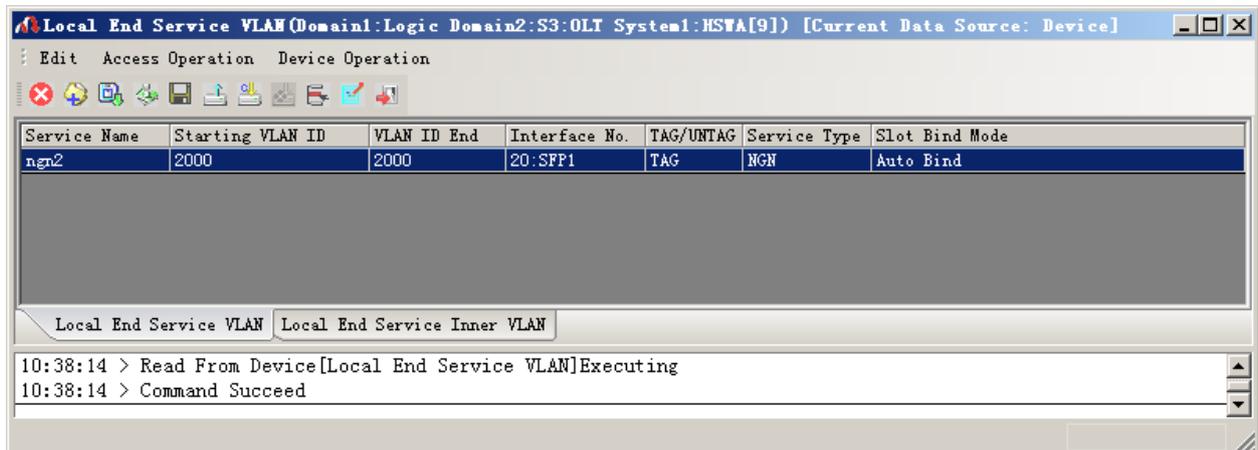


Figure 4-22 Configuring the local end service VLAN - MGCP example

### 4.2.3.4 Configuring the NGN Uplink Interface

#### Configuration purpose

Configure the relevant parameters of the media gateway controller, including: the IP address of the MGC, the protocol port No. of the NGN, etc.

#### Operation steps

1. Right-click the **HWSA[9]** card in the **Object Tree** pane and select **Config** → **Voice Config** → **NGN Interface** from the shortcut menu to access the **NGN Interface** window.
2. Select **Edit** → **Append** on the menu bar or directly click the  button. Either operation brings up the **Please Input the Rows for Add:** dialog box. Type **1** and click **OK** to add one NGN uplink interface.
3. Configure the parameters according to the planned data in Table 4-5.
4. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the NGN uplink interface configuration is completed. See Figure 4-23.

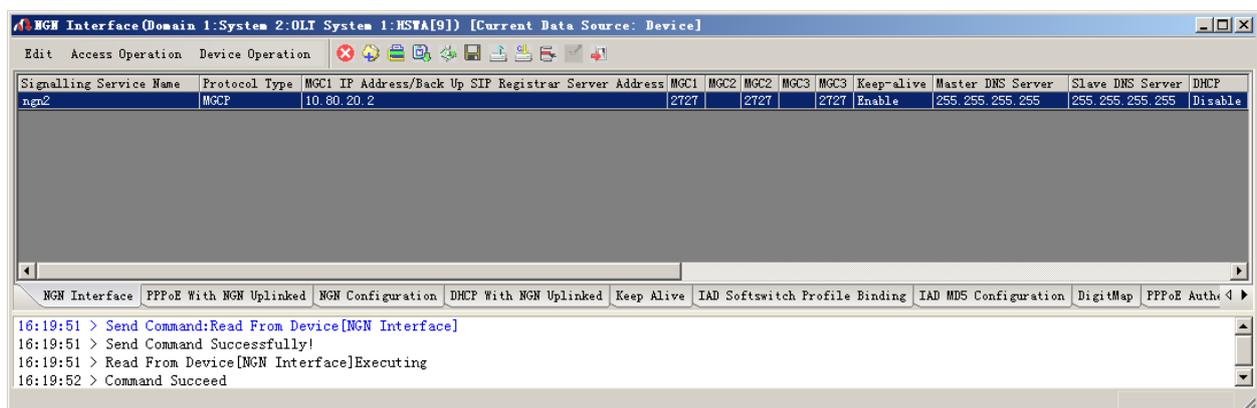


Figure 4-23 Configuring the NGN uplink port - MGCP example

### 4.2.3.5 Configuring the NGN Uplink Subscriber Data

#### Configuration purpose

Configure the public network IP of the ONU, the endpoint domain name and the endpoint user name corresponding to the ONU, etc.

#### Operation steps

1. In the **NGN Interface** window, click the **NGN Configuration** tab to access the **NGN Configuration** window.
2. Select **Edit** → **Append** on the menu bar or directly click the  button. Either operation brings up the **Please Input the Rows for Add:** dialog box. Type **4** and click **OK** to add four NGN uplink subscriber information entries.
3. Configure the parameters according to the planned data in Table 4-5.
4. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the configuration of the NGN uplink subscriber information is completed. See Figure 4-24.

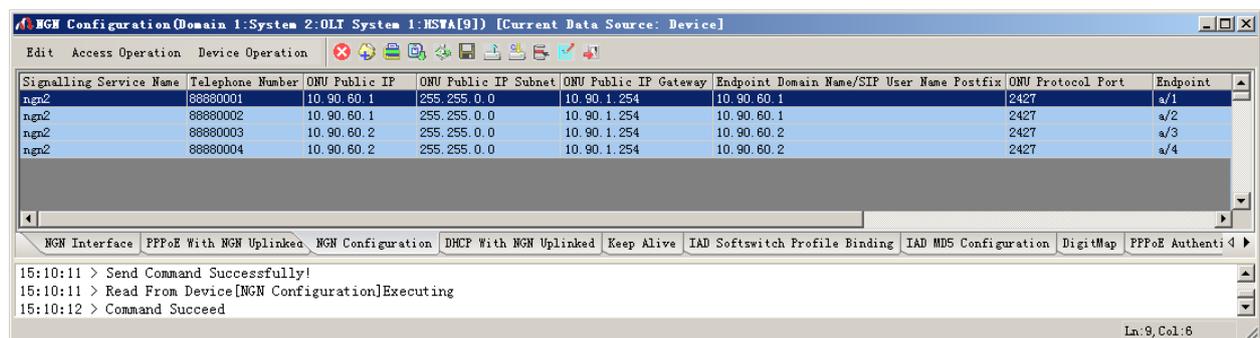


Figure 4-24 Configuring the NGN uplink subscriber data - MGCP example

### 4.2.3.6 Configuring the VoIP Service Bandwidth of the ONU

#### Configuration purpose

Configure the VoIP service bandwidth of the ONU.

#### Operation steps

1. Click the **GC8B[15]** card in the **Object Tree** pane to display all ONUs 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. Select **Edit** → **Append** on the menu bar or directly click the  button. Either operation brings up the **Please Input the Rows for Add:** dialog box. Type **1** and click **OK** to add 1 VoIP service.
3. Configure the parameters according to the planned data in Table 4-6.
4. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the configuration of PON1-AN5506-04-B[1] VoIP service bandwidth is completed. See Figure 4-25.

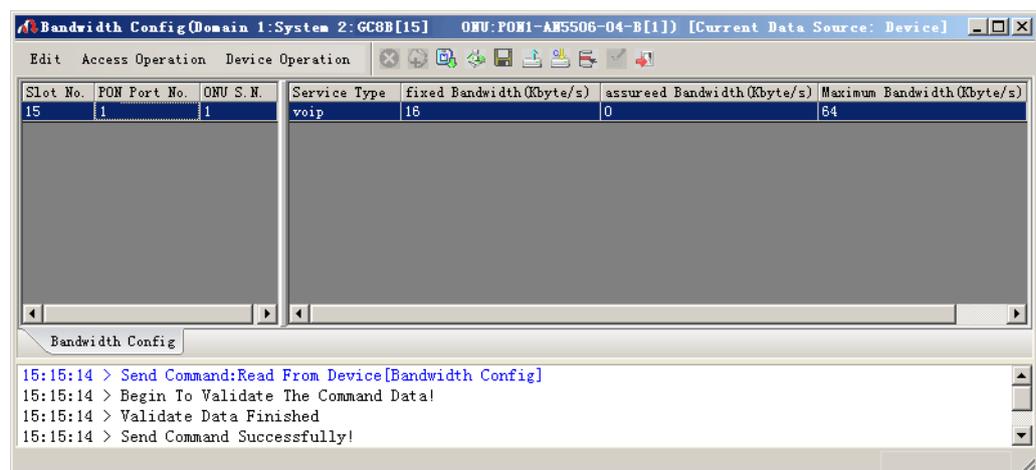


Figure 4-25 AN5506-04-B bandwidth configuration – MGCP example

- Configure the bandwidth in the same way for the PON1-AN5506-10-B1[2] of the GC8B[15] card, as shown in Figure 4-26.

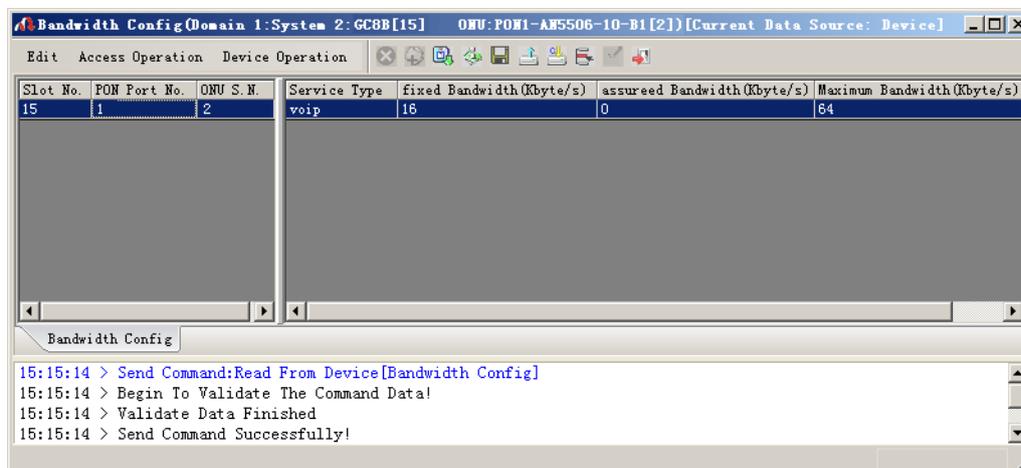


Figure 4-26 AN5506-10-B1 bandwidth configuration – MGCP example

### 4.2.3.7 Configuring the VoIP Service Parameters of the ONU

#### Configuration purpose

Configure the VoIP service parameters of the ONU, including VoIP service VLAN, voice codec, fax mode, silence switch, echo cancel, input / output gain, DTMF mode, etc.

#### Operation steps

- Click the **GC8B[15]** card in the **Object Tree** pane to display all ONUs 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 bring up the **Voice Config** dialog box.
- Select **FXS1** in **Voice Port List** and configure the parameters according to the planned data in Table 4-6, as shown in Figure 4-27.

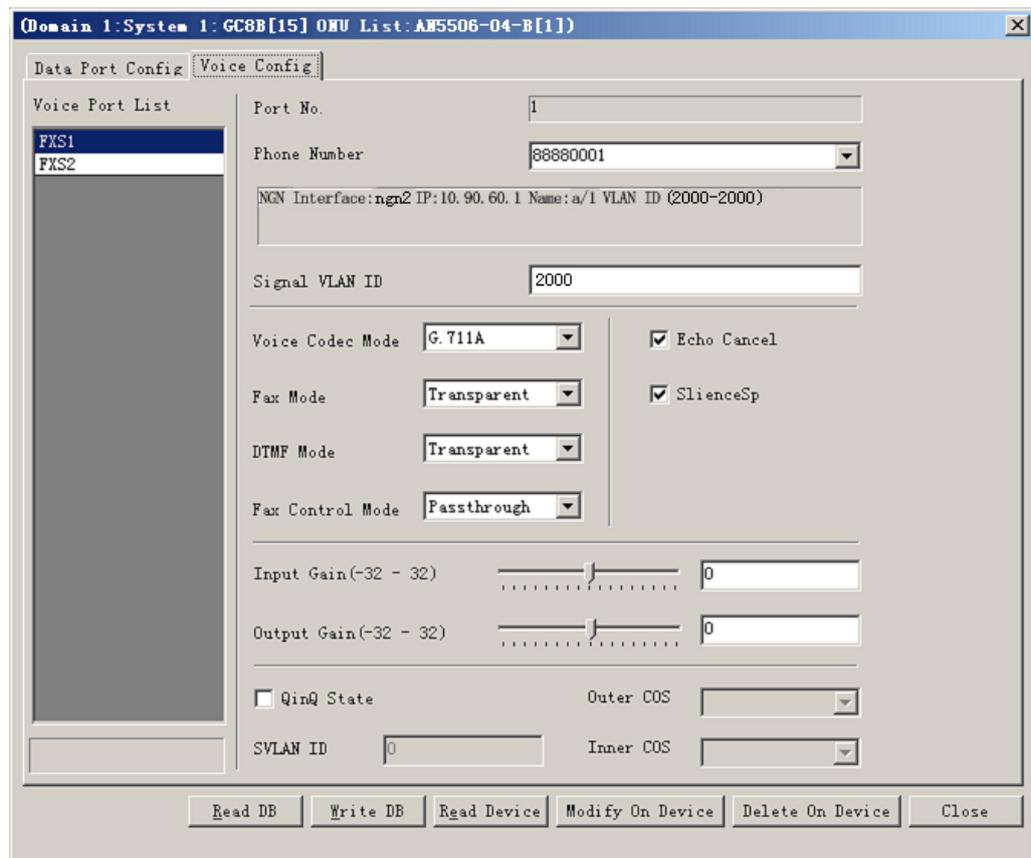


Figure 4-27 FXS1 voice configuration of the AN5506-04-B – MGCP example

3. Select **FXS2** in **Voice Port List** and configure the parameters according to the planned data in Table 4-6, as shown in Figure 4-28.

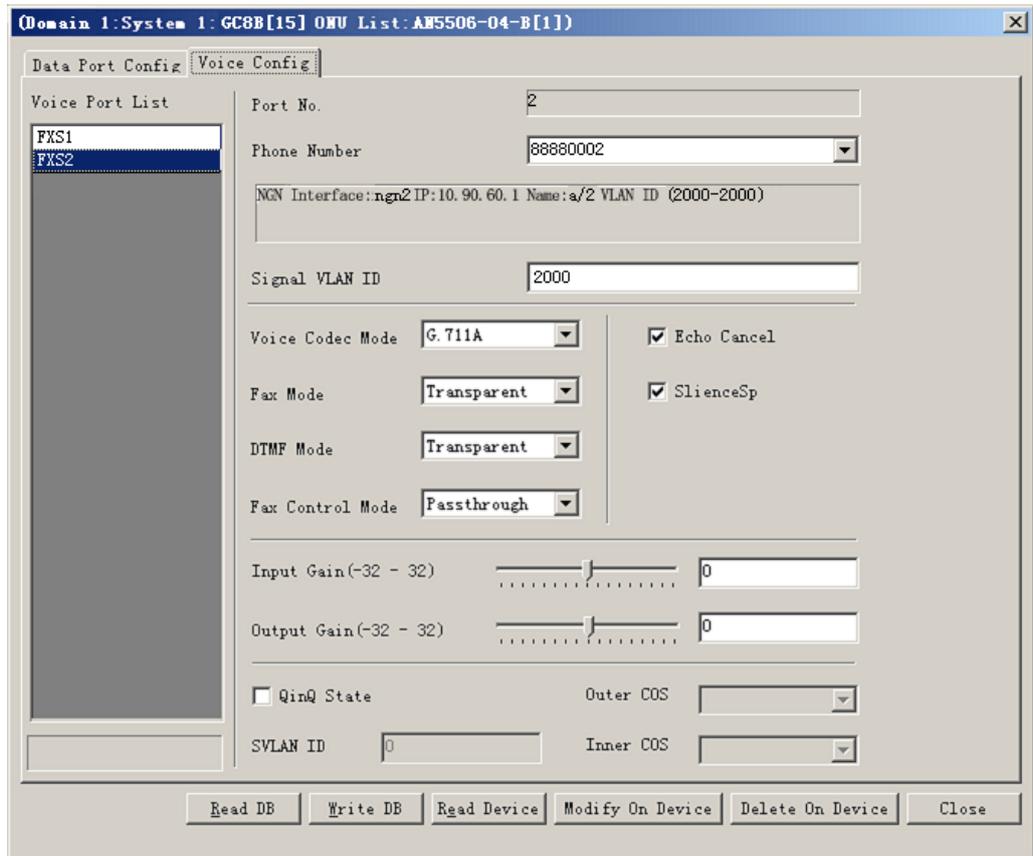


Figure 4-28 FXS2 voice configuration of the AN5506-04-B – MGCP example

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[15]** 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 planned data in Table 4-6, as shown in Figure 4-29.

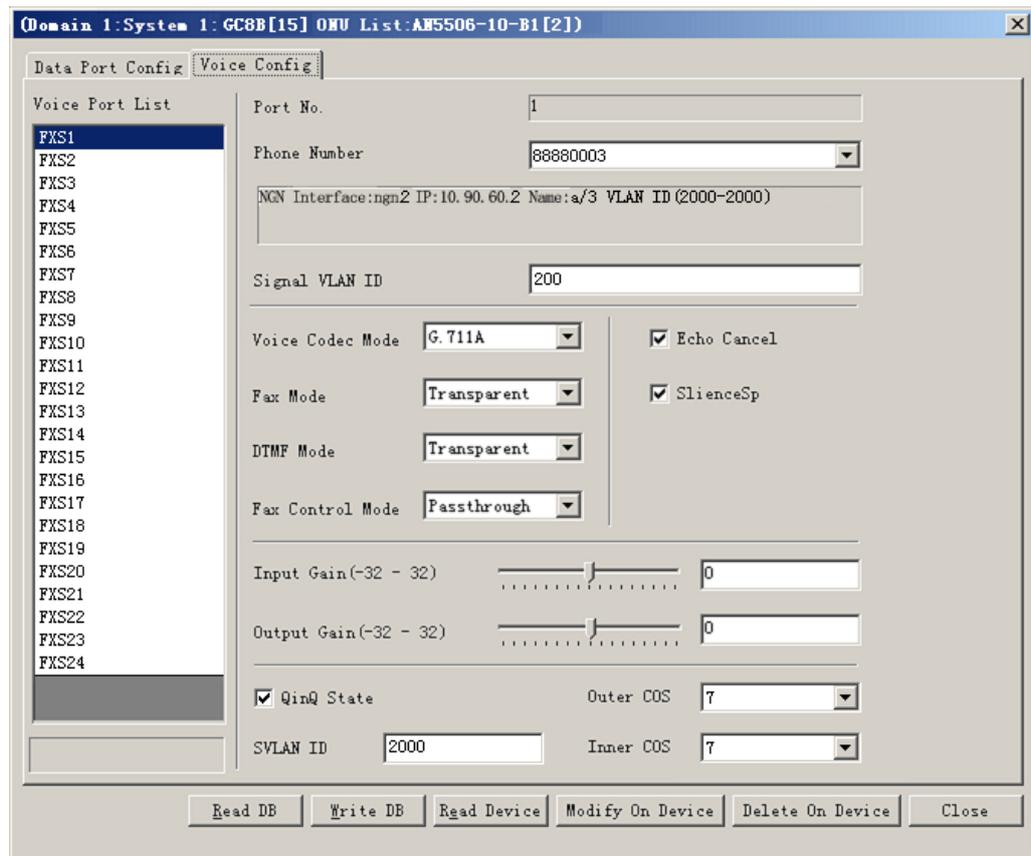


Figure 4-29 FXS1 voice configuration of the AN5506-10-B1 -- MGCP example

7. Select **FXS2** in **Voice Port List** and configure the parameters according to the planned data in Table 4-6, as shown in Figure 4-30.

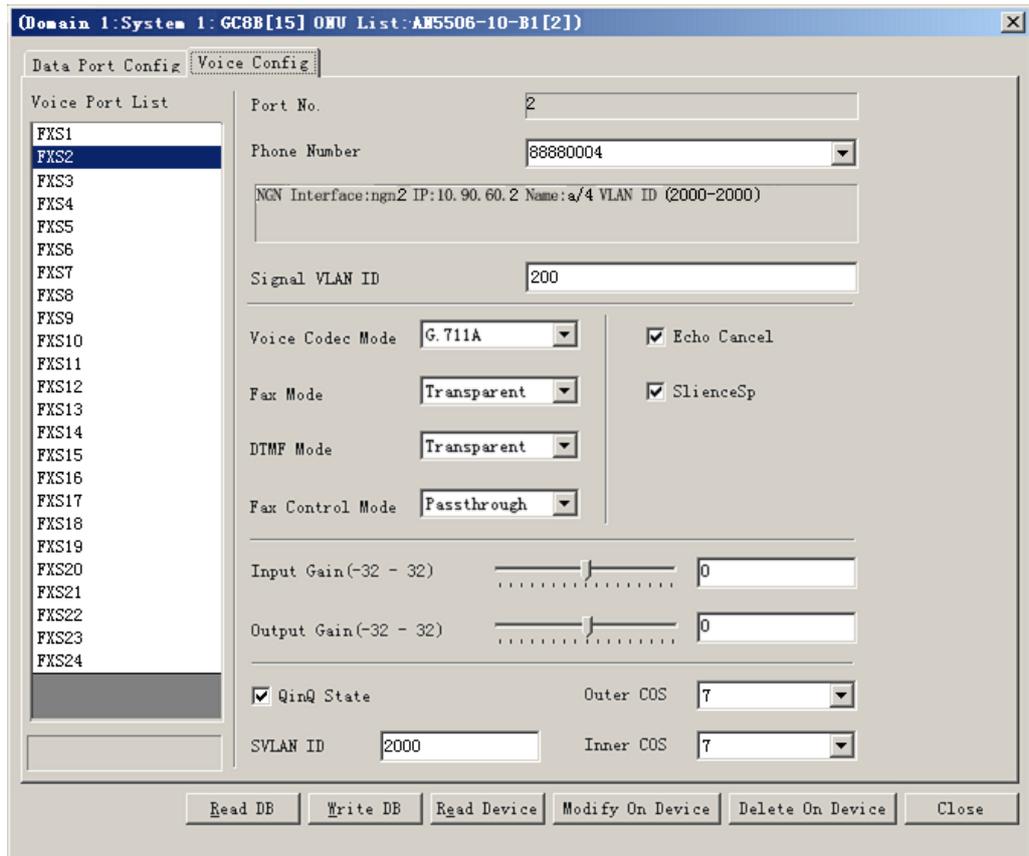


Figure 4-30 FXS2 voice configuration of the AN5506-10-B1 – MGCP example

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

### 4.2.3.8 End of Configuration

The subscribers under the FXS1 and FXS2 port 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 No.1 of the GC8B card in Slot 15 can access the voice service. Subscribers can call each other normally.

## 4.2.4 Configuring the Services in a Batch Manner

### 4.2.4.1 Planning Data

The following introduces how to start up the voice service by configuring the ONU ports in a batch manner. The planned data is shown in Table 4-7 and 4-8.

Table 4-7 Planned data on the OLT side of the VoIP service based on the MGCP protocol (configuring in a batch manner)

Item		Description	Example	
ONU Information	ONU Type	Configure this item according to the actual ONU type.	AN5506-04-B	AN5506-10-B1
	Slot No.	Configure this item according to the PON interface card slot number actually used.	15	
	PON port No.	Configure this item according to the PON port number actually used.	1	
	ONU Auth No.	Configure this item according to the operator's network planning.	1	2
Local End Service VLAN	Service Name	Configure this item according to the operator's network planning.	ngn2	
	Starting VLAN ID	The start service VLAN ID of the uplink interface. Configure this item according to the operator's network planning.	2000	
	VLAN ID End	The end service VLAN ID of the uplink interface. Configure this item according to the operator's network planning.	2000	
	Interface No.	Configure this item according to the uplink interface No. actually used.	20:SFP1	

Item	Description	Example
	<p>The TAG processing mode of the uplink service VLAN. There are two options: <b>TAG</b> and <b>UNTAG</b>. <b>TAG</b> means that when the uplink data packet passes the port, its tag will not be stripped and it keeps going in the tagged mode. And for the downlink data packet, only the data packet in tagged mode will be accepted, and it keeps going in the tagged mode. <b>UNTAG</b> 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.</p>	TAG
	Service Type	Select <b>ngn</b> for VoIP services.
	Slot Bind Mode	Select <b>Auto Bind</b> or <b>Manually Bind</b> .
NGN Uplink Interface	Signaling Service Name	This item should be consistent with the <b>Service Name</b> set in the <b>Local End Service VLAN</b> configuration.
	Protocol Type	Select <b>MGCP</b> .
	MGC1 IP Address	The IP address or domain name of the primary softswitch platform MGC.
	MGC1 Port No.	The communication port number of the primary softswitch platform MGC. The default is <b>2727</b> .
	Keep-alive	Whether the ONU regularly sends keep-alive messages to the softswitch platform MGC. <b>Enable</b> (default) or <b>Disable</b> .
	Master / Slave DNS Server	The master / slave DNS IP address. You configure the DNS server when the MGC3 is configured as the domain name. When the MGC is configured as the IP address, it is not necessary to configure this item.
	DHCP	Enable or disable the DHCP function. The default setting is <b>Disable</b> .

Table 4-8 Planned data on the ONU side of the VoIP service based on the MGCP 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 this item according to the operator's network planning.	
	Service Type	Select <b>VOIP</b>	
	Fixed Bandwidth (Kbyte/s)	Configure this item according to the operator's network planning. The default setting is 16.	
	Assured Bandwidth (Kbyte/s)	Configure this item according to the operator's network planning. The default setting is 0.	
	Maximum Bandwidth (Kbyte/s)	Configure this item according to the operator's network planning. The default setting is 64.	
ONU Configuration	Slot No.	15	15
	PON No.	1	1
	ONU No.	1	2
	Bandwidth Profile	a	a
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 ( <b>0</b> to <b>9</b> ), letters ( <b>a</b> to <b>z</b> and <b>A</b> to <b>Z</b> ), and underlines. Configure this item according to the operator's network planning.	
	Voice Code Mode	Configure this item according to the operator's network planning; the default setting is <b>G.711A</b> .	

Item		Description	Example	
	Fax Mode	Configure this item according to the operator's network planning; the default setting is <b>Transparent</b> .	Transparent	
	Silence Switch	Configure this item according to the operator's network planning; the default setting is <b>Enable</b> .	Enable	
	Echo Cancel	Configure this item according to the operator's network planning; the default setting is <b>Enable</b> .	Enable	
	Input Gain (DB)	Configure this item according to the operator's network planning; the default setting is <b>0</b> .	0	
	Output Gain (DB)	Configure this item according to the operator's network planning; the default setting is <b>0</b> .	0	
	DTMF Mode	Configure this item according to the operator's network planning; the default setting is <b>Transparent</b> .	Transparent	
	Fax Control Mode	Configure this item according to the operator's network planning; the default setting is <b>Passthrough</b> .	Passthrough	
ONU Voice Basic Configure	Slot No.	Configure this item according to the PON interface card slot number actually used.	15	
	PON No.	The No. of the PON port actually used.	1	
	ONU No.	Select the ONU's authentication No. to be configured.	1	2
	IP Configuration Mode	Select <b>static</b> (default), <b>PPPoE</b> , or <b>DHCP</b> mode to get IP address.	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. You should configure this item according to the operator's network planning.	10.90.60.1	10.90.60.2

Item		Description	Example			
	ONU Static Public IP Mask	Configure this item according to the operator's network planning.	255.255.0.0		255.255.0.0	
	ONU Static Public IP Gateway	Configure this item according to the operator's network planning.	10.90.1.254		10.90.1.254	
ONU POTS Configure	Slot No.	Configure this item according to the PON interface card slot number actually used.	15			
	PON No.	The No. of the PON port actually used.	1			
	ONU No.	Select the ONU's authentication No. to be configured.	1		2	
	Port No.	Select the ONU port number actually connected with user telephone.	1	2	1	2
	Port Enable	Select <b>Enable</b> .	Enable	Enable	Enable	Enable
	Signaling Service Name	This item should be consistent with the <b>Service Name</b> in the <b>NGN Configuration</b> .	ngn2	ngn2	ngn2	ngn2
	Signaling VLAN ID	The voice service VLAN ID; it is the C-VLAN ID when the <b>QinQ State</b> is set to <b>Enable</b> .	2000	2000	200	200
	SVLAN State	Configure this item according to the operator's network planning; the default setting is <b>Disable</b> .	Disable	Disable	Enable	Enable
	SVLAN ID	The SVLAN ID should be within the range of the uplink interface VLAN ID when the QinQ is enabled. And it is invalid when the QinQ is disabled.	—	—	2000	2000
	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 gateway's domain name address. 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	

Item		Description	Example			
	ONU Protocol Port No.	Configure this item according to the operator's network planning; the default setting is <b>2427</b> .	2427	2427	2427	2427
	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

### 4.2.4.2 Configuration Flow Chart

The flow chart for starting up the MGCP protocol based voice services in a batch manner is illustrated in the Figure 4-31.

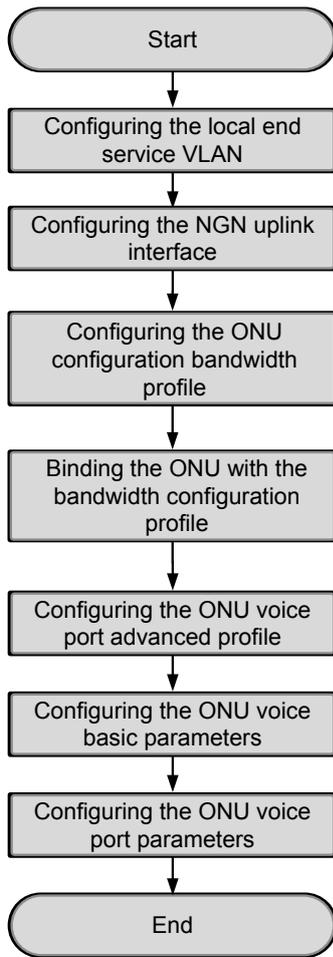


Figure 4-31 Flow chart for configuring VoIP services in a batch manner - MGCP

### 4.2.4.3 Configuring the Local End Service VLAN

#### Configuration purpose

Configure the service VLAN of the uplink port, limit the VLAN ID range of the service passing the uplink port and process the VLAN Tag.

#### Operation steps

1. Right-click the **HWSA[9]** card in the **Object Tree** pane and select **Config** → **Local VLAN** from the shortcut menu to bring up the configuration window. Then click the **Local End Service VLAN** tab in the window to access the **Local End Service VLAN** window.
2. Select **Edit** → **Append** on the menu bar or directly click the  button. Either operation brings up the **Please Input the Rows for Add:** dialog box. Type **1** and click **OK** to add one local VLAN.
3. Configure the local VLAN according to the planned data in Table 4-7.
4. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the local end service VLAN configuration is completed. See Figure 4-32.

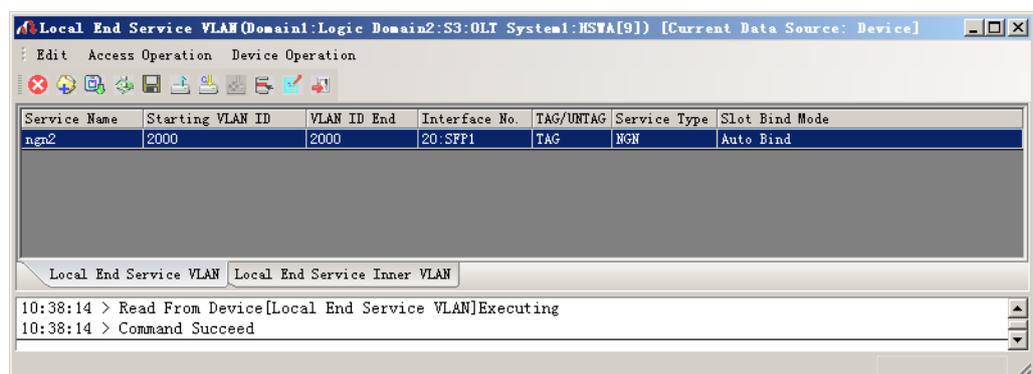


Figure 4-32 Configuring the local end service VLAN - MGCP example

### 4.2.4.4 Configuring the NGN Uplink Interface

#### Configuration purpose

Configure the relevant parameters of the media gateway controller, including: the IP address of the MGC, the protocol port No. of the NGN, etc.

#### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane and select **Config** → **Voice Config** → **NGN Interface** from the shortcut menu to access the **NGN Interface** window.
2. Select **Edit** → **Append** on the menu bar or directly click the  button. Either operation brings up the **Please Input the Rows for Add:** dialog box. Type **1** and click **OK** to add one NGN uplink interface.
3. Configure the parameters according to the planned data in Table 4-7.
4. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the NGN uplink interface configuration is completed. See Figure 4-33.

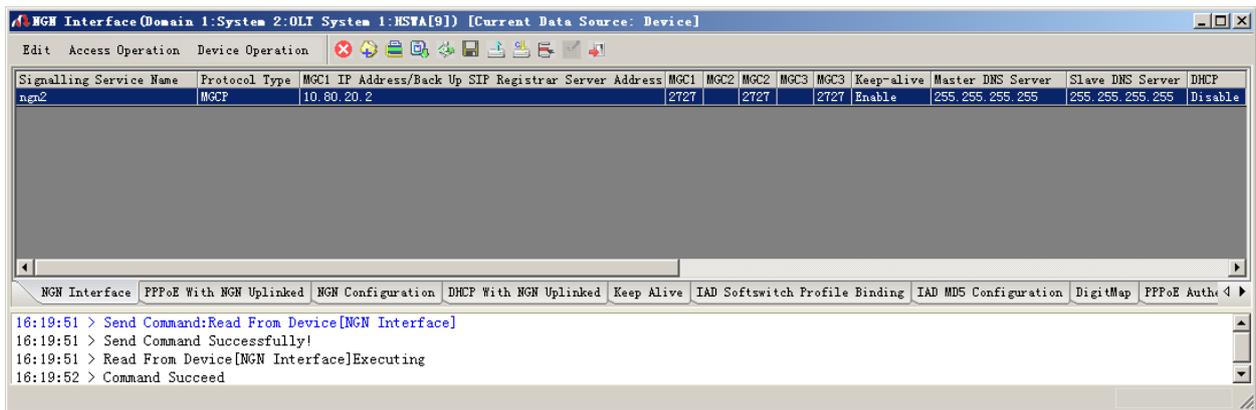


Figure 4-33 Configuring the NGN uplink interface - MGCP example

### 4.2.4.5 Configuring the ONU Bandwidth Configuration Profile

#### Configuration purpose

Configure the VoIP service bandwidth profile of the ONU.

#### Operation steps

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. Select **Edit** → **Append** on the menu bar or directly click the  button. Either operation brings up the **Please Input the Rows for Add:** dialog box. Type **1** and click **OK** to add one bandwidth configuration profile. Input **a** in the **Profile Name** column.
3. Select profile **a**, click a blank area in the right pane, and select **Edit** → **Append** on the menu bar or directly click the  button. Either operation brings up the **Please Input the Rows for Add:** dialog box. Type **1** and click **OK** to add one service. Configure the parameters according to the planned data in Table 4-8.
4. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the VoIP service bandwidth configuration profile is configured. See Figure 4-34.

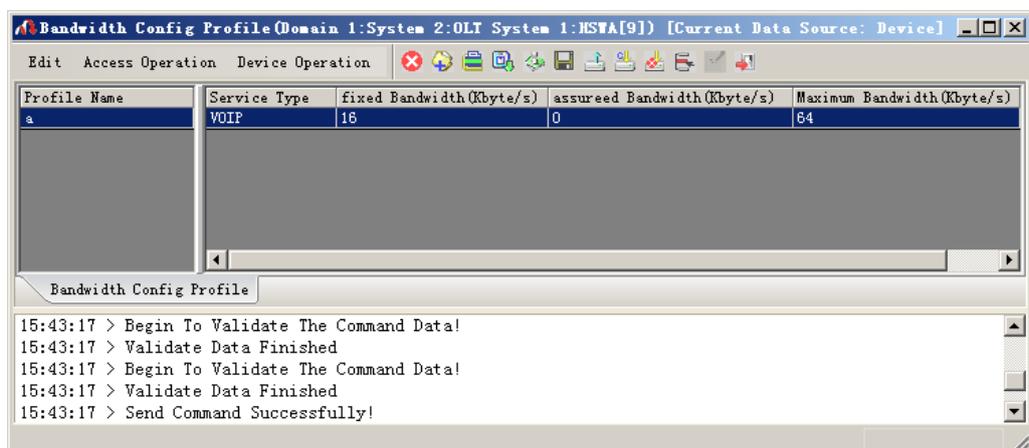


Figure 4-34 The ONU bandwidth configuration profile

## 4.2.4.6 Binding the ONU with the Bandwidth Configuration Profile

### Configuration purpose

Bind the ONU with the bandwidth configuration profile, that is, apply the bandwidth configuration profile to the ONU.

### Operation steps

1. Right-click the system in the **Object Tree** pane, select **Config** → **Batch Configure** → **ONU Config** 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 No.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 display in the right pane. Configure the parameters according to the planned data in Table 4-8, and select **a** in the drop-down lists of **GPON Bandwidth**.
4. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the ONU is bound to the bandwidth configuration profile. See Figure 4-35.

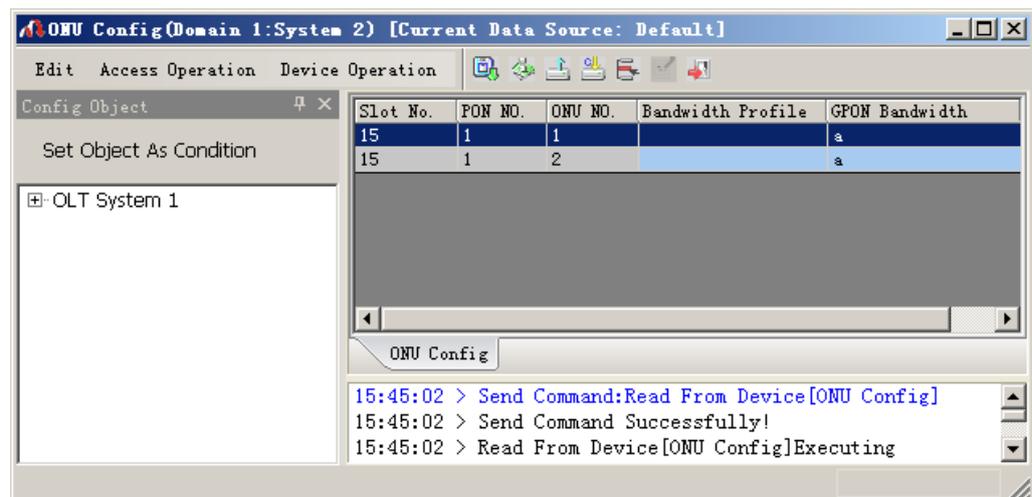


Figure 4-35 ONU configuration

## 4.2.4.7 Configuring the ONU Voice Port Advanced Profile

### Configuration purpose

Configure the profile of the ONU voice service parameters, including voice codec, fax mode, silence switch, echo cancel, input / output gain, DTMF mode, etc.

### Operation steps

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. Select **Edit** → **Append** on the menu bar or directly click the  button. Either operation brings up the **Please Input the Rows for Add:** dialog box. Type **1** and click **OK** to add one ONU voice port advanced profile.
3. Configure the parameters according to the planned data in Table 4-8.
4. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the ONU voice port advanced profile is configured. See Figure 4-36.

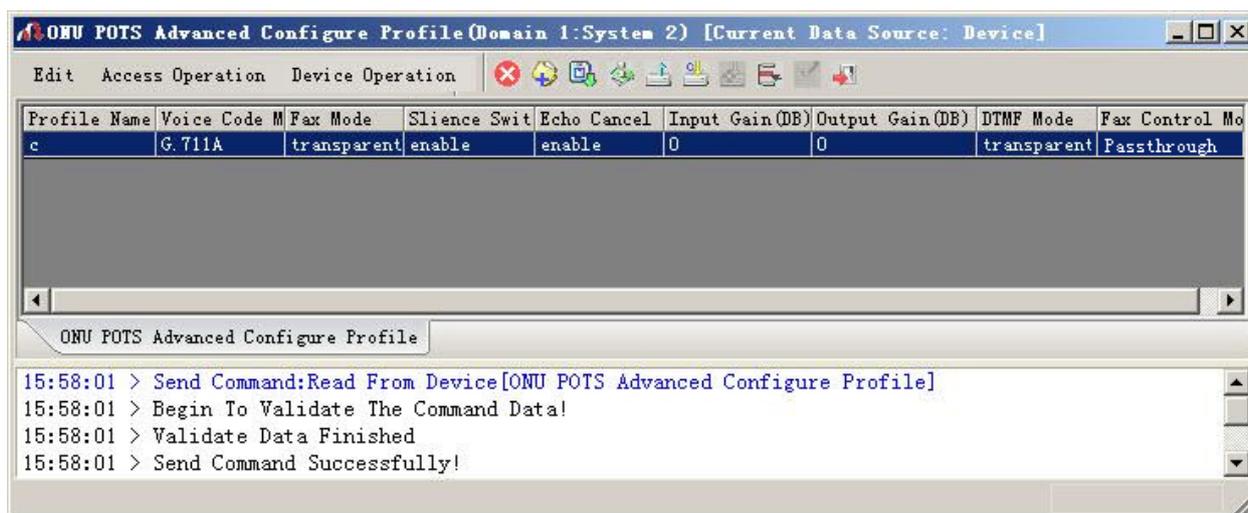


Figure 4-36 ONU voice port advanced configuration profile

#### 4.2.4.8 Configuring the Basic Voice Parameters for the ONU

##### Configuration purpose

Configure the configuration method for the public network IP address and the public network IP information of the ONU voice service.

##### Operation steps

1. Right-click the system in the **Object Tree** pane and select **Config** → **Batch Configure** → **ONU Voice Basic Configure** from the shortcut menu 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 No.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 display in the right pane. Configure the parameters according to the planned data in Table 4-8.

- When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the configuration of the basic voice parameters for the ONU is completed. See Figure 4-37.

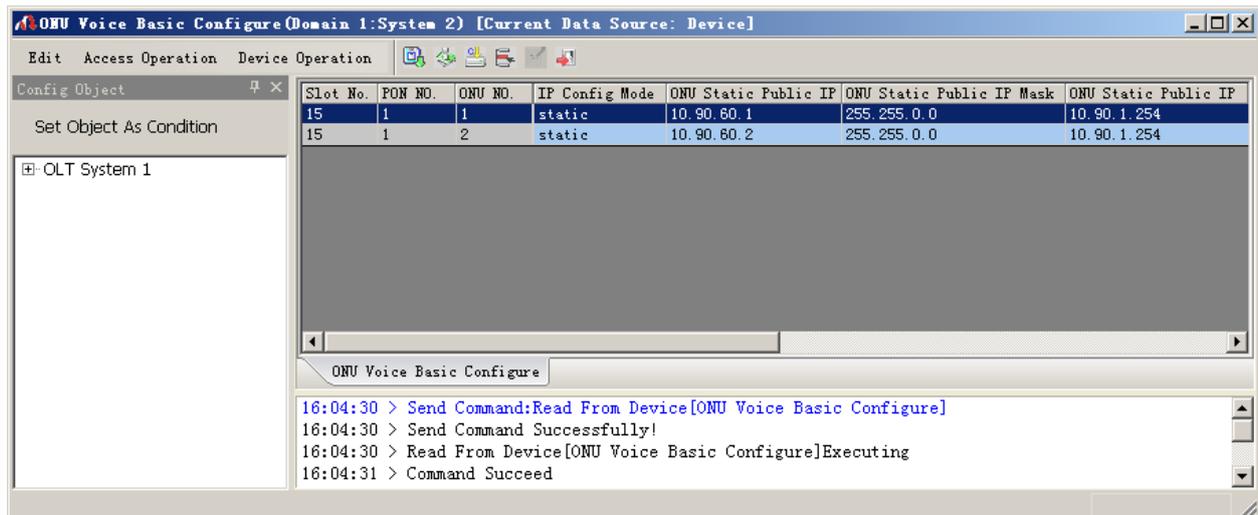


Figure 4-37 Basic voice configuration for the ONU

### 4.2.4.9 Configuring the ONU Voice Port Parameters

#### Configuration purpose

Configure the relevant parameters of the ONU voice port, including: telephone number, voice service VLAN, endpoint domain name, endpoint username, binding the ONU voice port advanced profile, etc.

#### Operation steps

- Right-click the system in the **Object Tree** pane and select **Config** → **Batch Configure** → **ONU POTS Configure** from the shortcut menu to access the **ONU POTS Configure** window.
- Click the **Set Object as Condition** button, select **AN5506-04-B[1]** and **AN5506-10-B1[2]** under the PON port No.1 of the GC8B card in Slot.15, and click the **OK** button.

3. The detailed information of the object will display in the right pane. Configure the parameters according to the planned data in Table 4-8.
4. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the ONU voice port parameter configuration is completed. See Figure 4-38.

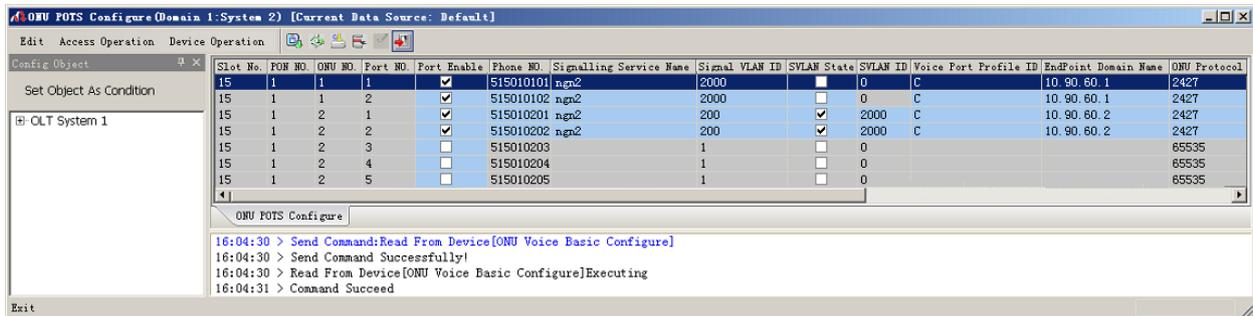


Figure 4-38 ONU voice port configuration

### 4.2.4.10 End of Configuration

The subscribers under the FXS1 and FXS2 port 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 No.1 of the GC8B card in Slot 15 can access the voice service. Subscribers can call each other normally.

## 4.3 Configuring the VoIP Services – SIP Example

### 4.3.1 Configuring Rules

- ◆ When the softswitch platform uses the SIP protocol to control the access terminals, you should set the MGC protocol type to the SIP protocol 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.

### 4.3.2 Service Network

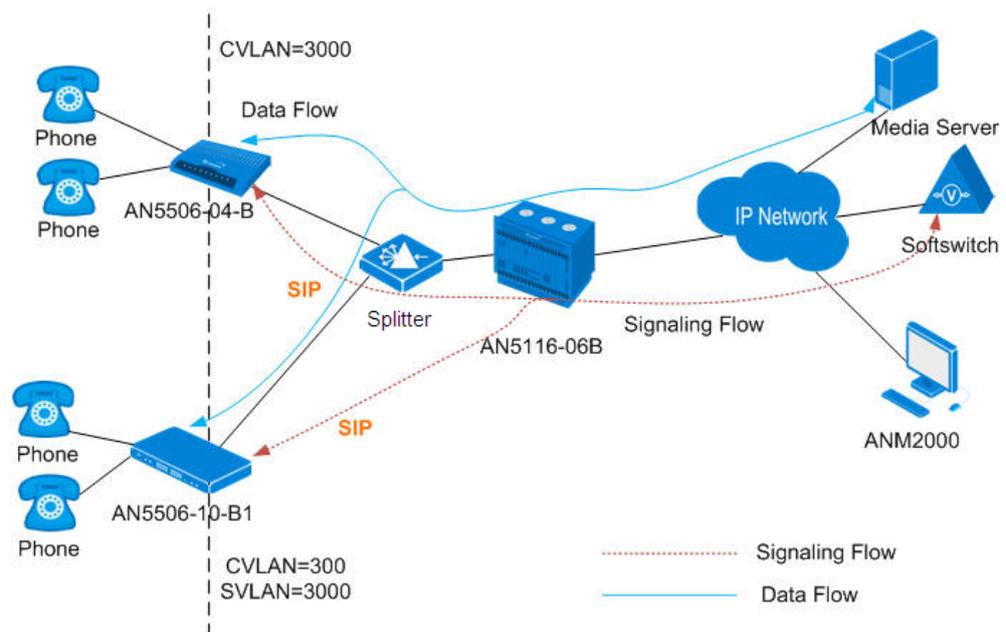


Figure 4-39 The VoIP service network based on the SIP protocol

As shown in the figure above, the GPON system conducts signaling interaction with the softswitch based on the SIP protocol to implement call control. The ONU adopts 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.

The following takes the network with the AN5116-06B, the AN5506-04-B and the AN5506-10-B1 as an example to introduce the start-up process of the VoIP service based on the SIP protocol. The AN5116-06B chose the HU1A card and the GC4B card as the interface cards on the network side and the client end respectively, and the HSWA card and the PUBA card are required.

### 4.3.3 Configuring the Services Respectively

#### 4.3.3.1 Planning Data

The following introduces the VoIP service start-up by configuring the ONU ports respectively. The planned data is shown in Table 4-9 and 4-10.

Table 4-9 Planned data on the OLT side of the VoIP service based on the SIP protocol (configuring respectively)

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

Item	Description	Example	
Interface No.	Configure this item according to the uplink interface No. actually used.	20:SFP1	
TAG / UNTAG	The TAG processing mode of the uplink service VLAN. There are two options: <b>TAG</b> and <b>UNTAG</b> . <b>TAG</b> means that when the uplink data packet passes the port, its tag will not be stripped and it keeps going in the tagged mode. And for the downlink data packet, only the data packet in tagged mode will be accepted, and it keeps going in the tagged mode. <b>UNTAG</b> 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	
Service Type	Select <b>ngn</b> for VoIP services.	ngn	
Slot Bind Mode	Select <b>Auto Bind</b> or <b>Manually Bind</b> .	Auto Bind	
NGN Uplink Interface	Signaling Service Name	This item should be consistent with the <b>Service Name</b> set in the <b>Local End Service VLAN</b> configuration.	ngn3
	Protocol Type	Select <b>SIP</b> .	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 is <b>5060</b> .	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 is <b>5060</b> .	5060

Item	Description	Example				
SIP Expires (S)	The timeout period of the SIP protocol. The value range is 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 <b>Service Name</b> set in the <b>Local End Service VLAN</b> 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 range is 1 to 99999999.	88880001	88880002	88880003	88880004
	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. You should configure this item according to the operator's network planning.	10.90.60.1		10.90.60.2	
	ONU Public IP Subnet Mask	Configure this item according to the operator's network planning.	255.255.0.0		255.255.0.0	
	ONU Public IP Gateway	Configure this item according to the operator's network planning.	10.90.1.254		10.90.1.254	
	SIP Telephone No.	Configure this item according to the operator's network planning.	88880001	88880002	88880003	88880004
	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 4-10 Planned data on the ONU side of the VoIP service based on the SIP protocol (configuring respectively)

Item	Description	Example (AN5506-04-B)		Example (AN5506-10-B1)		
ONU VoIP Bandwidth Configuration	Service Type	Select <b>voip</b> .	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 <b>Telephone Number</b> in the <b>NGN Configuration</b> .	88880001	88880002	88880003	88880004
	Signal VLAN ID	The voice service VLAN ID; it is the C-VLAN ID when the <b>QinQ State</b> is set to <b>Enable</b> .	3000	3000	300	300
	Voice Codec Mode	Configure this item according to the operator's network planning; the default setting is <b>G.711A</b> .	G.711A	G.711A	G.711A	G.711A

Item	Description	Example (AN5506-04-B)		Example (AN5506-10-B1)	
Fax Model	Configure this item according to the operator's network planning; the default setting is <b>Transparent</b> .	Transparent	Transparent	Transparent	Transparent
DTMF Mode	Configure this item according to the operator's network planning; the default setting is <b>Transparent</b> .	Transparent	Transparent	Transparent	Transparent
Fax Control Mode	Configure this item according to the operator's network planning; the default setting is <b>Passthrough</b> .	Passthrough	Passthrough	Passthrough	Passthrough
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 <b>0</b> .	0	0	0	0
Output Gain	Configure this item according to the operator's network planning; the default setting is <b>0</b> .	0	0	0	0
QinQ State	Configure this item according to the operator's network planning; the default setting is <b>Disable</b> .	Disable	Disable	Enable	Enable

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

### 4.3.3.2 Configuration Flow Chart

The flow chart for starting up the SIP protocol based voice services respectively is illustrated in the Figure 4-40.

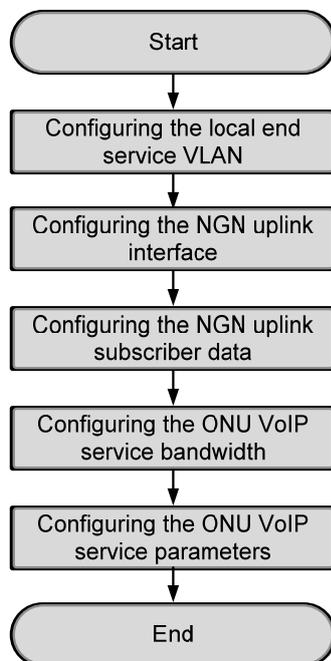


Figure 4-40 Flow chart for configuring the VoIP services respectively – SIP example

### 4.3.3.3 Configuring the Local End Service VLAN

#### Configuration purpose

Configure the service VLAN of the uplink port, limit the VLAN ID range of the service passing the uplink port and process the VLAN Tag.

#### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane and select **Config** → **Local VLAN** from the shortcut menu to bring up the configuration window. Then click the **Local End Service VLAN** tab to access the **Local End Service VLAN** window.
2. Select **Edit** → **Append** on the menu bar or directly click the  button. Either operation brings up the **Please Input the Rows for Add:** dialog box. Type **1** and click **OK** to add one local VLAN.
3. Configure the parameters according to the planned data in Table 4-9.
4. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the local end service VLAN configuration is completed. See Figure 4-41.

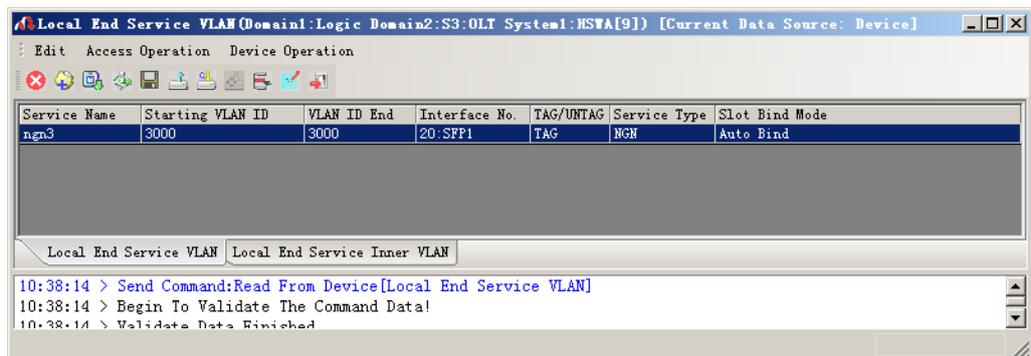


Figure 4-41 Configuring the local end service VLAN - SIP example

### 4.3.3.4 Configuring the NGN Uplink Interface

#### Configuration purpose

Configure the relevant parameters of the media gateway controller, including: the IP address of the MGC, the protocol port No. of the NGN, etc.

#### Operation steps

1. Right-click the **HWSA[9]** card in the **Object Tree** pane and select **Config** → **Voice Config** → **NGN Interface** from the shortcut menu to access the **NGN Interface** window.
2. Select **Edit** → **Append** on the menu bar or directly click the  button. Either operation brings up the **Please Input the Rows for Add:** dialog box. Type **1** and click **OK** to add one NGN uplink interface.
3. Configure the parameters according to the planned data in Table 4-9.
4. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the NGN uplink interface configuration is completed. See Figure 4-42.

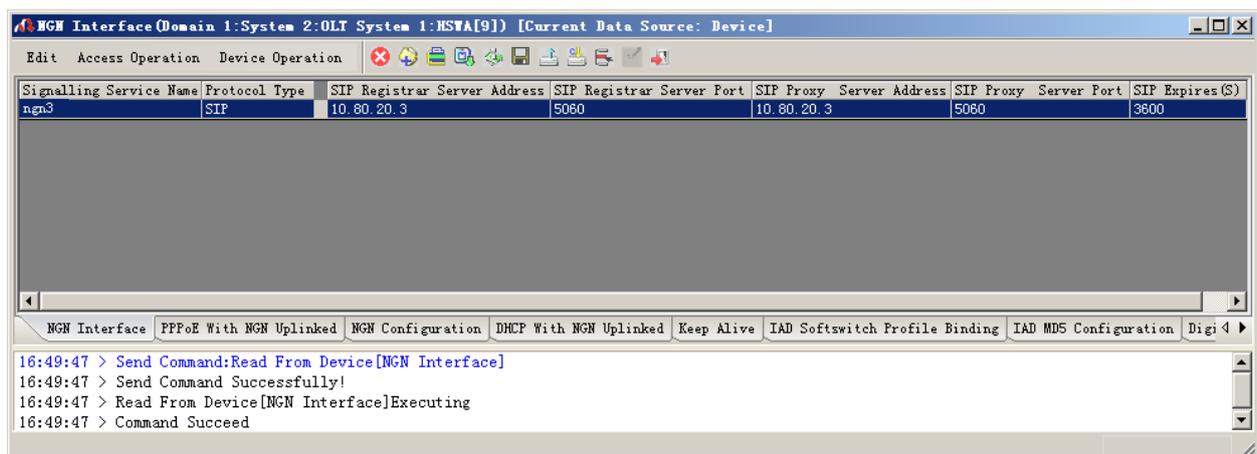


Figure 4-42 Configuring the NGN uplink interface - SIP example

### 4.3.3.5 Configuring the NGN Uplink Subscriber Data

#### Configuration purpose

Configure the public network IP of the ONU, the endpoint domain name and the endpoint user name corresponding to the ONU, etc.

#### Operation steps

1. In the **NGN Interface** window, click the **NGN Configuration** tab to access the **NGN Configuration** window.
2. Select **Edit** → **Append** on the menu bar or directly click the  button. Either operation brings up the **Please Input the Rows for Add:** dialog box. Type **4** and click **OK** to add four NGN uplink subscriber information entries.
3. Configure the parameters according to the planned data in Table 4-9.
4. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the configuration of the NGN uplink subscriber information is completed. See Figure 4-43.

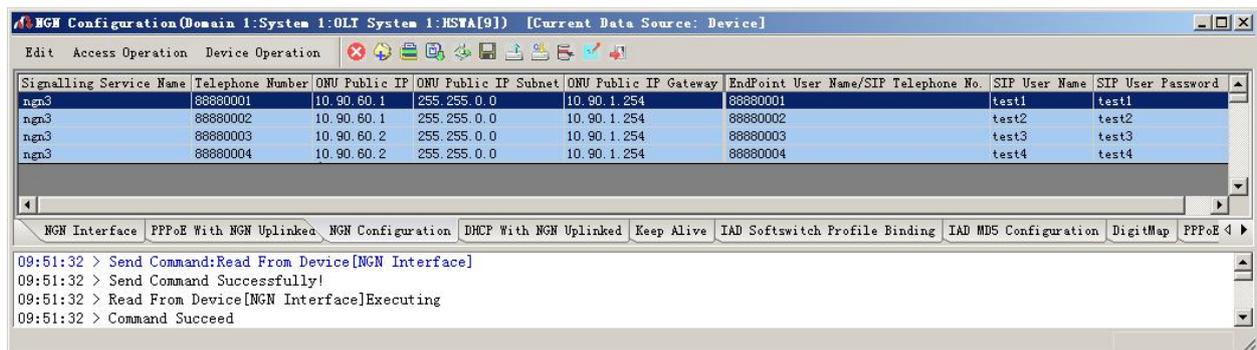


Figure 4-43 Configuring the NGN uplink subscriber data - SIP example

### 4.3.3.6 Configuring the VoIP Service Bandwidth of the ONU

#### Configuration purpose

Configure the VoIP service bandwidth of the ONU.

#### Operation steps

1. Click the **GC8B[15]** card in the **Object Tree** pane to display all ONUs 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. Select **Edit** → **Append** on the menu bar or directly click the  button. Either operation brings up the **Please Input the Rows for Add:** dialog box. Type **1** and click **OK** to add 1 VoIP service.
3. Configure the parameters according to the planned data in Table 4-10.
4. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the configuration of PON1-AN5506-04-B[1] VoIP service bandwidth is completed. See Figure 4-44.

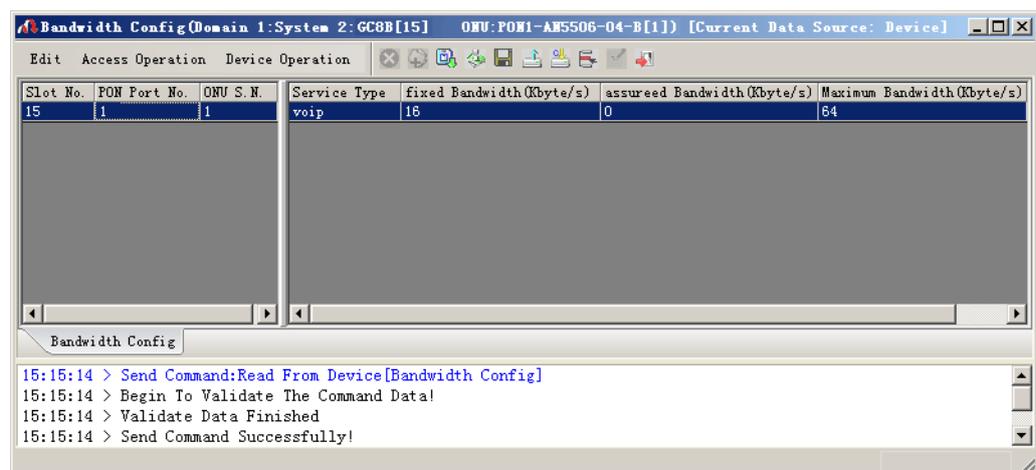


Figure 4-44 AN5506-04-B bandwidth configuration – SIP example

- Configure the bandwidth in the same way for the PON1-AN5506-10-B1[2] of the GC8B[15] card, as shown in Figure 4-7.

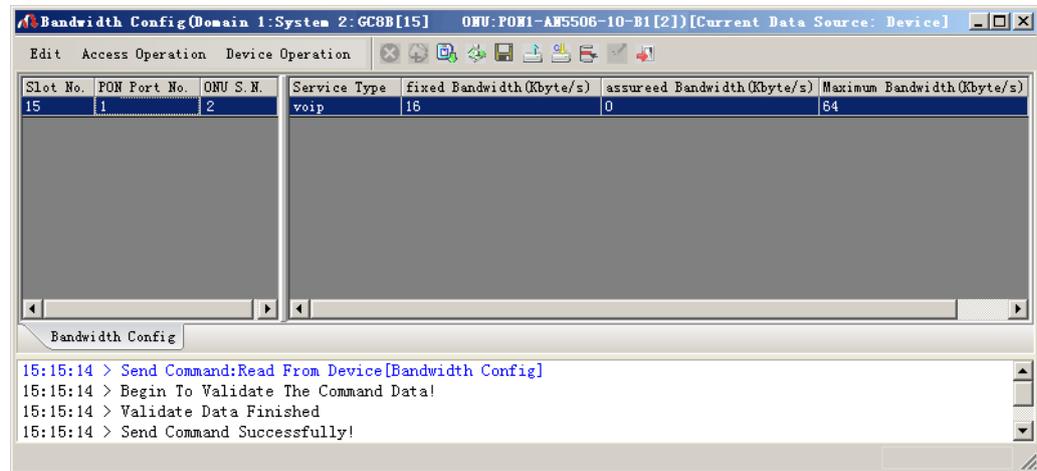


Figure 4-45 AN5506-10-B1 bandwidth configuration – SIP example

### 4.3.3.7 Configuring the VoIP Service Parameters of the ONU

#### Configuration purpose

Configure the VoIP service parameters of the ONU, including VoIP service VLAN, voice codec, fax mode, silence switch, echo cancel, input / output gain, DTMF mode, etc.

#### Operation steps

- Click the **GC8B[15]** card in the **Object Tree** pane to display all ONUs 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.
- Select **FXS1** in **Voice Port List** and configure the parameters according to the planned data in Table 4-10, as shown in Figure 4-46.

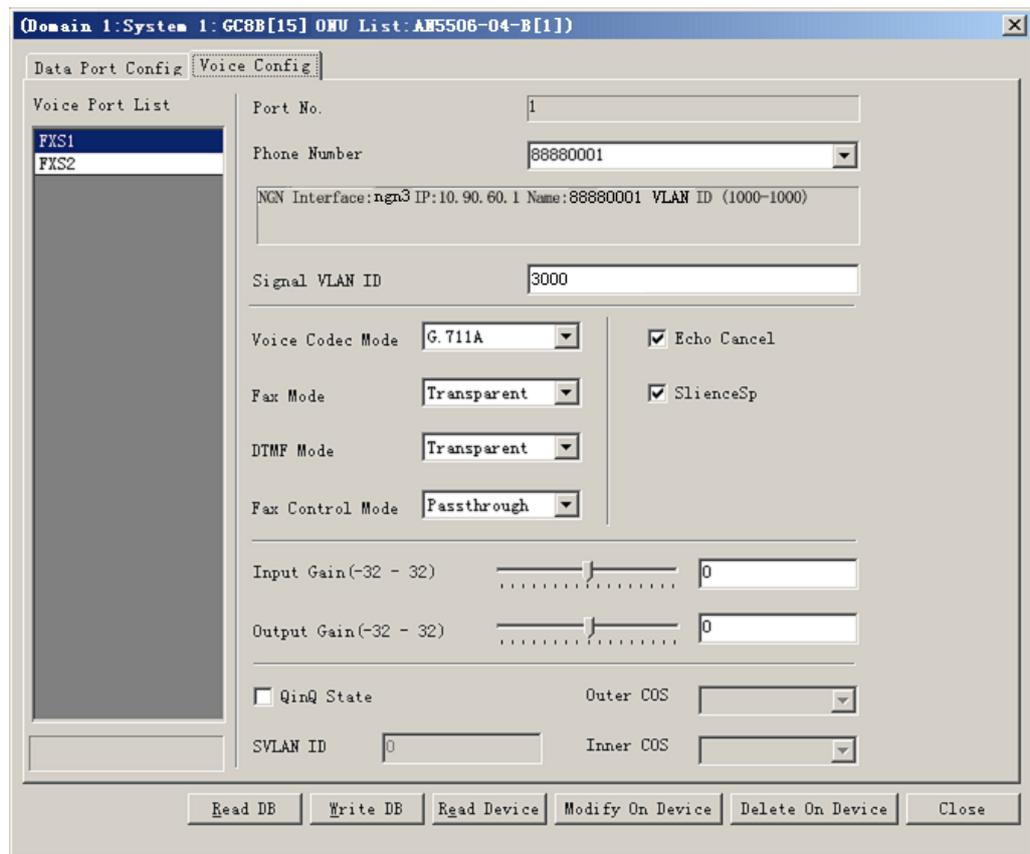


Figure 4-46 FXS1 voice configuration of the AN5506-04-B – SIP example

3. Select **FXS2** in **Voice Port List** and configure the parameters according to the planned data in Table 4-10, as shown in Figure 4-47.

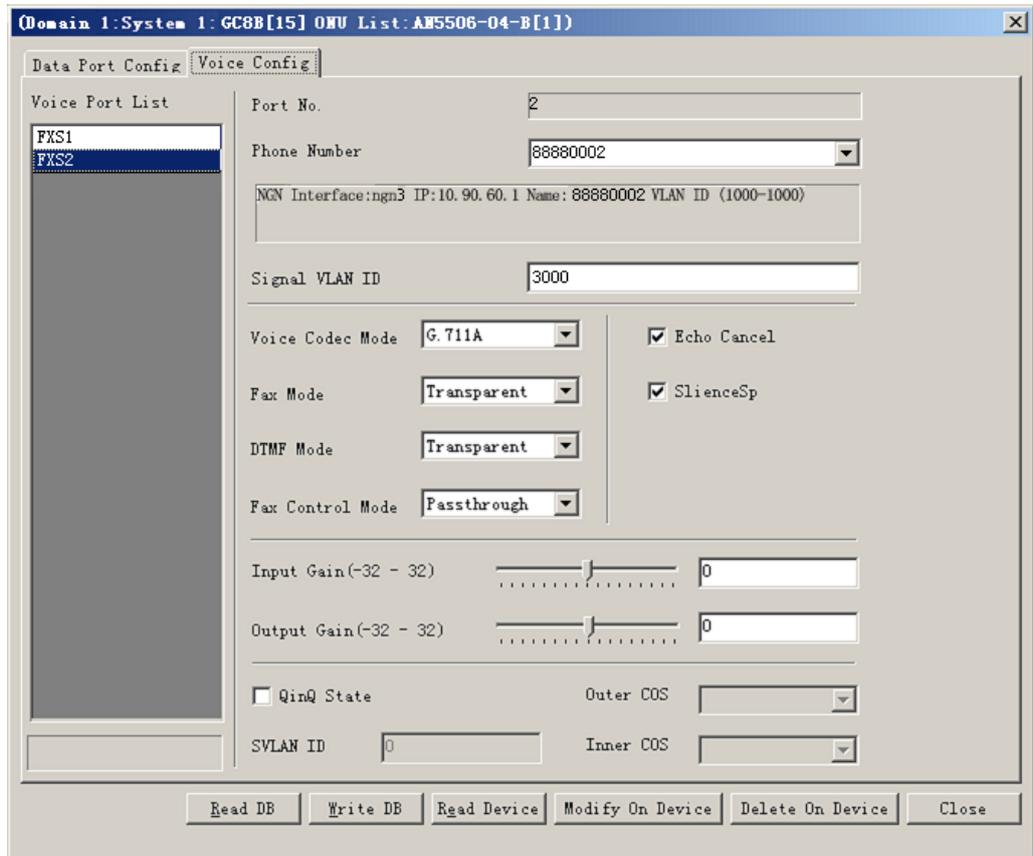


Figure 4-47 FXS2 voice configuration of the AN5506-04-B – SIP example

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[15]** 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 planned data in Table 4-10, as shown in Figure 4-48.

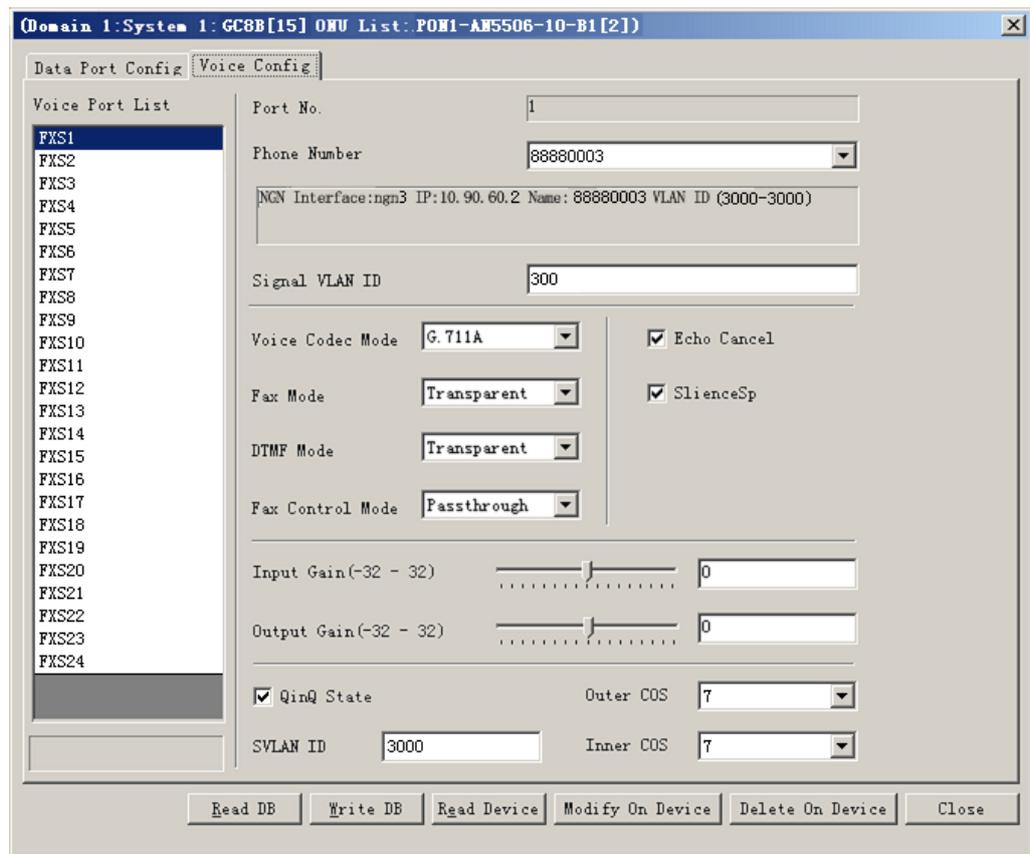


Figure 4-48 FXS1 voice configuration of the AN5506-10-B1 – SIP example

7. Select **FXS2** in **Voice Port List** and configure the parameters according to the planned data in Table 4-10, as shown in Figure 4-49.

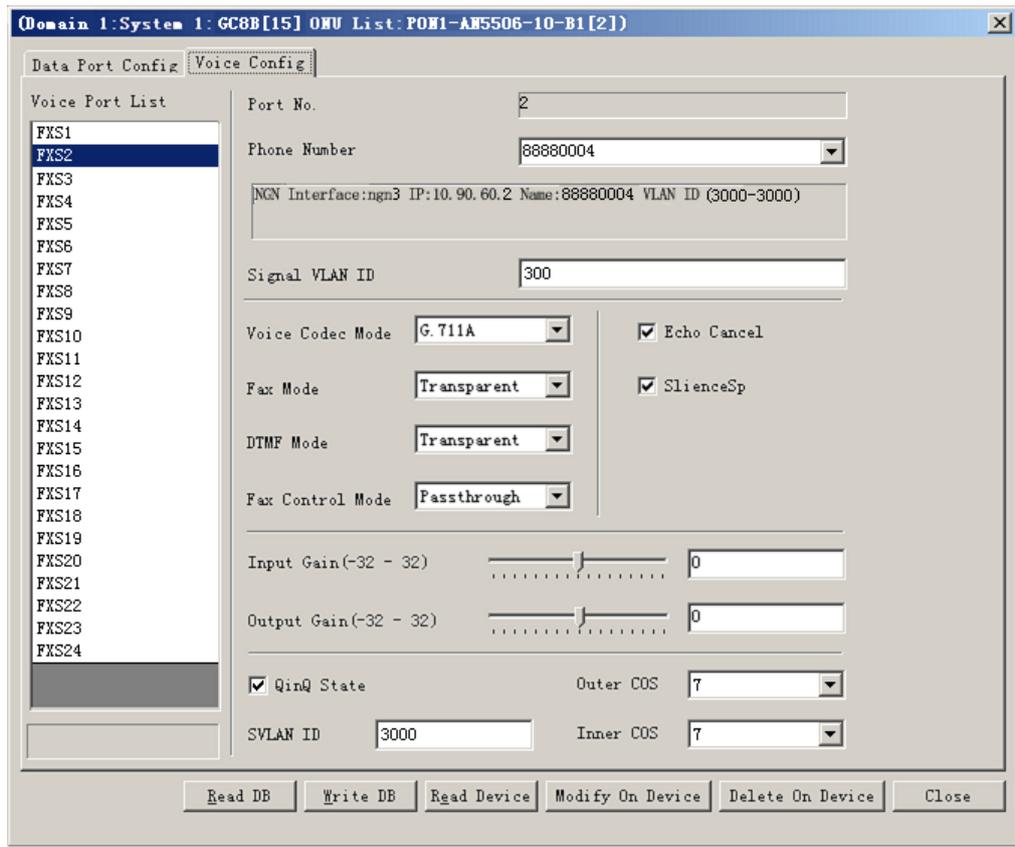


Figure 4-49 FXS2 voice configuration of the AN5506-10-B1 – SIP example

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

### 4.3.3.8 End of Configuration

The subscribers under the FXS1 and FXS2 port 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 No.1 of the GC8B card in Slot 15 can access the voice service. Subscribers can call each other normally.

## 4.3.4 Configuring the Services in a Batch Manner

### 4.3.4.1 Planning Data

The following introduces how to start up the voice service by configuring the ONU ports in a batch manner. The planned data is shown in Table 4-11 and 4-12.

Table 4-11 Planned data on the OLT side of the VoIP service based on the SIP protocol (configuring in a batch manner)

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

Item	Description	Example	
TAG/UNTAG	The TAG processing mode of the uplink service VLAN. There are two options: <b>TAG</b> and <b>UNTAG</b> . <b>TAG</b> means that when the uplink data packet passes the port, its tag will not be stripped and it keeps going in the tagged mode. And for the downlink data packet, only the data packet in tagged mode will be accepted, and it keeps going in the tagged mode. <b>UNTAG</b> 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	
	Service Type	Select <b>ngn</b> for VoIP services.	ngn
	Slot Bind Mode	Select <b>Auto Bind</b> or <b>Manually Bind</b> .	Auto Bind
NGN Uplink Interface	Signaling Service Name	This item should be consistent with the <b>Service Name</b> set in the <b>Local End Service VLAN</b> configuration.	ngn3
	Protocol Type	Select <b>SIP</b> .	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 is <b>5060</b> .	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 is <b>5060</b> .	5060
	SIP Expires (S)	The timeout period of the SIP protocol. The value range is 60 to 3600; the unit is second. The default setting is 3600 seconds.	3600

Table 4-12 Planned data on the ONU side of the VoIP service based on the SIP protocol (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 this item according to the operator's network planning.	a	
	Service Type	Select <b>VOIP</b>	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.	Configure this item according to the PON interface card slot number actually used.	15	15
	PON No.	Configure this item according to the PON port number actually used.	1	1
	ONU No.	Select the ONU authorization number to be configured.	1	2
	Bandwidth Profile	Select the bandwidth profile to be bound with the ONU.	a	a
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 ( <b>0 to 9</b> ), letters ( <b>a to z</b> and <b>A to Z</b> ), and underlines. Configure this item according to the operator's network planning.	c	
	Voice Code Mode	Configure this item according to the operator's network planning; the default setting is <b>G.711A</b> .	G.711A	

Item		Description	Example (AN5506-04-B)	Example (AN5506-10-B1)
	Fax Mode	Configure this item according to the operator's network planning; the default setting is <b>Transparent</b> .	Transparent	
	Silence Switch	Configure this item according to the operator's network planning; the default setting is <b>Enable</b> .	Enable	
	Echo Cancel	Configure this item according to the operator's network planning; the default setting is <b>Enable</b> .	Enable	
	Input Gain (DB)	Configure this item according to the operator's network planning; the default setting is <b>0</b> .	0	
	Output Gain (DB)	Configure this item according to the operator's network planning; the default setting is <b>0</b> .	0	
	DTMF Mode	Configure this item according to the operator's network planning; the default setting is <b>Transparent</b> .	Transparent	
	Fax Control Mode	Configure this item according to the operator's network planning; the default setting is <b>Passthrough</b> .	Passthrough	
ONU Voice Basic Configure	Slot No.	Configure this item according to the PON interface card slot number actually used.	15	
	PON No.	The No. of the PON port actually used.	1	
	ONU No.	Select the ONU's authentication No. to be configured.	1	2
	IP Configuration Mode	Select <b>static</b> (default), <b>PPPoE</b> , or <b>DHCP</b> mode to get IP address.	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. You should configure this item according to the operator's network planning.	10.90.60.1	10.90.60.2

Item		Description	Example (AN5506-04-B)		Example (AN5506-10-B1)	
	ONU Static Public IP Mask	Configure this item according to the operator's network planning.	255.255.0.0		255.255.0.0	
	ONU Static Public IP Gateway	Configure this item according to the operator's network planning.	10.90.1.254		10.90.1.254	
ONU POTS Configure	Slot No.	Configure this item according to the PON interface card slot number actually used.	15			
	PON No.	The No. of the PON port actually used.	1			
	ONU No.	Select the ONU's authentication No. to be configured.	1		2	
	Port No.	Select the ONU port number actually connected with user telephone.	1	2	1	2
	Port Enable	Select <b>Enable</b> .	Enable	Enable	Enable	Enable
	Signaling Service Name	This item should be consistent with the <b>Service Name</b> in the <b>NGN Configuration</b> .	ngn3	ngn3	ngn3	ngn3
	Signaling VLAN ID	The voice service VLAN ID; it is the C-VLAN ID when the <b>QinQ State</b> is set to <b>Enable</b> .	3000	3000	300	300
	SVLAN State	Configure this item according to the operator's network planning; the default setting is <b>Disable</b> .	Disable	Disable	Enable	Enable
	SVLAN ID	The SVLAN ID should be within the range of the uplink interface VLAN ID when the QinQ is enabled. And 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 <b>5060</b> .	5060	5060	5060	5060
	SIP Telephone No.	Configure this item according to the operator's network planning.	88880001	88880002	88880003	88880004

Item		Description	Example (AN5506-04-B)		Example (AN5506-10-B1)	
	SIP User Name	The user name of the SIP terminal 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 terminal and the SIP registrar. Configure this item according to the operator's network planning.	test1	test2	test3	test4

### 4.3.4.2 Configuration Flow Chart

The flow chart for starting up the SIP protocol based voice services in a batch manner is illustrated in the Figure 4-50.

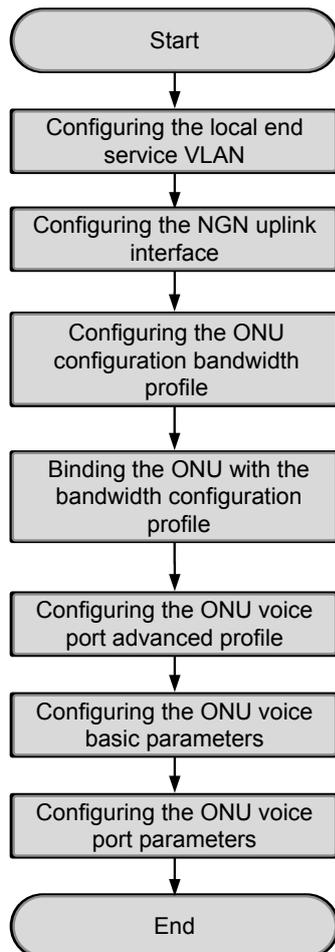


Figure 4-50 Flow chart for configuring VoIP services in a batch manner - SIP

### 4.3.4.3 Configuring the Local End Service VLAN

#### Configuration purpose

Configure the service VLAN of the uplink port, limit the VLAN ID range of the service passing the uplink port and process the VLAN Tag.

#### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane and select **Config** → **Local VLAN** from the shortcut menu to access the configuration window. Then click the **Local End Service VLAN** tab in the window to access the **Local End Service VLAN** window.
2. Select **Edit** → **Append** on the menu bar or directly click the  button. Either operation brings up the **Please Input the Rows for Add:** dialog box. Type **1** and click **OK** to add one local VLAN.
3. Configure the local VLAN according to the planned data in Table 4-11.
4. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the local end service VLAN configuration is completed. See Figure 4-51.

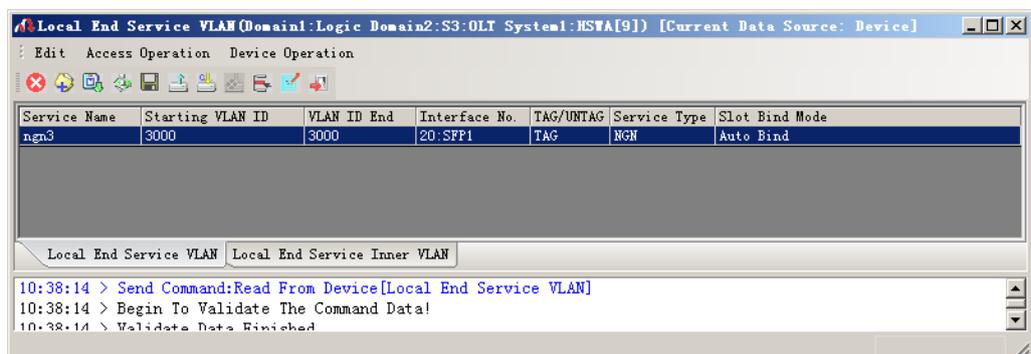


Figure 4-51 Configuring the local end service VLAN - SIP example

### 4.3.4.4 Configuring the NGN Uplink Interface

#### Configuration purpose

Configure the relevant parameters of the media gateway controller, including: the IP address of the MGC, the protocol port No. of the NGN, etc.

#### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane and select **Config** → **Voice Config** → **NGN Interface** from the shortcut menu to access the **NGN Interface** window.
2. Select **Edit** → **Append** on the menu bar or directly click the  button. Either operation brings up the **Please Input the Rows for Add:** dialog box. Type **1** and click **OK** to add one NGN uplink interface.
3. Configure the parameters according to the planned data in Table 4-11.
4. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the NGN uplink interface configuration is completed. See Figure 4-52.

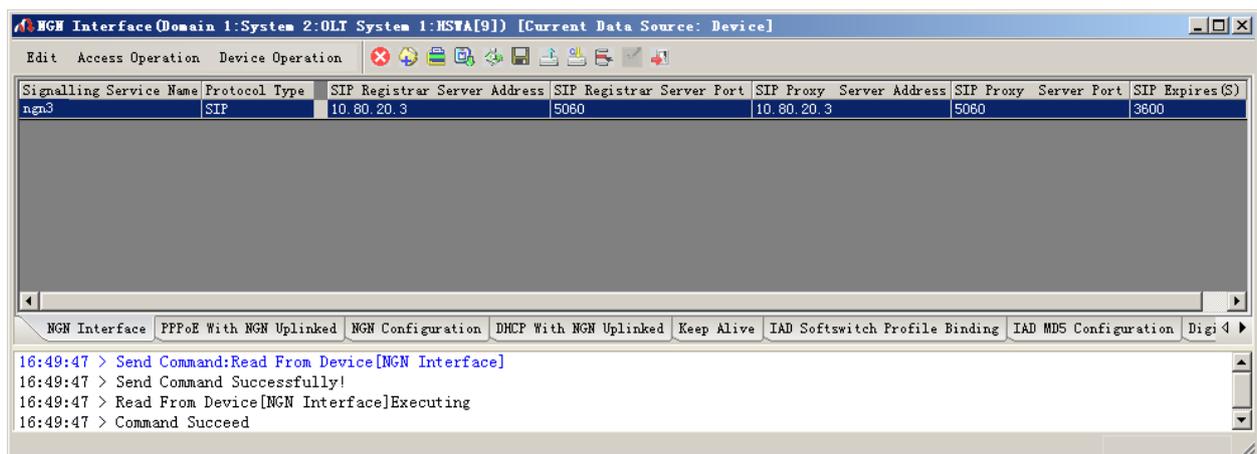


Figure 4-52 Configuring the NGN uplink interface - SIP example

### 4.3.4.5 Configuring the ONU Bandwidth Configuration Profile

#### Configuration purpose

Configure the VoIP service bandwidth profile of the ONU.

#### Operation steps

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. Select **Edit** → **Append** on the menu bar or directly click the  button. Either operation brings up the **Please Input the Rows for Add:** dialog box. Type **1** and click **OK** to add one bandwidth configuration profile. Input **a** in the **Profile Name** column.
3. Select profile **a**, click a blank area in the right pane, and select **Edit** → **Append** on the menu bar or directly click the  button. Either operation brings up the **Please Input the Rows for Add:** dialog box. Type **1** and click **OK** to add one service. Configure the parameters according to the planned data in Table 4-12.
4. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the VoIP service bandwidth configuration profile is configured. See Figure 4-53.

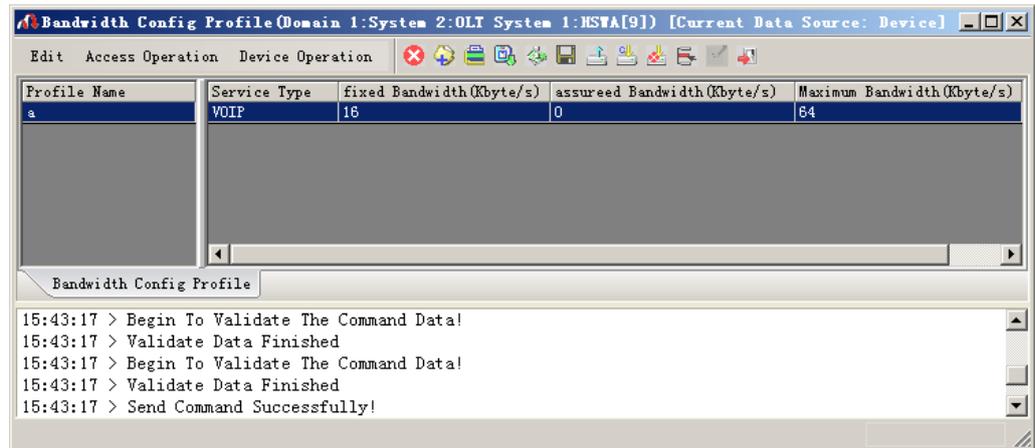


Figure 4-53 The ONU bandwidth configuration profile – SIP example

### 4.3.4.6 Binding the ONU with the Bandwidth Configuration Profile

#### Configuration purpose

Bind the ONU with the bandwidth configuration profile, that is, apply the bandwidth configuration profile to the ONU.

#### Operation steps

1. Right-click the system in the **Object Tree** pane, select **Config** → **Batch Configure** → **ONU Config** 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 No.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 display in the right pane. Configure the parameters according to the planned data in Table 4-12, and select **a** in the drop-down lists of **GPON Bandwidth**.

- When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the ONU is bound to the bandwidth configuration profile. See Figure 4-54.

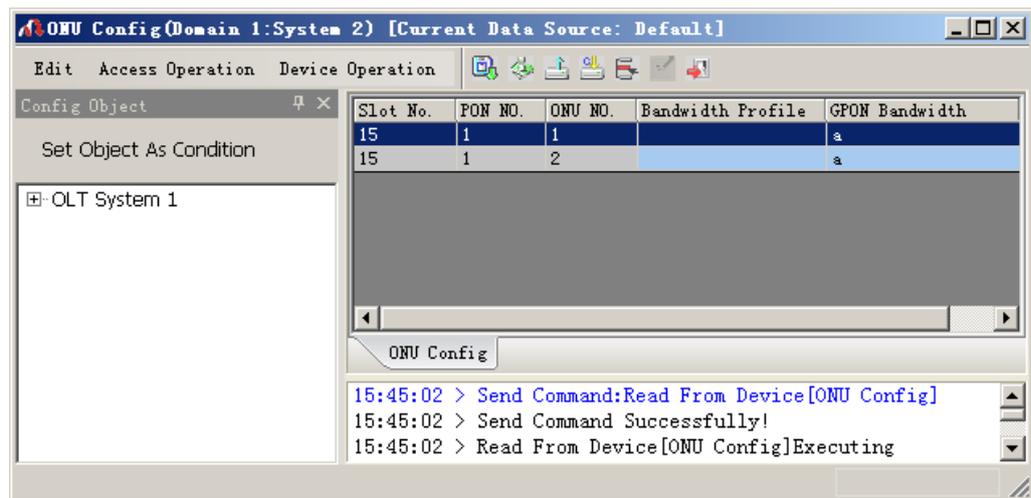


Figure 4-54 ONU configuration – SIP example

### 4.3.4.7 Configuring the ONU Voice Port Advanced Profile

#### Configuration purpose

Configure the profile of the ONU voice service parameters, including voice codec, fax mode, silence switch, echo cancel, input / output gain, DTMF mode, etc.

#### Operation steps

- 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.
- Select **Edit** → **Append** on the menu bar or directly click the  button. Either operation brings up the **Please Input the Rows for Add:** dialog box. Type **1** and click **OK** to add one ONU voice port advanced profile.
- Configure the parameters according to the planned data in Table 4-12.

- When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the ONU voice port advanced profile is configured. See Figure 4-55.

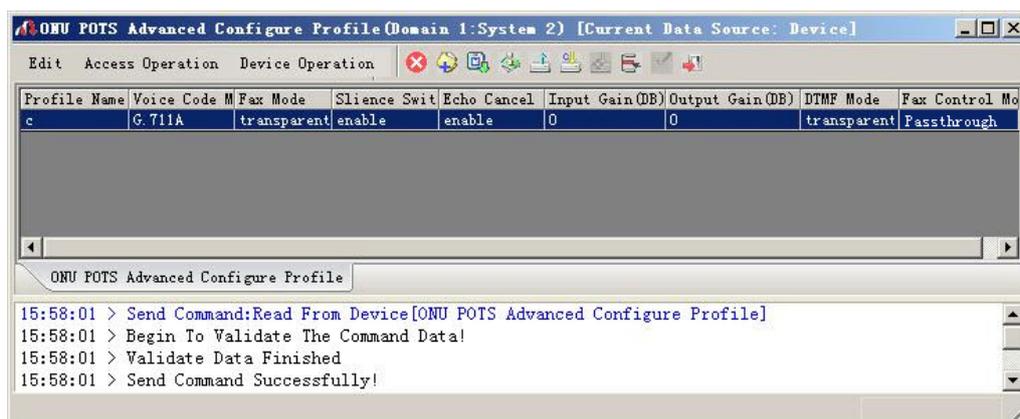


Figure 4-55 ONU voice port advanced configuration profile

### 4.3.4.8 Configuring the Basic Voice Parameters for the ONU

#### Configuration purpose

Configure the configuration method for the public network IP address and the public network IP information of the ONU voice service.

#### Operation steps

- Right-click the system in the **Object Tree** pane and select **Config** → **Batch Configure** → **ONU Voice Basic Configure** from the shortcut menu to access the **ONU Voice Basic Configure** window.
- Click the **Set Object as Condition** button, select **AN5506-04-B[1]** and **AN5506-10-B1[2]** under the PON port No.1 of the GC8B card in Slot 15 from the drop-down list of the object, and click the **OK** button.
- The detailed information of the object will display in the right pane. Configure the parameters according to the planned data in Table 4-12.

- When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the configuration of the basic voice parameters for the ONU is completed. See Figure 4-56.

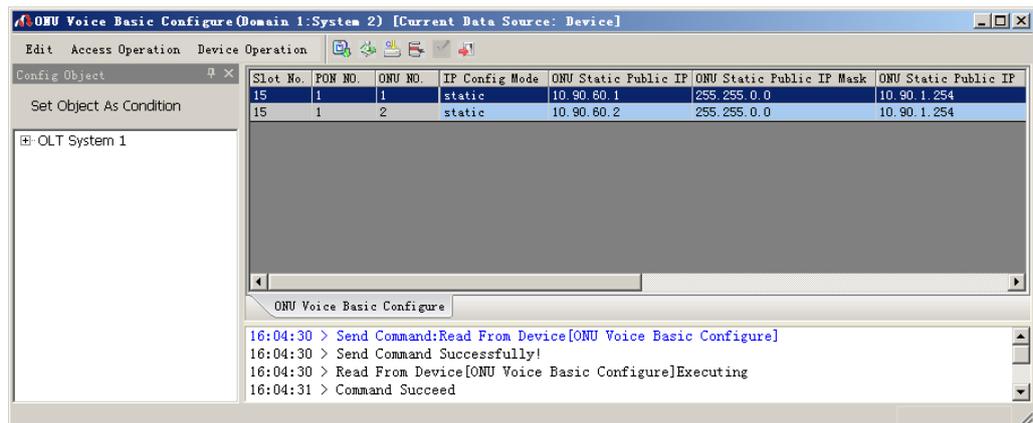


Figure 4-56 Basic voice configuration for the ONU – SIP example

### 4.3.4.9 Configuring the ONU Voice Port Parameters

#### Configuration purpose

Configure the relevant parameters of the ONU voice port, including: telephone number, voice service VLAN, endpoint domain name, endpoint username, binding the ONU voice port advanced profile, etc.

#### Operation steps

- Right-click the system in the **Object Tree** pane and select **Config** → **Batch Configure** → **ONU POTS Configure** from the shortcut menu to access the **ONU POTS Configure** window.
- Click the **Set Object as Condition** button, select **AN5506-04-B[1]** and **AN5506-10-B1[2]** under the PON port No.1 of the GC8B card in Slot 15, and click the **OK** button.

3. The detailed information of the object will display in the right pane. Configure the parameters according to the planned data in Table 4-12.
4. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the ONU voice port parameter configuration is completed. See Figure 4-57.

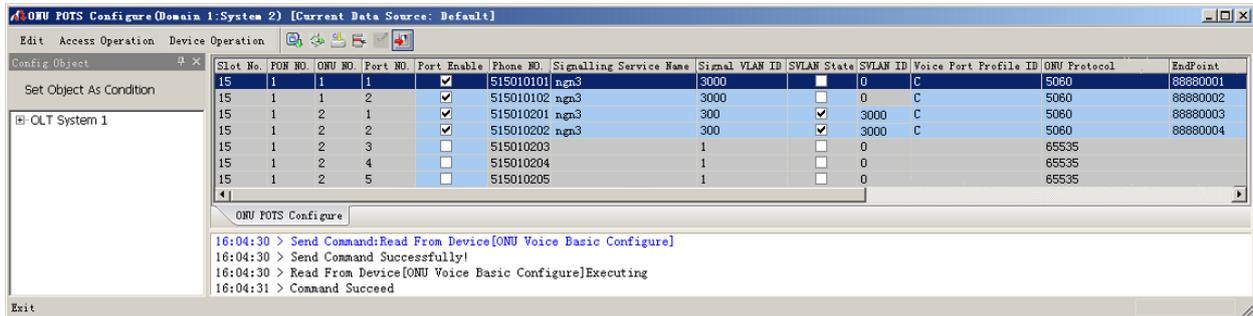


Figure 4-57 ONU voice port configuration – SIP example

### 4.3.4.10 End of Configuration

The subscribers under the FXS1 and FXS2 port 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 No.1 of the GC8B card in Slot 15 can access the voice service. Subscribers can call each other normally.

## 4.4 Configuring the DHCP Function for the NGN Uplink

### Configuration purpose

Configure the ONU to get the voice service IP using the DHCP method with the option 60 identifier.

### Prerequisites

This operation is needed only when you configure the DHCP option60. You should set the DHCP function of the NGN uplink interface as **Enable** first.

### Planning data

Table 4-13 Planned data for configuring the relevant parameters of the DHCP of the NGN uplink interface

Item	Description	Example
DHCP With NGN Uplinked	Slot No.	Configure this item according to the service interface card slot number actually used 15
	PON Port No.	Configure this item according to the PON port number actually used 1
	ONU No.	Configure this item according to the ONU number actually used 1
	DHCP Enable	Configure this item according to the operator's network planning Enable
	DHCP Option60 Enable	Configure this item according to the operator's network planning Enable
	DHCP Option60 Value	Configure this item according to the operator's network planning test

## Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane and select **Config** → **Voice Config** → **DHCP With NGN Uplinked** from the shortcut menu to access the **DHCP With NGN Uplinked** window.
2. Configure the parameters according to the planned data in Table 4-13.
3. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the configuration of the DHCP of the NGN uplink interface is completed. See Figure 4-58.

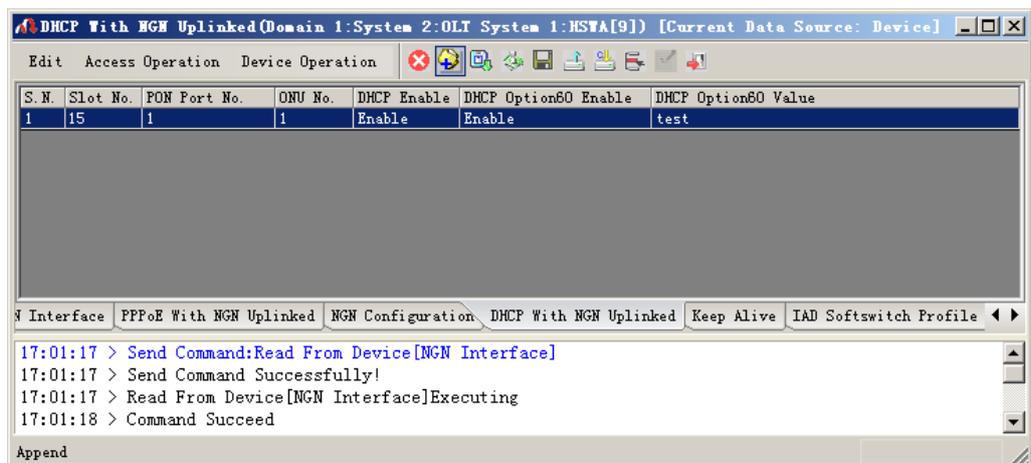


Figure 4-58 Configuring the parameters of the DHCP of the NGN uplink interface

## 4.5 Configuring the Advanced Profile Parameters for the Softswitch

### 4.5.1 Configuring the Softswitch Intercommunication Profiles

#### Configuration purpose

Configure the parameters in intercommunication of the VoIP services between the ONU and the softswitch.

#### Configuration rules

- ◆ By configuring the softswitch intercommunication profiles you set some advanced parameters for the intercommunication of the VoIP services between the ONUs and various softswitch platforms. You should configure the softswitch intercommunication profiles according to the actual intercommunication situation.
- ◆ 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 4-14 Planning data for configuring softswitch intercommunication profiles

Item		Description	Example
Softswitch Parameters Profile	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 fixed part of the RTP protocol resource name. If the full name is <b>RTP/1000</b> for example, the fixed part should be <b>RTP/</b> . This item is valid only for the H.248 protocol.	RTP/

Item	Description	Example
RTP Name Var Begin	The value range: <b>0</b> to <b>65534</b> . The <b>RTP Name Var Begin</b> value must be smaller than the <b>RTP Name Var End</b> value. The default setting is <b>4000</b> . This item is valid only for the H.248 protocol.	4000
RTP Name Var End	The value range: <b>0</b> to <b>65534</b> . The <b>RTP Name Var End</b> value must be larger than the <b>RTP Name Var Begin</b> value. The default setting is <b>9000</b> . This item is valid only for the H.248 protocol.	9000
RTP Name Var Step	The value range: <b>1</b> to <b>65534</b> . The default setting is <b>1</b> . This item is valid only for the H.248 protocol.	1
RTP Name Fixed Length	For controlling the length of the RTP source name. You can select <b>fixed</b> OR <b>unfixed</b> . The default setting is <b>fixed</b> . This item is valid only for the H.248 protocol.	fixed
Digit Map Begin Timer (s)	The <b>Digit Map Begin Timer</b> is the time of waiting for a dialing. The value range: <b>1</b> to <b>254</b> ; the unit: seconds. The default setting is <b>16</b> .	16
Digit Map Short Timer (s)	The <b>Digit Map Short Timer</b> : 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, the matching result will not be reported immediately. The value range is <b>1</b> to <b>254</b> ; the unit is second. The default setting is <b>4</b> .	4
Digit Map Long Timer (s)	The <b>Digit Map Long Timer</b> : at least a digit is required to match any numbering scheme of DigitMap. The value range is <b>1</b> to <b>254</b> ; the unit is second. The default setting is <b>16</b> .	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 <b>Notify Match Only</b> .	Notify Match Only
VBD State	Whether to enable the function of controlling the <b>VBD Tx Interval (ms)</b> and the <b>VBD Rx Interval (ms)</b> items. The default setting is <b>Disable</b> .	Disable
VBD Tx Interval (ms)	The time interval for sending packets. The value range is <b>1</b> to <b>254</b> ; the unit is ms. The default setting is <b>20</b> .	20
VBD Rx Interval (ms)	The time interval for receiving packets. The value range is <b>1</b> to <b>254</b> ; the unit is ms. The default setting is <b>10</b> .	10
VBD Voice Coder	The speech encoding method used in the T.30 transparent mode. The options include <b>G711U</b> , <b>G711A</b> , <b>G729</b> , <b>G723</b> , and <b>Unmodified</b> . The default setting is <b>Unmodified</b> .	G711U

Item	Description	Example
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 <b>Unregistered</b> .	Unregistered
Flash Threshold (ms)	The FLASH low-pulse width, usually between <b>90</b> and <b>120</b> ms. The value range is from <b>90</b> to <b>120</b> ; 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 <b>Non-auto-negotiation</b> .	Non-auto-negotiation
Def RFC2833 PT	The value of the RFC2833 default loading mode. The value range is <b>96</b> to <b>127</b> . The default setting is <b>97</b> .	97
Def RFC2198 PT	The default loading mode value of the RFC2198 redundancy mode. The value range is <b>96</b> to <b>127</b> . The default setting is <b>96</b> .	96
T38 Event Detect Mode	The detection and report mode of the T.38 event. The options include <b>normal</b> , <b>only V21</b> and <b>all V21</b> .	normal
Caller ID Mode	The caller ID mode: <b>FSK</b> or <b>DTMF</b> . The default setting is <b>FSK</b> .	FSK
On Hook Detect Time (ms)	The polling check time of on-hook events. The value range is <b>90</b> to <b>2500</b> ; the unit is ms. The default setting is <b>600</b> ms.	600
Dialing Tone Timeout (s)	The dialing tone timeout value. The value range is <b>1</b> to <b>254</b> seconds. The default setting is <b>60</b> seconds.	60
No Answer Tone Timeout (s)	The ringing (no answer tone) timeout value: if the timer is expired, it considers that nobody answers the phone. The value range is <b>1</b> to <b>254</b> seconds; The default setting is <b>60</b> seconds.	60
Busy Tone Timeout (s)	The busy tone timeout value. The value range is <b>1</b> to <b>254</b> seconds; The default setting is <b>60</b> seconds.	60
ROHT Timeout (s)	The timeout value of the phone playing the howler tone after the busy tone. The value range is <b>1</b> to <b>254</b> seconds; The default setting is <b>60</b> 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 range is <b>1</b> to <b>60</b> seconds; The default setting is <b>25</b> seconds.	25
EC Mode	Correct the packets with some errors; the default setting is <b>Disable</b> .	Disable

Item	Description	Example
CLI Language	The CLI language used by the IAD, <b>Chinese</b> or <b>English</b> . This item is valid only for the AN5506-05 at present.	English
NGN Register Timer Threshold (s)	The value range is <b>1</b> to <b>3600</b> seconds; the default setting is <b>600</b> seconds.	600
NGN Register User Threshold	The value range is from <b>1</b> to <b>4096</b> ; the default setting is <b>1</b> .	1
Alive format	You can select <b>Notify</b> or <b>Service Change</b> . The default configuration is <b>Notify</b> .	Notify

## Operation steps

Create a softswitch intercommunication profile named **ngn1** with all parameters using the defaults. The detailed steps are as follows:

1. Right-click the system in the **Object Tree** pane and select **Config** → **Profile Definition** → **Softswitch Parameters Profile** from the shortcut menu to access the **Softswitch Parameters Profile** window.
2. Select **Edit** → **Append** on the menu bar or directly click the  button. Either operation brings up the **Please Input the Rows for Add:** dialog box. Type **1** and click **OK** to add one softswitch intercommunication parameter profile.
3. Configure the parameters of the softswitch intercommunication profile according to the planned data in Table 4-14.
4. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the configuration of the parameters of the softswitch intercommunication profile is completed. See Figure 4-59.

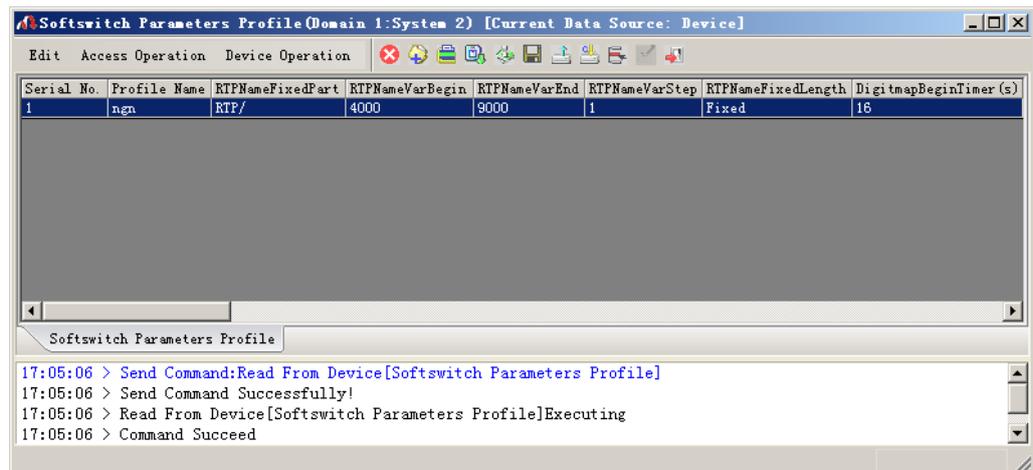


Figure 4-59 Configuring softswitch intercommunication profiles

## 4.5.2 Binding Softswitch Intercommunication Profiles

Configuration purpose

Send the configured software intercommunication profiles to the ONU.

Planning data

Table 4-15 Planning data for binding the softswitch intercommunication profiles

Item		Description	Example
IAD Softswitch Profile Binding	Slot No.	Configure this item according to the service interface card slot number actually used	15
	PON Port No.	Configure this item according to the PON port number actually used.	1
	ONU No.	Configure this item according to the ONU actually used	1
	Profile Name	Configure this item according to the profile actually used.	ngn1

## Operation steps

This operation should be performed after the softswitch intercommunication parameter profile is configured. In this example, we bind the softswitch intercommunication profile named **ngn1** to the ONU with the authentication No.1 under the PON port No.1 of the GC8B card in Slot 15. The detailed steps are as follows:

1. Right-click the **HSWA[9]** card in the **Object Tree** pane and select **Config** → **Voice Config** → **IAD Softswitch Profile Binding** from the shortcut menu to access the **IAD Softswitch Profile Binding** window.
2. Select **Edit** → **Append** on the menu bar or directly click the  button. Either operation brings up the **Please Input the Rows for Add:** dialog box. Type **1** and click **OK** to add one binding entry.
3. Configure the parameters according to the planned data in Table 4-15.
4. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the configuration of the binding the softswitch intercommunication profile is completed. See Figure 4-60.

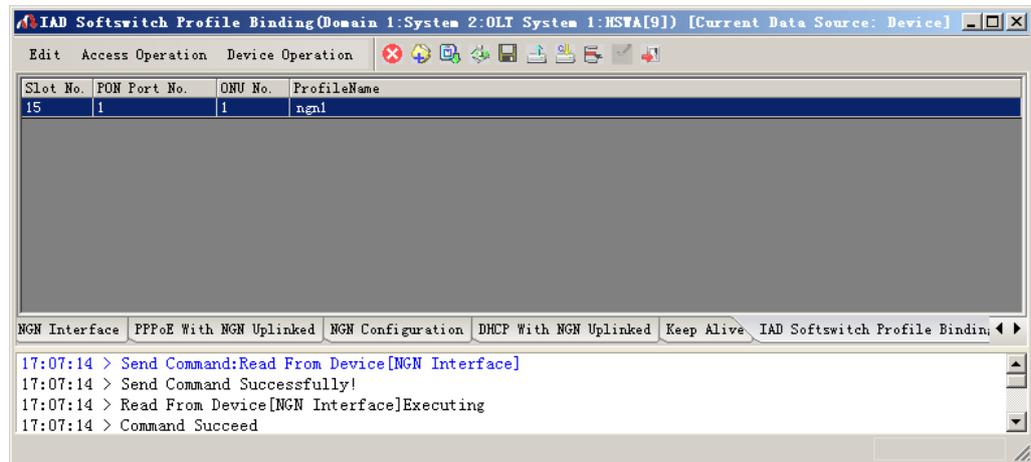


Figure 4-60 Binding the softswitch intercommunication profiles

## 4.6 Configuring the NGN Heartbeat Parameters

### Configuration purpose

Configure the heartbeat parameters between the MG and the MGC, and between the MGC and the MGC.

### Configuration rules

You should set the **Heartbeat Switch** item to **Enable** in the configuration of the parameters of the softswitch platform before you can configure the heartbeat parameters.

### Planning data

Table 4-16 Planning data for configuring the NGN heartbeat parameters

Item		Description	Example
Keep Alive	Signaling Service Name	Select according to the signaling service name configured in the softswitch platform parameter configuration.	ngn1
	Alive Interval (s)	The period of sending keep-alive messages. The value range is <b>1</b> to <b>86400</b> ; the unit is second; The default setting is <b>30</b> 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 range is 1 to 120; The default setting is 3.	3

### Configuration steps

Configure the heartbeat interval to 30 seconds and the heartbeat timeout times to 3 for the voice signaling service named **ngn1**. The detailed steps are as follows:

1. Right-click the **HSWA[9]** card in the **Object Tree** pane and select **Config** → **Voice Config** → **Keep Alive** from the shortcut menu to access the **Keep Alive** window.
2. Configure the parameters according to the planned data in Table 4-16.

- When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the configuration of the heartbeat parameters is completed. See Figure 4-61.

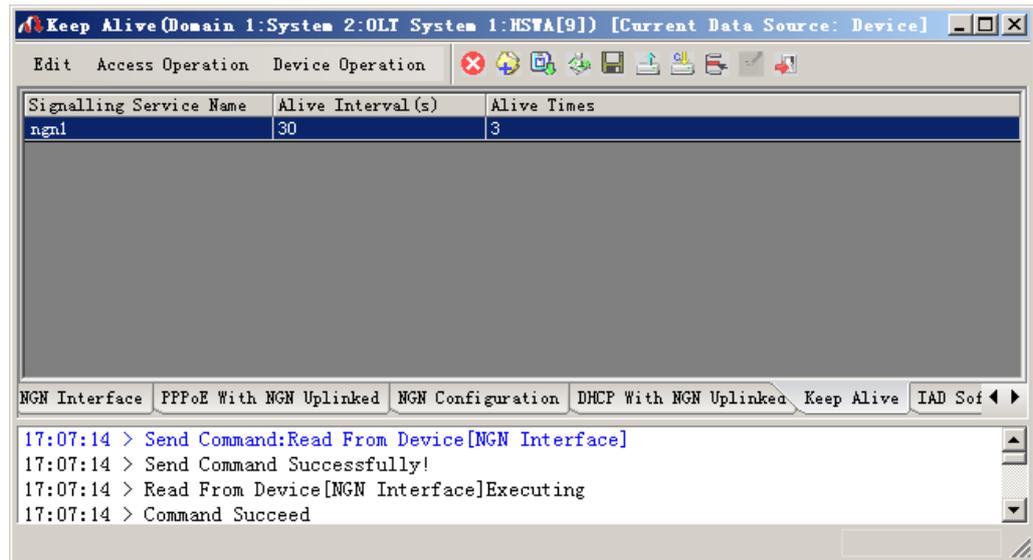


Figure 4-61 Configuring the NGN heartbeat parameters

## 4.7 Configuring the IAD MD5 Authentication

### Configuration purpose

This operation is to configure the MD5 authentication of the voice service, mainly used in the authentication between the IAD and the softswitch platform. This operation is only specific to the H.248 and the SIP protocol.

### Prerequisites

The endpoint domain name and the NGN configuration corresponding to the MD5 are configured for the destination ONU.

### Planning data

Table 4-17 Planning data for configuring the IAD MD5 authentication

Item	Description	Example	
IAD MD5 Configuration	S.N.	Default value	1
	Endpoint Domain Name	Set this item consistent with the endpoint domain name in the user information of voice service configuration	10.90.60.1
	MD5 State	Configure this item according to the operator's network planning.	Enable
	MGID	Configure this item according to the operator's network planning.	01234567
	KEY	Configure this item according to the operator's network planning.	0123456789ABCDEF
	DHG value	Configure this item according to the operator's network planning.	2
	DHP value	Configure this item according to the operator's network planning.	FFFFFFFFFFFFFFFFFA63A3620 F44C42E9625E7EC6E485B576 6D51C2454FE1356DF25F1437 302B0A6DCD3A431BEF9519B 38E3404DD514A08793B139B2 2020BBEA68A67CC7429024E0 880DC1CD1C4C6628B2168C2 34C90FDAA2FFFFFFFFFFFFFFF FFF

## Operation steps

1. Right-click the **HWSA[9]** card in the **Object Tree** pane and select **Config** → **Voice Config** → **IAD MD5 Configuration** from the shortcut menu to access the **IAD MD5 Configuration** window.
2. Select **Edit** → **Append** on the menu bar or directly click the  button. Either operation brings up the **Please Input the Rows for Add:** dialog box. Type **1** and click **OK** to add one IAD MD5 authentication entry.
3. Configure the parameters according to the planned data in Table 4-17.
4. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the configuration of the IAD MD5 authentication parameters is completed. See Figure 4-62.

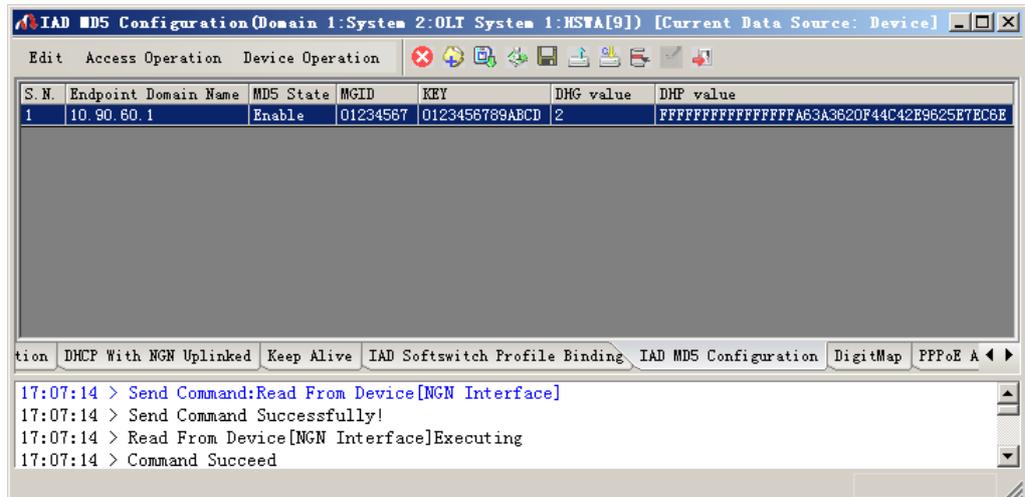


Figure 4-62 Configuring the IAD MD5 authentication

## 4.8 Registering / Unregistering the NGN User

### Configuration purpose

Registering or unregistering the NGN user to the MGC.

### 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 4-18 Planning data for registering / unregistering the NGN users

Item		Description	Example
NGN User Register / Unregister	Phone Number	Configure this item according to the telephone number in the user information of the voice service.	77770001
	Register / Unregister	Configure this item according to the actual situation. The options include <b>Register</b> and <b>Unregister</b> .	Register

### Configuration steps

In this example, this configuration should be performed after the VoIP service is started up and the softswitch intercommunication profile configuration is completed. We register the NGN user whose phone number is **77770001**.

1. Right-click the **HSWA[9]** 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 planned data in Table 4-18.

- When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the NGN users are registered / unregistered successfully. See Figure 4-63.

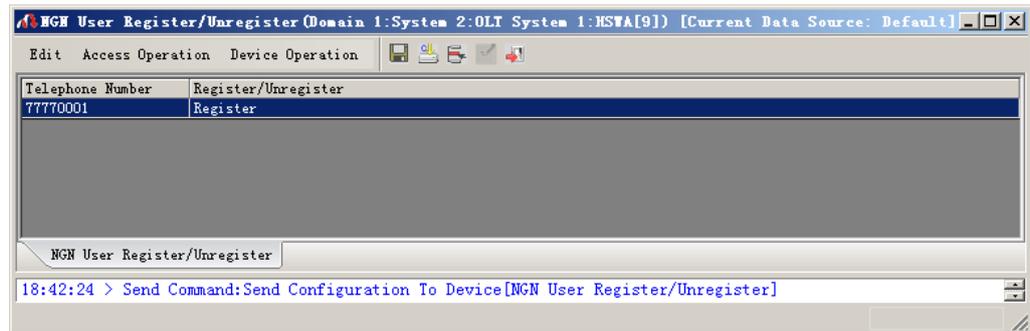


Figure 4-63 Registering / unregistering NGN users

## 4.9 Configuring the Digitmap

### Configuration purpose

Configure the digitmap of the SIP protocol. In course of dialing, the gateway matches the dialed digits against the numbering scheme in the digitmap and reports to the Softswitch or IMS when a match is found.

### Configuration rules

The configuration is only specific to the SIP protocol. The digitmaps of the H.248 and the MGCP protocols are sent by the softswitch and need no configuration. The content of the digitmaps depend on the actual conditions of the operators.

### Planning data

Table 4-19 Planning data for configuring the digitmap

Item		Description	Example
DigitMap	DigitMap	Configure this item according to the operator's network planning.	[2-9]XXXXXXXX 1[12]X 1[35]XXXXXXXXXX

### Operation steps

In this example, this configuration should be performed after the VoIP service is started up and the softswitch intercommunication profile configuration is completed. We input **[2-9]XXXXXXXX|1[12]X|1[35]XXXXXXXXXX** as the digitmap.

1. Right-click the **HSWA[9]** card in the **Object Tree** pane and select **Config** → **NGN Config** from the shortcut menu to bring up the configuration window. Click the **DigitMap** tab to access the **DigitMap** window.
2. Configure the digitmap according to the planned data in Table 4-19.

- When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the digitmap configuration is completed. See Figure 4-64.

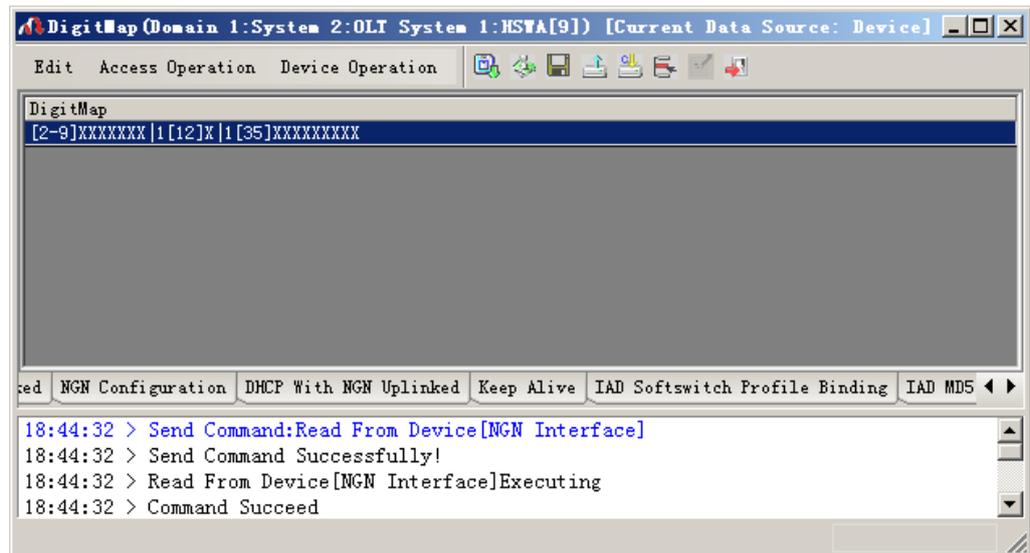


Figure 4-64 Configuring the digitmap

## 4.10 Displaying the Status Information

### 4.10.1 Viewing the MGC Register Server's Status

#### Configuration purpose

View the real-time connection status between the IAD and the softswitch platform MGC, including the IP address and the current registration status of the MGC connected with the IAD.

#### Planning data

Table 4-20 Planning data for displaying the MGC register server's status

Item		Description	Example
MGC/Register Server Status	Slot No.	The slot number of the service card corresponding to the ONU. The value range is 1 to 8 and 11 to 18.	17
	PON Port No.	The PON port No. of the service card corresponding to the ONU. The value range is 1 to 4.	1
	ONU Authorize No.	The authentication No. of the ONU. The value range is 1 to 64.	1

#### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane and select **Get Information** → **NGN Status** from the shortcut menu. Click the **MGC/Register Server Status** tab to access the **MGC/Register Server Status** window.
2. Configure the **Slot No.**, the **PON Port No.**, and the **ONU Authorize No.** according to the planned data in Table 4-20.
3. Click the  button to execute the command after the configuration is completed. The prompt pane at the bottom of the window displays **Read from Device Executing Command Succeed**. The window displays the MGC registrar address is **192.168.1.101** and the registration status is **Register**. See Figure 4-65.

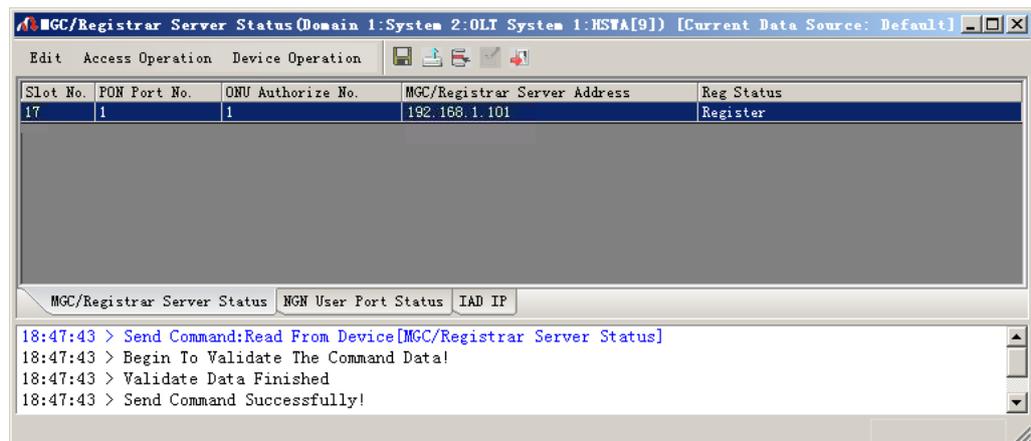


Figure 4-65 Displaying the MGC register server's status

## 4.10.2 Viewing the NGN User Port's Status

### Configuration purpose

This operation is to view the IAD user port's status according to the user's telephone number.

### Planning data

Table 4-21 Planning data for displaying the NGN user port's status

Item		Description	Example
NGN User Port Status	Telephone Number	The telephone number of the NGN user. This number has been set in the configuration by the steps of selecting the <b>HSWA[9]</b> card in the <b>Object Tree</b> pane and selecting <b>Config</b> → <b>NGN Config</b> from the shortcut menu. The value range is 1 to 99999999.	88880123

### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane and select **Get Information** → **NGN Status** from the shortcut menu. Click the **NGN User Port Status** tab to access the **NGN User Port Status** window.
2. Configure the telephone number of the NGN user port according to the planned data in Table 4-21.

- Click the  button to execute the command after the configuration is completed. The prompt pane at the bottom of the window displays **Read from Device Executing Command Succeed**. The window displays the NGN user port is in the **EP\_STATUS\_INACTIVE** status. See Figure 4-66.

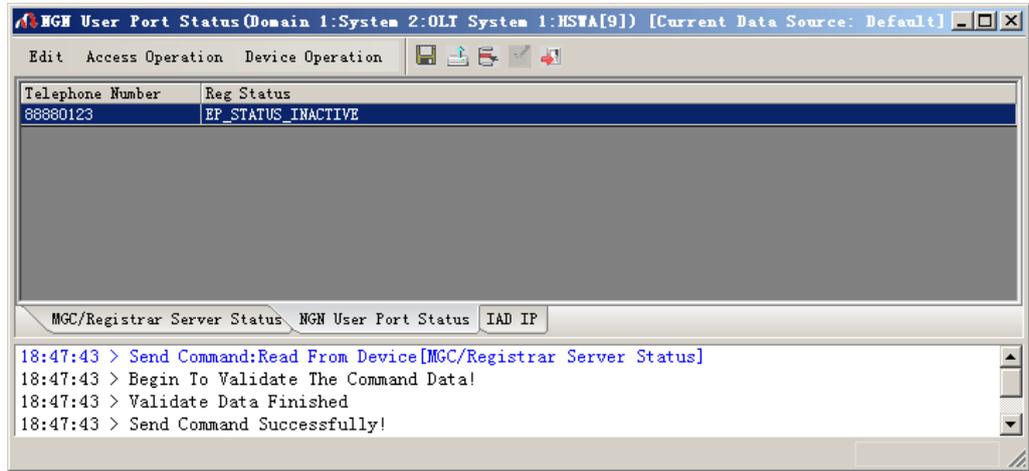


Figure 4-66 Displaying the NGN user port's status

### 4.10.3 Viewing the IAD IP Information

#### Configuration purpose

This operation is to view the voice IP address of the IAD. This IP address can be either the ONU static IP address configured in the NGN uplink user configuration or the dynamic IP address obtained by the DHCP or PPPoE method.

#### Planning data

Table 4-22 Planning data for displaying the IAD IP information

Item		Description	Example
IAD IP	Slot No.	The slot number of the service card corresponding to the ONU. The value range is <b>1 to 8</b> and <b>11 to 18</b> .	17
	PON Port No.	The PON port No. of the service card corresponding to the ONU. The value range is 1 to 4.	1
	ONU S.N.	The authentication No. of the ONU. The value range is 1 to 64.	1

## Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane and select **Get Information** → **NGN Status** from the shortcut menu. Click the **IAD IP** tab to access the **IAD IP** window.
2. Configure the **Slot No.**, the **PON Port No.**, and the **ONU S.N.** according to the planned data in Table 4-22.
3. Click the  button to execute the command. The prompt pane at the bottom of the window displays **Read from Device Executing Command Succeed**. The window displays the DHCP IP address is **192.168.1.2**, the mask is **255.255.0.0**, the gateway is **192.168.1.254**, and the primary DNS server IP is **255.255. 255.255**. See Figure 4-67.

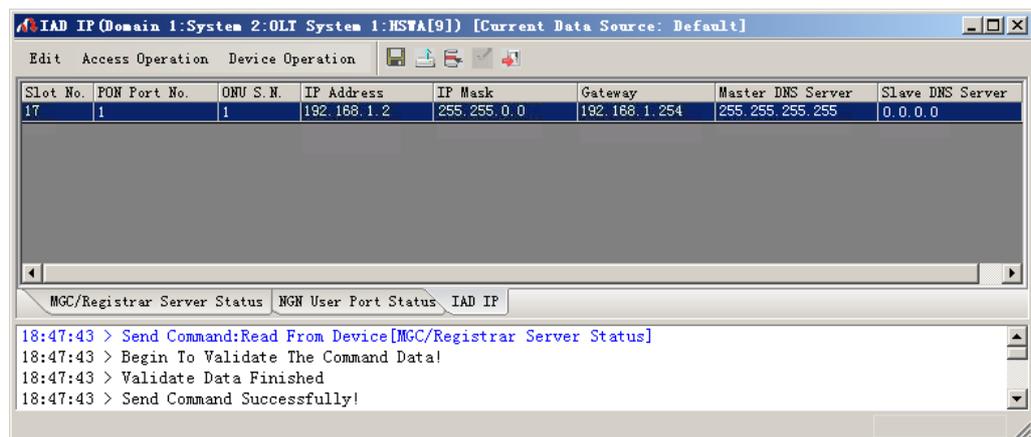


Figure 4-67 Displaying the IAD IP information



# 5 Configuring Data Services

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This chapter gives details on how to provision the data service using the AN5116-06B, and it mainly includes the following sections:

- ☑ 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

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

### 5.1.1 Configuration Rules

The AN5116-06B supports the QinQ data service, which means it supports the VLAN stacking as well. In this example the GC8B card is used as the service interface card and the AN5506-04-B and the AN5506-10-B1 are used as ONUs to introduce the data service configuration in the VLAN transparent transmission mode.

- ◆ The QinQ data service in the VLAN transparent transmission mode can be configured via the SVLAN configuration on the ONU or the OLT. In this example the service is configured on the 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 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. The CVLAN ID will be transparently transmitted and added with an SVLAN ID when passing the ONU. After being uploded to the AN5116-06B, the data service will not be processed using the AN5116-06B, but transparently transmitted to the upper layer network side equipment.
- ◆ 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 configuration parameter of the maximum bandwidth.
- ◆ An FE port of the AN5506-04-B ONU can support up to four data services, and an FE port of the AN5506-10-B1 ONU can support up to 16 data services.

## 5.1.2 Service Network

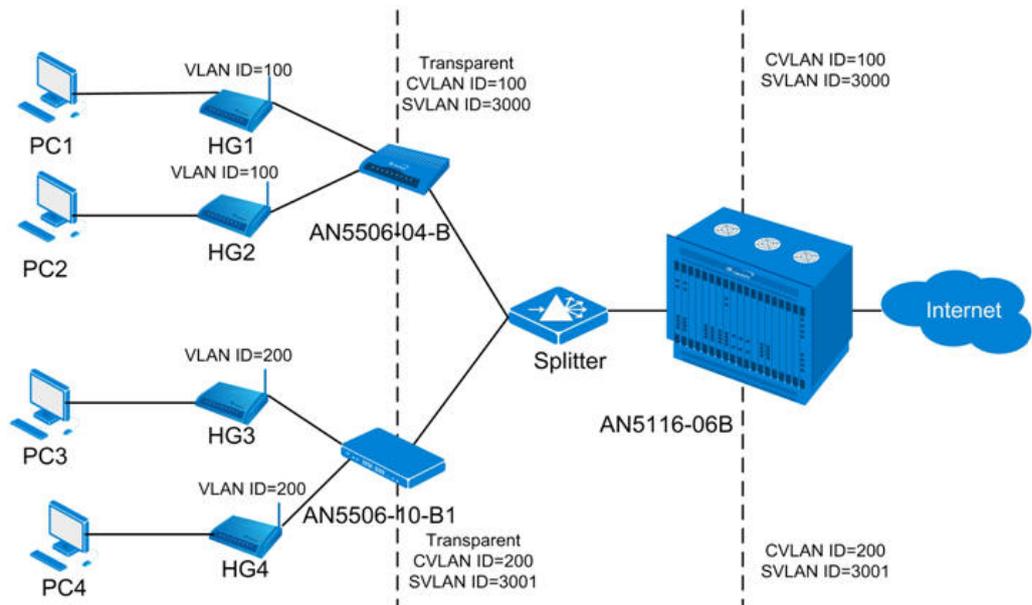


Figure 5-1 The data service network in the VLAN transparent transmission mode

As Figure 5-1 shows, each 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. For the downlink direction, the reverse process takes place.

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.

## 5.1.3 Configuring Data Services Respectively (for the AN5506-04-B)

### 5.1.3.1 Planning Data

Table 5-1 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 actually used slot	15
	PON No.	The number of the actually used PON port	1
	ONU No.	Configure according to the network planning of the operator.	1
	ONU Type	The type of an ONU	AN5506-04-B
Local end service VLAN	Service Name	Configure 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
	Uplink No. / TRUNK No.	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 <b>Tag</b> or <b>Untag</b> . 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 and downlinked in the form of TAG. Under TAG mode, the uplink data packets will not be processed but remain uplinked in the original form. For downlink packets, however, only packets with designated TAGs are received and the packets will not be processed but remain downlinked in the original form.	Tag
	Service Type	Select <b>data</b> in correspondence to the data service.	data
	Slot Bind Mode	Select <b>Auto Bind</b> or <b>Manually Bind</b> .	Auto Bind

Table 5-2 The planned data of data service configuration at the AN5506-04-B ONU side in the transparent transmission mode (configured respectively)

Item		Description	Example	
Bandwidth configuration	Service Type	Select broadband Internet access.	Broadband Internet access	
	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 16Kbyte/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 0Kbyte/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 64Kbyte/s.	1280	
Configuring the ONU port basic information	ONU Port Used	The actually used ONU port	1	2
	Enable / Disable Port	Configure according to the network planning of the operator. Enable is selected by default.	Default	
	Auto Negotiation	Configure according to the network planning of the operator. Enable is selected by default.	Default	
	Port Speed	Unconfigurable when auto negotiation is enabled. The default speed is 100M.	Default	
	Duplex	Unconfigurable when auto negotiation is enabled. The default value is full-duplex.	Default	
	Flow Control Enable / Disable	Configure according to the network planning of the operator. Disable is selected by default.	Default	
Configuring the ONU port service parameters	TAG Mode	Configured as <b>Tag</b> or <b>Untag</b> according to the network planning of the operator. In the <b>Tag</b> mode the uplink data packets are tagged, whereas in the <b>Untag</b> mode the uplink data packets are untagged.	Tag	
	Service Type	Configured as <b>Unicast</b> or <b>Multicast</b> .	Unicast	

Item		Description	Example
	VLAN Mode	When the CVLAN mode is set as <b>Transparent</b> , the VLAN mode should be consistent with the PON priority, ranging from 0 to 7. When the Tag mode is set as <b>Untag</b> , this item is unconfigurable.	0
	VLAN ID	When the CVLAN mode is set as <b>Transparent</b> , the VLAN mode should be consistent with the CVLAN ID, ranging from 1 to 4085. When the Tag mode is set as <b>Untag</b> , this item is unconfigurable.	100
	CVLAN Mode	When the Tag mode is set as <b>Untag</b> , the CVLAN mode can be set as <b>Tag</b> or <b>Transparent</b> . When the Tag mode is set as <b>Tag</b> , the CVLAN mode can set as <b>Translation</b> or <b>Transparent</b> .	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
	Ds Encrypt State	Disable is selected by default.	Disable
	QinQ Enable	Enable / disable the QinQ configuration	Enable
	SVLAN ID	Unconfigurable when the QinQ configuration is disabled. The range is 1 to 4085.	3000
	Service Name	Corresponding to the configured local end service VLAN. Unconfigurable when the QinQ configuration is disabled.	data1
	COS	The SVLAN priority, ranging from 0 to 7. Unconfigurable when the QinQ configuration is disabled.	0

### 5.1.3.2 Configuration Flow Chart

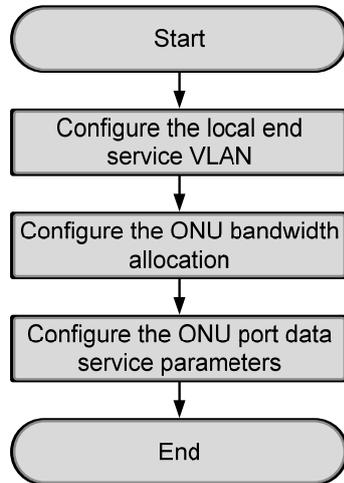


Figure 5-2 Flow chart for provisioning data services respectively in the transparent transmission mode (for the AN5506-04-B)

### 5.1.3.3 Configuring the Local End Service VLAN

#### Configuration purpose

Configure the uplink port VLAN of the AN5116-06B for designated service flow and limit the VLAN range of the service.

#### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane and select **Config** → **Local VLAN** from the shortcut menu to bring up the configuration window. In the window click the **Local End Service VLAN** tab and the local VLAN configuration window appears.
2. Click **Edit** → **Append** on the menu bar of the window or click the  button. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click **OK** to create a local VLAN.

- Configure according to the planned data in Table 5-1. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the local end service VLAN is configured. See Figure 5-3.

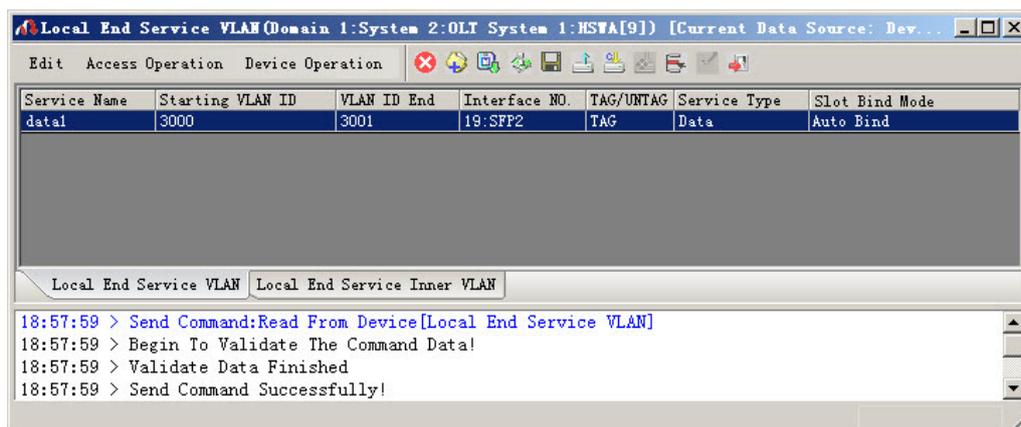


Figure 5-3 The **Local End Service VLAN** window - completed

### 5.1.3.4 Configuring the Bandwidth Allocation

#### Configuration purpose

Configure the bandwidth of the ONU data service to control the traffic flow.

#### Operation steps

- 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** → **Bandwidth Config** from the shortcut menu to access the bandwidth allocation configuration window.
- Click the right pane and select **Edit** → **Append** on the menu bar of the window, or click the  button. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click **OK**.

- Configure according to the planned data in Table 5-2. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the bandwidth allocation configuration is completed. See Figure 5-4.

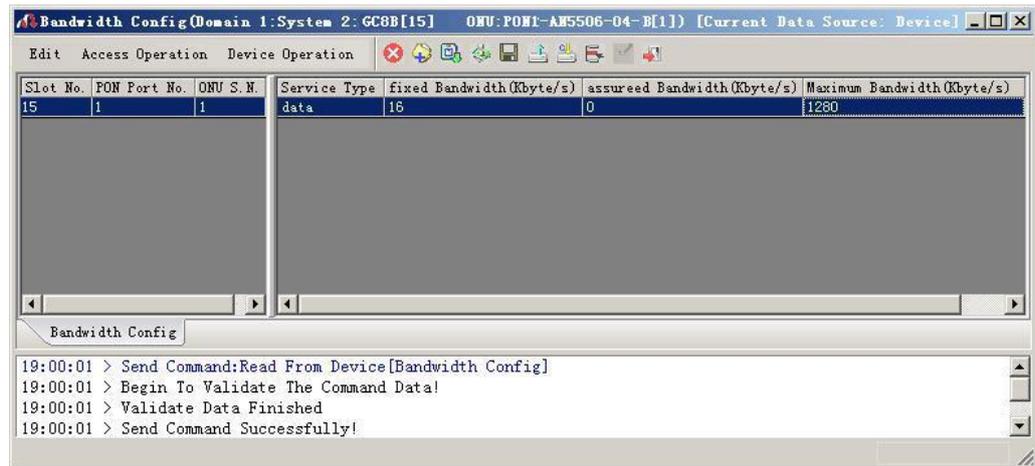


Figure 5-4 The **Bandwidth Config** window - completed

### 5.1.3.5 Configuring the ONU Port Data Service Parameters

#### Configuration purpose

Configure the FE port status and working mode of the ONU and add VLAN tags to the data service.

#### Operation steps

- Click the **GC8B[15]** card in the **Object Tree** pane and information about 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** → **Service Config** from the shortcut menu. Select the **ONU Port Config** tab, as shown in Figure 5-5.

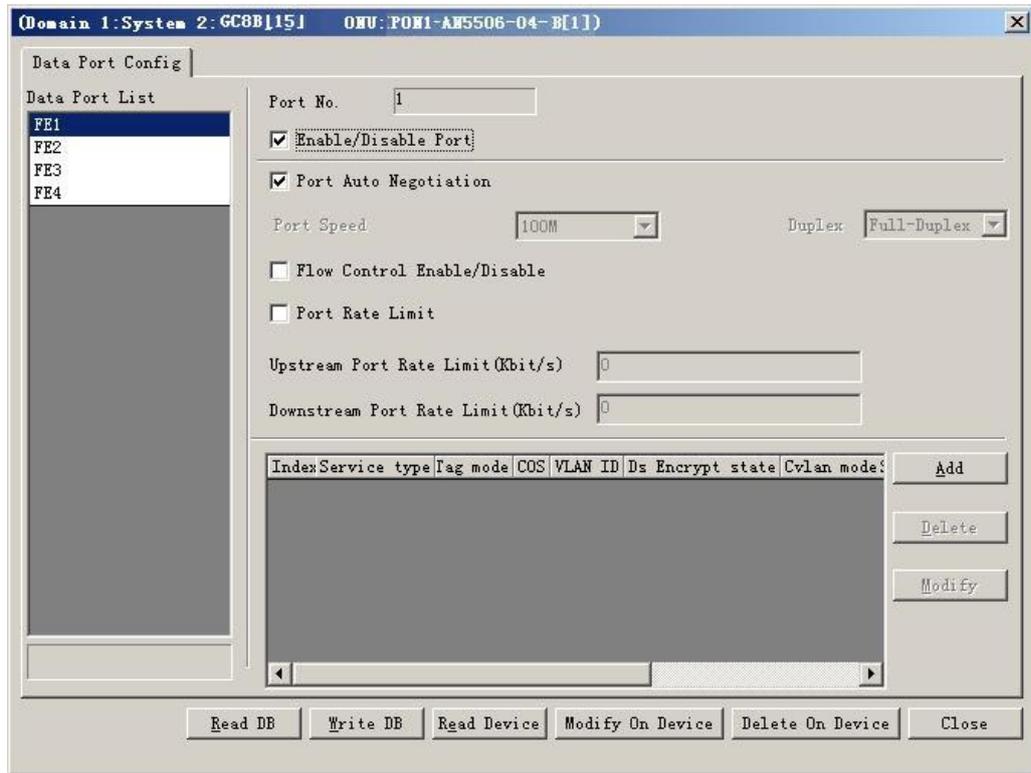


Figure 5-5 The ONU port service configuration

2. Select **FE1** from the **Data Port List** in Figure 5-5. Click **Add** to create a data service and configure it according to the planned data in Table 5-2.

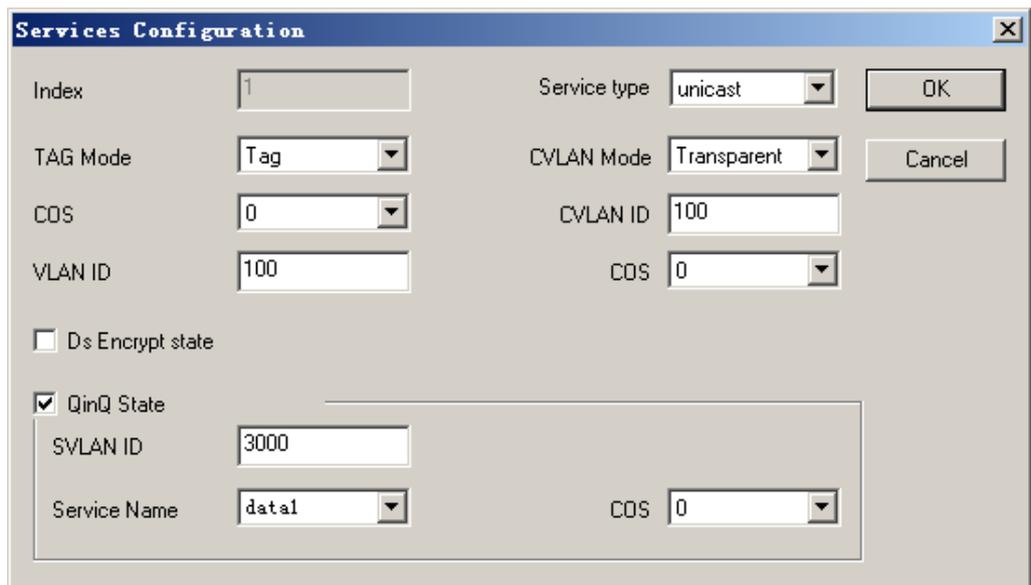


Figure 5-6 The **Services Configuration** dialog box

3. Click **OK** and return to the dialog box shown in Figure 5-5. Right-click **FE1** in the **Data Port List** and select **Copy Port Config**. Right-click **FE2** and select **Paste Port Config**.
4. After the configuration, click the **Modify on Device** button to complete the AN5506-04-B service configuration. If the **Command Succeed** of the AN5506-04-B data port service appears in the **Command Manager** window, the AN5506-04-B port service configuration is completed. See Figure 5-7.

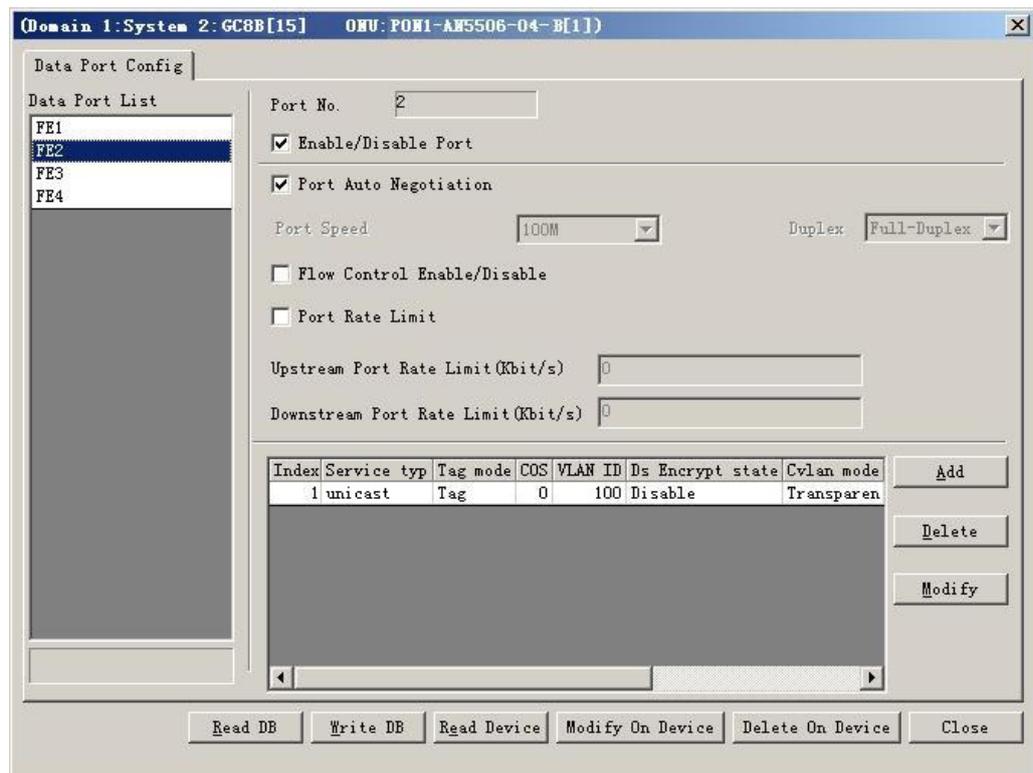


Figure 5-7 The port service configuration completed

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

### 5.1.4.1 Planning Data

Table 5-3 The planned 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 actually used slot	15
	PON No.	The number of the actually used PON port	1
	ONU No.	Configure according to the network planning of the operator.	1
	ONU type	The type of an ONU	AN5506-04-B
Local end service VLAN	Service Name	Configure 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
	Uplink No. / TRUNK No.	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 <b>Tag</b> or <b>Untag</b> . 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 and downlinked in the form of TAG. Under TAG mode, the uplink data packets will not be processed but remain uplinked in the original form. For downlink packets, however, only packets with designated TAGs are received and the packets will not be processed but remain downlinked in the original form.	Tag
	Service Type	Select <b>data</b> in correspondence to the data service.	data
Slot Bind Mode	Select <b>Auto Bind</b> or <b>Manually Bind</b> .	Auto Bind	

Table 5-4 The planned data of data service configuration at the AN5506-04-B ONU side in the transparent transmission mode (in a batch manner)

Item		Description	Example
Bandwidth configuration	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 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 16Kbyte/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 0Kbyte/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 64Kbyte/s.	1280
Data service profile configuration	Profile Name	Configure according to the network planning of the operator.	b
	Enable / Disable Port	Enable is selected by default.	Enable
	Auto Negotiation	Enable is selected by default.	Enable
	Port Speed	The default speed is 10M. Unconfigurable when the auto negotiation is enabled.	—
	Duplex	Full-duplex is selected by default. Unconfigurable when the auto negotiation is enabled.	—
	Flow control Enable / Disable	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.	—

Item		Description	Example	
	TAG Mode	Configured as <b>Tag</b> or <b>Untag</b> according to the network planning of the operator. In the <b>Tag</b> mode the uplink data packets are tagged, whereas in the <b>Untag</b> mode the uplink data packets are untagged.	Tag	
	COS Mode	When the CVLAN mode is set as <b>Transparent</b> , the VLAN mode should be consistent with the COS, ranging from 0 to 7. When the Tag mode is set as <b>Untag</b> , this item is unconfigurable.	0	
	VLAN ID	When the CVLAN mode is set as <b>Transparent</b> , the VLAN mode should be consistent with the CVLAN ID, ranging from 1 to 4085. When the Tag mode is set as <b>Untag</b> , this item is unconfigurable.	100	
	Ds Encrypt State	Disable is selected by default.	Disable	
	CVLAN Mode	When the Tag mode is set as <b>Untag</b> , the CLVAN mode can be set as <b>Tag</b> or <b>Transparent</b> . When the Tag mode is set as <b>Tag</b> , the CVLAN mode can be set as <b>Translate</b> or <b>Transparent</b> .	Transparent	
	CVLAN ID	Configure according to the network planning of the operator. The value range is 1 to 4085.	100	
	COS	The priority range is 0 to 7.	0	
	QinQ Enable State	Enable / disable the QinQ configuration. Disable is selected by default.	Enable	
	VLAN Name	Corresponding to the service name configured in the local VLAN. Unconfigurable when the QinQ enable state is disabled.	data1	
	SVLAN ID	Unconfigurable when the QinQ enable state is disabled. The range is 1 to 4085.	3000	
	COS	Unconfigurable when the QinQ enable state is disabled.	0	
	Service profile configuration	Profile Name		Configure according to the network planning of the operator.
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
		Profile Name	Corresponding to the profile name configured in the bandwidth allocation profile	a

Item		Description	Example		
	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	Corresponding to the profile name configured in the data service profile	b	
Service profile binding	Profile ID	Corresponding to 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	1		
	ONU S.N.	The ONU authorization number assigned according to the network planning of the operator	1		

### 5.1.4.2 Configuration Flow Chart

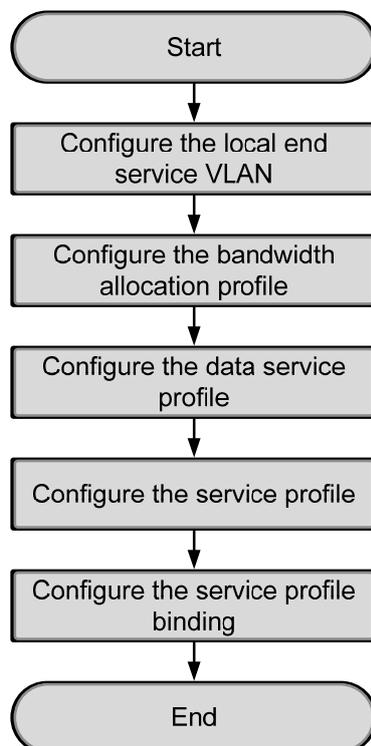


Figure 5-8 The batch configuration flow chart of data service provisioning in the transparent transmission mode (for the AN5506-04-B)

### 5.1.4.3 Configuring the Local End Service VLAN

See Section 5.1.3.3 for configuration procedures.

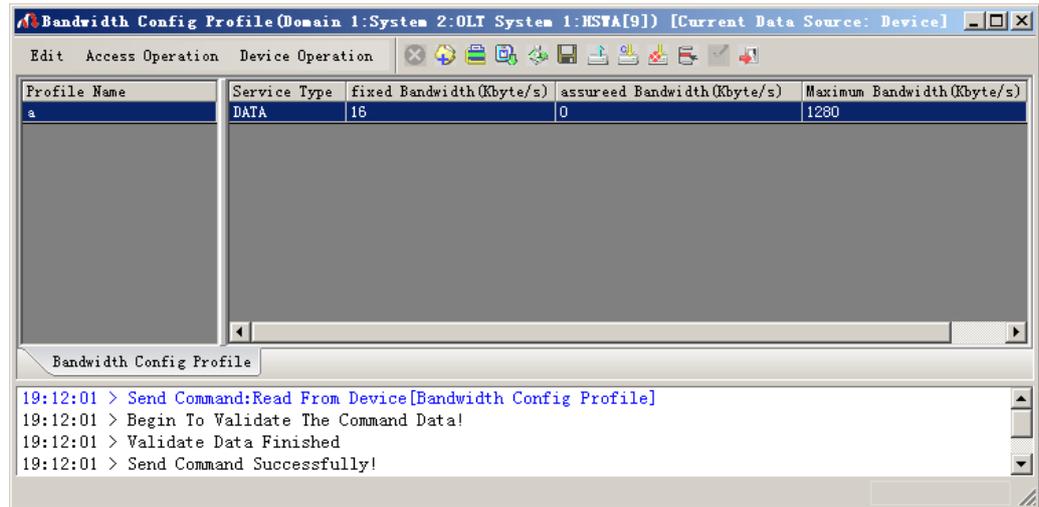
### 5.1.4.4 Configuring the Bandwidth Allocation Profile

Configuration purpose

Configure the bandwidth of the ONU data service and control the service flow.

Operation steps

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 select **Edit** → **Append** on the menu bar of the window or click the  button. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click the **OK** button. Double-click the **Profile Name** blank field and enter **a**.
3. Click the right pane and select **Edit** → **Append** on the menu bar of the window or 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 planned data in Table 5-4. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the bandwidth allocation profile is configured. See Figure 5-9.

Figure 5-9 The **Bandwidth Config Profile** window -completed

### 5.1.4.5 Configuring the Data Service Profile

#### Configuration purpose

Configure the FE port status and working mode of the ONU and add VLAN tags to the data service.

#### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane and select **Config** → **Data Service Profile** from the shortcut menu. Click the **Data Service Profile** tab and the **Data Service Profile** window appears.
2. Click the left pane and select **Edit** → **Append** on the menu bar. 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 planned data in Table 5-4.
3. Click the right pane and select **Edit** → **Append** in the menu bar. 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 planned data in Table 5-4.

- When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the data service profile is configured. See Figure 5-10.

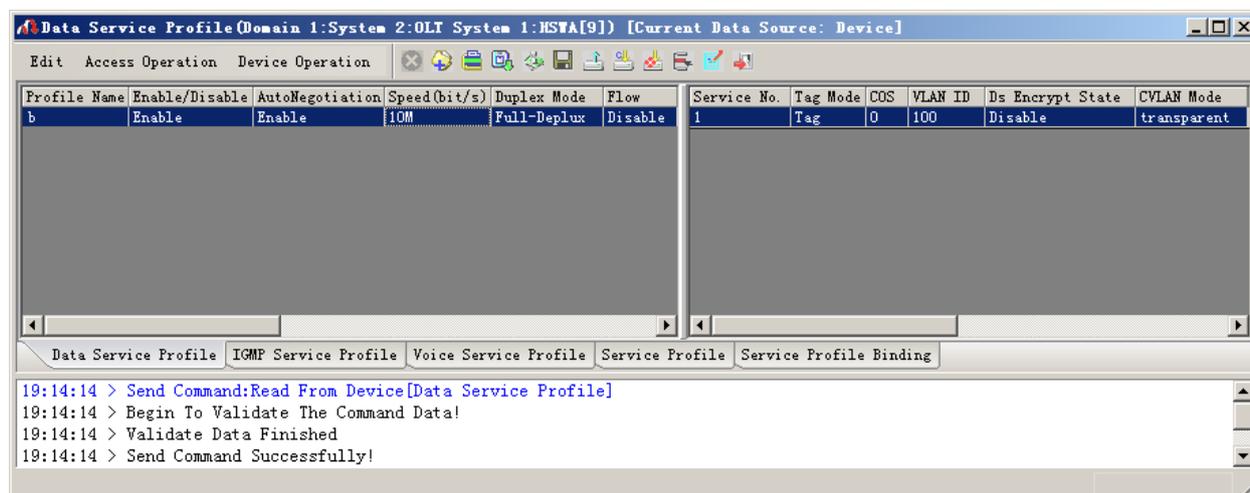


Figure 5-10 The Data Service Profile window - completed

### 5.1.4.6 Creating a Service Profile

#### Configuration purpose

Configure the bandwidth allocation profile and data service profile for the ONU binding.

#### Operation steps

- Right-click the **HSWA[9]** card in the **Object Tree** pane and select **Config** → **Service Profile** from the shortcut menu. Click the **Service Profile** tab and the **Service Profile** window appears.
- Click the left pane and select **Edit** → **Append** on the menu bar. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click **OK** to add a service profile.
- 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. Click the **Add** button to add a profile configuration. Click the **Profile Type** list box and select **Bandwidth Config Profile**. Click the **Profile Name** list box and select **a**.

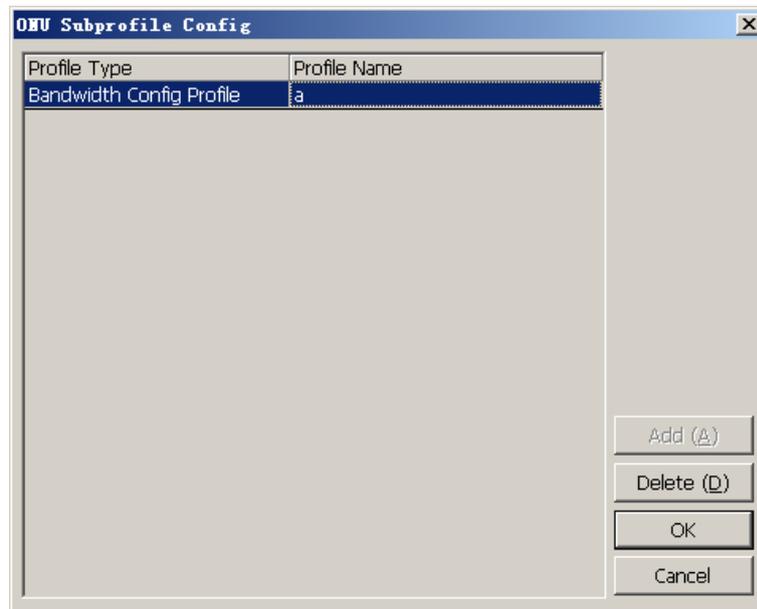


Figure 5-11 The **ONU Subprofile Config** dialog box

- Click **OK** and return to the **Service Profile** window.

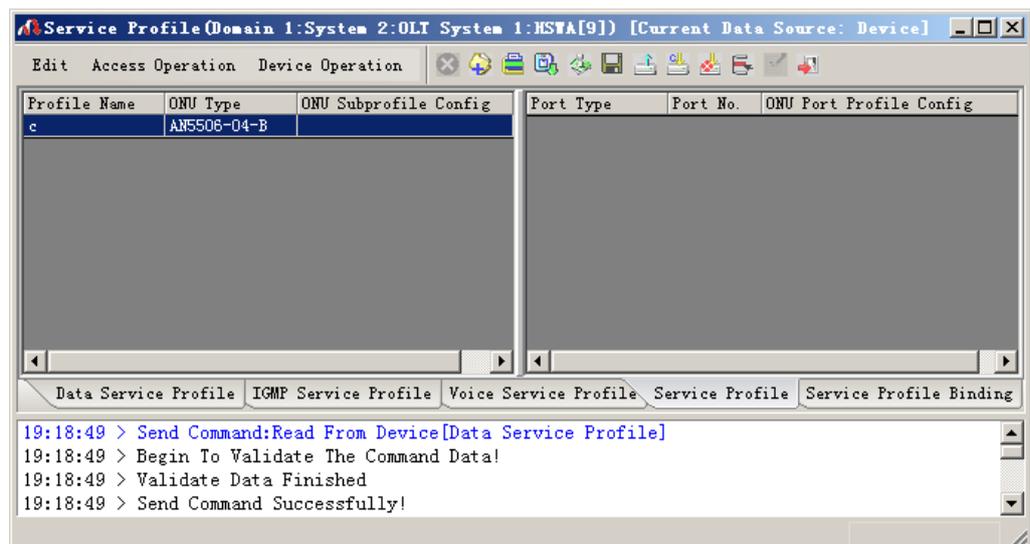


Figure 5-12 The **Service Profile** window

6. Click the right pane and select **Edit** → **Append** on the menu bar. Enter **2** in the **Please Input the Rows for Add** dialog box that appears and click **OK**.
7. Click the **Port Type** list box and select **FE**. Double-click the **Port No.** blank field and enter **1**. Repeat the procedure to enter **2**.
8. For Port No.1 click the **ONU Port Profile Config** field to bring up the **ONU Port Profile Config** dialog box. Click **Add** to add a profile configuration. Click the **Profile Type** list box and select **Data Service Profile**. Click the **Profile Name** list box and select **b**. Repeat the procedure for Port No.2.

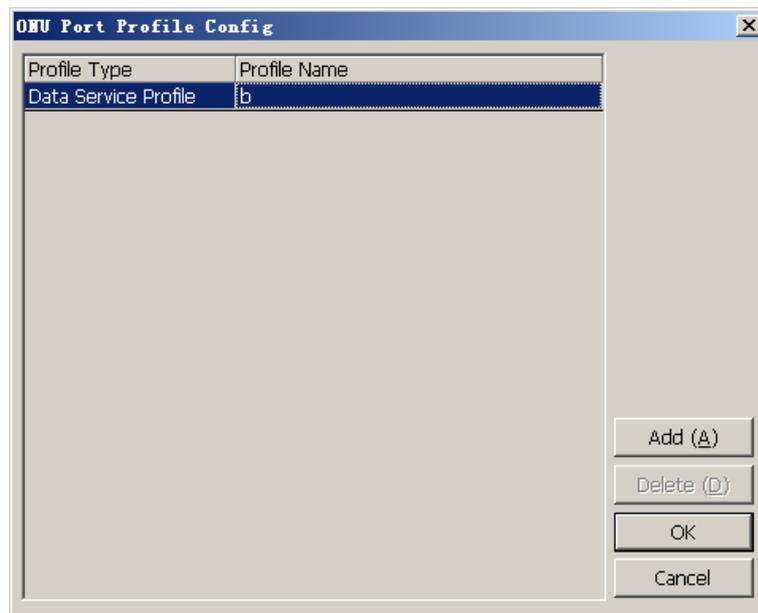


Figure 5-13 The **ONU Port Profile Config** dialog box

9. Click **OK** and return to the **Service Profile** window.
10. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the service profile is configured. See Figure 5-14.

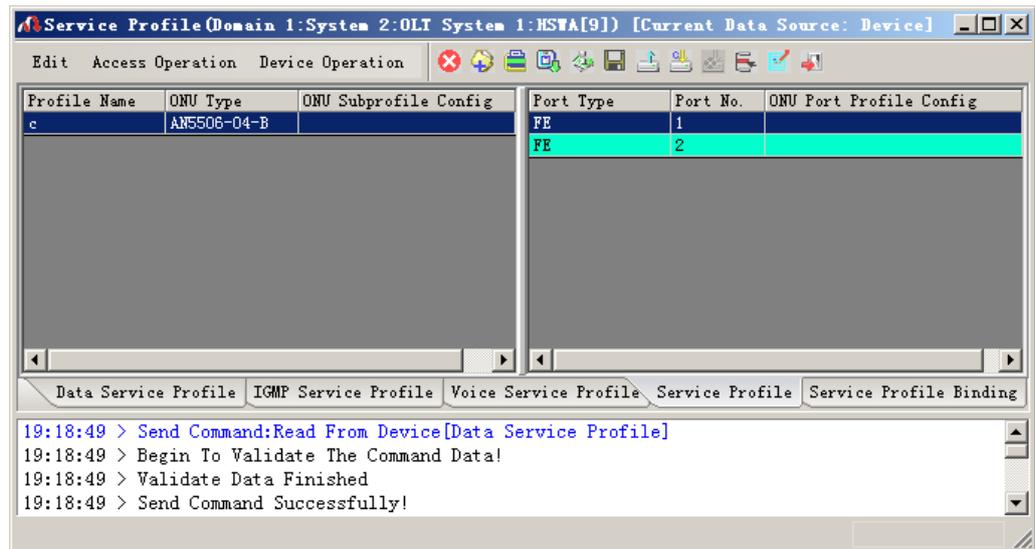


Figure 5-14 The Service Profile window - completed

### 5.1.4.7 Binding the ONU to the Service Profile

#### Configuration purpose

Apply the bandwidth allocation and data service configuration of the service profile to the ONU by binding the ONU to the service profile.

#### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane and select **Config** → **Service Profile Config** from the shortcut menu. Click the **Service Profile Binding** tab and the **Service Profile Binding** window appears.
2. Click the left pane and select **Edit** → **Append** on the menu bar. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click **OK**.
3. Click the **Profile ID** list box and select **c**. Click the **Action** list box and select **Attach**.
4. Click the right pane and select **Edit** → **Append** on the menu bar. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click **OK**.
5. Double-click the **ONU S.N.** field to bring up the **Select Objects** dialog box. Select **AN5506-04-B** in the dialog box.

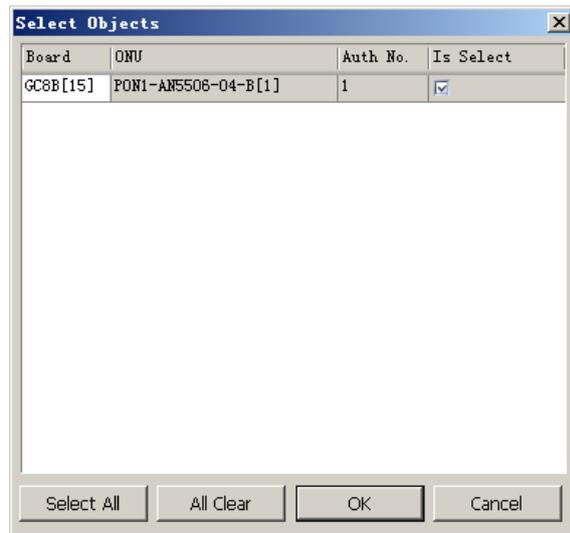


Figure 5-15 The **Select Objects** dialog box for the ONU number configuration

6. Click the **OK** button and return to the **Service Profile Binding** window. Click the  button to execute the command. The **If the service profile binding and the refresh operation is performed, the original ONU service configuration will be overwritten. Are you sure to execute this command?** dialogue box will appear. Click **OK** and then once again in the **Are you sure to write all data to the device?** dialog box.
7. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the AN5506-04-B has been bound to the service profile **c**. See Figure 5-16.

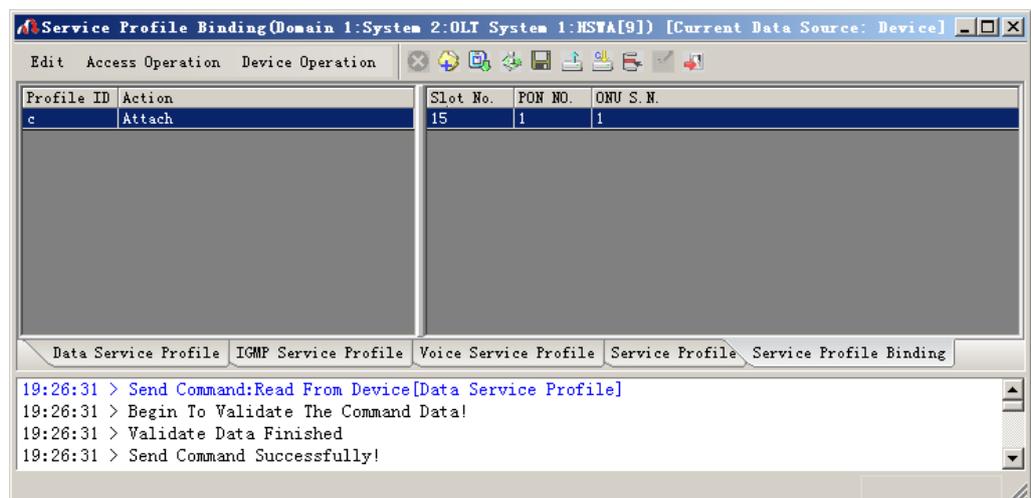


Figure 5-16 The **Service Profile Binding** window for the AN5506-04-B - completed

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

### 5.1.5.1 Planning Data

Table 5-5 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 actually used slot	15
	PON No.	The number of the actually used PON port	1
	ONU No.	Configure 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 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
	Uplink No. / TRUNK No.	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 <b>Tag</b> or <b>Untag</b> . 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 and downlinked in the form of TAG. Under TAG mode, the uplink data packets will not be processed but remain uplinked in the original form. For downlink packets, however, only packets with designated TAGs are received and the packets will not be processed but remain downlinked in the original form.	Tag
	Service Type	Select <b>data</b> in correspondence to the data service.	data
Slot Bind Mode	Select <b>Auto Bind</b> or <b>Manually Bind</b> .	Auto Bind	

Table 5-6 The planned data of data service configuration at the AN5506-10-B1 ONU side in the transparent transmission mode (configured respectively)

Item		Description	Example	
Bandwidth configuration	Service Type	Select integrate service.	Integrate Service	
	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 16Kbyte/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 0Kbyte/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 64Kbyte/s.	1280	
Configuring basic information of the ONU port	ONU Port Used	The actually used ONU port	1	2
	Enable / Disable Port	Configure according to the network planning of the operator. Enable is selected by default.	Default	
	Port Auto Negotiation	Configure according to the network planning of the operator. Enable is selected by default.	Default	
	Port Speed	Unconfigurable when the port auto negotiation is enabled. The default speed is 100M.	Default	
	Duplex	Unconfigurable when the port auto negotiation is enabled. The default value is full-duplex.	Default	
	Flow control Enable / Disable	Configure according to the network planning of the operator. Disable is selected by default.	Default	
Configuring ONU port service parameters	TLS	Configure according to the network planning of the operator. Select <b>TLS</b> or <b>No TLS</b> .	No TLS	
	Service Type	Data service. Select <b>Unicast</b> .	Unicast	
	VLAN Mode	Configure according to the network planning of the operator. Select <b>Tag</b> or <b>Transparent</b> .	Transparent	
	CVLAN TPID	The default value is 33024.	33024	
	CVLAN ID	Configure according to the network planning of the operator. The value range is 1 to 4085.	200	
	Priority or COS	The CVLAN priority. The value range is 1 to 7.	0	

Item	Description	Example
QinQ State	Enable / disable the QinQ configuration.	Enable
Service Name	Corresponding to the configured local end service VLAN.	data1
VLAN ID	Configure the SVLAN ID according to the network planning of the operator within the range of 1 to 4085.	3001
SVLAN TPID	The default value is 33024.	33024
Priority or COS	The SVLAN priority. The value range is 0 to 7.	0

### 5.1.5.2 Configuration Flow Chart

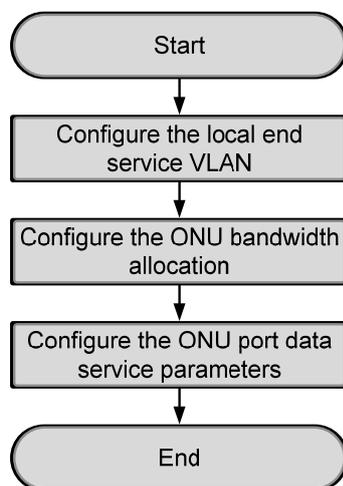


Figure 5-17 Flow chart for provisioning data services respectively in the transparent transmission mode (for the AN5506-10-B1)

### 5.1.5.3 Configuring the Local End Service VLAN

For configuration procedures see Section 5.1.3.3.

### 5.1.5.4 Configuring the Bandwidth Allocation

#### Configuration purpose

Configure the bandwidth of the ONU data service and limit the traffic flow.

#### Operation steps

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 right pane and select **Edit** → **Append** on the menu bar or click the  button. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click the **OK** button.
3. Configure according to the planned data in Table 5-6. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the bandwidth allocation is configured. See Figure 5-18.

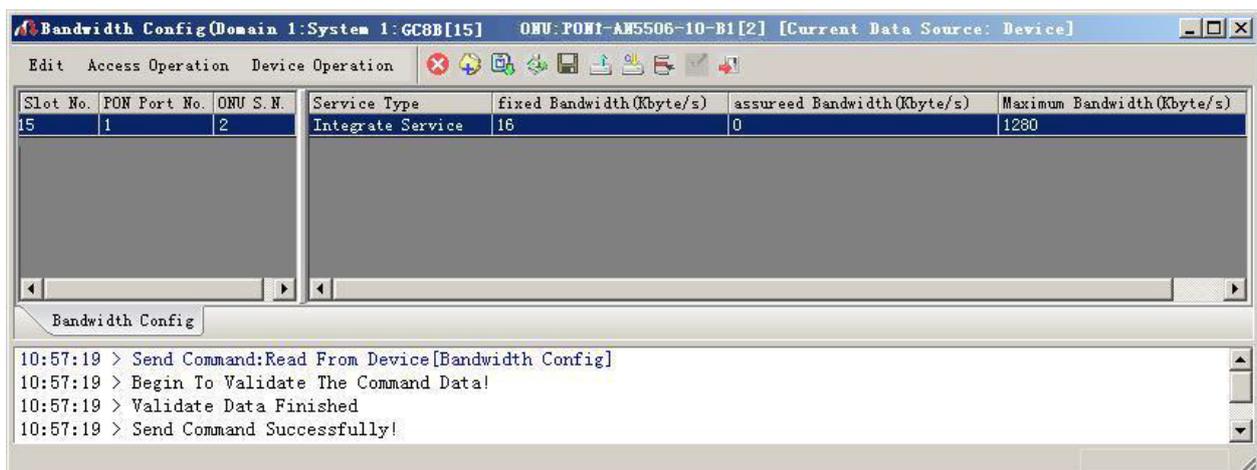


Figure 5-18 The **Bandwidth Config** window - completed

### 5.1.5.5 Configuring the ONU Port Data Service Parameters

#### Configuration purpose

Configure the FE port status and working mode of the ONU and add VLAN tags to the data service.

#### Operation steps

1. Click the **GC8B[15]** card in the **Object Tree** pane and information about 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. Select the **ONU Port Config** tab, as shown in Figure 5-19.

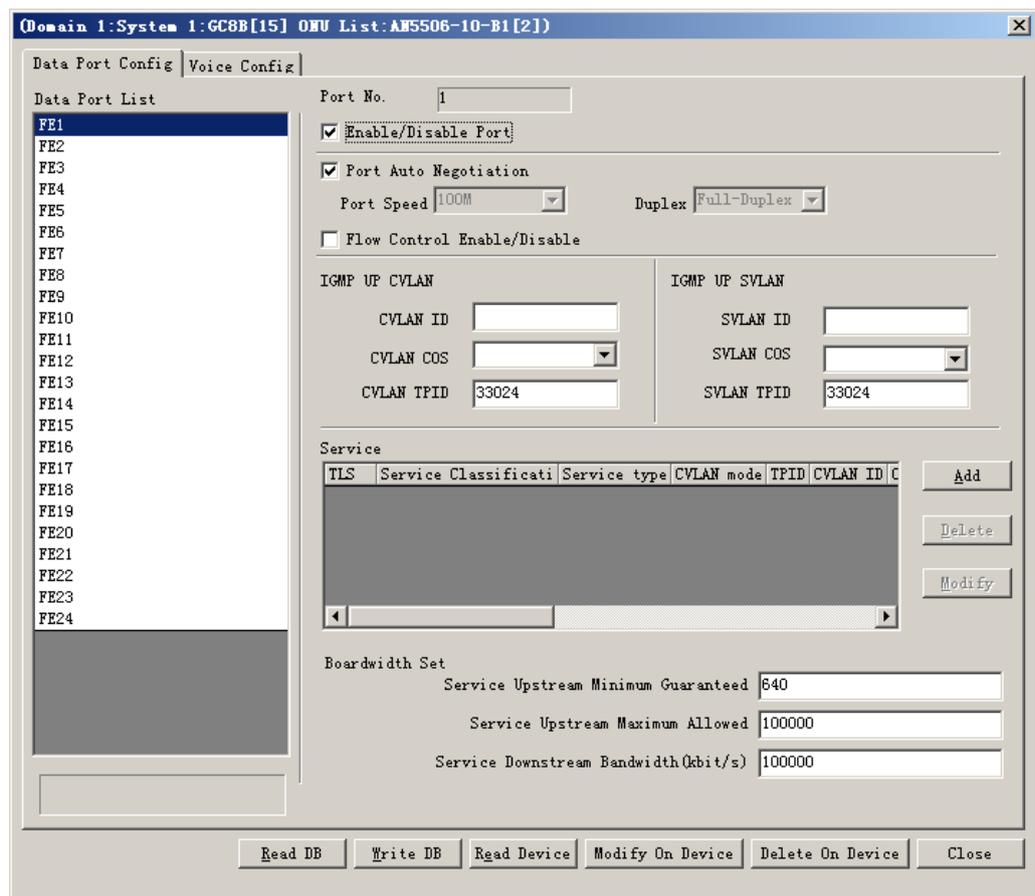


Figure 5-19 The ONU port service configuration

2. Select **FE1** from the **Data Port List** in Figure 5-19. Click **Add** to create a data service and configure it according to the planned data in Table 5-6.

Figure 5-20 The **Services Configuration** dialog box

3. Click **OK** and return to the dialog box shown in Figure 5-19. Right-click **FE1** in the **Data Port List** and select **Copy Port Config**. Right-click **FE2** and select **Paste Port Config** to enable the FE2 port.
4. After the configuration, click the **Modify on Device** button to complete the AN5506-10-B1 service configuration. If the **Command Succeed** of the **AN5506-10-B1** data port service appears in the **Command Manager** window, the AN5506-10-B1 port service configuration is completed. See Figure 5-21.

Domain 1: System 1: GC8B[15] ONU List: AH5506-10-B1[21]

Data Port Config | Voice Config

Data Port List

- FE1
- FE2
- FE3
- FE4
- FE5
- FE6
- FE7
- FE8
- FE9
- FE10
- FE11
- FE12
- FE13
- FE14
- FE15
- FE16
- FE17
- FE18
- FE19
- FE20
- FE21
- FE22
- FE23
- FE24

Port No. 2

Enable/Disable Port

Port Auto Negotiation

Port Speed 100M Duplex Full-Duplex

Flow Control Enable/Disable

IGMP UP CVLAN

CVLAN ID CVLAN COS CVLAN TPID 33024

IGMP UP SVLAN

SVLAN ID SVLAN COS SVLAN TPID 33024

Service

TLS	Service Classificati	Service type	CVLAN mode	TPID	CVLAN ID	C
No TL	0 Items	unicast	Transparen	3024	200	

Add Delete Modify

Boardwidth Set

Service Upstream Minimum Guaranteed 640

Service Upstream Maximum Allowed 100000

Service Downstream Bandwidth(kbit/s) 100000

Read DB Write DB Read Device Modify On Device Delete On Device Close

Figure 5-21 The port service configuration completed

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

### 5.1.6.1 Planning Data

Table 5-7 The planned 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 actually used slot	15
	PON No.	The number of the actually used PON port	1
	ONU No.	Configure according to the network planning of the operator.	2
	ONU type	The type of the ONU	AN5506-10-B1
Local VLAN configuration	Service Name	Configure 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
	Uplink No. / TRUNK No.	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 <b>Tag</b> or <b>Untag</b> . 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 and downlinked in the form of TAG. Under TAG mode, the uplink data packets will not be processed but remain uplinked in the original form. For downlink packets, however, only packets with designated TAGs are received and the packets will not be processed but remain downlinked in the original form.	Tag
	Service Type	Select <b>data</b> in correspondence to the data service.	data
Slot Bind Mode	Select <b>Auto Bind</b> or <b>Manually Bind</b> .	Auto Bind	

Table 5-8 The planned data of data service configuration at the AN5506-10-B1 ONU side in the transparent transmission mode (in a batch manner)

Item		Description	Example
Configuring the bandwidth	Profile Name	The name of the bandwidth allocation profile	a
	Service Type	Select integrated service.	Integrated Service
	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 16Kbyte/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 0Kbyte/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 64Kbyte/s.	1280
Binding bandwidth allocation profile	Slot No.	The number of the actually used slot	15
	PON No.	The number of the actually used PON	1
	ONU S.N.	The ONU authorization number allocated according to the network planning of the operator.	2
	GPON Bandwidth Profile	The name of the configured bandwidth allocation profile	a
Configuring the CVLAN profile	Profile Name	Configure according to the network planning of the operator.	b
	Service Type	Select unicast.	Unicast
	CVLAN Mode	Configure the CVLAN mode of the service as <b>Tag</b> or <b>Transparent</b> .	Transparent
	QinQ State	Configure the QinQ service and enable the function.	Enable
Configuring the SVLAN profile	Profile Name	The SVLAN profile name	c
	SVLAN Name	Corresponding to the configured local end service VLAN	data1
	STPID	The default value is 33024.	33024
	SVLAN ID	The configured SVLAN ID. The value range is 1 to 4085.	3001
	SCOS	The SVLAN priority. The value range is 0 to 7 with the 7 as the highest priority and 0 as the lowest.	0

Item		Description	Example	
Configuring the ONU data port	Port No.	The number of the actually used ONU port	1	2
	Port Enable / Disable	Configure the port enable function.	Enable	
	MAC Limit	Configured as no MAC limit.	0	
Configuring the ONU data service	CTPID	The default value is 33024.	33024	
	CVLAN ID	The CVLAN ID, ranging from 1 to 4085.	200	
	CCOS	The user CVLAN priority configuration, ranging from 0 to 7 with 7 as the highest priority and 0 as the lowest.	0	
	Service ID	Corresponding to the configured local end service VLAN	data1	
	Service Profile	Select the configured service model profile.	b	
	SVLAN Profile	Select the configured SVLAN profile.	c	

### 5.1.6.2 Configuration Flow Chart

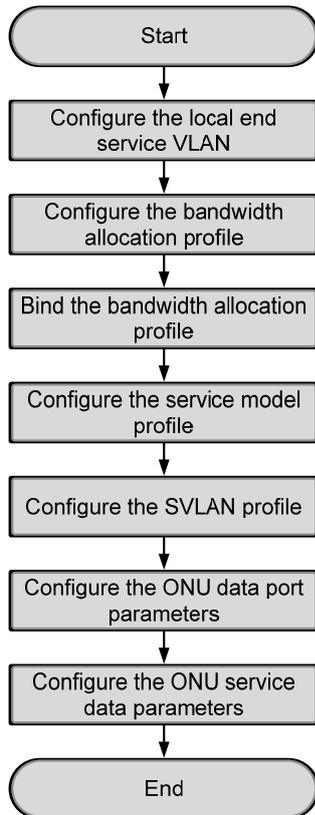


Figure 5-22 The batch configuration flow chart of data service provisioning in the transparent transmission mode (for the AN5506-10-B1)

### 5.1.6.3 Configuring the Local End Service VLAN

See Section 5.1.3.3 for configuration procedures.

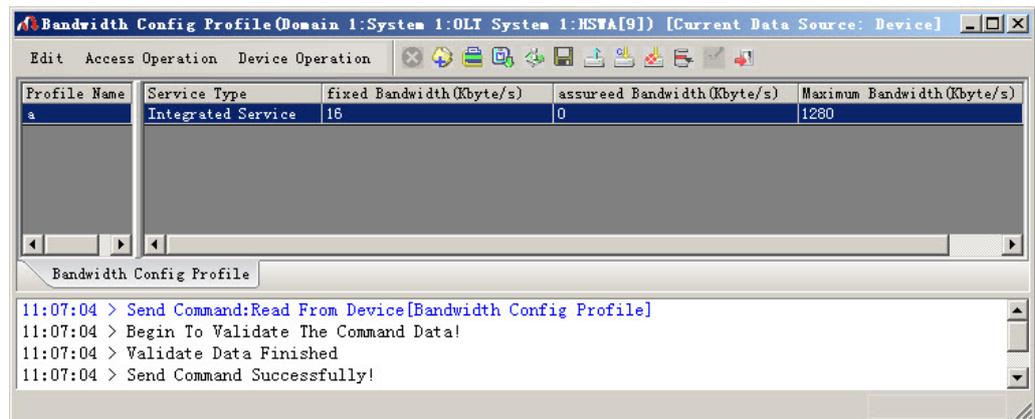
### 5.1.6.4 Configuring the Bandwidth Allocation Profile

#### Configuration purpose

Configure the bandwidth of the ONU data service and limit the traffic flow.

#### Operation steps

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 select **Edit** → **Append** on the menu bar or click the  button. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click the **OK** button. Double-click the **Profile Name** blank field and enter **a**.
3. Click the right pane and select **Edit** → **Append** on the menu bar or 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 planned data in Table 5-8. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the bandwidth allocation profile is configured. See Figure 5-23.

Figure 5-23 The **Bandwidth Config Profile** window - completed

### 5.1.6.5 Binding the Bandwidth Allocation Profile

#### Configuration purpose

Bind the configured bandwidth allocation profile to the ONU.

#### Configuration example

1. Right-click the system in the **Object Tree**, select **Config and Command** → **Batch Config** → **ONU Configuration** from the shortcut menu to access the ONU configuration window.
2. Click **Set Object as Condition** in the **Config Object** pane and all configuration objects will appear in the lower pane (you can drill down and select a specific port as the object). Select the **AN5506-10-B1[2]** under the PON 1 in Slot 15 and click the **OK** button.

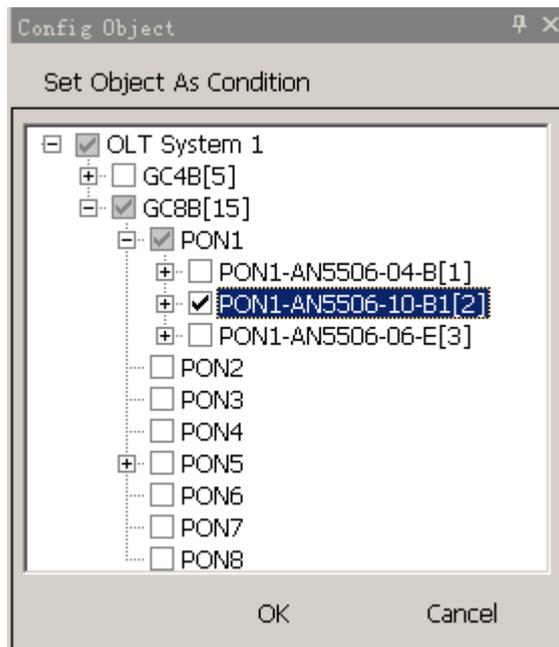


Figure 5-24 Set configuration objects

- 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**.
- When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the bandwidth allocation profile is bound. See Figure 5-25.

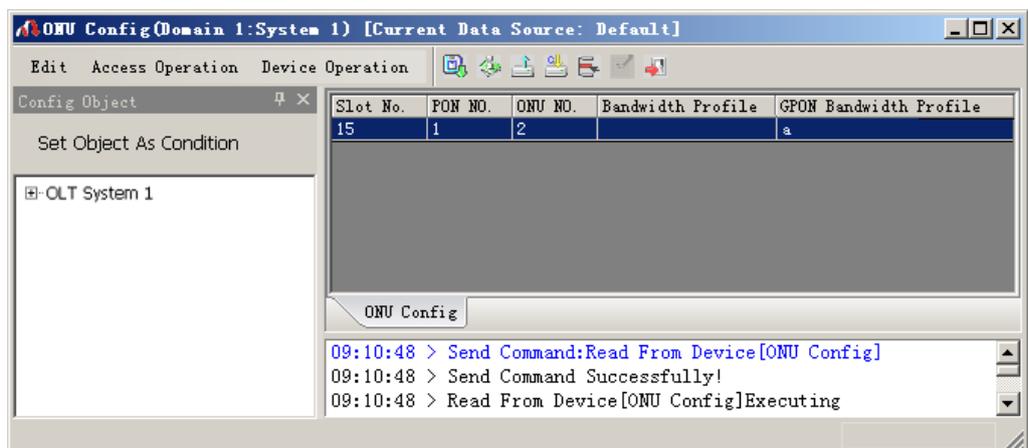


Figure 5-25 Binding the bandwidth allocation profile

### 5.1.6.6 Configuring the Service Model Profile

#### Configuration purpose

Select the data service type, CVLAN mode and determine whether to enable the translation function and the QinQ function.

#### Configuration example

1. Right-click the system in the **Object Tree** pane, select **Config** → **Profile Definition** → **Service Model Profile** from the shortcut menu to access the service model profile configuration window.
2. Select **Edit** → **Append** on the menu bar of the window or click the  button. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click **OK** to add a service model profile.
3. Configure according to the planned data in Table 5-8. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the service model profile is configured. See Figure 5-26.

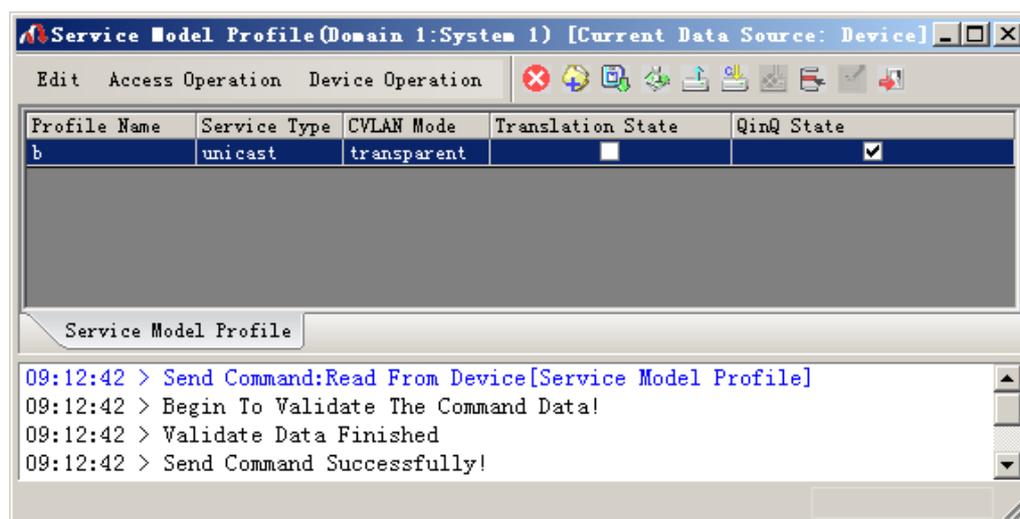


Figure 5-26 The **Service Model Profile** window

### 5.1.6.7 Configuring the SVLAN Profile

#### Configuration purpose

Configure the SVLAN value to apply in the ONU data service parameter configuration.

#### Configuration example

1. Right-click the system in the **Object Tree** pane and select **Config** → **Profile Definition** → **SVLAN Profile** from the shortcut menu to access the SVLAN profile configuration window.
2. Select **Edit** → **Append** on the menu bar of the window or click the  button. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click **OK** to create an SVLAN profile.
3. Configure according to the planned data in Table 5-8. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the SVLAN profile is configured. See Figure 5-27.

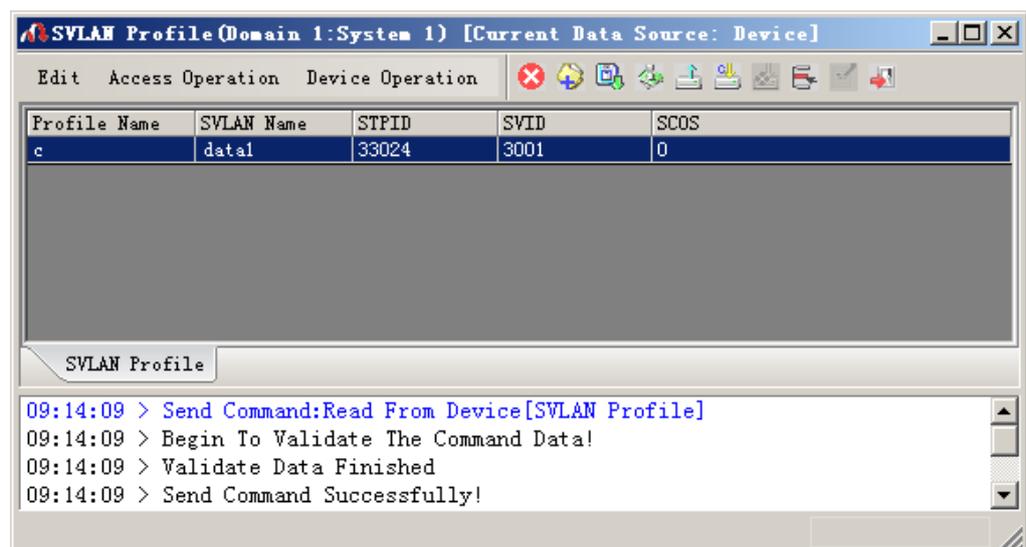


Figure 5-27 The **SVLAN Profile** window

### 5.1.6.8 Configuring the ONU Data Port Parameters

#### Configuration purpose

Enable the ONU ports and limit the number of MAC addresses in a batch manner.

#### Configuration example

1. Right-click the system in the **Object Tree** pane and select **Config** → **Batch Config** → **ONU Data Port Config** from the shortcut menu to access the ONU data port configuration window.
2. Click **Set Object as Condition** in the **Config Object** pane and all configuration objects (you can drill down and select a specific port as the object) will appear in the lower part. Select **FE1** and **FE2** of the AN5506-10-B1[2] listed under the PON 1 in Slot 15 and click **OK**.

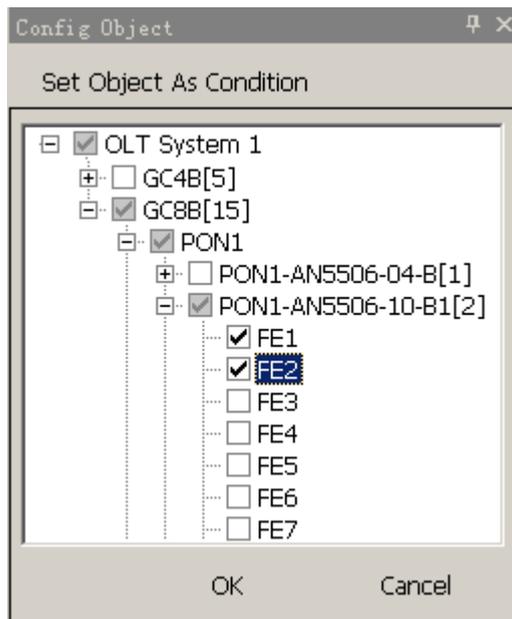


Figure 5-28 Set configuration objects

- The specific configuration information of the objects will appear in the right pane. Configure according to the planned data in Table 5-8. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the ONU data port parameters are configured. See Figure 5-29.

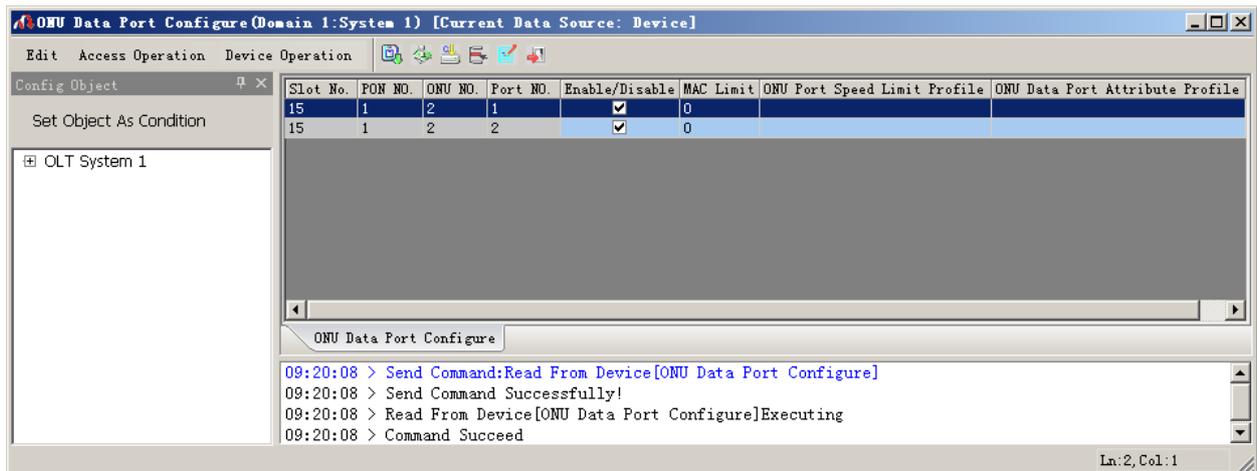


Figure 5-29 The ONU Data Port Configure window

### 5.1.6.9 Configuring the ONU Data Service Parameters

#### Configuration purpose

Configure the CVLAN and SVLAN for the data service flow uplinked to the ONU port in a batch manner.

#### Configuration example

- Right-click the system in the **Object Tree** pane and select **Config** → **Batch Config** → **ONU Data Service Configure** from the shortcut menu to access the ONU data service configuration window.
- Click the  button on the menu bar and the **Add Item Number** dialog box appears. Select configuration objects (you can drill down and select a specific port as the object) in the left pane. Select **FE1** and **FE2** of the ONU and click **OK** to return to the **ONU Data Service Configure** window.

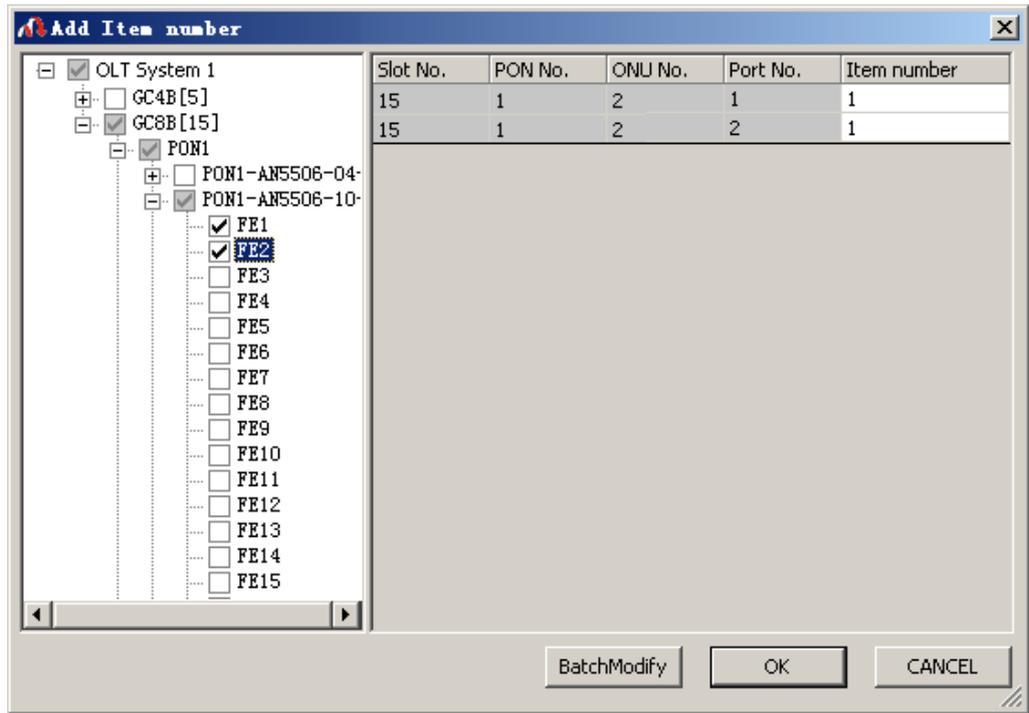


Figure 5-30 Set the configuration objects

- The specific configuration information of the objects will appear in the right pane. Configure according to the planned data in Table 5-8. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the ONU data service parameters are configured. See Figure 5-31.

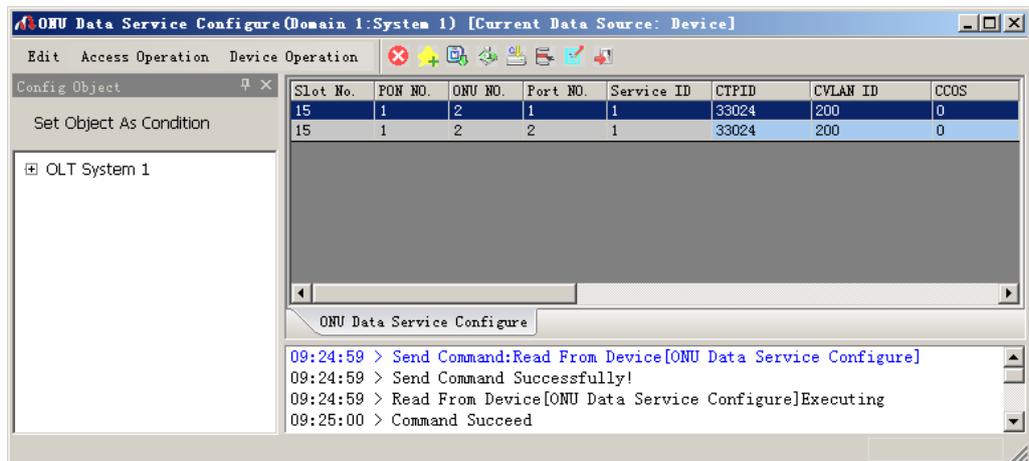


Figure 5-31 The ONU Data Service Configure window

## **5.1.7 End of Configuration**

After being added with stacked VLAN tags, the PC1 to PC4 can access the Internet via home gateways normally.

## 5.2 Example for Data Service Configuration – in the Tag Mode

### 5.2.1 Configuration Rules

The AN5116-06B supports the QinQ data service, which means it supports VLAN stacking as well. In this example the GC8B card is used as the service interface card and the AN5506-04-B and the AN5506-10-B1 are used as ONUs to introduce the data service configuration in the Tag mode.

- ◆ The QinQ data service in the Tag mode can be configured via the SVLAN configuration on the ONU or the OLT. In this example the service is configured on the 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 Tag mode: The Ethernet data uploaded from the subscriber side will be added with the CVLAN ID and SVLAN ID when passing the ONU. The data service will not be processed using the AN5116-06B, but transparently transmitted to the upper layer network side equipment.
- ◆ 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 configuration parameter of the 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.

## 5.2.2 Service Network

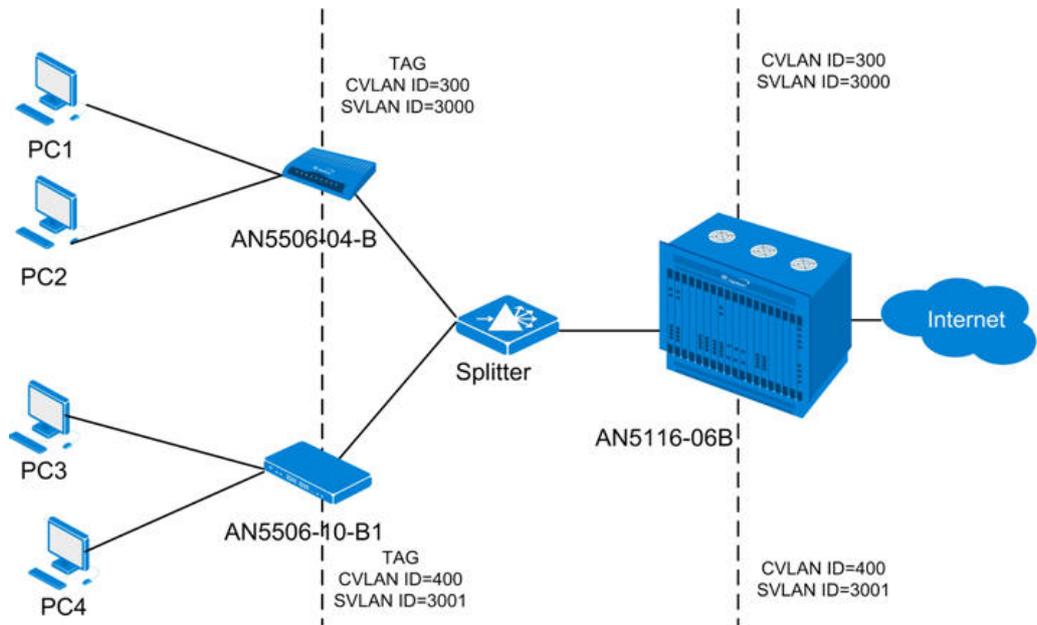


Figure 5-32 The data service network diagram (in the Tag mode)

As Figure 5-32 shows, each PC is connected to an ONU, which adds the CLAN ID and SVLAN ID to the data service uploaded from the PC. When the services are received at the OLT, the OLT will transmit the services to the upper layer network via the uplink port directly. For the downlink direction, the reverse process takes place.

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.

## 5.2.3 Configuring Data Services Respectively (for the AN5506-04-B)

### 5.2.3.1 Planning Data

Table 5-9 The planned data of data service configuration at the OLT side in the Tag 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 No.	Configure according to the network planning of the operator.	1
	ONU type	The type of an ONU	AN5506-04-B
Local end service VLAN	Service Name	Configure 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
	Uplink No. / TRUNK No.	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 <b>Tag</b> or <b>Untag</b> . 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 and downlinked in the form of TAG. Under TAG mode, the uplink data packets will not be processed but remain uplinked in the original form. For downlink packets, however, only packets with designated TAGs are received and the packets will not be processed but remain downlinked in the original form.	Tag
	Service Type	Select <b>data</b> in correspondence to the data service.	data
	Slot Bind Mode	Select <b>Auto Bind</b> or <b>Manually Bind</b> .	Auto Bind

Table 5-10 The planned data of data service configuration at the AN5506-04-B ONU side in the Tag mode (configured respectively)

Item		Description	Example	
Bandwidth configuration	Service Type	Select broadband Internet access.	Broadband Internet access	
	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 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 0Kbyte/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 64Kbyte/s.	1280	
Basic information of the ONU port	ONU Port Used	The actually used ONU port	1	2
	Enable / Disable Port	Configure according to the network planning of the operator. Enable is selected by default.	Default	
	Port Auto Negotiation	Configure according to the network planning of the operator. Enable is selected by default.	Default	
	Port Speed	Unconfigurable when the port auto negotiation is enabled. The default speed is 100M.	Default	
	Duplex	Unconfigurable when the port auto negotiation is enabled. The default value is full-duplex.	Default	
	Flow control Enable / Disable	Configure according to the network planning of the operator. Disable is selected by default.	Default	
ONU port service configuration	TAG Mode	Configured as <b>Tag</b> or <b>Untag</b> according to the network planning of the operator. In the <b>Tag</b> mode the uplink data packets are tagged, while in the <b>Untag</b> mode the uplink data packets are untagged.	Untag	
	Service Type	Configured as <b>Unicast</b> or <b>Multicast</b> .	Unicast	

Item		Description	Example
	VLAN Mode	When the CVLAN mode is set as <b>Transparent</b> , the VLAN mode should be consistent with the COS, ranging from 0 to 7. When the Tag mode is set as <b>Untag</b> , this item is unconfigurable.	—
	VLAN ID	When the CVLAN mode is set as <b>Transparent</b> , the VLAN mode should be consistent with the CVLAN ID, ranging from 1 to 4085. When the Tag mode is set as <b>Untag</b> , this item is unconfigurable.	—
	CVLAN Mode	When the Tag mode is set as <b>Untag</b> , the CVLAN mode can be set as <b>Tag</b> or <b>Transparent</b> . When the Tag mode is set as <b>Tag</b> , the CVLAN mode can set as <b>Translation</b> or <b>Transparent</b> .	Tag
	CVLAN ID	Configure according to the network planning of the operator. The range is 1 to 4085.	300
	COS	The CVLAN priority, ranging from 1 to 7.	0
	Ds Encrypt State	Disable is selected by default.	Disable
	QinQ Enable	Enable / disable the QinQ configuration	Enable
	SVLAN ID	Unconfigurable when the QinQ enable status is disabled. The range is 1 to 4085.	3000
	Service Name	Corresponds to the configured local end service VLAN. Unconfigurable when the QinQ enable status is disabled.	data2
	COS	The SVLAN priority, ranging from 1 to 7. Unconfigurable when the QinQ enable status is disabled.	0

### 5.2.3.2 Configuration Flow Chart

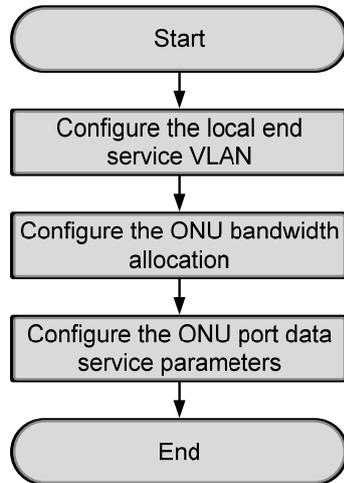


Figure 5-33 Flow chart for provisioning data services respectively in the Tag mode (for the AN5506-04-B)

### 5.2.3.3 Configuring the Local End Service VLAN

#### Configuration purpose

Configure the uplink port VLAN of the AN5116-06B for the designated service flow and limit the VLAN range of the service.

#### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane and select **Config** → **Local VLAN** from the shortcut menu. In the window click the **Local End Service VLAN** tab and the local VLAN configuration window appears.
2. Click **Edit** → **Append** on the menu bar of the window or click the  button. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click **OK** to create a local VLAN.

- Configure according to the planned data in Table 5-9. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the local VLAN is configured. See Figure 5-34.

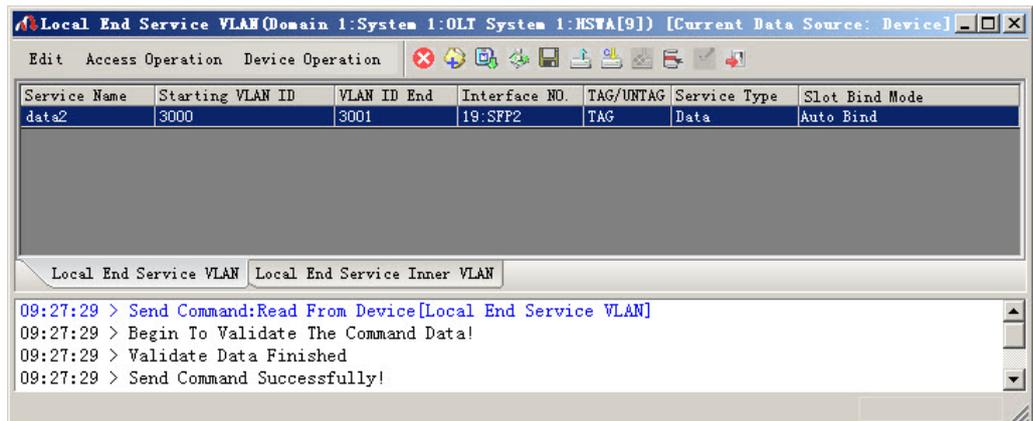


Figure 5-34 The **Local End Service VLAN** window - completed

## 5.2.3.4 Configuring the Bandwidth Allocation

### Configuration purpose

Configure the bandwidth of the ONU data service and limit the traffic flow.

### Operation steps

- 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** → **Bandwidth Config** from the shortcut menu to access the bandwidth allocation configuration window.
- Click the right pane and select **Edit** → **Append** from the menu bar, or click the  button. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click **OK**.

- Configure according to the planned data in Table 5-10. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the bandwidth allocation is configured. See Figure 5-35.

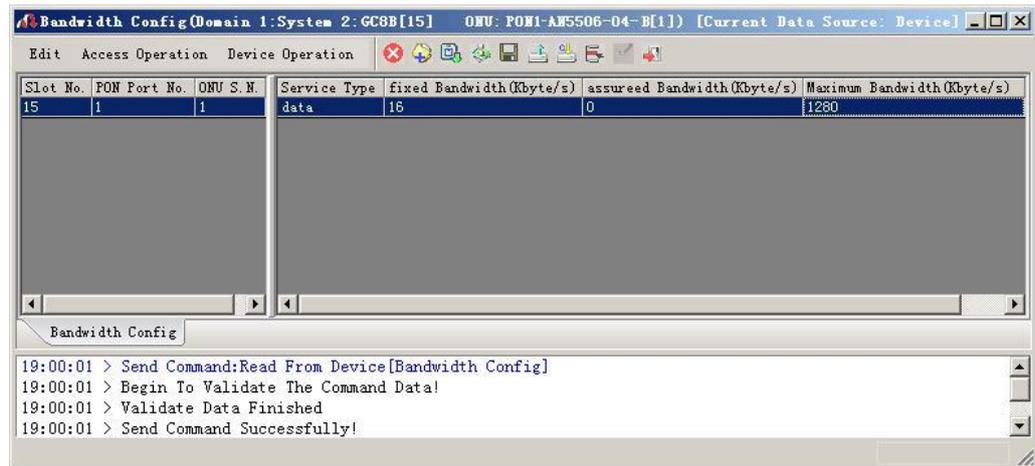


Figure 5-35 The **Bandwidth Config** window - completed

### 5.2.3.5 Configuring the ONU Port Data Service Parameters

#### Configuration purpose

Configure the FE port status and working mode of the ONU and add VLAN tags to the data service.

#### Operation steps

- Click the **GC8B[15]** card in the **Object Tree** pane and information about 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** → **Service Config** from the shortcut menu. Select the **ONU Port Config** tab, as shown in Figure 5-36.

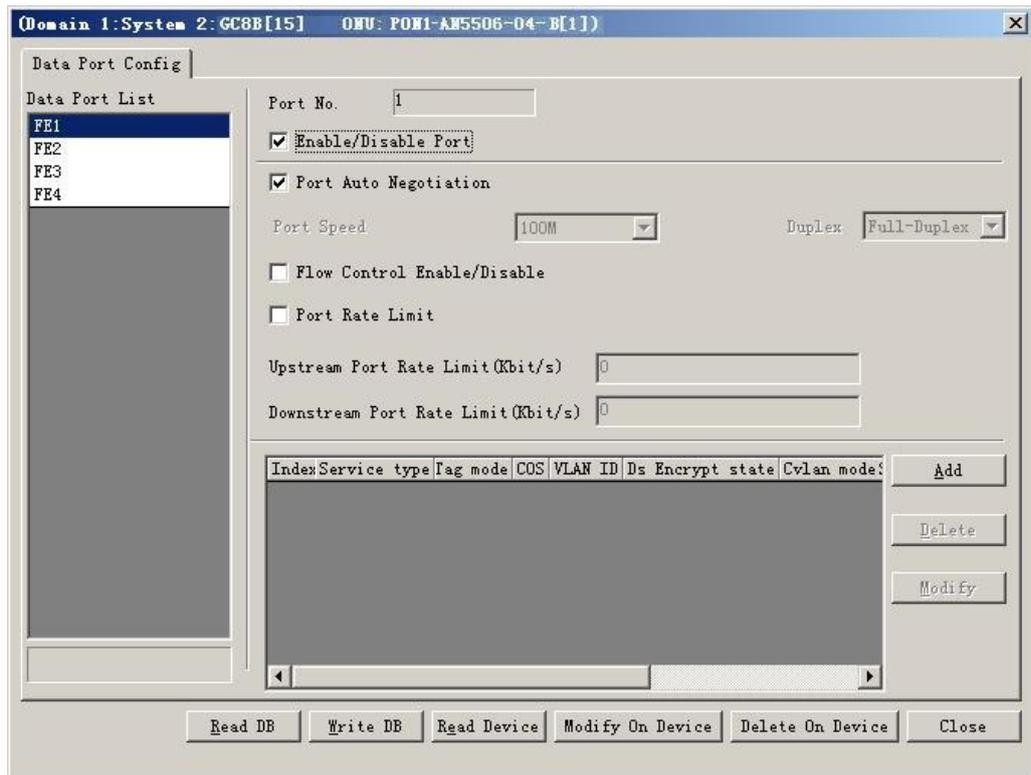


Figure 5-36 The ONU port service configuration

2. Select **FE1** from the **Data Port List** in Figure 5-36. Click **Add** to create a data service and configure according to the planned data in Table 5-10.

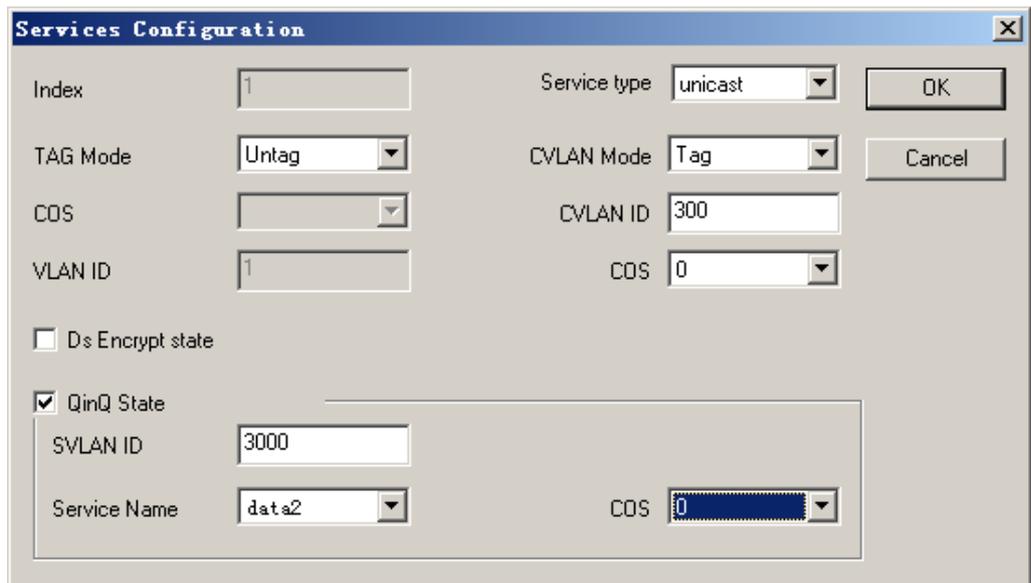


Figure 5-37 The **Services Configuration** dialog box

3. Click **OK** and return to the dialog box shown in Figure 5-36. Right-click **FE1** in the **Data Port List** and select **Copy Port Config**. Right-click **FE2** and select **Paste Port Config**.
4. After the configuration, click the **Modify on Device** button to complete the AN5506-04-B service configuration. If the **Command Succeed** of the AN5506-04-B data port service appears in the **Command Manager** window, the AN5506-04-B port service configuration is completed. See Figure 5-38.

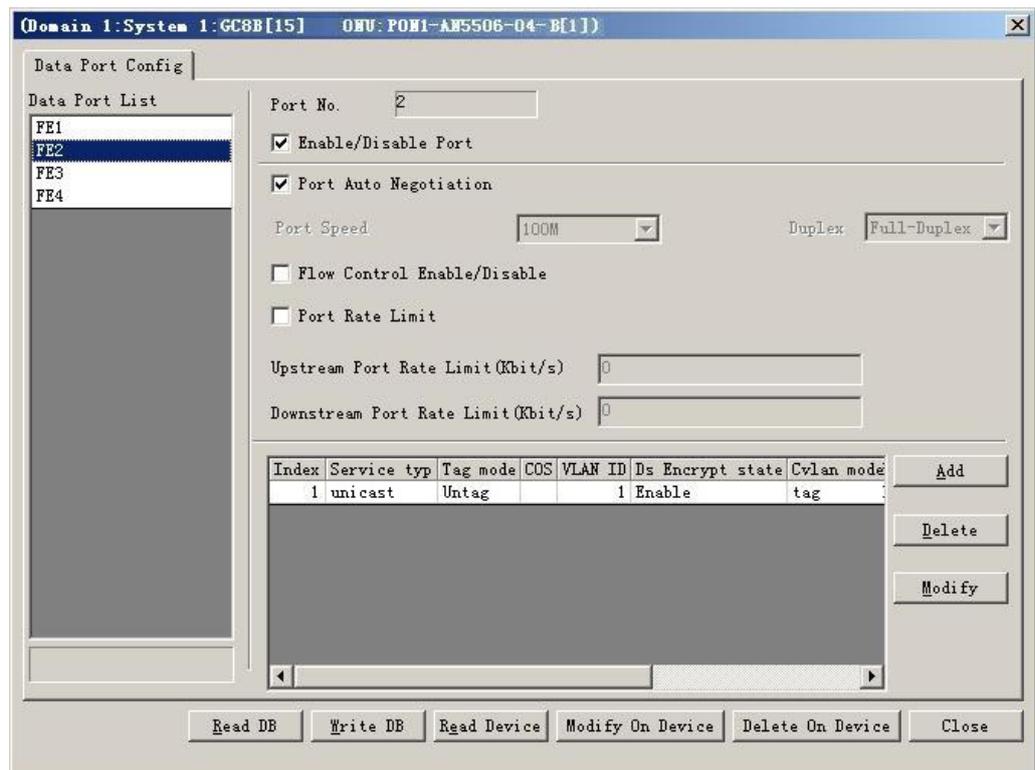


Figure 5-38 The port service configuration completed

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

### 5.2.4.1 Planning Data

Table 5-11 The planned data of data service configuration at the OLT side in the Tag 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.	Configure 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 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
	Uplink No. / TRUNK No.	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 <b>Tag</b> or <b>Untag</b> . 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 and downlinked in the form of TAG. Under TAG mode, the uplink data packets will not be processed but remain uplinked in the original form. For downlink packets, however, only packets with designated TAGs are received and the packets will not be processed but remain downlinked in the original form.	Tag
	Service Type	Select <b>data</b> in correspondence to the data service.	data
Slot Bind Mode	Select <b>Auto Bind</b> or <b>Manually Bind</b> .	Auto Bind	

Table 5-12 The planned data of data service configuration at the AN5506-04-B ONU side in the Tag mode (in a batch manner)

Item		Description	Example
Bandwidth configuration	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 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 16Kbyte/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 0Kbyte/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 64Kbyte/s.	1280
Data service profile	Profile Name	Configure according to the network planning of the operator.	b
	Enable / Disable Port	Enable is selected by default.	Enable
	Port Auto Negotiation	Enable is selected by default.	Enable
	Port Speed	The default speed is 10M. Unconfigurable when the auto negotiation is enabled.	—
	Duplex	Full-duplex is selected by default. Unconfigurable when the auto negotiation is enabled.	—
	Flow control Enable / Disable	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.	—

Item		Description	Example		
	TAG Mode	Configured as <b>Tag</b> or <b>Untag</b> according to the network planning of the operator. In the <b>Tag</b> mode the uplink data packets are tagged, while in the <b>Untag</b> mode the uplink data packets are untagged.	Untag		
	COS Mode	When the CVLAN mode is set as <b>Transparent</b> , the VLAN mode should be consistent with the COS, ranging from 0 to 7. When the Tag mode is set as <b>Untag</b> , this item is unconfigurable.	—		
	VLAN ID	When the CVLAN mode is set as <b>Transparent</b> , the VLAN mode should be consistent with the CVLAN ID, ranging from 1 to 4085. When the Tag mode is set as <b>Untag</b> , this item is unconfigurable.	—		
	Ds Encrypt State	Disable is selected by default.	Disable		
	CVLAN Mode	When the Tag mode is set as <b>Untag</b> , the CLVAN mode can be set as <b>Tag</b> or <b>Transparent</b> . When the Tag mode is set as <b>Tag</b> , the CVLAN mode can be set as <b>Translate</b> or <b>Transparent</b> .	Tag		
	CVLAN ID	Configure according to the network planning of the operator. The value range is 1 to 4085.	300		
	COS	The priority range is 0 to 7.	0		
	QinQ Enable State	Enable / disable the QinQ configuration. Disable is selected by default.	Enable		
	VLAN Name	The service name configured in the corresponding local VLAN. Unconfigurable when the QinQ enable state is disabled.	data2		
	SVLAN ID	Unconfigurable when the QinQ enable state is disabled. The range is 1 to 4085.	3000		
	COS	Unconfigurable when the QinQ enable state is disabled.	0		
Service profile	Profile Name	Configure according to the network planning of the operator.	c		
	ONU Type	The actually used ONU type	AN5506-04-B		
	ONU Subprofile Config	Profile Type	The bandwidth allocation profile should be selected.	Bandwidth allocation profile	
		Profile Name	The profile name configured in the corresponding 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	

Item		Description	Example
	ONU Port Profile Config	Profile Type	The data service profile should be selected. Data service profile
		Profile Name	The profile name configured in the corresponding data service profile b
Service profile binding	Profile ID		The profile name configured in the corresponding 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 1
	ONU S.N.		The ONU authorization number assigned according to the network planning of the operator 1

### 5.2.4.2 Configuration Flow Chart

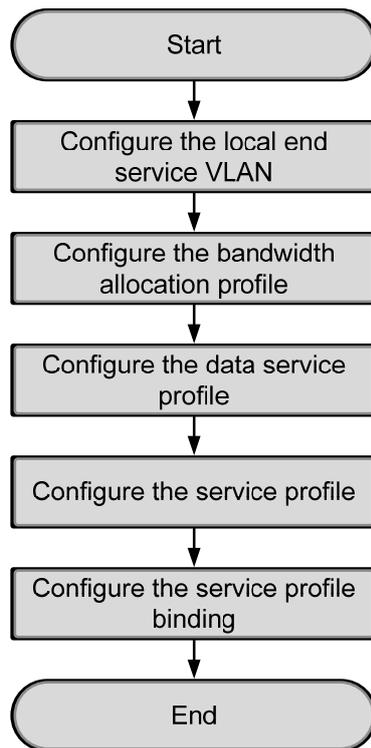


Figure 5-39 The batch configuration flow chart of data service provisioning in the Tag mode (for the AN5506-04-B)

### 5.2.4.3 Configuring the Local End Service VLAN

See Section 5.2.3.3 for configuration procedures.

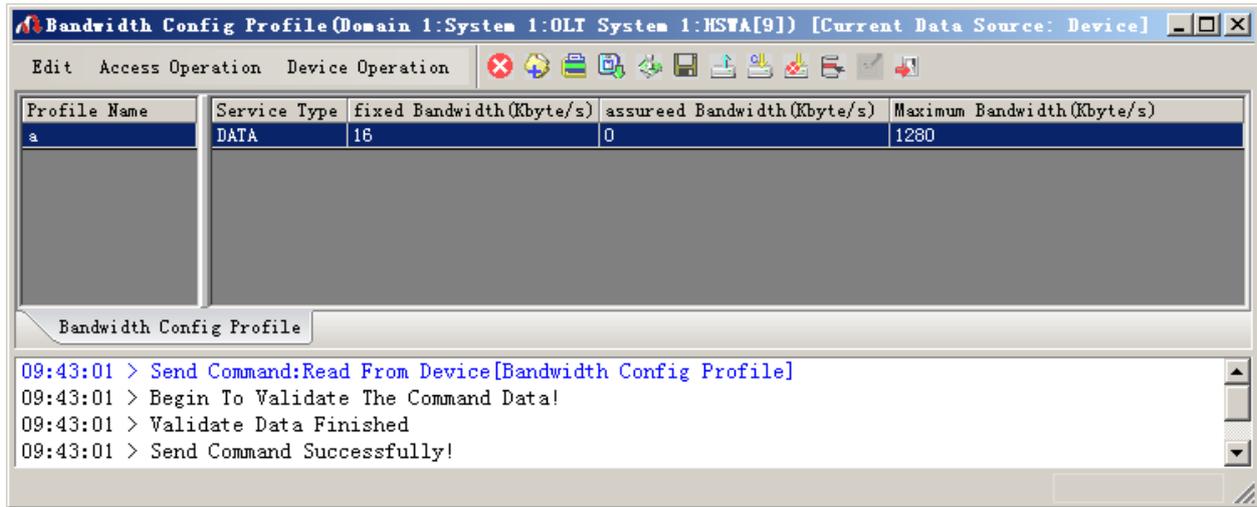
### 5.2.4.4 Configuring the Bandwidth Allocation Profile

Configuration purpose

Configure the bandwidth of the ONU data service and limit the traffic flow.

Operation steps

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 select **Edit** → **Append** on the menu bar or click the  button. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click the **OK** button. Double-click the **Profile Name** blank field and enter **a**.
3. Click the right pane and select **Edit** → **Append** on the menu bar or 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 planned data in Table 5-12. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the bandwidth allocation profile is configured. See Figure 5-40.

Figure 5-40 The **Bandwidth Config Profile** window - completed

### 5.2.4.5 Configuring the Data Service Profile

#### Configuration purpose

Configure the FE port status and working mode of the ONU and add VLAN tags to the data service.

#### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane and select **Config** → **Data Service Profile** from the shortcut menu. Click the **Data Service Profile** tab and the **Data Service Profile** window appears.
2. Click the left pane and select **Edit** → **Append** on the menu bar. 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 planned data in Table 5-12.
3. Click the right pane and select **Edit** → **Append** in the menu bar. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click **OK**. Configure the VLAN tags of the service flow according to the planned data in Table 5-12.

- When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the data service profile is configured. See Figure 5-41.

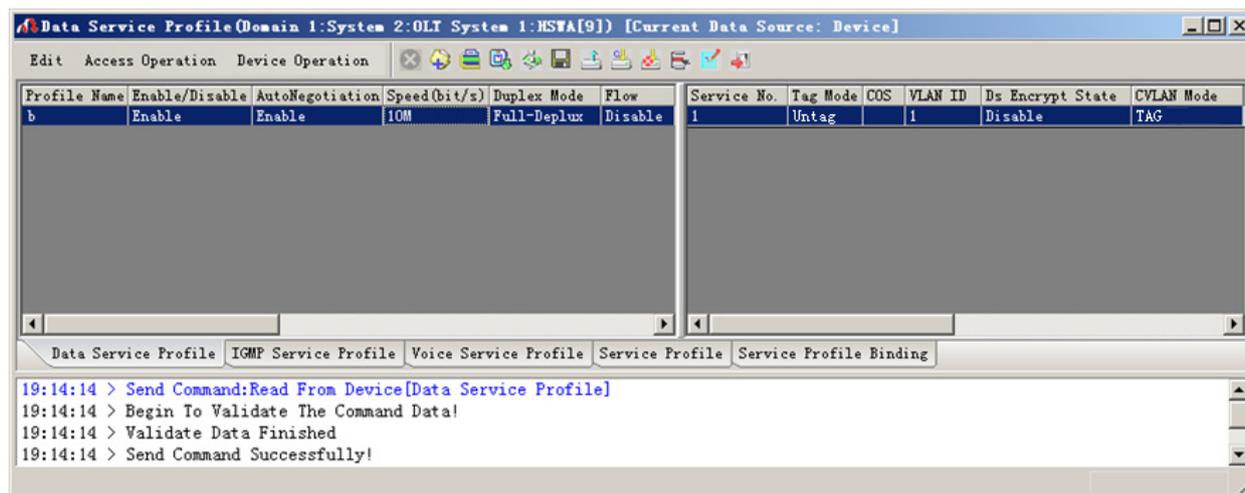


Figure 5-41 The **Data Service Profile** window - completed

## 5.2.4.6 Creating a Service Profile

### Configuration purpose

Configure the bandwidth allocation profile and data service profile for the ONU binding.

### Operation steps

- Right-click the **HSWA[9]** card in the **Object Tree** pane and select **Config** → **Service Profile** from the shortcut menu. Click the **Service Profile** tab and the **Service Profile** window appears.
- Click the left pane and select **Edit** → **Append** in the menu bar. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click **OK** to add a service profile.
- 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 access the **ONU Subprofile Config** dialog box. Click the **Add** button to add a profile configuration. Click the **Profile Type** list box and select **Bandwidth Config Profile**. Click the **Profile Name** list box and select **a**.

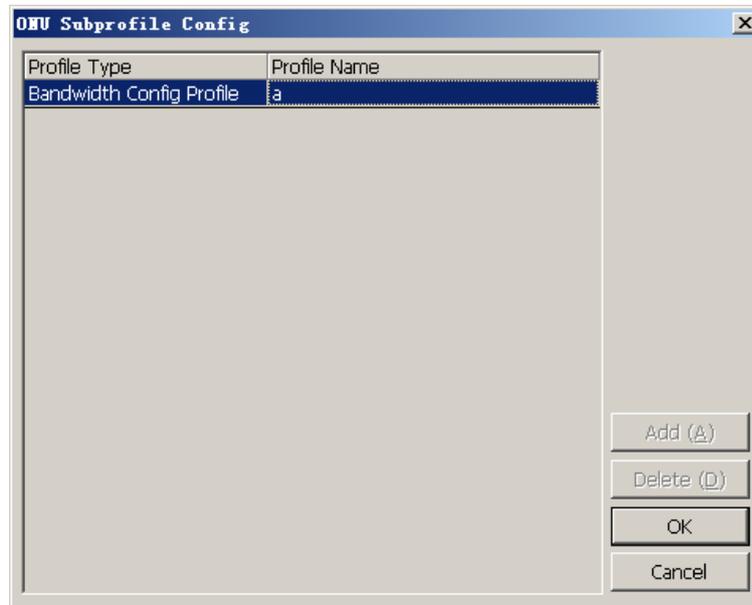


Figure 5-42 The **ONU Subprofile Config** dialog box

- Click **OK** and return to the **Service Profile** window.

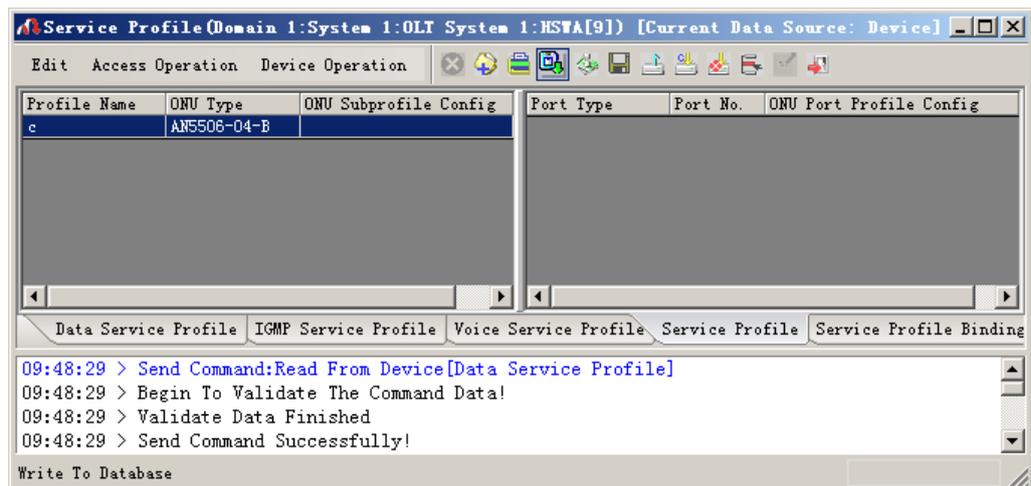


Figure 5-43 The **Service Profile** window

6. Click the right pane and select **Edit** → **Append** in the menu bar. Enter **2** in the **Please Input the Rows for Add** dialog box that appears and click **OK**.
7. Click the **Port Type** list box and select **FE**. Double-click the **Port No.** blank field and enter **1**. Repeat the procedure to enter **2**.
8. For Port No.1 click the **ONU Port Profile Config** field to access the **ONU Port Profile Config** dialog box. Click **Add** to add a profile configuration. Click the **Profile Type** list box and select **Data Service Profile**. Click the **Profile Name** list box and select **b**. Repeat the procedure for Port No.2.

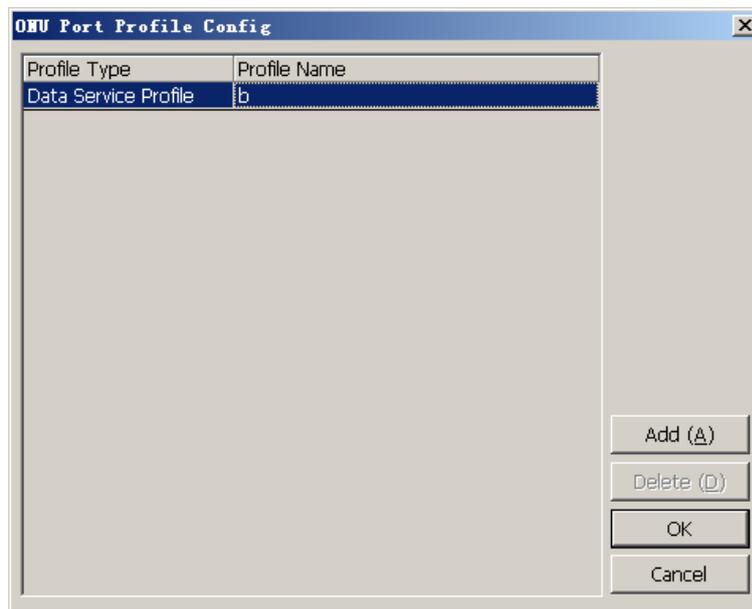


Figure 5-44 The **ONU Port Profile Config** dialog box

9. Click **OK** and return to the **Service Profile** window.
10. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the service profile is configured. See Figure 5-45.

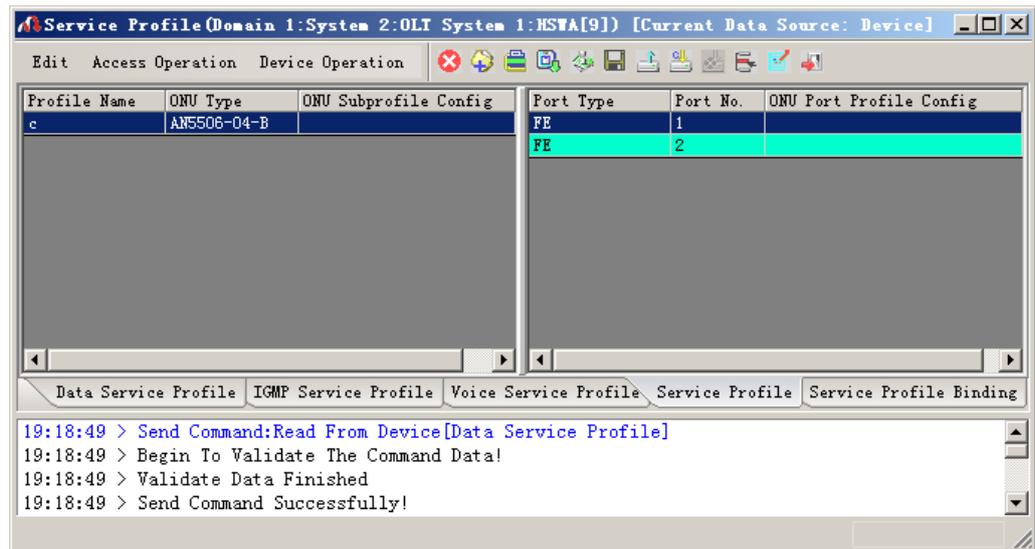


Figure 5-45 The Service Profile window - completed

### 5.2.4.7 Binding the ONU to the Service Profile

#### Configuration purpose

Apply the bandwidth allocation and data service configuration of the service profile to the ONU by binding the ONU to the service profile.

#### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane and select **Config** → **Service Profile Config** from the shortcut menu. Click the **Service Profile Binding** tab and the **Service Profile Binding** window appears.
2. Click the left pane and select **Edit** → **Append** in the menu bar. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click **OK**.
3. Click the **Profile ID** list box and select **c**. Click the **Action** list box and select **Attach**.
4. Click the right pane and select **Edit** → **Append** in the menu bar. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click **OK**.
5. Double-click the **ONU S.N.** field to bring up the **Select Objects** dialog box. Select **AN5506-04-B** in the dialog box.

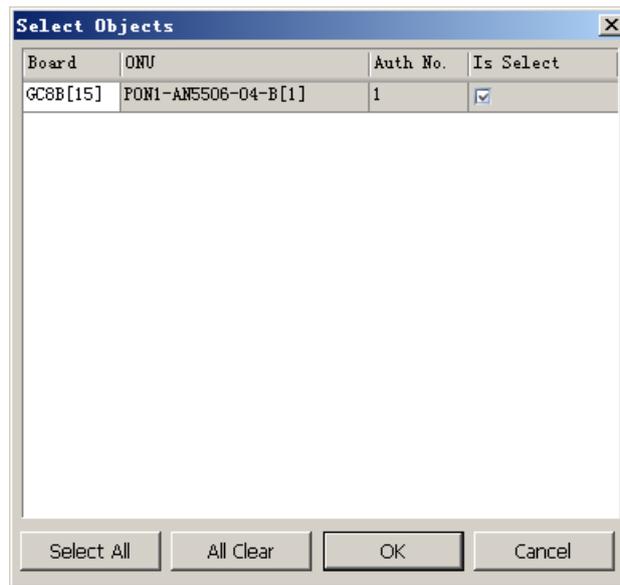


Figure 5-46 The **Select Objects** dialog box

6. Click the **OK** button and return to the **Service Profile Binding** window. Click the  button to execute the command. The **If the service profile binding and the refresh operation is performed, the original ONU service configuration will be overwritten. Are you sure to execute this command?** dialog box will appear. Click **OK** and then once again in the **Are you sure to write all data to the device?** dialog box.
7. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the AN5506-04-B has been bound to the service profile **c**. See Figure 5-47.

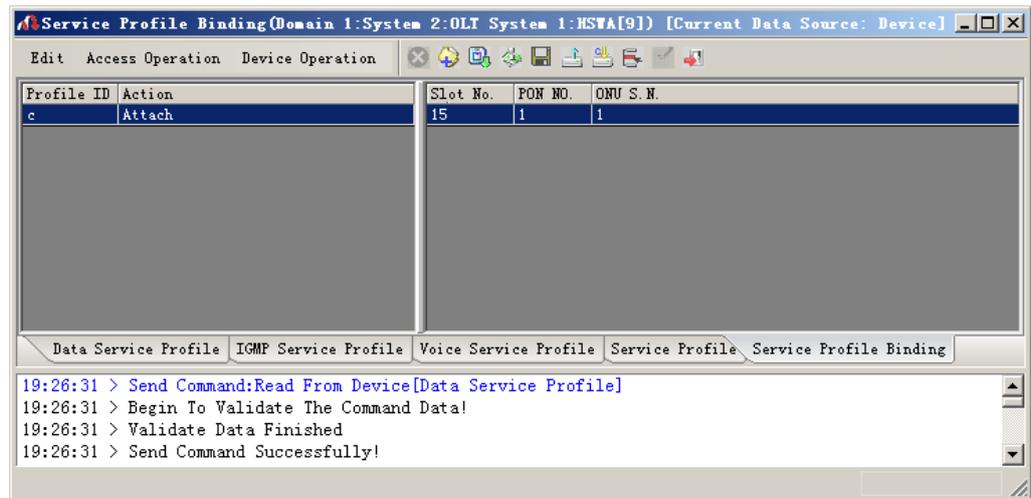


Figure 5-47 The Service Profile Binding window

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

### 5.2.5.1 Planning Data

Table 5-13 The planned data of data service configuration at the OLT side in the Tag 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 No.	Configure 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 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
	Uplink No. / TRUNK No.	The number of the actually used uplink port.	19:SFP2

Item		Description	Example
	TAG / UNTAG	The Tag processing mode of the uplink service VLAN can be set as <b>Tag</b> or <b>Untag</b> . 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 and downlinked in the form of TAG. Under TAG mode, the uplink data packets will not be processed but remain uplinked in the original form. For downlink packets, however, only packets with designated TAGs are received and the packets will not be processed but remain downlinked in the original form.	Tag
	Service Type	Select <b>data</b> in correspondence to the data service.	data
	Slot Bind Mode	Select <b>Auto Bind</b> or <b>Manually Bind</b> .	Auto Bind

Table 5-14 The planned data of data service configuration at the AN5506-10-B1 ONU side in the Tag mode (configured respectively)

Item		Description	Example	
Bandwidth configuration	Service Type	Select integrate Service.	Integrated Service	
	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 16Kbyte/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 0Kbyte/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 64Kbyte/s.	1280	
Basic information of the ONU port	ONU Port Used	The actually used ONU port	1	2
	Enable / Disable Port	Configure according to the network planning of the operator. Enable is selected by default.	Default	
	Port Auto Negotiation	Configure according to the network planning of the operator. Enable is selected by default.	Default	

Item		Description	Example
	Port Speed	Unconfigurable when the port auto negotiation is enabled. The default speed is 100M.	Default
	Duplex	Unconfigurable when the port auto negotiation is enabled. The default value is full-duplex.	Default
	Flow control Enable / Disable	Configure according to the network planning of the operator. Disable is selected by default.	Default
ONU port service config	TLS	Configure according to the network planning of the operator. Select TLS or No TLS.	No TLS
	Service Type	Data service. Select Unicast.	Unicast
	VLAN Mode	Configure according to the network planning of the operator. Select Tag or Transparent.	Tag
	CVLAN TPID	The default value is 33024.	33024
	CVLAN ID	Configure according to the network planning of the operator. The value range is 1 to 4085.	400
	Priority or COS	The CVLAN priority. The value range is 1 to 7.	0
	QinQ State	Enable / disable the QinQ configuration.	Enable
	Service Name	Corresponding to the configured local end service VLAN.	data2
	VLAN ID	Configure the SVLAN ID according to the network planning of the operator within the range of 1 to 4085.	3001
	SVLAN TPID	The default value is 33024.	33024
	Priority or COS	The SVLAN priority. The value range is 0 to 7.	0

### 5.2.5.2 Configuration Flow Chart

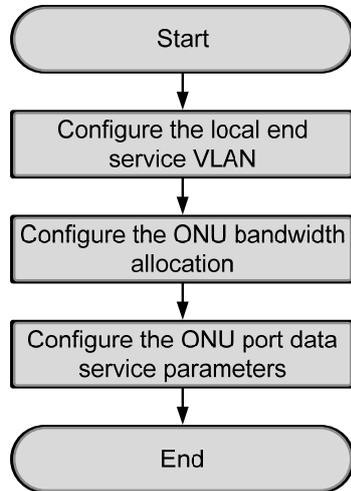


Figure 5-48 Flow chart for provisioning data services respectively in the Tag mode (for the AN5506-10-B1)

### 5.2.5.3 Configuring the Local End Service VLAN

See Section 5.2.3.3 for configuration procedures.

### 5.2.5.4 Configuring the Bandwidth Allocation

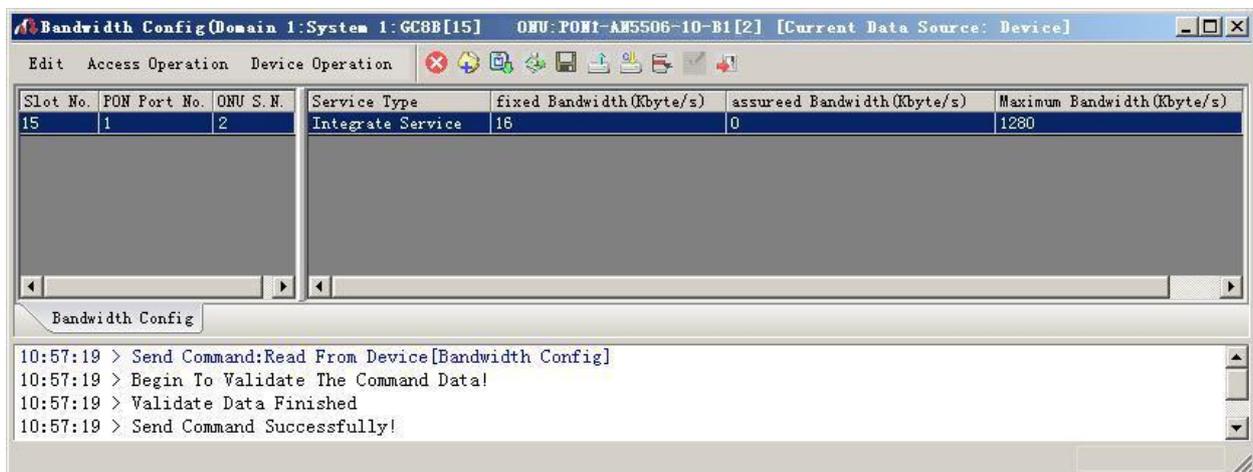
Configuration purpose

Configure the bandwidth of the ONU data service and limit the traffic flow.

Operation steps

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.

- Click the right pane and select **Edit** → **Append** on the menu bar or click the  button. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click the **OK** button.
- Configure according to the planned data in Table 5-14. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the bandwidth allocation is configured. See Figure 5-49.

Figure 5-49 The **Bandwidth Config** window - completed

### 5.2.5.5 Configuring the ONU Port Data Service Parameters

#### Configuration purpose

Configure the FE port status and working mode of the ONU and add VLAN tags to the data service.

#### Operation steps

- Click the **GC8B[15]** card in the **Object Tree** pane and information about 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. Select the **ONU Port Config** tab, as shown in Figure 5-50.

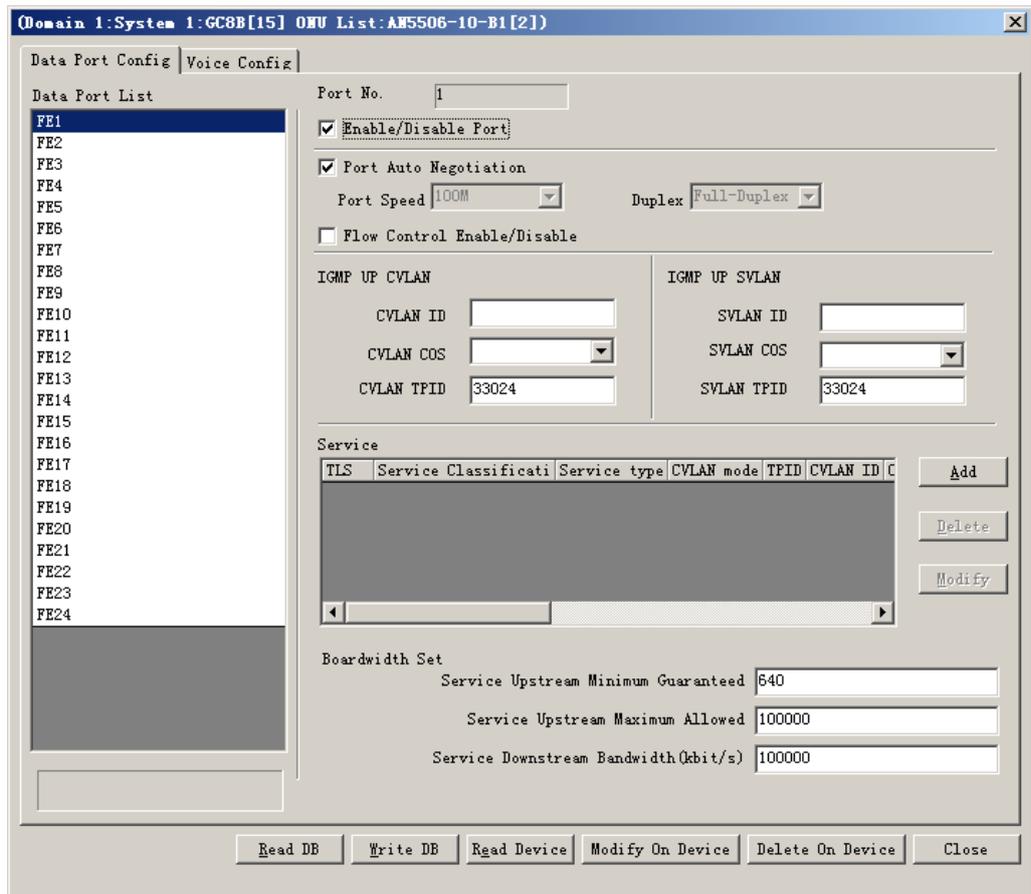


Figure 5-50 The ONU port service configuration

2. Select **FE1** from the **Data Port List** in Figure 5-50. Click **Add** to create a data service and configure it according to the planned data in Table 5-14.

Figure 5-51 The **Services Configuration** dialog box

3. Click **OK** and return to the dialog box shown in Figure 5-50. Right-click **FE1** in the **Data Port List** and select **Copy Port Config**. Right-click **FE2** and select **Paste Port Config** to enable the FE2 port.
4. After the configuration, click the **Modify on Device** button to complete the AN5506-10-B1 service configuration. If the **Command Succeed** of the **AN5506-10-B1** data port service appears in the **Command Manager** window, the AN5506-10-B1 port service configuration is completed. See Figure 5-52.

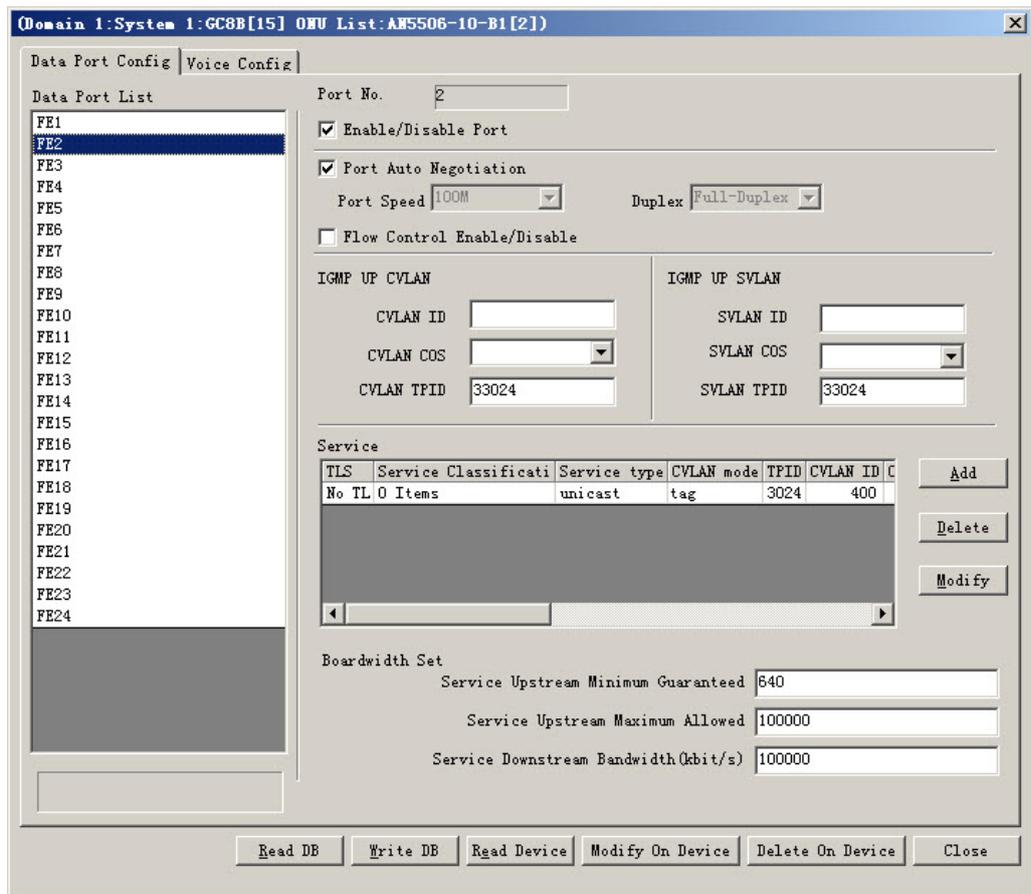


Figure 5-52 The ONU port service configuration completed

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

### 5.2.6.1 Planning Data

Table 5-15 The planned data of data service configuration at the OLT side in the Tag 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.	Configure 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 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
	Uplink No. / TRUNK No.	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 <b>Tag</b> or <b>Untag</b> . 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 and downlinked in the form of TAG. Under TAG mode, the uplink data packets will not be processed but remain uplinked in the original form. For downlink packets, however, only packets with designated TAGs are received and the packets will not be processed but remain downlinked in the original form.	Tag
	Service Type	Select <b>data</b> in correspondence to the data service.	data
Slot Bind Mode	Select <b>Auto Bind</b> or <b>Manually Bind</b> .	Auto Bind	

Table 5-16 The planned data of data service configuration at the AN5506-10-B1 ONU side in the Tag mode (in a batch manner)

Item		Description	Example
Bandwidth Config Profile	Profile Name	The name of the bandwidth allocation profile	a
	Service Type	Select integrated service.	Integrated Service
	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 16Kbyte/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 0Kbyte/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 64Kbyte/s.	1280
Bandwidth allocation profile binding	Slot No.	The number of the actually used slot	15
	PON No.	The number of the actually used PON	1
	ONU S.N.	The ONU authorization number allocated according to the network planning of the operator.	2
	GPON Bandwidth Profile	The name of the configured bandwidth allocation profile	a
Service model VLAN	Profile Name	Configure 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	Configure the QinQ service and enable the function.	Enable
SVLAN profile	Profile Name	The SVLAN profile name	c
	SVLAN Name	The corresponding configured local end service VLAN	data2
	STPID	The default value is 33024.	33024
	SVLAN ID	The configured SVLAN ID. The value range is 1 to 4085.	3001

Item		Description	Example	
	SCOS	The SVLAN priority. The value range is 0 to 7 with the 7 as the highest priority and 0 as the lowest.	0	
ONU data port configuration	Port No.	The actually used ONU port	1	2
	Port Enable / Disable	Configure the port enable function.	Enable	
	MAC Limit	Configured as no MAC limit.	0	
ONU data service configuration	CTPID	The default value is 33024.	33024	
	CVLAN ID	The CVLAN ID, ranging from 1 to 4085.	400	
	CCOS	The user CVLAN priority configuration, ranging from 0 to 7 with the 7 as the highest priority and 0 as the lowest.	0	
	Service ID	The corresponding configured local end service VLAN	data2	
	Service Profile	Select the configured service model profile.	b	
	SVLAN Profile	Select the configured SVLAN profile.	c	

### 5.2.6.2 Configuration Flow Chart

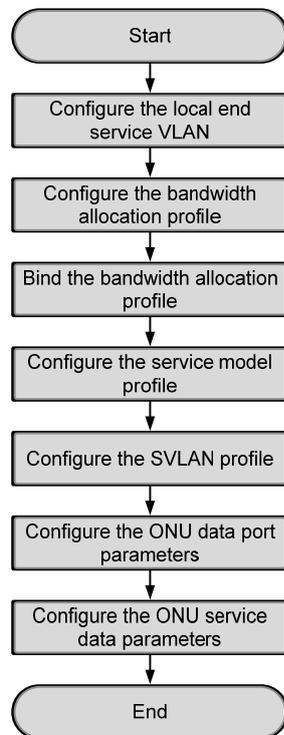


Figure 5-53 The batch configuration flow chart of data service provisioning in the Tag mode (for the AN5506-10-B1)

### 5.2.6.3 Configuring the Local End Service VLAN

See Section 5.2.3.3 for configuration procedures.

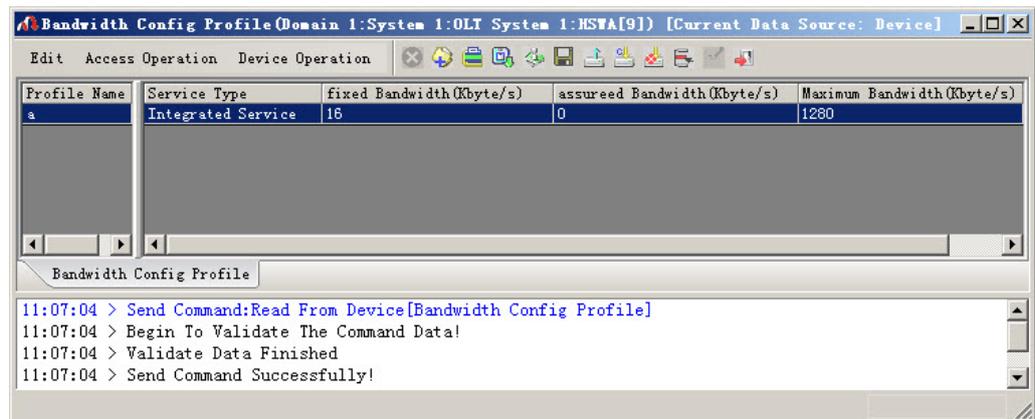
### 5.2.6.4 Configuring the Bandwidth Allocation Profile

Configuration purpose

Configure the bandwidth of the ONU data service and limit the traffic flow.

Operation steps

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 select **Edit** → **Append** on the menu bar or click the  button. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click the **OK** button. Double-click the **Profile Name** blank field and enter **a**.
3. Click the right pane and select **Edit** → **Append** on the menu bar or 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 planned data in Table 5-16. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the bandwidth allocation profile is configured. See Figure 5-54.

Figure 5-54 The **Bandwidth Config Profile** window - completed

### 5.2.6.5 Binding the Bandwidth Allocation Profile

#### Configuration purpose

Bind the configured bandwidth allocation profile to the ONU.

#### Configuration example

1. Right-click the system in the **Object Tree** and select **Config** → **Batch Config** → **ONU Configuration** to access the ONU configuration window.
2. Click **Set Object as Condition** in the **Config Object** pane and all configuration objects will appear in the lower pane (you can drill down and select a specific port as the object). Select the **AN5506-10-B1[2]** under the PON 1 in Slot 15 and click the **OK** button.

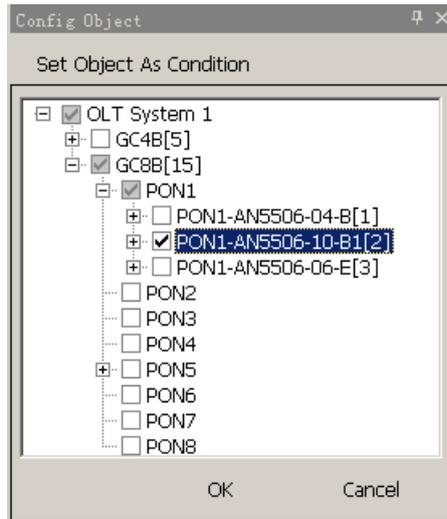


Figure 5-55 Set the configuration objects

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. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the bandwidth allocation profile is bound. See Figure 5-56.

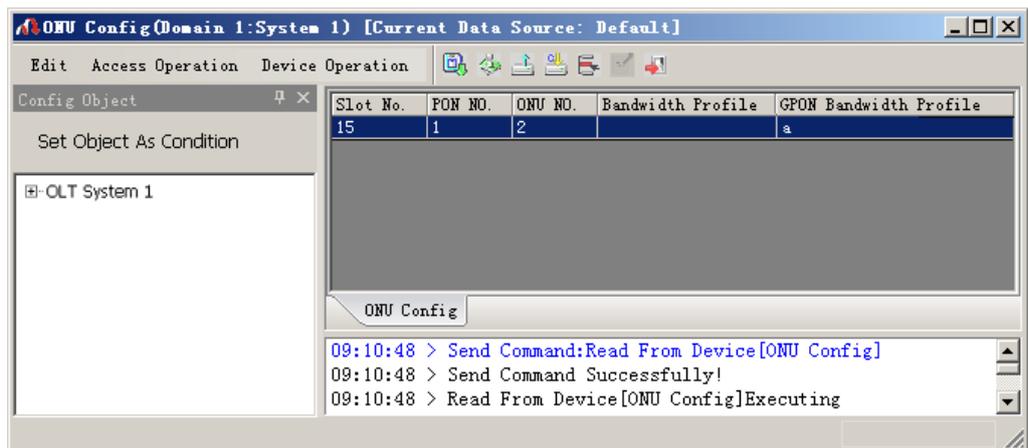


Figure 5-56 The **ONU Config** window - completed

## 5.2.6.6 Configuring the Service Model Profile

### Configuration purpose

Select the data service type, CVLAN mode and determine whether to enable the translation function and the QinQ function.

### Configuration example

1. Right-click the system in the **Object Tree** pane and select **Config** → **Profile Definition** → **Service Model Profile** to access the service model profile configuration window.
2. Select **Edit** → **Append** in the menu bar of the window or click the  button. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click **OK** to add a service model profile.
3. Configure according to the planned data in Table 5-16. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the service model profile is configured. See Figure 5-57.

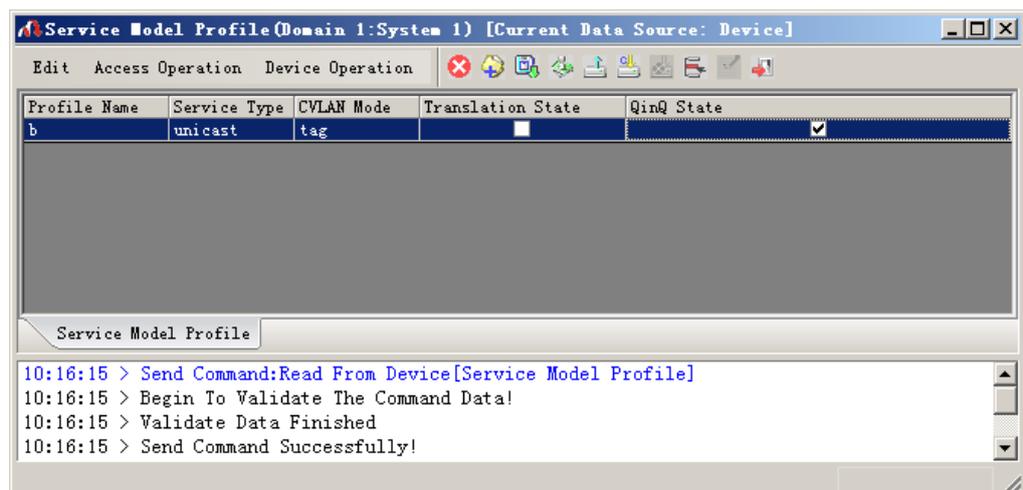


Figure 5-57 The **Service Model Profile** window - completed

## 5.2.6.7 Configuring the SVLAN Profile

### Configuration purpose

Configure the SVLAN value to apply in the ONU data service parameter configuration.

### Configuration example

1. Right-click the system in the **Object Tree** pane and select **Config** → **Profile Definition** → **SVLAN Profile** from the shortcut menu to access the SVLAN profile configuration window.
2. Select **Edit** → **Append** in the menu bar of the window or click the  button. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click **OK** to create an SVLAN profile.
3. Configure according to the planned data in Table 5-16. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the SVLAN profile is configured. See Figure 5-58.

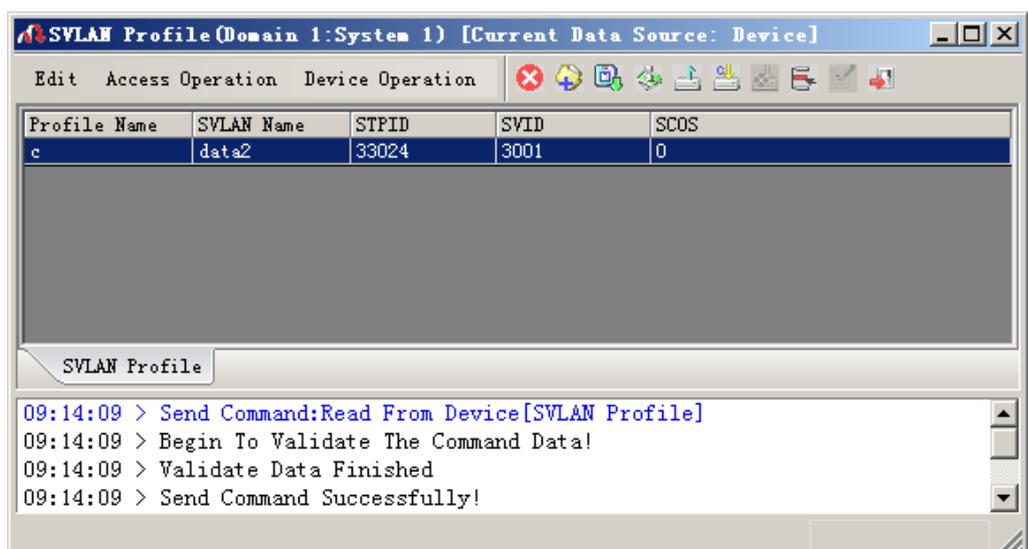


Figure 5-58 The **SVLAN Profile** window - completed

### 5.2.6.8 Configuring the ONU Data Port Parameters

#### Configuration purpose

Enable the ONU ports and limit the number of MAC addresses in a batch manner.

#### Configuration example

1. Right-click the system in the **Object Tree** pane and select **Config** → **Batch Config** → **ONU Data Port Config** from the shortcut menu to access the ONU data port configuration window.
2. Click **Set Object as Condition** in the **Config Object** pane and all configuration objects (you can drill down and select a specific port as the object) will appear in the lower part. Select **FE1** and **FE2** of the AN5506-10-B1[2] listed under the PON 1 in Slot 15 and click **OK**.

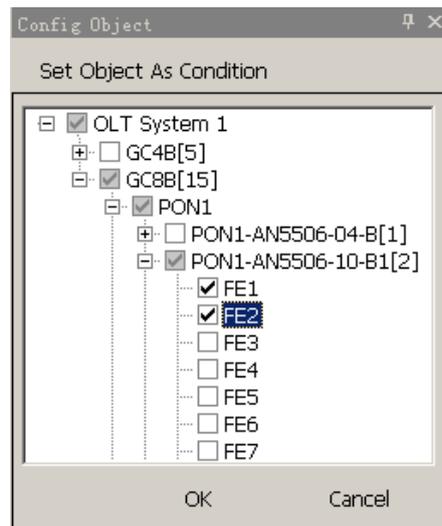


Figure 5-59 Set the configuration objects

3. The specific configuration information of the objects will appear in the right pane. Configure according to the planned data in Table 5-16. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the ONU data port parameters are configured. See Figure 5-60.

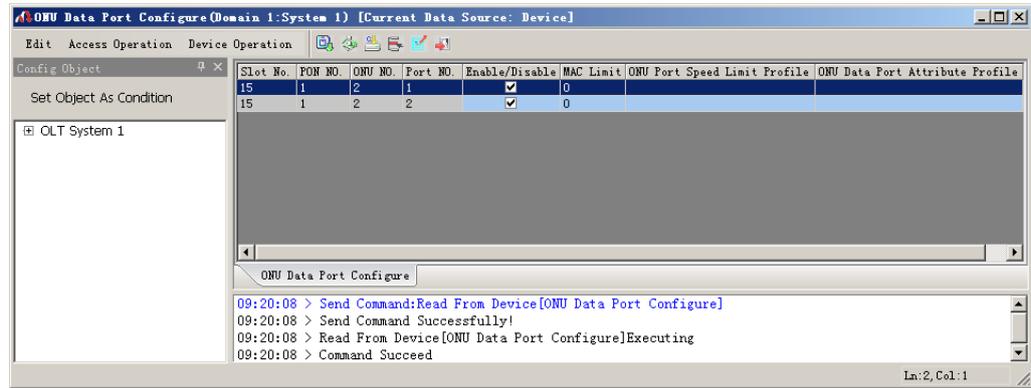


Figure 5-60 The ONU Data Port Configure window

## 5.2.6.9 Configuring the ONU Data Service Parameters

### Configuration purpose

Configure the CVLAN and SVLAN for the data service flow uplinked to the ONU port in a batch manner.

### Configuration example

1. Right-click the system in the **Object Tree** pane and select **Config** → **Batch Config** → **ONU Data Service Configure** from the shortcut menu to access the ONU data service configuration window.
2. Click the  button on the menu bar and the **Add Item Number** dialog box appears. Select configuration objects (you can drill down and select a specific port as the object) in the left pane. Select **FE1** and **FE2** of the ONU and click **OK** to return to the **ONU Data Service Configure** window.

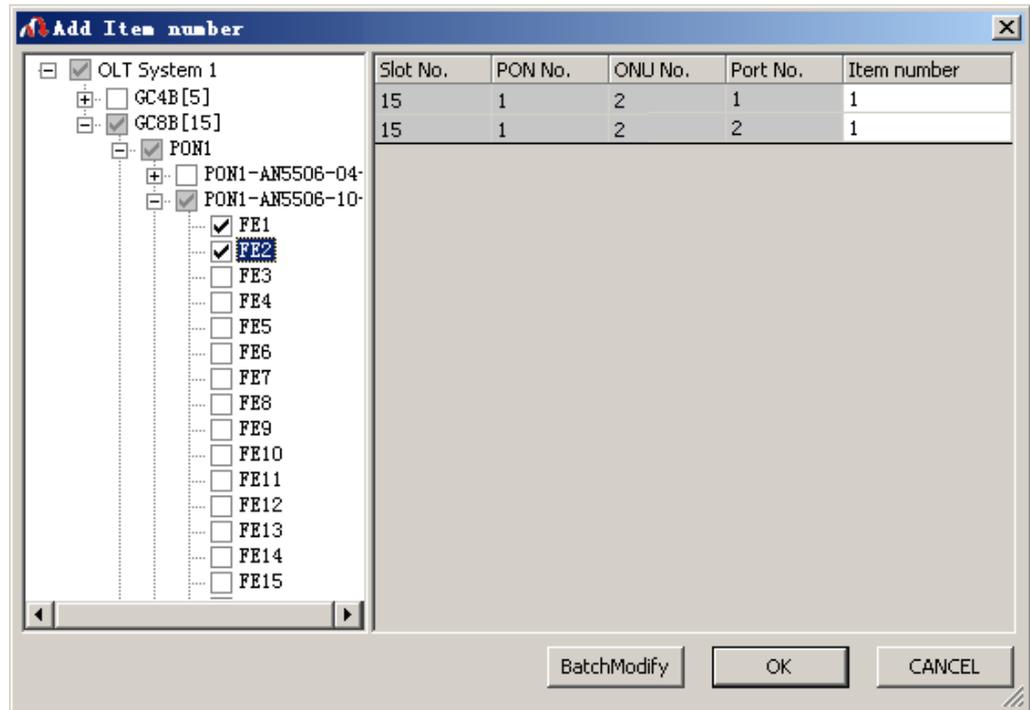


Figure 5-61 The Add Item Number dialog box

- The specific configuration information of the objects will appear in the right pane. Configure according to the planned data in Table 5-16. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the ONU data service parameters are configured. See Figure 5-62.

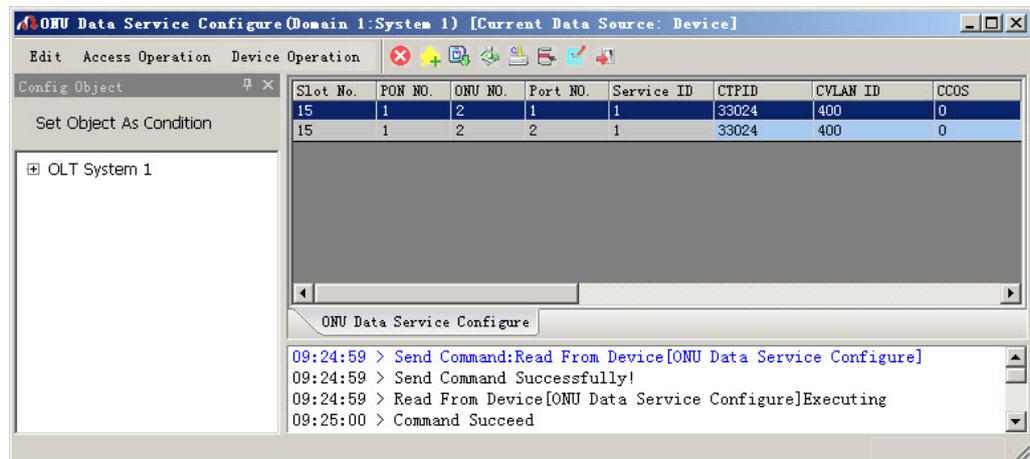


Figure 5-62 The ONU Data Service Configure window

## **5.2.7 End of Configuration**

After being added with stacked VLAN tags, the PC1 to PC4 can access the Internet via home gateways normally.

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

### 5.3.1 Configuration Rules

The AN5116-06B supports the QinQ data service, which means it supports the VLAN stacking as well. In this example the GC8B card is used as the service interface card and the AN5506-04-B and the AN5506-10-B1 are used as ONUs to introduce the data service configuration in the VLAN 1:1 translation mode.

- ◆ The QinQ data service in the VLAN 1:1 translation mode can be configured via the SVLAN configuration on the ONU or the OLT. In this example the service is configured via the SVLAN configuration on the OLT.
- ◆ The inner layer VLAN translation can be configured on the ONU or the OLT. In this example the translation is configured on the 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.
- ◆ Translation mode: The Ethernet data uploaded from the subscriber side will be added with a fixed Tag when passing the subscriber's home gateway. Because the Tag added by the HG may not fall in the valid range defined by the operator, the default Tag added by the HG will be deleted by the ONU when the service is uplinked to the ONU equipment. The service will be added with a reasonable Tag and transmitted to the AN5116-06B, which will then add the SVLAN ID to the data service. Finally the data service with stacked service VLAN tags will be transmitted to the upper layer network side equipment.
- ◆ 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 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.

### 5.3.2 Service Network

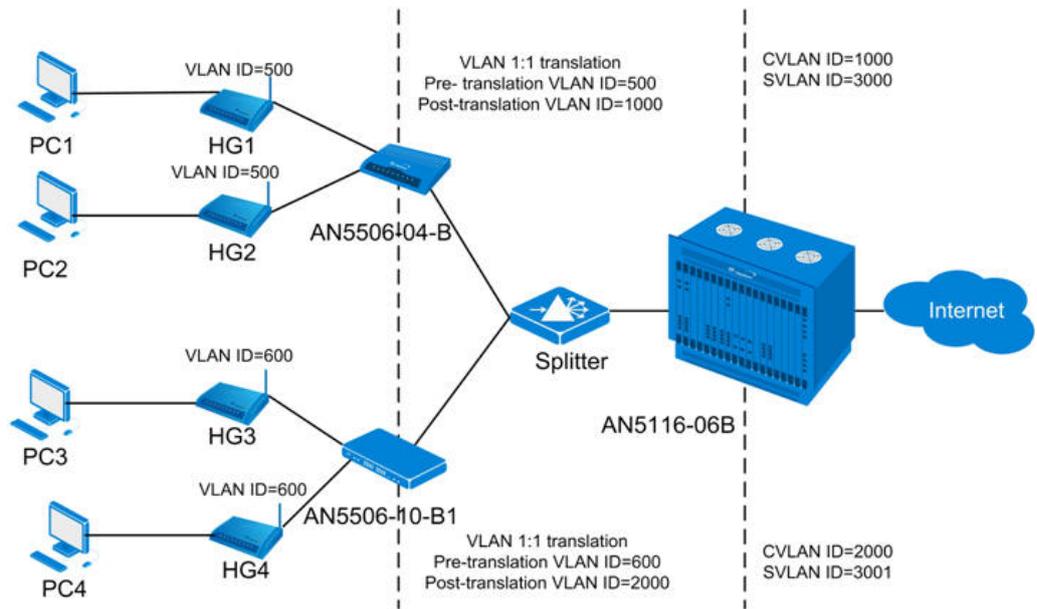


Figure 5-63 The data service network diagram (in the VLAN 1:1 translation mode)

As Figure 5-63 shows, the data uploaded from the subscriber is added with fixed Tag and then sent to the ONU using the HG. The ONU translates the VLAN ID of the fixed Tag and transmits it to the AN5116-06B via the splitter. And the AN5116-06B adds the second SVLAN tag to the first VLAN tag and transmits the packet to the upper layer network. For the downlink direction, the reverse process takes place.

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.

## 5.3.3 Configuring Data Services Respectively (for the AN5506-04-B)

### 5.3.3.1 Planning Data

Table 5-17 The planned data of data service configuration 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 No.	Configure 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 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.	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 <b>Tag</b> or <b>Untag</b> . 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 and downlinked in the form of TAG. Under TAG mode, the uplink data packets will not be processed but remain uplinked in the original form. For downlink packets, however, only packets with designated TAGs are received and the packets will not be processed but remain downlinked in the original form.	Tag
	Service Type	Select <b>data</b> in correspondence to the data service.	data
	Slot Bind Mode	Select <b>Auto Bind</b> or <b>Manually Bind</b> .	Auto Bind

Table 5-18 The planned data of data service configuration at the AN5506-04-B ONU side in the VLAN 1:1 translation mode (configured respectively)

Item		Description	Example	
Bandwidth Configuration	Service Type	Select broadband Internet access.	Broadband Internet access	
	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 16Kbyte/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 0Kbyte/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 64Kbyte/s.	1280	
Basic information of the ONU port	ONU Port Used	The actually used ONU port	1	2
	Enable / Disable Port	Configure according to the network planning of the operator. Enable is selected by default.	Default	
	Port Auto Negotiation	Configure according to the network planning of the operator. Enable is selected by default.	Default	
	Port Speed	Unconfigurable when the port auto negotiation is enabled. The default speed is 100M.	Default	
	Duplex	Unconfigurable when the port auto negotiation is enabled. The default value is full-duplex.	Default	
	Flow control Enable / Disable	Configure according to the network planning of the operator. Disabled by default.	Default	
ONU port data service parameters	TAG Mode	Configured as <b>Tag</b> or <b>Untag</b> according to the network planning of the operator. In the <b>Tag</b> mode the uplink data packets are tagged, while in the <b>Untag</b> mode the uplink data packets are untagged.	Tag	
	Service Type	Configured as <b>Unicast</b> or <b>Multicast</b> .	Unicast	
	VLAN Mode	When the CVLAN mode is set as <b>Transparent</b> , the VLAN mode should be consistent with the COS, ranging from 0 to 7. When the Tag mode is set as <b>Untag</b> , this item is unconfigurable.	0	

Item		Description	Example	
	VLAN ID	When the CVLAN mode is set as <b>Transparent</b> , the VLAN mode should be consistent with the CVLAN ID, ranging from 1 to 4085. When the Tag mode is set as <b>Untag</b> , this item is unconfigurable.	500	
	CVLAN Mode	When the Tag mode is set as <b>Untag</b> , the CVLAN mode can be set as <b>Tag</b> or <b>Transparent</b> . When the Tag mode is set as <b>Tag</b> , the CVLAN mode can set as <b>Translation</b> or <b>Transparent</b> .	Translation	
	CVLAN ID	Configure according to the network planning of the operator. The range is 1 to 4085.	1000	
	COS	The CVLAN priority, ranging from 1 to 7.	0	
	Ds Encrypt State	Disable is selected by default.	Disable	
	QinQ Enable	Enable / disable the QinQ configuration	Disable	
	SVLAN ID	Unconfigurable when the QinQ enable status is disabled. The range is 1 to 4085.	—	
	Service Name	Corresponds to the configured local end service VLAN. Unconfigurable when the QinQ enable status is disabled.	—	
	COS	The SVLAN priority, ranging from 1 to 7. Unconfigurable when the QinQ enable status is disabled.	—	
GPON OLT VLAN Operation Table	Domain Name	Configure according to the network planning of the operator.	abc1	
	VLAN ID	The corresponding inner VLAN value of the uplink service flow from the ONU, ranging from 1 to 4085.	1000	
	Priority	The inner VLAN translation priority of the downlink service flow, ranging from 0 to 7.	—	
	VLAN Layer 2	Outer VLAN Cos	The SVLAN priority, ranging from 0 to 7.	0
		Outer VLAN Vid	The item is used to add the SVLAN value, ranging from 1 to 4085.	3000
	VLAN Layer 1	Inner VLAN Cos	The inner VLAN translation priority of the uplink service flow, ranging from 0 to 7, or null.	—

Item		Description	Example
	Inner VLAN ID	The item can be used to translate the inner VLAN of the uplink service flow from the ONU. If translation is required, the item is the translated VLAN value. If not required, the item is consistent with the VLAN identifier or null.	—
PON Attach / Detach VLAN Table	Slot No.	The number of the actually used slot	15
	PON Port	The number of the actually used PON	1
	Action	Attach / detach the VLAN operation table.	Attach
	Table Name	Select the configured VLAN operation table name.	abc1

### 5.3.3.2 Configuration Flow Chart

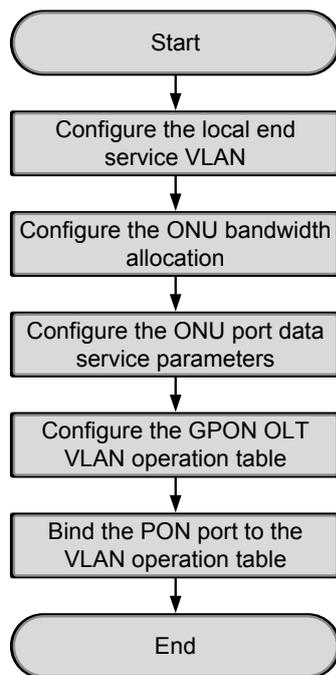


Figure 5-64 Flow chart for provisioning data services respectively in the VLAN 1:1 translation mode (for the AN5506-04-B)

### 5.3.3.3 Configuring the Local End Service VLAN

#### Configuration purpose

Configure the uplink port VLAN of the AN5116-06B for the designated service flow and limit the VLAN range of the service.

#### Operation steps

1. Right-click the **HWSA[9]** card in the **Object Tree** pane and select **Config** → **Local VLAN** from the shortcut menu. In the window click the **Local End Service VLAN** tab and the local VLAN configuration window appears.
2. Click **Edit** → **Append** in the menu bar of the window or click the  button. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click **OK** to create a local VLAN.
3. Configure according to the planned data in Table 5-17. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the local end service VLAN is configured. See Figure 5-56.

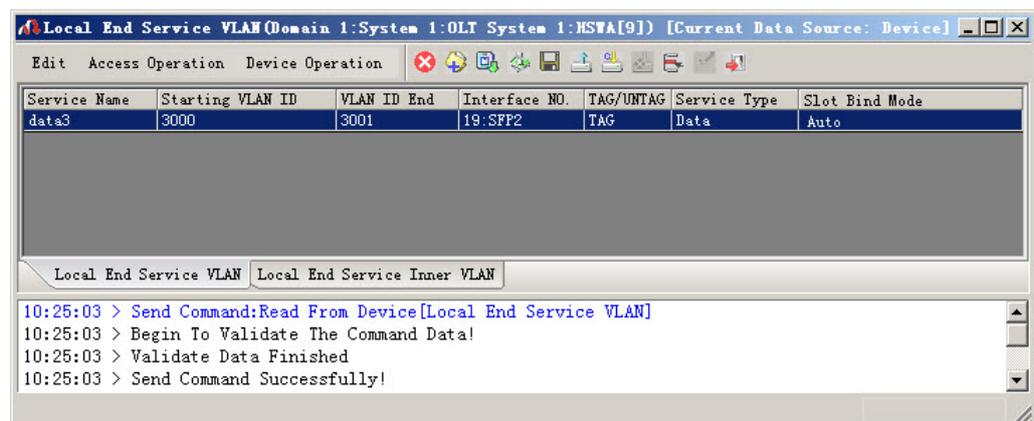


Figure 5-65 The **Local End Service VLAN** window - completed

### 5.3.3.4 Configuring the Bandwidth Allocation

#### Configuration purpose

Configure the bandwidth of the ONU data service and limit the traffic flow.

#### Operation steps

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** → **Bandwidth Config** from the shortcut menu to access the bandwidth allocation configuration window.
2. Click the right pane and select **Edit** → **Append** from the menu bar, or click the  button. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click **OK**.
3. Configure according to the planned data in Table 5-18. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the bandwidth allocation is configured. See Figure 5-66.

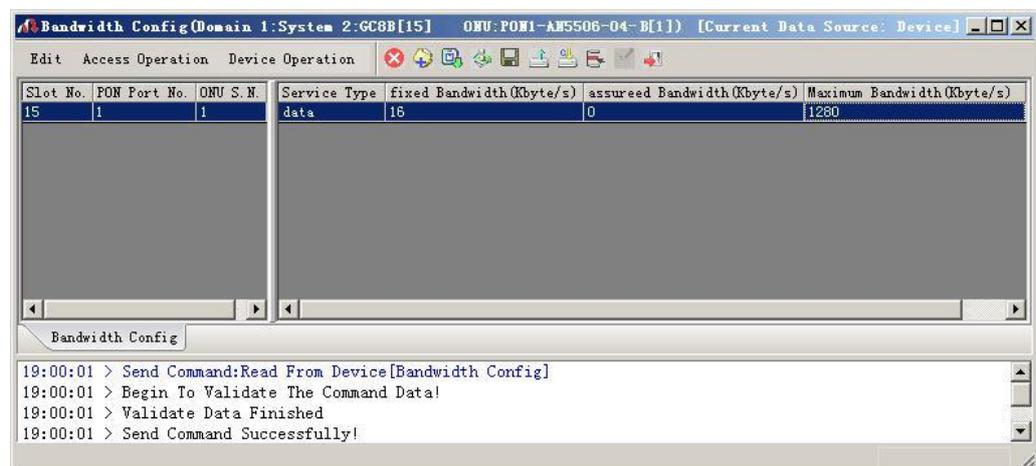


Figure 5-66 The **Bandwidth Config** window

### 5.3.3.5 Configuring the ONU Port Data Service Parameters

#### Configuration purpose

Configure the FE port status and working mode of the ONU and add VLAN tags to the data service.

#### Operation steps

1. Click the **GC8B[15]** card in the **Object Tree** pane and information about 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** → **Service Config** from the shortcut menu. Select the **ONU Port Config** tab, as shown in Figure 5-67.

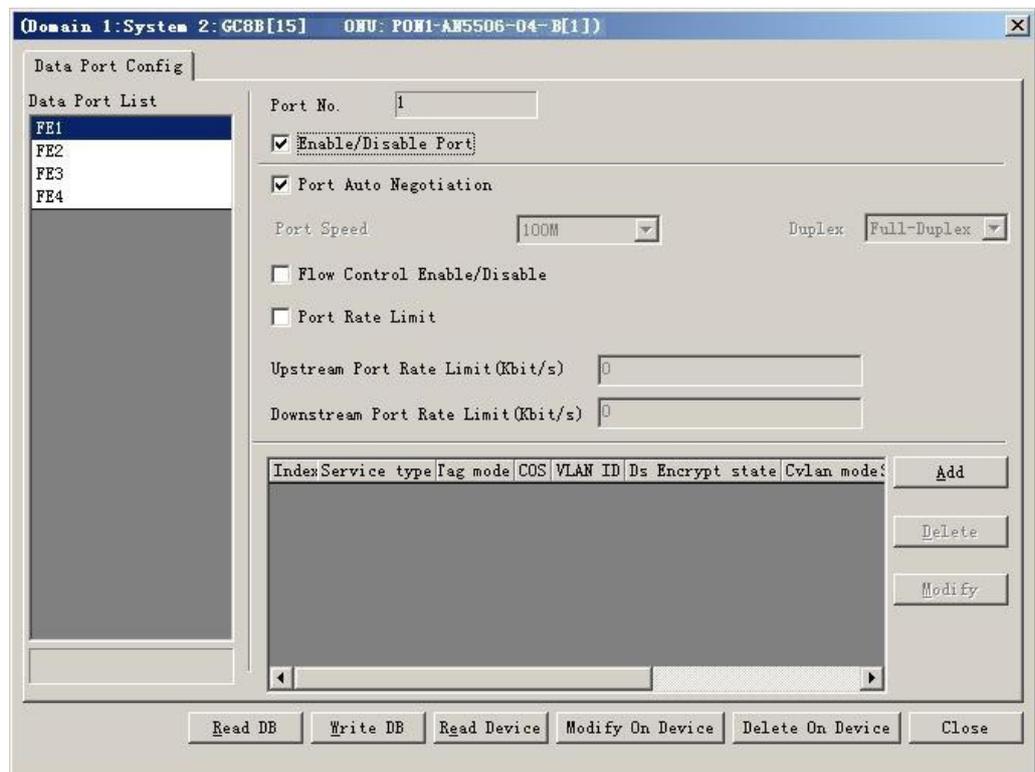
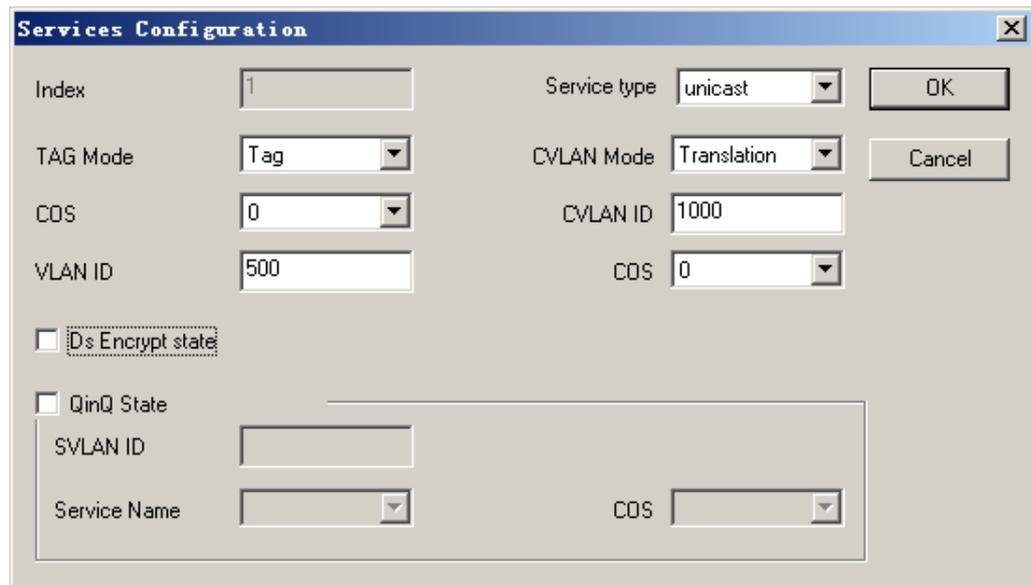


Figure 5-67 The ONU port service configuration

2. Select **FE1** from the **Data Port List** in Figure 5-67. Click **Add** to create a data service and configure according to the planned data in Table 5-18.



The Services Configuration dialog box is shown with the following fields and controls:

- Index: 1
- Service type: unicast
- OK button
- TAG Mode: Tag
- CVLAN Mode: Translation
- Cancel button
- COS: 0
- CVLAN ID: 1000
- VLAN ID: 500
- COS: 0
- Ds Encrypt state
- QinQ State
- SVLAN ID: [empty text box]
- Service Name: [empty dropdown menu]
- COS: [empty dropdown menu]

Figure 5-68 The **Services Configuration** dialog box

3. Click **OK** and return to the dialog box shown in Figure 5-67. Right-click **FE1** in the **Data Port List** and select **Copy Port Config**. Right-click **FE2** and select **Paste Port Config**.
4. After the configuration, click the **Modify on Device** button and complete the AN5506-04-B service configuration. When the **Command Succeed** of the AN5506-04-B data port service appears in the **Command Manager** window, the AN5506-04-B port service configuration is completed. See Figure 5-69.

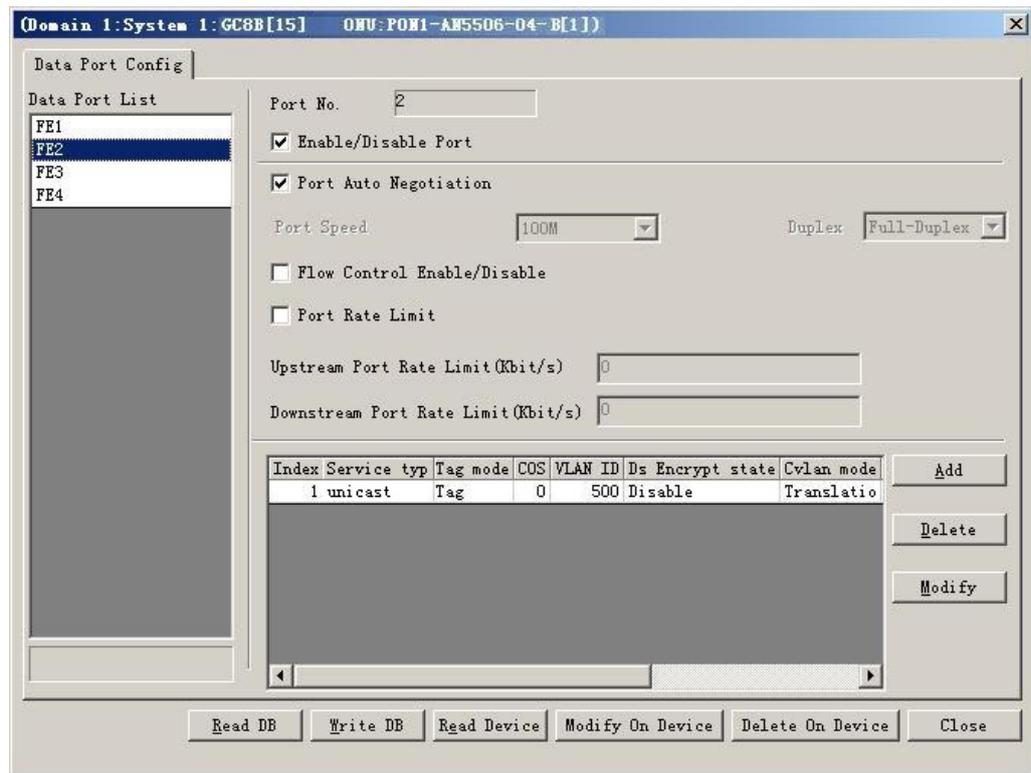


Figure 5-69 The port service configuration completed

### 5.3.3.6 Configuring the GPON OLT VLAN Operation Table

#### Configuration purpose

Perform the QinQ function of the data service by completing the SVLAN ID configuration on the GPON OLT VLAN operation table.

#### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane and select **Config** → **QinQ** → **GPON OLT VLAN Operation Table** from the shortcut menu to access the **GPON OLT VLAN Operation Table** window.
2. Select **Edit** → **Append** in the menu bar or click the  button. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click the **OK** button. Double-click the **Domain Name** blank field and enter **abc1**.

- Configure according to the planned data in Table 5-18. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the GPON OLT VLAN operation table is configured. See Figure 5-70.

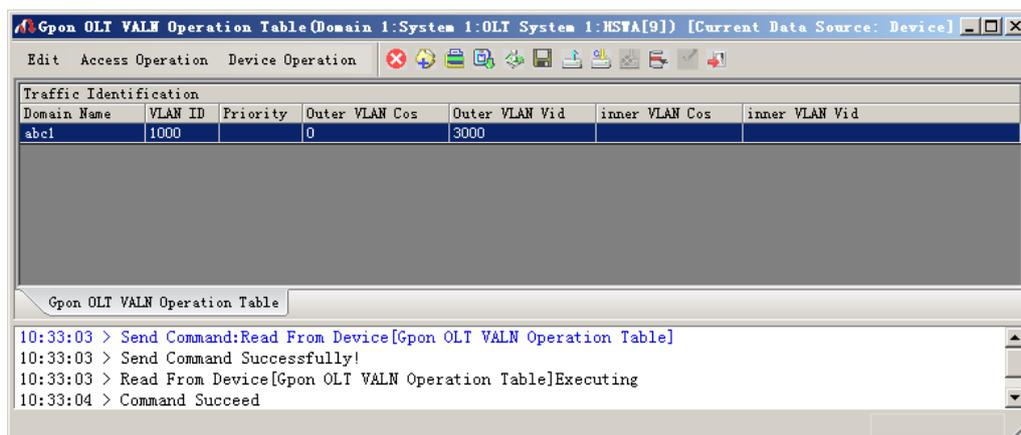


Figure 5-70 The GPON OLT VLAN Operation Table window - completed

### 5.3.3.7 Binding the PON Port to the VLAN Operation Table

#### Configuration purpose

Apply the data service configuration to the PON port on the GC8B card by binding the PON port to the VLAN operation table.

#### Operation steps

- Right-click the **GC8B[15]** card in the **Object Tree** pane and select **Config** → **PON Attach / Detach VLAN Operation Table** from the shortcut menu to access the **PON attach / detach VLAN Table** window.
- Status information of eight PON ports of the GC8B card is shown in the left pane. Select the PON port 1 and select **Attach** in the **Action** field.

3. Click the right pane, select **Edit** → **Append** in the menu bar of the window or click the  button. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click **OK**. Click the **Table Name** list box and select **abc1**.
4. Click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the PON port 1 has been bound to the operation table **abc1**. See Figure 5-71.

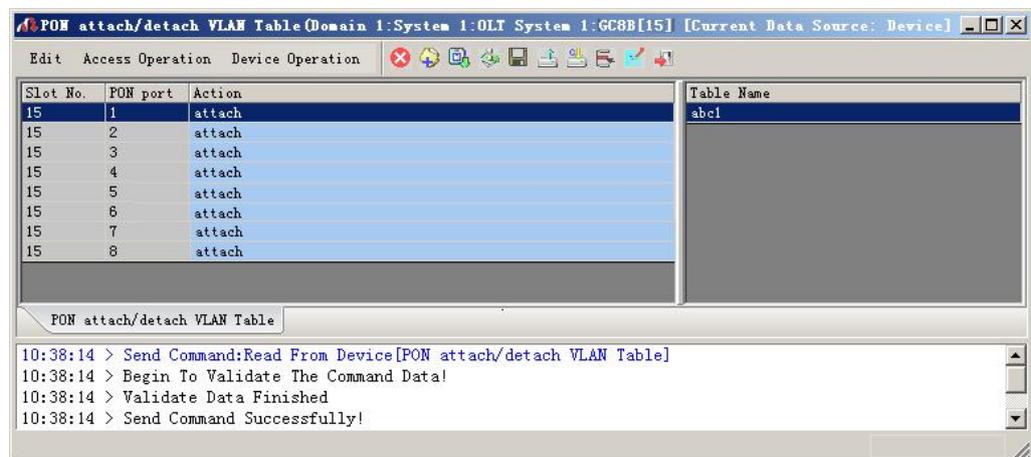


Figure 5-71 The PON attach / detach VLAN Table window

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

### 5.3.4.1 Planning Data

Table 5-19 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.	Configure according to the network planning of the operator.	1
	ONU type	The type of an ONU	AN5506-04-B
Local end service VLAN	Service Name	Configure 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.	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 <b>Tag</b> or <b>Untag</b> . 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 and downlinked in the form of TAG. Under TAG mode, the uplink data packets will not be processed but remain uplinked in the original form. For downlink packets, however, only packets with designated TAGs are received and the packets will not be processed but remain downlinked in the original form.	Tag
	Service Type	Select <b>data</b> in correspondence to the data service.	data
	Slot Bind Mode	Select <b>Auto Bind</b> or <b>Manually Bind</b> .	Auto Bind

Table 5-20 The planned data of data service configuration at the AN5506-04-B ONU side in the VLAN 1:1 translation mode (in a batch manner)

Item		Description	Example
Bandwidth Profile Configuration	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 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 16Kbyte/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 0Kbyte/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 64Kbyte/s.	1280
Data Service Profile	Profile Name	Configure according to the network planning of the operator.	b
	Enable / Disable Port	Enable is selected by default.	Enable
	Port Auto Negotiation	Enable is selected by default.	Enable
	Port Speed	The default speed is 10M. Unconfigurable when the auto negotiation is enabled.	—
	Duplex	Full-duplex is selected by default. Unconfigurable when the auto negotiation is enabled.	—
	Flow control Enable / Disable	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.	—	

Item		Description	Example	
	TAG Mode	Configured as <b>Tag</b> or <b>Untag</b> according to the network planning of the operator. In the <b>Tag</b> mode the uplink data packets are tagged, while in the <b>Untag</b> mode the uplink data packets are untagged.	Tag	
	COS Mode	When the CVLAN mode is set as <b>Transparent</b> , the VLAN mode should be consistent with the COS, ranging from 0 to 7. When the Tag mode is set as <b>Untag</b> , this item is unconfigurable.	0	
	VLAN ID	When the CVLAN mode is set as <b>Transparent</b> , the VLAN mode should be consistent with the CVLAN ID, ranging from 1 to 4085. When the Tag mode is set as <b>Untag</b> , this item is unconfigurable.	500	
	Ds Encrypt State	Disable is selected by default.	Disable	
	CVLAN Mode	When the Tag mode is set as <b>Untag</b> , the CLVAN mode can be set as <b>Tag</b> or <b>Transparent</b> . When the Tag mode is set as <b>Tag</b> , the CVLAN mode can be set as <b>Translate</b> or <b>Transparent</b> .	Translation	
	CVLAN ID	Configure according to the network planning of the operator. The value range is 1 to 4085.	1000	
	COS	The priority range is 0 to 7.	0	
	QinQ Enable State	Enable / disable the QinQ configuration. Disable is selected by default.	Disable	
	VLAN Name	The service name configured in the corresponding local VLAN. Unconfigurable when the QinQ enable state is disabled.	—	
	SVLAN ID	Unconfigurable when the QinQ enable state is disabled. The range is 1 to 4085.	—	
	COS	Unconfigurable when the QinQ enable state is disabled.	—	
Service Profile	Profile Name	Configure according to the network planning of the operator.	c	
	ONU Type	The actually used ONU type	AN5506-04-B	
	ONU Subprofile Config	Profile Type	The bandwidth allocation profile should be selected.	Bandwidth allocation profile
		Profile Name	The profile name configured in the corresponding bandwidth allocation profile	a

Item		Description	Example		
	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 corresponding data service profile	b	
Service Profile Binding	Profile ID	The profile name configured in the corresponding 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	1		
	ONU S.N.	The ONU authorization number assigned according to the network planning of the operator	1		
GPON OLT VLAN Operation Table	Domain Name		Configure according to the network planning of the operator.		
	VLAN ID		The corresponding inner VLAN value of the uplink service flow from the ONU, ranging from 1 to 4085.		
	Priority		The inner VLAN translation priority of the downlink service flow, ranging from 0 to 7, or null.		
	VLAN Layer 2	Outer VLAN Cos	The SVLAN priority, ranging from 0 to 7.	0	
		Outer VLAN Vid	The item can be used to add the SVLAN value, ranging from 1 to 4085.	3000	
	VLAN Layer 1	Inner VLAN Cos	The inner VLAN translation priority of the uplink service flow, ranging from 0 to 7, or null.	—	
		Inner VLAN Vid	The item can be used to translate the inner VLAN of the uplink service flow from the ONU. If translation is required, the item is the translated VLAN value. If not required, the item is consistent with the VLAN identifier or null.	—	
PON Attach / Detach VLAN Table	Slot No.	The number of the actually used slot	15		
	PON Port	The number of the actually used PON	1		
	Action	Attach / detach the VLAN operation table.	Attach		

Item	Description	Example
Table Name	Selects the configured VLAN operation table name.	abc1

### 5.3.4.2 Configuration Flow Chart

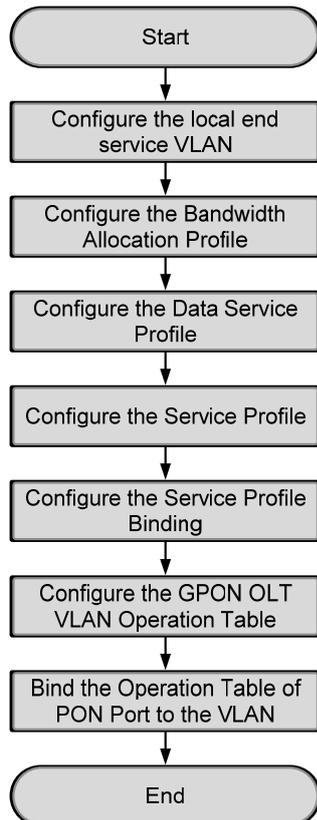


Figure 5-72 The batch configuration flow chart of data service provisioning in the VLAN 1:1 translation mode (for the AN5506-04-B)

### 5.3.4.3 Configuring the Local End Service VLAN

See Section 5.2.3.3 for configuration procedures.

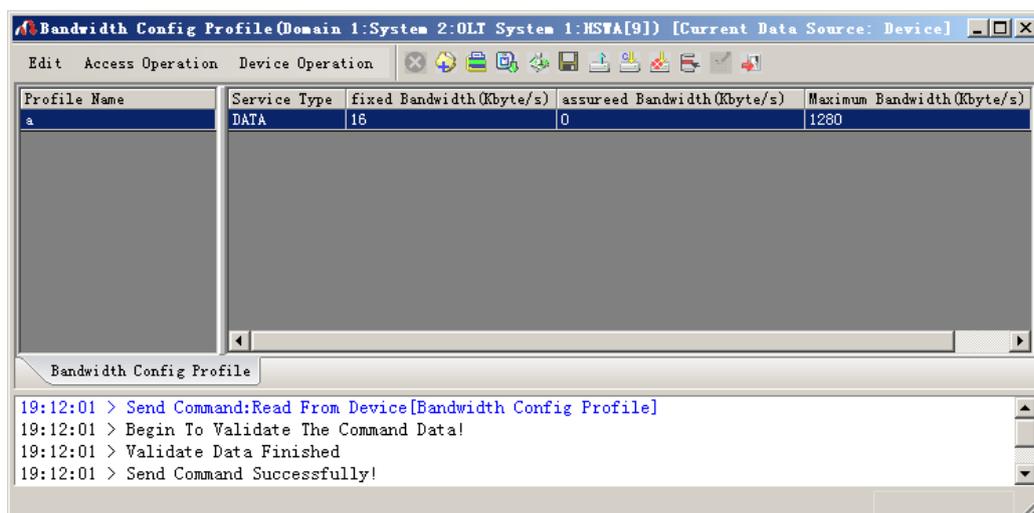
### 5.3.4.4 Configuring the Bandwidth Allocation Profile

#### Configuration purpose

Configure the bandwidth of the ONU data service and limit the traffic flow.

#### Operation steps

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 select **Edit** → **Append** in the menu bar or click the  button. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click the **OK** button. Double-click the **Profile Name** blank field and enter **a**.
3. Click the right pane and select **Edit** → **Append** in the menu bar or 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 planned data in Table 5-20. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the bandwidth allocation is configured. See Figure 5-73.

Figure 5-73 The **Bandwidth Config Profile** window - completed

### 5.3.4.5 Configuring the Data Service Profile

#### Configuration purpose

Configure the FE port status and working mode of the ONU and translate the inner VLAN of the data service.

#### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane and select **Config** → **Data Service Profile** from the shortcut menu. Click the **Data Service Profile** tab and the **Data Service Profile** window appears.
2. Click the left pane and select **Edit** → **Append** in the menu bar. 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 planned data in Table 5-20.
3. Click the right pane and select **Edit** → **Append** in the menu bar. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click **OK**. Configure the VLAN tags of the service flow according to the planned data in Table 5-20.

- When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the data service profile is configured. See Figure 5-74.

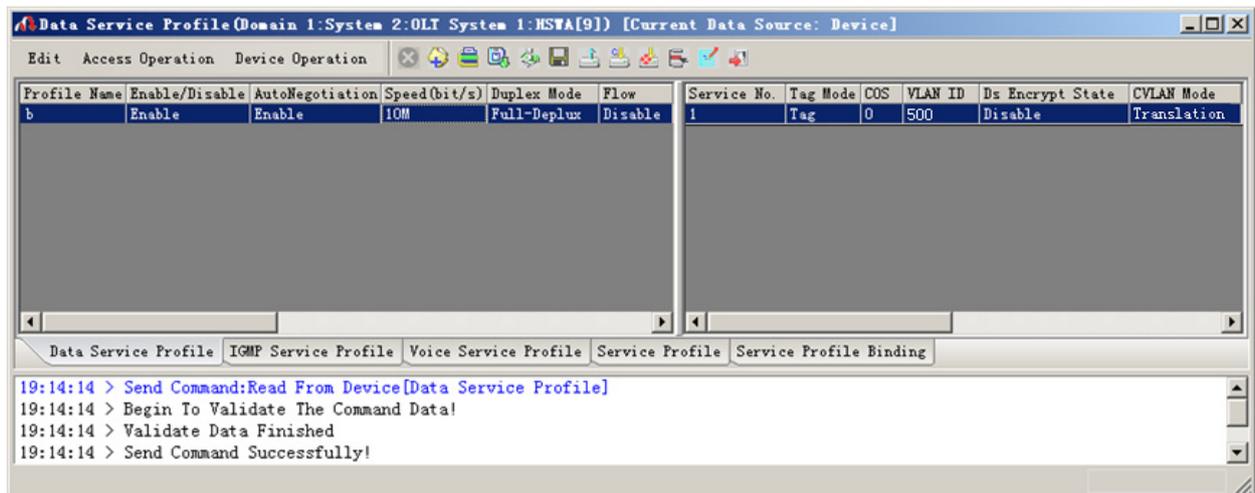


Figure 5-74 The **Data Service Profile** window - completed

### 5.3.4.6 Creating a Service Profile

#### Configuration purpose

Configure the bandwidth allocation profile and data service profile for the ONU binding.

#### Operation steps

- Right-click the **HSWA[9]** card in the **Object Tree** pane and select **Config** → **Service Profile** from the shortcut menu. Click the **Service Profile** tab and the **Service Profile** window appears.
- Click the left pane and select **Edit** → **Append** in the menu bar. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click **OK** to add a service profile.
- 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 access the **ONU Subprofile Config** dialog box. Click the **Add** button to add a profile configuration. Click the **Profile Type** list box and select **Bandwidth Config Profile**. Click the **Profile Name** list box and select **a**.

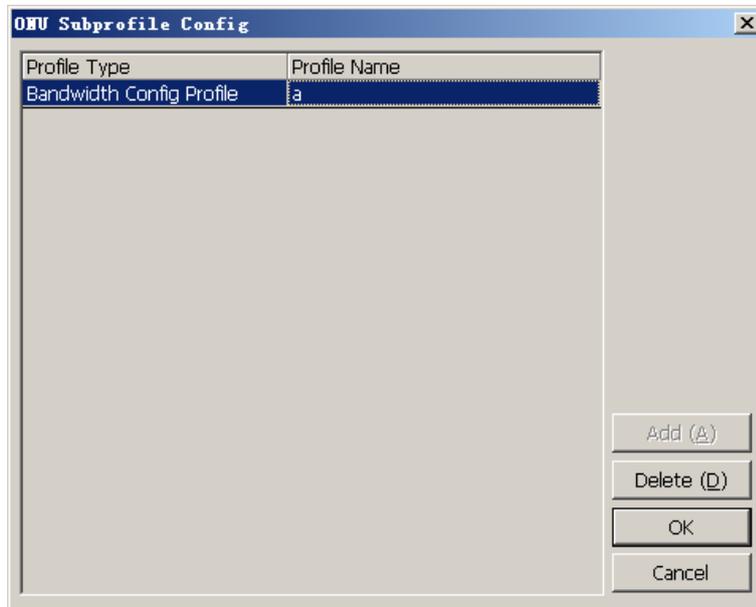


Figure 5-75 The **ONU Subprofile Config** dialog box

- Click **OK** and return to the **Service Profile** window.

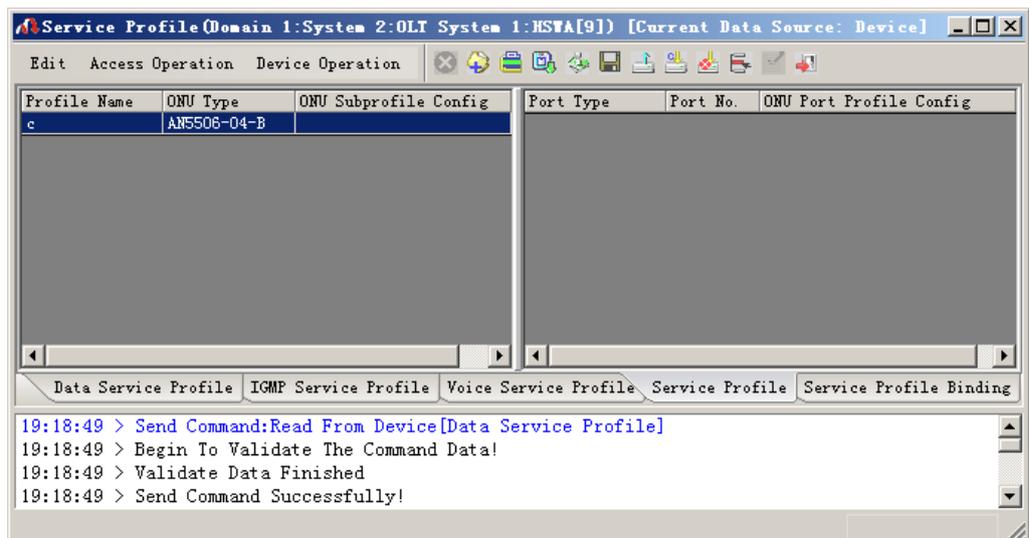


Figure 5-76 The **Service Profile** window

6. Click the right pane and select **Edit** → **Append** in the menu bar. Enter **2** in the **Please Input the Rows for Add** dialog box that appears and click **OK**.
7. Click the **Port Type** list box and select **FE**. Double-click the **Port No.** blank field and enter **1**. Repeat the procedure to enter **2**.
8. For Port No.1 click the **ONU Port Profile Config** field to access the **ONU Port Profile Config** dialog box. Click **Add** to add a profile configuration. Click the **Profile Type** list box and select **Data Service Profile**. Click the **Profile Name** list box and select **b**. Repeat the procedure for Port No.2.

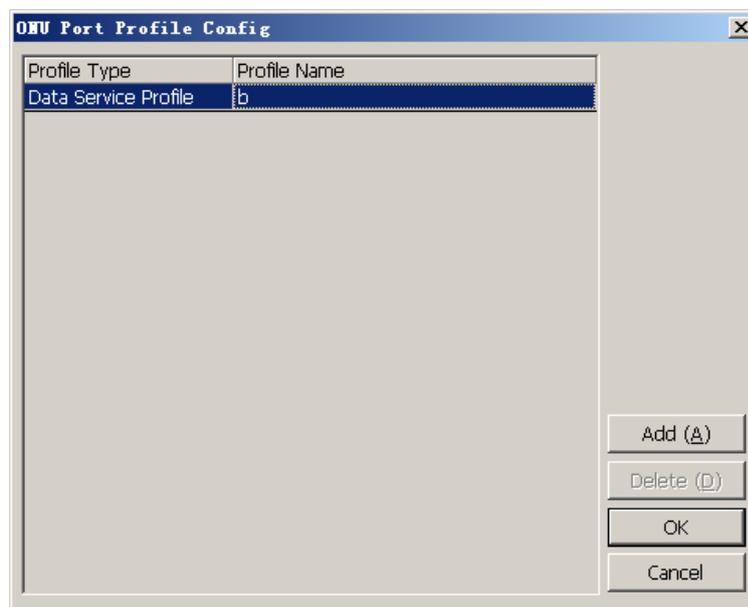
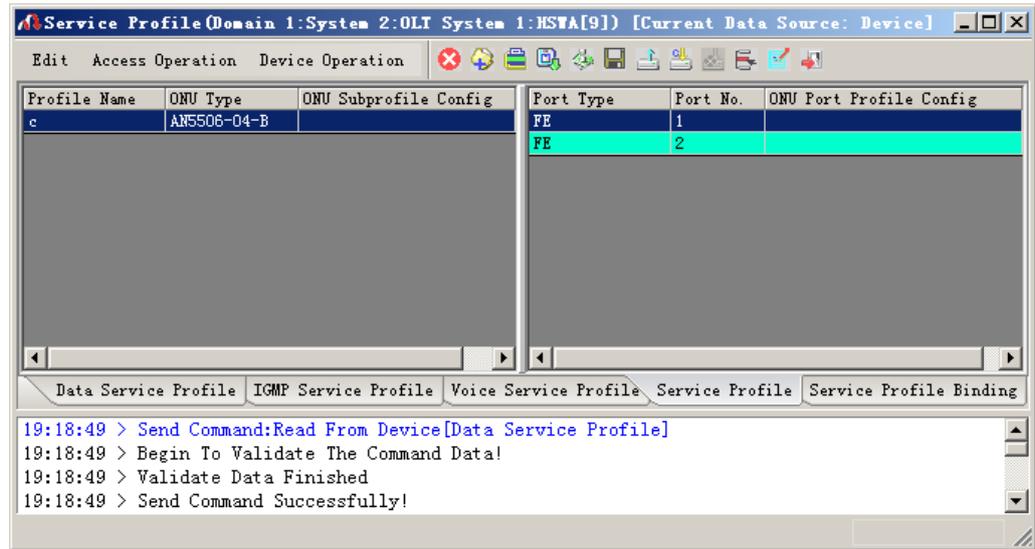


Figure 5-77 The **ONU Port Profile Config** dialog box

9. Click the **OK** button and return to the **Service Profile** window.
10. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the service profile is configured. See Figure 5-78.

Figure 5-78 The **Service Profile** window - completed

### 5.3.4.7 Binding the ONU to the Service Profile

#### Configuration purpose

Apply the bandwidth allocation and data service configuration of the service profile to the ONU by binding the ONU to the service profile.

#### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane and select **Config** → **Service Profile Config** from the shortcut menu. Click the **Service Profile Binding** tab and the **Service Profile Binding** window appears.
2. Click the left pane and select **Edit** → **Append** in the menu bar. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click **OK**.
3. Click the **Profile ID** list box and select **c**. Click the **Action** list box and select **Attach**.
4. Click the right pane and select **Edit** → **Append** in the menu bar. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click **OK**.

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

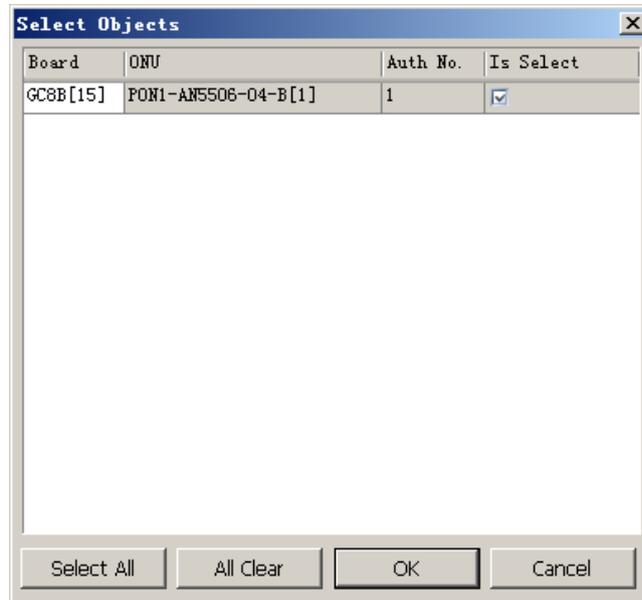
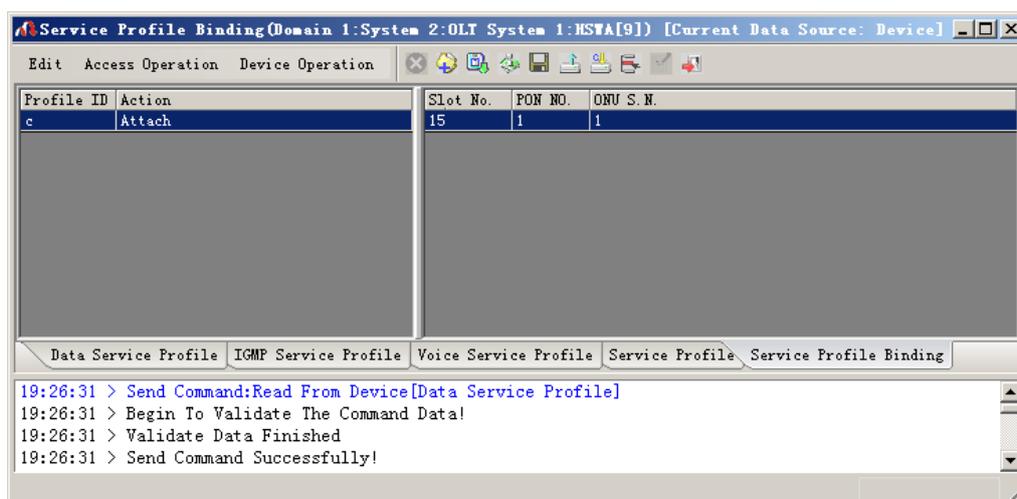


Figure 5-79 The **Select Objects** dialog box

6. Click the **OK** button and return to the **Service Profile Binding** window. Click the  button to execute the command. The **If the service profile binding and the refresh operation is performed, the original ONU service configuration will be overwritten. Are you sure to execute this command?** dialog box will appear. Click **OK** and then once again in the **Are you sure to write all data to the device?** dialog box.
7. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the AN5506-04-B has been bound to the service profile **c**. See Figure 5-80.

Figure 5-80 The **Service Profile Binding** window

### 5.3.4.8 Configuring the GPON OLT VLAN Operation Table

#### Configuration purpose

Perform the QinQ function of the data service by completing the SVLAN ID configuration on the GPON OLT VLAN operation table.

#### Operation steps

1. Right-click the **HSTA[9]** card in the **Object Tree** pane, select **Config** → **QinQ** → **GPON OLT VLAN Operation Table** from the shortcut menu to access the **GPON OLT VLAN Operation Table** window.
2. Select **Edit** → **Append** on the menu bar or click the  button. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click the **OK** button. Double-click the **Domain Name** blank field and enter **abc1**.
3. Configure according to the planned data in Table 5-20. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the GPON OLT VLAN operation table is configured. See Figure 5-81.

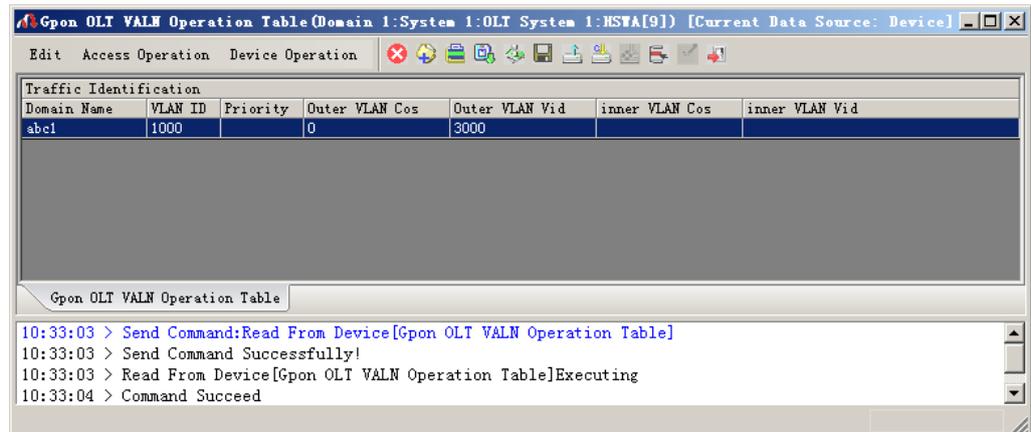


Figure 5-81 The GPON OLT VLAN Operation Table window - completed

### 5.3.4.9 Binding the PON Port to the VLAN Operation Table

#### Configuration purpose

Apply the data service configuration to the PON port on the GC8B card by binding the PON port to the VLAN operation table.

#### Operation steps

1. Right-click the **GC8B[15]** card in the **Object Tree** pane, select **Config** → **PON Attach / Detach VLAN Operation Table** from the shortcut menu to access the **PON attach / detach VLAN Table** window.
2. Status information of eight PON ports of the GC8B card is shown in the left pane. Select the PON port 1 and select **Attach** in the **Action** field.
3. Click the right pane, select **Edit** → **Append** in the menu bar of the window or click the  button. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click **OK**. Click the **Table Name** list box and select **abc1**.
4. Click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the PON port 1 has been bound to the operation table **abc1**. See Figure 5-82.

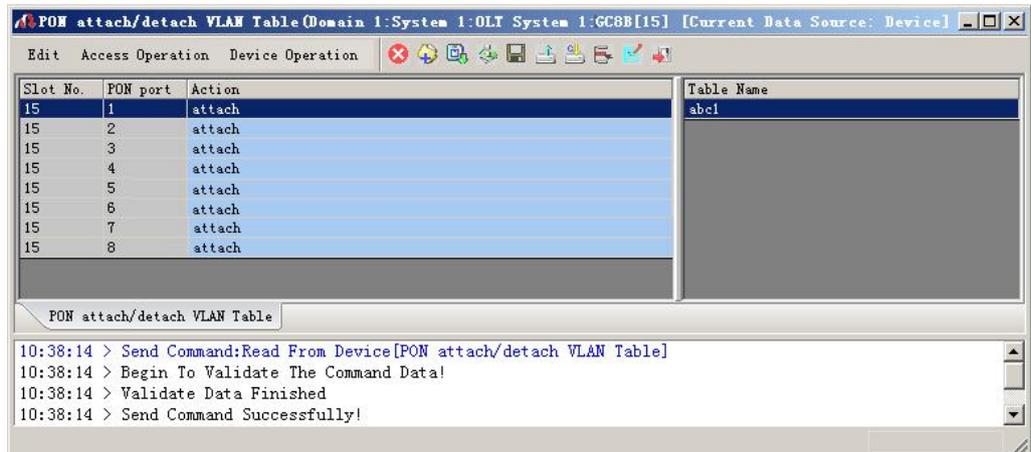


Figure 5-82 The PON attach / detach VLAN Table window - completed

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

### 5.3.5.1 Planning Data

Table 5-21 The planned data of data service configuration 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 No.	Configure 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 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.	The number of the actually used uplink port.	19:SFP2

Item		Description	Example
	TAG / UNTAG	The Tag processing mode of the uplink service VLAN can be set as <b>Tag</b> or <b>Untag</b> . 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 and downlinked in the form of TAG. Under TAG mode, the uplink data packets will not be processed but remain uplinked in the original form. For downlink packets, however, only packets with designated TAGs are received and the packets will not be processed but remain downlinked in the original form.	Tag
	Service Name	Configure according to the network planning of the operator.	data
	Slot Bind Mode	Select <b>Auto Bind</b> or <b>Manually Bind</b> .	Auto Bind

Table 5-22 The planned data of data service configuration at the AN5506-10-B1 ONU side in the VLAN 1:1 translation mode (configured respectively)

Item		Description	Example	
Bandwidth configuration	Service Type	Select integrate service.	Integrate Service	
	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 16Kbyte/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 0Kbyte/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 64Kbyte/s.	1280	
Basic information of the ONU port	ONU Port Used	The actually used ONU port	1	2
	Enable / Disable Port	Configure according to the network planning of the operator. Enable is selected by default.	Default	

Item		Description	Example	
	Port Auto Negotiation	Configure according to the network planning of the operator. Enable is selected by default.	Default	
	Port Speed	Unconfigurable when the port auto negotiation is enabled. The default speed is 100M.	Default	
	Duplex	Unconfigurable when the port auto negotiation is enabled. The default value is full-duplex.	Default	
	Flow control Enable / Disable	Configure according to the network planning of the operator. Disable is selected by default.	Default	
ONU port service parameters	TLS	Configured as <b>TLS</b> or <b>No TLS</b> according to the network planning of the operator.	No TLS	
	Service Type	Data service. Select unicast.	Unicast	
	VLAN Mode	Configured as <b>Tag</b> or <b>Transparent</b> according to the network planning of the operator.	Transparent	
	CVLAN TPID	The default value is 33024.	33024	
	CVLAN ID	The pre-translation VLAN ID. The value range is 1 to 4085.	600	
	Priority or COS	The CVLAN priority. The value range is 0 to 7.	0	
	Translation State	Enable / disable the translation configuration.	Enable	
	Translation Value	The translated VLAN ID, ranging from 1 to 4085.	2000	
	SVLAN TPID	The default value is 33024.	33024	
	Priority or COS	The translation priority, ranging from 0 to 7 with 7 as the highest priority and 0 as the lowest.	0	
GPON OLT VLAN Operation Table	Domain Name	Configure according to the network planning of the operator.	abc2	
	VLAN ID	The corresponding inner VLAN value of the uplink service flow from the ONU, ranging from 1 to 4085.	2000	
	Priority	The inner VLAN translation priority of the downlink service flow, ranging from 0 to 7, or null.	—	
	VLAN Layer 2	Outer VLAN Cos	The SVLAN priority, ranging from 0 to 7.	0
		Outer VLAN Vid	The item is used to add SVLAN value, ranging from 1 to 4085.	3001

Item		Description	Example	
	VLAN Layer 1	Inner VLAN Cos	The inner VLAN translation priority of the uplink service flow, ranging from 0 to 7, or null.	—
		Inner VLAN Vid	The item can be used to translate the inner VLAN of the uplink service flow from the ONU. If translation is required, the item is the translated VLAN value. If not required, the item is consistent with the VLAN identifier or null.	—
PON Attach / Detach VLAN Table	Slot No.	The number of the actually used slot	15	
	PON Port	The number of the actually used PON	1	
	Action	Attach / detach the VLAN operation table.	Attach	
	Table Name	Selects the configured VLAN operation table name.	abc2	

### 5.3.5.2 Configuration Flow Chart

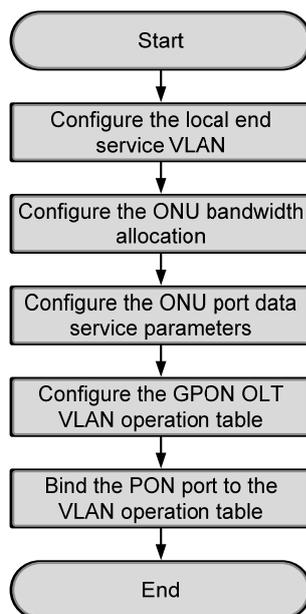


Figure 5-83 Flow chart for provisioning data services respectively in the VLAN 1:1 translation mode (for the AN5506-10-B1)

### 5.3.5.3 Configuring the Local End Service VLAN

See Section 5.3.3.3 for configuration procedures.

### 5.3.5.4 Configuring the Bandwidth Allocation

#### Configuration purpose

Configure the bandwidth of the ONU data service and limit the traffic flow.

#### Operation steps

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, select **Config** → **Bandwidth Config** from the shortcut menu to access the bandwidth allocation configuration window.
2. Click the right pane and select **Edit** → **Append** on the menu bar or click the  button. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click the **OK** button.
3. Configure according to the planned data in Table 5-22. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the bandwidth allocation is configured. See Figure 5-84.

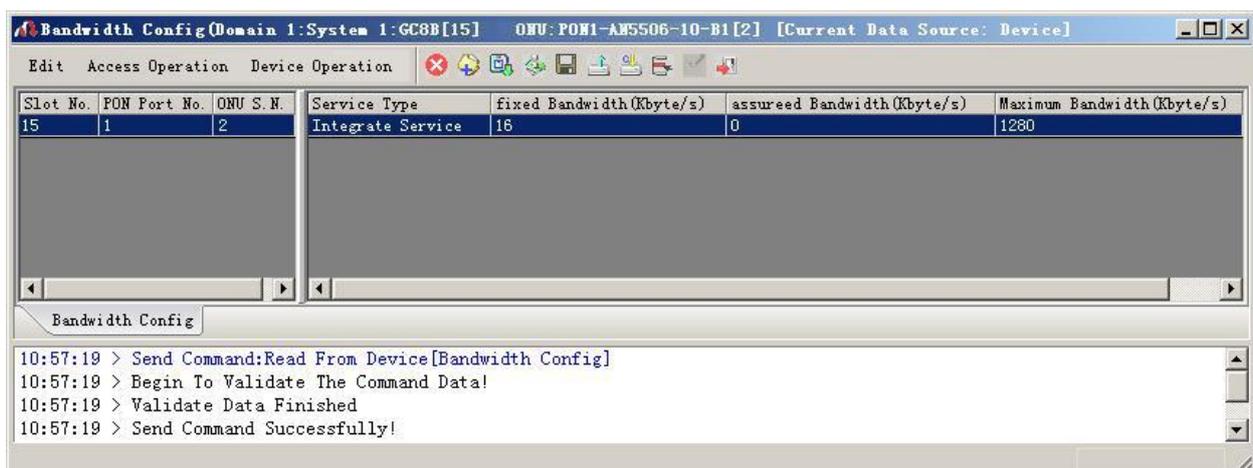


Figure 5-84 The **Bandwidth Config** window

### 5.3.5.5 Configuring the ONU Port Data Service Parameters

#### Configuration purpose

Configure the FE port status and working mode of the ONU and add VLAN tags to the data service.

#### Operation steps

1. Click the **GC8B[15]** card in the **Object Tree** pane and information about 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. Select the **ONU Port Config** tab, as shown in Figure 5-85.

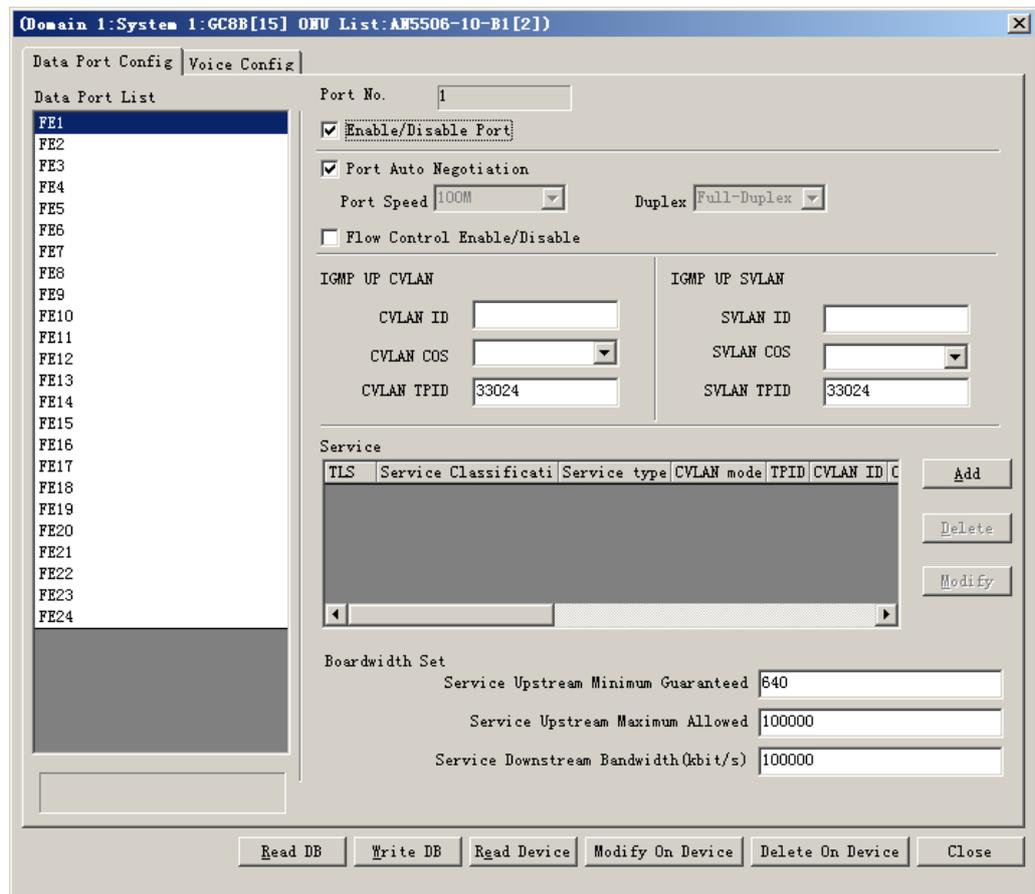


Figure 5-85 The ONU port data service configuration

2. Select **FE1** from the **Data Port List** in Figure 5-85. Click **Add** to create a data service and configure it according to the planned data in Table 5-22.

Figure 5-86 The **Services Configuration** dialog box

3. Click **OK** and return to the dialog box shown in Figure 5-85. Right-click **FE1** in the **Data Port List** and select **Copy Port Config**. Right-click **FE2** and select **Paste Port Config** to enable the FE2 port.
4. After the configuration, click the **Modify on Device** button to complete the AN5506-10-B1 service configuration. If the **Command Succeed** of the **AN5506-10-B1** data port service appears in the **Command Manager** window, the AN5506-10-B1 port service configuration is completed. See Figure 5-87.

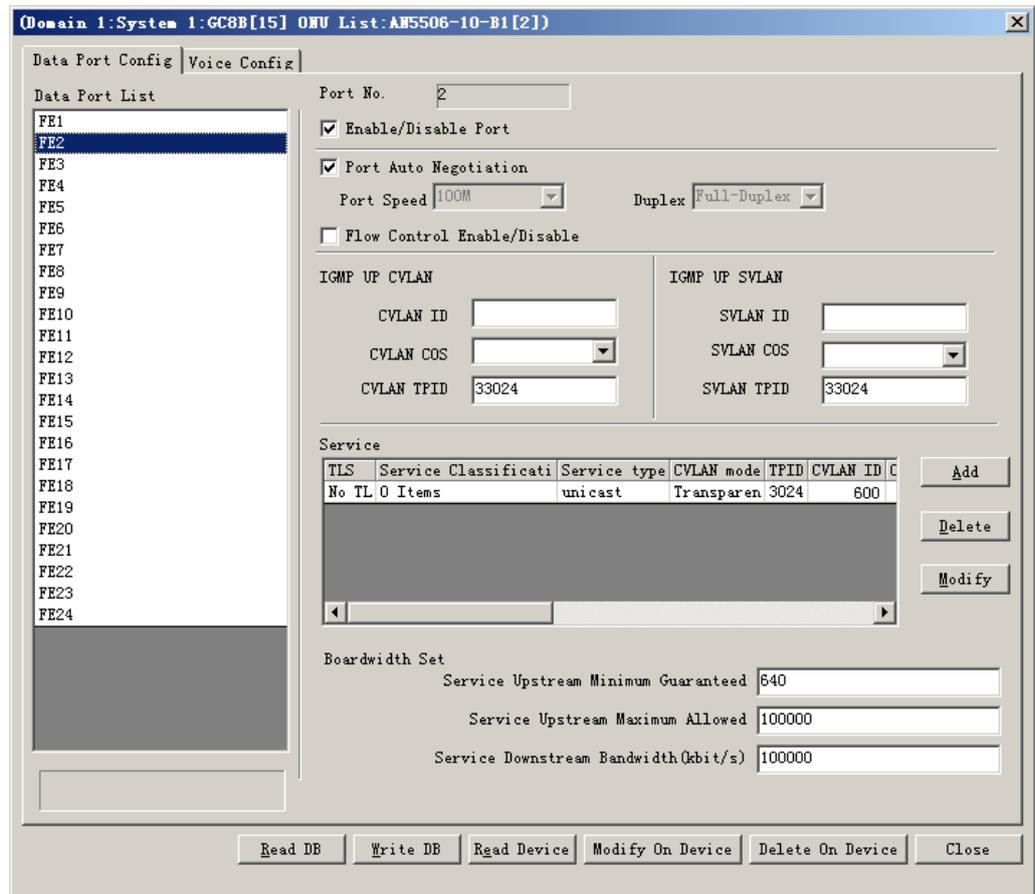


Figure 5-87 The port service configuration completed

### 5.3.5.6 Configuring the GPON OLT VLAN Operation Table

#### Configuration purpose

Perform the QinQ function of the data service by completing the SVLAN ID configuration on the GPON OLT VLAN operation table.

#### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, select **Config** → **QinQ** → **GPON OLT VLAN Operation Table** from the shortcut menu to access the **GPON OLT VLAN Operation Table** window.

2. Select **Edit** → **Append** on the menu bar or click the  button. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click the **OK** button. Double-click the **Domain Name** blank field and enter **abc2**.
  
3. Configure according to the planned data in Table 5-22. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the GPON OLT VLAN operation table is configured. See Figure 5-88.

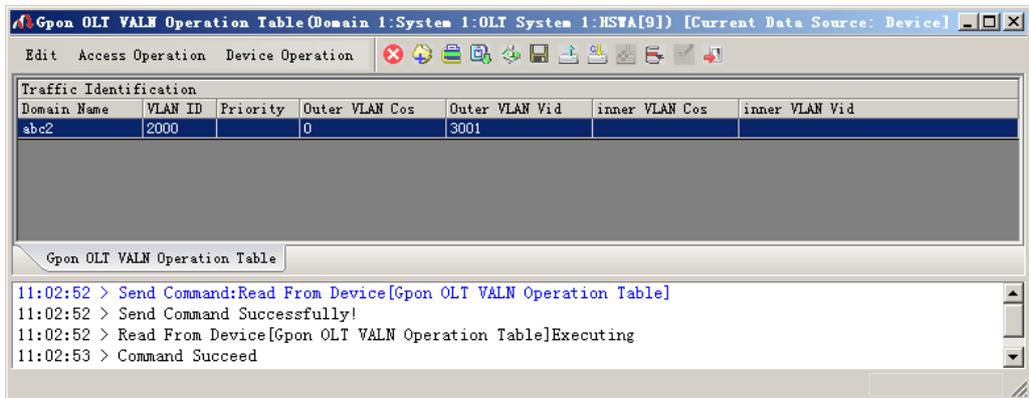


Figure 5-88 The GPON OLT VLAN Operation Table window - completed

### 5.3.5.7 Binding the PON Port to the VLAN Operation Table

#### Configuration purpose

Apply the data service configuration to the PON port on the GC8B card by binding the PON port to the VLAN operation table.

#### Operation steps

1. Right-click the **GC8B[15]** card in the **Object Tree** pane, select **Config** → **PON Attach / Detach VLAN Operation Table** from the shortcut menu to access the **PON attach / detach VLAN Table** window.
  
2. Status information of eight PON ports of the GC8B card is shown in the left pane. Select the PON port 1 and select **Attach** in the **Action** field.

3. Click the right pane, select **Edit** → **Append** in the menu bar of the window or click the  button. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click **OK**. Click the **Table Name** list box and select **abc2**.
4. Click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the PON port 1 has been bound to the operation table **abc2**. See Figure 5-89.

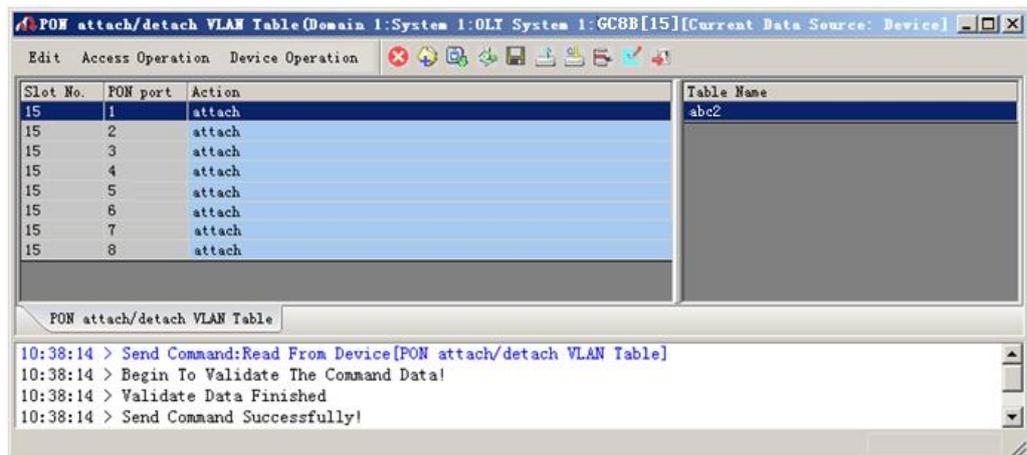


Figure 5-89 The PON attach / detach VLAN table window - completed

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

### 5.3.6.1 Planning Data

Table 5-23 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.	Configure 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 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.	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 <b>Tag</b> or <b>Untag</b> . 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 and downlinked in the form of TAG. Under TAG mode, the uplink data packets will not be processed but remain uplinked in the original form. For downlink packets, however, only packets with designated TAGs are received and the packets will not be processed but remain downlinked in the original form.	Tag
	Service Type	Select <b>data</b> in correspondence to the data service.	data
	Slot Bind Mode	Select <b>Auto Bind</b> or <b>Manually Bind</b> .	Auto Bind

Table 5-24 The planned data of data service configuration at the AN5506-10-B1 ONU side in the VLAN 1:1 translation mode (in a batch manner)

Item	Description		Example
Bandwidth config profile	Profile Name	The name of the bandwidth allocation profile	a
	Service Type	Select integrated service.	Integrated Service
	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 16Kbyte/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 0Kbyte/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 64Kbyte/s.	1280
Bandwidth allocation profile binding	Slot No.	The number of the actually used slot	15
	PON No.	The number of the actually used PON	1
	ONU S.N.	The ONU authorization number allocated according to the network planning of the operator.	2
	GPON Bandwidth Profile	The name of the configured bandwidth allocation profile	a
Service Model Profile	Profile Name	Configure according to the network planning of the operator	b
	Service Type	Select unicast	Unicast
	CVLAN Mode	Configure the CVLAN mode of the service as <b>Tag</b> or <b>Transparent</b> .	Transparent
	Translation State	Configure the translation function.	Enable
ONU data port configuration	PON No.	The actually used ONU port	1   2
	Port Enable / Disable	Enable / disable the port.	Enable
	MAC Limit	Configured as no MAC limit.	0
ONU data	CTPID	The default value is 33024.	33024

Item		Description	Example	
service configuration	CVLAN ID	The pre-translation VLAN ID, ranging from 1 to 4085.	600	
	CCOS	The CVLAN priority configuration, ranging from 0 to 7 with 7 as the highest priority and 0 as the lowest.	0	
	VLAN ID	The default value is 33024.	33024	
	Translation VID	The translated VLAN ID, ranging from 1 to 4085.	2000	
	COS	The translation VLAN priority, ranging from 0 to 7, or null.	0	
	Service Model Profile	Select the configured service model profile.	b	
GPON OLT VLAN Operation Table	Domain Name	Configure according to the network planning of the operator.	abc2	
	VLAN ID	The corresponding inner VLAN value of the uplink service flow from the ONU, ranging from 1 to 4085.	2000	
	Priority	The inner VLAN translation priority of the downlink service flow, ranging from 0 to 7, or null.	—	
	VLAN Layer 2	Outer VLAN Cos	The SVLAN priority, ranging from 0 to 7.	0
		Outer VLAN Vid	The item is used to add the SVLAN value, ranging from 1 to 4085.	3001
	VLAN Layer 1	Inner VLAN Cos	The inner VLAN translation priority of the uplink service flow, ranging from 0 to 7, or null.	—
		Outer VLAN Cos	The item can be used to translate the inner VLAN of the uplink service flow from the ONU. If translation is required, the item is the translated VLAN value. If not required, the item is consistent with the VLAN identifier or null.	—
	PON Attach / Detach VLAN Table	Slot No.	The number of the actually used slot	15
PON Port		The number of the actually used PON	1	
Action		Attach / detach the VLAN operation table.	Attach	
Table Name		Select the configured VLAN operation table name.	abc2	

### 5.3.6.2 Configuration Flow Chart

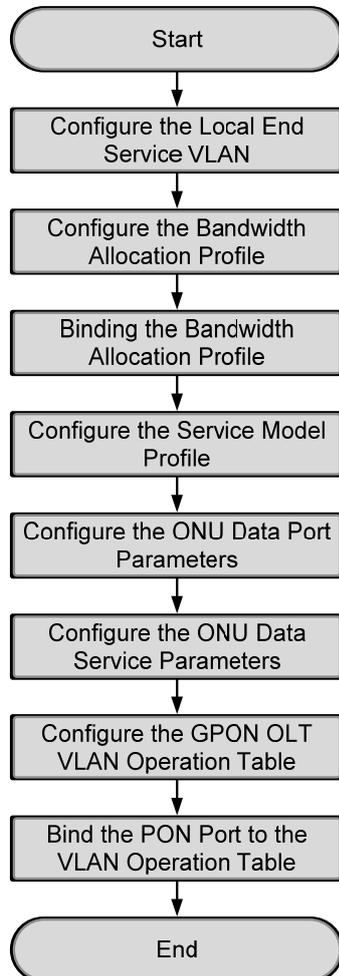


Figure 5-90 The batch configuration flow chart of data service provisioning in the VLAN 1:1 translation mode (for the AN5506-10-B1)

### 5.3.6.3 Configuring the Local End Service VLAN

See Section 5.3.3.3 for configuration procedures.

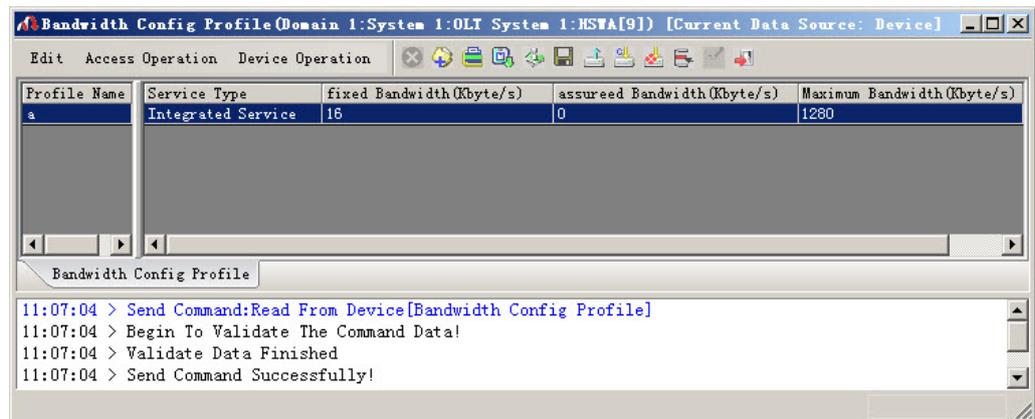
### 5.3.6.4 Configuring the Bandwidth Allocation Profile

#### Configuration purpose

Configure the bandwidth of the ONU data service and limit the traffic flow.

#### Operation steps

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 select **Edit** → **Append** on the menu bar or click the  button. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click the **OK** button. Double-click the **Profile Name** blank field and enter **a**.
3. Click the right pane and select **Edit** → **Append** on the menu bar or 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 planned data in Table 5-24. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the bandwidth allocation profile is configured. See Figure 5-91.

Figure 5-91 The **Bandwidth Config Profile** window - completed

### 5.3.6.5 Binding the Bandwidth Allocation Profile

#### Configuration purpose

Bind the configured bandwidth allocation profile to the ONU.

#### Configuration example

1. Right-click the system in the **Object Tree**, select **Config** → **Batch Config** → **ONU Configuration** to access the ONU configuration window.
2. Click **Set Object as Condition** in the **Config Object** pane and all configuration objects will appear in the lower pane (you can drill down and select a specific port as the object). Select the **AN5506-10-B1[2]** under the PON 1 in Slot 15 and click the **OK** button.

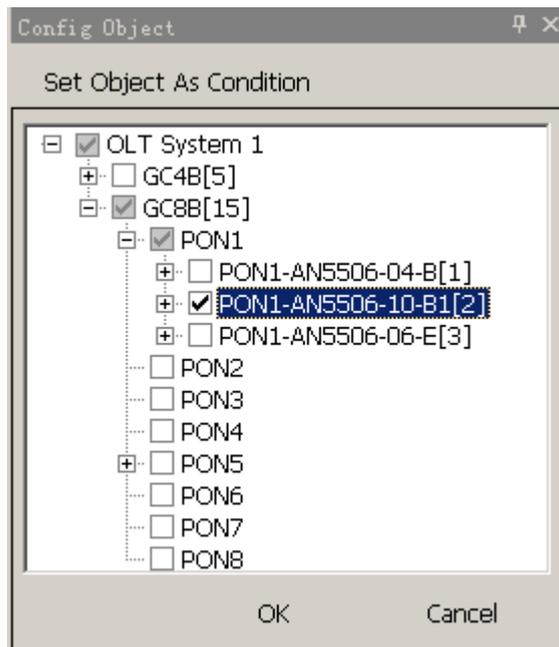


Figure 5-92 Set the configuration object

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. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the bandwidth allocation profile is bound. See Figure 5-93.

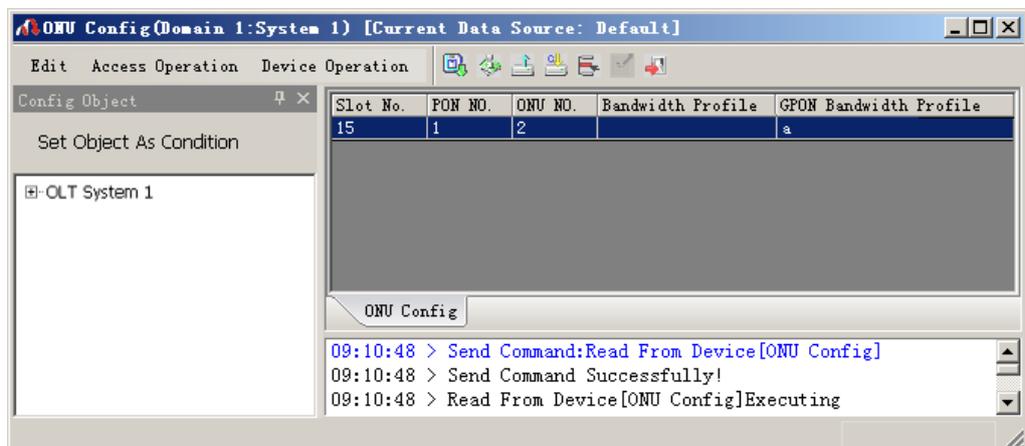


Figure 5-93 Binding the bandwidth allocation profile

### 5.3.6.6 Configuring the Service Model Profile

#### Configuration purpose

Select the data service type, CVLAN mode and determine whether to enable the translation function and the QinQ function.

#### Configuration example

1. Right-click the system in the **Object Tree** pane, select **Config** → **Profile Definition** → **Service Model Profile** to access the service model profile configuration window.
2. Select **Edit** → **Append** in the menu bar of the window or click the  button. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click **OK** to add a service model profile.
3. Configure according to the planned data in Table 5-24. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the service model profile is configured. See Figure 5-94.

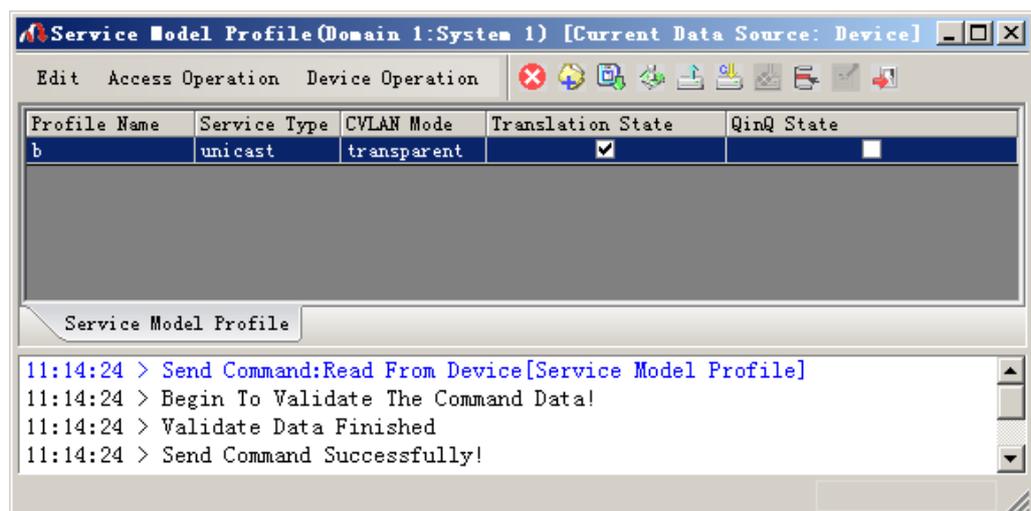


Figure 5-94 The **Service Model Profile** window - completed

### 5.3.6.7 Configuring the ONU Data Port Parameters

#### Configuration purpose

Enable the ONU ports and limit the number of MAC addresses in a batch manner.

#### Configuration Example

1. Right-click the system in the **Object Tree** pane, select **Config** → **Batch Config** → **ONU Data Port Config** from the shortcut menu to access the ONU data port configuration window.
2. Click **Set Object as Condition** in the **Config Object** pane and all configuration objects (you can drill down and select a specific port as the object) will appear in the lower part. Select **FE1** and **FE2** of the AN5506-10-B1[2] listed under the PON 1 in Slot 15 and click **OK**.

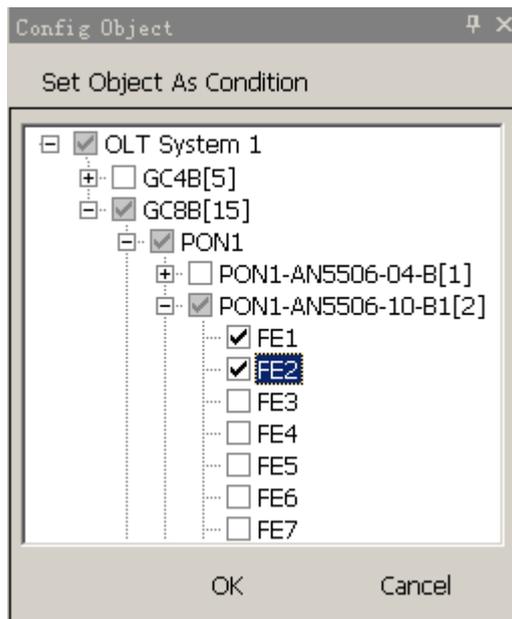


Figure 5-95 Set configuration objects

- The specific configuration information of the objects will appear in the right pane. Configure according to the planned data in Table 5-24. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the ONU data port parameters are configured. See Figure 5-96.

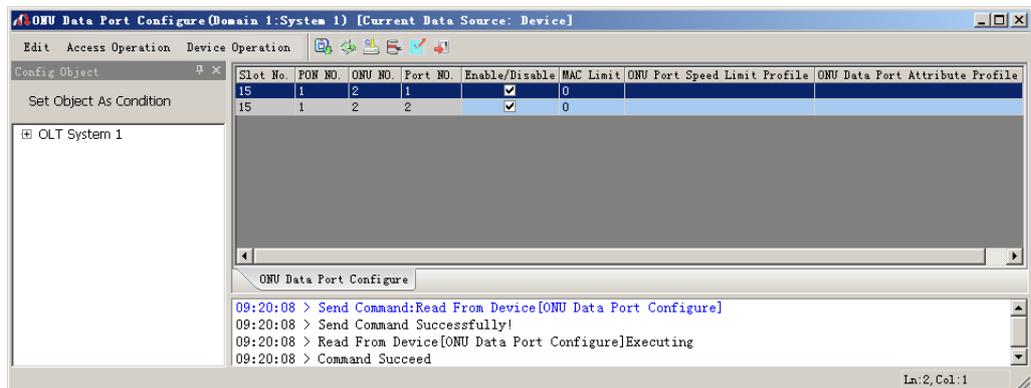


Figure 5-96 The ONU Data Port Configure window - completed

### 5.3.6.8 Configuring the ONU Data Service Parameters

#### Configuration purpose

Configure the CVLAN and SVLAN for the data service flow uplinked to the ONU port in a batch manner.

#### Configuration example

- Right-click the system in the **Object Tree** pane, select **Config** → **Batch Config** → **ONU Data Service Configure** from the shortcut menu to access the ONU data service configuration window.
- Click the  button in the menu bar and the **Add Item Number** dialog box appears. Select configuration objects (you can drill down and select a specific port as the object) in the left pane. Select **FE1** and **FE2** of the ONU and click **OK** to return to the **ONU Data Service Configure** window.

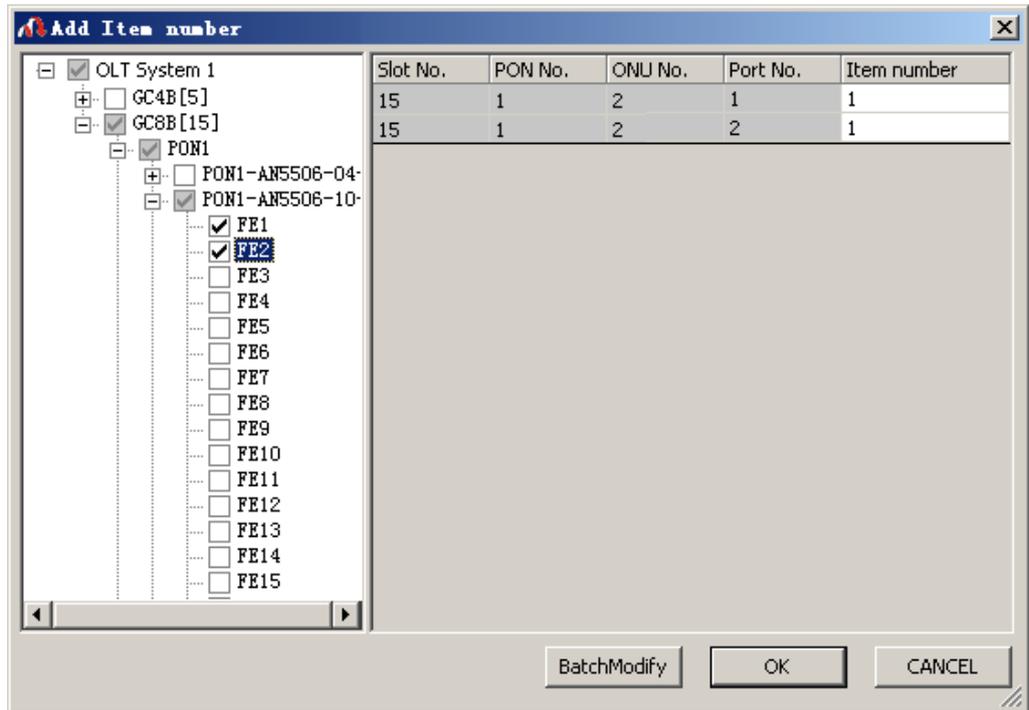


Figure 5-97 Set configuration objects

3. The specific configuration information of the objects will appear in the right pane. Configure according to the planned data in Table 5-24. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the ONU data service parameters are configured. See Figure 5-98.

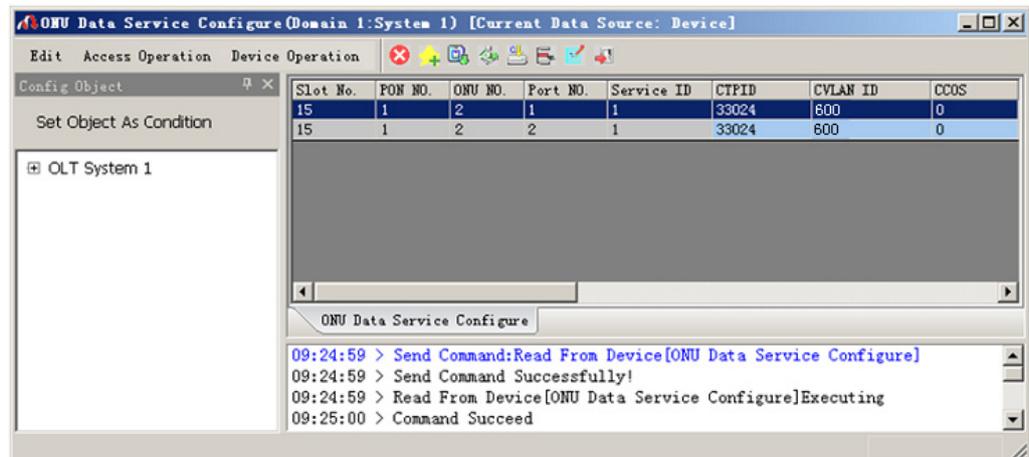


Figure 5-98 The ONU Data Service Configure window - completed

### 5.3.6.9 Configuring the GPON OLT VLAN Operation Table

#### Configuration purpose

Perform the QinQ function of the data service by completing the SVLAN ID configuration on the GPON OLT VLAN operation table.

#### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, select **Config** → **QinQ** → **GPON OLT VLAN Operation Table** from the shortcut menu to access the **GPON OLT VLAN Operation Table** window.
2. Select **Edit** → **Append** in the menu bar or click the  button. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click the **OK** button. Double-click the **Domain Name** blank field and enter **abc2**.
3. Configure according to the planned data in Table 5-24. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the GPON OLT VLAN operation table is configured. See Figure 5-99.

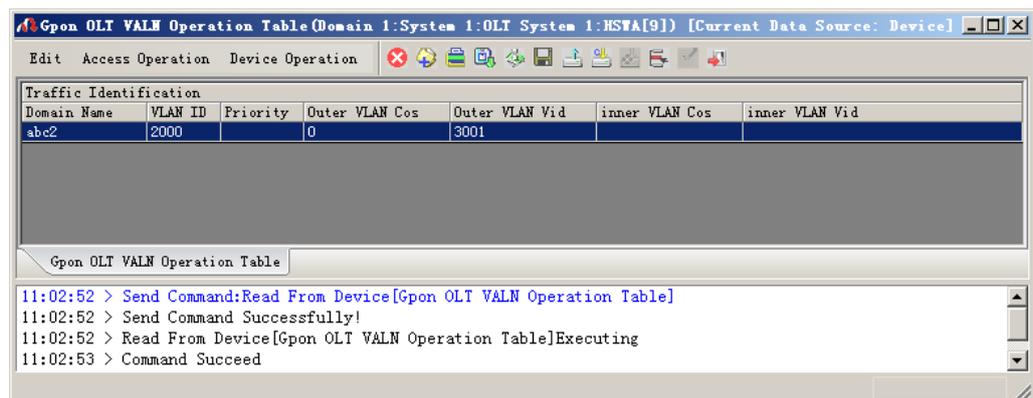


Figure 5-99 The **GPON OLT VLAN Operation Table** window - completed

### 5.3.6.10 Binding the PON Port to the VLAN Operation Table

#### Configuration purpose

Apply the data service configuration to the PON port on the GC8B card by binding the PON port to the VLAN operation table.

#### Operation steps

1. Right-click the **GC8B[15]** card in the **Object Tree** pane, select **Config** → **PON Attach / Detach VLAN Operation Table** from the shortcut menu to access the **PON attach / detach VLAN Table** window.
2. Status information of eight PON ports of the GC8B card is shown in the left pane. Select the PON port 1 and select **Attach** in the **Action** field.
3. Click the right pane, select **Edit** → **Append** in the menu bar of the window or click the  button. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click **OK**. Click the **Table Name** list box and select **abc2**.
4. Click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the PON port 1 has been bound to the operation table **abc2**. See Figure 5-100.

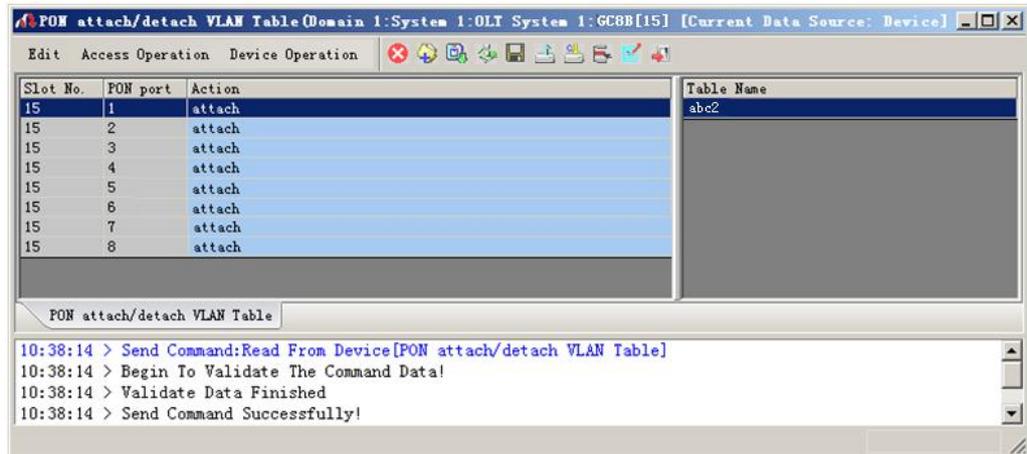


Figure 5-100 The PON attach / detach VLAN Table window - completed

### 5.3.7 End of Configuration

After VLAN translation and VLAN tag adding, the PC1 to PC4 can access the Internet via the home gateways normally.

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

### 5.4.1 Configuration Rules

The AN5116-06B supports the QinQ data service, which means it supports the VLAN stacking as well. In this example the GC8B card is used as the service interface card and the AN5506-04-B and the AN5506-10-B1 are used as ONUs to introduce the data service configuration in the VLAN N:1 translation mode.

- ◆ The QinQ data service in the VLAN N:1 translation mode can be configured via the SVLAN configuration on the ONU or the OLT. In this example the service is configured via the SVLAN configuration on the OLT.
- ◆ The inner layer VLAN translation can be configured on the ONU or the OLT. In this example the translation is configured on the 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.
- ◆ Translation mode: The Ethernet data uploaded from the subscriber side will be added with a fixed Tag when passing the subscriber's home gateway. Because the Tag added by the HG may not fall in the valid range defined by the operator, the default Tag added by the HG will be deleted by the ONU when the service is uplinked to the ONU equipment. The service will be added with a reasonable Tag and transmitted to the AN5116-06B, which will then add the SVLAN ID to the data service. Finally the data service with stacked service VLAN tags will be transmitted to the upper layer network side equipment.
- ◆ 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 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.

## 5.4.2 Service Network

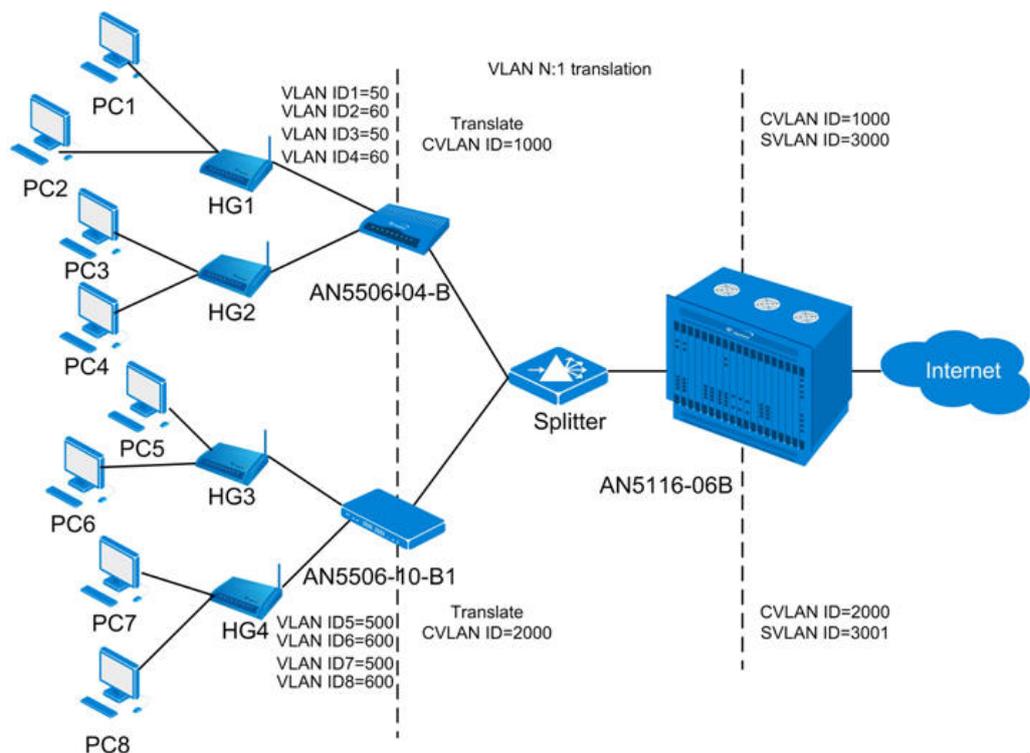


Figure 5-101 The data service network diagram (in the VLAN N:1 translation mode)

As Figure 5-101 shows, each HG is connected to two terminal subscribers. The data uploaded from different subscribers is added with different tags and then transmitted to the ONUs using the HGs. The ONUs translate the VLAN IDs of different tags and transmit them to the AN5116-06B via the splitter. And the AN5116-06B adds an SVLAN tag in addition to the CVLAN tag and transmits the packet to the upper layer network. For the downlink direction, the reverse process takes place.

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.

### 5.4.3 Configuring Data Services Respectively (for the AN5506-04-B)

#### 5.4.3.1 Planning Data

Table 5-25 The planned data of data service configuration 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 No.	Configure 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 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.	The number of the actually used uplink port.	19:SFP2

Item		Description	Example
	TAG / UNTAG	The Tag processing mode of the uplink service VLAN can be set as <b>Tag</b> or <b>Untag</b> . 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 and downlinked in the form of TAG. Under TAG mode, the uplink data packets will not be processed but remain uplinked in the original form. For downlink packets, however, only packets with designated TAGs are received and the packets will not be processed but remain downlinked in the original form.	Tag
	Service Type	Configure according to the network planning of the operator.	data
	Slot Bind Mode	Select <b>Auto Bind</b> or <b>Manually Bind</b> .	Auto Bind

Table 5-26 The planned data of data service configuration at the AN5506-04-B ONU side in the VLAN N:1 translation mode (configured respectively)

Item		Description	Example	
Bandwidth Configuration	Service Type	Select broadband Internet access.	Broadband Internet access	
	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 16Kbyte/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 0Kbyte/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 64Kbyte/s.	1280	
Basic information of the ONU port	ONU Port Used	The actually used ONU port	1	2
	Enable / Disable Port	Configure according to the network planning of the operator. Enable is selected by default.	Default	

Item		Description	Example			
	Port Auto Negotiation	Configure according to the network planning of the operator. Enable is selected by default.	Default			
	Port Speed	Unconfigurable when the port auto negotiation is enabled. The default speed is 100M.	Default			
	Duplex	Unconfigurable when the port auto negotiation is enabled. The default value is full-duplex.	Default			
	Flow control Enable / Disable	Configure according to the network planning of the operator. Disable is selected by default.	Default			
ONU port service parameter config	Index	The configured service serial number. An ONU port can support up to six services.	1	2	1	2
	TAG Mode	Configured as <b>Tag</b> or <b>Untag</b> according to the network planning of the operator. In the <b>Tag</b> mode the uplink data packets are tagged, while in the <b>Untag</b> mode the uplink data packets are untagged.	Tag			
	Service Type	Configured as <b>Unicast</b> or <b>Multicast</b> .	Unicast			
	COS	If the CVLAN mode is set as Translation, the item is configured as the pre-translation service priority, ranging from 1 to 7. Unconfigurable when the Tag mode is set as <b>Untag</b> .	0			
	VLAN ID	When the CVLAN mode is set as <b>Translation</b> , the item is the pre-translation VLAN ID, ranging from 1 to 4085. When the Tag mode is set as <b>Untag</b> , this item is unconfigurable.	50	60	50	60
	CVLAN Mode	When the Tag mode is set as <b>Untag</b> , the CVLAN mode can be set as <b>Tag</b> or <b>Transparent</b> . When the Tag mode is set as <b>Tag</b> , the CVLAN mode can set as <b>Translation</b> or <b>Transparent</b> .	Translation			
	CVLAN ID	The post-translation VLAN ID, ranging from 1 to 4085.	1000			
	COS	The translated priority, ranging from 0 to 7.	0			
	Ds Encrypt State	Enable is selected by default.	Disable			
	QinQ State	Enable / disable the QinQ configuration.	Disable			
	SVLAN ID	Unconfigurable when the QinQ state is disabled.	—			
	Service Name	Corresponds to the configured local end service VLAN. Unconfigurable when the QinQ enable status is disabled.	—			

Item		Description	Example	
	COS	The SVLAN priority, ranging from 1 to 7. Unconfigurable when the QinQ enable status is disabled.	—	
GPON OLT VLAN operation table	Domain Name	Configure according to the network planning of the operator.	abc3	
	VLAN ID	The corresponding inner VLAN value of the uplink service flow from the ONU, ranging from 1 to 4085.	1000	
	Priority	The inner VLAN translation priority of the downlink service flow, ranging from 0 to 7, or null.	—	
	VLAN Layer 2	Outer VLAN COS	The SVLAN priority, ranging from 0 to 7.	0
		Outer VLAN Vid	The item is used to add the SVLAN value, ranging from 1 to 4085.	3000
	VLAN Layer 1	Inner VLAN COS	The inner VLAN translation priority of the uplink service flow, ranging from 0 to 7, or null.	—
		Inner VLAN Vid	The item can be used to translate the inner VLAN of the uplink service flow from the ONU. If translation is required, the item is the translated VLAN value. If not required, the item is consistent with the VLAN identifier or null.	—
PON Attach / Detach VLAN Table	Slot No.	The number of the actually used slot	15	
	PON Port	The number of the actually used PON	1	
	Action	Attach / detach the VLAN operation table.	Attach	
	Table Name	Select the configured VLAN operation table name.	abc3	

### 5.4.3.2 Configuration Flow Chart

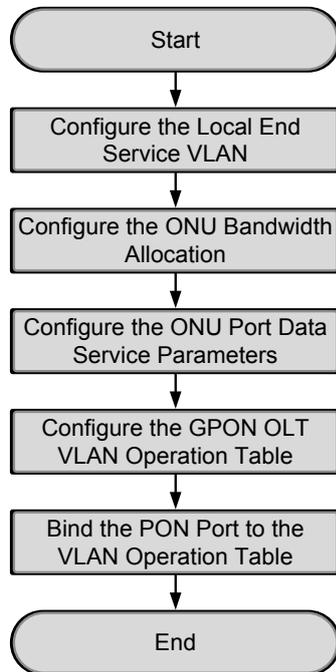


Figure 5-102 Flow chart for provisioning data services respectively in the VLAN N:1 translation mode (for the AN5506-04-B)

### 5.4.3.3 Configuring the Local End Service VLAN

#### Configuration purpose

Configure the uplink port VLAN of the AN5116-06B for the designated service flow and limit the VLAN range of the service.

#### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane and select **Config** → **Local VLAN** from the shortcut menu. In the window click the **Local End Service VLAN** tab and the local VLAN configuration window appears.

2. Click **Edit** → **Append** in the menu bar of the window or click the  button. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click **OK** to create a local VLAN.
3. Configure according to the planned data in Table 5-25. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the local end service VLAN is configured. See Figure 5-103.

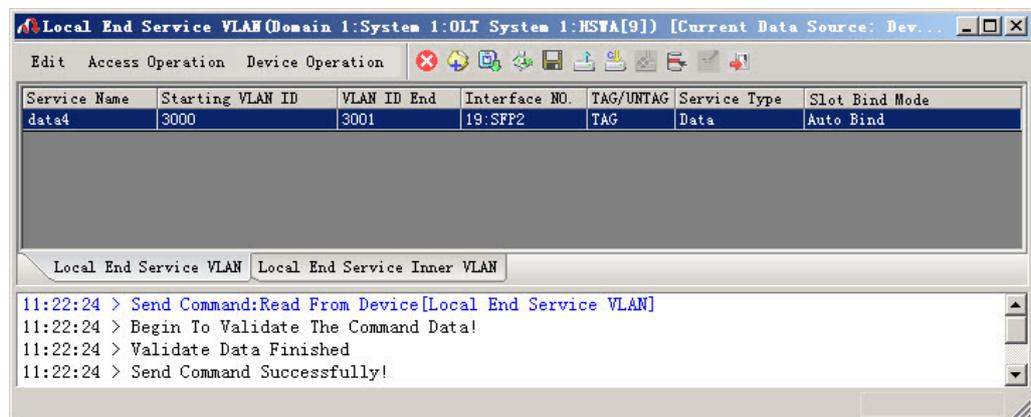


Figure 5-103 The Local End Service VLAN window – completed

### 5.4.3.4 Configuring the Bandwidth Allocation

#### Configuration purpose

Configure the bandwidth of the ONU data service and limit the traffic flow.

#### Operation steps

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, select **Config** → **Bandwidth Config** from the shortcut menu to access the bandwidth allocation configuration window.

- Click the right pane and select **Edit** → **Append** from the menu bar, or click the  button. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click **OK**.
- Configure according to the planned data in Table 5-26. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the bandwidth allocation is configured. See Figure 5-104.

Figure 5-104 The **Bandwidth Config** window - completed

### 5.4.3.5 Configuring the ONU Port Data Service Parameters

#### Configuration purpose

Configure the FE port status and working mode of the ONU and add VLAN tags to the data service.

#### Operation steps

- Click the **GC8B[15]** card in the **Object Tree** pane and information about 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** → **Service Config** from the shortcut menu. Select the **ONU Port Config** tab, as shown in Figure 5-105.

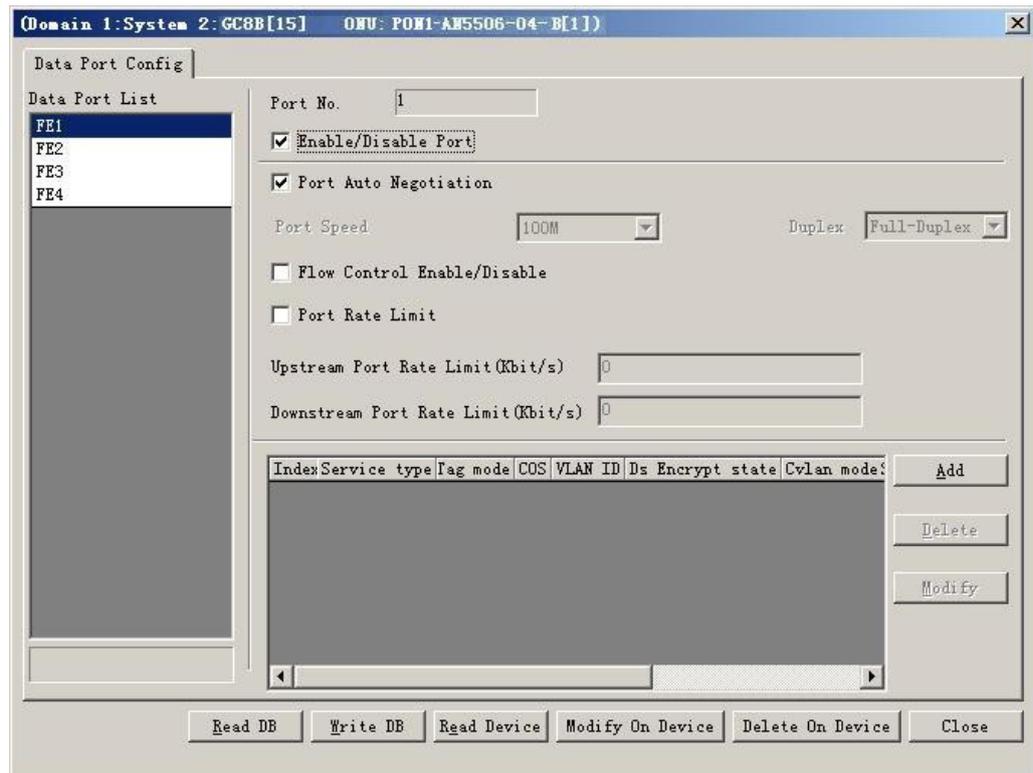
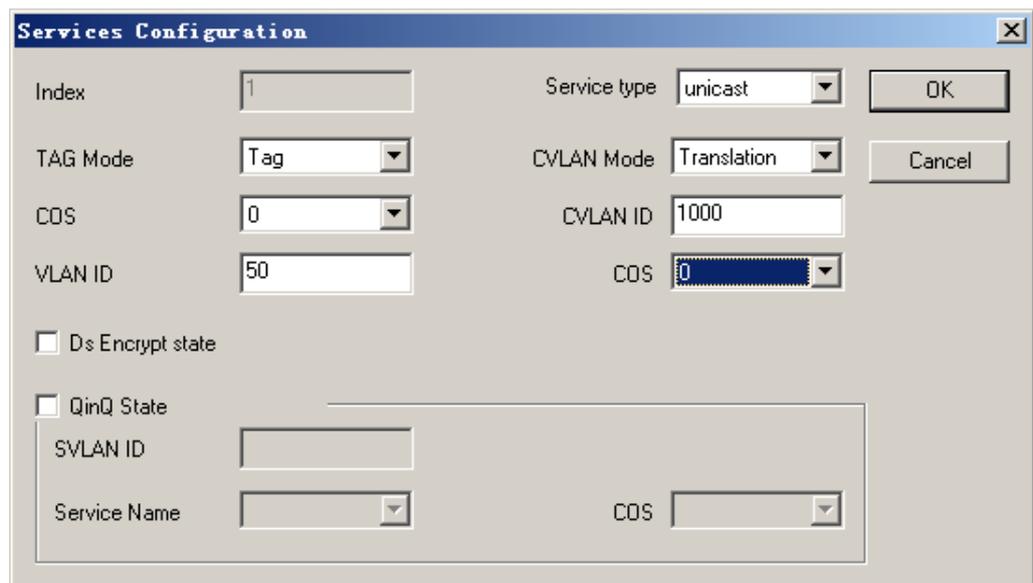


Figure 5-105 The ONU port service configuration

2. Select **FE1** from the **Data Port List** in Figure 5-105. Click **Add** to create two data services and configure according to the planned data in Table 5-26.

Figure 5-106 The **Services Configuration** dialog box (1)

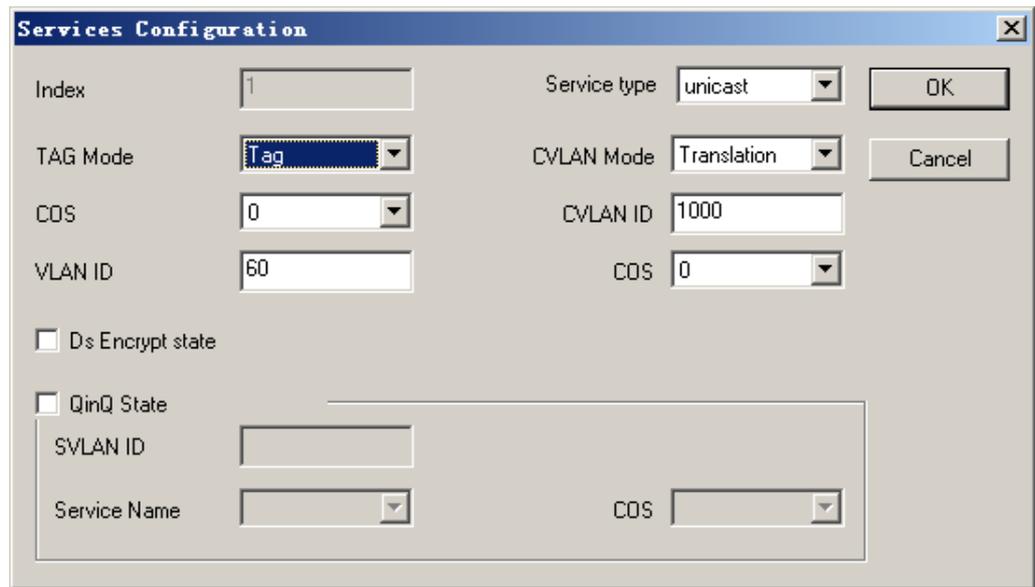


Figure 5-107 The **Services Configuration** dialog box (2)

3. Click **OK** and return to the dialog box shown in Figure 5-105. Right-click **FE1** in the **Data Port List** and select **Copy Port Config**. Right-click **FE2** and select **Paste Port Config**.
4. After the configuration, click the **Modify on Device** button and complete the AN5506-04-B service configuration. When the **Command Succeed** of the AN5506-04-B data port service appears in the **Command Manager** window, the AN5506-04-B port service configuration is completed. See Figure 5-108.

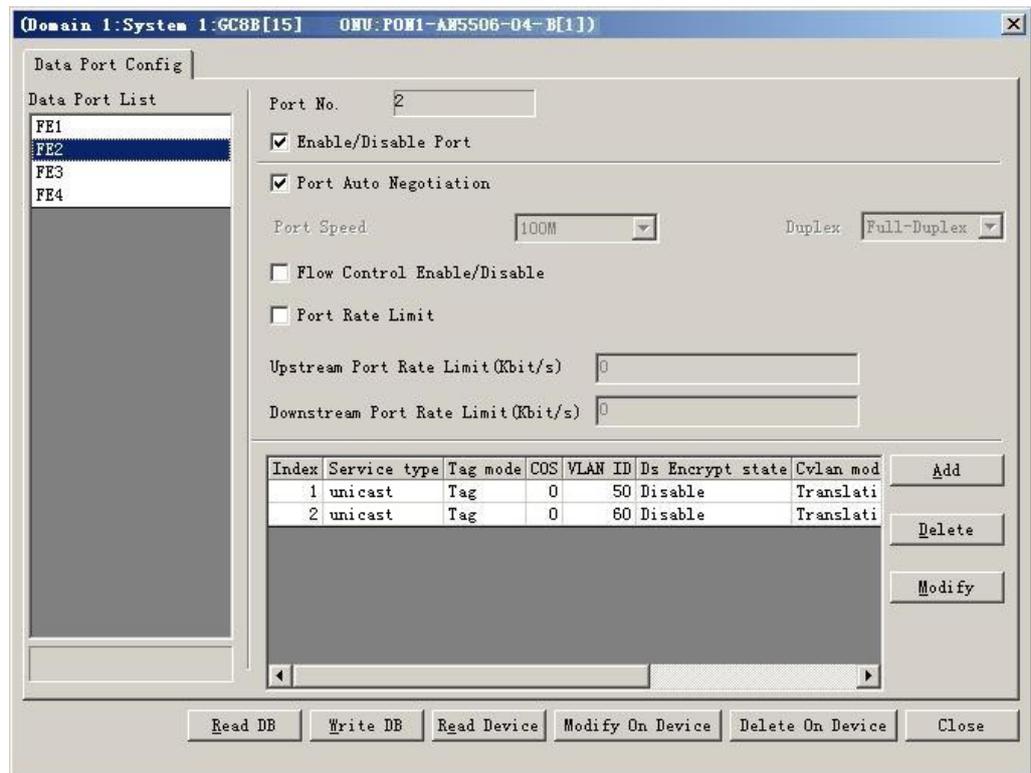


Figure 5-108 The port service configuration completed

### 5.4.3.6 Configuring the GPON OLT VLAN Operation Table

#### Configuration purpose

Perform the QinQ function of the data service by completing the SVLAN ID configuration on the GPON OLT VLAN operation table.

#### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, select **Config** → **QinQ** → **GPON OLT VLAN Operation Table** from the shortcut menu to access the **GPON OLT VLAN Operation Table** window.
2. Select **Edit** → **Append** in the menu bar or click the  button. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click the **OK** button. Double-click the **Domain Name** blank field and enter **abc3**.

- Configure according to the planned data in Table 5-26. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the GPON OLT VLAN operation table is configured. See Figure 5-109.

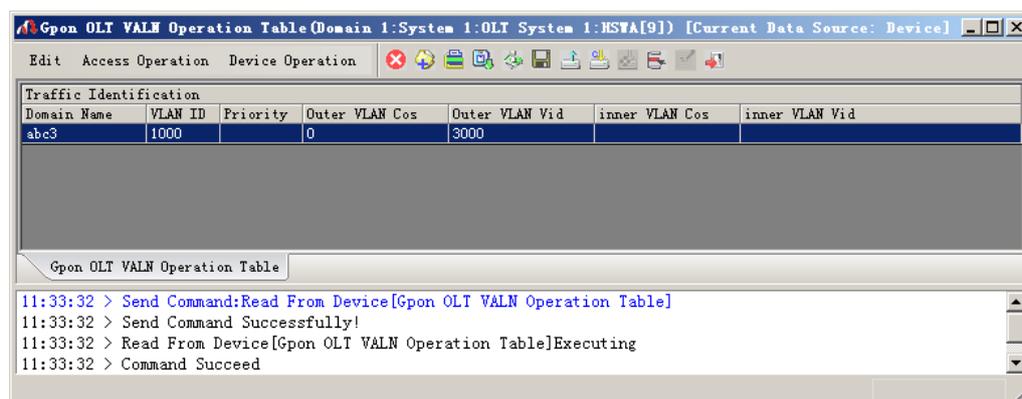


Figure 5-109 The GPON OLT VLAN Operation Table window - completed

### 5.4.3.7 Binding the PON Port to the VLAN Operation Table

#### Configuration purpose

Apply the data service configuration to the PON port on the GC8B card by binding the PON port to the VLAN operation table.

#### Operation steps

- Right-click the **GC8B[15]** card in the **Object Tree** pane, select **Config** → **PON Attach / Detach VLAN Operation Table** from the shortcut menu to access the **PON attach / detach VLAN Table** window.
- Status information of eight PON ports of the GC8B card is shown in the left pane. Select the PON port 1 and select **Attach** in the **Action** field.
- Click the right pane, select **Edit** → **Append** in the menu bar of the window or click the  button. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click **OK**. Click the **Table Name** list box and select **abc3**.

- Click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the PON port 1 has been bound to the operation table **abc3**. See Figure 5-110.

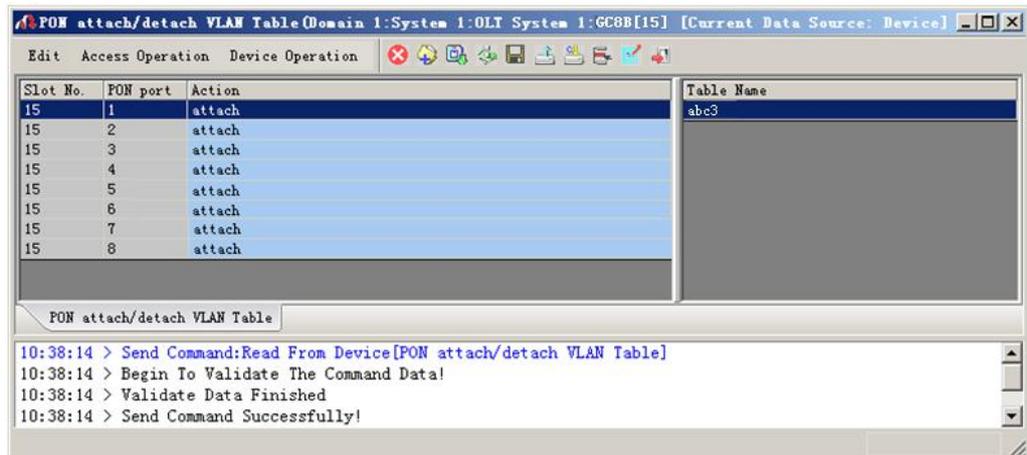


Figure 5-110 The PON attach / detach VLAN Table window - completed

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

### 5.4.4.1 Planning Data

Table 5-27 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 No.	Configure 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 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.	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 <b>Tag</b> or <b>Untag</b> . 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 and downlinked in the form of TAG. Under TAG mode, the uplink data packets will not be processed but remain uplinked in the original form. For downlink packets, however, only packets with designated TAGs are received and the packets will not be processed but remain downlinked in the original form.	Tag
	Service Type	Configure according to the network planning of the operator.	data
Slot Bind Mode	Select <b>Auto Bind</b> or <b>Manually Bind</b> .	Auto Bind	

Table 5-28 The planned data of data service configuration at the AN5506-04-B ONU side in the VLAN N:1 translation mode (in a batch manner)

Item		Description	Example
Bandwidth configuration	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 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 16Kbyte/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 0Kbyte/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 64Kbyte/s.	1280
Data Service Profile	Profile Name	Configure according to the network planning of the operator.	b
	Enable / Disable Port	Enable is selected by default.	Enable
	Port Auto Negotiation	Enable is selected by default.	Enable
	Port Speed	The default speed is 10M. Unconfigurable when the auto negotiation is enabled.	—
	Duplex	Full-duplex is selected by default. Unconfigurable when the auto negotiation is enabled.	—
	Flow control Enable / Disable	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.	—

Item		Description	Example	
	TAG Mode	Configured as <b>Tag</b> or <b>Untag</b> according to the network planning of the operator. In the <b>Tag</b> mode the uplink data packets are tagged, while in the <b>Untag</b> mode the uplink data packets are untagged.	Tag	
	COS	When the CVLAN mode is set as <b>Translate</b> , the item is the pre-translation service priority, ranging from 0 to 7. When the Tag mode is set as <b>Untag</b> , this item is unconfigurable.	0	
	VLAN ID	When the CVLAN mode is set as <b>Translate</b> , the item is the pre-translation VLAN ID, ranging from 1 to 4085. When the Tag mode is set as <b>Untag</b> , this item is unconfigurable.	50	60
	Ds Encrypt State	Disable is selected by default.	Disable	
	CVLAN Mode	When the Tag mode is set as <b>Untag</b> , the CLVAN mode can be set as <b>Tag</b> or <b>Transparent</b> . When the Tag mode is set as <b>Tag</b> , the CVLAN mode can be set as <b>Translate</b> or <b>Transparent</b> .	Translate	
	CVLAN ID	Configure according to the network planning of the operator. The value range is 1 to 4085.	1000	
	COS	The priority range is 0 to 7.	0	
	QinQ Enable State	Enable / disable the QinQ configuration. Disable is selected by default.	Disable	
	VLAN Name	The service name configured in the corresponding local VLAN. Unconfigurable when the QinQ enable state is disabled.	—	
	SVLAN ID	Unconfigurable when the QinQ enable state is disabled.	—	
	COS	Unconfigurable when the QinQ enable state is disabled.	—	
Service Profile	Profile Name	Configure according to the network planning of the operator.	c	
	ONU Type	The actually used ONU type	AN5506-04-B	
	ONU Subprofile	Profile Type The bandwidth allocation profile should be selected.	Bandwidth allocation profile	

Item			Description	Example
	Config	Profile Name	The profile name configured in the corresponding 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 corresponding data service profile	b
Service Profile Binding	Profile ID		The profile name configured in the corresponding 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	1
	ONU S.N.		The ONU authorization number assigned according to the network planning of the operator	1
GPON OLT VLAN Operation Table	Domain Name		Configure according to the network planning of the operator.	abc3
	VLAN ID		The corresponding inner VLAN value of the uplink service flow from the ONU, ranging from 1 to 4085.	1000
	Priority		The inner VLAN translation priority of the downlink service flow, ranging from 0 to 7, or null.	—
	VLAN Layer 2	Outer VLAN COS	The SVLAN priority, ranging from 0 to 7.	0
		Outer VLAN Vid	The item can be used to add the SVLAN value, ranging from 1 to 4085.	3000
	VLAN Layer 1	Inner VLAN COS	The inner VLAN translation priority of the uplink service flow, ranging from 0 to 7, or null.	—
		Inner VLAN Vid	The item can be used to translate the inner VLAN of the uplink service flow from the ONU. If translation is required, the item is the translated VLAN value. If not required, the item is consistent with the VLAN identifier or null.	—

Item		Description	Example
PON Attach / Detach VLAN Table	Slot No.	The number of the actually used slot	15
	PON Port	The number of the actually used PON	1
	Action	Attach / detach the VLAN operation table.	Attach
	Table Name	Selects the configured VLAN operation table name.	abc3

### 5.4.4.2 Configuration Flow Chart

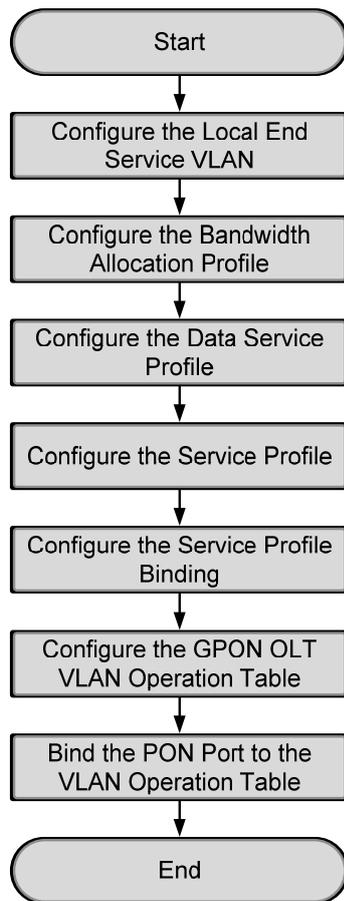


Figure 5-111 The batch configuration flow chart of data service provisioning in the VLAN N:1 translation mode (for the AN5506-04-B)

### 5.4.4.3 Configure the Local End Service VLAN

See Section 5.4.3.3 for configuration procedures.

### 5.4.4.4 Configure the Bandwidth Allocation Profile

#### Configuration purpose

Configure the bandwidth of the ONU data service and limit the traffic flow.

#### Operation steps

1. Right-click the **HWSA[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 select **Edit** → **Append** in the menu bar or click the  button. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click the **OK** button. Double-click the **Profile Name** blank field and enter **a**.
3. Click the right pane and select **Edit** → **Append** in the menu bar or 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 planned data in Table 5-28. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the bandwidth allocation is configured. See Figure 5-112.

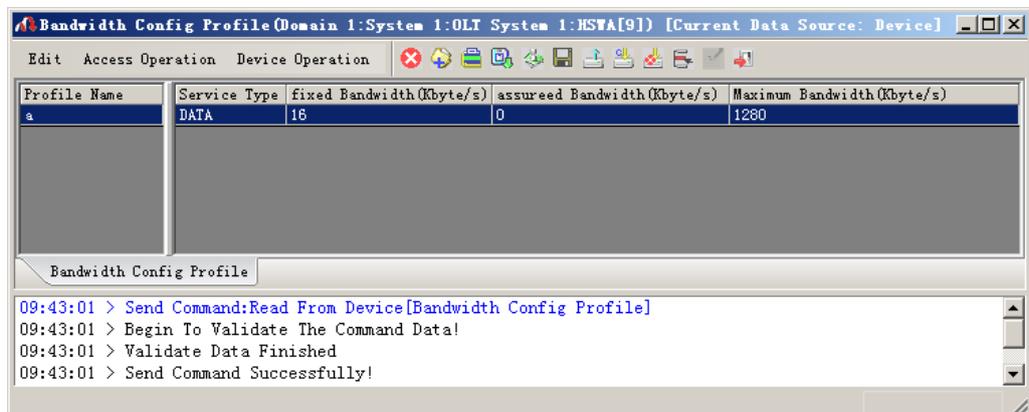


Figure 5-112 The **Bandwidth Config Profile** window - completed

### 5.4.4.5 Configuring the Data Service Profile

#### Configuration purpose

Configure the FE port status and working mode of the ONU and translate the inner VLAN of the data service.

#### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane and select **Config** → **Data Service Profile** from the shortcut menu. Click the **Data Service Profile** tab and the **Data Service Profile** window appears.
2. Click the left pane and select **Edit** → **Append** in the menu bar. 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 planned data in Table 5-28.
3. Click the right pane and select **Edit** → **Append** in the menu bar. Enter **2** in the **Please Input the Rows for Add** dialog box that appears and click **OK**. Configure the VLAN tags of the service flow according to the planned data in Table 5-28.
4. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the data service profile is configured. See Figure 5-113.

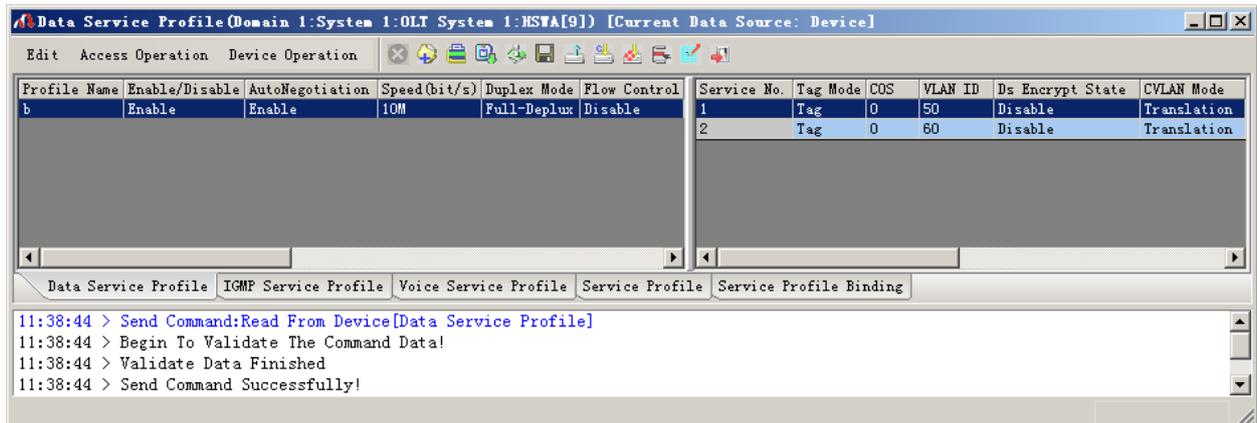


Figure 5-113 The Data Service Profile window - completed

### 5.4.4.6 Creating a Service Profile

#### Configuration purpose

Configure the bandwidth allocation profile and data service profile for the ONU binding.

#### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane and select **Config** → **Service Profile** from the shortcut menu. Click the **Service Profile** tab and the **Service Profile** window appears.
2. Click the left pane and select **Edit** → **Append** in the menu bar. Enter **1** in the **Please Input the Rows for Add** dialog box that appears 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.
4. Click the **ONU Subprofile Config** field to access the **ONU Subprofile Config** dialog box. Click the **Add** button to add a profile configuration. Click the **Profile Type** list box and select **Bandwidth Config Profile**. Click the **Profile Name** list box and select **a**.

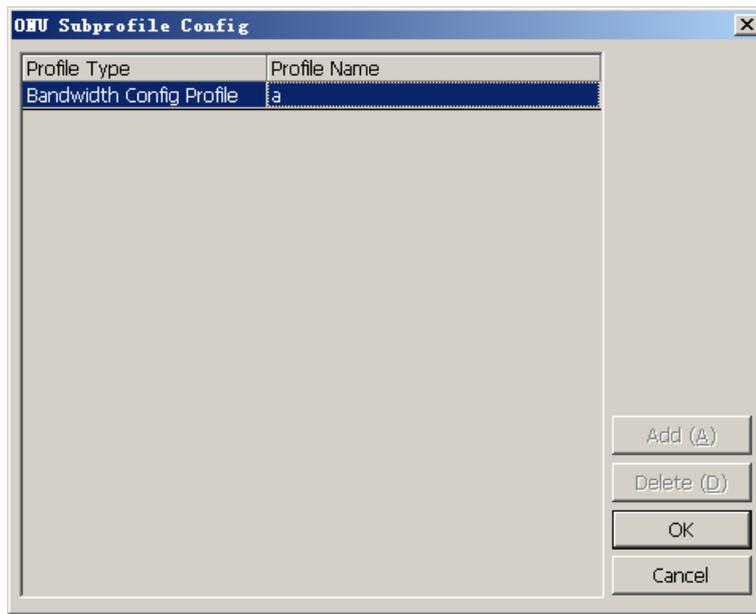


Figure 5-114 The **ONU Subprofile Config** dialog box

5. Click **OK** and return to the **Service Profile** window.

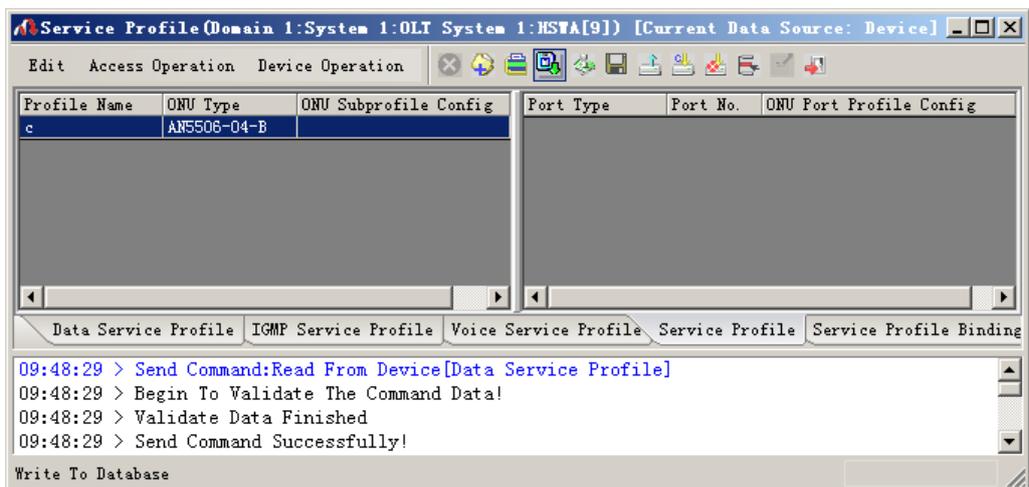


Figure 5-115 The **Service Profile** window

6. Click the right pane and select **Edit** → **Append** in the menu bar. Enter **2** in the **Please Input the Rows for Add** dialog box that appears and click **OK**.
7. Click the **Port Type** list box and select **FE**. Double-click the **Port No.** blank field and enter **1**. Repeat the procedure to enter **2**.

8. For Port No.1 click the **ONU Port Profile Config** field to access the **ONU Port Profile Config** dialog box. Click **Add** to add a profile configuration. Click the **Profile Type** list box and select **Data Service Profile**. Click the **Profile Name** list box and select **b**. Repeat the procedure for Port No.2.

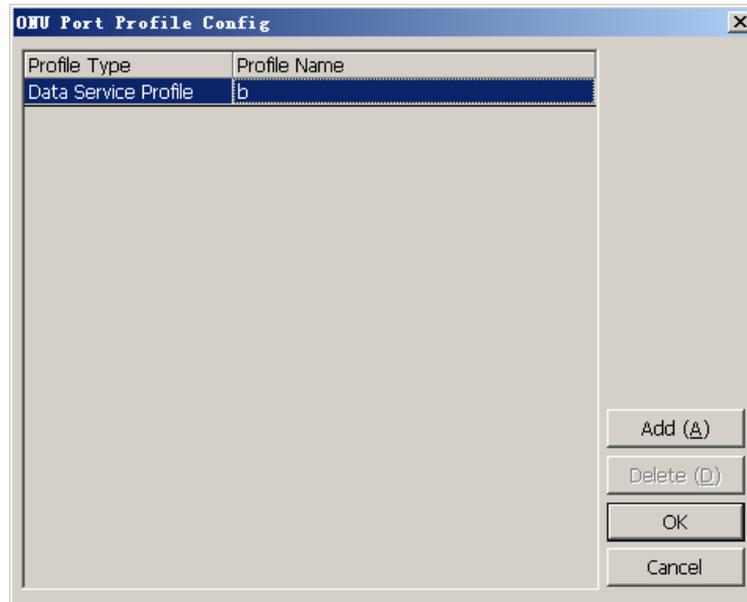


Figure 5-116 The **ONU Port Profile Config** dialog box

9. Click **OK** and return to the **Service Profile** window.
10. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the service profile is configured. See Figure 5-117.

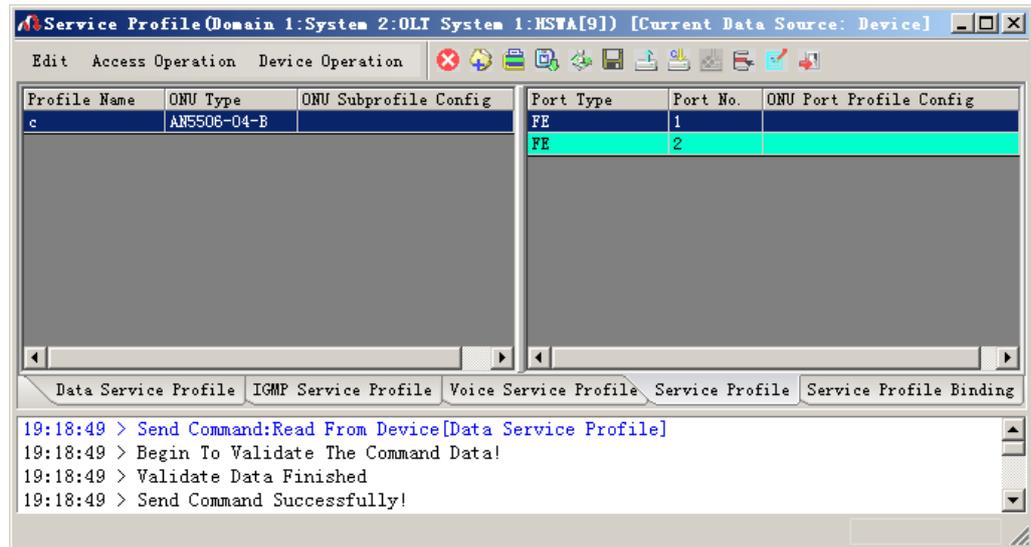


Figure 5-117 The Service Profile window - completed

### 5.4.4.7 Binding the ONU to the Service Profile

#### Configuration purpose

Apply the bandwidth allocation and data service configuration of the service profile to the ONU by binding the ONU to the service profile.

#### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane and select **Config** → **Service Profile Config** from the shortcut menu. Click the **Service Profile Binding** tab and the **Service Profile Binding** window appears.
2. Click the left pane and select **Edit** → **Append** in the menu bar. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click **OK**.
3. Click the **Profile ID** list box and select **c**. Click the **Action** list box and select **Attach**.
4. Click the right pane and select **Edit** → **Append** in the menu bar. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click **OK**.
5. Double-click the **ONU S.N.** field to bring up the **Select Objects** dialog box. Select **AN5506-04-B** in the dialog box.

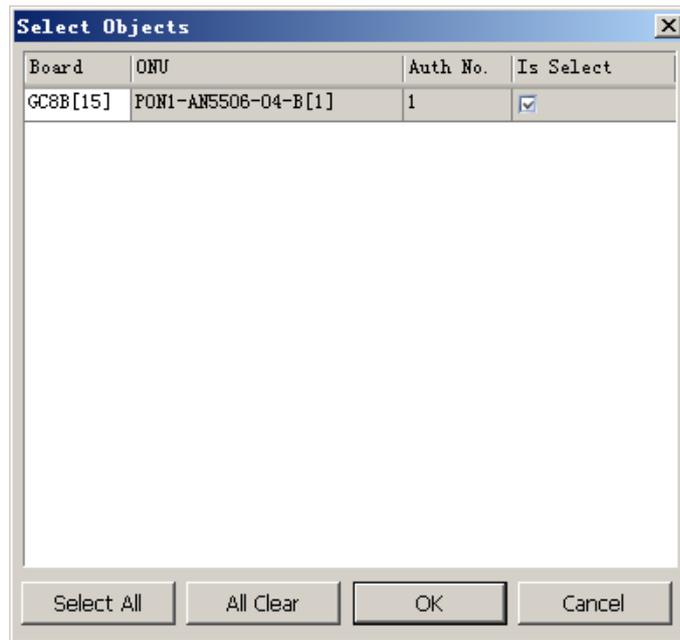
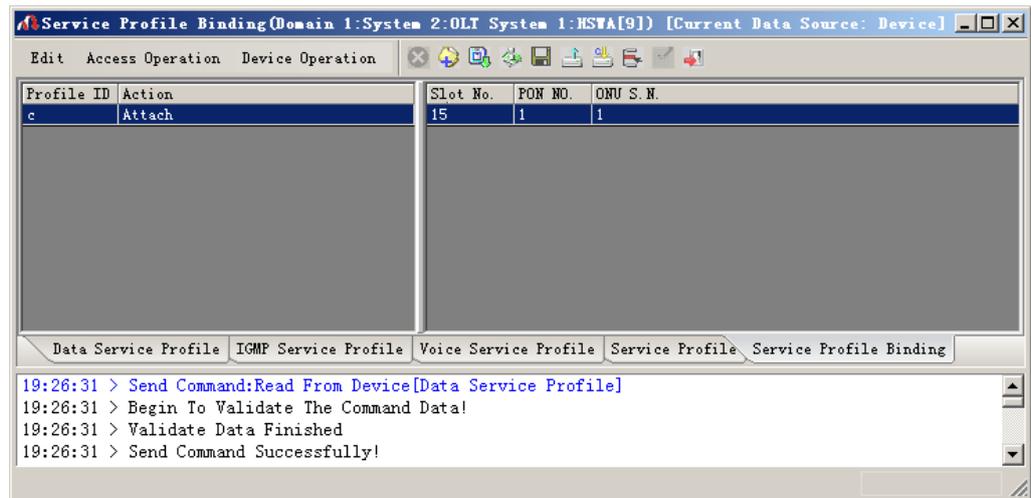


Figure 5-118 The **Select Objects** dialog box

- Click the **OK** button and return to the **Service Profile Binding** window. Click the  button to execute the command. The **If the service profile binding and the refresh operation is performed, the original ONU service configuration will be overwritten. Are you sure to execute this command?** dialog box will appear. Click **OK** and then once again in the **Are you sure to write all data to the device?** dialog box.
- Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the AN5506-04-B has been bound to the service profile **c**. See Figure 5-119.

Figure 5-119 The **Service Profile Binding** window - completed

### 5.4.4.8 Configuring the GPON OLT VLAN Operation Table

#### Configuration purpose

Perform the QinQ function of the data service by completing the SVLAN ID configuration on the GPON OLT VLAN operation table.

#### Operation steps

1. Right-click the **HSTA[9]** card in the **Object Tree** pane, select **Config** → **QinQ** → **GPON OLT VLAN Operation Table** from the shortcut menu to access the **GPON OLT VLAN Operation Table** window.
2. Select **Edit** → **Append** on the menu bar or click the  button. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click the **OK** button. Double-click the **Domain Name** blank field and enter **abc3**.
3. Configure according to the planned data in Table 5-28. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the GPON OLT VLAN operation table is configured. See Figure 5-120.

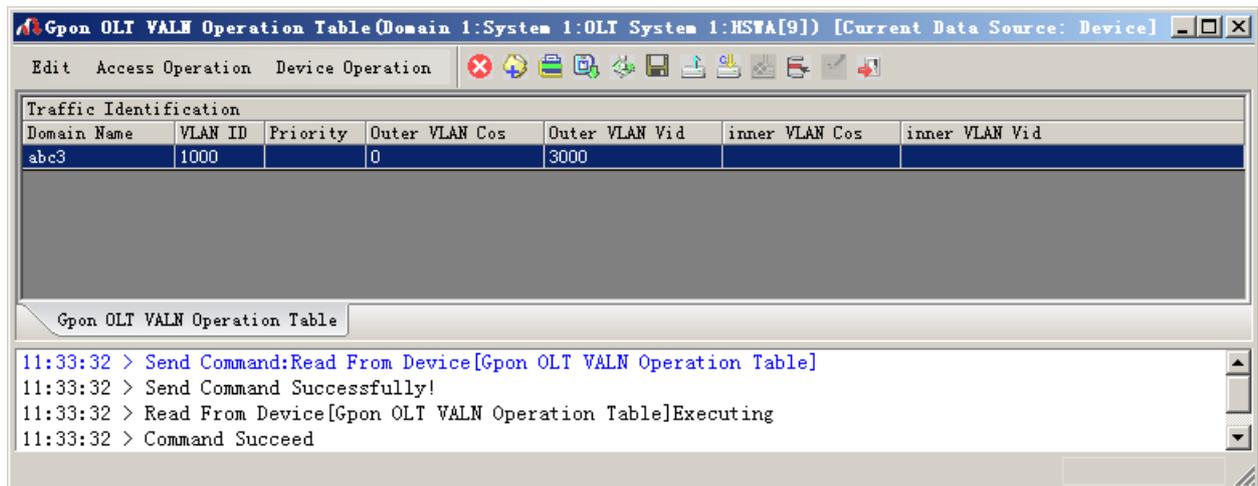


Figure 5-120 The GPON OLT VLAN Operation Table window - completed

### 5.4.4.9 Binding the PON Port to the VLAN Operation Table

#### Configuration purpose

Apply the data service configuration to the PON port on the GC8B card by binding the PON port to the VLAN operation table.

#### Operation steps

1. Right-click the **GC8B[15]** card in the **Object Tree** pane, select **Config** → **PON Attach / Detach VLAN Operation Table** from the shortcut menu to access the **PON attach / detach VLAN Table** window.
2. Status information of eight PON ports of the GC8B card is shown in the left pane. Select the PON port 1 and select **Attach** in the **Action** field.
3. Click the right pane, select **Edit** → **Append** in the menu bar of the window or click the  button. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click **OK**. Click the **Table Name** list box and select **abc3**.

- Click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the PON port 1 has been bound to the operation table **abc3**. See Figure 5-121.

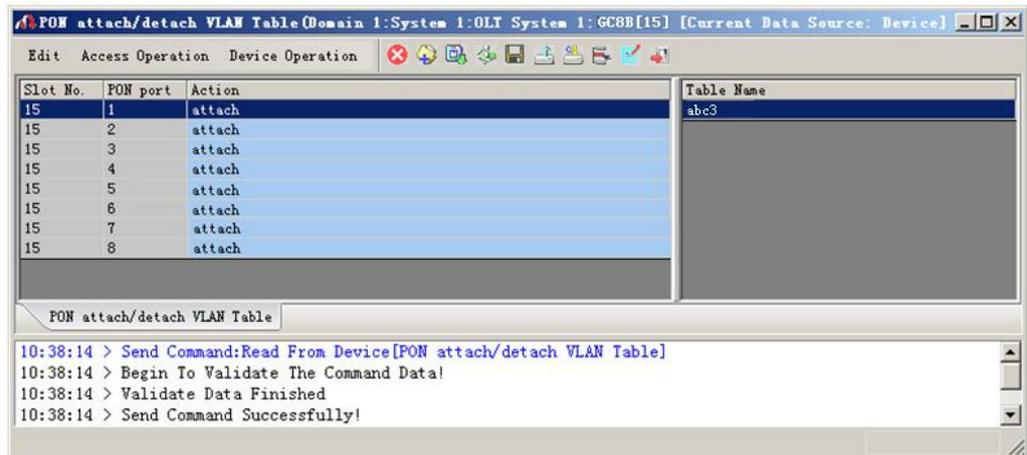


Figure 5-121 The **PON attach / detach VLAN Table** window - completed

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

### 5.4.5.1 Planning Data

Table 5-29 The planned data of data service configuration 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 No.	Configure 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 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.	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 <b>Tag</b> or <b>Untag</b> . 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 and downlinked in the form of TAG. Under TAG mode, the uplink data packets will not be processed but remain uplinked in the original form. For downlink packets, however, only packets with designated TAGs are received and the packets will not be processed but remain downlinked in the original form.	Tag
	Service Type	Configure according to the network planning of the operator.	data
	Slot Bind Mode	Select <b>Auto Bind</b> or <b>Manually Bind</b> .	Auto Bind

Table 5-30 The planned data of data service configuration at the AN5506-10-B1 ONU side in the VLAN N:1 translation mode (configured respectively)

Item		Description	Example			
Bandwidth Configuration	Service Type	Select integrated service.	Integrated Service			
	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 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			
Basic information of the ONU port	ONU Port Used	The actually used ONU port	1	2		
	Enable / Disable Port	Configure according to the network planning of the operator. Enable is selected by default.	Default			
	Port Auto Negotiation	Configure according to the network planning of the operator. Enable is selected by default.	Default			
	Port Speed	Unconfigurable when the port auto negotiation is enabled. The default speed is 100M.	Default			
	Duplex	Unconfigurable when the port auto negotiation is enabled. The default value is full-duplex.	Default			
	Flow control Enable / Disable	Configure according to the network planning of the operator. Disable is selected by default.	Default			
ONU port service parameter config	Port No.	The configured service serial number. An ONU port can support up to 16 services.	1	2	1	2
	TLS	Configured as <b>TLS</b> or <b>No TLS</b> according to the network planning of the operator.	No TLS			
	Service Type	Data service. Select Unicast.	Unicast			
	VLAN Mode	Configured as <b>Tag</b> or <b>Transparent</b> according to the network planning of the operator.	Transparent			
	TPID	The default value is 33024.	33024			

Item		Description	Example			
	CVLAN ID	The pre-translation CVLAN ID, ranging from 1 to 4085.	500	600	500	600
	Priority or COS	The CVLAN priority, ranging from 0 to 7.	0			
	Translation State	Enable / disable the translation configuration.	Enable			
	Translation Value	The translated VLAN ID, ranging from 1 to 4085.	2000			
	TPID	The default value is 33024.	33024			
	Priority or COS	The translation priority, ranging from 0 to 7 with 7 as the highest priority and 0 as the lowest.	0			
GPON OLT VLAN operation table	Domain Name		Configure according to the network planning of the operator.	abc4		
	VLAN ID		The corresponding inner VLAN value of the uplink service flow from the ONU, ranging from 1 to 4085.	2000		
	Priority		The inner VLAN translation priority of the downlink service flow, ranging from 0 to 7, or null.	—		
	VLAN Layer 2	Outer VLAN COS	The SVLAN priority, ranging from 0 to 7.	0		
		Outer VLAN Vid	The item is used to add the SVLAN value, ranging from 1 to 4085.	3001		
	VLAN Layer 1	Inner VLAN COS	The inner VLAN translation priority of the uplink service flow, ranging from 0 to 7, or null.	—		
		Inner VLAN Vid	The item can be used to translate the inner VLAN of the uplink service flow from the ONU. If translation is required, the item is the translated VLAN value. If not required, the item is consistent with the VLAN identifier or null.	—		
PON Attach / Detach VLAN Table	Slot No.		The number of the actually used slot	15		
	PON Port		The number of the actually used PON	1		
	Action		Attach / detach the VLAN operation table.	Attach		
	Table Name		Select the configured VLAN operation table name.	abc4		

### 5.4.5.2 Configuration Flow Chart

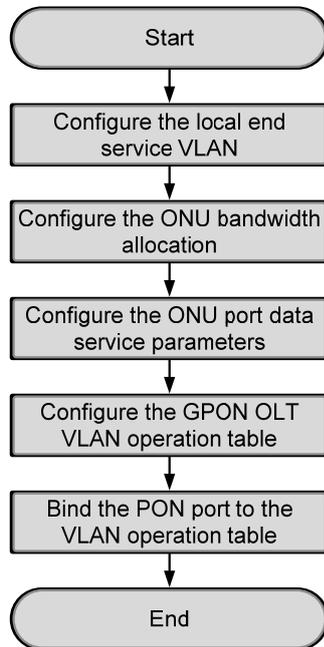


Figure 5-122 Flow chart for provisioning data services respectively in the VLAN N:1 translation mode (for the AN5506-10-B1)

### 5.4.5.3 Configuring the Local End Service VLAN

See Section 5.4.3.3 for configuration procedures.

### 5.4.5.4 Configuring the Bandwidth Allocation

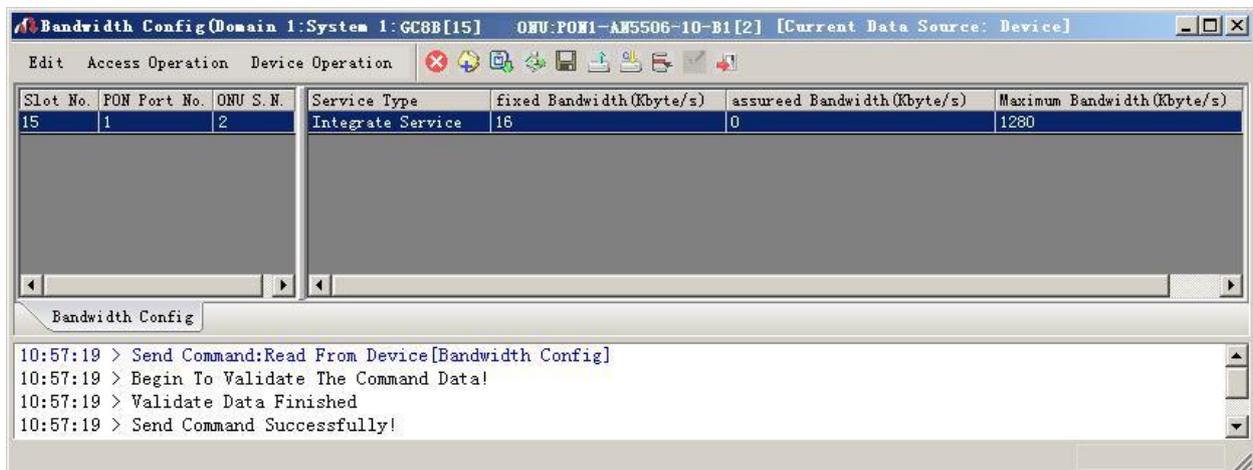
Configuration purpose

Configure the bandwidth of the ONU data service and limit the traffic flow.

Operation steps

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, select **Config** → **Bandwidth Config** from the shortcut menu to access the bandwidth allocation configuration window.

- Click the right pane and select **Edit** → **Append** on the menu bar or click the  button. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click the **OK** button.
- Configure according to the planned data in Table 5-30. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the bandwidth allocation is configured. See Figure 5-123.

Figure 5-123 The **Bandwidth Config** window

### 5.4.5.5 Configuring the ONU Port Data Service Parameters

#### Configuration purpose

Configure the FE port status and working mode of the ONU and add VLAN tags to the data service.

#### Operation steps

- Click the **GC8B[15]** card in the **Object Tree** pane and information about 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. Select the **ONU Port Config** tab, as shown in Figure 5-124.

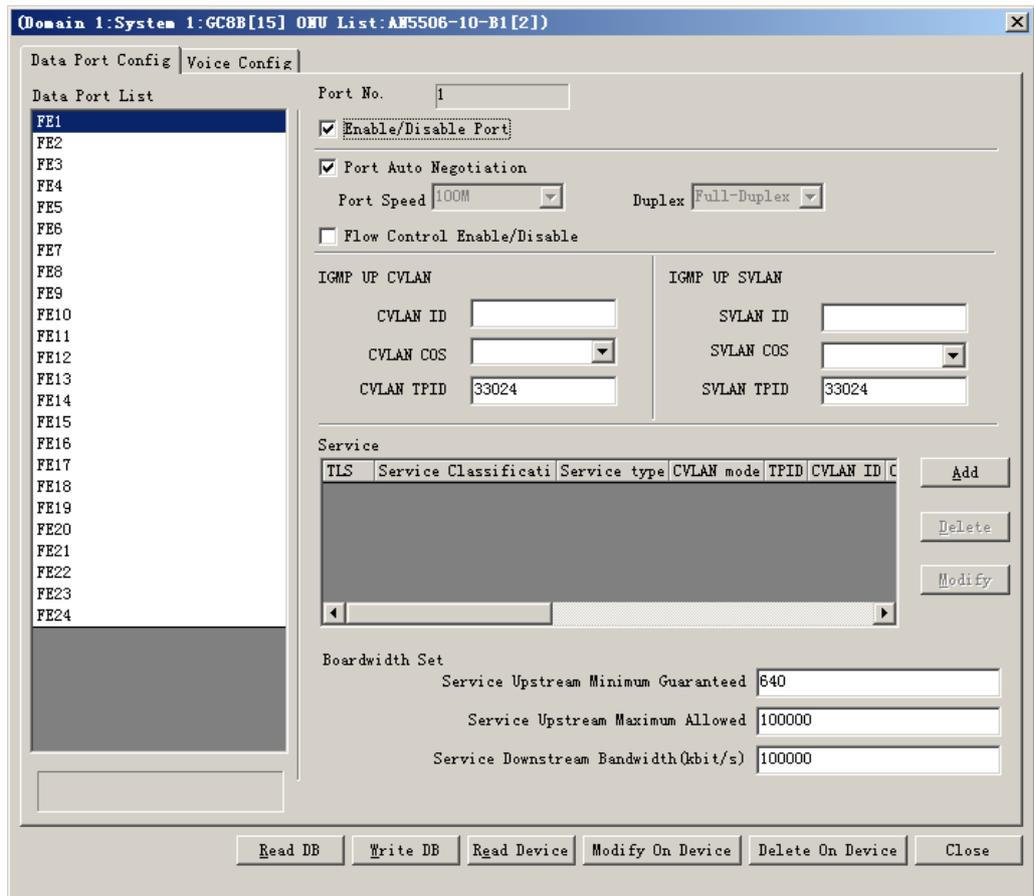


Figure 5-124 The ONU port service configuration

2. Select **FE1** from the **Data Port List** in Figure 5-124. Click **Add** to create a data service and configure it according to the planned data in Table 5-30.

The screenshot shows the 'Services Configuration' dialog box. The fields are as follows:

- TLS: No TLS
- Service type: unicast
- TPID: 33024
- VLAN Mode: Transparent
- CVLAN ID: 500
- Priority Or COS: 0
- Translation State:  Translation value: 2000
- Qinq State:
- Buttons: Set Service Classificati..., OK, Cancel
- Bottom section: Service Name (dropdown), VLAN ID (text), TPID: 33024, Priority Or COS (dropdown)

Figure 5-125 The service configuration (1)

The screenshot shows the 'Services Configuration' dialog box with the following fields:

- TLS: No TLS
- Service type: unicast
- TPID: 33024
- VLAN Mode: Transparent
- CVLAN ID: 600
- Priority Or COS: 0
- Translation State:  Translation value: 2000
- Qinq State:
- Buttons: Set Service Classificati..., OK, Cancel
- Bottom section: Service Name (dropdown), VLAN ID (text), TPID: 33024, Priority Or COS (dropdown)

Figure 5-126 The services configuration (2)

- Click **OK** and return to the dialog box shown in Figure 5-124. Right-click **FE1** in the **Data Port List** and select **Copy Port Config**. Right-click **FE2** and select **Paste Port Config** to enable the FE2 port.

- After the configuration, click the **Modify on Device** button to complete the AN5506-10-B1 service configuration. If the **Command Succeed** of the **AN5506-10-B1** data port service appears in the **Command Manager** window, the AN5506-10-B1 port service configuration is completed. See Figure 5-127.

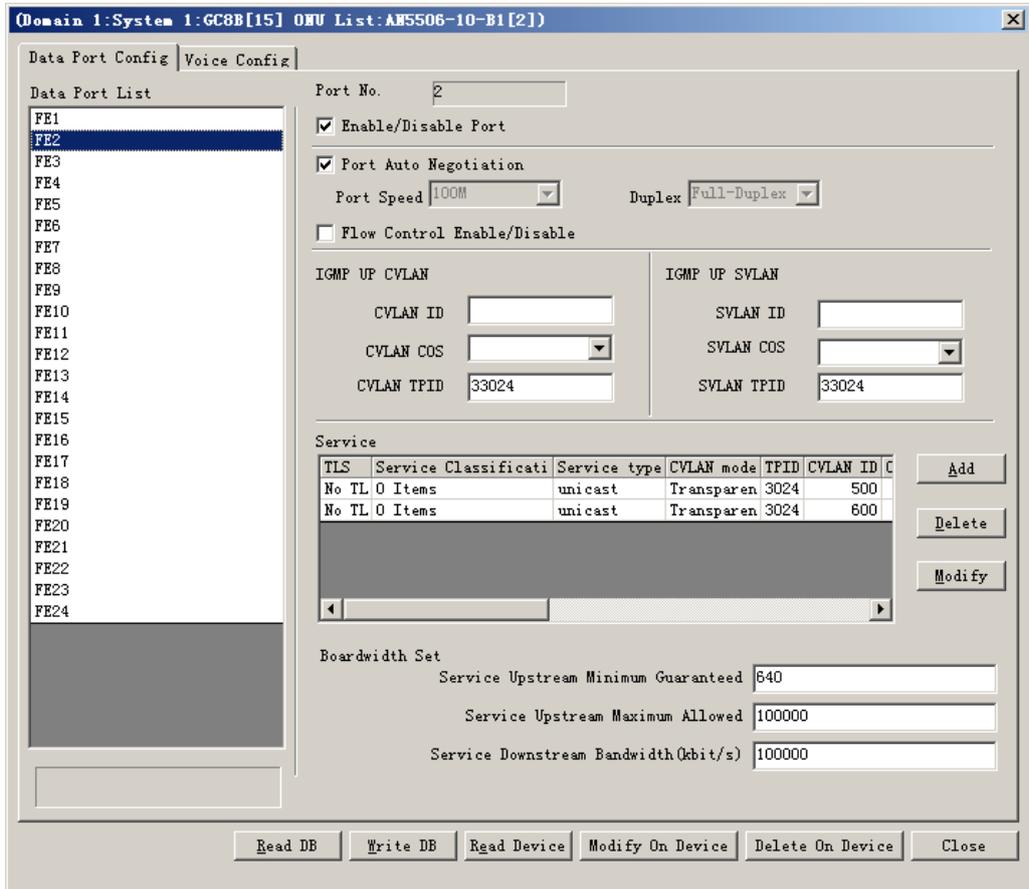


Figure 5-127 The port service configuration - completed

### 5.4.5.6 Configuring the GPON OLT VLAN Operation Table

#### Configuration purpose

Perform the QinQ function of the data service by completing the SVLAN ID configuration on the GPON OLT VLAN operation table.

## Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, select **Config** → **QinQ** → **GPON OLT VLAN Operation Table** from the shortcut menu to access the **GPON OLT VLAN Operation Table** window.
2. Select **Edit** → **Append** on the menu bar or click the  button. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click the **OK** button. Double-click the **Domain Name** blank field and enter **abc4**.
3. Configure according to the planned data in Table 5-30. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the GPON OLT VLAN operation table is configured. See Figure 5-128.

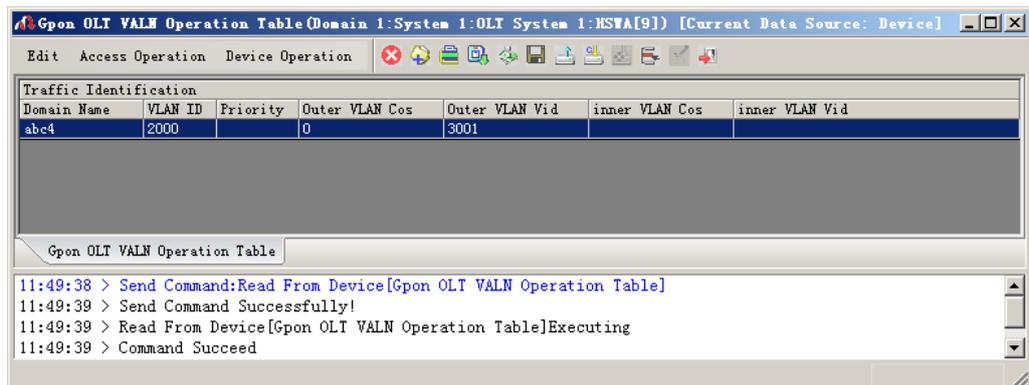


Figure 5-128 The **GPON OLT VLAN Operation Table** window - completed

### 5.4.5.7 Binding the PON Port to the VLAN Operation Table

#### Configuration purpose

Apply the data service configuration to the PON port on the GC8B card by binding the PON port to the VLAN operation table.

## Operation steps

1. Right-click the **GC8B[15]** card in the **Object Tree** pane, select **Config** → **PON Attach / Detach VLAN Operation Table** from the shortcut menu to access the **PON attach / detach VLAN Table** window.
2. Status information of eight PON ports of the GC8B card is shown in the left pane. Select the PON port 1 and select **Attach** in the **Action** field.
3. Click the right pane, select **Edit** → **Append** in the menu bar of the window or click the  button. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click **OK**. Click the **Table Name** list box and select **abc4**.
4. Click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the PON port 1 has been bound to the operation table **abc4**. See Figure 5-129.

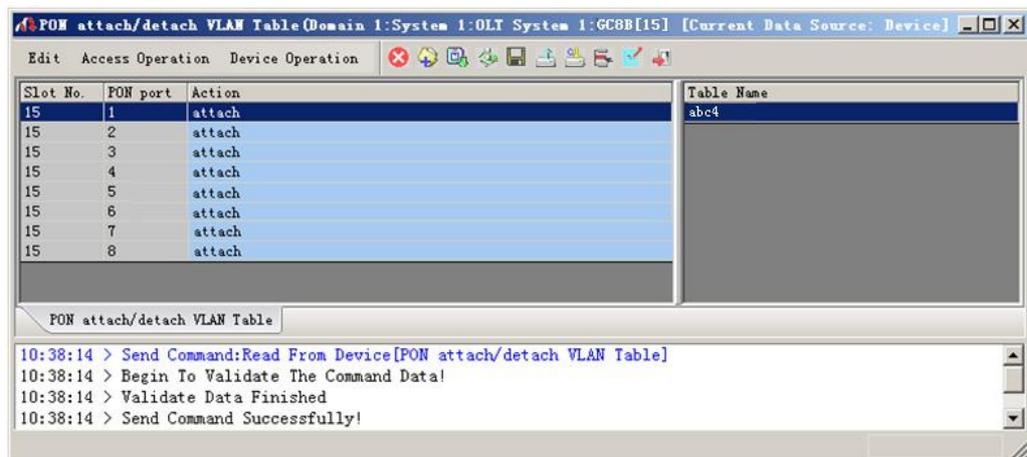


Figure 5-129 The **PON attach / detach VLAN Table** window - completed

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

### 5.4.6.1 Planning Data

Table 5-31 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.	Configure 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 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.	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 <b>Tag</b> or <b>Untag</b> . 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 and downlinked in the form of TAG. Under TAG mode, the uplink data packets will not be processed but remain uplinked in the original form. For downlink packets, however, only packets with designated TAGs are received and the packets will not be processed but remain downlinked in the original form.	Tag
	Service Type	Configure according to the network planning of the operator.	data
	Slot Bind Mode	Select <b>Auto Bind</b> or <b>Manually Bind</b> .	Auto Bind

Table 5-32 The planned data of data service configuration at the AN5506-10-B1 ONU side in the VLAN N:1 translation mode (in a batch manner)

Item	Description		Example	
Bandwidth config profile	Profile Name	The name of the bandwidth allocation profile	a	
	Service Type	Select integrated service.	Integrated Service	
	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 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	
Bandwidth allocation profile binding	Slot No.	The number of the actually used slot	15	
	PON No.	The number of the actually used PON	1	
	ONU S.N.	The ONU authorization number allocated according to the network planning of the operator.	2	
	GPON Bandwidth Profile	The name of the configured bandwidth allocation profile	a	
Service Model Profile	Profile Name	Configure according to the network planning of the operator	b	
	Service Type	Select unicast	Unicast	
	CVLAN Mode	Configure the CVLAN mode of the service as <b>Tag</b> or <b>Transparent</b> .	Transparent	
	Translation State	Configure the translation function.	Enable	
ONU data port configuration	PON No.	The actually used ONU port	1	2
	Port Enable / Disable	Enable / disable the port.	Enable	

Item		Description	Example			
	MAC Limit	Configured as no MAC limit.	0			
ONU Data Service Config	CTPID	The default value is 33024.	33024			
	CVLAN ID	The pre-translation VLAN ID, ranging from 1 to 4085.	500	600	500	600
	CCOS	The CVLAN priority configuration, ranging from 0 to 7 with 7 as the highest priority and 0 as the lowest.	0			
	TTPID	The default value is 33024.	33024			
	Translation VID	The translated VLAN ID, ranging from 1 to 4085.	2000			
	COS	The translation VLAN priority, ranging from 0 to 7, or null.	0			
	Service Model Profile	Select the configured service model profile.	b			
GPON OLT VLAN Operation Table	Domain Name		Configure according to the network planning of the operator.		abc4	
	VLAN ID		The corresponding inner VLAN value of the uplink service flow from the ONU, ranging from 1 to 4085.		2000	
	Priority		The inner VLAN translation priority of the downlink service flow, ranging from 0 to 7, or null.		—	
	VLAN Layer 2	Outer VLAN COS	The SVLAN priority, ranging from 0 to 7.		0	
		Outer VLAN Vid	The item is used to add the SVLAN value, ranging from 1 to 4085.		3001	
	VLAN Layer 1	Inner VLAN COS	The inner VLAN translation priority of the uplink service flow, ranging from 0 to 7, or null.		—	
		Inner VLAN Vid	The item can be used to translate the inner VLAN of the uplink service flow from the ONU. If translation is required, the item is the translated VLAN value. If not required, the item is consistent with the VLAN identifier or null.		—	

Item		Description	Example
PON Attach / Detach VLAN Table	Slot No.	The number of the actually used slot	15
	PON Port	The port of the actually used PON	1
	Action	Attach / detach the VLAN operation table.	Attach
	Table Name	Select the configured VLAN operation table name.	abc4

### 5.4.6.2 Configuration Flow Chart

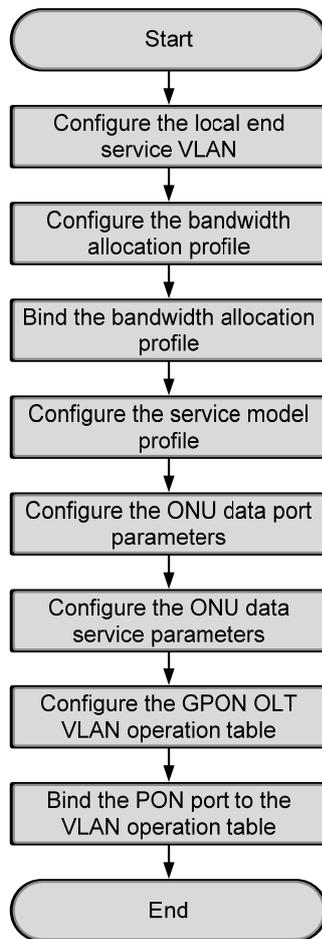


Figure 5-130 The batch configuration flow chart of data service provisioning in the VLAN N:1 translation mode (for the AN5506-10-B1)

### 5.4.6.3 Configuring the Local End Service VLAN

See Section 5.4.3.3 for configuration procedures.

### 5.4.6.4 Configuring the Bandwidth Allocation Profile

#### Configuration purpose

Configure the bandwidth of the ONU data service and limit the traffic flow.

#### Operation steps

1. Right-click the **HWSA[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 select **Edit** → **Append** on the menu bar or click the  button. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click the **OK** button. Double-click the **Profile Name** blank field and enter **a**.
3. Click the right pane and select **Edit** → **Append** on the menu bar or 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 planned data in Table 5-32. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the bandwidth allocation profile is configured. See Figure 5-131.

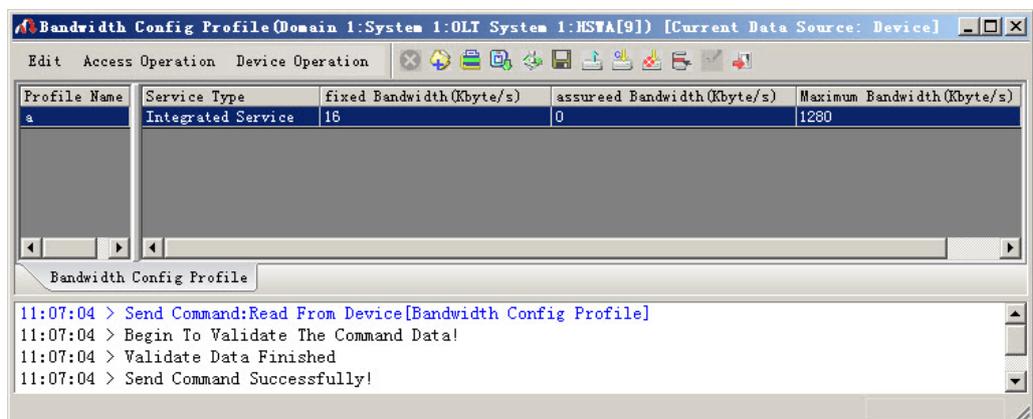


Figure 5-131 The **Bandwidth Config Profile** window - completed

### 5.4.6.5 Binding the Bandwidth Allocation Profile

#### Configuration purpose

Bind the configured bandwidth allocation profile to the ONU.

#### Configuration example

1. Right-click the system in the **Object Tree**, select **Config** → **Batch Config** → **ONU Configuration** to access the ONU configuration window.
2. Click **Set Object as Condition** in the **Config Object** pane and all configuration objects will appear in the lower pane (you can drill down and select a specific port as the object). Select the **AN5506-10-B1[2]** under the PON 1 in Slot 15 and click the **OK** button.

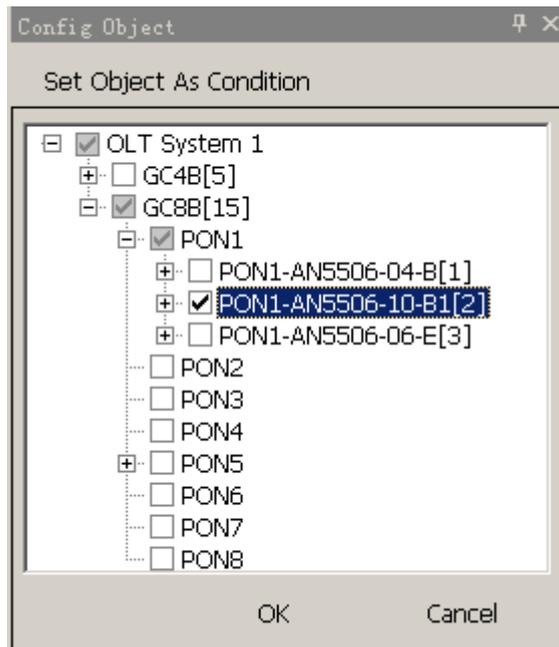


Figure 5-132 Set configuration objects

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**.

- When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the bandwidth allocation profile is bound. See Figure 5-133.

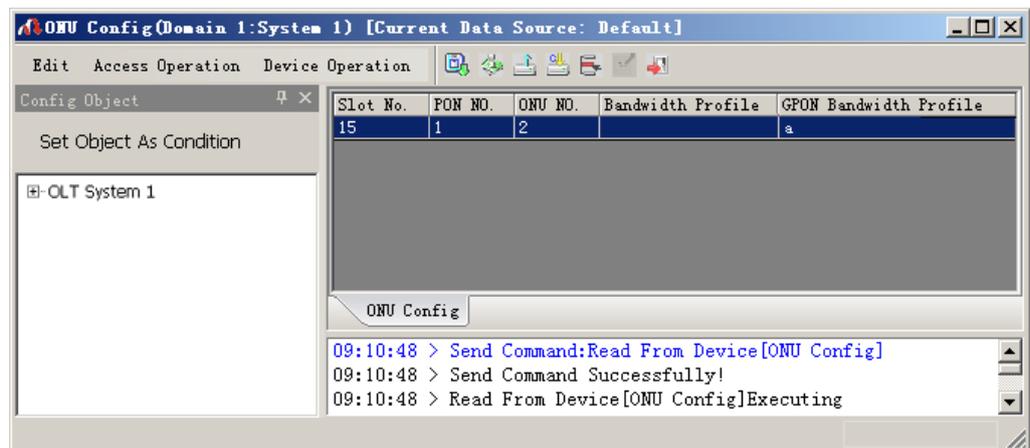


Figure 5-133 Binding the bandwidth allocation profile

### 5.4.6.6 Configuring the Service Model Profile

#### Configuration purpose

Select the data service type, CVLAN mode and determine whether to enable the translation function and the QinQ function.

#### Configuration example

- Right-click the system in the **Object Tree** pane, select **Config** → **Profile Definition** → **Service Model Profile** to access the service model profile configuration window.
- Select **Edit** → **Append** in the menu bar of the window or click the  button. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click **OK** to add a service model profile.

- Configure according to the planned data in Table 5-32. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the service model profile is configured. See Figure 5-134.

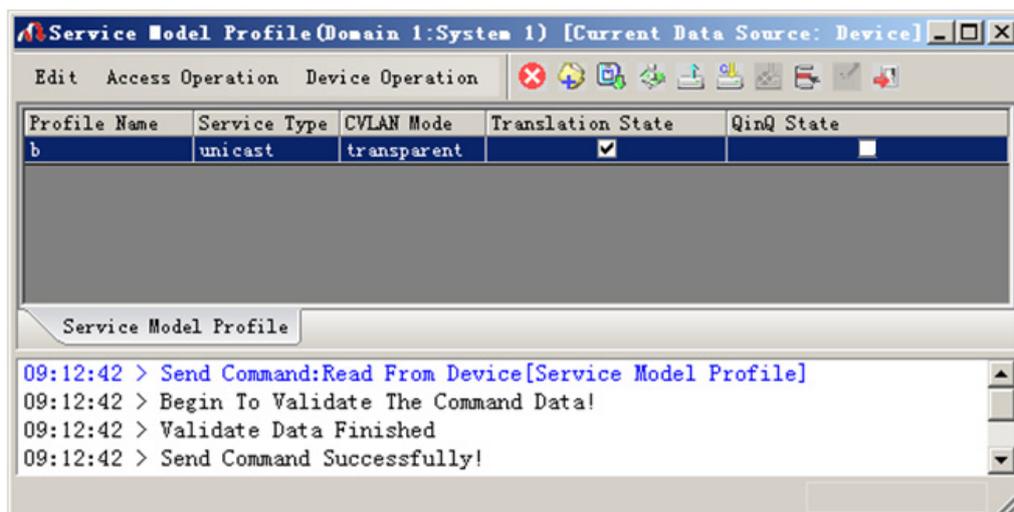


Figure 5-134 The **Service Model Profile** window - completed

### 5.4.6.7 Configuring the ONU Data Port Parameters

Configuration purpose

Enable the ONU ports and limit the number of MAC addresses in a batch manner.

Configuration example

- Right-click the system in the **Object Tree** pane, select **Config** → **Batch Config** → **ONU Data Port Config** from the shortcut menu to access the ONU data port configuration window.
- Click **Set Object as Condition** in the **Config Object** pane and all configuration objects (you can drill down and select a specific port as the object) will appear in the lower part. Select **FE1** and **FE2** of the AN5506-10-B1[2] listed under the PON 1 in Slot 15 and click **OK**.

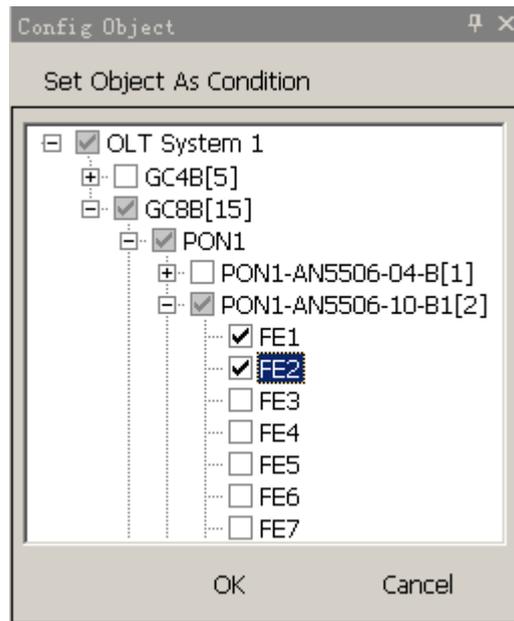


Figure 5-135 Set configuration objects

- The specific configuration information of the objects will appear in the right pane. Configure according to the planned data in Table 5-32. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the ONU data port parameters are configured. See Figure 5-136.

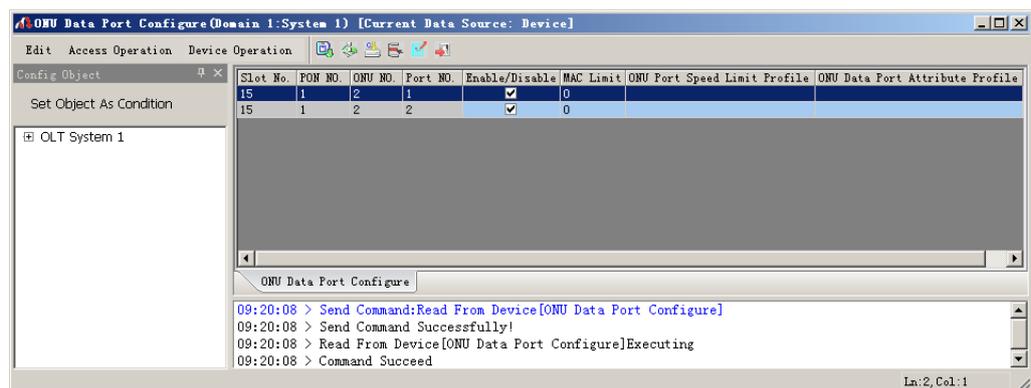


Figure 5-136 The ONU Data Port Configure window - completed

### 5.4.6.8 Configuring the ONU Data Service Parameters

#### Configuration purpose

Configure the CVLAN and SVLAN for the data service flow uplinked to the ONU port in a batch manner.

#### Configuration example

1. Right-click the system in the **Object Tree** pane, select **Config** → **Batch Config** → **ONU Data Service Configure** from the shortcut menu to access the ONU data service configuration window.
2. Click the  button in the menu bar and the **Add Item Number** dialog box appears. Select configuration objects (you can drill down and select a specific port as the object) in the left pane. Select **FE1** and **FE2** of the ONU and click **OK** to return to the **ONU Data Service Configure** window.

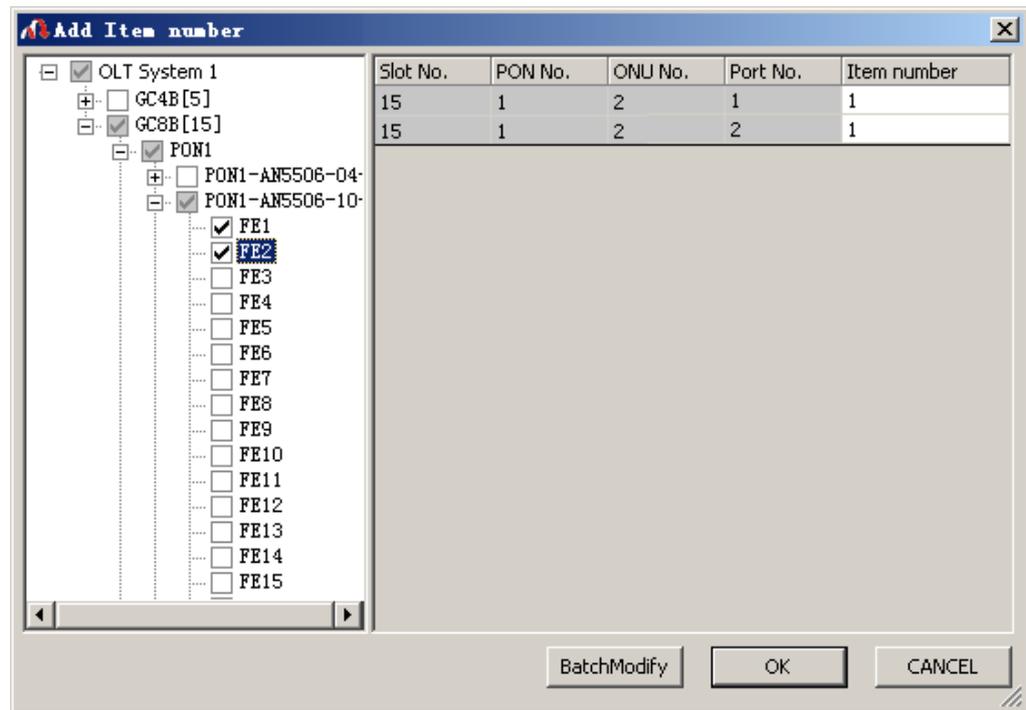


Figure 5-137 Set configuration objects (1)

- Click the **Batch Modify** button and select the **Item No.** field in the **Batch Modify** dialog box that appears. In the **Parameter Define** pane, double-click the **Start Value** blank field and enter **2**. Click the **Modify Selected Item** button and configure two services for each port.

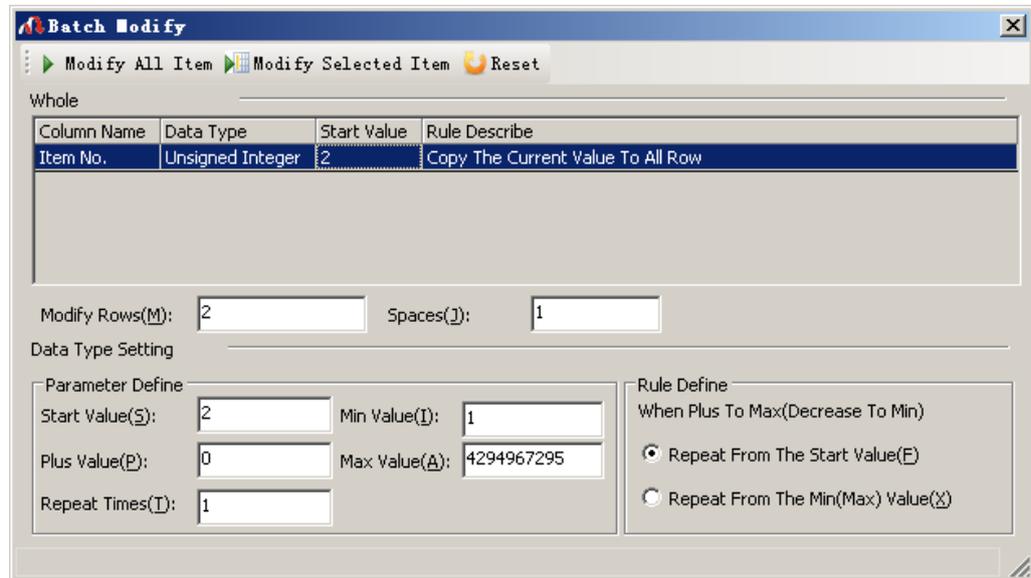


Figure 5-138 The **Batch Modify** dialog box

- Return to the **Add Item Number** dialog box and each port is configured with two services. Click the **OK** button and return to the **ONU Data Service Config** window.

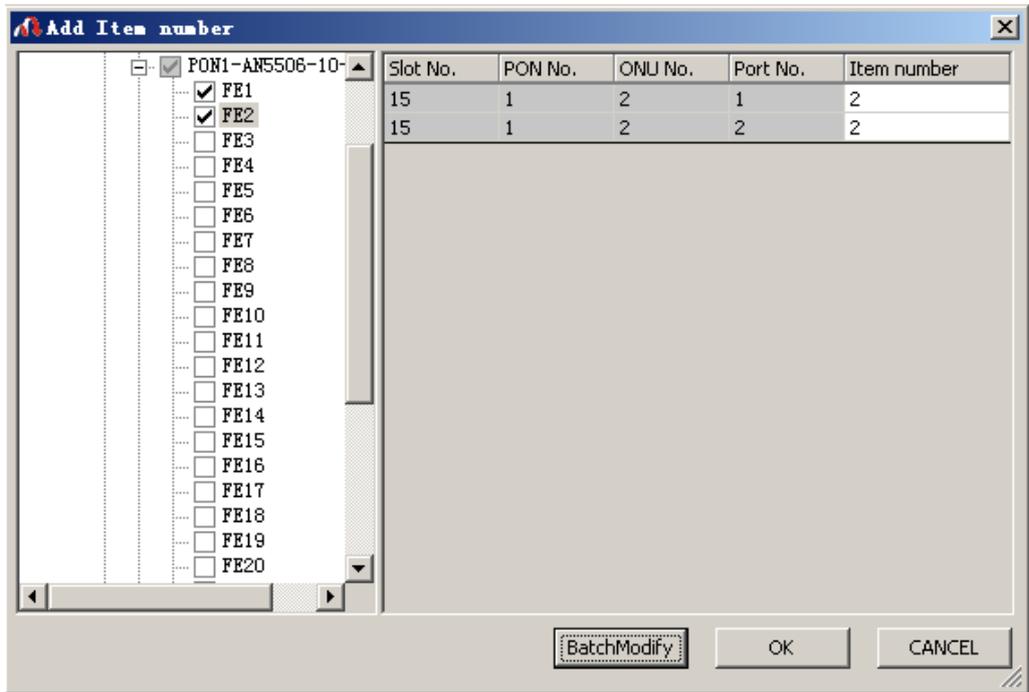


Figure 5-139 Set configuration objects (2)

- The specific configuration information of the objects will appear in the right pane. Configure according to the planned data in Table 5-32. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the ONU data service parameters are configured. See Figure 5-140.

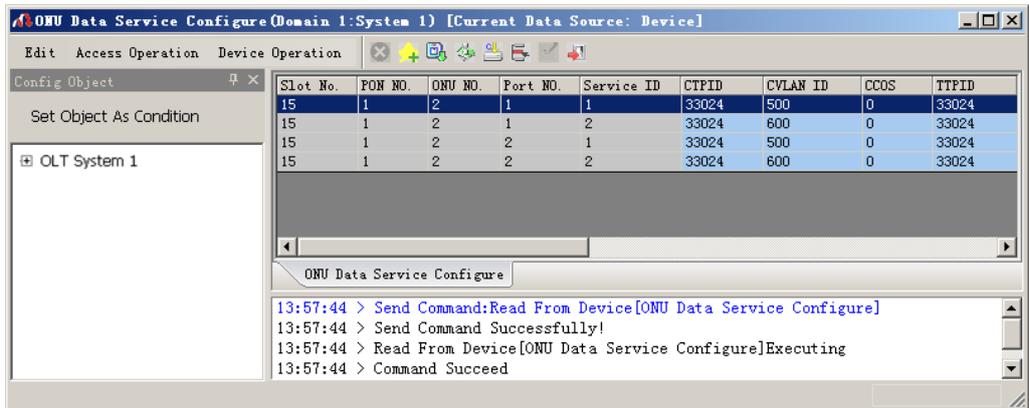


Figure 5-140 The ONU Data Service Configure window - completed

### 5.4.6.9 Configuring the GPON OLT VLAN Operation Table

#### Configuration purpose

Perform the QinQ function of the data service by completing the SVLAN ID configuration on the GPON OLT VLAN operation table.

#### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, select **Config** → **QinQ** → **GPON OLT VLAN Operation Table** from the shortcut menu to access the **GPON OLT VLAN Operation Table** window.
2. Select **Edit** → **Append** in the menu bar or click the  button. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click the **OK** button. Double-click the **Domain Name** blank field and enter **abc4**.
3. Configure according to the planned data in Table 5-32. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the GPON OLT VLAN operation table is configured. See Figure 5-141.

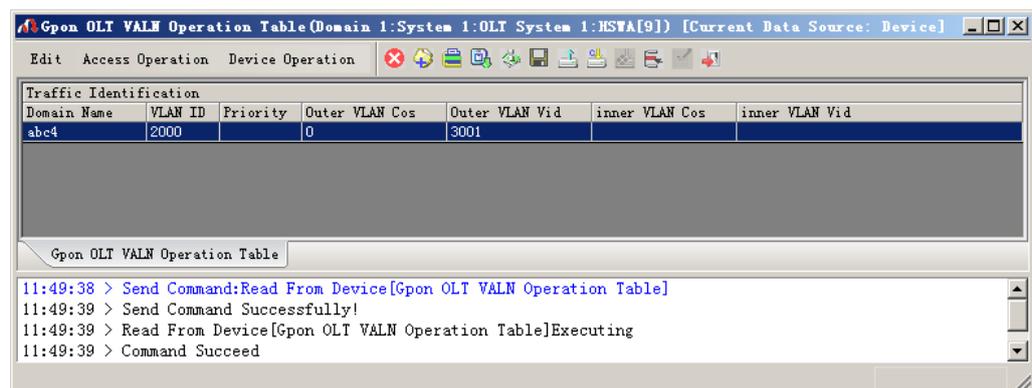


Figure 5-141 The **GPON OLT VLAN Operation Table** window - completed

## 5.4.6.10 Binding the PON Port to the VLAN Operation Table

### Configuration purpose

Apply the data service configuration to the PON port on the GC8B card by binding the PON port to the VLAN operation table.

### Operation steps

1. Right-click the **GC8B[15]** card in the **Object Tree** pane, select **Config** → **PON Attach / Detach VLAN Operation Table** from the shortcut menu to access the **PON attach / detach VLAN Table** window.
2. Status information of eight PON ports of the GC8B card is shown in the left pane. Select the PON port 1 and select **Attach** in the **Action** field.
3. Click the right pane, select **Edit** → **Append** in the menu bar of the window or click the  button. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click **OK**. Click the **Table Name** list box and select **abc4**.
4. Click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the PON port 1 has been bound to the operation table **abc4**. See Figure 5-142.

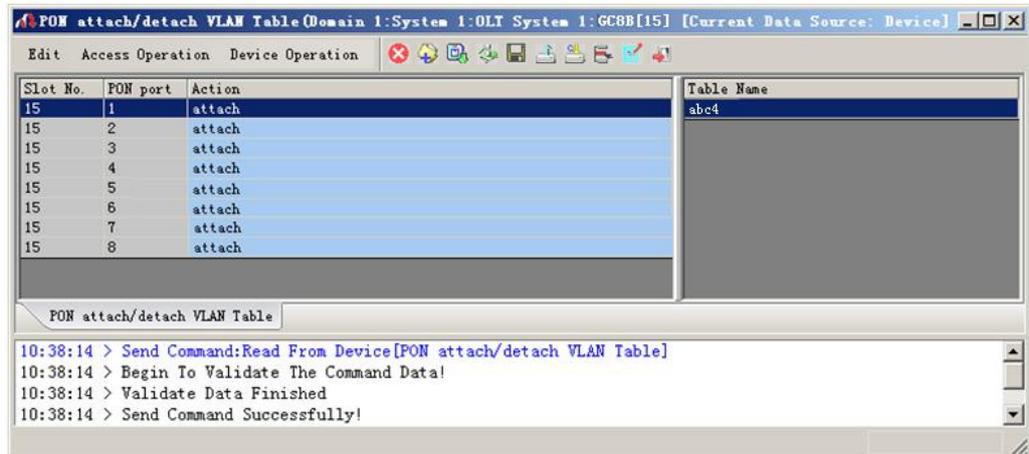


Figure 5-142 The PON attach / detach VLAN Table window - completed

## 5.4.7 End of Configuration

After being translated and added with a layer of VLAN, the PC1 to PC8 can access the Internet via the home gateways normally.

## 5.5 Example for Data Service Configuration – in the Flexible QinQ mode

### 5.5.1 Configuration Rules

The AN5116-06B supports the QinQ data service, which means it supports the VLAN stacking as well. In this example the GC8B card is used as the service interface card and the AN5506-04-B and the AN5506-10-B1 are used as ONUs to introduce the data service configuration in the flexible QinQ mode.

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.

### 5.5.2 Service Network

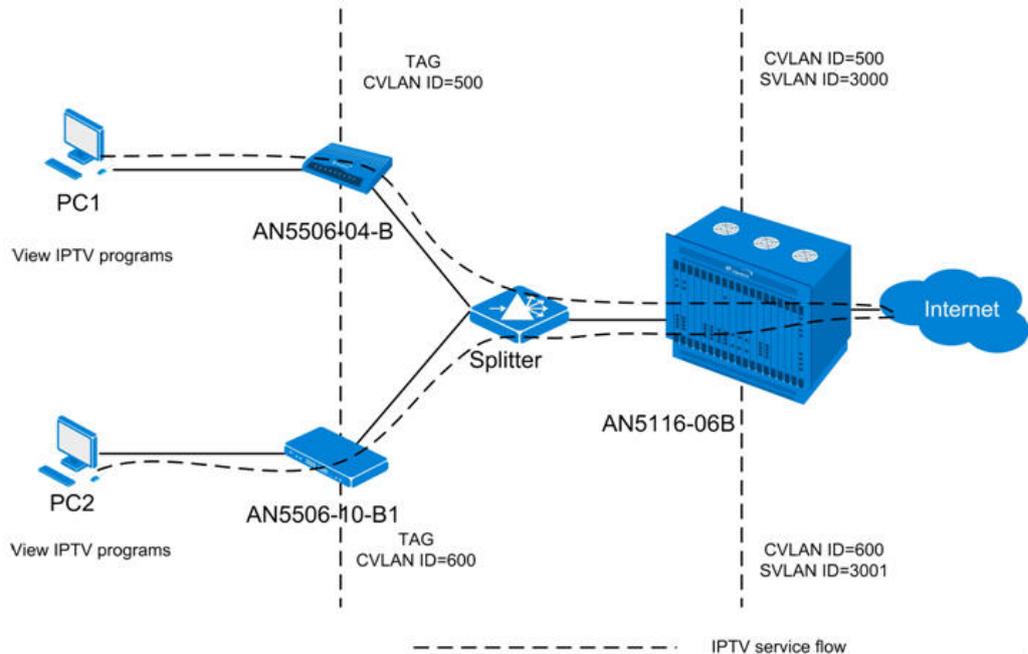


Figure 5-143 The data service network diagram (in the flexible QinQ mode)

As Figure 5-143 shows, each PC is connected to the ONU directly. The data uploaded from the PC is added with a CVLAN ID and then transmitted to the OLT by the ONU. The OLT classifies the uploaded data services according to Ethernet types, adds SVLAN tags to the service flow of the IPoE Ethernet type and transmits the service flow to the upper layer network via the uplink port. For the downlink direction, the reverse process takes place.

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.

### 5.5.3 Configuring Data Services in the Flexible QinQ Mode (for the AN5506-04-B)

#### 5.5.3.1 Planning Data

Table 5-33 The planned data of the data service 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 No.	Configure 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 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.	The number of the actually used uplink port.	19:SFP2

Item		Description	Example
	TAG / UNTAG	The Tag processing mode of the uplink service VLAN can be set as <b>Tag</b> or <b>Untag</b> . 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 and downlinked in the form of TAG. Under TAG mode, the uplink data packets will not be processed but remain uplinked in the original form. For downlink packets, however, only packets with designated TAGs are received and the packets will not be processed but remain downlinked in the original form.	Tag
	Service Type	Configure according to the network planning of the operator.	data
	Slot Bind Mode	Select <b>Auto Bind</b> or <b>Manually Bind</b> .	Auto Bind

Table 5-34 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	Select broadband Internet access.	Broadband Internet access
	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 16Kbyte/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 0Kbyte/s.	0

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 64Kbyte/s.	1280
Basic information of the ONU port	ONU Port Used	The actually used ONU port	1
	Enable / Disable Port	Configure according to the network planning of the operator. Enable is selected by default.	Default
	Port Auto Negotiation	Configure according to the network planning of the operator. Enable is selected by default.	Default
	Port Speed	Unconfigurable when the port auto negotiation is enabled. The default speed is 100M.	Default
	Duplex	Unconfigurable when the port auto negotiation is enabled. The default value is full-duplex.	Default
	Flow control Enable / Disable	Configure according to the network planning of the operator. Disable is selected by default.	Default
ONU port service parameters	TAG Mode	Configured as <b>Tag</b> or <b>Untag</b> according to the network planning of the operator. In the <b>Tag</b> mode the uplink data packets are tagged, while in the <b>Untag</b> mode the uplink data packets are untagged.	Untag
	COS	The priority range: 1 to 7. Unconfigurable when the Tag mode is set as <b>Untag</b> .	—
	VLAN ID	The value range: 1 to 4085. Unconfigurable when the Tag mode is set as <b>Untag</b> .	—
	CVLAN Mode	When the Tag mode is set as <b>Untag</b> , the CVLAN mode can be set as <b>Tag</b> or <b>Transparent</b> . When the Tag mode is set as <b>Tag</b> , the CVLAN mode can set as <b>Translation</b> or <b>Transparent</b> .	Tag
	CVLAN ID	Configure according to the network planning of the operator. The value range: 1 to 4085.	500
	COS	The CVLAN priority, ranging from 0 to 7.	0
	Ds Encrypt State	Disable is selected by default.	Disable
	QinQ State	Enable / disable the QinQ configuration.	Disable

Item		Description	Example	
	SVLAN ID	Unconfigurable when the QinQ state is disabled. The value range: 1 to 4085.	—	
	Service Name	Corresponding to the configured local end service VLAN. Unconfigurable when the QinQ enable status is disabled.	—	
	COS	The SVLAN priority, ranging from 1 to 7. Unconfigurable when the QinQ enable status is disabled.	—	
OLT QinQ Domain	Domain Name	The configured flexible QinQ domain name	aa	
	Service Type	Single is selected by default.	Single	
	Subscriber VLAN Layer 1	CVLAN ID	Configure the transparently transmitted CVLAN ID.	500
		Old_VLAN Coslow	The transparently transmitted subscriber CVLAN priority, ranging from 0 to 7 with 7 as the highest priority and 0 as the lowest.	0
		Action	Configure according to the subscriber VLAN Layer 1 value. If the subscriber VLAN layer 1 value is given, the <b>Action</b> can be set as <b>Transparent</b> or <b>Translation</b> . If not given, the <b>Action</b> can be set as <b>Transparent</b> or <b>Add</b> .	Transparent
		TPID	The default value is 33024.	Default
	Subscriber VLAN Layer 2	Action	Add	Add
		TPID	The default value is 33024.	Default
		COS	The added SVLAN priority configuration, ranging from 0 to 7 with 7 as the highest priority and 0 as the lowest.	0
		New VID	The SVLAN ID value.	3000
OLT QinQ domain service uplink rules	Up_Clause	Select <b>Ethtype</b> .	Ethtype	
	Operator	Select <b>=</b> .	=	
	Value	Select the Ethernet type based on IPoE.	2048	
OLT QinQ domain service downlink rules	Down_Clause	Select <b>SA</b>	SA	
	Operator	Select <b>Match if exist</b>	Match if exist	
	Value	Configure according to the network planning of the operator.	00-00-00-00-77-77	

Item		Description	Example
PON attach / detach VLAN Table	Slot No.	The slot number of the GC8B card connected with the ONU. Read only.	15
	PON Port	The PON port of the actually used GC8B card. Read only.	1
	Action	Bind the PON port to the QinQ domain.	Attach
	Table Name	The bound QinQ domain.	aa

### 5.5.3.2 Configuration Flow Chart

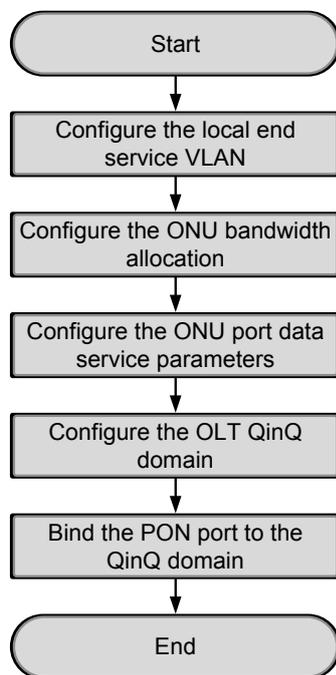


Figure 5-144 The configuration flow chart of the data service provisioning in the flexible QinQ mode (for AN5506-04-B)

### 5.5.3.3 Configuring the Local End Service VLAN

#### Configuration purpose

Configure the uplink port VLAN of the AN5116-06B for the designated service flow and limit the VLAN range of the service.

## Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane and select **Config** → **Local VLAN** from the shortcut menu. In the window click the **Local End Service VLAN** tab and the local VLAN configuration window appears.
2. Click **Edit** → **Append** in the menu bar of the window or click the  button. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click **OK** to create a local VLAN.
3. Configure according to the planned data in Table 5-33. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the local end service VLAN is configured. See Figure 5-145.

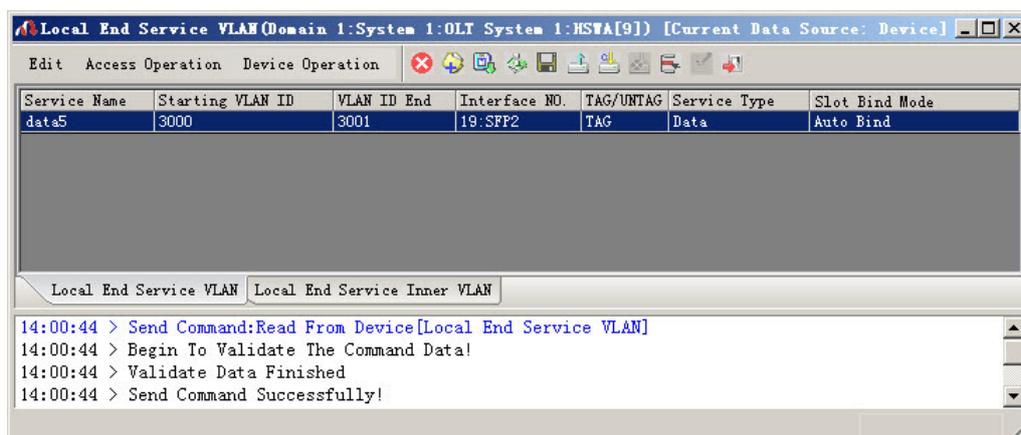


Figure 5-145 The **Local End Service VLAN** window - completed

### 5.5.3.4 Configuring the Bandwidth Allocation

#### Configuration purpose

Configure the bandwidth of the ONU data service and limit the traffic flow.

## Operation steps

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, select **Config** → **Bandwidth Config** from the shortcut menu to access the bandwidth allocation configuration window.
2. Click the right pane and select **Edit** → **Append** from the menu bar, or click the  button. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click **OK**.
3. Configure according to the planned data in Table 5-34. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the bandwidth allocation is configured. See Figure 5-146.

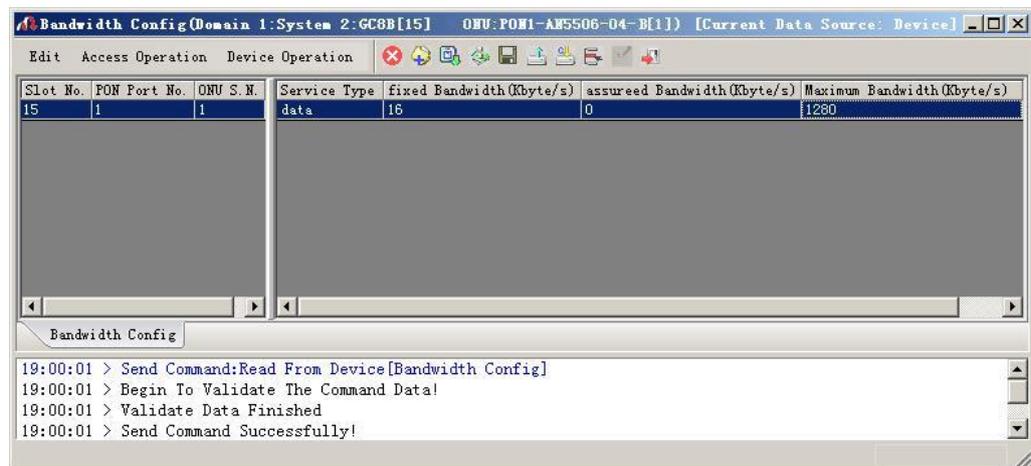


Figure 5-146 The **Bandwidth Config** window - completed

### 5.5.3.5 Configuring the ONU Port Data Service Parameters

#### Configuration purpose

Configure the FE port status and working mode of the ONU and add VLAN tags to the data service.

## Operation steps

1. Click the **GC8B[15]** card in the **Object Tree** pane and information about 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** → **Service Config** from the shortcut menu. Select the **ONU Port Config** tab, as shown in Figure 5-147.

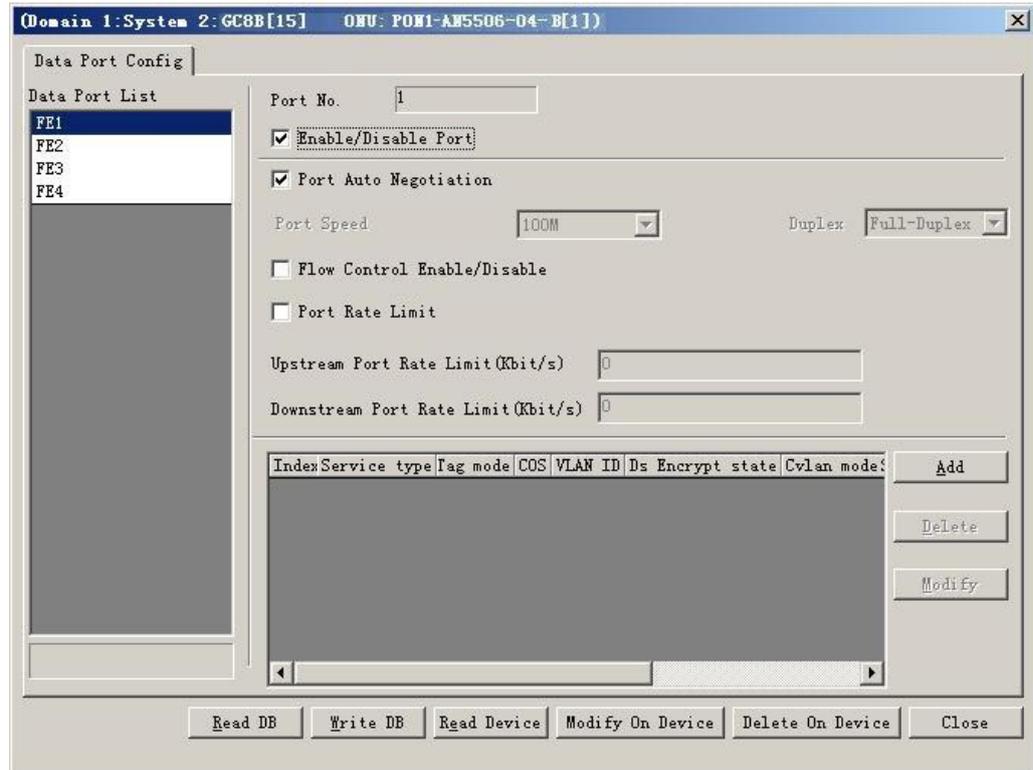
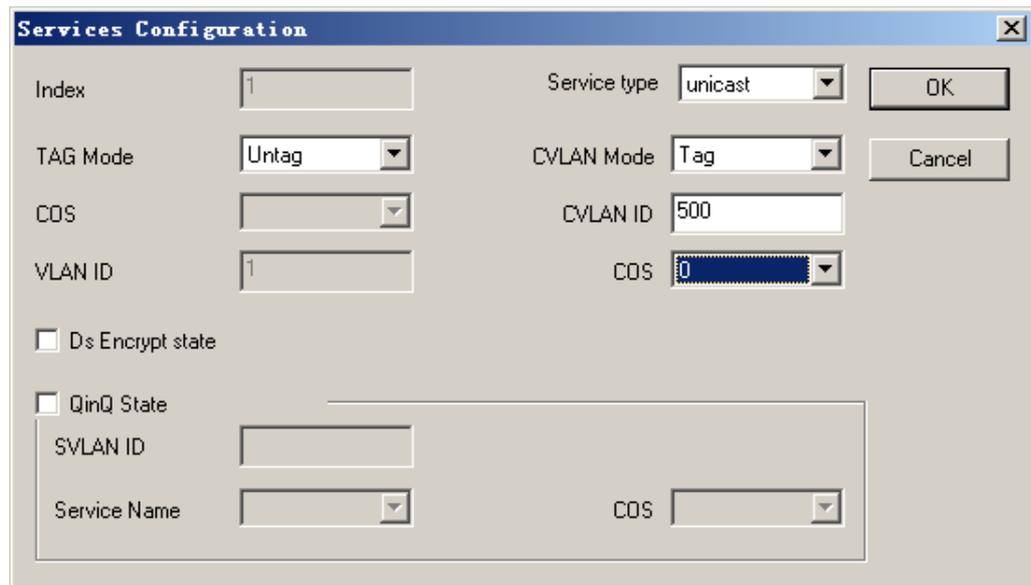


Figure 5-147 The ONU port service configuration

2. Select **FE1** from the **Data Port List** in Figure 5-147. Click **Add** to create two data services and configure according to the planned data in Table 5-34.



The Services Configuration dialog box is shown with the following fields and values:

Field	Value
Index	1
Service type	unicast
TAG Mode	Untag
CVLAN Mode	Tag
COS	
CVLAN ID	500
VLAN ID	1
COS	0
Ds Encrypt state	<input type="checkbox"/>
QinQ State	<input type="checkbox"/>
SVLAN ID	
Service Name	
COS	

Buttons: OK, Cancel

Figure 5-148 The **Services Configuration** dialog box

3. Click the OK button and return to the dialog box shown in Figure 5-147. Click the **Modify on Device** button and complete the AN5506-04-B service configuration. When the **Command Succeed** of the AN5506-04-B data port service appears in the **Command Manager** window, the AN5506-04-B port service configuration is completed. See Figure 5-149.

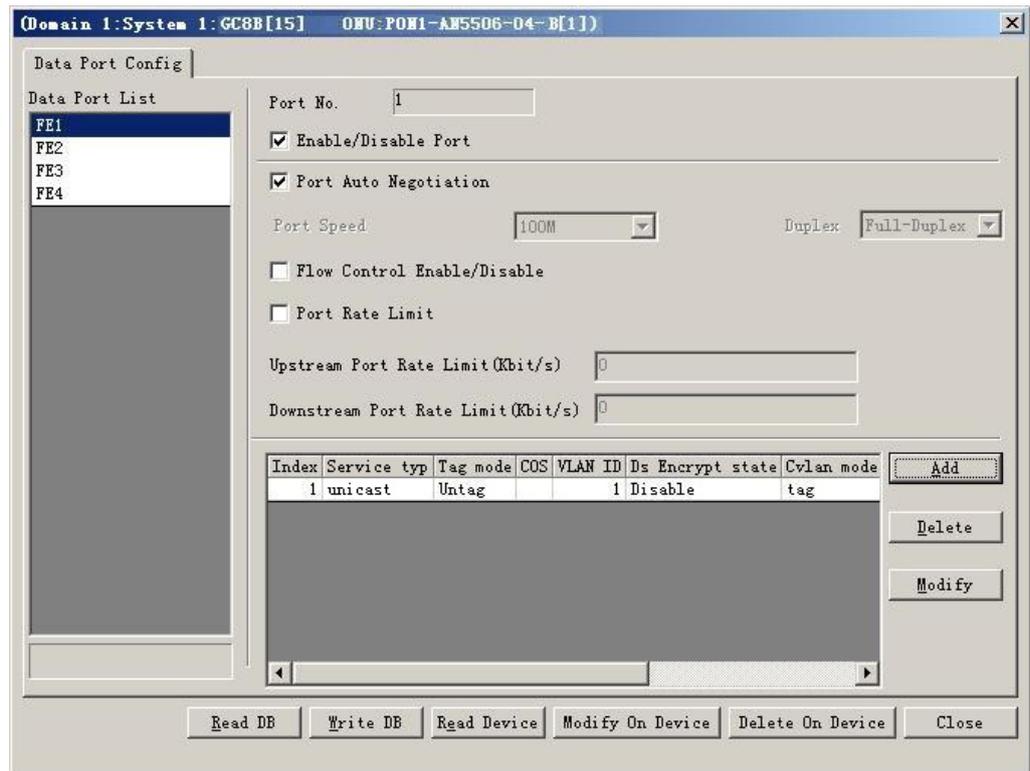


Figure 5-149 The port service configuration - completed

### 5.5.3.6 Configuring the OLT QinQ Domain

#### Configuration purpose

Process flexibly the VLAN Tag of the service flow uploaded to the OLT by configuring the OLT QinQ domain.

#### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** and select **Config** → **QinQ** → **OLT QinQ Domain** from the shortcut menu. Click the **OLT QinQ Domain** tab in the window and the OLT QinQ domain configuration window appears.
2. Click the left pane and select **Edit** → **Append** on the menu bar or click the  button. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click the **OK** button. Double-click the **Domain Name** blank field of the **Serial No.1** and enter **aa**.

3. Click the right pane and select **Edit** → **Append** on the menu bar or click the  button. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click the **OK** button. Configure in the right pane according to the planned data in Table 5-34.
4. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the OLT QinQ domain is configured. See Figure 5-150.

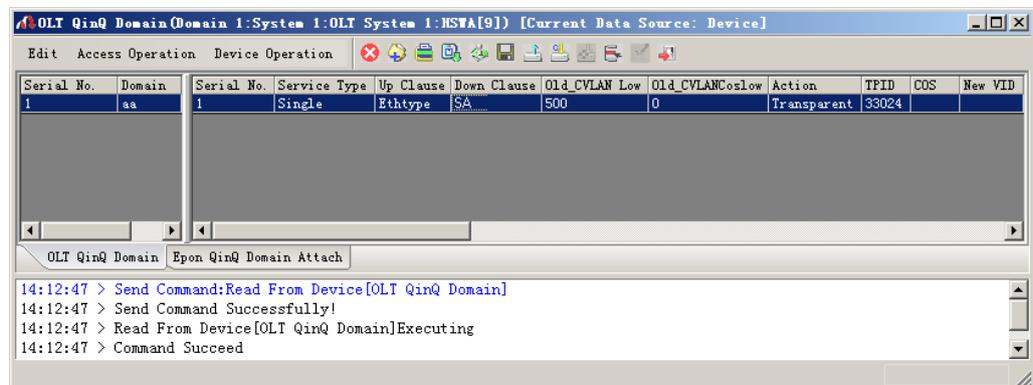


Figure 5-150 The OLT QinQ Domain window - completed

### 5.5.3.7 Binding the PON Port to the QinQ Domain

Configuration purpose

Apply the configured OLT QinQ domain to the PON port.

Operation steps

1. Right-click the **GC8B[15]** card in the **Object Tree** pane, select **Config** → **PON Attach / Detach VLAN Operation Table** from the shortcut menu to access the **PON attach / detach VLAN Table** window.
2. Status information of eight PON ports of the GC8B card is shown in the left pane. Select the PON port 1 and select **Attach** in the **Action** field.
3. Click the right pane, select **Edit** → **Append** in the menu bar of the window or click the  button. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click **OK**. Click the **Table Name** list box and select **aa**.
4. Click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the PON port 1 has been bound to the operation table **aa**. See Figure 5-151.

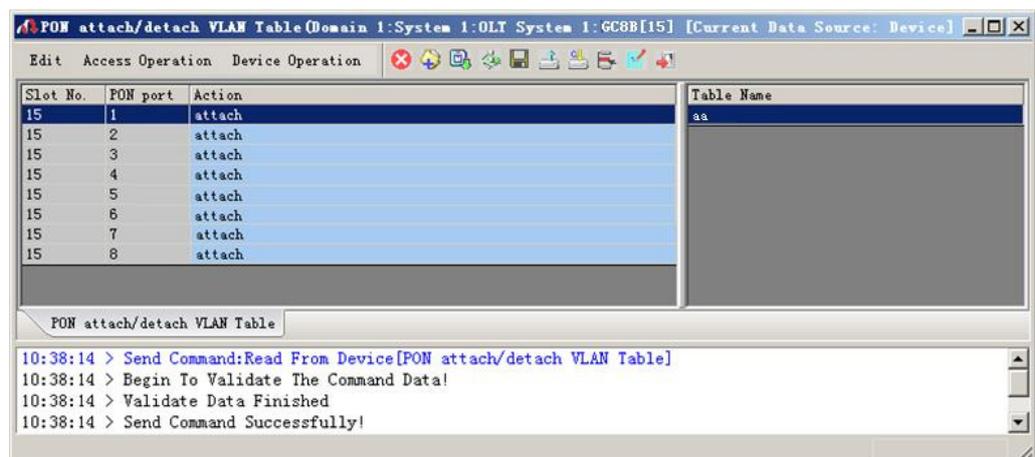


Figure 5-151 The **PON attach / detach VLAN Table** window - completed

## 5.5.4 Configuring Data Services in the Flexible QinQ Mode (for the AN5506-10-B1)

### 5.5.4.1 Planning Data

Table 5-35 The planned data of the data service 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 No.	Configure 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 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.	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 <b>Tag</b> or <b>Untag</b> . 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 and downlinked in the form of TAG. Under TAG mode, the uplink data packets will not be processed but remain uplinked in the original form. For downlink packets, however, only packets with designated TAGs are received and the packets will not be processed but remain downlinked in the original form.	Tag
	Service Type	Configure according to the network planning of the operator.	data
	Slot Bind Mode	Select <b>Auto Bind</b> or <b>Manually Bind</b> .	Auto Bind

Table 5-36 The planned data of data service configuration at the AN5506-10-B1 ONU side in the flexible QinQ mode

Item		Description	Example
Bandwidth allocation	Service Type	Select integrated service.	Integrated Service
	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 16Kbyte/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 0Kbyte/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 64Kbyte/s.	1280
Basic information of the ONU port	ONU Port Used	The actually used ONU port	1
	Enable / Disable Port	Configure according to the network planning of the operator. Enable is selected by default.	Default
	Port Auto Negotiation	Configure according to the network planning of the operator. Enable is selected by default.	Default
	Port Speed	Unconfigurable when the port auto negotiation is enabled. The default speed is 100M.	Default
	Duplex	Unconfigurable when the port auto negotiation is enabled. The default value is full-duplex.	Default
	Flow control Enable / Disable	Configure according to the network planning of the operator. Disable is selected by default.	Default
ONU port service parameters	TLS	Configured as <b>TLS</b> or <b>No TLS</b> according to the network planning of the operator.	No TLS
	Service Type	Data service. Select Unicast.	Unicast
	VLAN Mode	Configured as <b>Tag</b> or <b>Transparent</b> according to the network planning of the operator.	Tag
	TPID	The default value is 33024.	33024

Item		Description	Example	
	CVLAN ID	Configure according to the network planning of the operator, ranging from 1 to 4085.	600	
	Priority or COS	The CVLAN priority, ranging from 1 to 7.	0	
OLT QinQ Domain	Domain Name	The configured flexible QinQ domain name	bb	
	Service Type	Single is selected by default.	Single	
	Subscriber VLAN Layer 1	CVLAN ID	Configure the transparently transmitted CVLAN ID.	600
		Old_VLAN Coslow	The transparently transmitted subscriber CVLAN priority, ranging from 0 to 7 with 7 as the highest priority and 0 as the lowest.	0
		Action	Configure according to the subscriber VLAN Layer 1 value. If the subscriber VLAN layer 1 value is given, the <b>Action</b> can be set as <b>Transparent</b> or <b>Translation</b> . If not given, the <b>Action</b> can be set as <b>Transparent</b> or <b>Add</b> .	Transparent
		IPID	The default value is 33024.	Default
	Subscriber VLAN Layer 2	Action	Add	Add
		TPID	The default value is 33024.	Default
		COS	The added SVLAN priority configuration, ranging from 0 to 7 with 7 as the highest priority and 0 as the lowest.	0
		New VID	The SVLAN ID value.	3001
OLT QinQ domain service uplink rules	Up_Clause	Select <b>Ethtype</b> .	Ethtype	
	Operator	Select =.	=	
	Value	Select the Ethernet type based on IPoE.	2048	
OLT QinQ domain service downlink rules	Down_Clause	Select SA	SA	
	Operator	Select <b>Match if exist</b>	Match if exist	
	Value	Configure according to the network planning of the operator.	00-00-00-00-77-77	
PON attach / detach VLAN Table	Slot No.	The slot number of the GC8B card connected with the ONU. Read only.	15	
	PON Port	The PON port of the actually used GC8B card. Read only.	1	
	Action	Bind the PON port to the QinQ domain.	Attach	
	Table Name	The bound QinQ domain.	bb	

### 5.5.4.2 Configuration Flow Chart

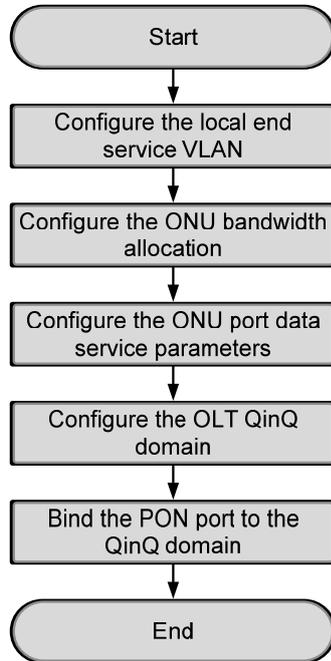


Figure 5-152 The configuration flow chart of the data service provisioning in the flexible QinQ mode (for the AN5506-10-B1)

### 5.5.4.3 Configuring the Local End Service VLAN

See Section 5.5.3.3 for configuration procedures.

### 5.5.4.4 Configuring the Bandwidth Allocation

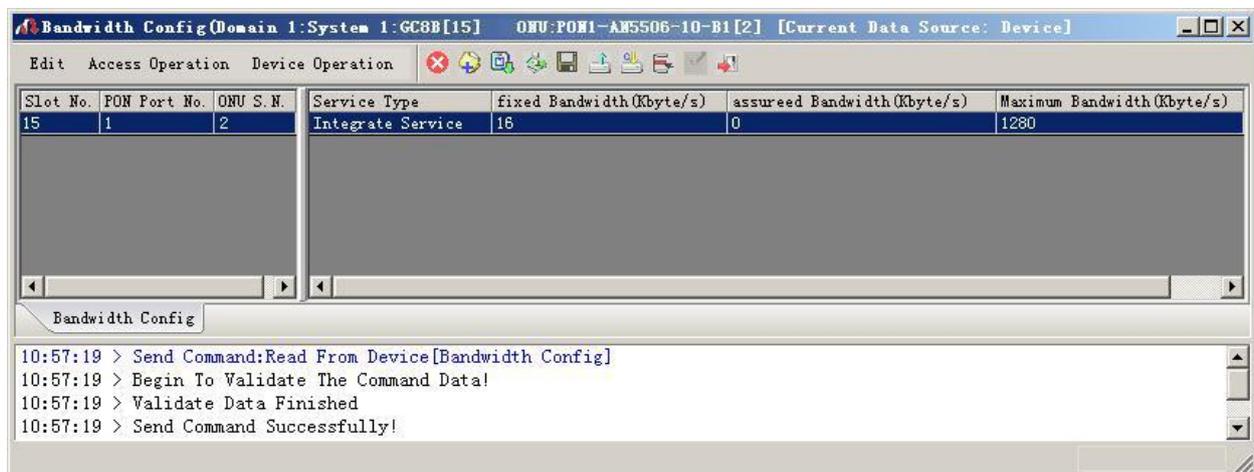
Configuration purpose

Configure the bandwidth of the ONU data service and limit the traffic flow.

Operation steps

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, select **Config** → **Bandwidth Config** from the shortcut menu to access the bandwidth allocation configuration window.

- Click the right pane and select **Edit** → **Append** from the menu bar, or click the  button. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click **OK**.
- Configure according to the planned data in Table 5-36. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the bandwidth allocation is configured. See Figure 5-153.

Figure 5-153 The **Bandwidth Config** window – completed ONU

### 5.5.4.5 Configuring the ONU Port Data Service Parameters

#### Configuration purpose

Configure the FE port status and working mode of the ONU and add VLAN tags to the data service.

#### Operation steps

- Click the **GC8B[15]** card in the **Object Tree** pane and information about 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. Select the **ONU Port Config** tab, as shown in Figure 5-154.

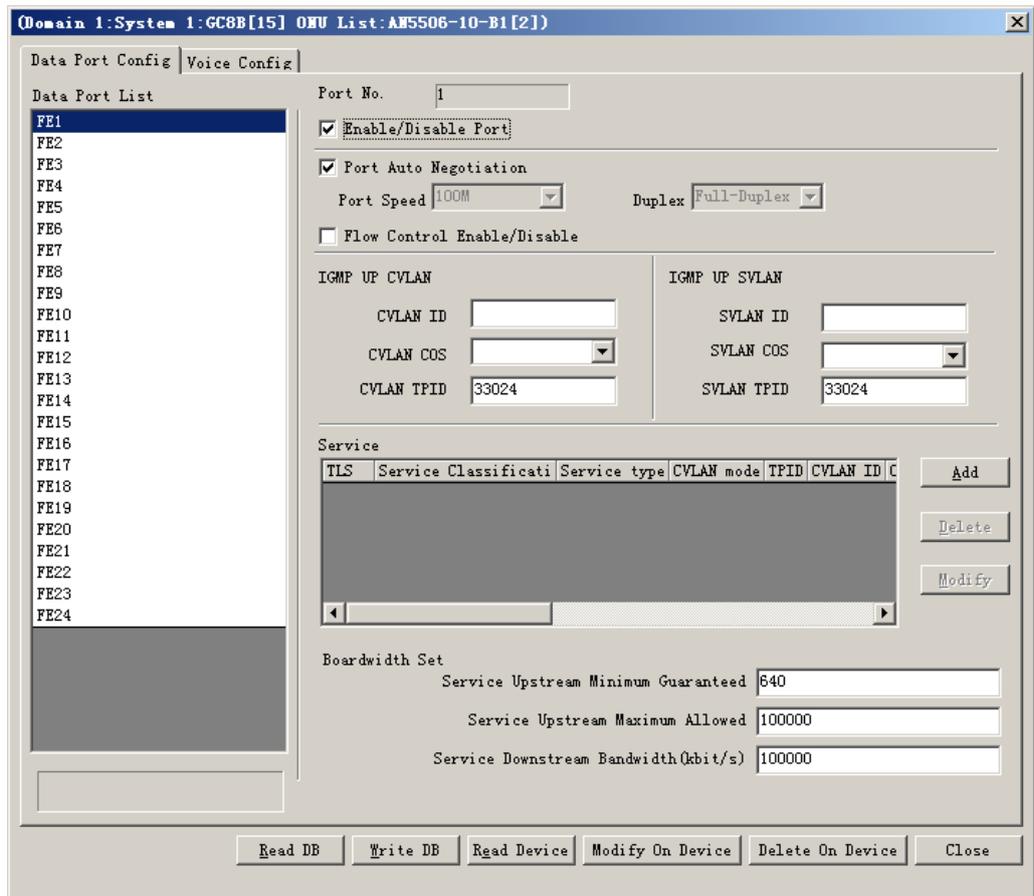


Figure 5-154 The ONU port service configuration

2. Select **FE1** from the **Data Port List** in Figure 5-154. Click **Add** to create two data services and configure according to the planned data in Table 5-36.

The screenshot shows the 'Services Configuration' dialog box with the following fields and controls:

- TLS:** No TLS (dropdown)
- Service type:** unicast (dropdown)
- TPID:** 33024 (text field)
- VLAN Mode:** tag (dropdown)
- CVLAN ID:** 600 (text field)
- Priority Or COS:** 0 (dropdown)
- Buttons:** Set Service Classificati..., OK, Cancel
- Translation State:**  Translation State, Translation value (text field), Priority Or COS (dropdown)
- QinQ State:**  QinQ State, Choose QinQ Profile... (button), (text field)
- Service Name:** (dropdown)
- VLAN ID(3000-3001):** (text field)
- TPID:** 33024 (text field)
- Priority Or COS:** (dropdown)

Figure 5-155 The **Services Configuration** dialog box

- Click the OK button and return to the dialog box shown in Figure 5-154. Click the **Modify on Device** button and complete the AN5506-10-B1 service configuration. When the **Command Succeed** of the AN5506-10-B1 data port service appears in the **Command Manager** window, the AN5506-10-B1 port service configuration is completed. See Figure 5-156.

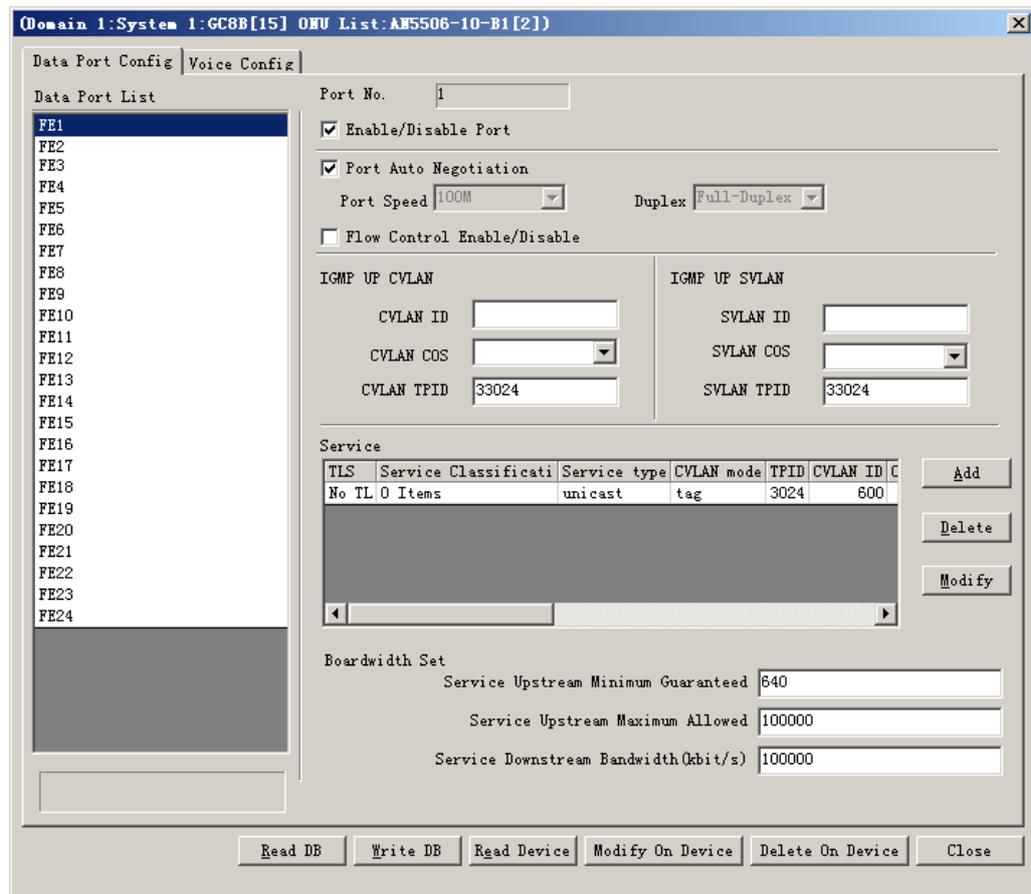


Figure 5-156 The port service configuration completed

## 5.5.4.6 Configuring the OLT QinQ Domain

### Configuration purpose

Process flexibly the VLAN Tag of the service flow uploaded to the OLT by configuring the OLT QinQ domain.

### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** and select **Config** → **QinQ** → **OLT QinQ Domain** from the shortcut menu. Click the **OLT QinQ Domain** tab in the window and the OLT QinQ domain configuration window appears.

2. Click the left pane and select **Edit** → **Append** on the menu bar or click the  button. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click the **OK** button. Double-click the **Domain Name** blank field of the **Serial No.1** and enter **bb**.
3. Click the right pane and select **Edit** → **Append** on the menu bar or click the  button. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click the **OK** button. Configure in the right pane according to the planned data in Table 5-36.
4. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the OLT QinQ domain is configured. See Figure 5-157.

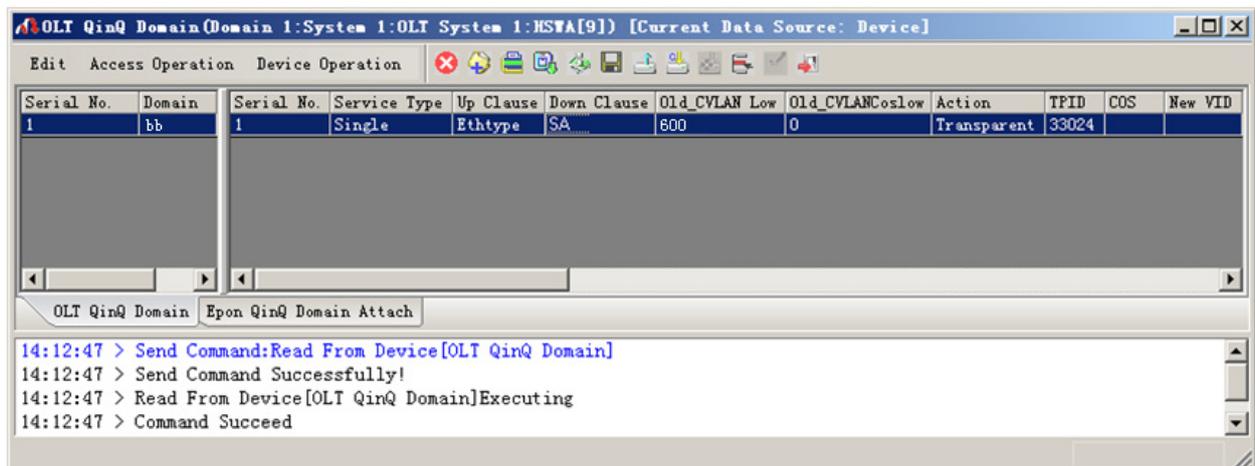


Figure 5-157 The OLT QinQ Domain window – completed

### 5.5.4.7 Binding the PON Port to the QinQ Domain

Configuration purpose

Apply the configured OLT QinQ domain to the PON port.

## Operation steps

1. Right-click the **GC8B[15]** card in the **Object Tree** pane, select **Config** → **PON Attach / Detach VLAN Operation Table** from the shortcut menu to access the **PON attach / detach VLAN Table** window.
2. Status information of eight PON ports of the GC8B card is shown in the left pane. Select the PON port 1 and select **Attach** in the **Action** field.
3. Click the right pane, select **Edit** → **Append** in the menu bar of the window or click the  button. Enter **1** in the **Please Input the Rows for Add** dialog box that appears and click **OK**. Click the **Table Name** list box and select **bb**.
4. Click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the PON port 1 has been bound to the operation table **bb**. See Figure 5-158.

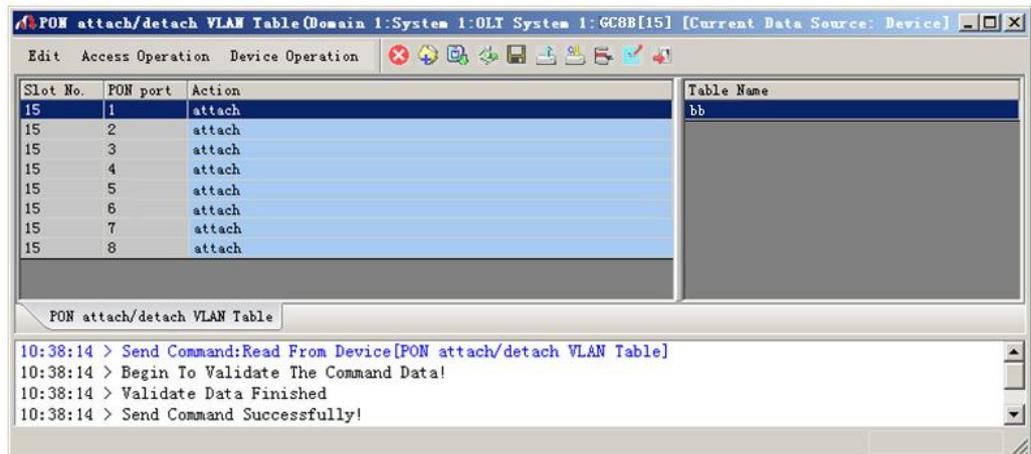


Figure 5-158 The **PON attach / detach VLAN Table** window - completed

## 5.5.5 End of Configuration

After being added with stacked VLAN tags, the PC1 and PC2 can view the IPTV programs normally.

# 6 Configuring Multicast Services

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This chapter introduces how to configure multicast services on the AN5116-06B. The AN5116-06B supports four different multicast modes: proxy, snooping, proxy-snooping and controllable. Different modes suit different network environments. Users can select one of the four modes as needed. In the proxy, snooping and proxy-snooping modes, the service configuration steps are the same, except that the “multicast proxy IP” is not needed for the snooping mode. This chapter takes the proxy and controllable modes as an example to introduce how to configure the multicast services. It includes the following sections:

- ☑ Example for multicast service configuration -- proxy mode
- ☑ Example for multicast service configuration -- controllable mode
- ☑ Configuring the multicast concatenation
- ☑ Configuring the maximum multicast bandwidth for the uplink ports
- ☑ Configuring OLT multicast protocol parameters
- ☑ Configuring ONU multicast parameters
- ☑ Configuring prejoin groups
- ☑ Configuring multicast default preview parameters
- ☑ Configuring multicast logs
- ☑ Viewing the multicast statistical information
- ☑ Forcing users to leave
- ☑ Refreshing the multicast configuration information
- ☑ Querying the fast leave capability of the ONU

## 6.1 Example for Multicast Service Configuration – Proxy Mode

### 6.1.1 Configuration Rules

- ◆ 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.
- ◆ See the configuration of the AN5506-04-B for the multicast service start-up method of the ONU type 1; and see the configuration of the AN5506-10-B1 for the multicast service start-up method of the ONU type 2.
- ◆ 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 type 2; If the data service is started up on the ONU port, 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 which provides channel for the multicast uplink / downlink protocol messages; for ONU type 2, users need not add the unicast 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 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 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.
- ◆ Each of the uplink ports on the AN5116-06B cannot join multiple VLANs in the untag mode.

## 6.1.2 Service Network

Figure 6-1 shows the network diagram of the AN5116-06B to provide the multicast services in proxy mode. Take the AN5506-04-B and the AN5506-10-B1 as the ONU examples for introduction.

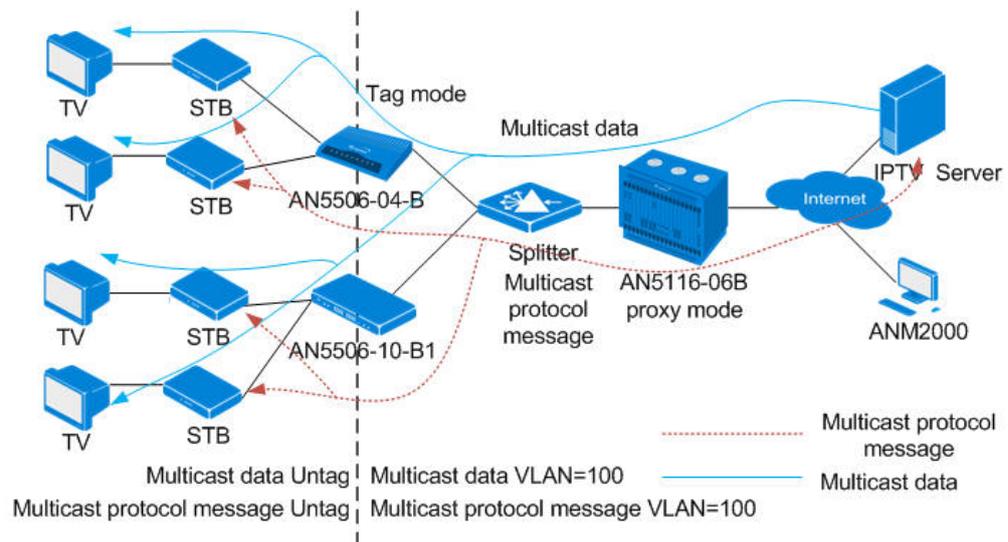


Figure 6-1 Network diagram of multicast services (proxy mode)

Downlink direction: The AN5506-04-B 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 AN5506-04-B attaches the join / leave multicast protocol message with the VLAN=100 tag; then sends the messages to the AN5116-06B for forwarding them 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.

## 6.1.3 Configuring Multicast Services Respectively (for the AN5506-04-B)

### 6.1.3.1 Planning Data

This section introduces how to start up the multicast services in proxy mode for the AN5506-04-B by configuring the ports respectively. Tables 6-1 and 6-2 show the planning data.

Table 6-1 The OLT side planning data of the multicast services under the proxy mode (configuring respectively)

Item		Description	Example	
ONU information	ONU type	Configure according to the type of the ONU that is actually used.	AN5506-04-B	AN5506-10-B1
	Slot No.	Configure according to the slot number of the PON interface card that is actually used.	15	
	PON port No.	Configure according to the No. of the PON port that is actually used.	1	
	ONU authentication 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.	iptv1	
	Starting VLAN ID	The starting VLAN ID of the uplink port services. Configure according to the network planning of the operator.	100	
	VLAN ID End	The ending VLAN ID of the uplink port services. Configure according to the network planning of the operator.	100	

Item		Description	Example
	Interface No.	Configure according to the No. of the uplink port that is actually used.	20:SFP1
	TAG / UNTAG	Configure the tag processing mode for the uplink service VLAN. There are two options: <b>TAG</b> and <b>UNTAG</b> . Under <b>UNTAG</b> mode, the TAGs of the uplink packets will be stripped automatically and the packets will be uplinked in the form of <b>UNTAG</b> when they pass the port, whereas the downlink UNTAG packets will be added with designated TAGs and downlinked in the form of <b>TAG</b> . Under <b>TAG</b> mode, the uplink data packets will not be processed but remain uplinked in the original form. For downlink packets, however, only packets with designated TAGs are received and the packets will not be processed but remain downlinked in the original form.	TAG
	Service Type	Select <b>IPTV</b> for configuring the multicast services.	IPTV
	Slot Bind Mode	Select <b>Auto Bind</b> or <b>Manually Bind</b> .	Auto Bind
Uplink port packet suppression	Port No.	Select <b>20:2</b> , which is corresponding to <b>20:SFP1</b> .	20:2
	Type of Packet	Select the multicast packet in this example.	MultiCast Package
	Enable / Disable	Select to disable the suppression in this example.	Disable
Multicast task selection	IGMP Version	According to the network planning of the operator, select <b>IGMP V1 / V2</b> in this example.	IGMP V1 / V2
Multicast mode	IGMP Mode	According to the network planning of the operator, select the proxy mode in this example.	Proxy Mode
Multicast proxy IP	IGMP Proxy's IP	Configure according to the network planning of the operator; the default value is 10.25.14.57.	10.25.10.1
Multicast VLAN	VLAN	Configure according to the network planning of the operator. The multicast VLAN should be in the range of the local VLAN.	100

Table 6-2 The AN5506-04-B side planning data of the multicast services under the proxy mode (configuring respectively)

Item		Description	Example
ONU multicast bandwidth config	Service Type for multicast services	Select <b>IPTV</b> for the multicast services.	IPTV
	Fixed Bandwidth (Kbyte/s)	Configure according to the network planning of the operator; the default value is 16.	16
	Assured Bandwidth (Kbyte/s) for multicast services	Configure according to the network planning of the operator; the default value is 0.	0
	Maximum Bandwidth (Kbyte/s) for multicast services	Configure according to the network planning of the operator; the default value is 64.	64
	Service Type for data services	Select <b>data</b> for the data services.	data
	Fixed Bandwidth (Kbyte/s) for data services	Configure according to the network planning of the operator; the default value is 16.	16
	Assured Bandwidth (Kbyte/s) for data services	Configure according to the network planning of the operator; the default value is 0.	0
	Maximum Bandwidth (Kbyte/s) for data services	Configure according to the network planning of the operator; the default value is 64.	1280
ONU multicast service config	Port No.	Configure according to the port number of the ONU that is actually used.	1 to 2
	IGMP data VLAN mode	The options include <b>TAG</b> and <b>UNTAG</b> . <b>TAG</b> means that the downlink multicast stream that passes the ONU port carries the designated VLAN tag; <b>UNTAG</b> means that the downlink multicast stream that passes the ONU port is untagged. Configure according to the network planning of the operator.	TAG
	IGMP data VLAN	The multicast data VLAN indicates that the ONU only receives the downlink multicast stream with the designated VLAN tag. Configure according to the network planning of the operator.	100

Item	Description	Example
IGMP protocol VLAN mode	Configure according to the network planning of the operator. The options include: <b>TRANSPARENT</b> , <b>TAG</b> , <b>RETAG</b> and <b>REMOVE</b> . <b>TRANSPARENT</b> means to transparently transmit the uplink multicast protocol message; <b>TAG</b> means to add a VLAN tag to the uplink multicast protocol message; <b>RETAG</b> means to reset the VLAN tag that the uplink multicast protocol message carries; <b>REMOVE</b> means to remove the VLAN tag that the uplink multicast protocol message carries.	RETAG
IGMP Up protocol VLAN	Configure 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 config	Data Port List	FE1 to FE2
	TAG Mode	Untag
	CVLAN Mode	Tag
	CVLAN ID	100
COS	The priority level of the multicast uplink / downlink protocol message. The value range is 0 to 7 with 7 as the highest level of priority and 0 as the lowest level of priority.	7

### 6.1.3.2 Configuration Flow Chart

Figure 6-2 shows the configuration flow chart for starting up the multicast services in proxy mode for the AN5506-04-B by configuring the ports respectively.

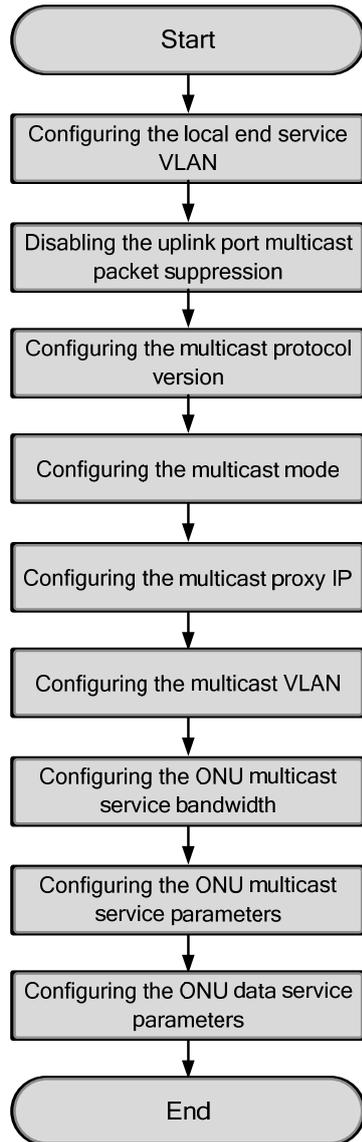


Figure 6-2 Configuration flow chart of starting up the multicast services in proxy mode by configuring the ports respectively (on the AN5506-04-B)

### 6.1.3.3 Configuring the Local End Service Data

#### Configuration purpose

Configure the uplink port service VLAN, set range limit on the VLAN IDs of the services that pass the uplink port, and process the VLAN tag.

#### Operation steps

1. Right-click the **HWSA[9]** card in the **Object Tree** pane, and select **Config** → **Local VLAN** from the shortcut menu. Then select the **Local End Service VLAN** tab in the window that appears subsequently to access the associated window.
2. Select **Edit** → **Append** from the menu bar or click  in the toolbar, and input **1** in the **Please Input the Rows for Add:** dialog box that appears subsequently. Then click **OK** to add a local VLAN.
3. Configure the parameters according to the planning data in the Table 6-1. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the local end service VLAN is configured. See Figure 6-3.

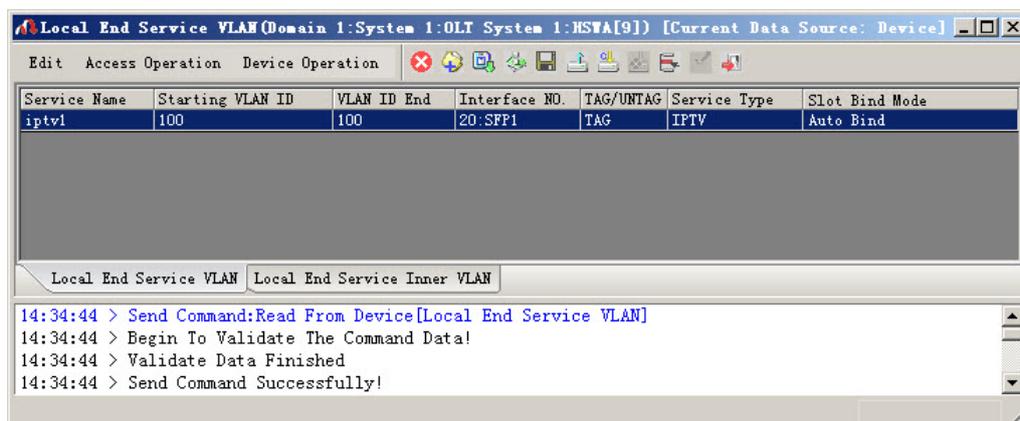


Figure 6-3 Configuring the local end service data

### 6.1.3.4 Disabling the Uplink Port Multicast Packet Suppression

#### Configuration purpose

Disable the suppression on the uplink port multicast streams.

#### Operation steps

1. Right-click the **HSTA[9]** card in the **Object Tree** pane and select **Config** → **Uplink Port Packet Rate Control** from the shortcut menu to access the **Uplink Port Packet Suppression** window.
2. According to the planning data in the Table 6-1, select **20:2** in the **Port No.** pane, and then clear the check box corresponding to the multicast packet.
3. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the configuration of disabling the uplink port multicast packet suppression is completed. See Figure 6-4.

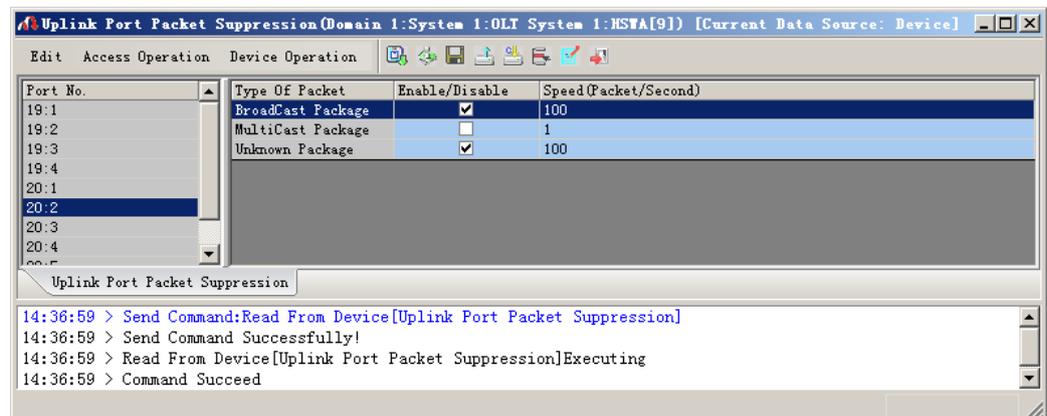


Figure 6-4 Disabling the suppression of the designated packet on the uplink port

### 6.1.3.5 Configuring the Multicast Protocol Version

#### Configuration purpose

Select the multicast protocol version of the AN5116-06B. The options include **IGMP V1 / V2** and **IGMP V3**.

#### Operation steps

1. Right-click the **HSTA[9]** card in the **Object Tree** pane and select **Config** → **IGMP Config** → **IGMP Task** from the shortcut menu to access the **IGMP Task** window.
2. According to the planning data in the Table 6-1, select **IGMP V1 / V2** from the pulldown list of the **Igmp version** item.
3. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the configuration of the multicast protocol version is completed. See Figure 6-5.

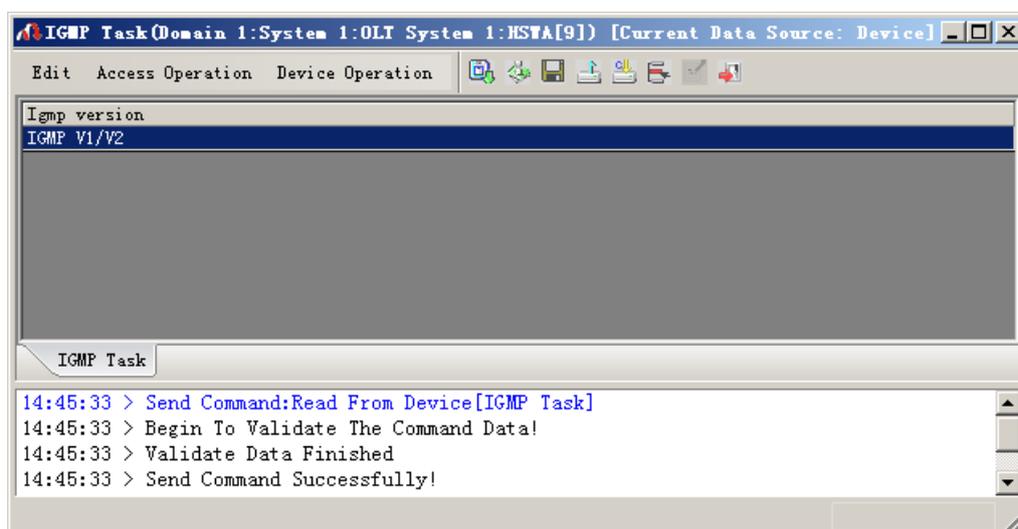


Figure 6-5 Configuring the multicast protocol version

### 6.1.3.6 Configuring the Multicast Mode

#### Configuration purpose

Configure the multicast operation mode of the AN5116-06B. The options include **Proxy Mode**, **Snooping Mode**, **Proxy-snooping Mode**, **Controlled Mode** and **Disable**.

#### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, and select **Config** → **IGMP Config** → **IGMP Mode** from the shortcut menu to access the **IGMP Mode** window.
2. According to the planning data in Figure 6-1, select **Proxy Mode** in the pulldown list of the **IGMP Mode** item.
3. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the multicast mode is set as **Proxy Mode**. See Figure 6-6.

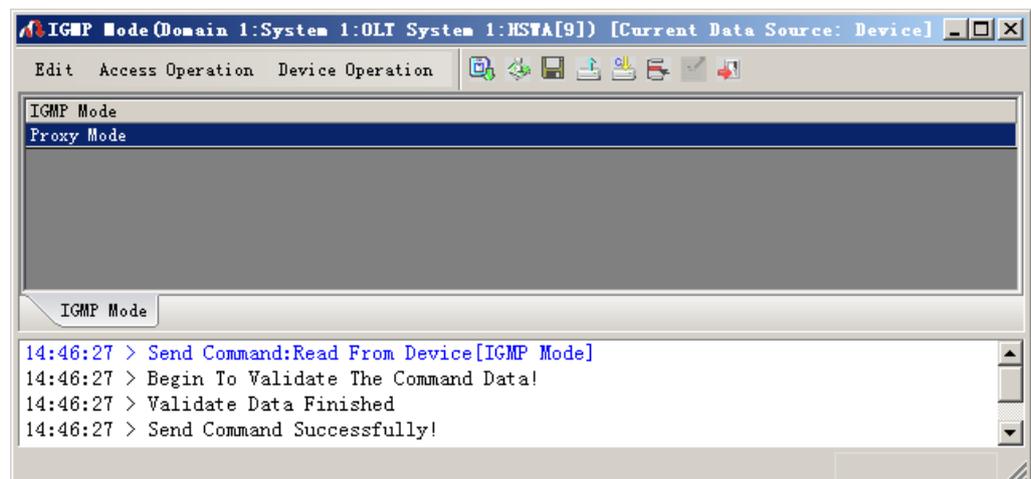


Figure 6-6 Configuring the multicast mode

### 6.1.3.7 Configuring the Multicast Proxy IP

#### Configuration purpose

Configure the multicast proxy IP for the AN5116-06B. The configured IP serves as the source IP address of the AN5116-06B to send multicast protocol messages to the multicast server.

#### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, and select **Config** → **IGMP Config** → **IGMP Proxy IP** from the shortcut menu to access the **IGMP Proxy IP** window.
2. According to the planning data in Figure 6-1, double-click the **IGMP Proxy's IP** column and input **10.25.10.1**.
3. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the multicast proxy IP has been set to **10.25.10.1**. See Figure 6-7.

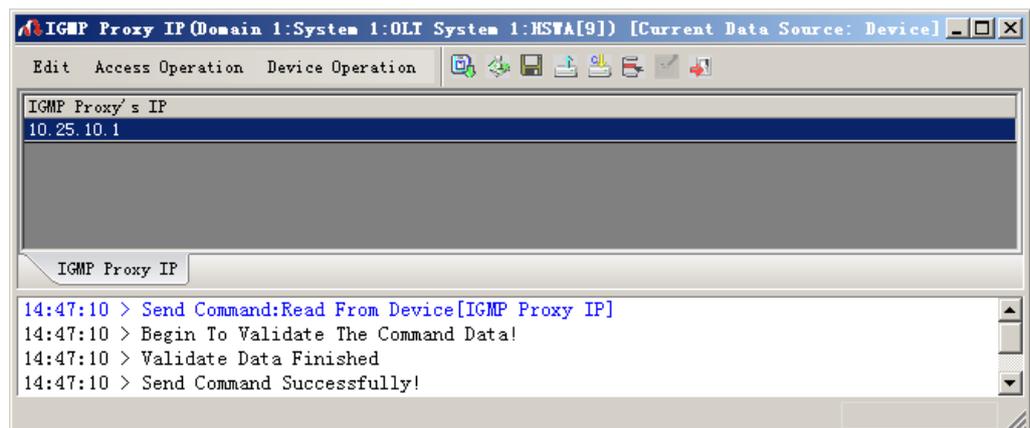


Figure 6-7 Configuring the multicast proxy IP

### 6.1.3.8 Configuring the Multicast VLAN

#### Configuration purpose

Configure the default VLAN of the AN5116-06B's multicast services. The multicast VLAN is used to identify the multicast streams. The users can configure one or more VLANs dedicated for the multicast service to isolate it from other services.



#### Note:

The priority level of the default VLAN is lower than that of the VLAN dedicated for the multicast group in the multicast profile.

---

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 a set of multicast programs under the management of a unified authorization entry).

#### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, and select **Config** → **IGMP Config** → **Multicast VLAN** from the shortcut menu to access the **Multicast VLAN** window.
2. According to the planning data in Figure 6-1, double-click the **VLAN** column and input **100**.
3. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the multicast VLAN has been set to **100**. See Figure 6-8.

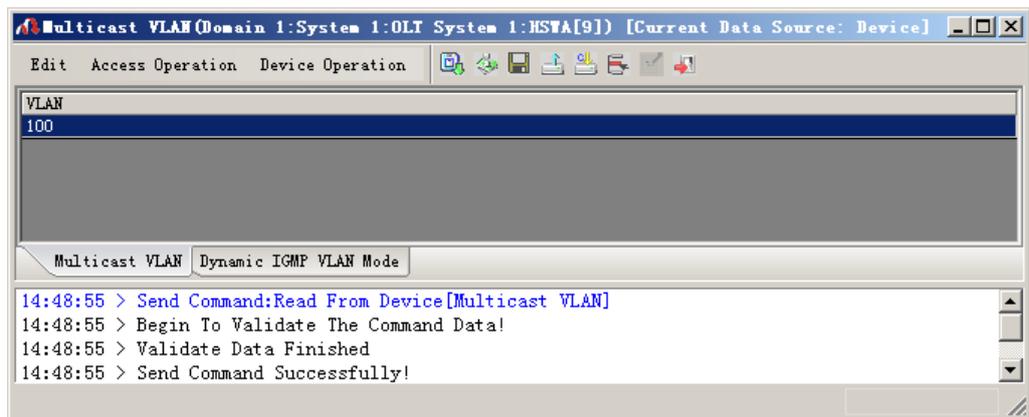


Figure 6-8 Configuring the multicast VLAN

### 6.1.3.9 Configuring the ONU Multicast Service Bandwidth

#### Configuration purpose

Configure the bandwidth of the ONU downlink multicast stream and the uplink / downlink multicast protocol. The service type of the downlink multicast stream is **IPTV** and that of the uplink / downlink multicast protocol is **data**.

#### Operation steps

1. Click the **GC8B[15]** card in the **Object Tree** pane to display all ONUs under this card in the right pane. Next 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 a blank area in the right pane, then select **Edit** → **Append** from the menu bar or click  in the toolbar, and input **2** in the **Please Input the Rows for Add:** dialog box that appears subsequently. After that, click **OK** to add two services.
3. Configure the parameters according to the planning data in the Table 6-2.

- When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the allocation of multicast bandwidth is completed. See Figure 6-9.

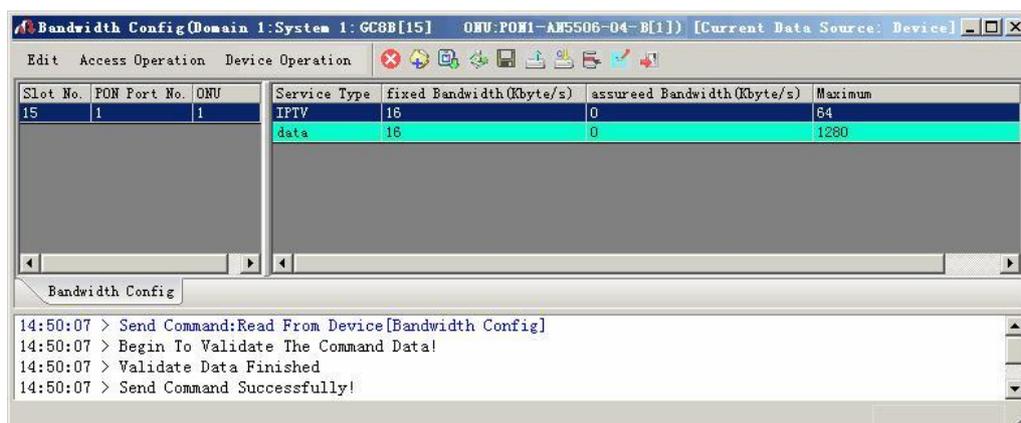


Figure 6-9 Allocating the multicast bandwidth

### 6.1.3.10 Configuring the ONU Multicast Service Parameters

#### Configuration purpose

Configure the VLAN of the multicast data stream and the VLAN of the uplink / downlink multicast protocol message.

#### Operation steps

- Click the **GC8B[15]** card in the **Object Tree** pane to display all ONUs under this card in the right pane. Next 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.
- Configure the parameters according to the planning data in the Table 6-2.

- When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the configuration of multicast services for port 1 and port 2 is completed. See Figure 6-10.

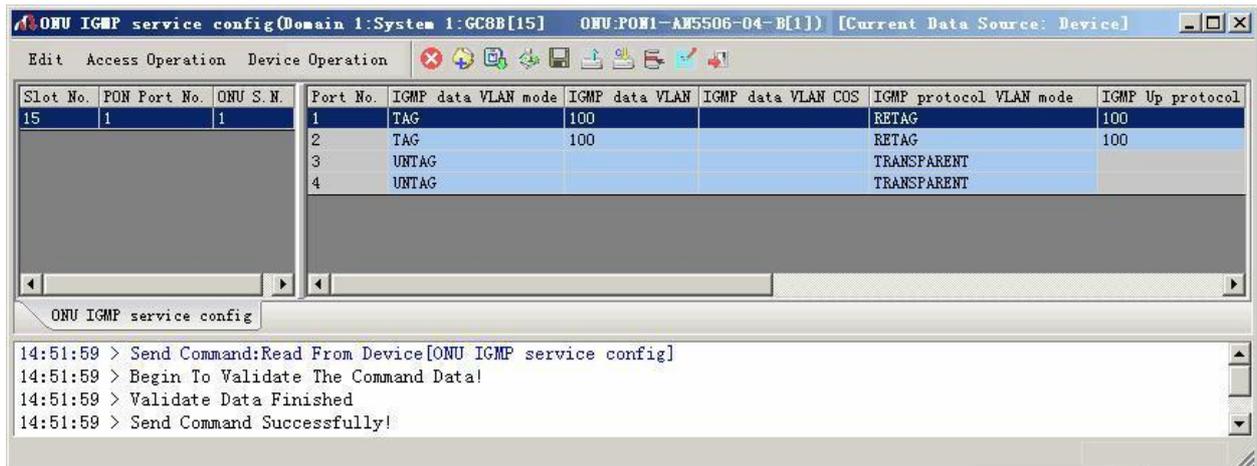


Figure 6-10 Configuring the ONU multicast services

### 6.1.3.11 Configuring the ONU Data Service Parameters

#### Configuration purpose

Configure the VLAN information of the uplink / downlink multicast protocol message.

#### Operation steps

- Click the **GC8B[15]** card in the **Object Tree** pane to display all ONUs under this card in the right pane. Next right-click the **PON1-AN5506-04-B[1]** ONU and select **Config** → **Service Config** from the shortcut menu, and then click the **Data Port Config** tab from the dialog box that appears subsequently, as shown in Figure 6-11.

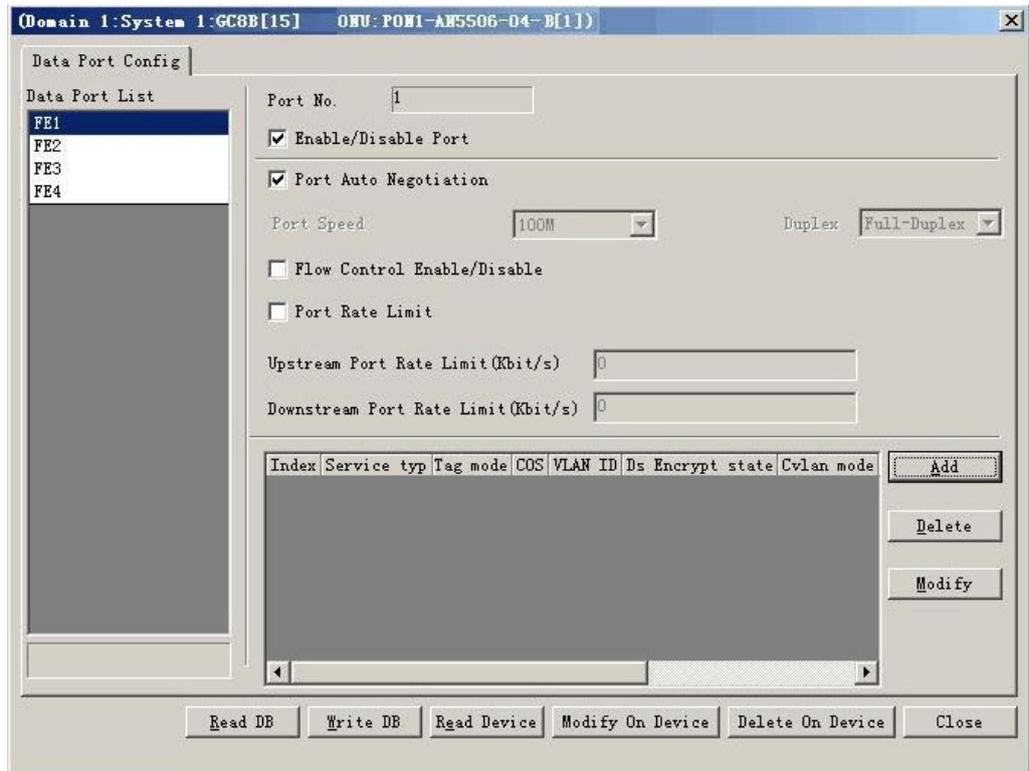


Figure 6-11 Service configuration of the AN5506-04-B (1)

2. Select **FE1** in the **Data Port List** pane, and click the **Add** button to bring up the **Services Configuration** dialog box. According to the planning data in Table 6-2, configure the parameters in the dialog box, as shown in Figure 6-12.

Services Configuration

Index: 1      Service type: unicast      OK

TAG Mode: Untag      CVLAN Mode: Tag      Cancel

COS:      CVLAN ID: 100

VLAN ID: 1      COS: 7

Ds Encrypt state

QinQ State

SVLAN ID:      Service Name:      COS:      CVLAN ID: 100

Figure 6-12 Service configuration of the AN5506-04-B (2)

- After the configuration is completed, click the **OK** button and return to the dialog box as shown in Figure 6-13.

(Domain 1: System 1: GC8B[15] ONU: PON1-AN5506-04-B[1])

Data Port Config

Data Port List: FE1, FE2, FE3, FE4

Port No.: 1

Enable/Disable Port

Port Auto Negotiation

Port Speed: 100M      Duplex: Full-Duplex

Flow Control Enable/Disable

Port Rate Limit

Upstream Port Rate Limit (Kbit/s): 0

Downstream Port Rate Limit (Kbit/s): 0

Index	Service typ	Tag mode	COS	VLAN ID	Ds Encrypt state	Cvlan mode
1	unicast	Untag	7	1	Disable	tag

Buttons: Add, Delete, Modify

Bottom Buttons: Read DB, Write DB, Read Device, Modify On Device, Delete On Device, Close

Figure 6-13 Service configuration of the AN5506-04-B (3)

4. Select **FE2** in the **Data Port List** pane, and then implement the same configuration as the FE1 port on it.
5. After returning to the dialog box as shown in Figure 6-13, click the **Modify On Device** button and the **Command Manager** window appears subsequently. When **Command Succeed** is displayed for the data port services in the window, the data service configuration of the AN5506-04-B ports is completed.

### 6.1.3.12 End of Configuration

The multicast services on the FE1 and FE2 ports that belong to the AN5506-04-B (whose authorization No. is 1) connected to the No.1 PON port of the GC8B card (in Slot 15) is started up; and the users can watch the video programs whose multicast VLAN is 100 normally.

## 6.1.4 Configuring Multicast Services Respectively (for the AN5506-10-B1)

### 6.1.4.1 Planning Data

This section introduces how to start up the multicast services in proxy mode for the AN5506-10-B1 by configuring the ports respectively. Tables 6-3 and 6-4 show the planning data.

Table 6-3 The OLT side planning data of the multicast services under the proxy mode (configuring respectively)

Item		Description	Example	
ONU information	ONU type	Configure according to the type of the ONU that is actually used.	AN5506-04-B	AN5506-10-B1
	Slot No.	Configure according to the slot number of the PON interface card that is actually used.	15	
	PON port No.	Configure according to the No. of the PON port that is actually used.	1	

Item		Description	Example	
	ONU authentication No.	Configure according to the network planning of the operator.	1	2
Local 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.	100	
	VLAN ID End	The ending VLAN ID of the uplink port services. Configure according to the network planning of the operator.	100	
	Interface No.	Configure according to the No. of the uplink port that is actually used.	20:SFP1	
	TAG / UNTAG	Configure the tag processing mode for the uplink service VLAN. There are two options: <b>TAG</b> and <b>UNTAG</b> . Under <b>UNTAG</b> mode, the TAGs of the uplink packets will be stripped automatically and the packets will be uplinked in the form of <b>UNTAG</b> when they pass the port, whereas the downlink UNTAG packets will be added with designated TAGs and downlinked in the form of <b>TAG</b> . Under <b>TAG</b> mode, the uplink data packets will not be processed but remain uplinked in the original form. For downlink packets, however, only packets with designated TAGs are received and the packets will not be processed but remain downlinked in the original form.	TAG	
	Service Type	Select <b>IPTV</b> for configuring the multicast services.	IPTV	
	Slot Bind Mode	Select <b>Auto Bind</b> or <b>Manually Bind</b> .	Auto Bind	
Uplink port packet suppression	Port No.	Select <b>20:2</b> , which is corresponding to <b>20:SFP1</b> .	20:2	
	Type of Packet	Select the multicast packet in this example.	MultiCast Package	
	Enable / Disable	Select to disable the suppression in this example.	Disable	

Item		Description	Example
Multicast task selection	IGMP Version	According to the network planning of the operator, select <b>IGMP V1 / V2</b> in this example.	IGMP V1 / V2
Multicast mode	IGMP Mode	According to the network planning of the operator, select the proxy mode in this example.	Proxy Mode
Multicast proxy IP	IGMP Proxy's IP	Configure according to the network planning of the operator; the default value is 10.25.14.57.	10.25.10.1
Multicast VLAN	VLAN	Configure according to the network planning of the operator. The multicast VLAN should be in the range of the local VLAN.	100

Table 6-4 The AN5506-10-B1 side planning data of the multicast services under the proxy mode (configuring respectively)

Item		Description	Example
ONU multicast bandwidth configuration	Service Type for multicast services	Select <b>IPTV</b> for configuring the multicast services.	IPTV
	Fixed Bandwidth (Kbyte/s) for multicast services	Configure according to the network planning of the operator; the default value is 16.	16
	Assured Bandwidth (Kbyte/s) for multicast services	Configure according to the network planning of the operator; the default value is 0.	0
	Maximum Bandwidth (Kbyte/s) for multicast services	Configure according to the network planning of the operator; the default value is 64.	64
	Service Type for data services	Select <b>Integrate Service</b> for the data services.	Integrate Service

Item		Description	Example
	Fixed Bandwidth (Kbyte/s) for data services	Configure according to the network planning of the operator; the default value is 16.	16
	Assured Bandwidth (Kbyte/s) for data services	Configure according to the network planning of the operator; the default value is 0.	0
	Maximum Bandwidth (Kbyte/s) for data services	Configure according to the network planning of the operator; the default value is 64.	1280
ONU multicast service configuration	Data Port List	Configure according to the port number of the ONU that is actually used.	FE1 to FE2
	Service type	Select <b>multicast</b> for the multicast services.	multicast
	VLAN Mode	Configure according to the network planning of the operator. The options include <b>tag</b> and <b>transparent</b> . <b>Tag</b> means to remove the VLAN tag from the downlink multicast stream that passes the ONU port; <b>transparent</b> means to transparently transmit the downlink multicast stream.	tag
	CVLAN ID	The VLAN ID that the downlink multicast stream carries. Configure according to the network planning of the operator.	100
ONU port parameters	ONU Port No.	Configure according to the port number of the ONU that is actually used.	1, 2
	Control Switch	Select <b>Controlled</b> in this example.	Controlled
	Profile Name	Select <b>Detach</b> in this example.	Detach
	Signal vlan	Multicast uplink protocol message VLAN. Configure according to the network planning of the operator.	100

## 6.1.4.2 Configuration Flow Chart

Figure 6-14 shows the configuration flow chart for starting up the multicast services in proxy mode for the AN5506-10-B1 by configuring the ports respectively.

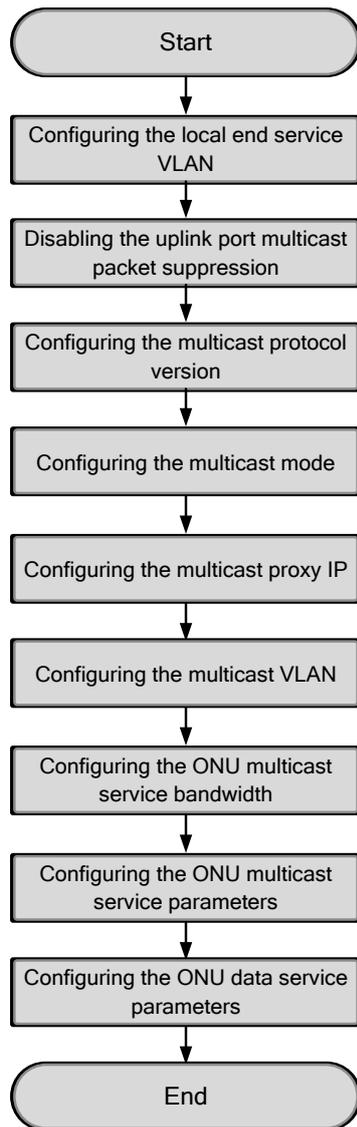


Figure 6-14 Configuration flow chart of starting up the multicast services in proxy mode by configuring the ports respectively (on the AN5506-10-B1)

See Section 6.1.3.3 to Section 6.1.3.8 for the steps 1-6 of the configuration flow chart. Only step 7 to step 9 are introduced in the following part.

### 6.1.4.3 Configuring the ONU Multicast Service Bandwidth

#### Configuration purpose

Configure the bandwidth of the ONU downlink multicast stream and the uplink / downlink multicast protocol. The service type of the downlink multicast stream is **IPTV** and that of the uplink / downlink multicast protocol is **Integrate Service**.

#### Operation steps

1. Click the **GC8B[15]** card in the **Object Tree** pane to display all ONUs under this card in the right pane. Next 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 a blank area in the right pane, then select **Edit** → **Append** from the menu bar or click  in the toolbar, and input **2** in the **Please Input the Rows for Add:** dialog box that appears subsequently. After that, click **OK** to add two services.
3. Configure the parameters according to the planning data in the Table 6-4.
4. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the allocation of multicast bandwidth is completed, as shown in Figure 6-15.

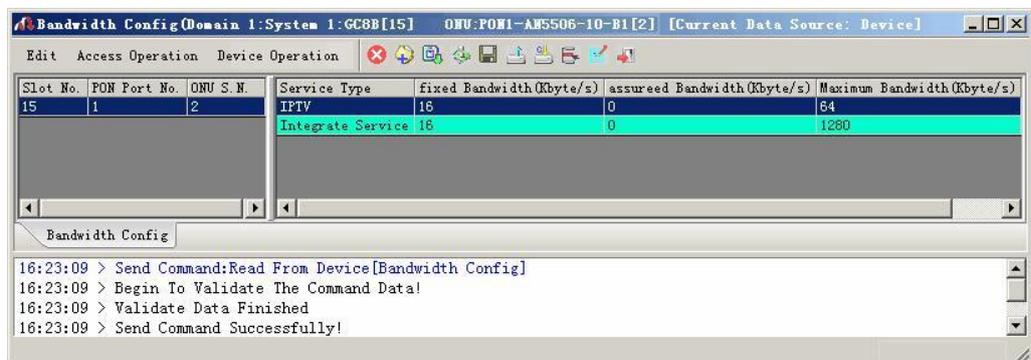


Figure 6-15 Allocating the multicast bandwidth

### 6.1.4.4 Configuring the ONU Multicast Service Parameters

#### Configuration purpose

Configure the VLAN of the multicast data stream and the VLAN of the downlink multicast protocol message.

#### Operation steps

1. Click the **GC8B[15]** card in the **Object Tree** pane to display all ONUs under this card in the right pane. Next right-click the **PON1-AN5506-10-B1[2]** ONU and select **Config** → **Service Config** from the shortcut menu, and then click the **Data Port Config** tab from the dialog box that appears subsequently, as shown in Figure 6-16.

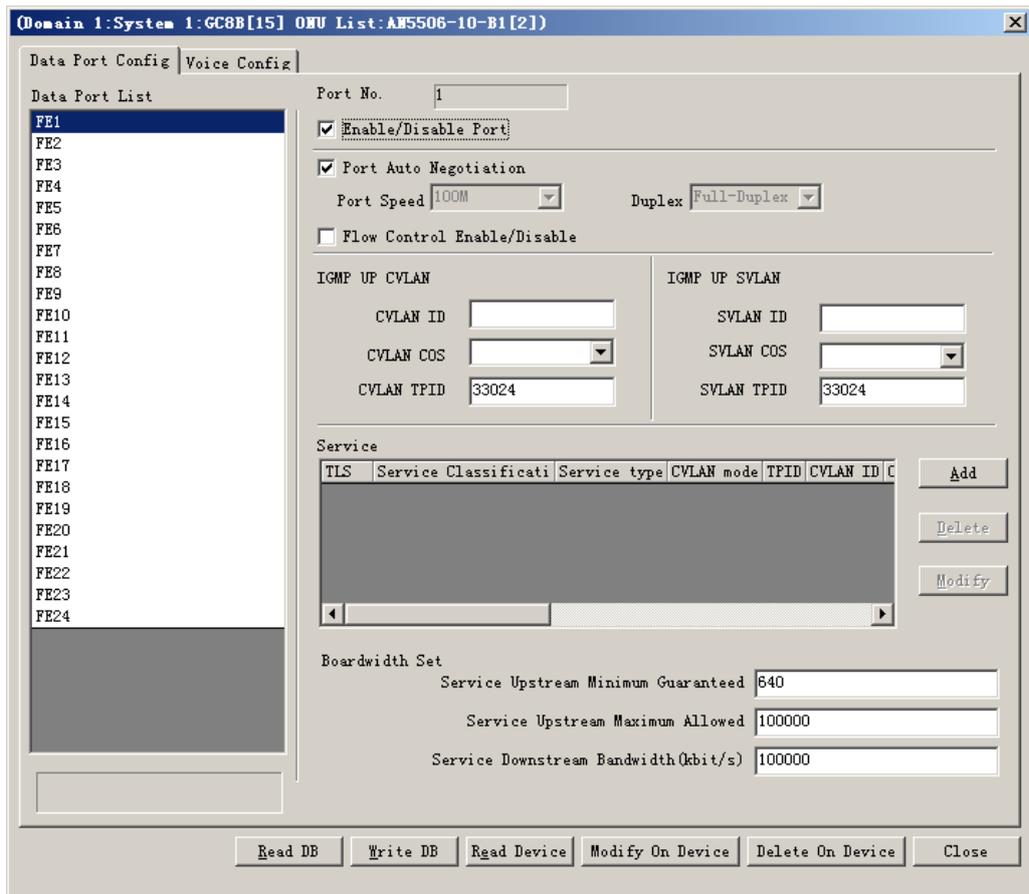


Figure 6-16 Service configuration of the AN5506-10-B1 (1)

2. Select **FE1** in the **Data Port List** pane, and click the **Add** button to bring up the **Services Configuration** dialog box. According to the planning data in Table 6-4, configure the parameters in the dialog box, as shown in Figure 6-17.

The screenshot shows the 'Services Configuration' dialog box with the following settings:

- TLS: No TLS
- Service type: multicast
- TPID: 33024
- VLAN Mode: tag
- CVLAN ID: 100
- Priority Or COS: (dropdown menu)
- Translation State:
- Translation value: (text box)
- QinQ State:
- Choose QinQ Profile...: (button)
- Service Name: (dropdown menu)
- VLAN ID: (text box)
- TPID: 33024
- Priority Or COS: (dropdown menu)

Figure 6-17 Service configuration of the AN5506-10-B1 (2)

3. After the configuration is completed, click the **OK** button and return to the dialog box as shown in Figure 6-18.

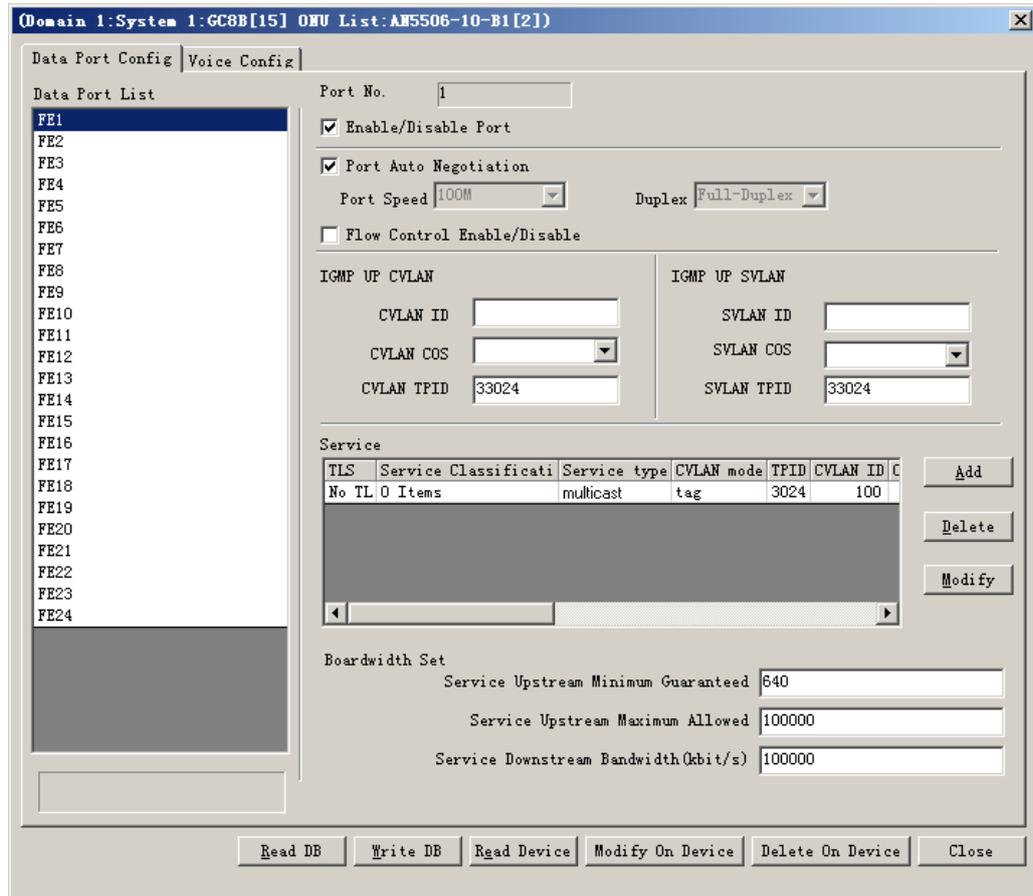


Figure 6-18 Service configuration of the AN5506-10-B1 (3)

4. Select **FE2** in the **Data Port List** pane, and then implement the same configuration as the FE1 port on it.
5. After returning to the dialog box as shown in Figure 6-18, click the **Modify On Device** button and the **Command Manager** window appears subsequently. When **Command Succeed** is displayed for the data port services in the window, the data service configuration of the AN5506-10-B1 ports is completed.

### 6.1.4.5 Configuring the ONU Port Parameters

#### Configuration purpose

Configure the VLAN of the multicast uplink protocol message.

#### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, and select **Config** → **IGMP Config** → **IGMP Profile and Port** from the shortcut menu. And then click the **Port Parameters** tab from the window that appears subsequently.
2. Configure the parameters according to the planning data in the Table 6-4.
3. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the configuration of the ONU port parameters is completed. See Figure 6-19.



#### Note:

Under the uncontrollable mode, only the parameters of the itmes **signal vlan** and **LEAVE MODE** are valid.

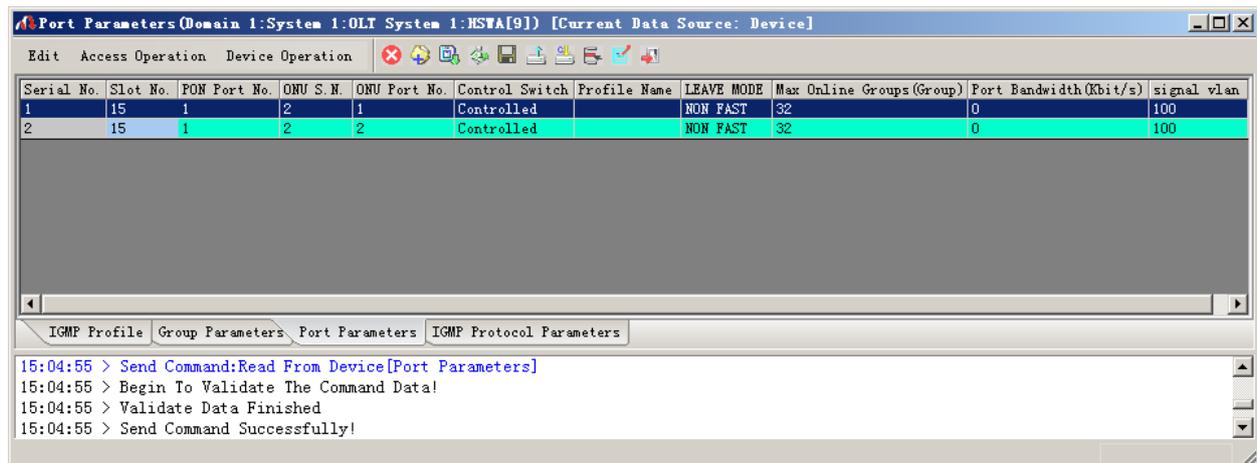


Figure 6-19 Configuring the ONU port parameters

## 6.1.4.6 End of Configuration

The multicast services on the FE1 and FE2 ports that belong to the AN5506-10-B1 (whose the authorization No. is 2) connected to the No.1 PON port of the GC8B card (in Slot 15) is started up; and the users can watch the video programs whose multicast VLAN is 100 normally.

## 6.1.5 Configuring Multicast Services in a Batch Manner (for the AN5506-04-B)

### 6.1.5.1 Planning Data

This section introduces how to start up the multicast services in proxy mode for the AN5506-04-B by configuring the ports in a batch manner. Tables 6-5 and 6-6 show the planning data.

Table 6-5 The OLT side planning data of the multicast services under the proxy mode (configuring in a batch manner)

Item		Description	Example	
ONU information	ONU type	Configure according to the type of the ONU that is actually used.	AN5506-04-B	AN5506-10-B1
	Slot No.	Configure according to the slot number of the PON interface card that is actually used.	15	
	PON port No.	Configure according to the No. of the PON port that is actually used.	1	
	ONU No.	Configure according to the network planning of the operator.	1	2
Local 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.	100	
	VLAN ID End	The ending VLAN ID of the uplink port services. Configure according to the network planning of the operator.	100	

Item		Description	Example
	Interface No.	Configure according to the No. of the uplink port that is actually used.	20:SFP1
	TAG / UNTAG	Configure the tag processing mode for the uplink service VLAN. There are two options: <b>TAG</b> and <b>UNTAG</b> . Under <b>UNTAG</b> mode, the TAGs of the uplink packets will be stripped automatically and the packets will be uplinked in the form of <b>UNTAG</b> when they pass the port, whereas the downlink UNTAG packets will be added with designated TAGs and downlinked in the form of <b>TAG</b> . Under <b>TAG</b> mode, the uplink data packets will not be processed but remain uplinked in the original form. For downlink packets, however, only packets with designated TAGs are received and the packets will not be processed but remain downlinked in the original form.	TAG
	Service Type	Select <b>IPTV</b> for configuring the multicast services.	IPTV
	Slot Bind Mode	Select <b>Auto Bind</b> or <b>Manually Bind</b> .	Auto Bind
Uplink port packet suppression	Port No.	Select <b>20:2</b> , which is corresponding to <b>20:SFP1</b> .	20:2
	Type of Packet	Select the multicast packet in this example.	MultiCast Package
	Enable / Disable	Select to disable the suppression in this example.	Disable
Multicast task selection	IGMP Version	According to the network planning of the operator, select <b>IGMP V1 / V2</b> in this example.	IGMP V1 / V2
Multicast mode	IGMP Mode	According to the network planning of the operator, select the proxy mode in this example.	Proxy Mode

Item		Description	Example
Multicast proxy IP	IGMP Proxy's IP	Configure according to the network planning of the operator; the default value is 10.25.14.57.	10.25.10.1
Multicast VLAN	VLAN	Configure according to the network planning of the operator. The multicast VLAN should be in the range of the local VLAN.	100

Table 6-6 The AN5506-04-B side planning data of the multicast services under the proxy mode (configuring in a batch manner)

Item		Description	Example
ONU bandwidth allocation profile	Profile Name	Configure according to the network planning of the operator.	a
	Service Type for multicast services	Select <b>IPTV</b> for configuring the multicast services.	IPTV
	Fixed Bandwidth (Kbyte/s) for multicast services	Configure according to the network planning of the operator; the default value is 16.	16
	Assured Bandwidth (Kbyte/s) for multicast services	Configure according to the network planning of the operator; the default value is 0.	0
	Maximum Bandwidth (Kbyte/s) for multicast services	Configure according to the network planning of the operator; the default value is 64.	64
	Service Type for data services	Select <b>DATA</b> for the data services.	DATA
	Fixed Bandwidth (Kbyte/s) for data services	Configure according to the network planning of the operator; the default value is 16.	16

Item		Description	Example
	Assured Bandwidth (Kbyte/s) for data services	Configure according to the network planning of the operator; the default value is 0.	0
	Maximum Bandwidth (Kbyte/s) for data services	Configure according to the network planning of the operator; the default value is 64.	1280
ONU multicast service profile	Profile Name	Configure according to the network planning of the operator.	b
	IGMP Data VLAN Mode	The options include <b>Tag</b> and <b>Untag</b> . <b>Tag</b> means that the downlink multicast stream that passes the ONU port carries the designated VLAN tag; <b>Untag</b> means that the downlink multicast stream that passes the ONU port is untagged. Configure according to the network planning of the operator.	Tag
	IGMP Data VLAN	The multicast data VLAN indicates that the ONU only receives the downlink multicast stream with the designated VLAN tag. Configure according to the network planning of the operator.	100
	IGMP Protocol VLAN Mode	Configure according to the network planning of the operator. The options include: <b>TRANSPARENT</b> , <b>TAG</b> , <b>RETAG</b> and <b>REMOVE</b> . <b>TRANSPARENT</b> means to transparently transmit the uplink multicast protocol message; <b>TAG</b> means to add a VLAN tag to the uplink multicast protocol message; <b>RETAG</b> means to reset the VLAN tag that the uplink multicast protocol message carries; <b>REMOVE</b> means to remove the VLAN tag that the uplink multicast protocol message carries.	RETAG
	IGMP Up Protocol VLAN	Configure according to the network planning of the operator. The uplink multicast protocol should be in the range of the local VLAN.	100

Item		Description	Example
Service Profile	Profile Name	Configure according to the network planning of the operator.	c
	ONU Type	Specify the type of the ONU that is used.	AN5506-04-B
	ONU Subprofile Config	Select the ONU bandwidth allocation profile.	a
	Port Type	Specify the type of the ONU port.	FE
	Port No.	Select the port number of the ONU that is used.	1, 2
	ONU Port Profile Config	Select the ONU multicast service profile.	b
Service profile binding	Profile ID	Select the service profile to which the ONU bind.	c
	Action	Select <b>Attach</b> in this example.	Attach
	Slot No.	Configure according to the slot number of the PON interface card that is actually used.	15
	PON No.	Configure according to the No. of the PON port that is actually used.	1
	ONU S.N.	Configure according to the ONU authentication No. that binds to the service No.	1

### 6.1.5.2 Configuration Flow Chart

Figure 6-20 shows the configuration flow chart for starting up the multicast services in proxy mode for the AN5506-04-B by configuring the ports in a batch manner.

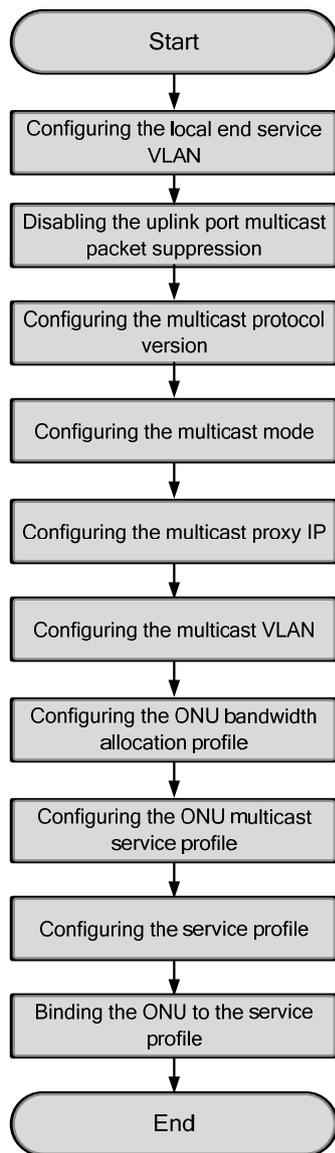


Figure 6-20 Configuration flow chart of starting up the multicast services in proxy mode by configuring the ports in a batch manner (on the AN5506-04-B)

See Section 6.1.3.3 to Section 6.1.3.8 for the steps 1-6 of the configuration flow chart. Only step 7 to step 10 are introduced in the following part.

### 6.1.5.3 Configuring the ONU Bandwidth Allocation Profile

#### Configuration purpose

Configure the bandwidth profile of the ONU downlink multicast stream and the uplink / downlink multicast protocol. The service type of the downlink multicast stream is **IPTV** and that of the uplink / downlink multicast protocol is **DATA**.

#### Operation steps

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 **Edit** → **Append** from the menu bar or click  in the toolbar, and input **1** in the **Please Input the Rows for Add:** dialog box that appears subsequently. After that, click **OK** to add one bandwidth allocation profile and input **a** for the **Profile Name** item.
3. Click a blank area in the right pane, then select **Edit** → **Append** from the menu bar or click  in the toolbar, and input **2** in the **Please Input the Rows for Add:** dialog box that appears subsequently. After that, click **OK** to add two services.
4. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the configuration multicast bandwidth allocation profile is completed, as shown in Figure 6-21.

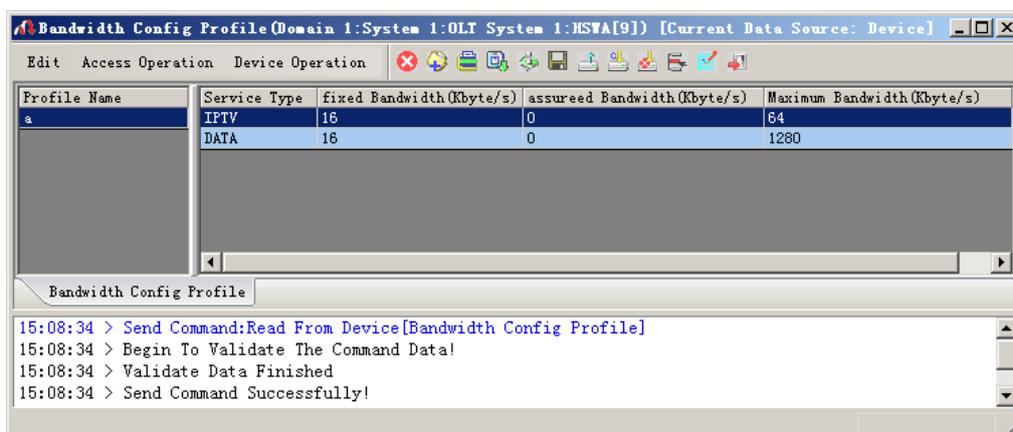


Figure 6-21 Configuring the ONU bandwidth allocation profile

### 6.1.5.4 Configuring the ONU Multicast Service Profile

#### Configuration purpose

Configure the multicast service profile that includes the ONU downlink multicast stream VLAN, the uplink / downlink multicast protocol message VLAN and other service parameters.

#### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, and select **Config** → **Service Profile Config** from the shortcut menu. And then click the **IGMP Service Profile** tab from the window that appears subsequently.
2. Click **Edit** → **Append** from the menu bar or click  in the toolbar, and input **1** in the **Please Input the Rows for Add:** dialog box that appears subsequently. After that, click **OK** to add one multicast service profile.
3. Configure the parameters according to the planning data in the Table 6-6.

- When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the configuration of multicast service profile is completed, as shown in Figure 6-22.

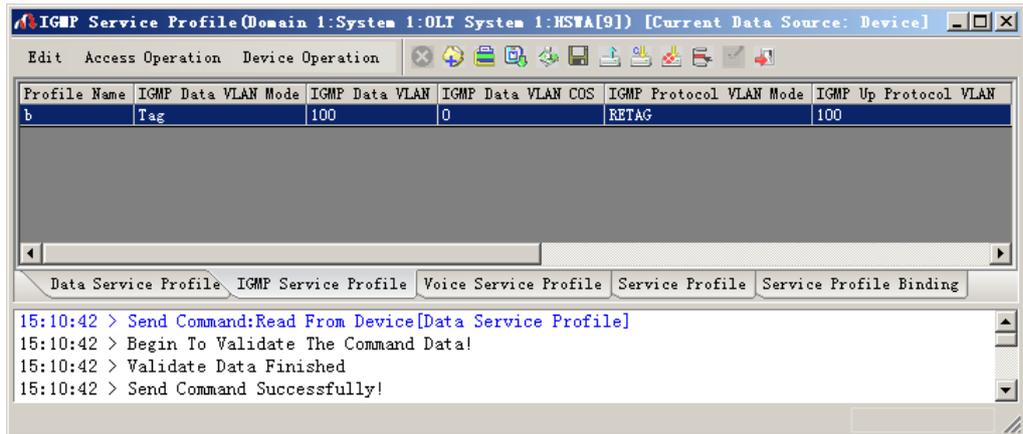


Figure 6-22 Configuring the multicast service profile

### 6.1.5.5 Configuring the Service Profile

#### Configuration purpose

Create a service profile to bind the multicast bandwidth allocation profile and the multicast service profile.

#### Operation steps

- Click the **Service Profile** tab from the **IGMP Service Profile** window to access the **Service Profile** window.
- Click **Edit** → **Append** from the menu bar or click  in the toolbar, and input **1** in the **Please Input the Rows for Add:** dialog box that appears subsequently. After that, click **OK** to add one service profile.

3. According to the planning data in Table 6-6, input the profile name, select the ONU type, and double-click a blank area under the **ONU Subprofile Config** item to bring up the **ONU Subprofile Config** dialog box. Then click the **Add (A)** button, select **Bandwidth Config Profile** in the pulldown list of the **Profile Type** item, and select **a** in the pulldown list of the **Profile Name** item. After that, click the **OK** button, as shown in Figure 6-23.

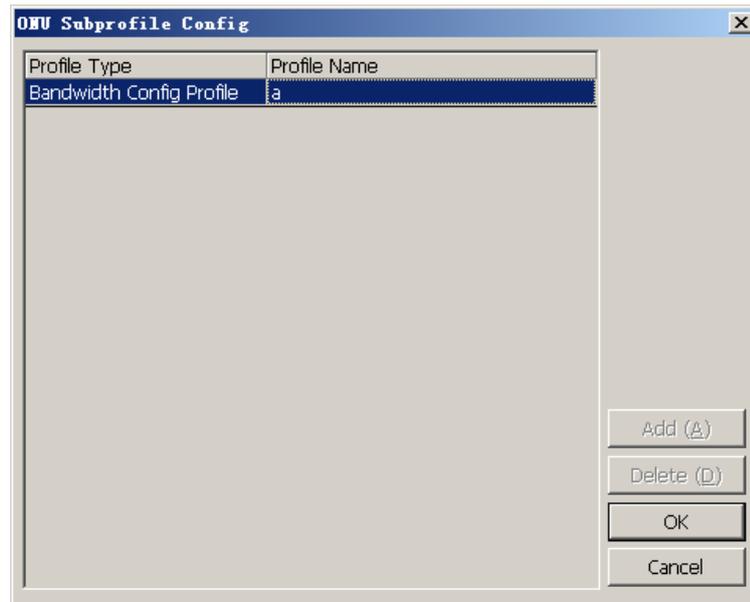


Figure 6-23 Configuring the ONU sub-profile

4. After returning to the **Service Profile** window, click a blank area in the right pane, then select **Edit** → **Append** from the menu bar or click  in the toolbar, and input **2** in the **Please Input the Rows for Add:** dialog box that appears subsequently. After that, click **OK** to add two ONU port sub-profiles.
5. According to the planning data in Table 6-6, select the port type, input the port no, and double-click a blank area under the **ONU Port Profile Config** item to bring up the **ONU Port Profile Config** dialog box. Then click the **Add (A)** button, select **IGMP Service Profile** in the pulldown list of the **Profile Type** item, and select **b** in the pulldown list of the **Profile Name** item. After that, click the **OK** button, as shown in Figure 6-24.

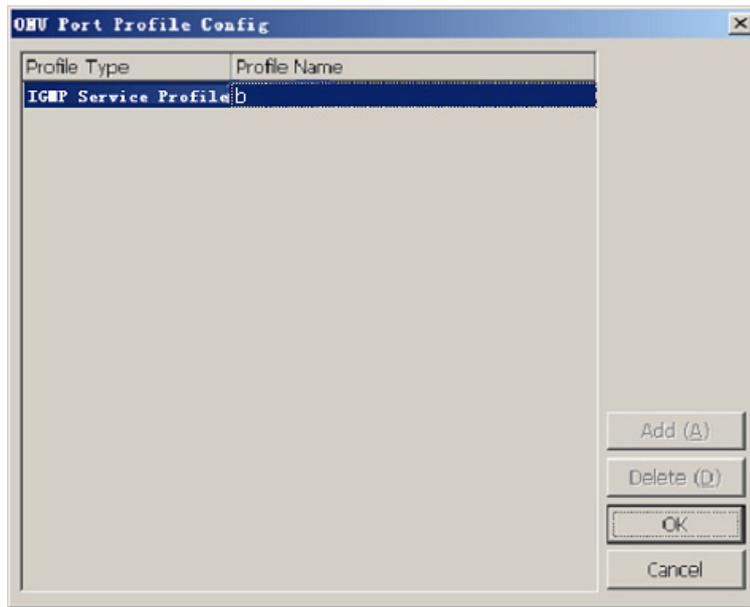


Figure 6-24 Configuring the ONU port sub-profile

- After returning to the **Service Profile** window, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the configuration of service profile is completed, as shown in Figure 6-25.

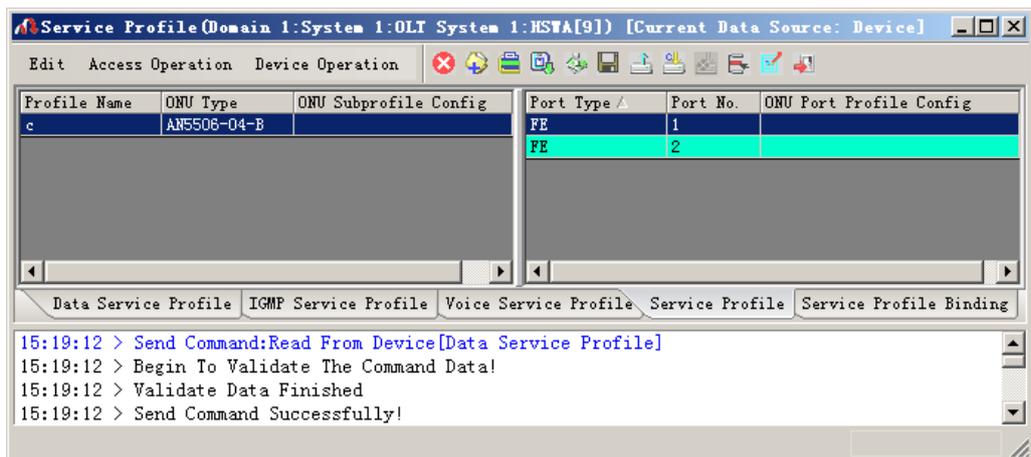


Figure 6-25 Configuring the service profile

### 6.1.5.6 Binding the ONU to the Service Profile

#### Configuration purpose

Bind the ONU to the service profile, namely applying the parameters of the service profile to the ONU.

#### Operation steps

1. Click the **Service Profile Binding** tab from the **Service Profile** window to access the **Service Profile Binding** window.
2. Click **Edit** → **Append** from the menu bar or click  in the toolbar, and input **1** in the **Please Input the Rows for Add:** dialog box that appears subsequently. After that, click **OK** to add one service profile.
3. According to the planning data in Table 6-6, select **c** in the pulldown list of the **Profile ID** item, and select **Attach** in the pulldown list of the **Action** item.
4. Click a blank area in the right pane, then select **Edit** → **Append** from the menu bar or click  in the toolbar, and input **1** in the **Please Input the Rows for Add:** dialog box that appears subsequently. After that, click **OK** to add one binding object.
5. Double-click a blank area under the **ONU S.N.** item to bring up the **Select Objects** dialog box, then select the designated ONU, as shown in Figure 6-26.

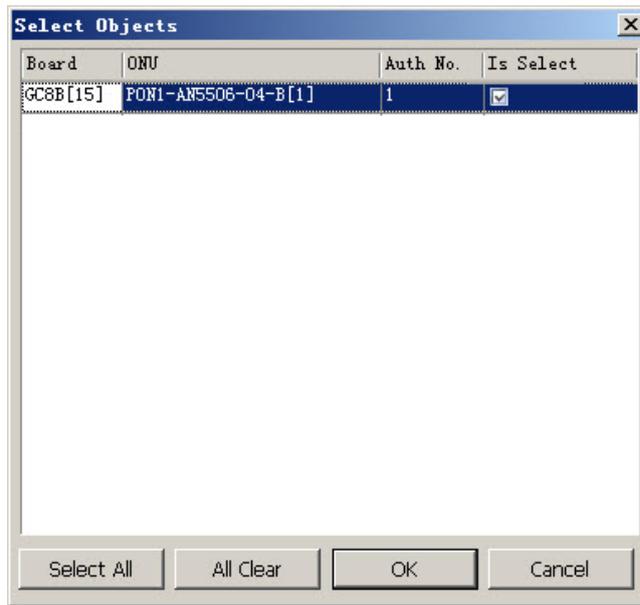


Figure 6-26 Selecting the object

- Click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the operation of binding the ONU to the service profile is completed, as shown in Figure 6-27.

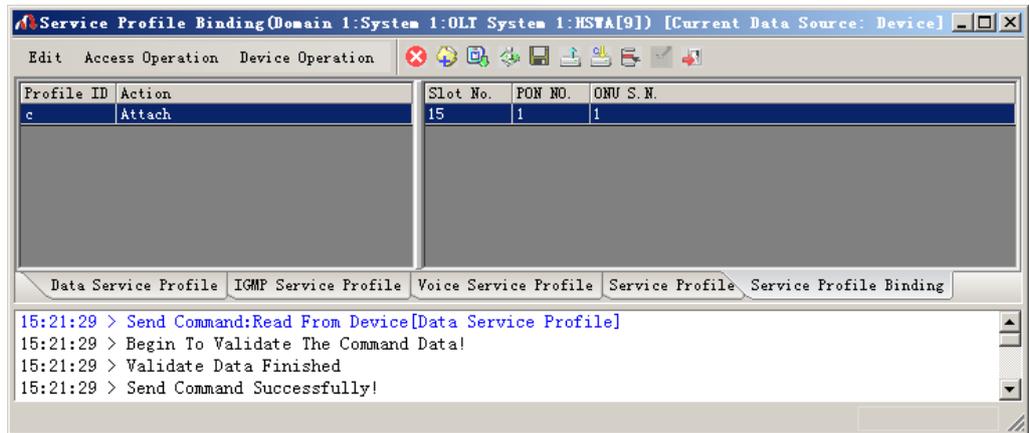


Figure 6-27 Binding the ONU to the service profile

### 6.1.5.7 End of Configuration

The multicast services on the FE1 and FE2 ports that belong to the AN5506-04-B (whose authorization No. is 1) connected to the No.1 PON port of the GC8B card (in Slot 15) is started up; and the users can watch the video programs whose multicast VLAN is 100 normally.

## 6.1.6 Configuring Multicast Services in a Batch Manner (for the AN5506-10-B1)

### 6.1.6.1 Planning Data

This section introduces how to start up the multicast services in proxy mode for the AN5506-10-B1 by configuring the ports in a batch manner. Tables 6-7 and 6-8 show the planning data.

Table 6-7 The OLT side planning data of the multicast services under the proxy mode (configuring in a batch manner)

Item		Description	Example	
ONU information	ONU type	Configure according to the type of the ONU that is actually used.	AN5506-04-B	AN5506-10-B1
	Slot No.	Configure according to the slot number of the PON interface card that is actually used.	15	
	PON port No.	Configure according to the No. of the PON port that is actually used.	1	
	ONU No.	Configure according to the network planning of the operator.	1	2
Local 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.	100	
	VLAN ID End	The ending VLAN ID of the uplink port services. Configure according to the network planning of the operator.	100	

Item		Description	Example
	Interface No.	Configure according to the No. of the uplink port that is actually used.	20:SFP1
	TAG / UNTAG	Configure the tag processing mode for the uplink service VLAN. There are two options: <b>TAG</b> and <b>UNTAG</b> . Under <b>UNTAG</b> mode, the TAGs of the uplink packets will be stripped automatically and the packets will be uplinked in the form of <b>UNTAG</b> when they pass the port, whereas the downlink UNTAG packets will be added with designated TAGs and downlinked in the form of <b>TAG</b> . Under <b>TAG</b> mode, the uplink data packets will not be processed but remain uplinked in the original form. For downlink packets, however, only packets with designated TAGs are received and the packets will not be processed but remain downlinked in the original form.	TAG
	Service Type	Select <b>IPTV</b> for configuring the multicast services.	IPTV
	Slot Bind Mode	Select <b>Auto Bind</b> or <b>Manually Bind</b> .	Auto Bind
Uplink port packet suppression	Port No.	Select <b>20:2</b> , which is corresponding to <b>20:SFP1</b> .	20:2
	Type of Packet	Select the multicast packet in this example.	MultiCast Package
	Enable / Disable	Select to disable the suppression in this example.	Disable
Multicast task selection	IGMP Version	According to the network planning of the operator, select <b>IGMP V1 / V2</b> in this example.	IGMP V1 / V2
Multicast mode	IGMP Mode	According to the network planning of the operator, select the proxy mode in this example.	Proxy Mode
Multicast proxy IP	IGMP Proxy's IP	Configure according to the network planning of the operator; the default value is 10.25.14.57.	10.25.10.1
Multicast VLAN	VLAN	Configure according to the network planning of the operator. The multicast VLAN should be in the range of the local VLAN.	100

Table 6-8 The AN5506-10-B1 side planning data of the multicast services under the proxy mode (configuring in a batch manner)

Item		Description	Example
ONU bandwidth allocation profile	Profile Name	Configure according to the network planning of the operator.	d
	Service Type for multicast services	Select <b>IPTV</b> for configuring the multicast services.	IPTV
	Fixed Bandwidth (Kbyte/s) for multicast services	Configure according to the network planning of the operator; the default value is 16.	16
	Assured Bandwidth (Kbyte/s) for multicast services	Configure according to the network planning of the operator; the default value is 0.	0
	Maximum Bandwidth (Kbyte/s) for multicast services	Configure according to the network planning of the operator; the default value is 64.	64
	Service Type for data services	Select <b>Integrated Service</b> for the data services.	Integrated Service
	Fixed Bandwidth (Kbyte/s) for data services	Configure according to the network planning of the operator; the default value is 16.	16
	Assured Bandwidth (Kbyte/s) for data services	Configure according to the network planning of the operator; the default value is 0.	0
	Maximum Bandwidth (Kbyte/s) for data services	Configure according to the network planning of the operator; the default value is 64.	1280
ONU config	Slot No.	Configure according to the slot number of the PON interface card that is actually used.	15

Item		Description	Example
	PON No.	Configure according to the No. of the PON port that is actually used.	1
	ONU No.	Select the authentication No. of the ONU to be configured.	2
	GPON Bandwidth Profile	Select the name of the bandwidth profile that the ONU binds to.	d
Multicast service model profile	Profile Name	Configure according to the network planning of the operator.	e
	Service Type	Select <b>multicast</b> for the multicast services.	multicast
	CVLAN Mode	Configure according to the network planning of the operator. The options include <b>tag</b> and <b>transparent</b> . <b>Tag</b> means to remove the VLAN tag from the downlink multicast stream that passes the ONU port; <b>transparent</b> means to transparently transmit the downlink multicast stream.	tag
ONU data service config	Slot No.	Configure according to the slot number of the PON interface card that is actually used.	15
	PON No..	Configure according to the No. of the PON port that is actually used.	1
	ONU No.	Select the authentication No. of the ONU to be configured.	2
	Port No.	Select the port number of the ONU to be configured.	1, 2
	Service ID	Select the serial number of the port downlink service stream.	1
	CVLAN ID	Select the VLAN ID carried by the downlink multicast stream.	100
	Service Model Profile	Select the multicast service model profile that the ONU port binds to.	e
ONU port parameters	ONU Port No.	Configure according to the port number of the ONU that is actually used.	1, 2
	Control Switch	Select <b>Controlled</b> in this example.	Controlled
	Profile Name	Select <b>Detach</b> in this example.	Detach
	Signal vlan	Multicast uplink protocol message VLAN. Configure according to the network planning of the operator.	100

### 6.1.6.2 Configuration Flow Chart

Figure 6-28 shows the configuration flow chart for starting up the multicast services in proxy mode for the AN5506-10-B1 by configuring the ports in a batch manner.

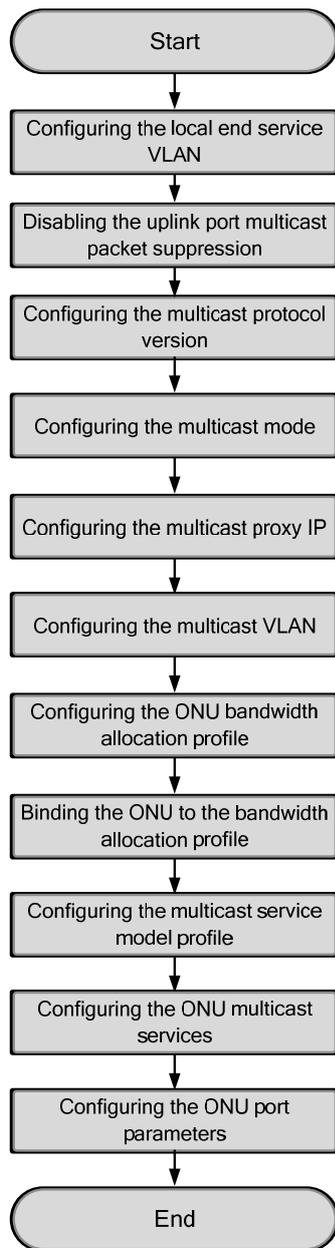


Figure 6-28 Configuration flow chart of starting up the multicast services in proxy mode by configuring the ports in a batch manner (on the AN5506-10-B1)

See Section 6.1.3.3 to Section 6.1.3.8 for the steps 1-6 of the configuration flow chart. Only step 7 to step 11 are introduced in the following part.

### 6.1.6.3 Configuring the ONU Bandwidth Allocation Profile

#### Configuration purpose

Configure the bandwidth profile of the ONU downlink multicast stream and the uplink / downlink multicast protocol. The service type of the downlink multicast stream is **IPTV** and that of the uplink / downlink multicast protocol is **Integrated Service**.

#### Operation steps

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 **Edit** → **Append** from the menu bar or click  in the toolbar, and input **1** in the **Please Input the Rows for Add:** dialog box that appears subsequently. After that, click **OK** to add one bandwidth allocation profile and input **d** for the **Profile Name** item.
3. Click a blank area in the right pane, then select **Edit** → **Append** from the menu bar or click  in the toolbar, and input **2** in the **Please Input the Rows for Add:** dialog box that appears subsequently. After that, click **OK** to add two services.
4. Configure the parameters according to the planning data in the Table 6-8.
5. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the configuration of multicast bandwidth allocation profile is completed. See Figure 6-29.

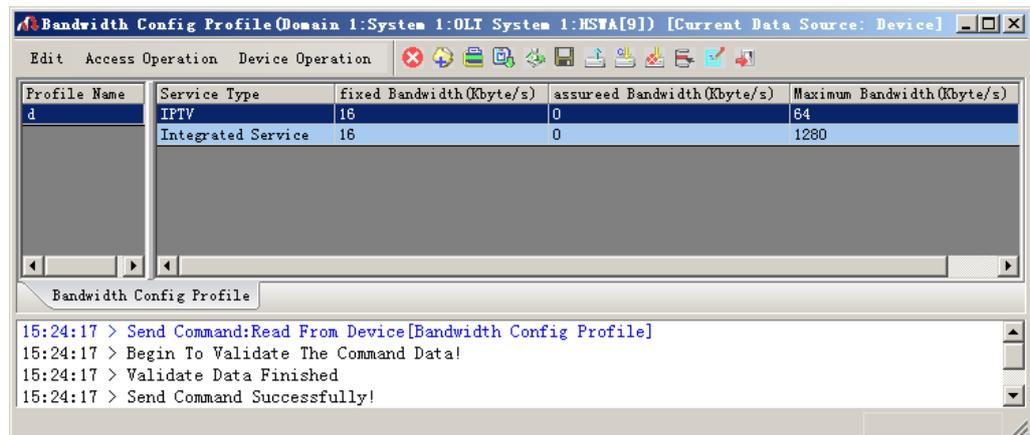


Figure 6-29 Configuring the ONU bandwidth allocation profile

### 6.1.6.4 Binding the ONU to the Bandwidth Allocation Profile

#### Configuration purpose

Bind the ONU to the bandwidth allocation profile, namely applying the bandwidth allocation profile to the ONU.

#### Operation steps

1. Right-click the system in the **Object Tree** pane and select **Config** → **Batch Configure** → **ONU Config** from the shortcut menu to access the **ONU Config** window.
2. Click the **Set Object as Condition** button, and select the AN5506-10-B1[2] connected to the No.1 pon port of the GC8B card in Slot 15, and then click the **OK** button.
3. The specific information of the configuration object is displayed in the right pane. According to the planning data in Table 6-8, select **d** in the pulldown list of the **GPON Bandwidth Profile** item.

- When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the operation of binding the ONU to the multicast bandwidth allocation profile is completed. See Figure 6-30.

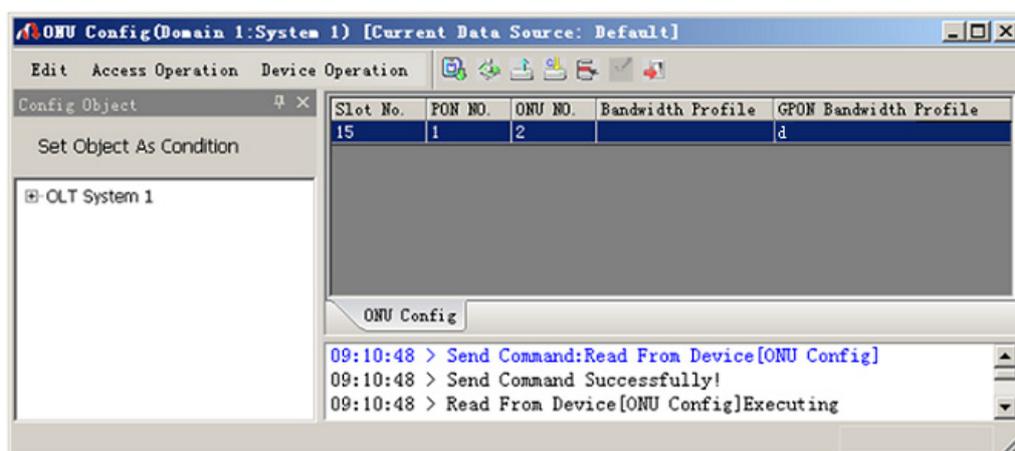


Figure 6-30 Binding the ONU to the bandwidth allocation profile

### 6.1.6.5 Configuring the Multicast Service Model Profile

#### Configuration purpose

Configure the VLAN profile of the multicast service stream.

#### Operation steps

- Right-click the system in the **Object Tree** pane and select **Config** → **Profile Definition** → **Service Model Profile** from the shortcut menu to access the **Service Model Profile** window.
- Click **Edit** → **Append** from the menu bar or click  in the toolbar, and input **1** in the **Please Input the Rows for Add:** dialog box that appears subsequently. After that, click **OK** to add one service model profile.
- Configure the parameters according to the planning data in the Table 6-8.

- When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the configuration of multicast service model profile is completed. See Figure 6-31.

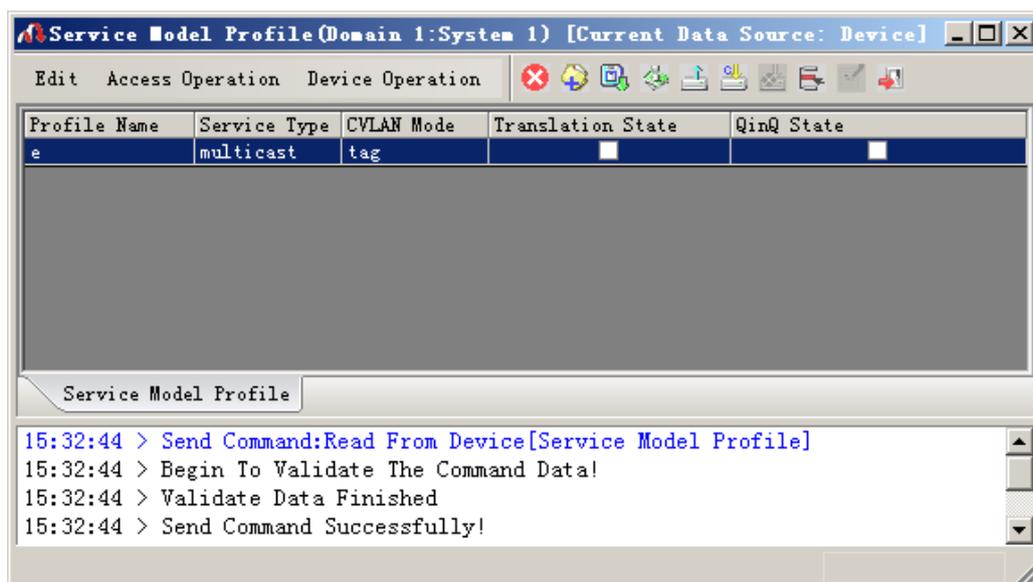


Figure 6-31 Configuring the service model profile

### 6.1.6.6 Configuring the ONU Multicast Services

#### Configuration purpose

Bind the multicast service model profile to the ONU ports and configure the VLAN ID of the downlink multicast data stream.

#### Operation steps

- Right-click the system in the **Object Tree** pane, and select **Config** → **Batch Configure** → **ONU Data Service Configure** from the shortcut menu to access the **ONU Data Service Configure** window.
- Click the  button in the toolbar, and select **GC8B[15]** → **PON1** → **PON1-AN5506-10-B1[2]** → **FE1** and **FE2** in the **Add Item number** dialog box that appears subsequently, then click the **OK** button as shown in Figure 6-32.

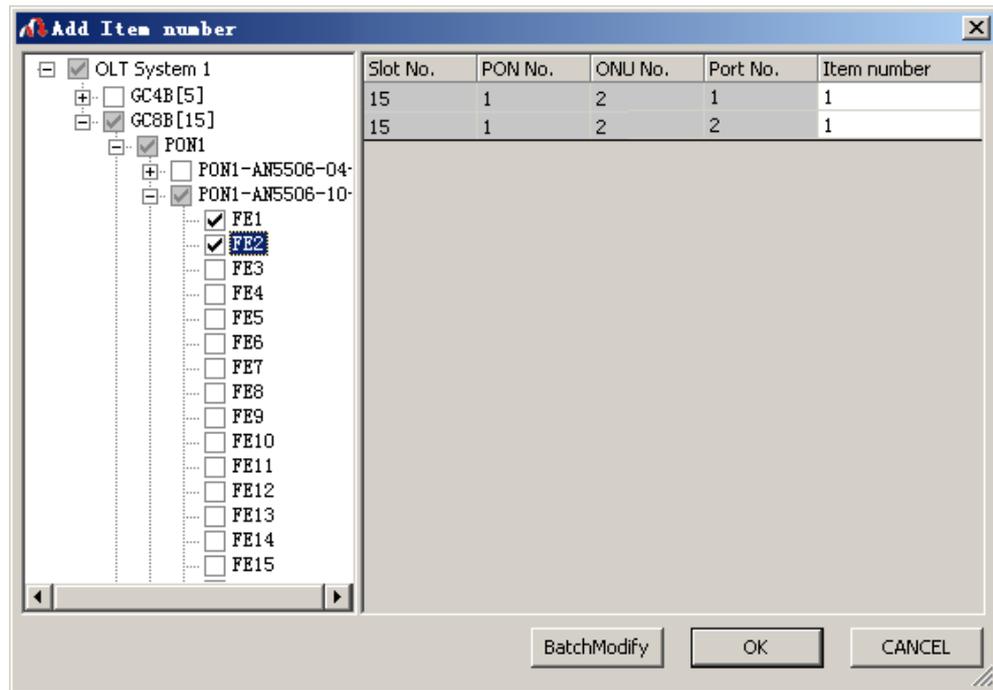


Figure 6-32 Adding two items

- The specific information of the configuration object is displayed in the right pane, and configure the parameters according to the planning data in the Table 6-8.
- When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the configuration of ONU multicast services is completed. See Figure 6-33.

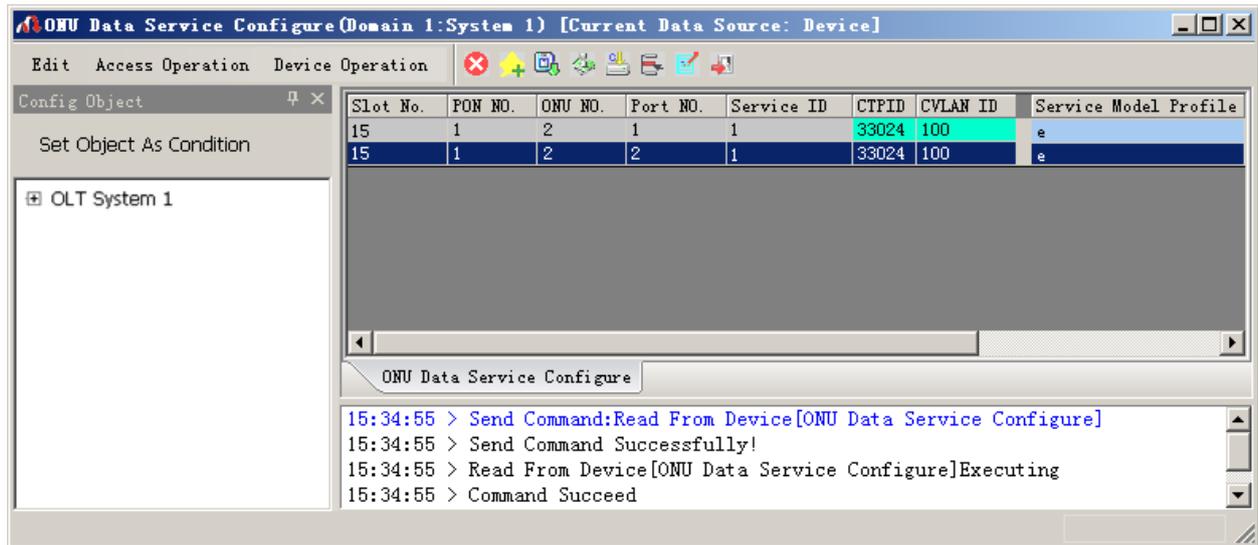


Figure 6-33 Configuring the ONU multicast services

### 6.1.6.7 Configuring the ONU Port Parameters

#### Configuration purpose

Configure the VLAN of the multicast uplink protocol message.

#### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, and select **Config** → **IGMP Config** → **IGMP Profile and Port** from the shortcut menu. And then click the **Port Parameters** tab from the window that appears subsequently.
2. Configure the parameters according to the planning data in the Table 6-8.
3. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the configuration of the ONU port parameters is completed. See Figure 6-34.



Note:

Under the uncontrollable mode, only the parameters of the itmes **signal vlan** and **LEAVE MODE** are valid.

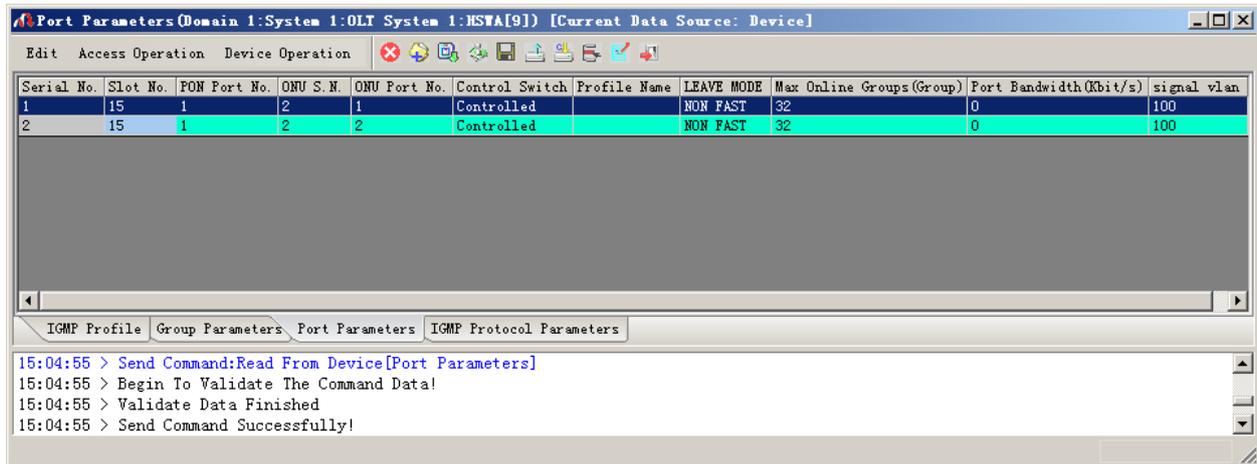


Figure 6-34 Configuring the port parameters

## 6.1.6.8 End of Configuration

The multicast services on the FE1 and FE2 ports that belong to the AN5506-10-B1 (whose the authorization No. is 2) connected to the No.1 PON port of the GC8B card (in Slot 15) is started up; and the users can watch the video programs whose multicast VLAN is 100 normally.

## 6.1.7 Viewing Operations

### 6.1.7.1 Viewing the Multicast Address Table of the Core Switch Card

#### Configuration purpose

View the multicast address and the group member information of the core switch card.

#### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, and select **Get Information** → **IGMP Config** → **Igmp Information** from the shortcut menu. And then click the **GSW IGMP Addr Table** tab from the window that appears subsequently.
2. The command pane in the lower part of the window first displays **Send Command Successfully!** for delivering the command to the device, and then **Command Succeed** for reading the multicast address table of the core switch card, as shown in Figure 6-35.

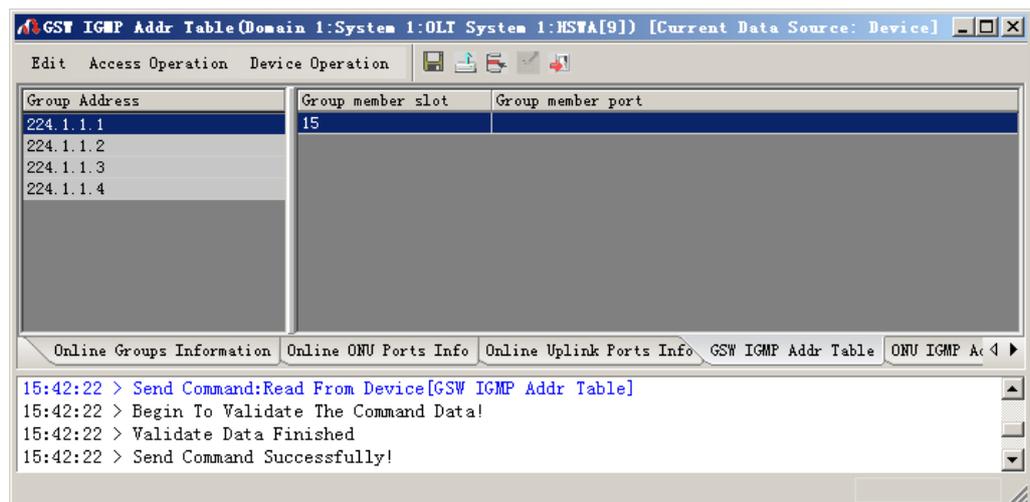


Figure 6-35 Viewing the multicast address table of the core switch card

### 6.1.7.2 Viewing the ONU Multicast Address Table

Configuration purpose

View the multicast address and port information of the ONU.

Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, and select **Get Information** → **IGMP Config** → **Igmp Information** from the shortcut menu. And then click the **ONU IGMP Addr Table** tab from the window that appears subsequently.
2. The command pane in the lower part of the window first displays **Send Command Successfully!** for delivering the command to the device, and then **Command Succeed** for reading the ONU multicast address table, as shown in Figure 6-36.

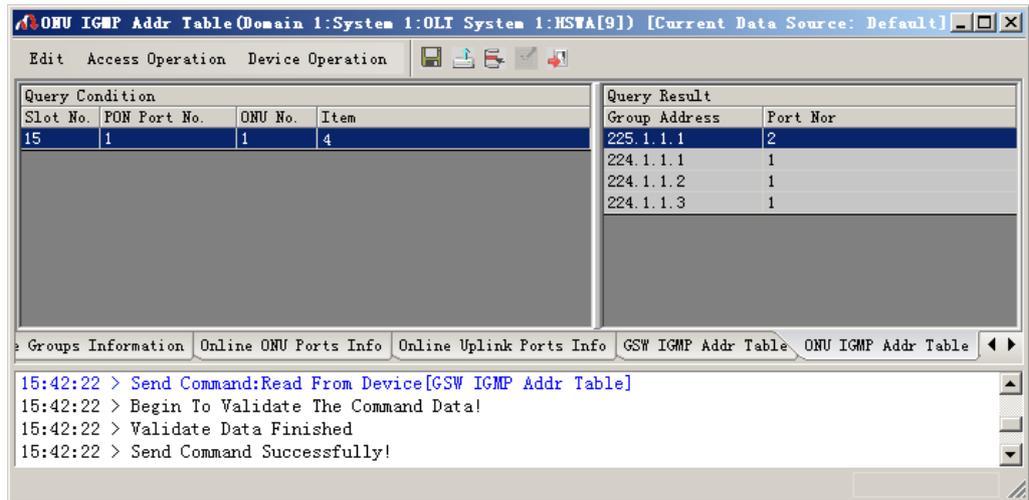


Figure 6-36 Viewing the ONU multicast address table

### 6.1.7.3 Viewing the Multicast Address Table of the Line Card

Configuration purpose

View the multicast address and the PON port information of the line card.

Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, and select **Get Information** → **IGMP Config** → **Igmp Information** from the shortcut menu. And then click the **Line Card IGMP Addr Table** tab from the window that appears subsequently.
2. The command pane in the lower part of the window first displays **Send Command Successfully!** for delivering the command to the device, and then **Command Succeed** for reading the multicast address table of the line card, as shown in Figure 6-37.

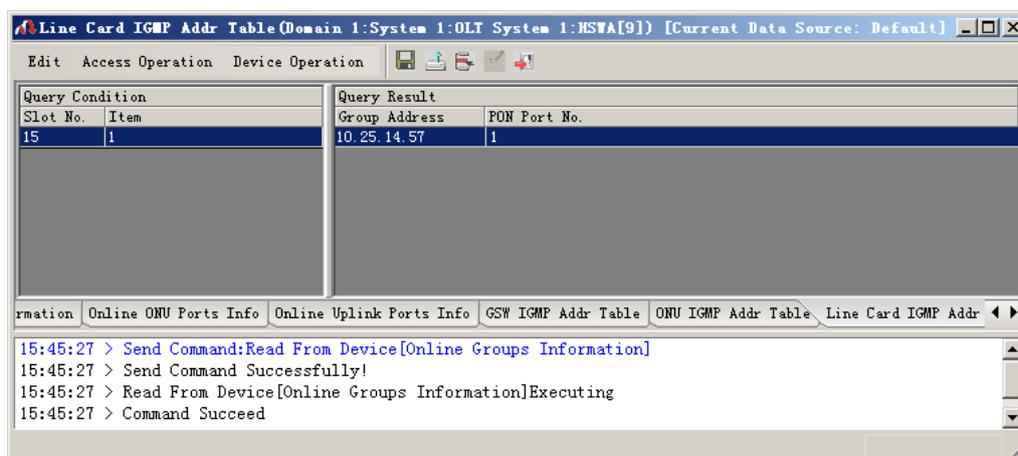


Figure 6-37 Viewing the multicast address table of the line card

## 6.2 Example for Multicast Service Configuration – Controllable Mode

### 6.2.1 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, so each subscriber can view up to 32 multicast programs simultaneously.
- ◆ See the configuration of the AN5506-04-B for the multicast service start-up method of the ONU type 1; and see the configuration of the AN5506-10-B1 for the multicast service start-up method of the ONU type 2.
- ◆ 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 type 2; If the data service is started up on the ONU port, 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 which provides channel for the multicast uplink / downlink protocol messages; for ONU type 2, users need not add the unicast 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.

- ◆ Each of the uplink ports on the AN5116-06B cannot join multiple VLANs in the untag mode.

## 6.2.2 Service Network

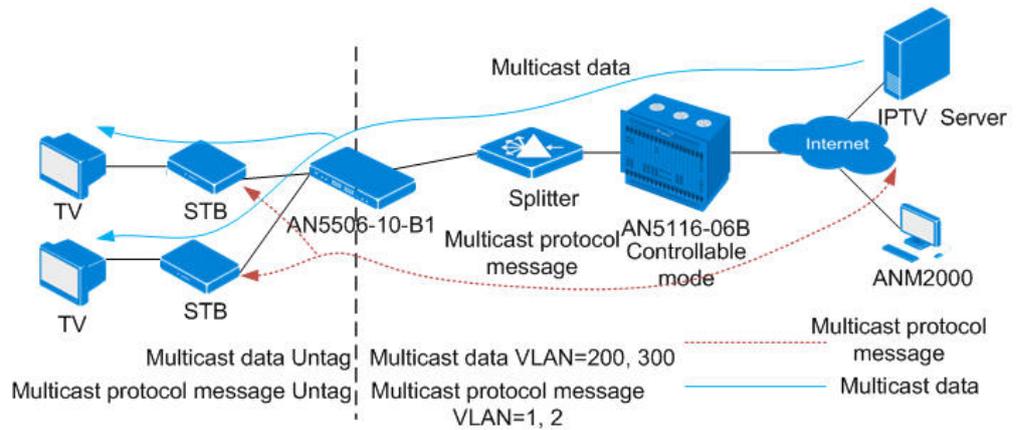


Figure 6-38 Network diagram of multicast services (controllable mode)

## 6.2.3 Configuring Multicast Services Respectively

### 6.2.3.1 Planning Data

This section introduces how to start up the multicast services in controllable mode for the AN5506-10-B1 by configuring the ports respectively. Tables 6-9 and 6-10 show the planning data.

Table 6-9 The OLT side planning data of the multicast services under the controllable mode (configuring respectively)

Item		Description	Example
ONU information	ONU type	Configure according to the type of the ONU that is actually used.	AN5506-10-B1
	Slot No.	Configure according to the slot number of the PON interface card that is actually used.	15
	PON port No.	Configure according to the No. of the PON port that is actually used.	1
	ONU No.	Configure according to the network planning of the operator.	2
Local VLAN	Service Name	Configure according to the network planning of the operator.	iptv2
	Starting VLAN ID	The starting VLAN ID of the uplink port services. Configure according to the network planning of the operator.	200
	VLAN ID End	The ending VLAN ID of the uplink port services. Configure according to the network planning of the operator.	300
	Interface No.	Configure according to the No. of the uplink port that is actually used.	20:SFP1
	TAG / UNTAG	Configure the tag processing mode for the uplink service VLAN. There are two options: <b>TAG</b> and <b>UNTAG</b> . Under <b>UNTAG</b> mode, the TAGs of the uplink packets will be stripped automatically and the packets will be uplinked in the form of <b>UNTAG</b> when they pass the port, whereas the downlink UNTAG packets will be added with designated TAGs and downlinked in the form of <b>TAG</b> . Under <b>TAG</b> mode, the uplink data packets will not be processed but remain uplinked in the original form. For downlink packets, however, only packets with designated TAGs are received and the packets will not be processed but remain downlinked in the original form.	TAG

Item		Description	Example		
	Service Type	Select <b>IPTV</b> for configuring the multicast services.	IPTV		
	Slot Bind Mode	Select <b>Auto Bind</b> or <b>Manually Bind</b> .	Auto Bind		
Uplink port packet suppression	Port No.	Select <b>20:2</b> , which is corresponding to <b>20:SFP1</b> .	20:2		
	Type of Packet	Select the multicast packet in this example.	MultiCast Package		
	Enable / Disable	Select to disable the suppression in this example.	Disable		
Multicast task selection	IGMP Version	According to the network planning of the operator, select <b>IGMP V1 / V2</b> in this example.	IGMP V1 / V2		
Multicast mode	IGMP Mode	According to the network planning of the operator, select the controllable mode in this example.	Controlled Mode		
Multicast proxy IP	IGMP Proxy's IP	Configure according to the network planning of the operator; the default value is 10.25.14.57.	10.25.10.1		
Multicast VLAN	VLAN	Configure according to the network planning of the operator. The multicast VLAN should be in the range of the local VLAN.	200		
Multicast profile	Profile Name	Configure according to the network planning of the operator.	igmp1		
	Auth group	The IP address of the multicast program. Configure 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 <b>Normal</b> and <b>Preview</b> . Configure according to the network planning of the operator.	Normal	Normal	Preview
Group parameters	Preview Counts (Times)	The maximum number of times a subscriber can preview a given program. Configure according to the network planning of the operator.	—	—	4

Item		Description	Example		
	Preview Time (Min)	The maximum viewing time for each preview. Configure according to the network planning of the operator.	—	—	10
	Preview Interval (min)	The interval limit of the users to preview the multicast programs. Configure according to the network planning of the operator.	—	—	30
	Preview Reset (h)	The reset period of subscriber preview authority. Configure according to the network planning of the operator.	—	—	24
	Preview Total Time (min)	The total duration limit of the users to preview the multicast programs. Configure according to the network planning of the operator.	—	—	254
	Group VLAN	VLAN ID of the multicast group. Configure 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	2	
	Control Switch	Configure according to the network planning of the operator. The options include <b>Controlled</b> and <b>Uncontrolled</b> .	Controlled		
	Profile Name	Name of the profile that 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	2	

Table 6-10 The AN5506-10-B1 side planning data of the multicast services under the controllable mode (configuring respectively)

Item		Description	Example
ONU multicast bandwidth configuration	Service Type for multicast services	Select <b>IPTV</b> for configuring the multicast services.	IPTV
	Fixed Bandwidth (Kbyte/s) for multicast services	Configure according to the network planning of the operator; the default value is 16.	16
	Assured Bandwidth (Kbyte/s) for multicast services	Configure according to the network planning of the operator; the default value is 0.	0
	Maximum Bandwidth (Kbyte/s) for multicast services	Configure according to the network planning of the operator; the default value is 64.	64
	Service Type for data services	Select <b>Integrate Service</b> for the data services.	Integrate Service
	Fixed Bandwidth (Kbyte/s) for data services	Configure according to the network planning of the operator; the default value is 16.	16
	Assured Bandwidth (Kbyte/s) for data services	Configure according to the network planning of the operator; the default value is 0.	0
	Maximum Bandwidth (Kbyte/s) for data services	Configure according to the network planning of the operator; the default value is 64.	1280
ONU multicast service configuration	Data Port List	Select the port no. of the ONU to be configured.	FE1 to FE2
	Service type	Select <b>multicast</b> for the multicast services.	multicast
	VLAN Mode	Configure according to the network planning of the operator. The options include <b>tag</b> and <b>transparent</b> . <b>Tag</b> means to remove the VLAN tag from the downlink multicast stream that passes the ONU port; <b>transparent</b> means to transparently transmit the downlink multicast stream.	tag
	CVLAN ID	The VLAN ID that the downlink multicast stream carries. Configure according to the network planning of the operator.	200, 300

## 6.2.3.2 Configuration Flow Chart

Figure 6-39 shows the configuration flow chart for starting up the the multicast services in controllable mode by configuring the ports respectively.

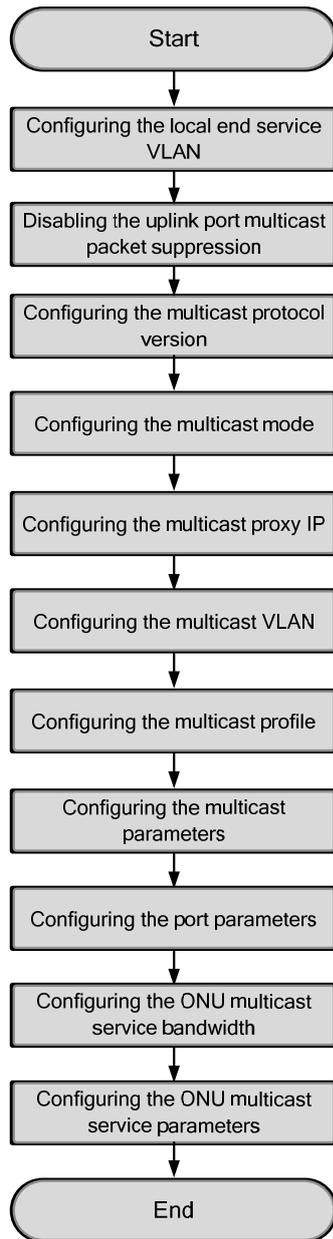


Figure 6-39 Configuration flow chart of starting up the the multicast services in controllable mode by configuring the ports respectively (on the AN5506-10-B1)

### 6.2.3.3 Configuring the Local End Service Data

#### Configuration purpose

Configure the uplink port service VLAN, and process the VLAN tags of the services that pass the uplink port.

#### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, and select **Config** → **Local VLAN** from the shortcut menu. Then select the **Local End Service VLAN** tab in the window that appears subsequently to access the associated window.
2. Select **Edit** → **Append** from the menu bar or click , and input **1** in the **Please Input the Rows for Add:** dialog box that appears subsequently. Then click **OK** to add a local VLAN.
3. Configure the parameters according to the planning data in the Table 6-9.
4. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the local end service VLAN is configured. See Figure 6-40.

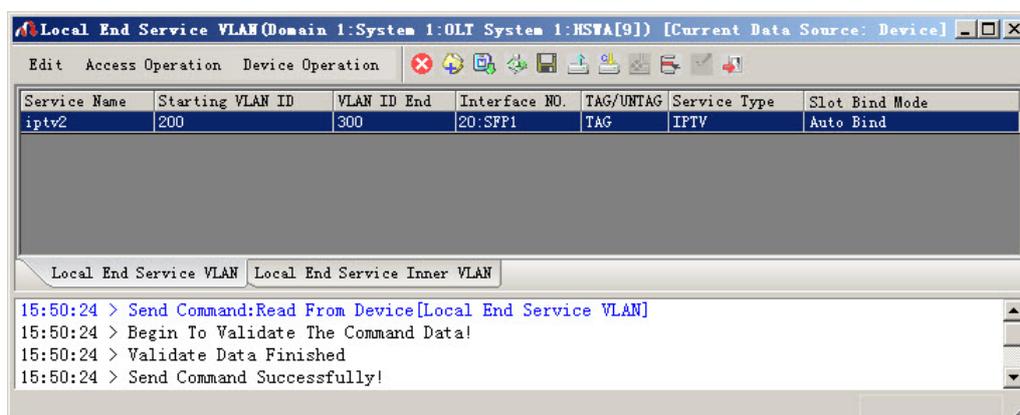


Figure 6-40 Configuring the local end service data

## 6.2.3.4 Disabling the Uplink Port Multicast Packet Suppression

### Configuration purpose

Disable the suppression on the uplink port multicast streams.

### Operation steps

1. Right-click the **H5WA[9]** card in the **Object Tree** pane, and select **Config** → **Uplink Port Packet Rate Control** from the shortcut menu to access the **Uplink Port Packet Suppression** window.
2. According to the planning data in the Table 6-9, select **20:2** in the **Port No.** Pane, and then clear the check box corresponding to the multicast packet.
3. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the configuration of disabling the uplink port multicast packet suppression is completed. See Figure 6-41.

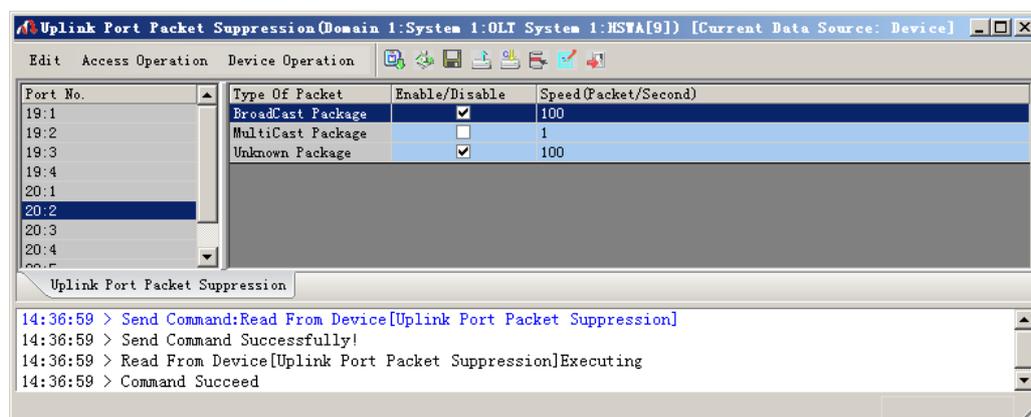


Figure 6-41 Disabling the suppression of the designated packet on the uplink port

### 6.2.3.5 Configuring the Multicast Protocol Version

#### Configuration purpose

Select the multicast protocol version of the AN5116-06B. The options include **IGMP V1 / V2** and **IGMP V3**.

#### Operation steps

1. Right-click the **HWSA[9]** card in the **Object Tree** pane, and select **Config** → **IGMP Config** → **IGMP Task** from the shortcut menu to access the **IGMP Task** window.
2. According to the planning data in the Table 6-9, select **IGMP V1 / V2** from the pulldown list of the **Igmp version** item.
3. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the configuration of the multicast protocol version is completed. See Figure 6-42.

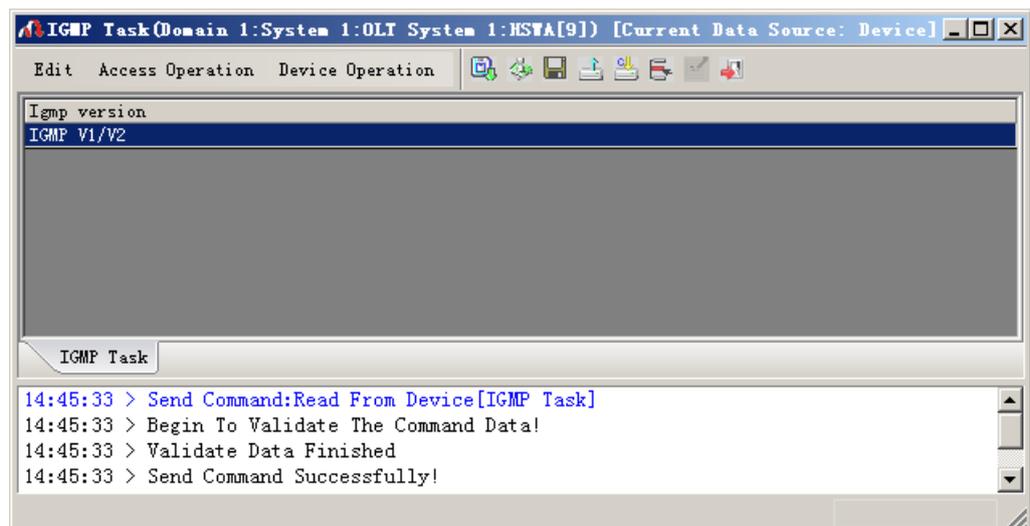


Figure 6-42 Configuring the multicast protocol version

### 6.2.3.6 Configuring the Multicast Mode

#### Configuration purpose

Configure the multicast operation mode of the AN5116-06B. The options include **Proxy Mode**, **Snooping Mode**, **Proxy-snooping Mode**, **Controlled Mode** and **Disable**.

#### Operation steps

1. Right-click the **HWSA[9]** card in the **Object Tree** pane, and select **Config** → **IGMP Config** → **IGMP Mode** from the shortcut menu to access the **IGMP Mode** window.
2. According to the planning data in Table 6-9, select **Controlled Mode** in the pulldown list of the **IGMP Mode** item.
3. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the multicast mode is set as **Controlled Mode**. See Figure 6-43.

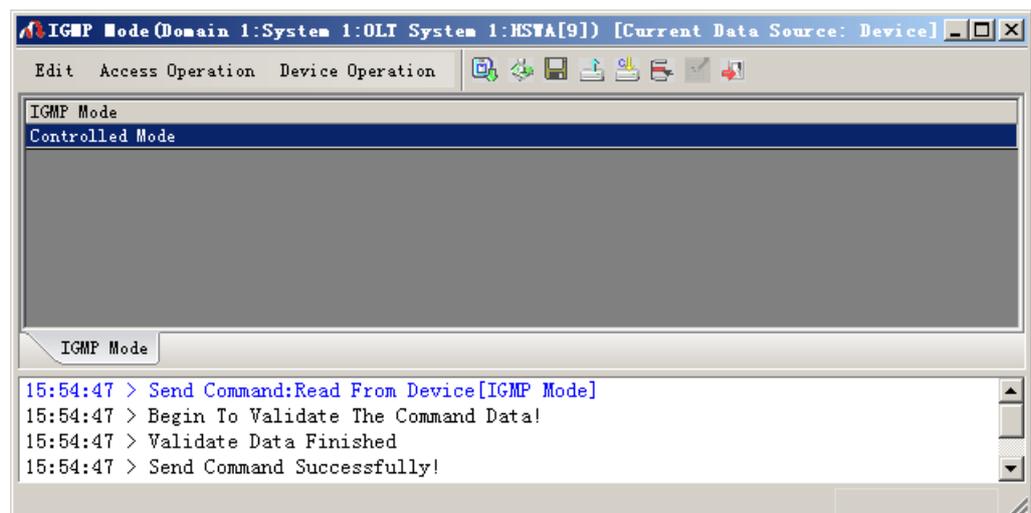


Figure 6-43 Configuring the multicast mode

### 6.2.3.7 Configuring the Multicast Proxy IP

#### Configuration purpose

Configure the multicast proxy IP for the AN5116-06B. The configured IP serves as the source IP address of the AN5116-06B to send multicast protocol messages to the multicast server.

#### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, and select **Config** → **IGMP Config** → **IGMP Proxy IP** from the shortcut menu to access the **IGMP Proxy IP** window.
2. According to the planning data in Table 6-9, double-click the **IGMP Proxy's IP** column and input **10.25.10.1**.
3. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the multicast proxy IP has been set to **10.25.10.1**. See Figure 6-44.

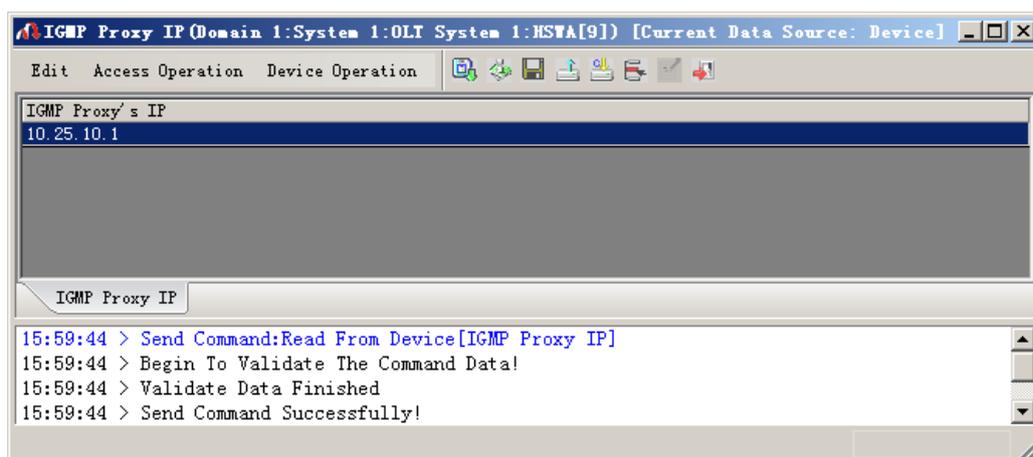


Figure 6-44 Configuring the multicast proxy IP

### 6.2.3.8 Configuring the Multicast VLAN

#### Configuration purpose

Configure the default VLAN of the AN5116-06B's multicast services. The multicast VLAN is used to identify the multicast streams. The users can configure one or more VLANs dedicated for the multicast service to isolate it from other services.

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).

#### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane and select **Config** → **IGMP Config** → **Multicast VLAN** from the shortcut menu to access the **Multicast VLAN** window.
2. According to the planning data in Table 6-9, double-click the **VLAN** column and input **200**.
3. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the multicast VLAN has been set to **200**. See Figure 6-45.

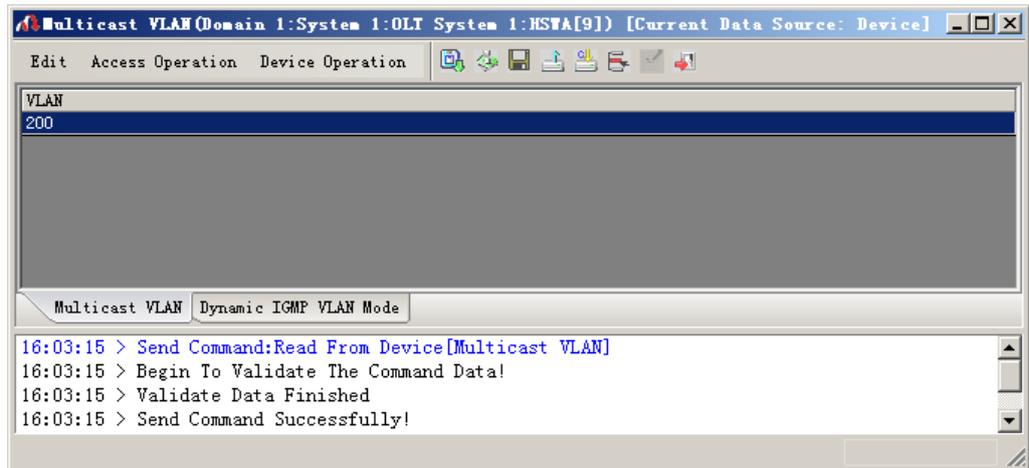


Figure 6-45 Configuring the multicast VLAN

### 6.2.3.9 Configuring the Multicast Profile

#### Configuration purpose

Create a multicast profile, add multicast programs to the profile, and set users with different authority ranges to view the programs, which include normal watching and preview.

#### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, and select **Config** → **IGMP Config** → **IGMP Profile and Port** from the shortcut menu. And then click the **IGMP Profile** tab from the window that appears subsequently.
2. Click **Edit** → **Append** from the menu bar or click  in the toolbar, and input **1** in the **Please Input the Rows for Add:** dialog box that appears subsequently. After that, click **OK** to add one multicast profile.
3. According to the planning data in Table 6-9, input **igmp1** for the **Profile Name** item.

4. Click a blank area in the right pane, then select **Edit** → **Append** from the menu bar or click  in the toolbar, and input **3** in the **Please Input the Rows for Add:** dialog box that appears subsequently. After that, click **OK** to add three multicast programs.
5. According to the planning data in Table 6-9, configure the items **Auth group** and **Authority**.
6. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the configuration of the multicast profile is completed. See Figure 6-46.

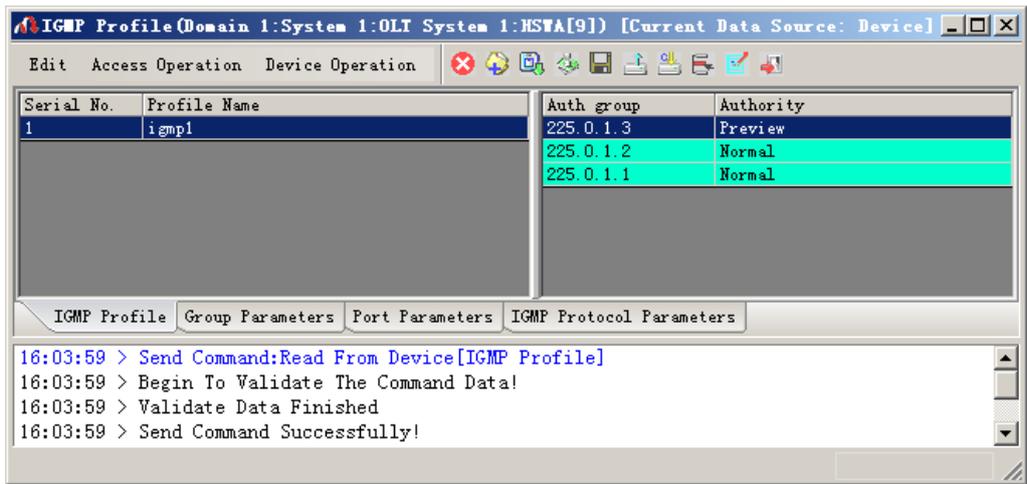


Figure 6-46 Configuring the multicast profile

### 6.2.3.10 Configuring the Multicast Parameters

#### Configuration purpose

Configure the parameters of the multicast programs added to the multicast profile, which include preview parameters, multicast group VLAN and multicast signal VLAN.

**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.

**Operation steps**

1. Click the **Group Parameters** tab from the **IGMP Profile** window to access the **Group Parameters** window.
2. Select **Edit** → **Append** from the menu bar or click  in the toolbar, and input **3** in the **Please Input the Rows for Add:** dialog box that appears subsequently. After that, 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 the parameters according to the planning data in the Table 6-9.
4. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the configuration of the multicast group parameters is completed. See Figure 6-47.

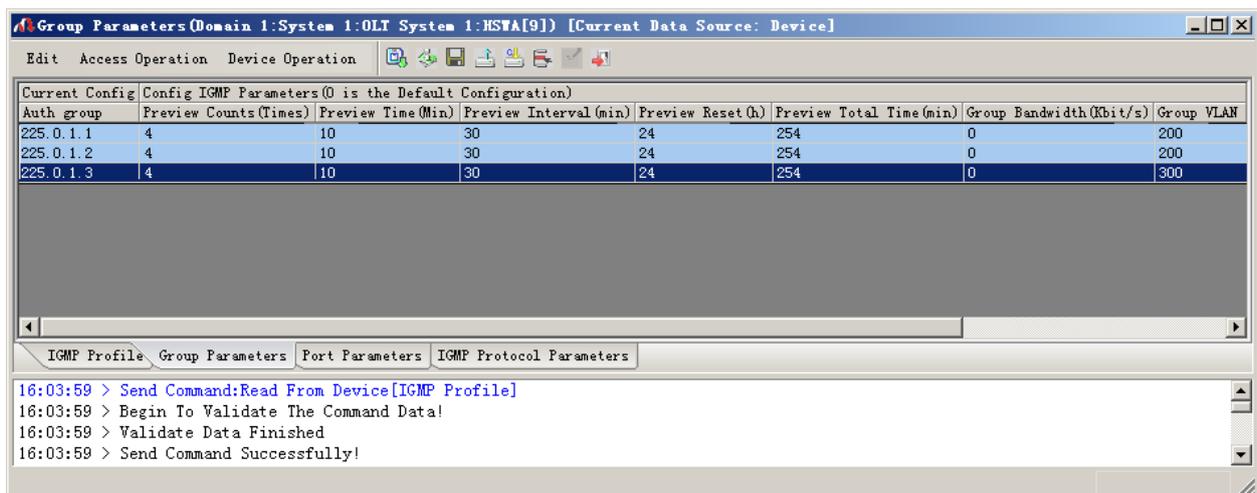


Figure 6-47 Configuring the multicast group parameters

## 6.2.3.11 Configuring the Port Parameters

### Configuration purpose

Configure the multicast parameters of the ONU ports, which include port's controllable switches, the profile that the port binds to and the multicast signal VLAN.

### Operation steps

1. Click the **Port Parameters** tab from the **IGMP Profile** window to access the **Port Parameters** window.
2. Select **Edit** → **Append** from the menu bar or click  in the toolbar, and input **2** in the **Please Input the Rows for Add:** dialog box that appears subsequently. After that, click **OK** to add two ONU ports.
3. Configure the parameters according to the planning data in the Table 6-9.
4. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the configuration of the port parameters is completed. See Figure 6-48.

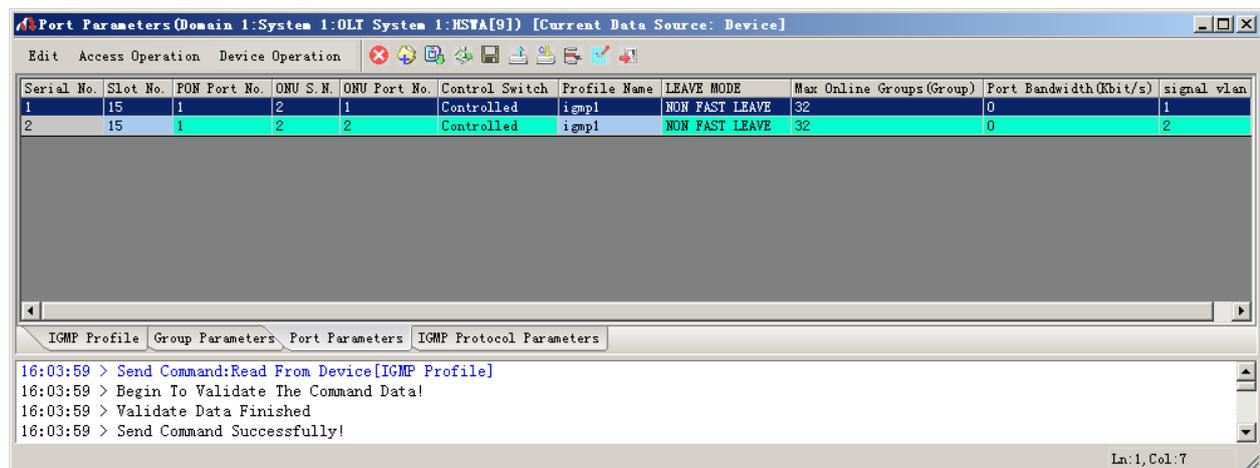


Figure 6-48 Configuring the port parameters

### 6.2.3.12 Configuring the ONU Multicast Service Bandwidth

#### Configuration purpose

Configure the bandwidth of the ONU downlink multicast stream and the uplink / downlink multicast protocol. The service type of the downlink multicast stream is **IPTV** and that of the uplink / downlink multicast protocol is **Integrate Service**.

#### Operation steps

1. Click the **GC8B[15]** card in the **Object Tree** pane to display all ONUs under this card in the right pane. Next 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 a blank area in the right pane, then select **Edit** → **Append** from the menu bar or click  in the toolbar, and input **2** in the **Please Input the Rows for Add:** dialog box that appears subsequently. After that, click **OK** to add two services.
3. Configure the parameters according to the planning data in the Table 6-10.
4. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the allocation of multicast bandwidth is completed. See Figure 6-49.

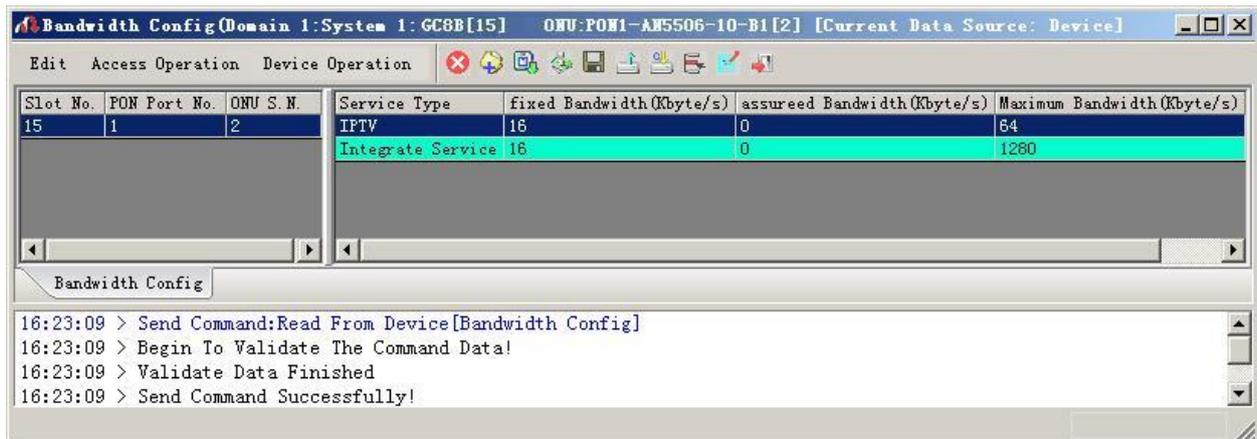


Figure 6-49 Allocating the multicast bandwidth

### 6.2.3.13 Configuring the ONU Multicast Service Parameters

#### Configuration purpose

Configure the VLAN of the multicast data stream and the VLAN of the downlink multicast protocol message.

#### Operation steps

1. Click the **GC8B[15]** card in the **Object Tree** pane to display all ONUs under this card in the right pane. Next right-click the **PON1-AN5506-10-B1[2]** ONU and select **Config** → **Service Config** from the shortcut menu, and then click the **Data Port Config** tab from the dialog box that appears subsequently, as shown in Figure 6-50.

Domain 1: System 1: GC8B[15] ONU List: AN5506-10-B1[2]

Data Port Config | Voice Config

Data Port List

- FE1
- FE2
- FE3
- FE4
- FE5
- FE6
- FE7
- FE8
- FE9
- FE10
- FE11
- FE12
- FE13
- FE14
- FE15
- FE16
- FE17
- FE18
- FE19
- FE20
- FE21
- FE22
- FE23
- FE24

Port No. 1

Enable/Disable Port

Port Auto Negotiation

Port Speed 100M Duplex Full-Duplex

Flow Control Enable/Disable

IGMP UP CVLAN

CVLAN ID CVLAN COS CVLAN TPID 33024

IGMP UP SVLAN

SVLAN ID SVLAN COS SVLAN TPID 33024

Service

TLS	Service Classification	Service type	CVLAN mode	TPID	CVLAN ID	C

Boardwidth Set

Service Upstream Minimum Guaranteed 640

Service Upstream Maximum Allowed 100000

Service Downstream Bandwidth(kbit/s) 100000

Read DB Write DB Read Device Modify On Device Delete On Device Close

Figure 6-50 Service configuration of the AN5506-10-B1 (1)

2. Select **FE1** in the **Data Port List** pane, and click the **Add** button to bring up the **Services Configuration** dialog box. According to the planning data in Table 6-4, add a multicast service whose **VLAN Mode** is **tag** and **CVLAN ID** is **200**, as shown in Figure 6-51.

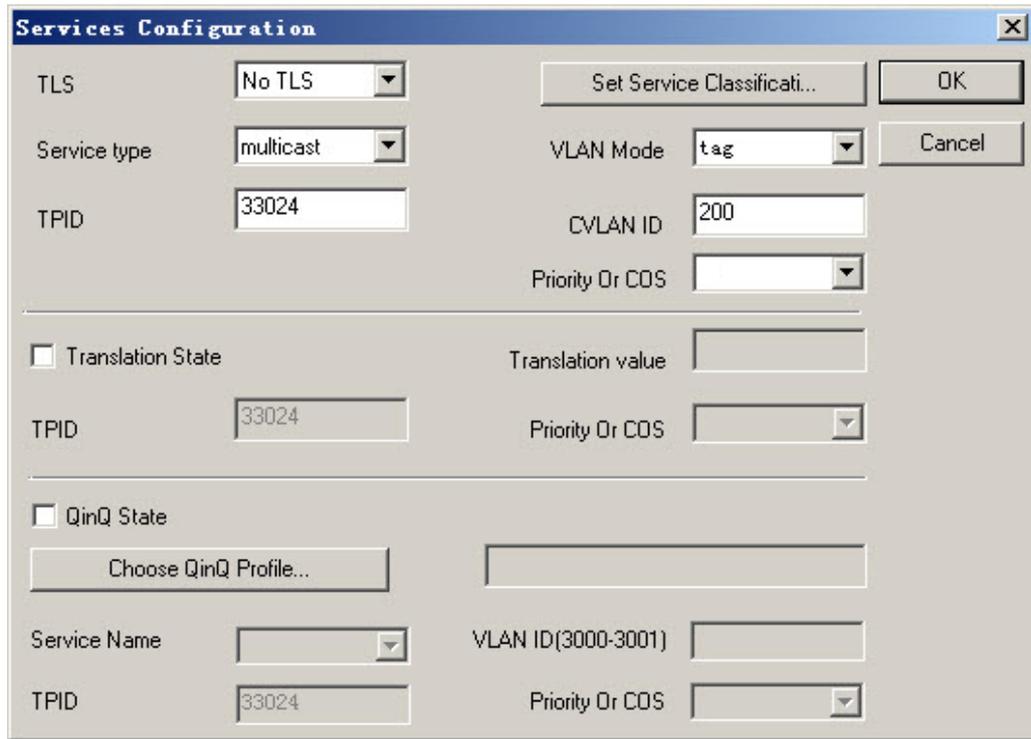


Figure 6-51 Service configuration of the AN5506-10-B1 (2)

3. After the configuration is completed, click the **OK** button and return to the dialog box as shown in Figure 6-52.

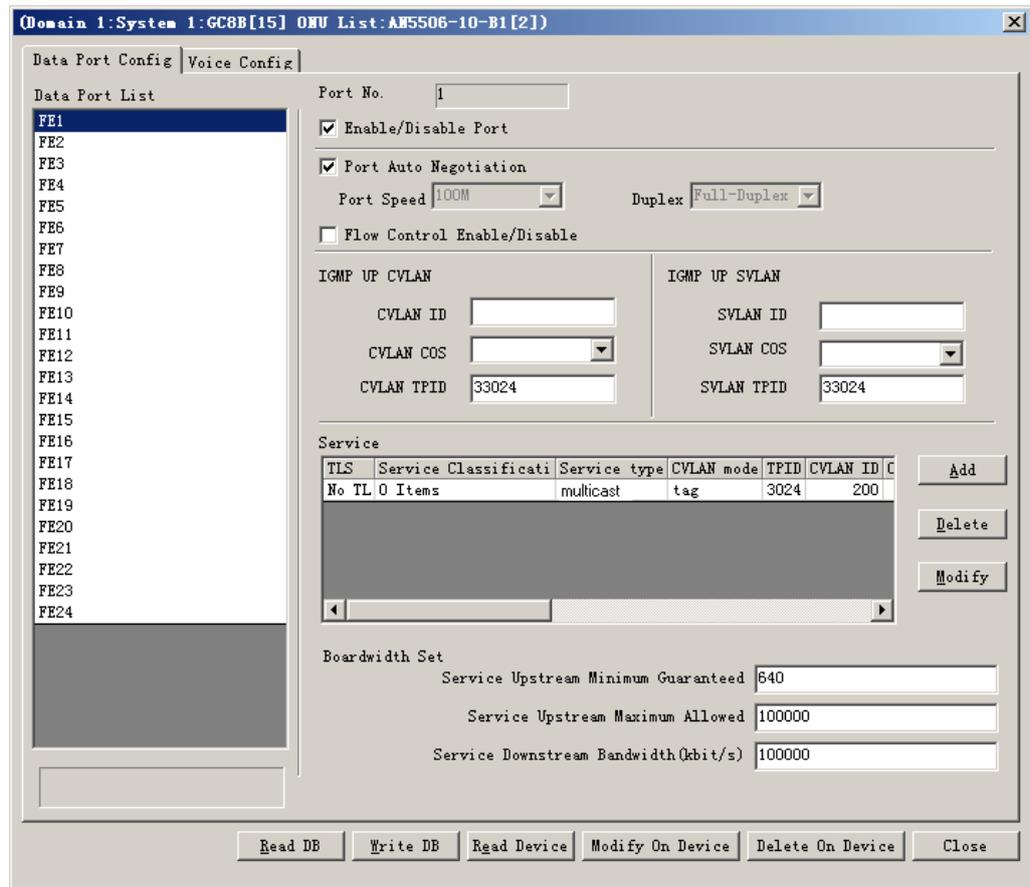


Figure 6-52 Service configuration of the AN5506-10-B1 (3)

4. Add one more multicast service with the **VLAN Mode** set as **tag** and the **CVLAN ID** set as **300**.
5. Select **FE2** in the **Data Port List** pane, and then implement the same configuration as the FE1 port on it.
6. After returning to the dialog box as shown in Figure 6-52, click the **Modify On Device** button and the **Command Manager** window appears subsequently. When **Command Succeed** is displayed for the data port services in the window, the data service configuration of the AN5506-10-B1 ports is completed.

### 6.2.3.14 End of Configuration

The multicast services on the FE1 and FE2 ports that belong to the AN5506-10-B1 (whose the authorization No. is 2) connected to the No.1 PON port of the GC8B card (in Slot 15) 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.

## 6.2.4 Configuring Multicast Services in a Batch Manner

### 6.2.4.1 Planning Data

This section introduces how to start up the multicast services in controllable mode for the AN5506-10-B1 by configuring the ports in a batch manner. Tables 6-11 and 6-12 show the planning data.

Table 6-11 The OLT side planning data of the multicast services under the controllable mode (configuring in a batch manner)

Item		Description	Example
ONU information	ONU type	Configure according to the type of the ONU that is actually used.	AN5506-10-B1
	Slot No.	Configure according to the slot number of the PON interface card that is actually used.	15
	PON port No.	Configure according to the No. of the PON port that is actually used.	1
	ONU No.	Configure according to the network planning of the operator.	2
Local VLAN	Service Name	Configure according to the network planning of the operator.	iptv2
	Starting VLAN ID	The starting VLAN ID of the uplink port services. Configure according to the network planning of the operator.	200
	VLAN ID End	The ending VLAN ID of the uplink port services. Configure according to the network planning of the operator.	300
	Interface No.	Configure according to the No. of the uplink port that is actually used.	20:SFP1

Item	Description	Example
TAG / UNTAG	Configure the tag processing mode for the uplink service VLAN. There are two options: <b>TAG</b> and <b>UNTAG</b> . Under <b>UNTAG</b> mode, the TAGs of the uplink packets will be stripped automatically and the packets will be uplinked in the form of <b>UNTAG</b> when they pass the port, whereas the downlink UNTAG packets will be added with designated TAGs and downlinked in the form of <b>TAG</b> . Under <b>TAG</b> mode, the uplink data packets will not be processed but remain uplinked in the original form. For downlink packets, however, only packets with designated TAGs are received and the packets will not be processed but remain downlinked in the original form.	TAG
Service Type	Select <b>IPTV</b> for configuring the multicast services.	IPTV
Slot Bind Mode	Select <b>Auto Bind</b> or <b>Manually Bind</b> .	Auto Bind
Uplink port packet suppression	Port No.	Select <b>20:2</b> , which is corresponding to <b>20:SFP1</b> .
	Type of Packet	Select the multicast packet in this example.
	Enable / Disable	Select to disable the suppression in this example.
Multicast task selection	According to the network planning of the operator, select <b>IGMP V1 / V2</b> in this example.	IGMP V1 / V2
Multicast mode	According to the network planning of the operator, select the controllable mode in this example.	Controlled Mode
Multicast proxy IP	Configure according to the network planning of the operator; the default value is 10.25.14.57.	10.25.10.1
Multicast VLAN	Configure according to the network planning of the operator. The multicast VLAN should be in the range of the local VLAN	200
Multicast profile	Configure according to the network planning of the operator.	igmp1

Item		Description	Example		
	Auth group	The IP address of the multicast program. Configure 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 <b>Normal</b> and <b>Preview</b> . Configure according to the network planning of the operator.	Normal	Normal	Preview
Group parameters	Preview Counts (Times)	The maximum number of times a subscriber can preview a given program. Configure according to the network planning of the operator.	—	—	4
	Preview Time (Min)	The maximum viewing time for each preview. Configure according to the network planning of the operator.	—	—	10
	Preview Interval (min)	The interval limit of the users to preview the multicast programs. Configure according to the network planning of the operator.	—	—	30
	Preview Reset (h)	The reset period of subscriber preview authority. Configure according to the network planning of the operator.	—	—	24
	Preview Total Time (min)	The total duration limit of the users to preview the multicast programs. Configure according to the network planning of the operator.	—	—	254
	Group VLAN	VLAN ID of the multicast group. Configure 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	2	
	Control Switch	Configure according to the network planning of the operator. The options include <b>Controlled</b> and <b>Uncontrolled</b> .	Controlled		
	Profile Name	Name of the profile that 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	2	

Table 6-12 The AN5506-10-B1 side planning data of the multicast services under the controllable mode (configuring in a batch manner)

Item	Description	Example	
ONU bandwidth allocation profile	Profile Name	Configure according to the network planning of the operator.	a
	Service Type for multicast services	Select <b>IPTV</b> for configuring the multicast services.	IPTV
	Fixed Bandwidth (Kbyte/s) for multicast services	Configure according to the network planning of the operator; the default value is 16.	16
	Assured Bandwidth (Kbyte/s) for multicast services	Configure according to the network planning of the operator; the default value is 0.	0
	Maximum Bandwidth (Kbyte/s) for multicast services	Configure according to the network planning of the operator; the default value is 64.	64
	Service Type for data services	Select <b>Integrated Service</b> for the data services.	Integrated Service
	Fixed Bandwidth (Kbyte/s) for data services	Configure according to the network planning of the operator; the default value is 16.	16
	Assured Bandwidth (Kbyte/s) for data services	Configure according to the network planning of the operator; the default value is 0.	0
ONU config	Slot No.	Configure according to the slot number of the PON interface card that is actually used.	15
	PON No.	Configure according to the No. of the PON port that is actually used.	1

Item		Description	Example
	ONU No.	Select the authentication No. of the ONU to be configured.	2
	GPON Bandwidth Profile	Select the name of the bandwidth profile that the ONU binds to.	a
Multicast service model profile	Profile Name	Configure according to the network planning of the operator.	b
	Service Type	Select <b>multicast</b> for the multicast services.	multicast
	CVLAN Mode	Configure according to the network planning of the operator. The options include <b>tag</b> and <b>transparent</b> . <b>Tag</b> means to remove the VLAN tag from the downlink multicast stream that passes the ONU port; <b>transparent</b> means to transparently transmit the downlink multicast stream.	tag
ONU data service config	Slot No.	Configure according to the slot number of the PON interface card that is actually used.	15
	PON No.	Configure according to the No. of the PON port that is actually used.	1
	ONU No.	Select the authentication No. of the ONU to be configured.	2
	Port No.	Select the port number of the ONU to be configured.	1, 2
	Service ID	Select the serial number of the port downlink service stream.	1, 2
	CVLAN ID	Select the VLAN ID carried by the downlink multicast stream.	200, 300
	Service Model Profile	Select the multicast service model profile that the ONU port binds to.	b

### 6.2.4.2 Configuration Flow Chart

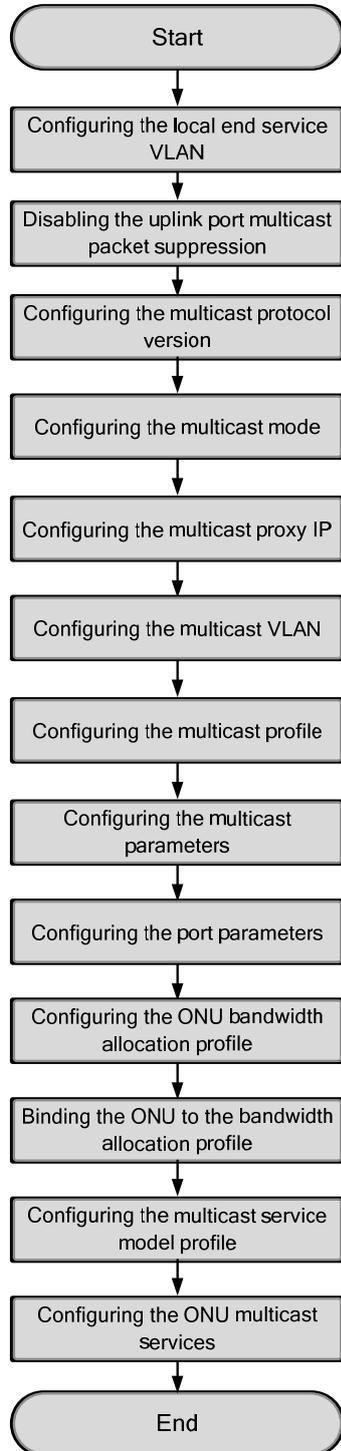


Figure 6-53 Configuration flow chart of starting up the the multicast services in controllable mode by configuring the ports in a batch manner (on the AN5506-10-B1)

See Section 6.2.3.3 to Section 6.2.3.11 for the steps 1 to 9 of the configuration flow chart. Only step 10 to step 13 are introduced in the following part.

### 6.2.4.3 Configuring the ONU Bandwidth Allocation Profile

#### Configuration purpose

Configure the bandwidth profile of the ONU downlink multicast stream and the uplink / downlink multicast protocol. The service type of the downlink multicast stream is **IPTV** and that of the uplink / downlink multicast protocol is **Integrated Service**.

#### Operation steps

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 **Edit** → **Append** from the menu bar or click  in the toolbar, and input **1** in the **Please Input the Rows for Add:** dialog box that appears subsequently. After that, click **OK** to add one bandwidth allocation profile and input **a** for the **Profile Name** item.
3. Click a blank area in the right pane, then select **Edit** → **Append** from the menu bar or click  in the toolbar, and input **2** in the **Please Input the Rows for Add:** dialog box that appears subsequently. After that, click **OK** to add two services.
4. Configure the parameters according to the planning data in the Table 6-12.
5. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the configuration of multicast bandwidth allocation profile is completed. See Figure 6-54.

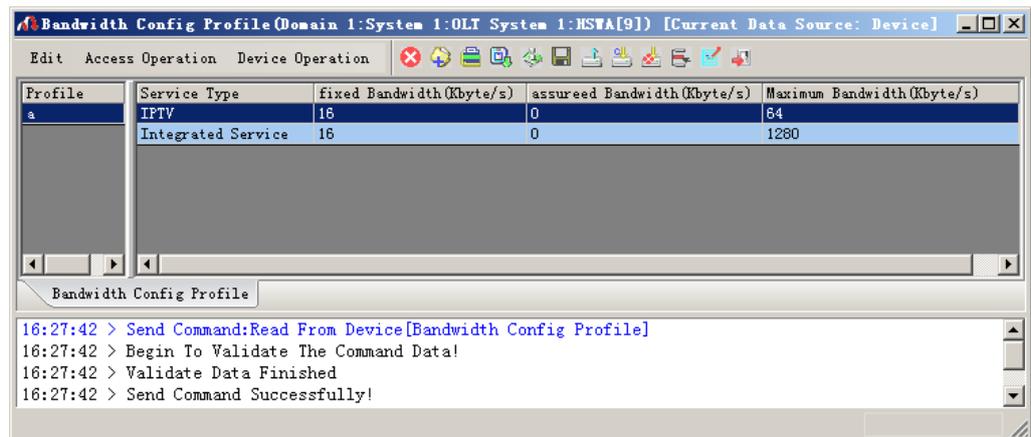


Figure 6-54 Configuring the ONU bandwidth allocation profile

## 6.2.4.4 Binding the ONU to the Bandwidth Allocation Profile

### Configuration purpose

Bind the ONU to the bandwidth allocation profile, namely applying the bandwidth allocation profile to the ONU.

### Operation steps

1. Right-click the system in the **Object Tree** pane, and select **Config** → **Batch Configure** → **ONU Config** from the shortcut menu to access the **ONU Config** window.
2. Click the **Set Object as Condition** button, and select the AN5506-10-B1[2] connected to the No.1 PON port of the GC8B card in Slot 15, and then click the **OK** button.
3. The specific information of the configuration object is displayed in the right pane. According to the planning data in Table 6-12, select **a** in the pulldown list of the **GPON Bandwidth Profile** item.

- When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the operation of binding the ONU to the multicast bandwidth allocation profile is completed. See Figure 6-55.

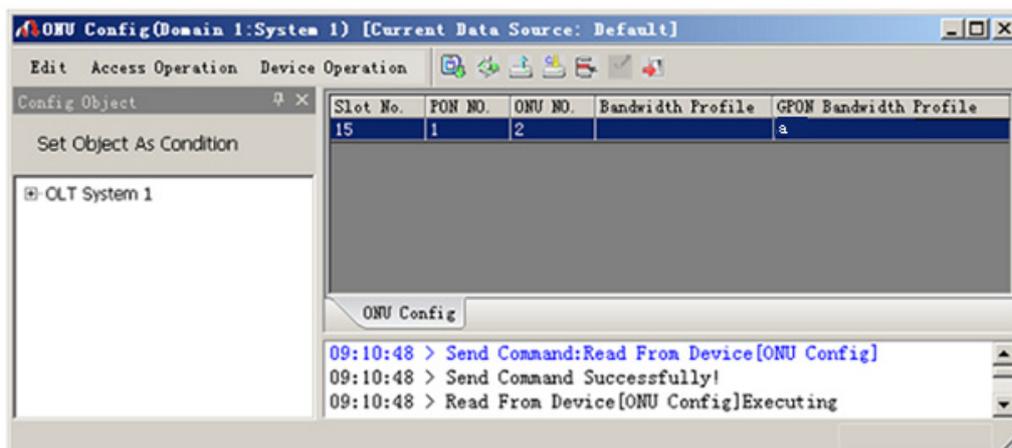


Figure 6-55 Binding the ONU to the bandwidth allocation profile

## 6.2.4.5 Configuring the Multicast Service Model Profile

### Configuration purpose

Configure the VLAN profile of the multicast service stream.

### Operation steps

- Right-click the system in the **Object Tree** pane and select **Config** → **Profile Definition** → **Service Model Profile** from the shortcut menu to access the **Service Model Profile** window.
- Click **Edit** → **Append** from the menu bar or click  in the toolbar, and input **1** in the **Please Input the Rows for Add:** dialog box that appears subsequently. After that, click **OK** to add one service model profile.
- Configure the parameters according to the planning data in the Table 6-12.

- When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the configuration of multicast service model profile is completed. See Figure 6-56.

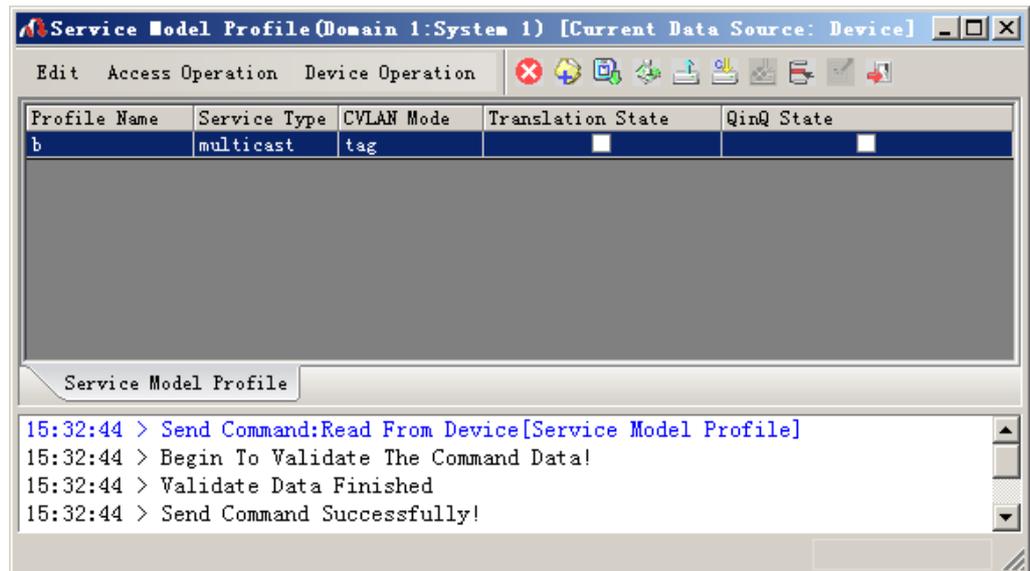


Figure 6-56 Configuring the service model profile

## 6.2.4.6 Configuring the ONU Multicast Services

### Configuration purpose

Bind the multicast service model profile with the ONU ports and configure the VLAN ID of the downlink multicast data stream.

### Operation steps

- Right-click the system in the **Object Tree** pane, and select **Config** → **Batch Configure** → **ONU Data Service Configure** from the shortcut menu to access the **ONU Data Service Configure** window.
- Click the  button in the toolbar, and select **GC8B[15]** → **PON1** → **PON1-AN5506-10-B1[2]** → **FE1** and **FE2** in the **Add Item number** dialog box that appears subsequently, then click the **OK** button as shown in Figure 6-57.

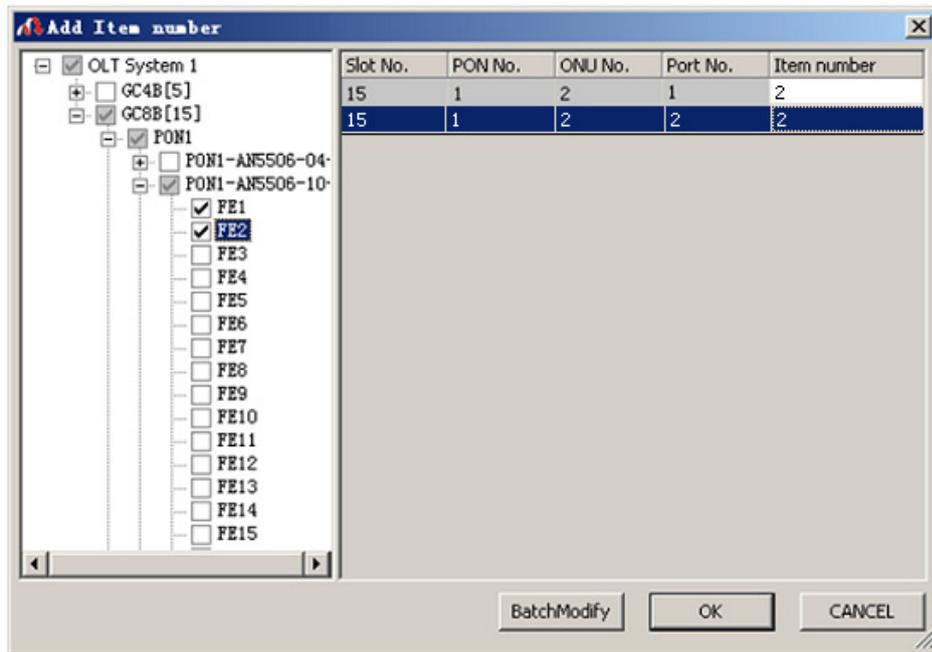


Figure 6-57 Adding the item number

- The specific information of the configuration object is displayed in the right pane, and configure the parameters according to the planning data in the Table 6-12.
- When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the configuration of ONU multicast services is completed. See Figure 6-58.

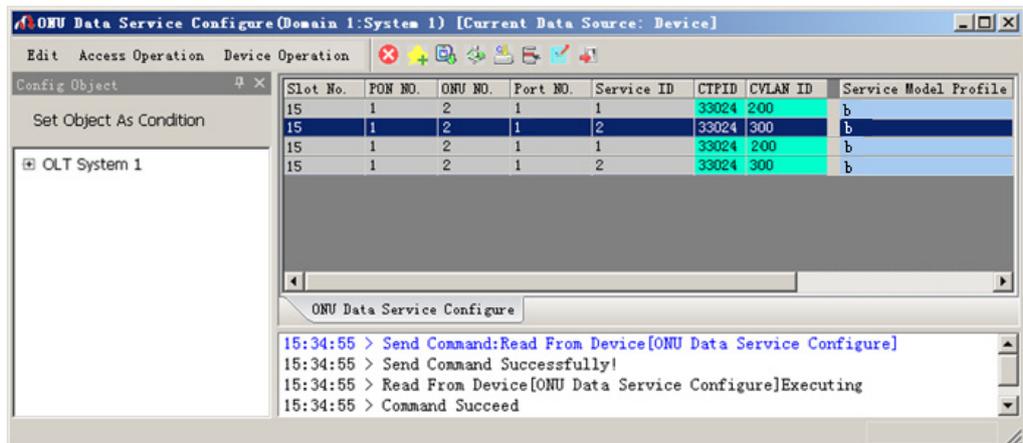


Figure 6-58 Configuring the ONU muticast services

### 6.2.4.7 End of Configuration

The multicast services on the FE1 and FE2 ports that belong to the AN5506-10-B1 (whose the authorization No. is 2) connected to the No.1 PON port of the GC8B card (in Slot 15) 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.

## 6.2.5 Viewing Operations

### 6.2.5.1 Viewing the Online Multicast Group Information

Configuration purpose

View the online multicast programs and the user information.

Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane or the HSWA card in Slot 9 in the module view, and select **Get Information** → **IGMP Config** → **Igmp Information** from the shortcut menu. And then click the **Online Groups Information** tab from the window that appears subsequently.
2. The command pane in the lower part of the window first displays **Send Command Successfully!** for delivering the command to the device, and then **Command Succeed** for reading the online multicast group information, as shown in Figure 6-59.

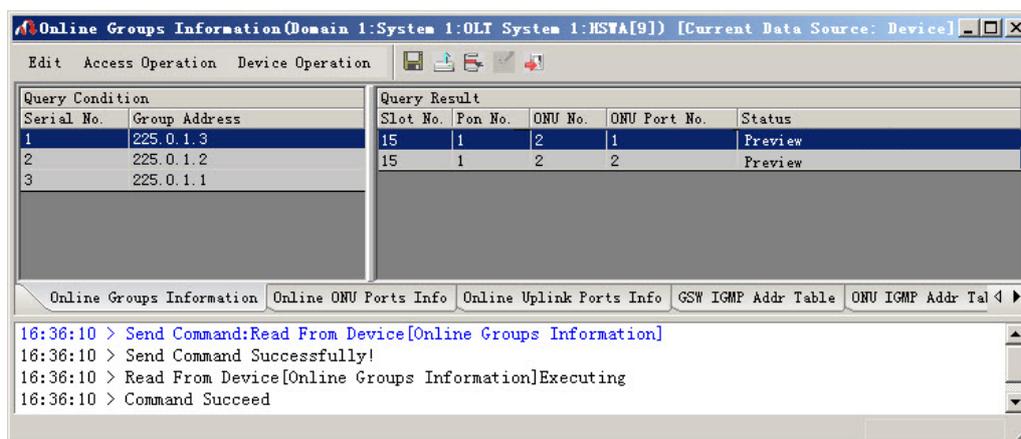


Figure 6-59 Viewing the online multicast group information

## 6.2.5.2 Viewing the Online Multicast Group Information of the Specified ONU Port

### Configuration purpose

View the online multicast program information of the specified ONU port.

### Operation steps

In this case, take the No.1 port of the ONU (whose authorization No. is 2) that connects to the No.1 PON port of the GC8B card in Slot 15 as an example for viewing the online multicast program information of the specified ONU port.

1. Right-click the **HSWA[9]** card in the **Object Tree** pane or the HSWA card in Slot 9 in the module view, and select **Get Information** → **IGMP Config** → **Igmp Information** from the shortcut menu. And then click the **Online ONU Ports Info** tab from the window that appears subsequently.
2. Input the related parameters in the **Query Condition** pane on the left, click  in the toolbar to execute the configuration commands. The command pane in the lower part of the window first displays **Send Command Successfully!** for delivering the command to the device, and then **Command Succeed** for reading the online multicast group information of the specified ONU port, as shown in Figure 6-60.

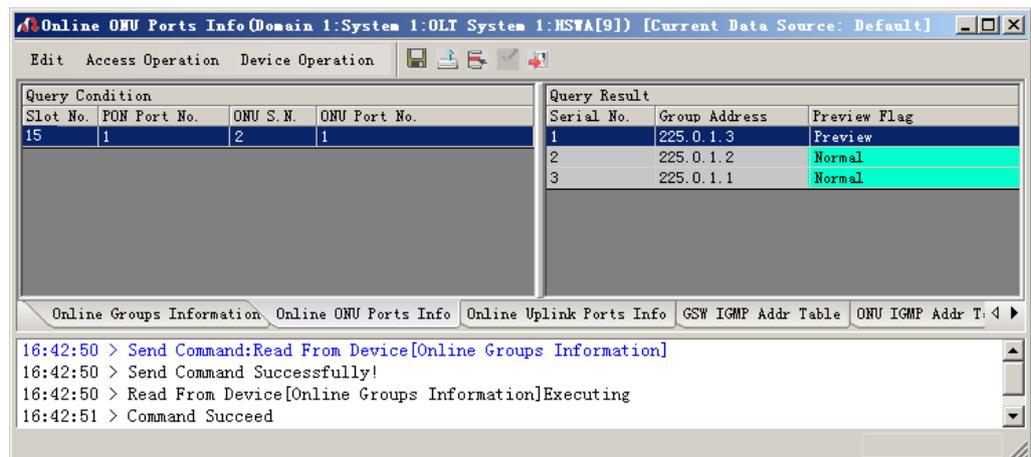


Figure 6-60 Viewing the online multicast group information of the specified ONU port

### 6.2.5.3 Viewing the Multicast Address Table of the Core Switch Card

#### Configuration purpose

View the multicast address and the group member information of the core switch card.

#### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane or the HSWA card in Slot 9 in the module view, and select **Get Information** → **IGMP Config** → **Igmp Information** from the shortcut menu. And then click the **GSW IGMP Addr Table** tab from the window that appears subsequently.
2. The command pane in the lower part of the window first displays **Send Command Successfully!** for delivering the command to the device, and then **Command Succeed** for reading the multicast address table of the core switch card, as shown in Figure 6-61.

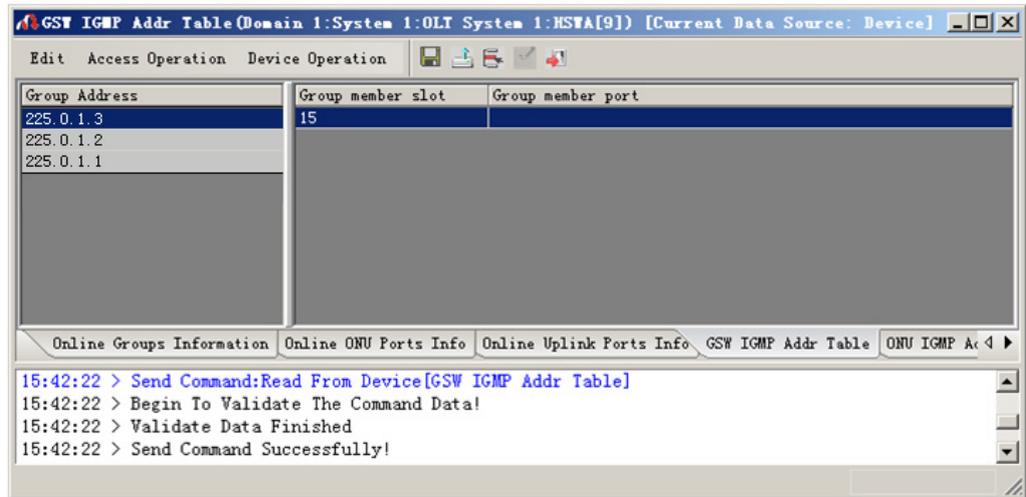


Figure 6-61 Viewing the multicast address table of the core switch card

## 6.2.5.4 Viewing the Multicast Address Table of the Line Card

Configuration purpose

View the multicast address and the PON port information of the line card.

Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane or the HSWA card in Slot 9 in the module view, and select **Get Information** → **IGMP Config** → **Igmp Information** from the shortcut menu. And then click the **Line Card IGMP Addr Table** tab from the window that appears subsequently.
2. The command pane in the lower part of the window first displays **Send Command Successfully!** for delivering the command to the device, and then **Command Succeed** for reading the multicast address table of the line card, as shown in Figure 6-62.

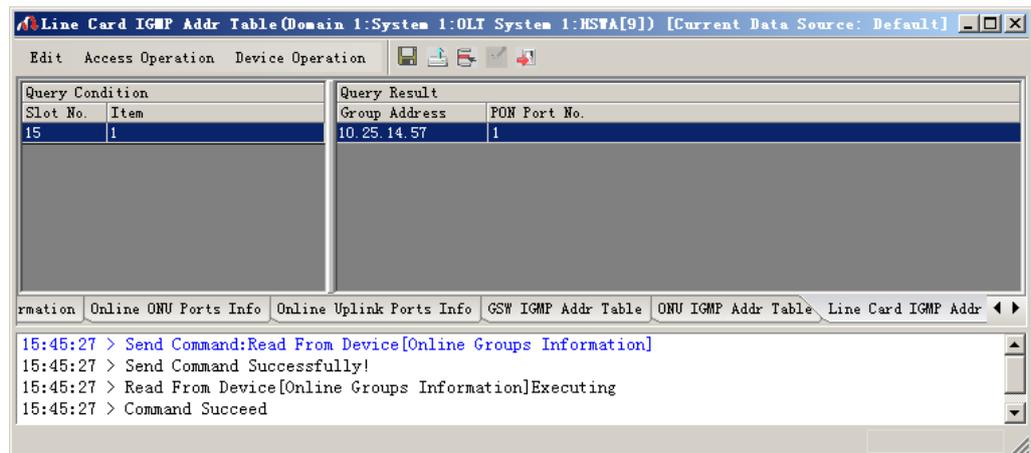


Figure 6-62 Viewing the multicast address table of the line card

## 6.3 Configuring the Multicast Concatenation

### 6.3.1 Configuring the Multicast Cascade Port

#### Configuration purpose

Configure the cascade port of the multicast service. When the equipment cascades the multicast service of other equipment, the users should set the uplink port that connects to the cascaded equipment as the cascade port.

#### Planning data

Table 6-13 Planned data of the multicast cascade port

Item	Description	Example
Cascade Ports No.	Configure according to the network planning of the operator.	20:SFP1

#### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, and select **Config** → **IGMP Config** → **IGMP Cascade Ports** from the shortcut menu. And then click the **IGMP Cascade Ports** tab from the window that appears subsequently.
2. Click **Edit** → **Append** from the menu bar or click  in the toolbar, and input **1** in the **Please Input the Rows for Add:** dialog box that appears subsequently. After that, click **OK** to add one item.
3. According to the planning data in the Table 6-13, select **20:SFP1** in the drop-down list of the **Cascade Ports No.** item.
4. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the configuration of the multicast cascade port is completed. See Figure 6-63.

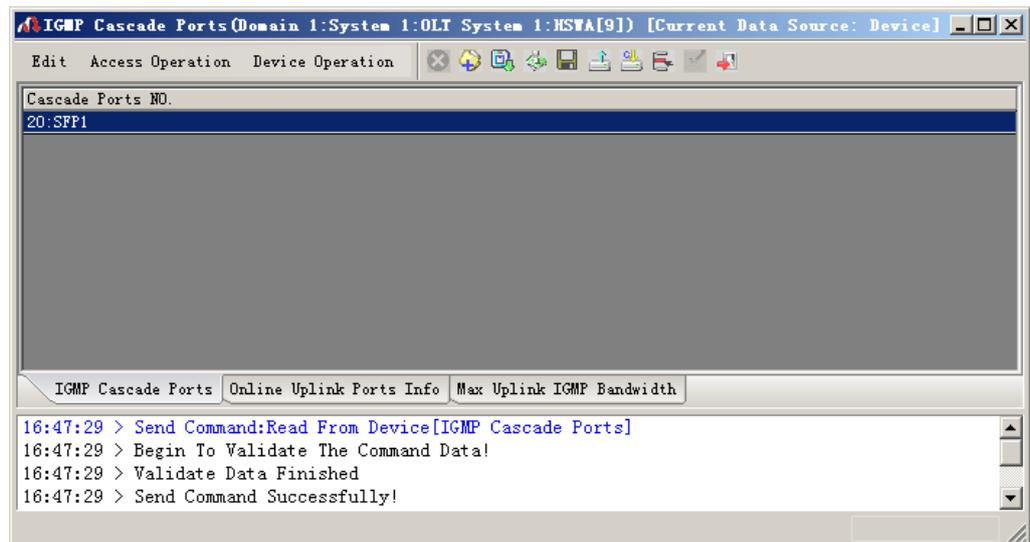


Figure 6-63 Configuring the multicast cascade port

## 6.3.2 Viewing the Uplink Port Information

### Configuration purpose

View the online multicast group address information of the cascade port.

### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, and select **Get Information** → **IGMP Config** → **Igmp Information** from the shortcut menu. And then click the **Online Uplink Ports Info** tab from the window that appears subsequently.
2. Select **20:SFP1** in the **Uplink Port No.** column of the left pane. Then the command pane in the lower part of the window first displays **Send Command Successfully!** for delivering the command to the device, and then **Command Succeed** for reading the online multicast group information of the cascade port, as shown in Figure 6-64.

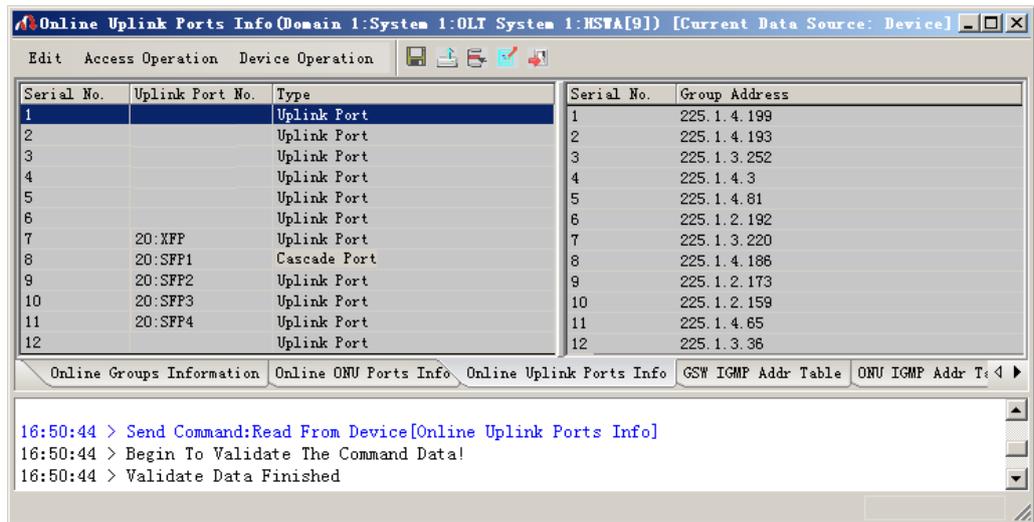


Figure 6-64 Viewing the uplink port information

## 6.4 Configuring the Maximum Multicast Bandwidth for Uplink Ports

### Configuration purpose

Configure the maximum bandwidth for multicast services of the uplink ports.

### Planning data

Table 6-14 Planned data of the uplink port's maximum multicast bandwidth

Item	Description	Example
Uplink Bandwidth (Kbit/s)	Configure according to the network planning of the operator. The default value is 0.	60000

### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, and select **Config** → **IGMP Config** → **IGMP Cascade Ports** from the shortcut menu. And then click the **Max Uplink IGMP Bandwidth** tab from the window that appears subsequently.
2. According to the planning data in the Table 6-14, input **60000** for the **Uplink Bandwidth (Kbit/s)** item.
3. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the configuration of the uplink port's maximum multicast bandwidth is completed. See Figure 6-65.

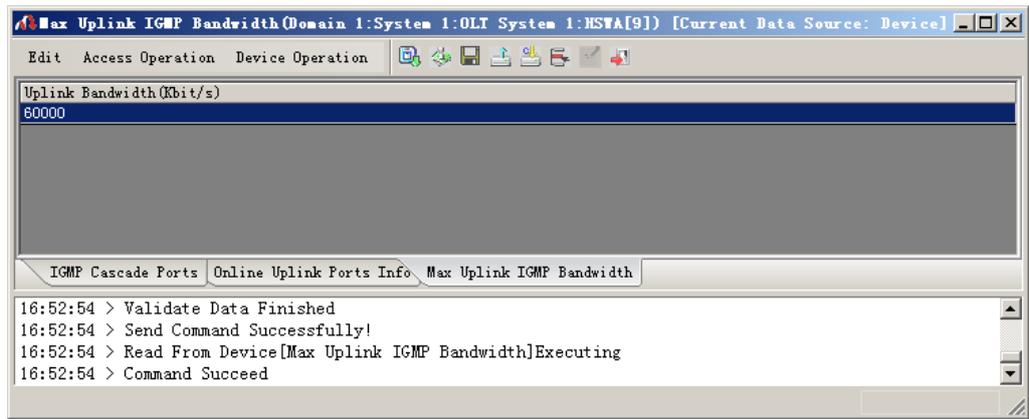


Figure 6-65 Configuring the uplink port's maximum multicast bandwidth

## 6.5 Configuring OLT Multicast Protocol Parameters

### Configuration purpose

Configure the multicast protocol parameters, which include the robustness variable and the related parameters of common query and specified query. Maintaining the default value is suggested.

### Planning data

Table 6-15 Planned data of the OLT multicast protocol parameters

Item	Description	Example
Robustness Variable	Configure according to the network planning of the operator. The default value is 2.	2
Query response interval (S)	Configure according to the network planning of the operator. The default value is 10.	10
Last member query interval (S)	Configure according to the network planning of the operator. The default value is 1.	1
Last member query count	Configure according to the network planning of the operator. The default value is 2.	2
Query interval (S)	Configure according to the network planning of the operator. The default value is 125.	125
Group Membership	For configuring the aging time of the group member (unit: s). Configure according to the network planning of the operator. The default value is 260.	260

### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, and select **Config** → **IGMP Config** → **IGMP Profile and Port** from the shortcut menu. And then click the **IGMP Protocol Parameters** tab from the window that appears subsequently.
2. Configure the parameters according to the planning data in the Table 6-15.

- When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the configuration of the multicast protocol parameters is completed. See Figure 6-66.

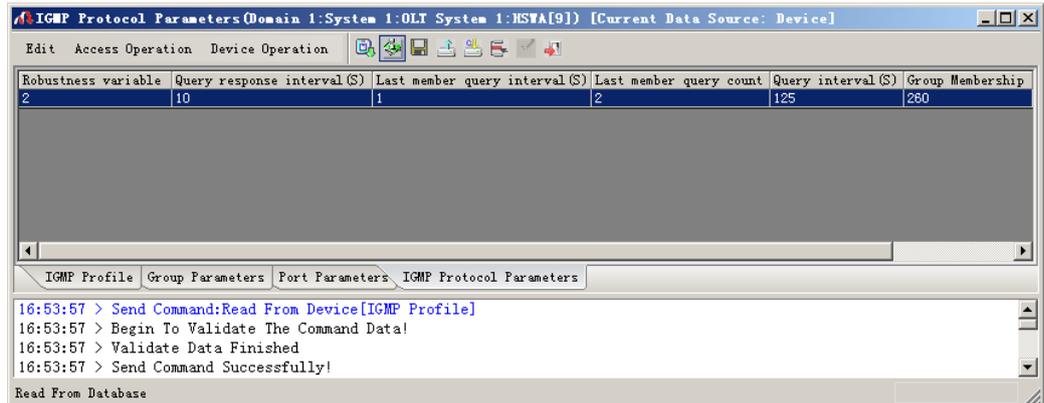


Figure 6-66 Configuring the multicast protocol parameters

## 6.6 Configuring ONU Multicast Parameters

### Configuration purpose

Configure the ONU multicast parameters, which include the ONU leave mode, the robustness parameter and the query time counts.

### Planning data

Table 6-16 Planned data of the ONU multicast parameter

Item	Description	Example
Slot No.	Configure according to the network planning of the operator.	5
PON Port No.	Configure according to the network planning of the operator.	1
ONU NO	Configure according to the network planning of the operator.	1
LEAVE MODE	Configure according to the network planning of the operator. The options include <b>NON FAST LEAVE</b> and <b>FAST LEAVE</b> .	NON FAST LEAVE
Robustness count	Configure according to the network planning of the operator. The default value is 2.	2
Last Member Query Count	Configure according to the network planning of the operator. The default value is 2.	2
IGMP mode	Configure according to the network planning of the operator. The options include <b>snooping mode</b> , <b>proxy mode</b> and <b>controlled mode</b> .	proxy mode

### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, and select **Config** → **IGMP Config** → **ONU Configuration** from the shortcut menu to access the **ONU Configuration** window.
2. Click **Edit** → **Append** from the menu bar or click  in the toolbar, and input **1** in the **Please Input the Rows for Add:** dialog box that appears subsequently. After that, click **OK** to add one item.
3. Configure the parameters according to the planning data in the Table 6-16.

- When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the configuration of the ONU multicast parameters is completed. See Figure 6-67.

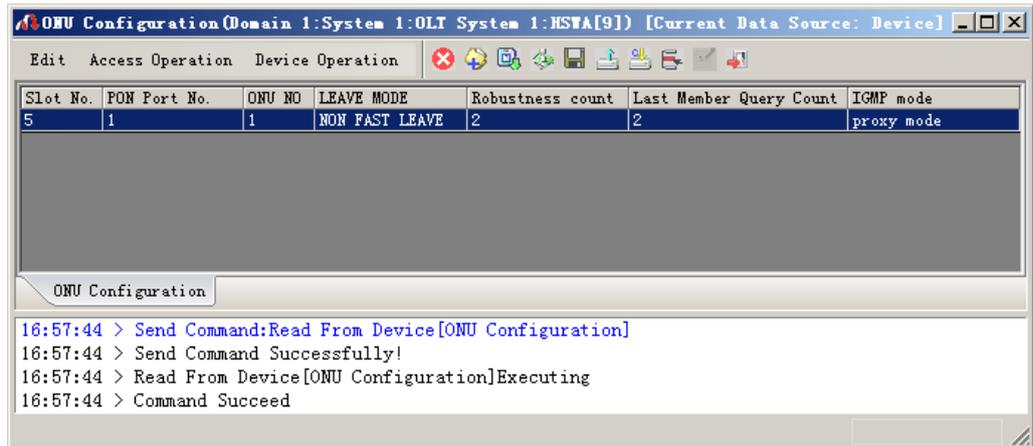


Figure 6-67 Configuring the ONU parameters

## 6.7 Configuring the Prejoin Groups

### Configuration purpose

Configure the prejoin multicast group. The prejoined multicast programs are connected to the uplink port. When users need to watch the prejoined multicast programs, they can watch them in fast viewing mode.

### Planning data

Table 6-17 Planned data of the prejoin groups

Item	Description	Example
Pre-join Group	Configure according to the network planning of the operator.	224.0.1.1

### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, and select **Config** → **IGMP Config** → **Prejoin Groups** from the shortcut menu to access the **Pre-join Groups** window.
2. Click **Edit** → **Append** from the menu bar or click  in the toolbar, and input **1** in the **Please Input the Rows for Add:** dialog box that appears subsequently. After that, click **OK** to add one prejoin group.
3. Configure the parameters according to the planning data in the Table 6-17.
4. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the configuration of the prejoin group is completed. See Figure 6-68.

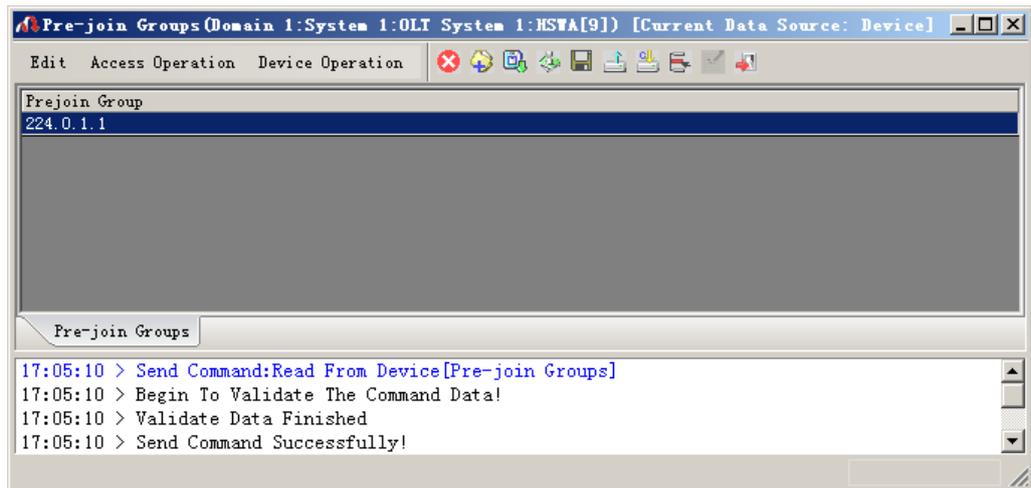


Figure 6-68 Configuring the prejoin group

## 6.8 Configuring Multicast Default Preview Parameters

### Configuration purpose

Configure the default value of the multicast preview parameters. If the preview parameters of a multicast program is not configured in the **Port Parameters** window, the users will preview the program with the default preview parameters.

### Planning data

Table 6-18 Planned data of the multicast default preview parameters

Item	Description	Example
Preview Counts (Times)	This parameter is valid only under the controllable mode when the authority of this multicast group is <b>Preview</b> . The maximum number of times a subscriber can preview a given program. The value range is 1 to 16; the unit is time; and the default value is 4.	4
Preview Time (Min)	This parameter is valid only under the controllable mode when the authority of this multicast group is <b>Preview</b> . The maximum viewing time for each preview. The value range is 1 to 254; the unit is minute; and the default value is 10.	10
Preview Interval (min)	This parameter is valid only under the controllable mode when the authority of this multicast group is <b>Preview</b> . The interval limit of the users to preview the multicast programs. The value range is 1 to 254; the unit is minute; and the default value is 30.	30
Preview Time (h)	This parameter is valid only under the controllable mode when the authority of this multicast group is <b>Preview</b> . The reset period of subscriber preview authority. The value range is 1 to 254; the unit is hour; and the default value is 24.	24
Preview Total Time (min)	This parameter is valid only under the controllable mode when the authority of this multicast group is <b>Preview</b> . The total duration limit of the users to preview the multicast programs. The value range is 1 to 254; the unit is minute; and the default value is 254.	254

## Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, and select **Config** → **IGMP Config** → **Default Preview Parameters** from the shortcut menu to access the **Default Preview Parameters** window.
2. Click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the configuration of the multicast default preview parameters is completed. See Figure 6-69.

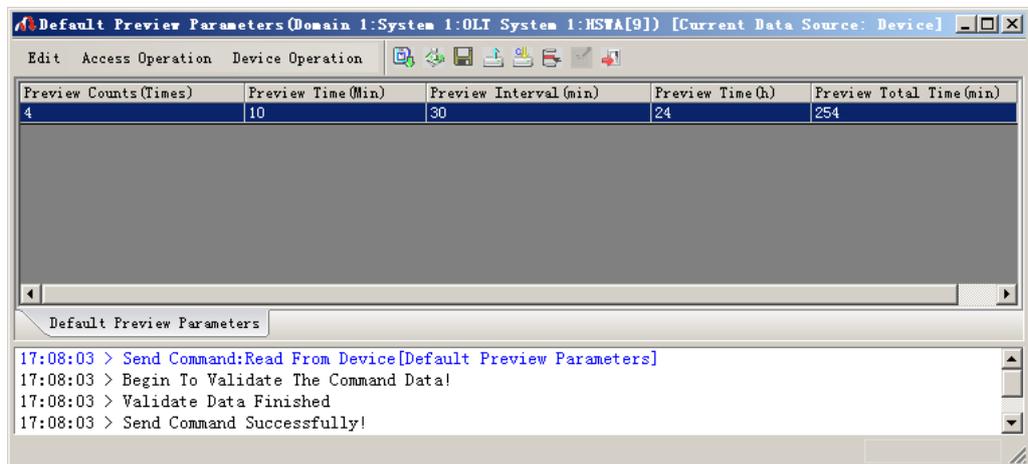


Figure 6-69 Configuring the multicast default preview parameters

## 6.9 Configuring Multicast Logs

The multicast log function is valid only under the controllable mode.

### 6.9.1 Configuring the Multicast Log Time

#### Configuration purpose

Configure the time parameters of the multicast log, which is used to record the operations of users joining or leaving the multicast groups.

#### Planning data

Table 6-19 Planned data of the multicast log time parameters

Item	Description	Example
Ignore Time (s)	When the duration of the users to watch the program is lower than this ignore 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
Generate interval (min)	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

#### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, and select **Config** → **IGMP Config** → **Log Management** from the shortcut menu to access the **Log Parameters** window.
2. Click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the configuration of the log time parameters is completed. See Figure 6-70.

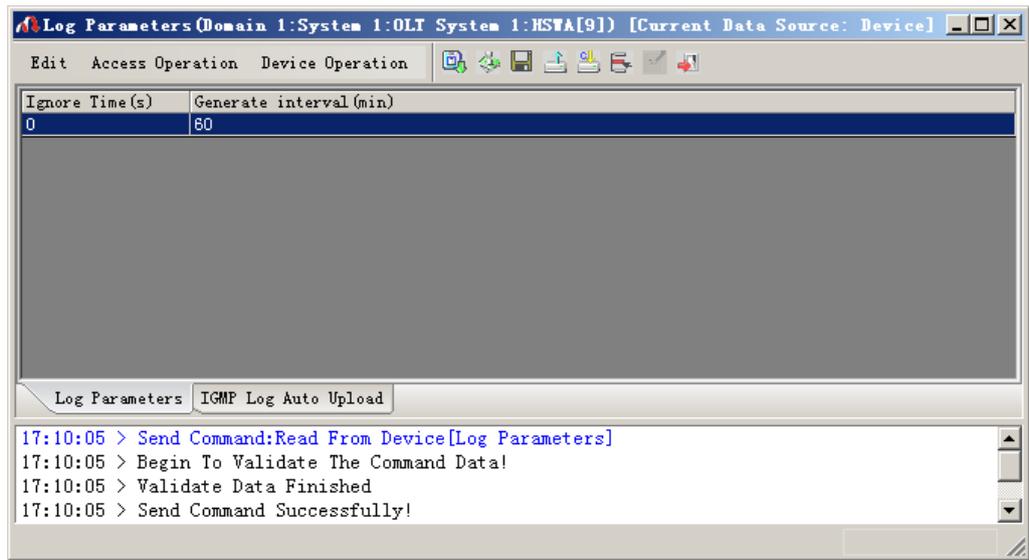


Figure 6-70 Configuring the multicast log time parameters

## 6.9.2 Configuring the Automatic Uploading of the Multicast Logs

### Configuration purpose

Enable / disable the function of automatic uploading the multicast logs to the server and configure the related parameters of this function.

### Planning data

Table 6-20 Planned data of the automatic uploading of the multicast logs

Item	Description	Example
Enable	<p>Enable / disable the function of automatic uploading the multicast logs to the server.</p> <p>Select <b>Enable</b> to enable the function of automatic uploading the multicast logs to the server, and users should configure the related parameters.</p> <p>Select <b>Disable</b> to disable the function of automatic uploading the multicast logs to the server, and users need not configure the related parameters.</p>	Enable

Item	Description	Example
Interval (min)	The interval time of automatic uploading the multicast logs to the server. The value range is 1 to 1440; the unit is minute.	30
Host IP	IP address of the server that the multicast logs are uploaded to.	192.168.1.1
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

### Operation steps

1. Click the **IGMP Log Auto Upload** tab from the **Log Parameters** window to access the **IGMP Log Auto Upload** window.
2. Configure the parameters according to the planning data in the Table 6-20.
3. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the configuration of automatic uploading the multicast logs is completed. See Figure 6-71.

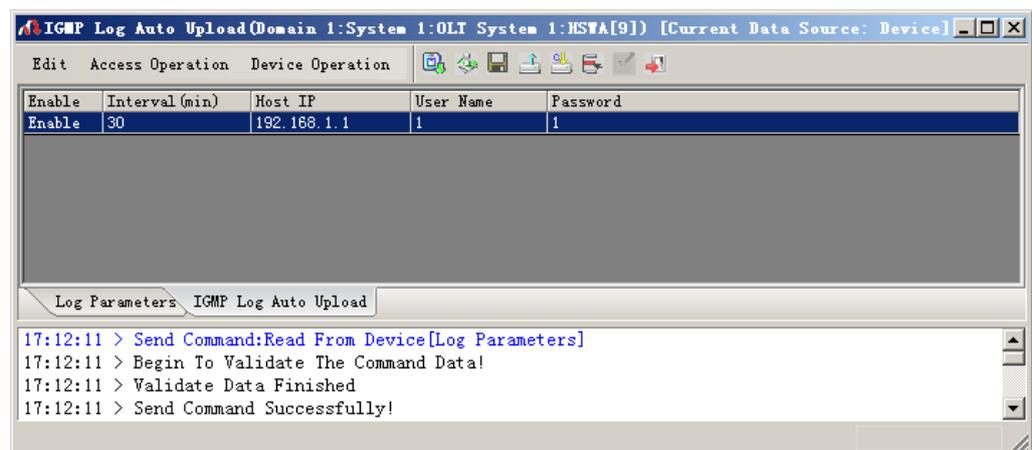


Figure 6-71 Configuring the automatic uploading of the multicast logs

### 6.9.3 Configuring the Uploading of the Multicast Logs to the FTP

#### Configuration purpose

Manually upload the multicast logs to the FTP server.

#### Planning data

Table 6-21 Planned data of uploading the multicast logs to the FTP

Item	Description	Example
Host IP	IP address of the server where the multicast logs are uploaded.	192.168.1.188
User Name	The user name used to log in the server where the multicast logs are uploaded.	1
Password	The password used to log in the server where the multicast logs are uploaded.	1
File Name	The name of the file that saves the multicast logs.	igmp.txt

#### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, and select **Control Command** → **IGMP Config** → **IGMP Log Upload** from the shortcut menu to access the **IGMP LOG Upload** window.
2. Configure the parameters according to the planning data in the Table 6-21.
3. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the multicast logs are uploaded to the designated FTP server. See Figure 6-72.

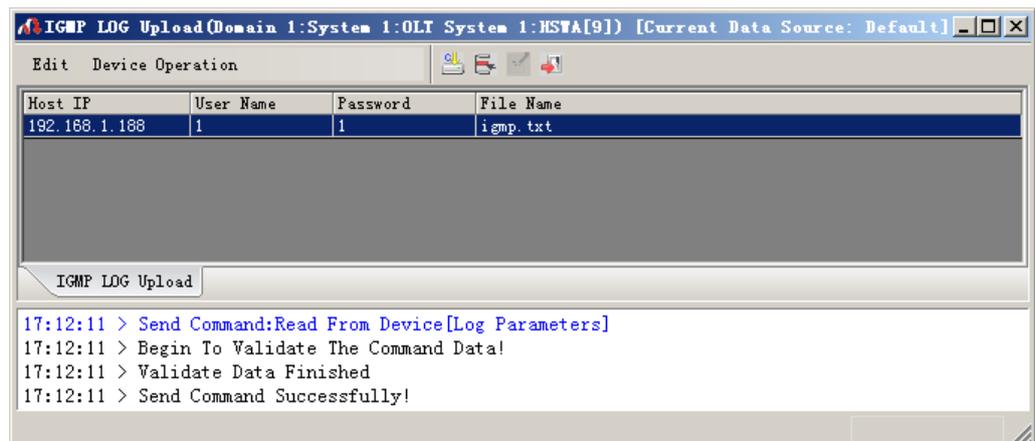


Figure 6-72 Uploading the multicast logs to the FTP

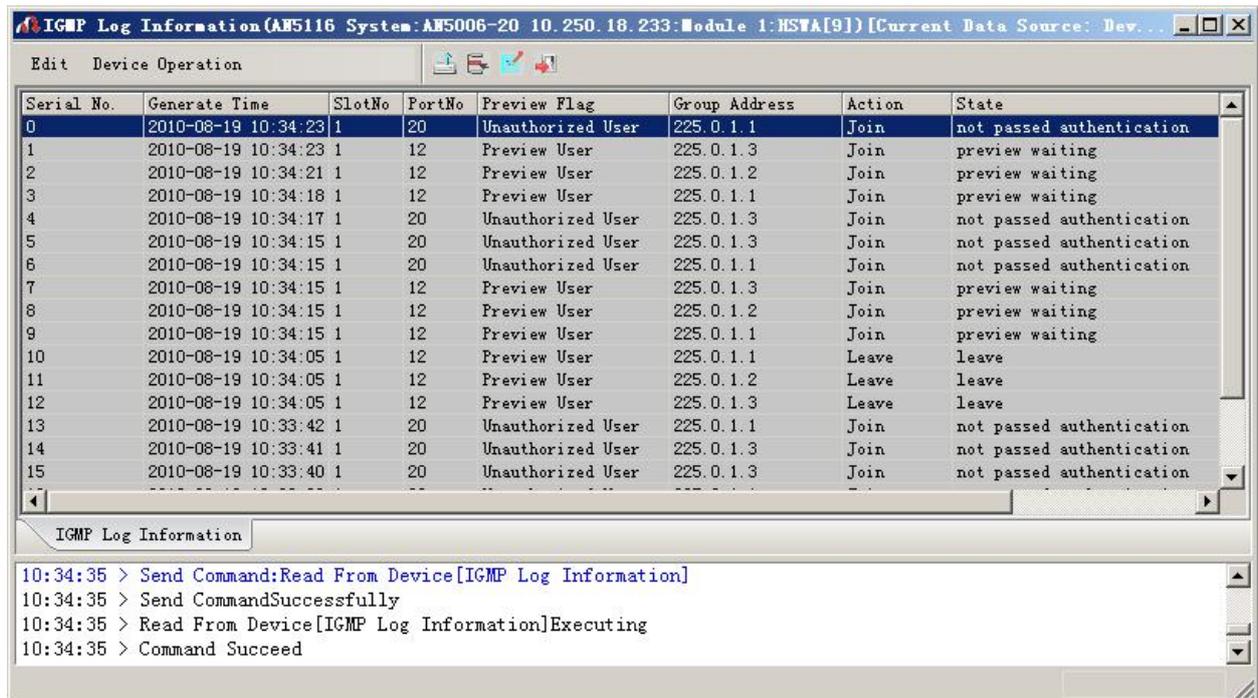
## 6.9.4 Viewing the Multicast Logs

Configuration purpose

View the multicast log information.

Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, and select **Get Information** → **IGMP Config** → **IGMP Log** from the shortcut menu to access the **IGMP Log Information** window.
2. The command pane in the lower part of the window first displays **Send Command Successfully!** for delivering the command to the device, and then **Command Succeed** for reading the multicast log information, as shown in Figure 6-73.



The screenshot shows a window titled "IGMP Log Information (AN5116 System: AN5006-20 10.250.18.233: Module 1: HSWA[9]) [Current Data Source: Dev...]. The window contains a table with the following data:

Serial No.	Generate Time	SlotNo	PortNo	Preview Flag	Group Address	Action	State
0	2010-08-19 10:34:23	1	20	Unauthorized User	225.0.1.1	Join	not passed authentication
1	2010-08-19 10:34:23	1	12	Preview User	225.0.1.3	Join	preview waiting
2	2010-08-19 10:34:21	1	12	Preview User	225.0.1.2	Join	preview waiting
3	2010-08-19 10:34:18	1	12	Preview User	225.0.1.1	Join	preview waiting
4	2010-08-19 10:34:17	1	20	Unauthorized User	225.0.1.3	Join	not passed authentication
5	2010-08-19 10:34:15	1	20	Unauthorized User	225.0.1.3	Join	not passed authentication
6	2010-08-19 10:34:15	1	20	Unauthorized User	225.0.1.1	Join	not passed authentication
7	2010-08-19 10:34:15	1	12	Preview User	225.0.1.3	Join	preview waiting
8	2010-08-19 10:34:15	1	12	Preview User	225.0.1.2	Join	preview waiting
9	2010-08-19 10:34:15	1	12	Preview User	225.0.1.1	Join	preview waiting
10	2010-08-19 10:34:05	1	12	Preview User	225.0.1.1	Leave	leave
11	2010-08-19 10:34:05	1	12	Preview User	225.0.1.2	Leave	leave
12	2010-08-19 10:34:05	1	12	Preview User	225.0.1.3	Leave	leave
13	2010-08-19 10:33:42	1	20	Unauthorized User	225.0.1.1	Join	not passed authentication
14	2010-08-19 10:33:41	1	20	Unauthorized User	225.0.1.3	Join	not passed authentication
15	2010-08-19 10:33:40	1	20	Unauthorized User	225.0.1.3	Join	not passed authentication

Below the table, the command history pane shows the following text:

```

10:34:35 > Send Command:Read From Device[IGMP Log Information]
10:34:35 > Send CommandSuccessfully
10:34:35 > Read From Device[IGMP Log Information]Executing
10:34:35 > Command Succeed

```

Figure 6-73 Viewing the log information

## 6.9.5 Clearing the Logs

### Configuration purpose

Clear the multicast log information saved in the core switch card's memory.

### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, and select **Control Command** → **IGMP Config** → **Clear IGMP Record** from the shortcut menu.
2. Click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the multicast logs are cleared. See Figure 6-74.

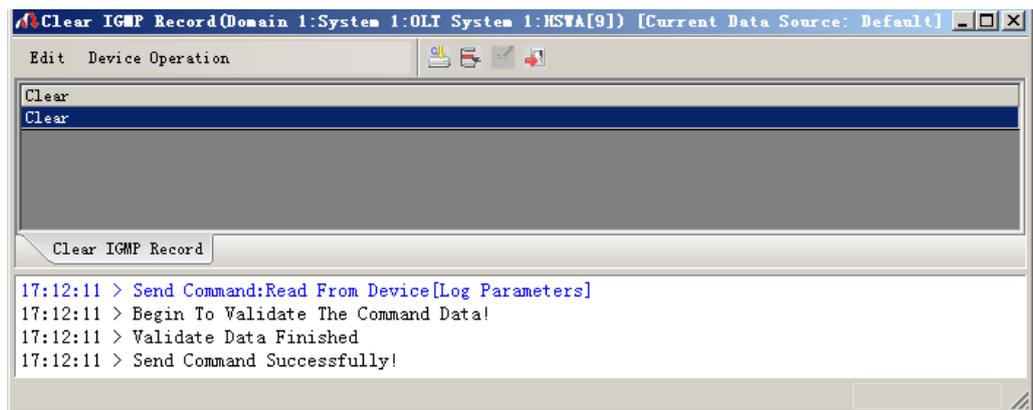


Figure 6-74 Clearing the logs

## 6.10 Viewing the Multicast Statistical Information

The multicast statistical information function is valid only under the controllable mode.

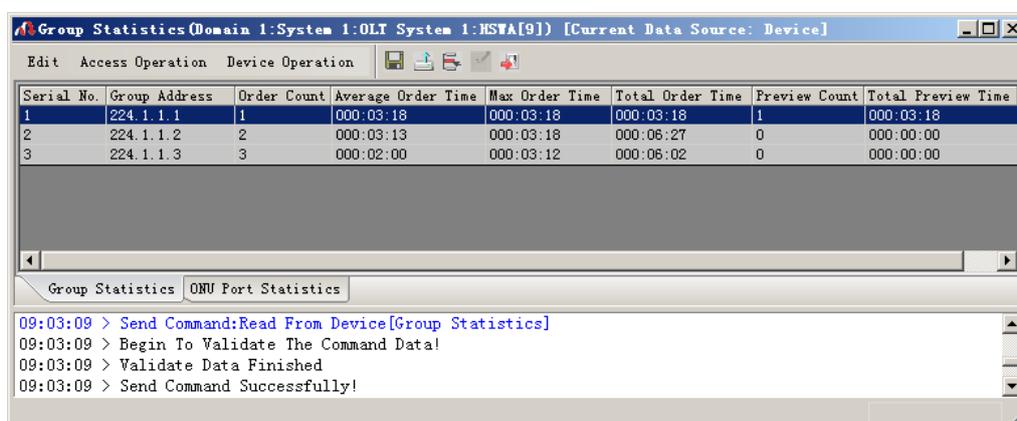
### 6.10.1 Viewing the Statistical Information of the Multicast Groups

#### Configuration purpose

View the statistical information of the multicast program, which include the average watching time of the multicast program, maximum watching time and the total watching time. For the program preview, the information also include times of preview and total preview time.

#### Operation steps

1. Right-click the **HSTA[9]** card in the **Object Tree** pane, and select **Get Information** → **IGMP Config** → **Igmp Statistics** from the shortcut menu. And then click the **Group Statistics** tab from the window that appears subsequently.
2. The command pane in the lower part of the window first displays **Send Command Successfully!** for delivering the configuration to the device, and then **Command Succeed** for reading the statistical information of the multicast groups, as shown in Figure 6-75.



Serial No.	Group Address	Order Count	Average Order Time	Max Order Time	Total Order Time	Preview Count	Total Preview Time
1	224.1.1.1	1	000:03:18	000:03:18	000:03:18	1	000:03:18
2	224.1.1.2	2	000:03:13	000:03:18	000:06:27	0	000:00:00
3	224.1.1.3	3	000:02:00	000:03:12	000:06:02	0	000:00:00

```

09:03:09 > Send Command:Read From Device[Group Statistics]
09:03:09 > Begin To Validate The Command Data!
09:03:09 > Validate Data Finished
09:03:09 > Send Command Successfully!

```

Figure 6-75 Viewing the statistical information of the multicast groups

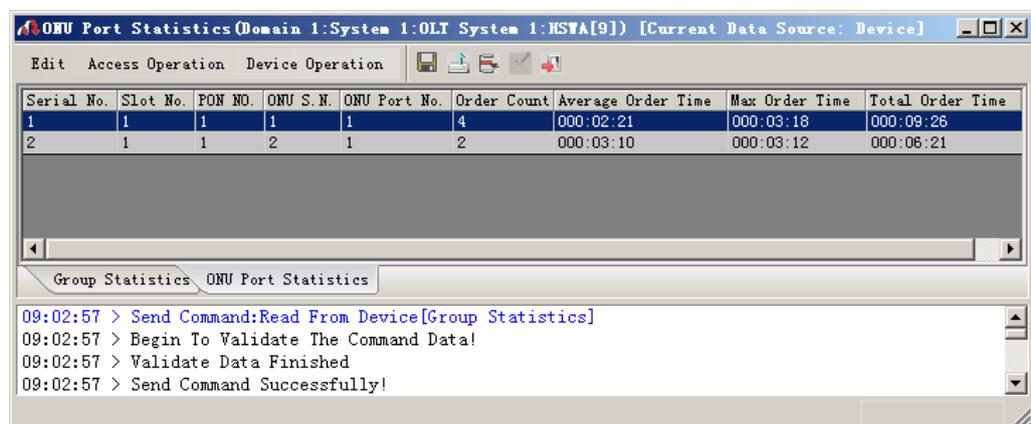
## 6.10.2 Viewing the Statistical Information of the ONU Port

### Configuration purpose

View the multicast statistical information of the ONU port, which include the average times of the port user to watch the multicast programs, the average watching time, the maximum watching time and the total watching time.

### Operation steps

1. Right-click the **HSTA[9]** card in the **Object Tree** pane, and select **Get Information** → **IGMP Config** → **Igmp Statistics** from the shortcut menu. And then click the **ONU Port Statistics** tab from the window that appears subsequently.
2. The command pane in the lower part of the window first displays **Send Command Successfully!** for delivering the configuration to the device, and then **Command Succeed** for reading the multicast statistical information of the ONU port, as shown in Figure 6-76.



The screenshot shows a window titled "ONU Port Statistics (Domain 1: System 1: OLI System 1: HSTA[9]) [Current Data Source: Device]". The window contains a table with the following data:

Serial No.	Slot No.	PON NO.	ONU S.N.	ONU Port No.	Order Count	Average Order Time	Max Order Time	Total Order Time
1	1	1	1	1	4	000:02:21	000:03:18	000:09:26
2	1	1	2	1	2	000:03:10	000:03:12	000:06:21

Below the table, there is a command log pane showing the following text:

```

09:02:57 > Send Command:Read From Device[Group Statistics]
09:02:57 > Begin To Validate The Command Data!
09:02:57 > Validate Data Finished
09:02:57 > Send Command Successfully!

```

Figure 6-76 Viewing the multicast statistical information of the ONU port

## 6.11 Forcing the Users to Leave

### Configuration purpose

Force the user that is watching the multicast programs to leave. This function is valid only under the controllable mode.

### Planning data

Table 6-22 Planned data of forcing users to leave

Item	Description	Example
Slot No.	The slot number of the PON interface card.	15
PON Port No.	The PON port number	1
ONU S.N.	The ONU authorization number	1
ONU Port S.N.	The ONU port number	1
Group Address	The IP address of the multicast program.	224.0.1.1

### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, and select **Control Command** → **IGMP Config** → **Force Leave** from the shortcut menu.
2. Configure the parameters according to the planning data in the Table 6-22.
3. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the user connects to the No.1 port on the No.1 ONU of the No.1 PON port in Slot 15 has left the multicast program 224.0.1.1. See Figure 6-77.

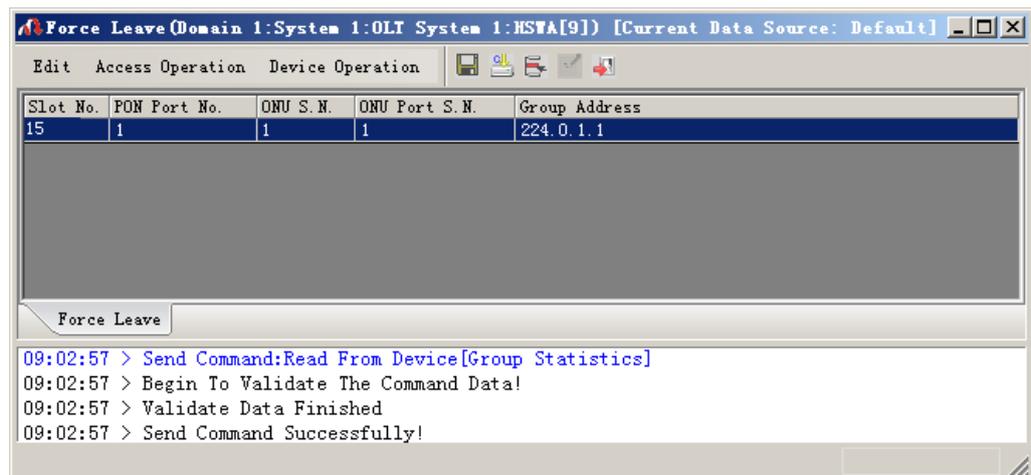


Figure 6-77 Forcing the users to leave

## 6.12 Refreshing the Multicast Configuration Information

### Configuration purpose

Redeliver all the multicast configuration to the equipment. This operation will not interfere with the users watching the multicast programs.

### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, and select **Control Command** → **IGMP Config** → **Flush Igmp Configuration** from the shortcut menu.
2. Click  in the toolbar to execute the configuration commands. The command pane in the lower part of the window displays **Send Command Successfully!** for refreshing the multicast configuration, as shown in Figure 6-78.

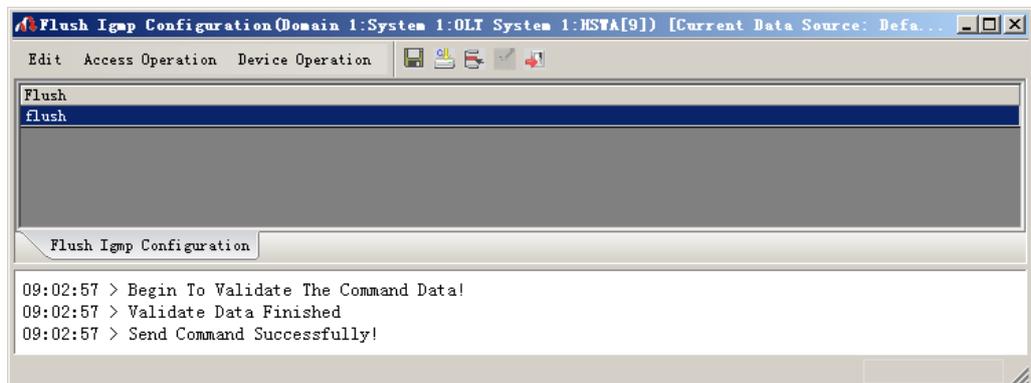


Figure 6-78 Refreshing the multicast configuration information

## 6.13 Querying the Fast Leave Capability of the ONU

Configuration purpose

Query whether the ONU has the capability of leaving the multicast group fast.

Operation steps

1. Right-click the **HSTA[9]** card in the **Object Tree** pane, and select **Get Information** → **IGMP Config** → **ONU Fast Leave Capability** from the shortcut menu.
2. Click  in the toolbar to execute the configuration commands. The command pane in the lower part of the window first displays **Send Command Successfully!** for delivering the configuration to the device, and then **Command Succeed** for querying the fast leave capability of the ONU, as shown in Figure 6-79.

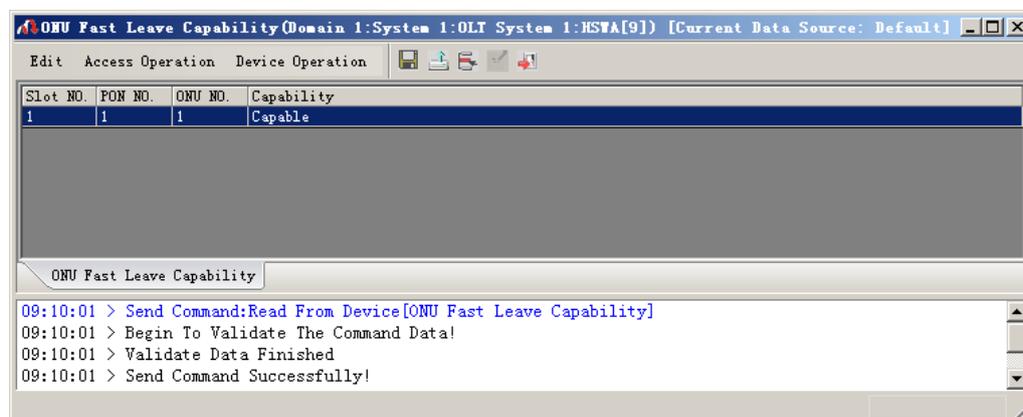


Figure 6-79 Querying the fast leave capability of the ONU



# 7 Configuring the TDM Services

---

This chapter introduces how to provision the TDM services on the AN5116-06B. It includes sections as follows:

- ☑ Configuration rules
- ☑ Service network
- ☑ Planning data
- ☑ Configuration Flow
- ☑ Configuring the system clock
- ☑ Configuring the clock recovery
- ☑ Configuring the bandwidth allocation
- ☑ Configuring the E1 parameters for ONU subscribers
- ☑ End of configuration

## 7.1 Configuration Rules

The E1 ports of the ONU must be one-to-one corresponding to the E1 sequence numbers of the TDM card.

## 7.2 Service Network

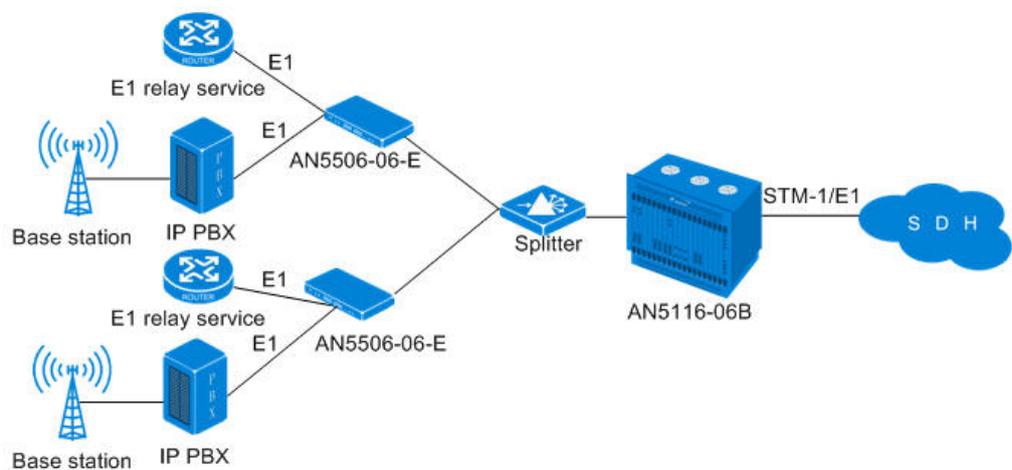


Figure 7-1 TDM service network diagram

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.

## 7.3 Planning Data

The AN5116-06B chooses the CE1B card and the GC8B card to act as the interface card on the network side and subscriber side respectively, and the HSWA card must be equipped. The TDM service requires the ONU of AN5506-06-E type on the remote end. The planned data is shown in the following table.

Table 7-1 Planned data for the OLT side of the TDM service

Item		Explanation	Example
ONU information	Slot No.	The slot of the GC8B card that is actually used.	15
	PON port No.	The PON port number that is actually used corresponding to the ONU.	1
	ONU Auth No.	Configure according to the network planning of the operator	3
	ONU type	ONU Type	AN5506-06-E
Configuring the system clock mode	Slot No.	The slot number of the TDM card that is actually used	12 / 1
	Clock source	The ways that the AN5116-06B getting the clock includes: internal, external clock 1, External clock 2, and E1 extraction. The default setting is internal.	internal
Configuring the clock recovery mode	Slot No.	The slot number of the TDM card that is actually used	1
	mode	The clock recovery mode between the ONU and the OLT, including adaptive clock, loopback clock, differential clock and enhanced adaptive clock.	Adaptive clock

Table 7-2 Planned data for the ONU (AN5506-06-E type) side of the TDM service

Item		Explanation	Example
Configuring the bandwidth	Service Type	Select <b>TDM</b>	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 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

Item	Explanation	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 E1 services for ONU	Port No.	The E1 port number of the ONU that is actually used.	1
	TDM Slot No.	The slot number of the TDM card that is actually used.	1
	TDM E1 No.	The E1 No. of the TDM card that is actually used.	8
	Remote 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 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

## 7.4 Configuration Flow

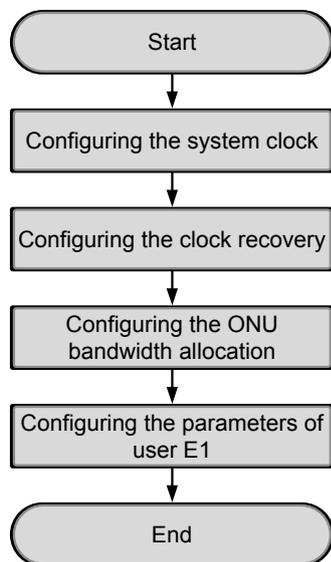


Figure 7-2 Flow chart for configuring the TDM services

## 7.5 Configuring the System Clock

### Configuration purpose

Configure the method to get the clock of the OLT, providing the downlink TDM service clock.

### Operation steps

1. Click the **CE1B[12]** card in the **Object Tree** pane and select **Config** → **system clock mode** from the shortcut menu to access the system clock mode configuration window.
2. Click the **Clock source** option and select **internal** from the pull-down list.
3. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the system clock mode configuration is completed. See Figure 7-3.

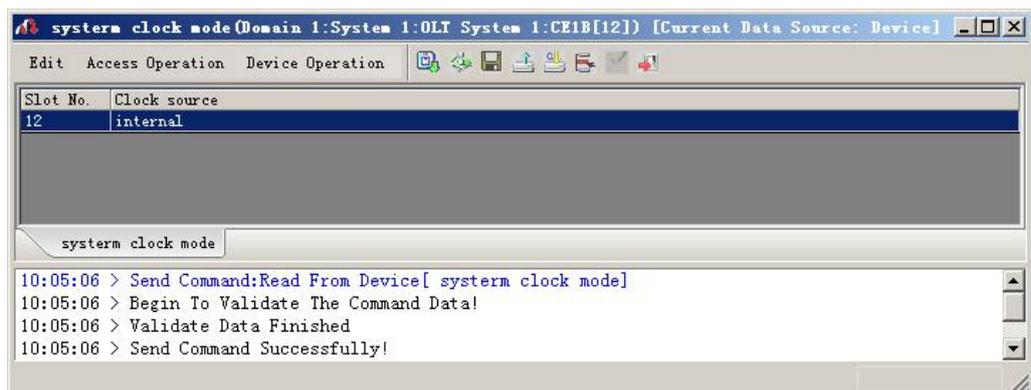


Figure 7-3 Completing the system clock configuration

## 7.6 Configuring the Clock Recovery

### Configuration purpose

When the GEM packets sent from the ONU side get to the OLT, the OLT will resolve the Ethernet packets from the GEM packets and adapt them to the TDM packets; meanwhile the OLT will recover the TDM service clock and send it to the uplink equipment.

### Operation steps

1. Click the **CE1B[1]** card in the **Object Tree** pane and select **Config** → **Clock Recovery Mode** from the shortcut menu to access the clock recovery mode configuration window.
2. Click the **mode** option and select **adaptive clock** from the pull-down list.
3. Click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the clock recovery mode configuration is completed. See Figure 7-4.

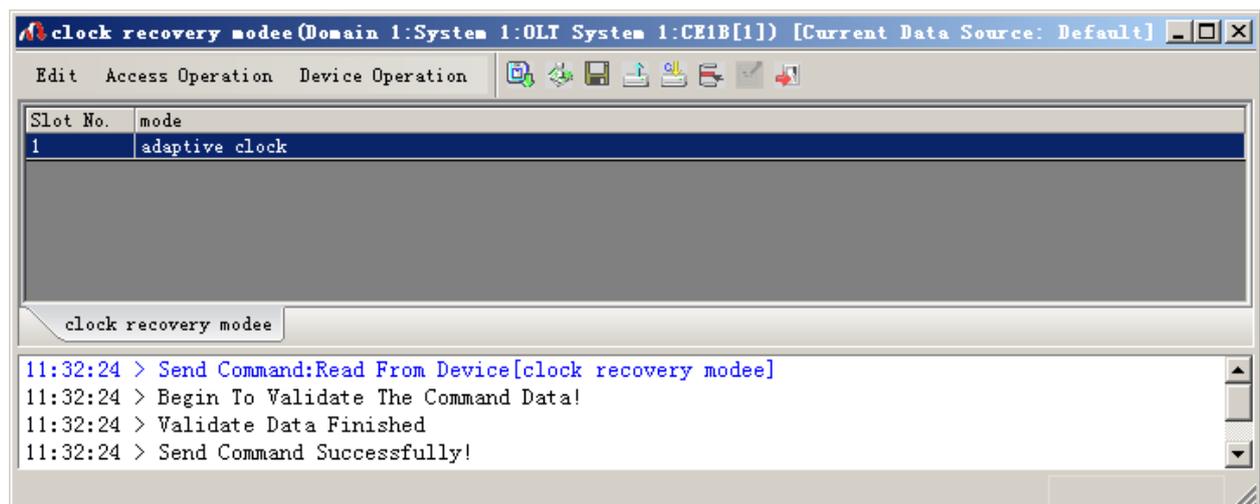


Figure 7-4 Completing the clock recovery mode configuration

## 7.7 Configuring the Bandwidth Allocation

### Configuration purpose

Configure the TDM service bandwidth to control the traffic flow.

### Operation steps

1. Click the **GC8B[15]** card in the **Object Tree** pane to display the ONUs under this card in the right pane. Then right-click the ONU of AN5506-06-E[3] and select **Config** → **Bandwidth Config** from the shortcut menu to access the bandwidth allocation configuration window.
2. The above operation brings up the **Bandwidth Config** dialog box. Click the right pane and select **Edit** → **Append** on the menu bar or directly click the  button on the toolbar. Either operation brings up the **Please Input the Rows for Add:** dialog box. Type **1** and click **OK** to add one bandwidth entry.
3. Configure according to the planned data in Table 7-2. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the bandwidth allocation configuration is completed. See Figure 7-5.

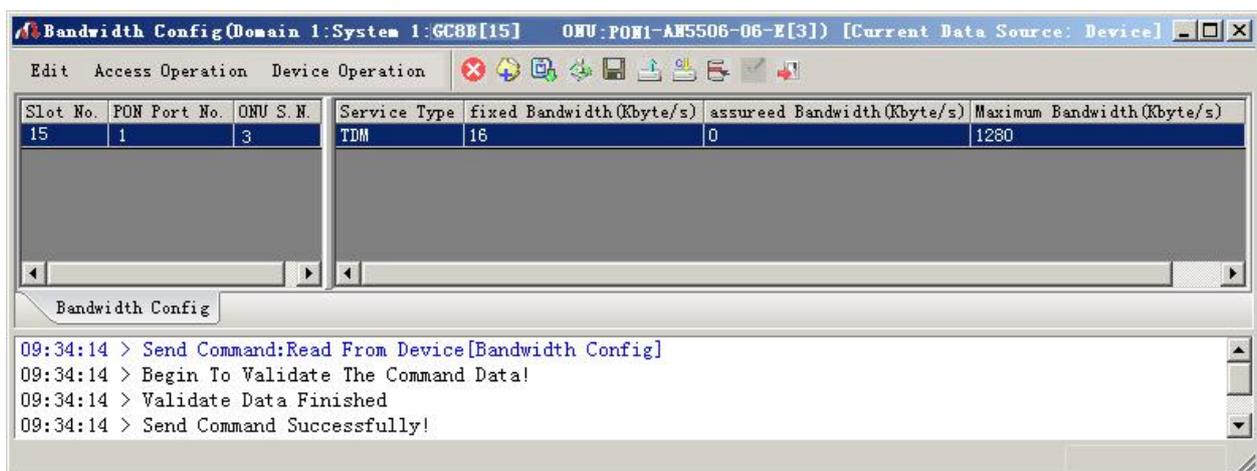


Figure 7-5 Completing the ONU bandwidth allocation configuration

## 7.8 Configuring the E1 Parameters for ONU Subscribers

### Configuration purpose

Bind the E1 port of the ONU with the corresponding E1 sequence No. of the TDM card, and configure the buffer of the remote and local end.

### Operation steps

1. Click the **GC8B[15]** card in the **Object Tree** pane to display the ONUs under this card in the right pane. Then right-click the ONU of AN5506-06-E[3], select **Config** → **Service Config** from the shortcut menu and select the **E1 Config** tab.
2. Configure according to the planned data in Table 7-2. Click the **Modify On Device** button after completing the configuration for the TDM service of AN5506-06-E. When the **Commande Manager** window displays **Command Succeed** for **Set User E1 Config** for the object **AN5506-06-E**, the E1 parameter configuration is completed, as shown in Figure 7-6.

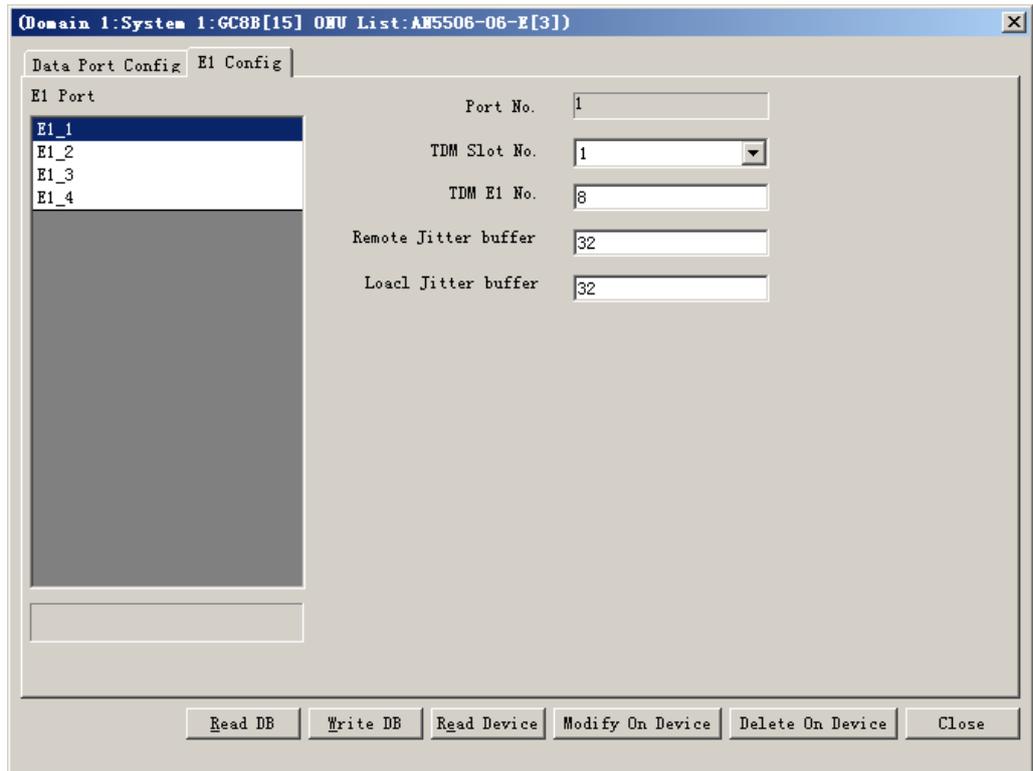


Figure 7-6 Completing the E1 parameter configuration

## 7.9 End of Configuration

After the above-mentioned configuration, the TDM service has been provisioned. Users can use the TDM service using the AN5506-06-E's E1 ports.



# 8      **Configuring the Wi-Fi Service**

---

This chapter introduces how to provision the Wi-Fi service on the AN5116-06B in details. It includes the following sections:

- Configuration rules
- Configuration example of the Wi-Fi service

## 8.1 Configuration Rules

- ◆ You should use the ONU with the Wi-Fi function to perform 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.

## 8.2 Configuration Example of the Wi-Fi Service

### 8.2.1 Service Network

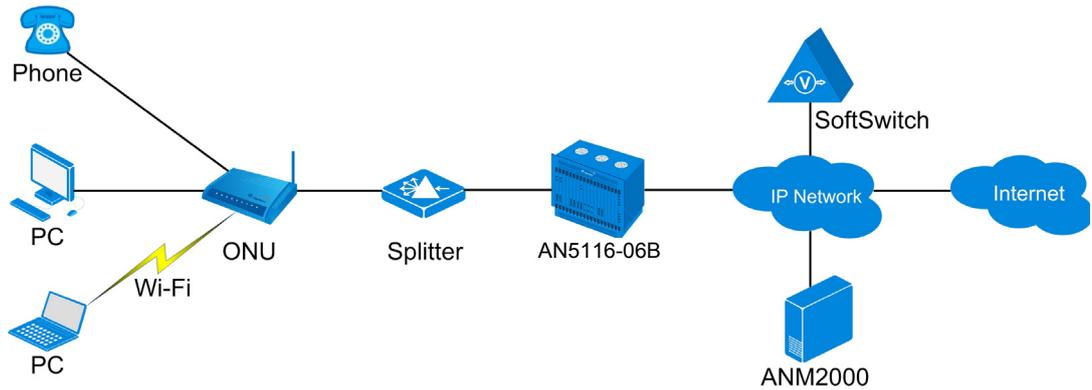


Figure 8-1 Wi-Fi service network

As shown in Figure 8-1, the mobile terminal equipment can access network using the Wi-Fi interface of the ONU. The network instruction is as follows:

#### ◆ Uplink

The ONU provides the integrated access service by connecting with the OLT equipment using the GPON interface.

#### ◆ Downlink

- ▶ 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.

## 8.2.2 Planning Data

The following takes provisioning the Wi-Fi service on the AN5506-04-G1 ONU as an example to illustrate the provision process and notes for the Wi-Fi service. The planned data is shown in Table 8-1.

Table 8-1 Planned data for configuring the Wi-Fi service

Item		Description	Example
ONU information	Slot No.	The slot number that is actually used by the GC8B card corresponding to the ONU	6
	PON Port No.	The PON port number corresponding to the ONU that is actually used.	1
	ONU No.	Configure according to the operator's network planning.	1
	ONU Type	The ONU type	AN5506-04-G1
Configuring a local service VLAN	Service Name	Configure according to the operator's network planning.	data
	Starting VLAN ID	The starting VLAN ID of the uplink port service. Configure according to the operator's network planning.	200
	VLAN ID End	The ending VLAN ID of the uplink port service. Configure according to the operator's network planning.	200
	Interface No.	Configure according to the uplink port number that is actually used.	19:SFP2
	TAG/UNTAG	The TAG processing mode of the uplink service VLAN. There are two options: <b>TAG</b> and <b>UNTAG</b> . <b>TAG</b> means that when the uplink data packet passes the port, its tag will not be stripped and it keeps going in the tagged mode. And for the downlink data packet, only the data packet in tagged mode will be accepted, and it keeps going in the tagged mode. <b>UNTAG</b> 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
	Service Type	Select <b>data</b> for the Wi-Fi service.	data
	Slot Bind Mode	Select <b>Auto Bind</b> or <b>Manually Bind</b> .	Auto Bind

Item		Description	Example
Configuring the GPON service bandwidth	Service Type	Select <b>data</b> for the Wi-Fi service.	data
	Fixed Bandwidth	The fixed bandwidth assigned to the ONU uplink service. If this service does not use this bandwidth resource, other services cannot occupy this resource. The default setting is 16.	16
	assured Bandwidth	The minimum bandwidth for provisioning the ONU uplink service. If this service does not use this bandwidth resource, other services can occupy this resource. The default setting is 0.	0
	Maximum Bandwidth	The maximum bandwidth assigned to the ONU uplink service. The sum of the fixed bandwidth and the assured bandwidth should not exceed the maximum bandwidth. The default setting is 64.	1280
Configuring the WAN connection service of the TL1 interface	WAN_Mode	Select <b>INTERNET</b> or the mode with INTERNET for the Wi-Fi service. Generally we recommend you to select <b>INTERNET</b> .	INTERNET
	WAN_Conn_Type	Select Bridge or Route according to the ISP requirement: Bridge: two-layer bridge connection mode; Route: three-layer route connection mode.	Route
	WAN_Vlan_Id	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
	WAN_Cos	The priority level of the 802.1p connected with this WAN within the value range 1 to 7.	1
Configuring the Wi-Fi service	IGD_WLAN_APMODULEEnable	Select <b>Enable</b> .	Enable
	IGD_WLAN_COUNTRY	The WLAN channel range. Select <b>ETSI</b> .	ETSI
	IGD_WLAN_CHANNEL	The serial number of the WLAN channel.	0
	IGD_WLAN_Standard	The WLAN specification supported by the equipment. Configure according to the operator's network planning.	802.11bgn

Item	Description	Example
SSID	The WLAN identifier. Configure according to the operator's network planning.	abc
IGD_WLAN_ENABLE	Select <b>Enable</b> .	Enable
IGD_WLAN_SSIDHide	Select whether to hide SSID.	Available
IGD_WLAN_Mode	Configure according to the operator's network planning.	WPAPSK
IGD_WLAN_EncrypTpe	Configure according to the operator's network planning.	TKIP
IGD_WLAN_PresharedKey	The WPA pre-shared key with an upper limit of 64 characters.	12345678
GD_WLAN_WPAReKeyInterval	The WPA key refresh interval; the unit is second.	86400

### 8.2.3 Configuration Flow

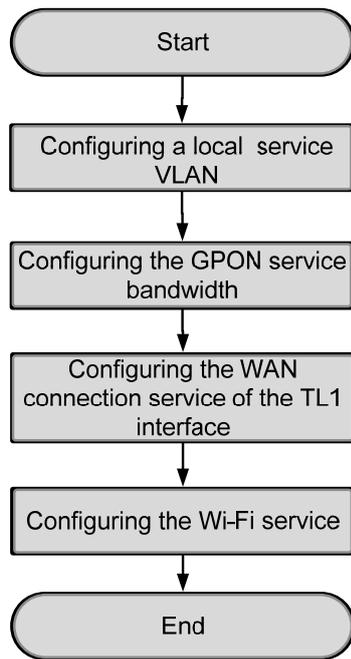


Figure 8-2 Flow chart for configuring the Wi-Fi service

## 8.2.4 Configuring the Local Service VLAN

### Configuration purpose

Configure the service VLAN of the uplink port to limit the service VLAN ID range that passes through the uplink port and to process the VLAN tag.

### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane and select **Config** → **Local VLAN** from the shortcut menu to bring up the configuration window. Then click the **Local End Service VLAN** tab to access the **Local End Service VLAN** window.
2. Select **Edit** → **Append** on the menu bar or directly click the  button. Either operation brings up the **Please Input the Rows for Add:** dialog box. Type **1** and click **OK** to add one local VLAN.
3. Configure the parameters according to the planned data in Table 8-1.
4. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the local end service VLAN configuration is completed. See Figure 8-3.

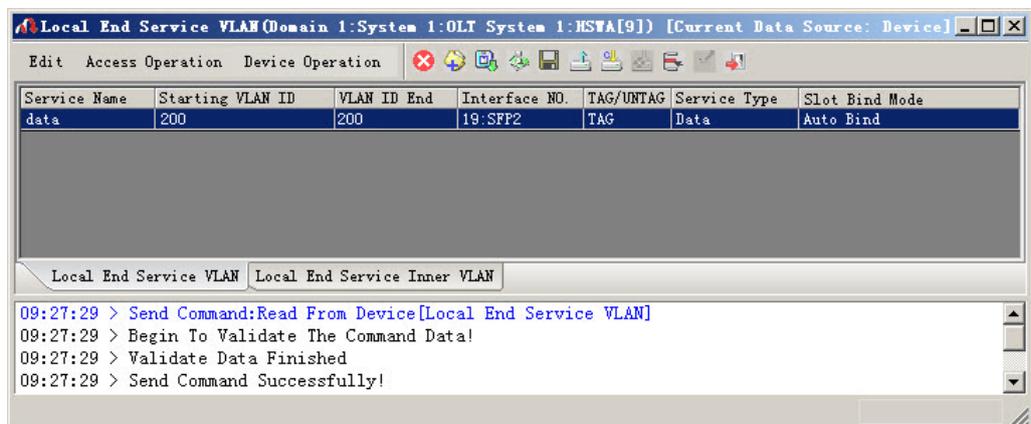


Figure 8-3 Configuring the local end service VLAN

## 8.2.5 Configuring the GPON Service Bandwidth

### Configuration purpose

Configure the bandwidth of the broadband internet service of the ONU to limit the service traffic flow.

### Operation steps

1. Click the **GC8B[6]** card in the **Object Tree** pane to display all the ONUs in the right pane. Right-click the **AN5506-04-G1** ONU and select **Config** → **GPON Service Bandwidth Config** from the shortcut menu to access the **GPON Service Bandwidth Config** window.
2. Select **Edit** → **Append** on the menu bar or directly click the  button. Either operation brings up the **Please Input the Rows for Add:** dialog box. Type **1** and click **OK**.
3. Configure the parameters according to the planned data in Table 8-1. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the GPON service bandwidth is configured. See Figure 8-4.

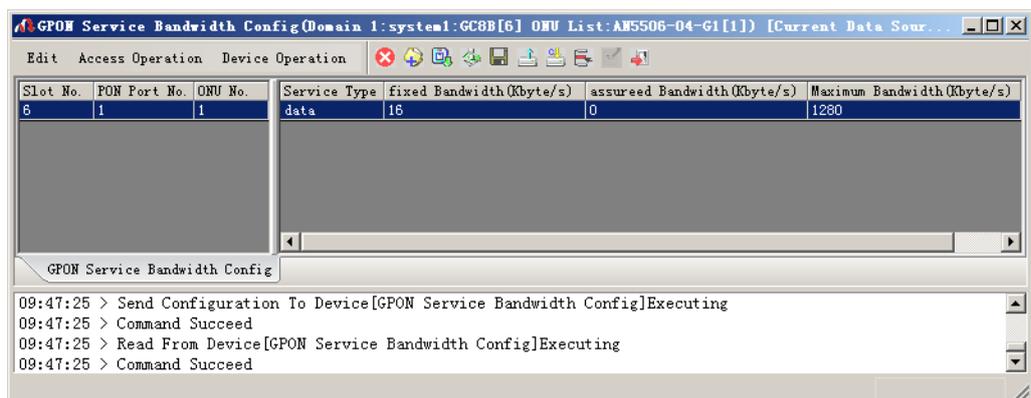


Figure 8-4 GPON service bandwidth

## 8.2.6 Configuring the WAN Connection Service of the TL1 Interface

### Interface

#### Configuration purpose

Configure the WAN parameters such as connection mode and type.

#### Operation steps

1. Click the **GC8B[6]** card in the **Object Tree** pane to display all ONUs in the right pane. Right-click the **AN5506-04-G1** ONU and select **Config** → **WAN Service** from the shortcut menu to access the **WAN Service** window.
2. Select **Edit** → **Append** on the menu bar or directly click the  button. Either operation brings up the **Please Input the Rows for Add:** dialog box. Type **1** and click **OK**.
3. Configure the parameters according to the planned data in Table 8-1. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the WAN connection service of the TL1 interface is configured. See Figure 8-5.

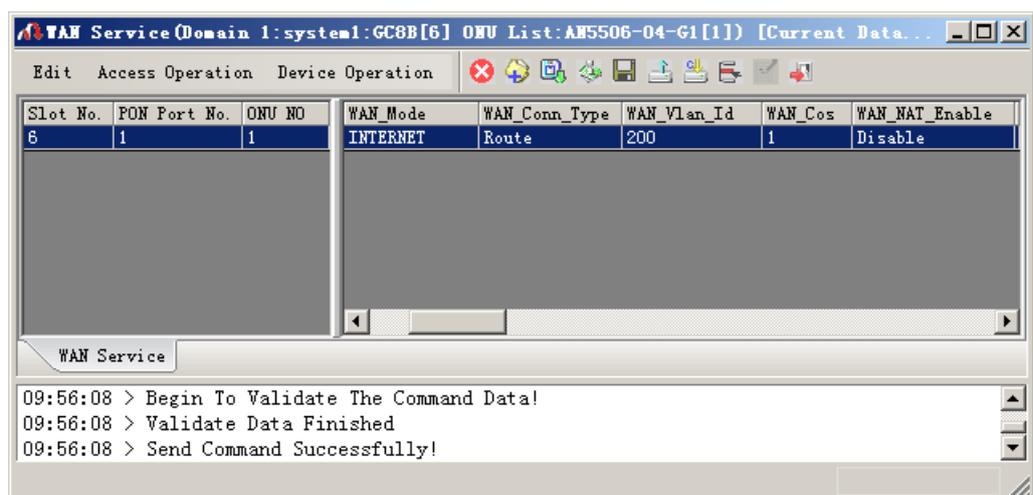


Figure 8-5 Configuring the WAN connection service of the TL1 interface

## 8.2.7 Configuring the Wi-Fi Service

### Configuration purpose

Configure the relevant parameters of the Wi-Fi service, including **SSID**, **IGD\_WLAN\_COUNTRY**, **IGD\_WLAN\_APModuleEnable**, etc.

### Operation steps

1. Click the **GC8B[6]** card in the **Object Tree** pane to display all ONUs in the right pane. Right-click the **AN5506-04-G1** ONU and select **Config** → **WiFi Service Config** from the shortcut menu to access the **WiFi Service Config** window.
2. Click the left pane and configure the parameters according to the planned data in Table 8-1.
3. Click the right pane and select **Edit** → **Append** on the menu bar or directly click the  button. Either operation brings up the **Please Input the Rows for Add:** dialog box. Type **1** and click **OK**.
4. Configure the parameters according to the planned data in Table 8-1. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the WiFi service configuration is completed. See Figure 8-6.

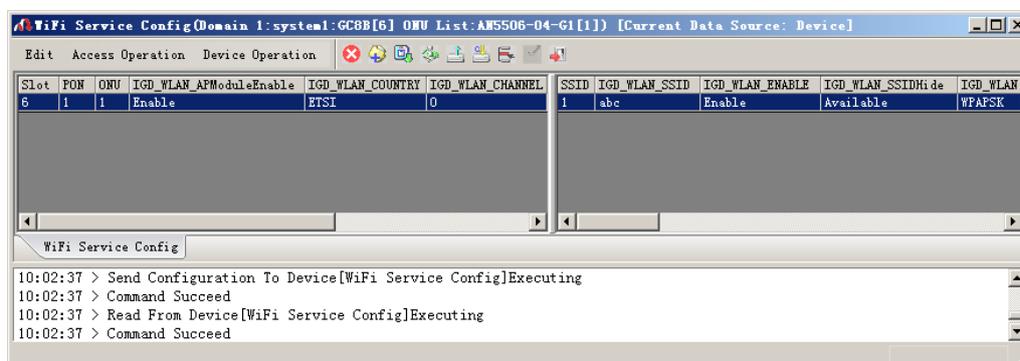


Figure 8-6 WiFi service configuration

## **8.2.8 End of Configuration**

Now you have completed the Wi-Fi service configuration based on the AN5506-04-G1 ONU. The mobile terminal can perform wireless connection with this ONU, and can access the Internet using this ONU.



# 9 Configuring the CATV Service

---

This chapter gives details on how to configure the CATV service using the AN5116-06B. And it includes the following sections:

- Configuration rules
- An example for the CATV service configuration

## 9.1 Configuration Rules

- ◆ To implement the the CATV function, an ONU with the CATV optical module is compulsory.
- ◆ By enabling / disabling the CATV service on the ONU, users can control the access of the CATV service.

## 9.2 An Example for the CATV Service Configuration

### 9.2.1 Service Network

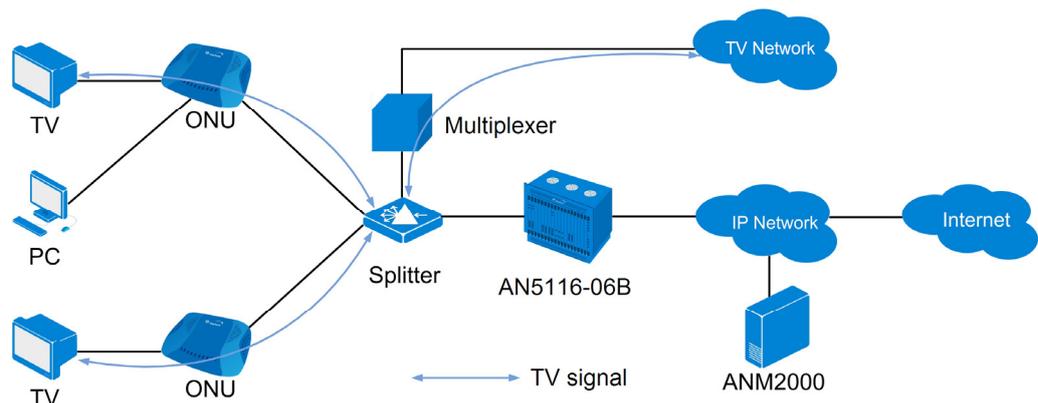


Figure 9-1 The CATV service network

As Figure 9-1 shows, 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.

### 9.2.2 Planning Data

In the following a CATV service using the AN5506-04-G1 ONU is used as an example to describe the detailed provisioning procedure of the CATV service. See Table 9-1 for the planned data.

Table 9-1 The planned data of the CATV service

Item		Description	Example
ONU information	Slot No.	The slot number of the corresponding GC8B card of the ONU.	6
	PON No.	The actual number of the corresponding PON of the ONU.	1
	ONU authorization No.	Configured according to the network planning of the operator.	1
	ONU type	The type of the ONU.	AN5506-04-G1
CATV configuration	CATV Enable / Disable	Enable the CATV service.	Enable

### 9.2.3 Configuring the CATV Service

#### Configuration example

1. Click the GC8B[6] card in the **Object Tree** pane and all ONUs listed under the GC8B[6] card are displayed in the right pane. Right-click the AN5506-04-G1 ONU and select **Service Config** → **User Service Config** from the shortcut menu and then click the **CATV Config** tab in the **ONU Port Service Config** dialog box.

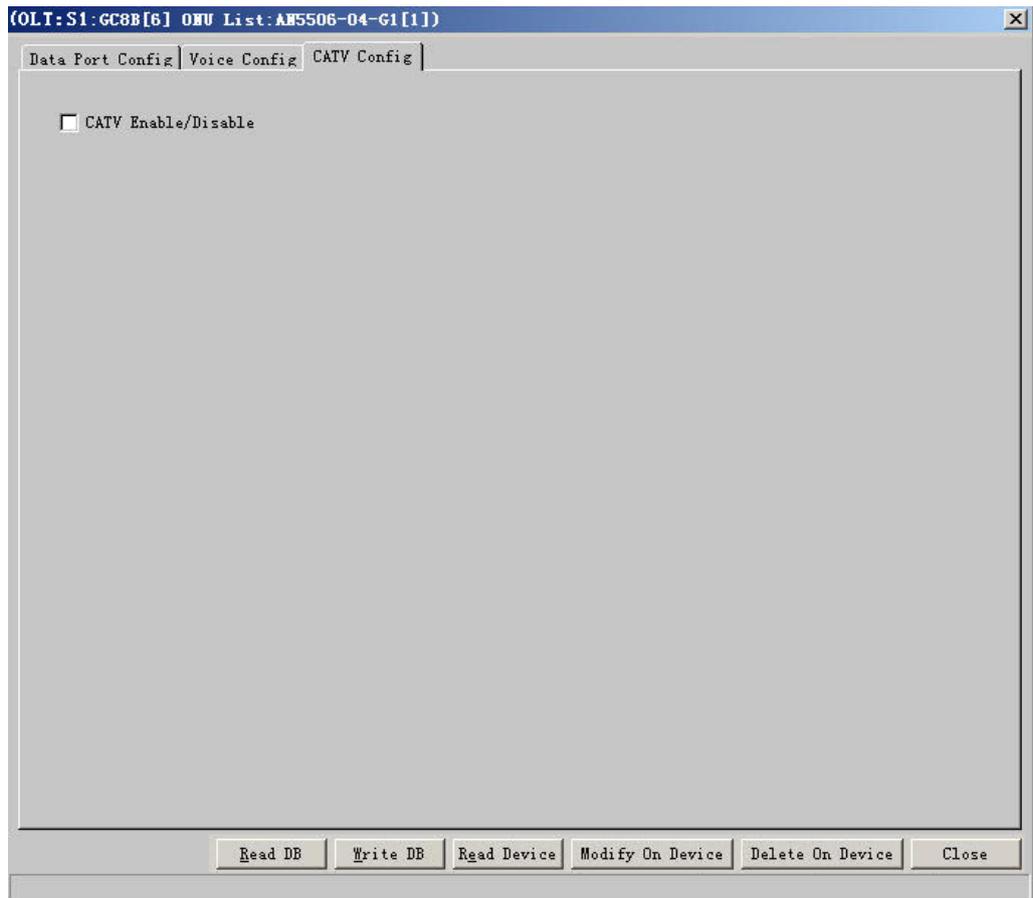


Figure 9-2 The CATV service configuration

2. Select the **CATV Enable / Disable** check box and click the **Modify on Device** button to complete the CATV service configuration. See Figure 9-3.

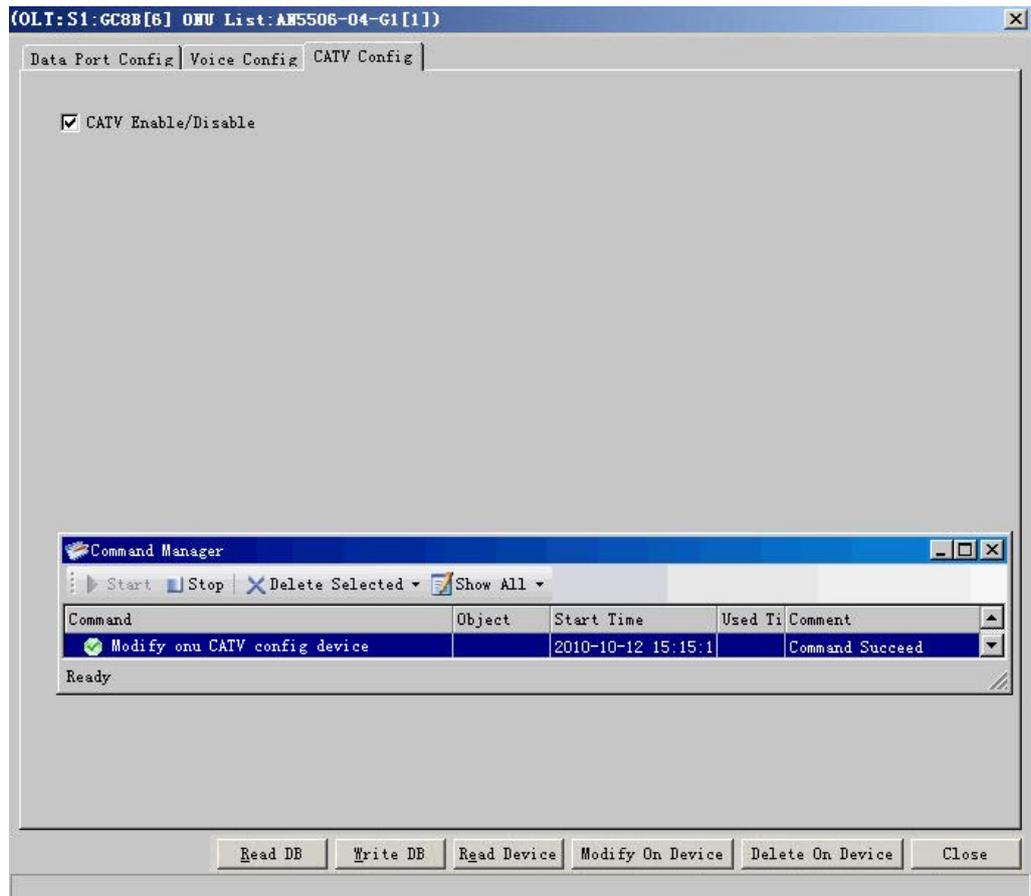


Figure 9-3 CATV service configuration – completed

Now the CATV service provisioning is completed. The CATV service is available as soon as the coaxial cable interface of the AN5506-04-G1 is connected.



# 10 Upgrading the Software

---

This chapter introduces the important notice, upgrading rules, planned data and upgrading steps. It includes the following sections:

- Important notice
- Upgrading the core switch card
- Upgrading the GPON interface card / TDM interface card / public card
- Upgrading the GPON interface card in a batch manner
- Upgrading the ONU manually
- Upgrading the ONU automatically

## 10.1 Important Notice

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.
- ◆ The manual and automatic upgrading should not be operated simultaneously on the GPON interface card of one slot.
- ◆ After upgrading the ONU automatically, the system will reboot the ONU.

## 10.2 Upgrading the Core Switch Card

### 10.2.1 Upgrading Rules

- ◆ If you only configure one core switch card, you need to reboot the entire system after upgrading the core switch card, which will impact the service. It is recommended to add a standby card first and then to upgrade the core switch card software.
- ◆ If you have configured the active and the standby core switch cards, 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.

### 10.2.2 Prerequisites

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.

During the upgrading and the backing up, the WFTP software should always be open.

## 10.2.3 Planning Data

This section takes upgrading the active and standby core switch cards as an example to introduce the entire steps.

Table 10-1 Planned data for upgrading the core switch card

Item	Explanation	Example
Relevant parameters of the cared to be upgraded	Configure according to the actual situation.	The HSWA card (active) in Slot 9; the HSWA card (standby) in Slot 10.
File Type	Select core switch card.	core switch card software
FTP Server IP	Configure according to the actual situation.	10.92.20.168
User Name	Configure according to the actual situation.	1
Password	Configure according to the actual situation.	1
File Name in backing up the configuration data	Configure according to the plan of operators. The file name should be no more than 20 characters.	20100618.txt
File Name in backing up the system software	Configure according to the plan of operators. The file name should be no more than 20 characters.	beifen.txt
File Name in upgrading the core control card software	Configure according to the plan of operators. The file name should be no more than 20 characters.	hswa.bin

## 10.2.4 Upgrading Flow Chart

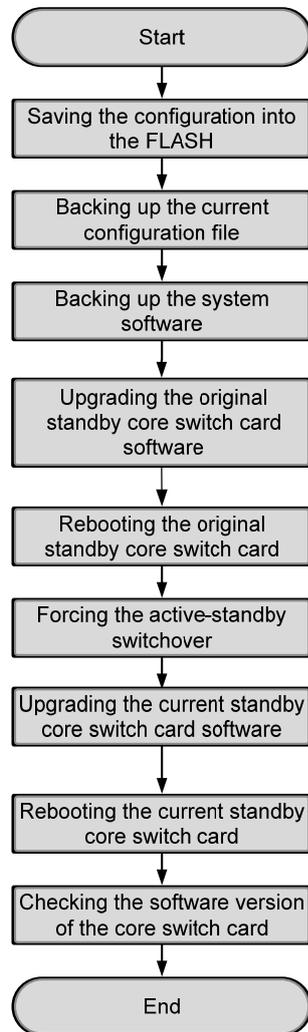


Figure 10-1 Flow chart for upgrading the core control card software

## 10.2.5 Saving the Current Configuration into the Flash

### Configuration purpose

Save the current configuration data into the flash in case that the equipment is disconnected with power leading to the loss of configuration data.

## Operation steps

1. Right-click **HSWA[9]** in the **Object Tree** pane and select **Control Command** → **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 10-2.

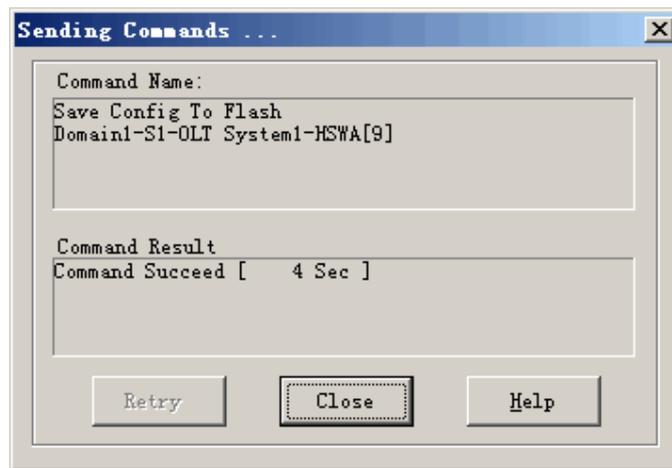


Figure 10-2 Saving the current configuration into the flash

## 10.2.6 Backing Up the Current Configuration File

### Configuration purpose

Back up all the current configuration files because you might want to use it for a restore in the case that the upgrading would fail.

### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane and select **Control Command** → **Export Config** from the shortcut menu to bring up the **Export Config File** dialog box.
2. In the **Export Config File** dialog box, configure according to the planned data in Table 10-1.

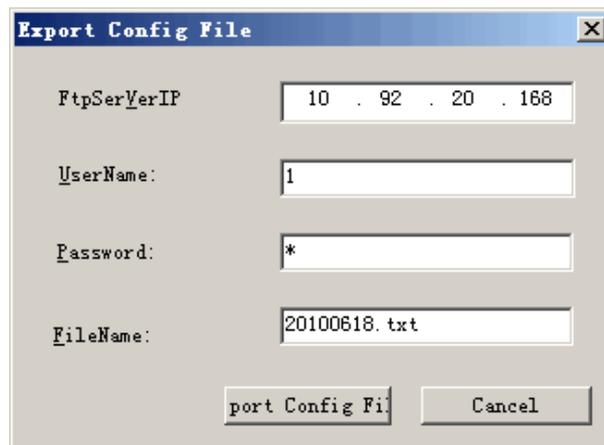


Figure 10-3 Backing up the current configuration

3. Click the **Export Config File** button, the system will prompt **Export Config File Successfully**. Click the **OK** button.

## 10.2.7 Backing Up the System Software

### Configuration purpose

Back up all the current system software because you might want to use it for a restore in the case that the upgrading would fail.

### Configuration steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane and select **Control Command** → **Backup Software** from the shortcut menu. This operation will bring up the **Backup System Software** dialog box.
2. In the **Backup System Software** dialog box, configure according to the planned data in Table 10-1.

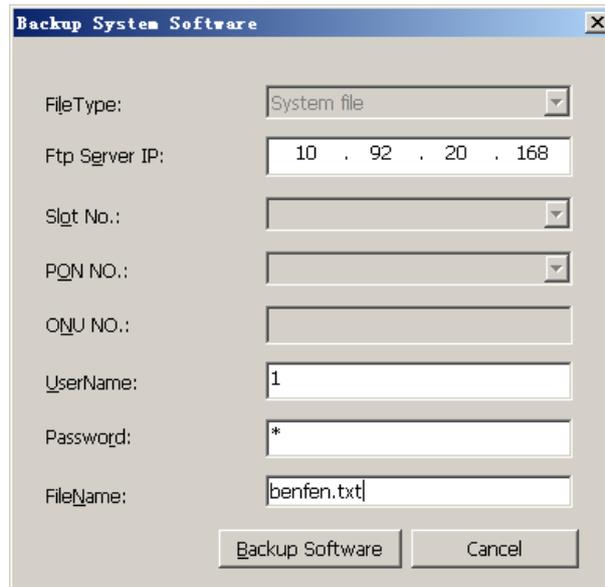


Figure10-4 Backing up the current configuration

3. Click the **Backup Software** button to complete the backing up.

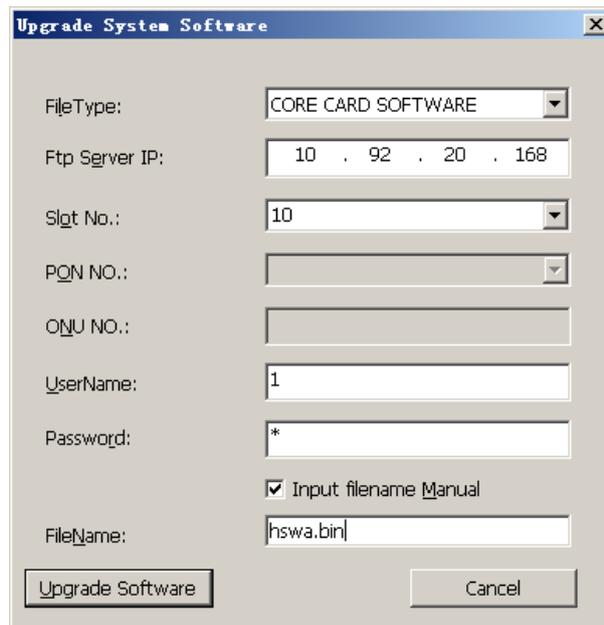
## 10.2.8 Upgrading the Original Standby Core Switch Card Software

### Configuration purpose

Upgrade the original standby core switch card software.

### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane and select **Control Command** → **Upgrade Software** from the shortcut menu. This operation will bring up the **Upgrade System Software** dialog box.
2. Enter the **Upgrade System Software** dialog box, and configure according to the planned data in Table 10-1.



Upgrade System Software

FileType: CORE CARD SOFTWARE

Ftp Server IP: 10 . 92 . 20 . 168

Slot No.: 10

PON NO.:

ONU NO.:

UserName: 1

Password: \*

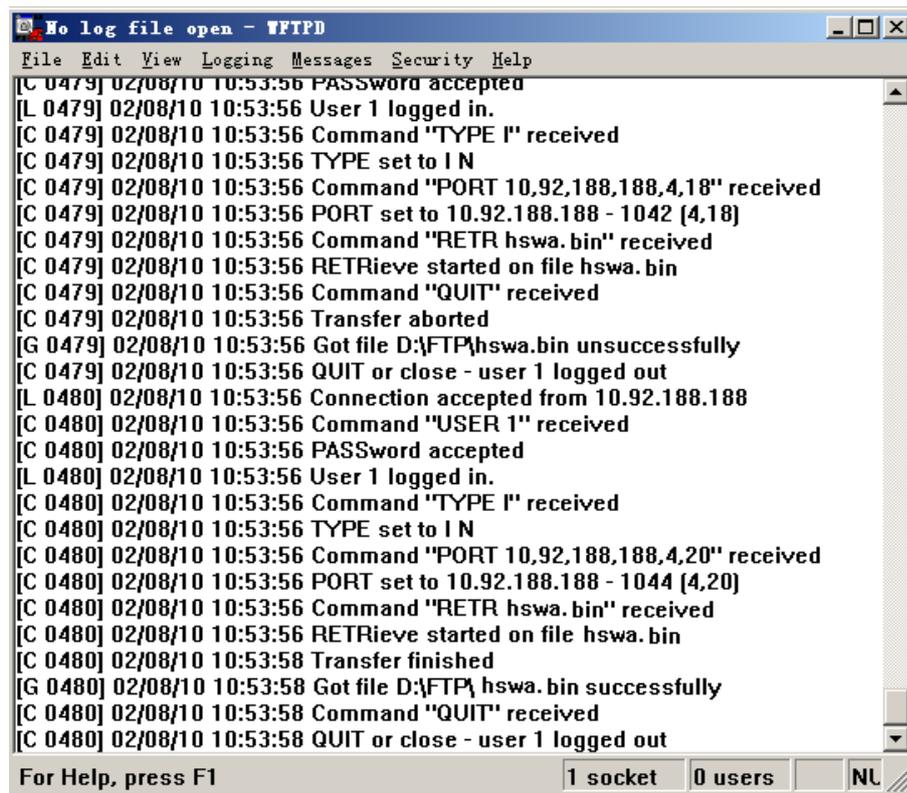
Input filename Manual

FileName: hswa.bin

Upgrade Software Cancel

Figure 10-5 Upgrading the original standby core switch 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 Figure 10-6.



```
No log file open - WFTPD
File Edit View Logging Messages Security Help
[C 0479] 02/08/10 10:53:56 PASSword accepted
[L 0479] 02/08/10 10:53:56 User 1 logged in.
[C 0479] 02/08/10 10:53:56 Command "TYPE I" received
[C 0479] 02/08/10 10:53:56 TYPE set to I N
[C 0479] 02/08/10 10:53:56 Command "PORT 10,92,188,188,4,18" received
[C 0479] 02/08/10 10:53:56 PORT set to 10.92.188.188 - 1042 [4,18]
[C 0479] 02/08/10 10:53:56 Command "RETR hswa.bin" received
[C 0479] 02/08/10 10:53:56 RETRIEve started on file hswa.bin
[C 0479] 02/08/10 10:53:56 Command "QUIT" received
[C 0479] 02/08/10 10:53:56 Transfer aborted
[G 0479] 02/08/10 10:53:56 Got file D:\FTP\hswa.bin unsuccessfully
[C 0479] 02/08/10 10:53:56 QUIT or close - user 1 logged out
[L 0480] 02/08/10 10:53:56 Connection accepted from 10.92.188.188
[C 0480] 02/08/10 10:53:56 Command "USER 1" received
[C 0480] 02/08/10 10:53:56 PASSword accepted
[L 0480] 02/08/10 10:53:56 User 1 logged in.
[C 0480] 02/08/10 10:53:56 Command "TYPE I" received
[C 0480] 02/08/10 10:53:56 TYPE set to I N
[C 0480] 02/08/10 10:53:56 Command "PORT 10,92,188,188,4,20" received
[C 0480] 02/08/10 10:53:56 PORT set to 10.92.188.188 - 1044 [4,20]
[C 0480] 02/08/10 10:53:56 Command "RETR hswa.bin" received
[C 0480] 02/08/10 10:53:56 RETRIEve started on file hswa.bin
[C 0480] 02/08/10 10:53:58 Transfer finished
[G 0480] 02/08/10 10:53:58 Got file D:\FTP\ hswa.bin successfully
[C 0480] 02/08/10 10:53:58 Command "QUIT" received
[C 0480] 02/08/10 10:53:58 QUIT or close - user 1 logged out

For Help, press F1      1 socket  0 users  NL
```

Figure 10-6 Ftp – upgrading the 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 10-7.

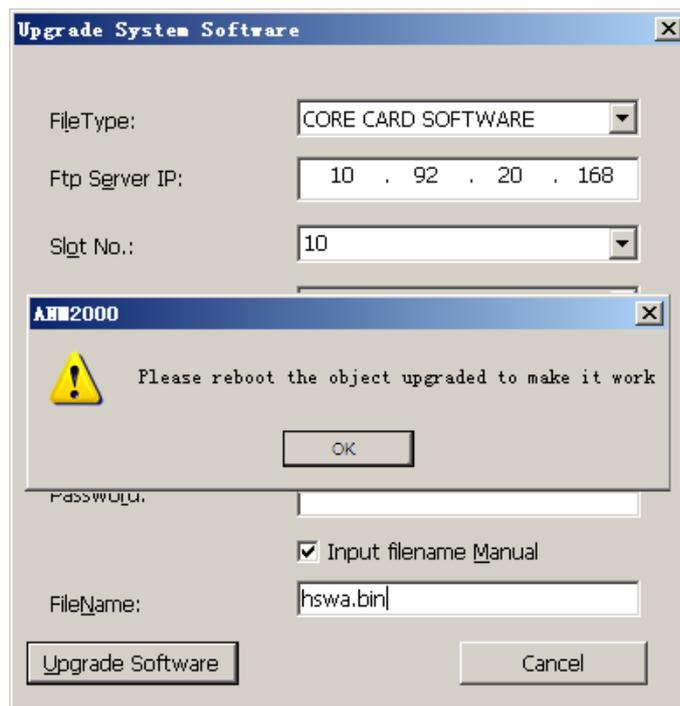


Figure 10-7 Upgrading the core switch card successfully

## 10.2.9 Rebooting the Original Standby Core Switch Card

### Configuration purpose

Reboot the original standby core switch card.

### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane and select **Control Command** → **Reset Standby HSWA** from the shortcut menu. This operation will bring up the **Sending Commands...** dialog box, as shown in Figure 10-8.

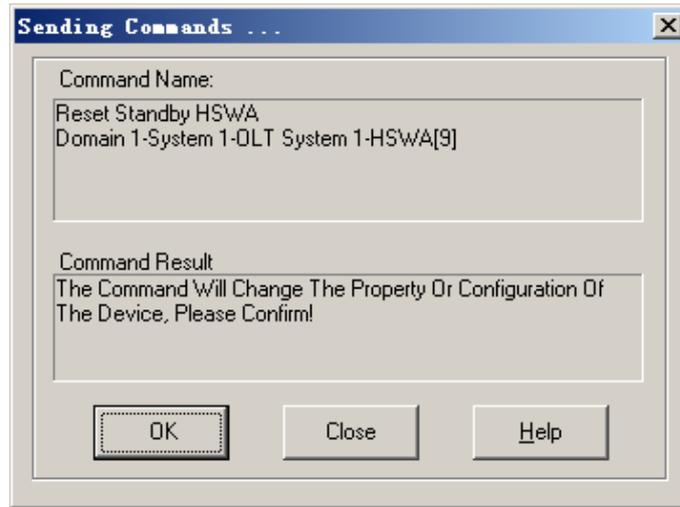


Figure 10-8 Reset the standby card – the **Sending Commands** dialog box

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.

## 10.2.10 Forcing the Active-standby Switchover

### Configuration purpose

Switch the active card and the standby card, that is, the original active card acts as the standby card while the original standby card acts as the active card.

### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane and select **Control Command** → **Force Switch** from the shortcut menu. This operation will bring up the **Sending Commands...** dialog box, as shown in Figure 10-9.

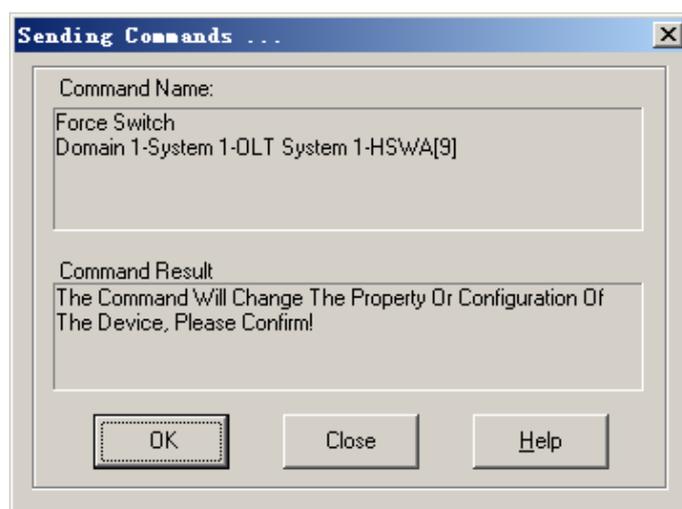


Figure10-9 Forcing the active-standby switchover - the **Sending Commands** dialog box

2. Click the **OK** button. Then wait a few seconds, it will show the **Command Succeed** of the **Command Result**, indicating that the active-standby switchover is successful. In this case, the HSWA card in Slot 9 is standby card, and the HSWA card in Slot 10 is the active card.

## 10.2.11 Upgrading the Current Standby Core Switch Card Software

Configuration purpose

Upgrade the current standby core switch card software.

Operation steps

1. Right-click the **HSWA[10]** card in the **Object Tree** pane and select **Control Command** → **Upgrade Software** from the shortcut menu. This operation will bring up the **Upgrade System Software** dialog box.
2. Enter the **Upgrade System Software** dialog box, and configure according to the planned data in Table 10-1.

**Note:**

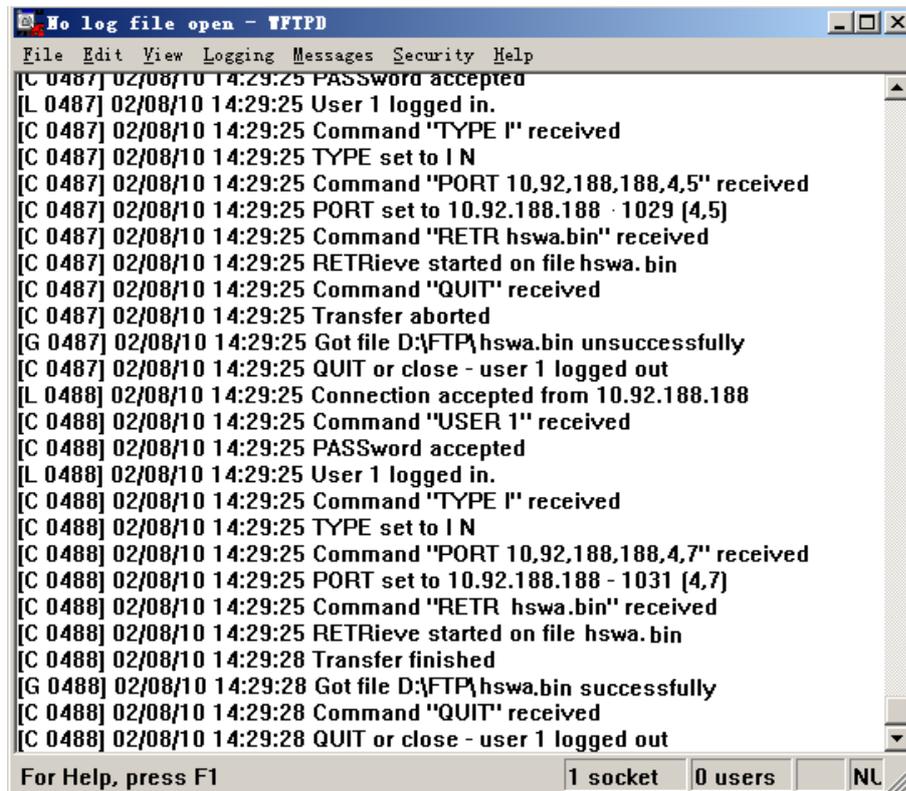
The HSWA card in Slot 9 is the standby card, so you should select **9** for the **Slot No.**

The screenshot shows a dialog box titled "Upgrade System Software". It contains the following fields and controls:

- FileType:** A dropdown menu with "CORE CARD SOFTWARE" selected.
- Ftp Server IP:** A text box containing "10 . 92 . 20 . 168".
- Slot No.:** A dropdown menu with "9" selected.
- PON NO.:** A dropdown menu.
- ONU NO.:** A text box.
- UserName:** A text box containing "1".
- Password:** A text box containing "\*".
- Input filename Manual
- FileName:** A text box containing "hswa.bin".
- Buttons: "Upgrade Software" and "Cancel".

Figure 10-10 Upgrading the standby core switch card software

3. After completing the parameter 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 Figure 10-11.



The screenshot shows a window titled "No log file open - WFTPD" with a menu bar (File, Edit, View, Logging, Messages, Security, Help). The main area contains a list of FTP session logs. The first session (0487) shows a user logging in, setting the type to I N, and attempting to retrieve the file hswa.bin, but the transfer is aborted. The second session (0488) shows a user logging in, setting the type to I N, and successfully retrieving the file hswa.bin. The status bar at the bottom indicates "For Help, press F1", "1 socket", "0 users", and "NL".

```
[C 0487] 02/08/10 14:29:25 Password accepted
[L 0487] 02/08/10 14:29:25 User 1 logged in.
[C 0487] 02/08/10 14:29:25 Command "TYPE I" received
[C 0487] 02/08/10 14:29:25 TYPE set to I N
[C 0487] 02/08/10 14:29:25 Command "PORT 10,92,188,188,4,5" received
[C 0487] 02/08/10 14:29:25 PORT set to 10.92.188.188 - 1029 [4,5]
[C 0487] 02/08/10 14:29:25 Command "RETR hswa.bin" received
[C 0487] 02/08/10 14:29:25 RETRIEve started on file hswa.bin
[C 0487] 02/08/10 14:29:25 Command "QUIT" received
[C 0487] 02/08/10 14:29:25 Transfer aborted
[G 0487] 02/08/10 14:29:25 Got file D:\FTP\hswa.bin unsuccessfully
[C 0487] 02/08/10 14:29:25 QUIT or close - user 1 logged out
[L 0488] 02/08/10 14:29:25 Connection accepted from 10.92.188.188
[C 0488] 02/08/10 14:29:25 Command "USER 1" received
[C 0488] 02/08/10 14:29:25 Password accepted
[L 0488] 02/08/10 14:29:25 User 1 logged in.
[C 0488] 02/08/10 14:29:25 Command "TYPE I" received
[C 0488] 02/08/10 14:29:25 TYPE set to I N
[C 0488] 02/08/10 14:29:25 Command "PORT 10,92,188,188,4,7" received
[C 0488] 02/08/10 14:29:25 PORT set to 10.92.188.188 - 1031 [4,7]
[C 0488] 02/08/10 14:29:25 Command "RETR hswa.bin" received
[C 0488] 02/08/10 14:29:25 RETRIEve started on file hswa.bin
[C 0488] 02/08/10 14:29:28 Transfer finished
[G 0488] 02/08/10 14:29:28 Got file D:\FTP\hswa.bin successfully
[C 0488] 02/08/10 14:29:28 Command "QUIT" received
[C 0488] 02/08/10 14:29:28 QUIT or close - user 1 logged out
```

Figure 10-11 Ftp – upgrading the 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 10-12.

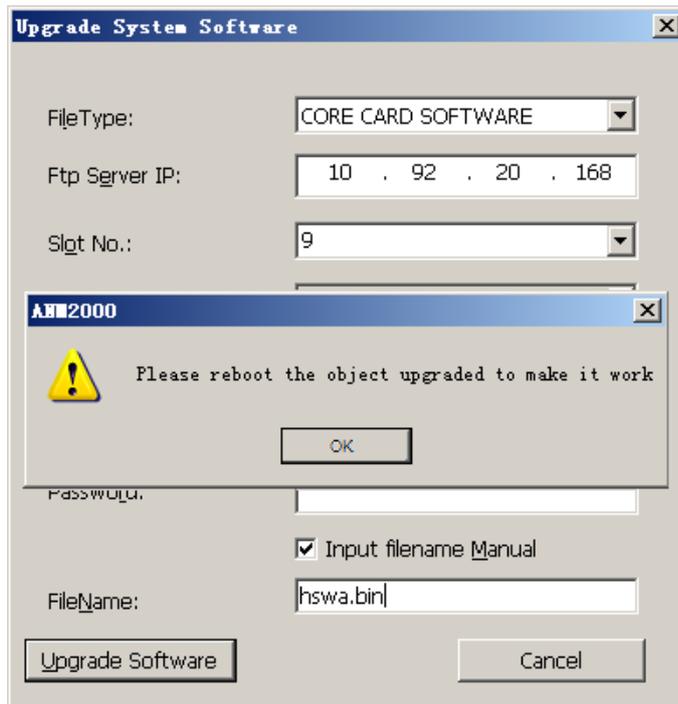


Figure 10-12 Upgrading the core switch card successfully

## 10.2.12 Rebooting the Current Standby Core Switch Card

### Configuration purpose

Reboot the current standby core switch card.

### Operation steps

1. Right-click the **HSWA[10]** card in the **Object Tree** pane and select **Control Command** → **Reset Standby HSWA** from the shortcut menu. This operation will bring up the **Sending Commands...** dialog box, as shown in Figure 10-13.

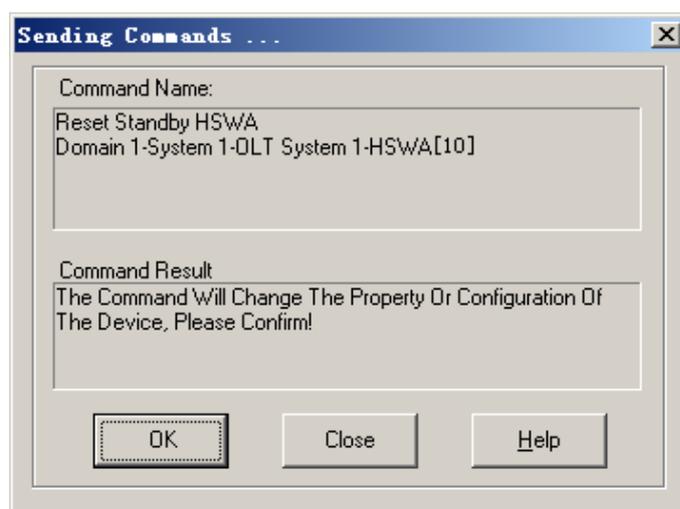


Figure 10-13 Reset the standby card

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.

## 10.2.13 Checking the Software Version of the Core Switch Card

### Configuration purpose

Check the software version of the core switch card to see if the core switch card is successfully upgraded.

### Operation steps

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. Enter the **Version of Card** window, and you can see the software version of the cards in each slot. Check if the software version of the core switch card in Slots 9 and 10 are desired, as shown in Figure 10-14.

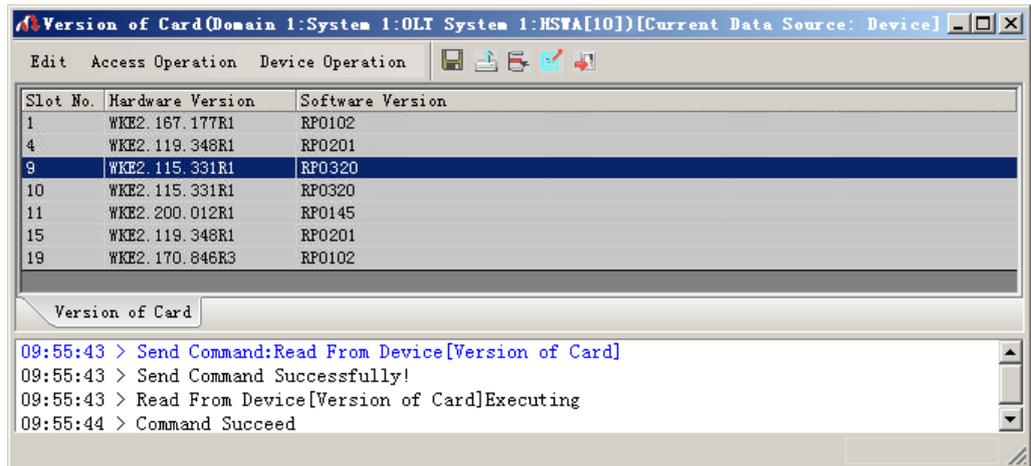


Figure 10-14 Check the card software version

## 10.3 Upgrading the GPON Interface Card / TDM Interface Card / Public Card

### 10.3.1 Upgrading Rules

If the upgrade object is the software of the GPON interface card, the card will be automatically rebooted after a successful upgrade and need no manual reboot. The automatic reboot of the interface card 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 **HSWA[9]** in the **Object Tree** window, and select **Control Command** → **Reboot the Appointed Device**. In the **Reboot the Appointed Device** window, select the card that needs to be rebooted to reboot.

---

### 10.3.2 Prerequisites

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.

During the upgrading and the backing up, the WFTP software should be always open.

### 10.3.3 Planning Data

The planned data for upgrading the GPON interface card are listed in Table 10-2.

Table 10-2 Planned data for upgrading the GPON interface card

Item	Description	Example
Parameters of the card to be upgraded	Configure according to the actual situation	The GC4B card in Slot 15
Download file type	The emerge file of the GPON interface card's CPU and the firmware	PON interface card software
FTP server IP	Configure according to the actual situation	10.92.20.168
FTP server username	Configure according to the actual situation	1
FTP server password	Configure according to the actual situation	1
File name	Configure according to the actual situation, and characters of the filename cannot exceed 20.	gc4c_1221v1.gz

### 10.3.4 Upgrading Flow Chart

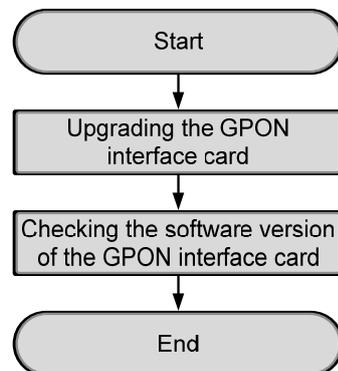


Figure 10-15 Flow chart for upgrading flow chart for the GPON interface card software

## 10.3.5 Upgrading the GPON Interface Card

Configuration purpose

Upgrade the GPON interface card.

Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, and select **Control Command** → **Upgrade Software** from the shortcut menu.
2. Enter the **Upgrade System Software** dialog box, and configure according to the planned data in Table 10-2.

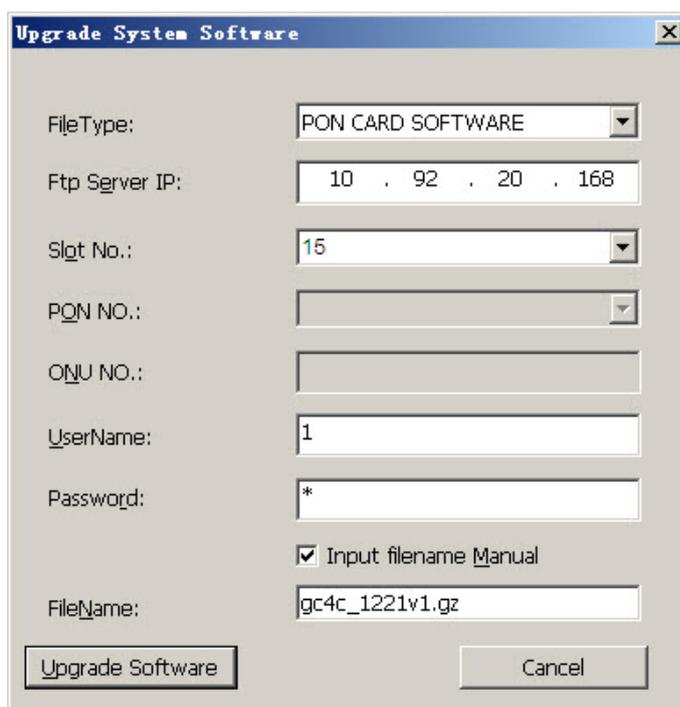


Figure 10-16 Upgrading the GPON interface card software

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 Figure 10-17.

```

File Edit View Logging Messages Security Help
[C 0481] 02/08/10 10:56:45 Password accepted
[L 0481] 02/08/10 10:56:45 User 1 logged in.
[C 0481] 02/08/10 10:56:45 Command "TYPE I" received
[C 0481] 02/08/10 10:56:45 TYPE set to I N
[C 0481] 02/08/10 10:56:45 Command "PORT 10,92,188,188,4,22" received
[C 0481] 02/08/10 10:56:45 PORT set to 10.92.188.188 - 1046 (4,22)
[C 0481] 02/08/10 10:56:45 Command "RETR gc4c_1221v1.gz" received
[C 0481] 02/08/10 10:56:45 RETRIEve started on file gc4c_1221v1.gz
[C 0481] 02/08/10 10:56:45 Command "QUIT" received
[C 0481] 02/08/10 10:56:45 Transfer aborted
[G 0481] 02/08/10 10:56:45 Got file D:\FTP\gc4c_1221v1.gz unsuccessfully
[C 0481] 02/08/10 10:56:45 QUIT or close - user 1 logged out
[L 0482] 02/08/10 10:56:45 Connection accepted from 10.92.188.188
[C 0482] 02/08/10 10:56:45 Command "USER 1" received
[C 0482] 02/08/10 10:56:45 Password accepted
[L 0482] 02/08/10 10:56:45 User 1 logged in.
[C 0482] 02/08/10 10:56:45 Command "TYPE I" received
[C 0482] 02/08/10 10:56:45 TYPE set to I N
[C 0482] 02/08/10 10:56:45 Command "PORT 10,92,188,188,4,24" received
[C 0482] 02/08/10 10:56:45 PORT set to 10.92.188.188 - 1048 (4,24)
[C 0482] 02/08/10 10:56:45 Command "RETR gc4c_1221v1.gz" received
[C 0482] 02/08/10 10:56:45 RETRIEve started on file gc4c_1221v1.gz
[C 0482] 02/08/10 10:56:46 Transfer finished
[G 0482] 02/08/10 10:56:46 Got file D:\FTP\gc4c_1221v1.gz successfully
[C 0482] 02/08/10 10:56:46 Command "QUIT" received
[C 0482] 02/08/10 10:56:46 QUIT or close - user 1 logged out
For Help, press F1      1 socket      0 users      NL

```

Figure 10-17 Ftp – upgrading an individual card

## 10.3.6 Checking the Software Version of the GPON Interface Card

### Configuration purpose

Check the software version of the GPON interface card to see if the GPON interface card is successfully upgraded.

### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane and select **Get Information** → **Card Version** from the shortcut menu.
2. Enter the **Version of Card** window, and you can see the software version of the cards in each slot. Check if the software version of the GC4B card in Slot 15 is desired, as shown in Figure 10-18.

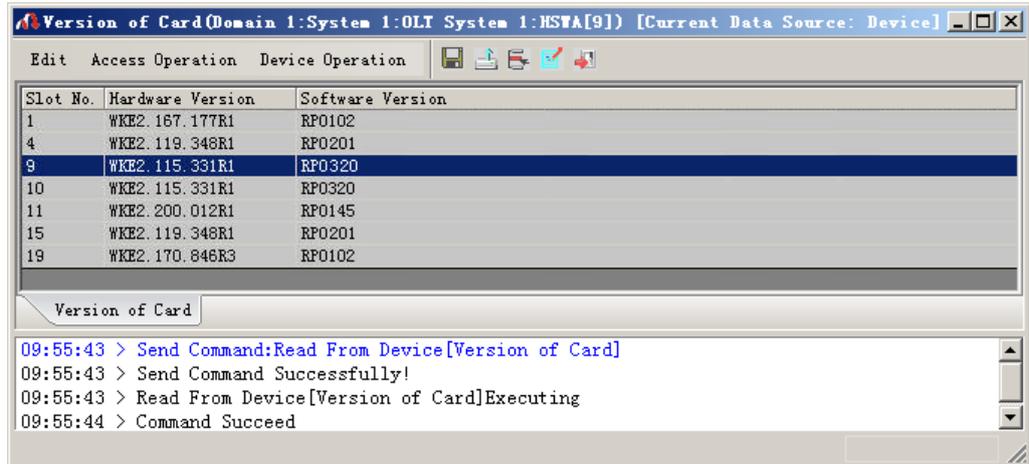


Figure 10-18 Check the card software version

## **10.4 Upgrading the GPON Interface Card in a Batch Manner**

### **10.4.1 Upgrading Rules**

If the upgrade object is the software of the GPON interface card, the card will be automatically rebooted after a successful upgrade and need no manual reboot. The automatic reboot of the interface card can cause an interruption of services.

### **10.4.2 Prerequisites**

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.

During the upgrading and the backing up, the WFTP software should always be open.

### 10.4.3 Planning Data

The planned data for upgrading the GPON interface card is shown in Table 10-3.

Table 10-3 Planned data for upgrading the GPON interface card

Item	Explanation	Example
Parameters of the card to be upgraded	Configure according to the actual situation	The GC4B card in Slots 4 and 15
Download file type	The emerge file of the GPON interface card's CPU and the firmware	PON interface card software
FTP Server IP	Configure according to the actual situation	10.92.20.168
FTP server username	Configure according to the actual situation	1
FTP server password	Configure according to the actual situation	1
File Name	Configure according to the actual situation, and characters of the filename cannot exceed 20.	gc4c_1221v1.gz

### 10.4.4 Upgrading Flow Chart

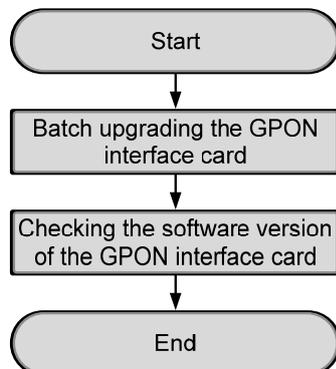


Figure 10-19 Flow chart for upgrading flow chart for the GPON interface card software

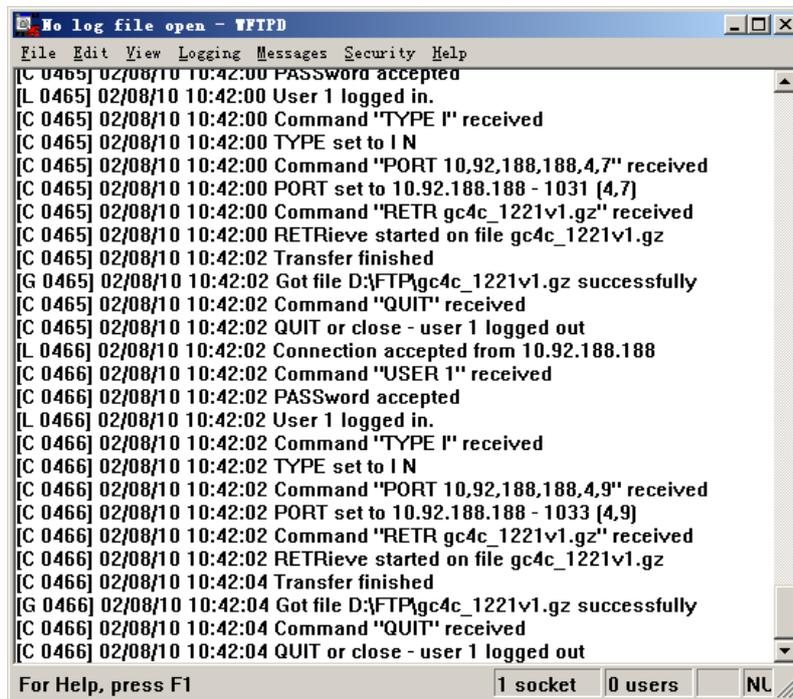
## 10.4.5 Upgrading the GPON Interface Card in a Batch Manner

### Configuration purpose

Upgrade the GPON interface card in a batch manner.

### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, and select **Control Command** → **Batch Upgrade Line Card** from the shortcut menu.
2. Enter the **Batch Upgrade Line Card** dialog box, and configure according to the planned data in Table 8-3. 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 Figure 10-20.



```

No log file open - WFTP
File Edit View Logging Messages Security Help
[C 0465] 02/08/10 10:42:00 PASSword accepted
[L 0465] 02/08/10 10:42:00 User 1 logged in.
[C 0465] 02/08/10 10:42:00 Command "TYPE I" received
[C 0465] 02/08/10 10:42:00 TYPE set to I N
[C 0465] 02/08/10 10:42:00 Command "PORT 10,92,188,188,4,7" received
[C 0465] 02/08/10 10:42:00 PORT set to 10.92.188.188 - 1031 [4,7]
[C 0465] 02/08/10 10:42:00 Command "RETR gc4c_1221v1.gz" received
[C 0465] 02/08/10 10:42:00 RETRIEve started on file gc4c_1221v1.gz
[C 0465] 02/08/10 10:42:02 Transfer finished
[G 0465] 02/08/10 10:42:02 Got file D:\FTP\gc4c_1221v1.gz successfully
[C 0465] 02/08/10 10:42:02 Command "QUIT" received
[C 0465] 02/08/10 10:42:02 QUIT or close - user 1 logged out
[L 0466] 02/08/10 10:42:02 Connection accepted from 10.92.188.188
[C 0466] 02/08/10 10:42:02 Command "USER 1" received
[C 0466] 02/08/10 10:42:02 PASSword accepted
[L 0466] 02/08/10 10:42:02 User 1 logged in.
[C 0466] 02/08/10 10:42:02 Command "TYPE I" received
[C 0466] 02/08/10 10:42:02 TYPE set to I N
[C 0466] 02/08/10 10:42:02 Command "PORT 10,92,188,188,4,9" received
[C 0466] 02/08/10 10:42:02 PORT set to 10.92.188.188 - 1033 [4,9]
[C 0466] 02/08/10 10:42:02 Command "RETR gc4c_1221v1.gz" received
[C 0466] 02/08/10 10:42:02 RETRIEve started on file gc4c_1221v1.gz
[C 0466] 02/08/10 10:42:04 Transfer finished
[G 0466] 02/08/10 10:42:04 Got file D:\FTP\gc4c_1221v1.gz successfully
[C 0466] 02/08/10 10:42:04 Command "QUIT" received
[C 0466] 02/08/10 10:42:04 QUIT or close - user 1 logged out
For Help, press F1      1 socket  0 users  NL

```

Figure 10-20 Ftp –upgrading the cards in a batch manner

- Switch to the **Batch Upgrade Line Card** window, and you can see the line card is upgraded successfully, as shown in Figure 10-21.

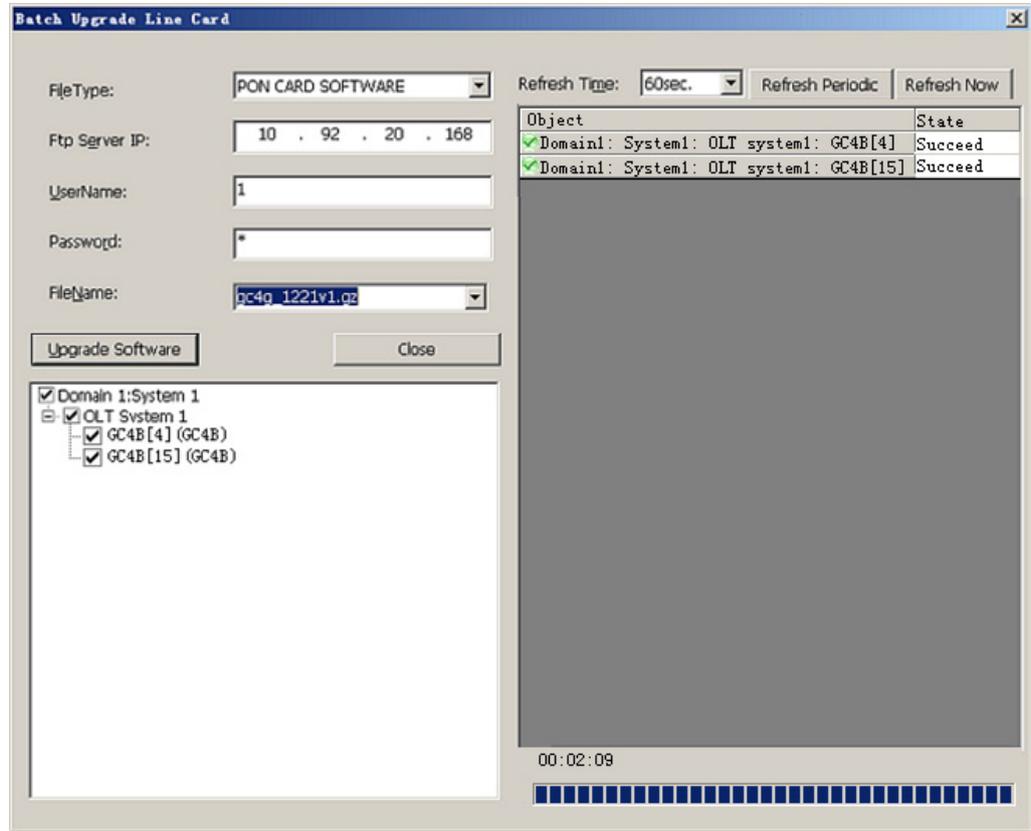


Figure 10-21 Upgrading the GPON interface card software in a batch manner

## 10.4.6 Checking the Software Version of the GPON Interface Card

### Configuration purpose

Check the software version of the GPON interface card to see if the GPON interface card is successfully upgraded.

### Operation steps

- Right-click the **HSWA[9]** card in the **Object Tree** pane and select **Get Information** → **Card Version** from the shortcut menu.

2. Enter the **Version of Card** window, and you can see the software version of the cards in each slot. Check if the software version of the GC4B card in Slots 4 and 15 are desired, as shown in Figure 10-22.

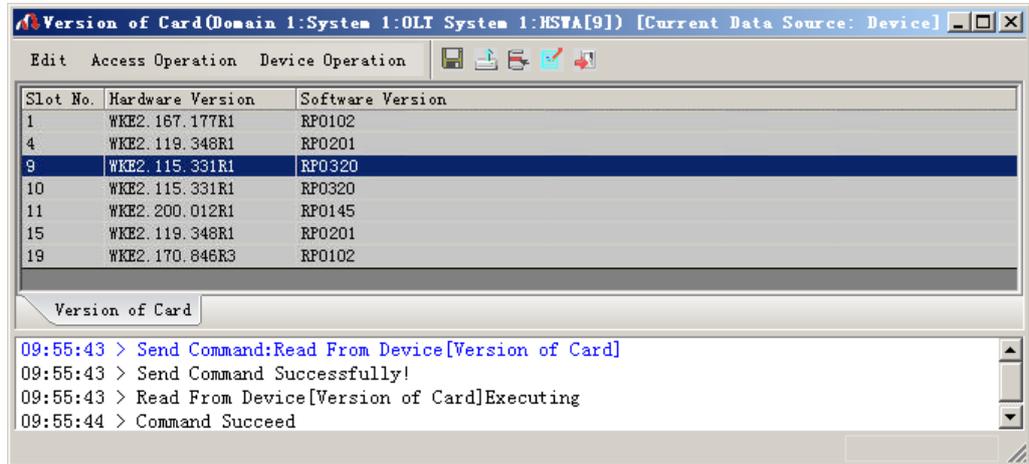


Figure 10-22 Check the card software version

## 10.5 Upgrading the ONU Manually

### 10.5.1 Upgrading Rules

- ◆ The ONU is present and normally authorized.
- ◆ Only the ONUs of the same type in the same slot can be manually upgraded.
- ◆ After manually upgrading an FTTB ONU's firmware and CPU software, the system will reboot the ONU. The following tables list the detailed information.

▶ For FTTH ONUs

Upgrade Object	Download File Type	Reboot Mode
ONU firmware	ONU firmware	Manual
ONU built-in IAD	ONU CPU / IAD software	Manual

▶ For FTTB ONUs

Upgrade Object	Download File Type	Reboot Mode
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

### 10.5.2 Prerequisites

Open the wftp software on the ftpP 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.

During the upgrading and the backing up, the WFTP software should always be open.

### 10.5.3 Planning Data

The following takes batch upgrading the CPU/IAD software of the ONU manually as an example. The planned data for upgrading the ONU software manually is shown in Table 10-4.

Table 10-4 Planned data for upgrading the ONU software manually

Item	Explanation	Example
Parameters of the card to be upgraded	Configure according to the actual situation	The ONU of AN5506-04-B type with the authorization No. 1 and 2 in PON port number1 in Slot 4.
Download file type	Configure according to the actual situation	ONU CPU / IAD software
FTP Server IP	Configure according to the actual situation	10.92.20.168
FTP server username	Configure according to the actual situation	1
FTP server password	Configure according to the actual situation	1
File Name	Configure according to the actual situation, and characters of the filename cannot exceed 16.	onu04_v2.bin

### 10.5.4 Upgrading Flow Chart

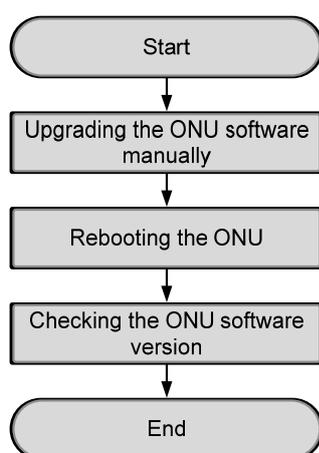


Figure 10-23 Flow chart for batch upgrading the ONU manually

## 10.5.5 Upgrading the ONU Software Manually

### Configuration purpose

Upgrade the ONUs in a batch manner manually.

### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, and select **Control Command** → **Batch Upgrade ONU** from the shortcut menu.
2. Enter the **Batch Upgrade ONU** dialog box, configure according to the planned data in Table 10-4. Select the ONUs of the AN5506-04-B type with authorization No. 1 and 2 under PON No.1 in the lower left part of the dialog box.
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 Figure 10-24.

```

No log file open - WFTP
File Edit View Logging Messages Security Help
[C 0477] 02/08/10 10:50:26 Password accepted
[L 0477] 02/08/10 10:50:26 User 1 logged in.
[C 0477] 02/08/10 10:50:26 Command "TYPE I" received
[C 0477] 02/08/10 10:50:26 TYPE set to I N
[C 0477] 02/08/10 10:50:26 Command "PORT 10,92,188,188,4,13" received
[C 0477] 02/08/10 10:50:26 PORT set to 10.92.188.188 - 1037 (4,13)
[C 0477] 02/08/10 10:50:26 Command "RETR onu04_v2.bin" received
[C 0477] 02/08/10 10:50:26 RETRIEve started on file onu04_v2.bin
[C 0477] 02/08/10 10:50:26 Command "QUIT" received
[C 0477] 02/08/10 10:50:26 Transfer aborted
[G 0477] 02/08/10 10:50:26 Got file D:\FTP\onu04_v2.bin unsuccessfully
[C 0477] 02/08/10 10:50:26 QUIT or close - user 1 logged out
[L 0478] 02/08/10 10:50:26 Connection accepted from 10.92.188.188
[C 0478] 02/08/10 10:50:26 Command "USER 1" received
[C 0478] 02/08/10 10:50:26 Password accepted
[L 0478] 02/08/10 10:50:26 User 1 logged in.
[C 0478] 02/08/10 10:50:26 Command "TYPE I" received
[C 0478] 02/08/10 10:50:26 TYPE set to I N
[C 0478] 02/08/10 10:50:26 Command "PORT 10,92,188,188,4,15" received
[C 0478] 02/08/10 10:50:26 PORT set to 10.92.188.188 - 1039 (4,15)
[C 0478] 02/08/10 10:50:26 Command "RETR onu04_v2.bin" received
[C 0478] 02/08/10 10:50:26 RETRIEve started on file onu04_v2.bin
[C 0478] 02/08/10 10:50:27 Transfer finished
[G 0478] 02/08/10 10:50:27 Got file D:\FTP\onu04_v2.bin successfully
[C 0478] 02/08/10 10:50:27 Command "QUIT" received
[C 0478] 02/08/10 10:50:27 QUIT or close - user 1 logged out
For Help, press F1      1 socket  0 users  NL

```

Figure 10-24 Ftp – upgrading the ONU

- Switch to the **Batch Upgrade ONU** window, and you can see the ONUs are manually upgraded successfully, as shown in Figure 10-25.

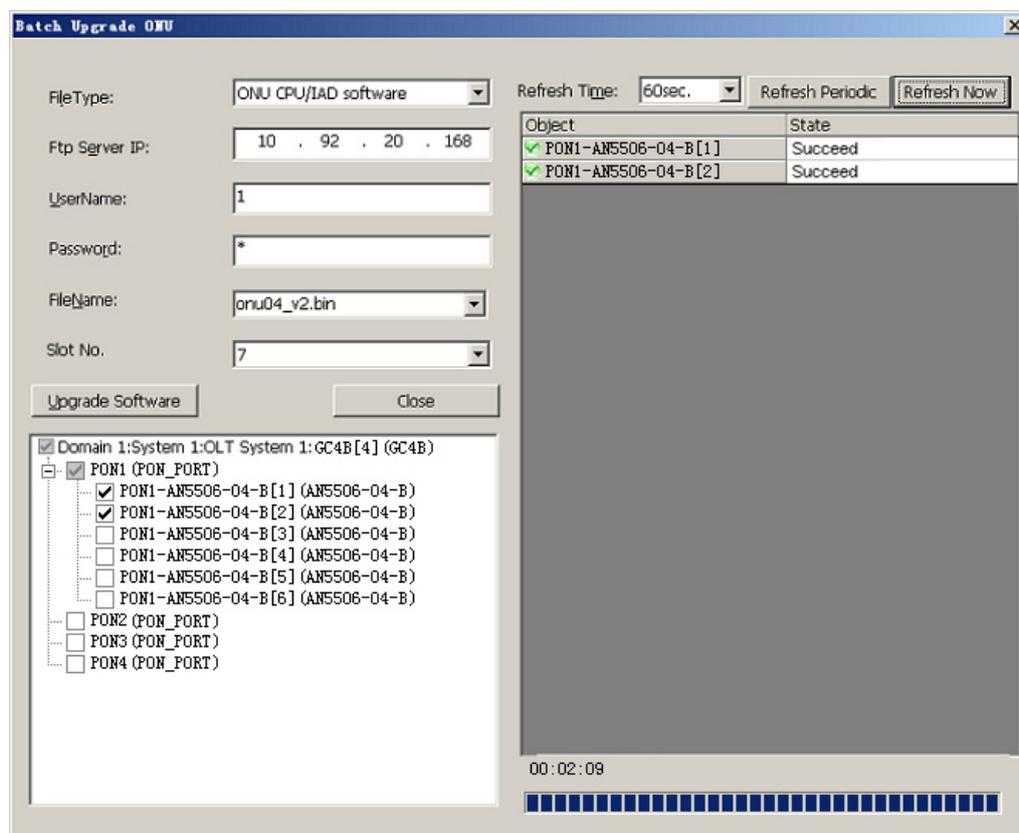


Figure 10-25 Batch upgrading the ONU manually

## 10.5.6 Rebooting the ONU

Configuration purpose

Reboot the ONUs in a batch manner.

Operation steps

- Right-click the **GC4B[4]** card in the **Object Tree** pane, and select **Control Command** → **Reset ONU** from the shortcut menu to bring up the **Reset ONU** dialog box.
- 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 No. (authorization No.) to be rebooted, as shown in Figure 10-26.

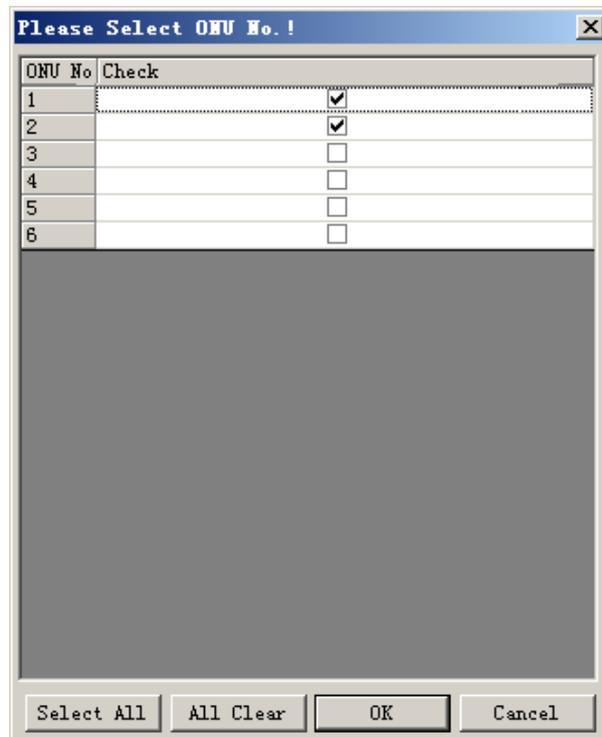


Figure 10-26 **Please Select ONU No.**

4. Click **OK** to access the **Reset ONU** window. Click  from the menu bar and click **OK** in the prompt dialog box. The command pane in the lower part of the window displays **Command Succeed**, indicating that rebooting the ONUs is successful.

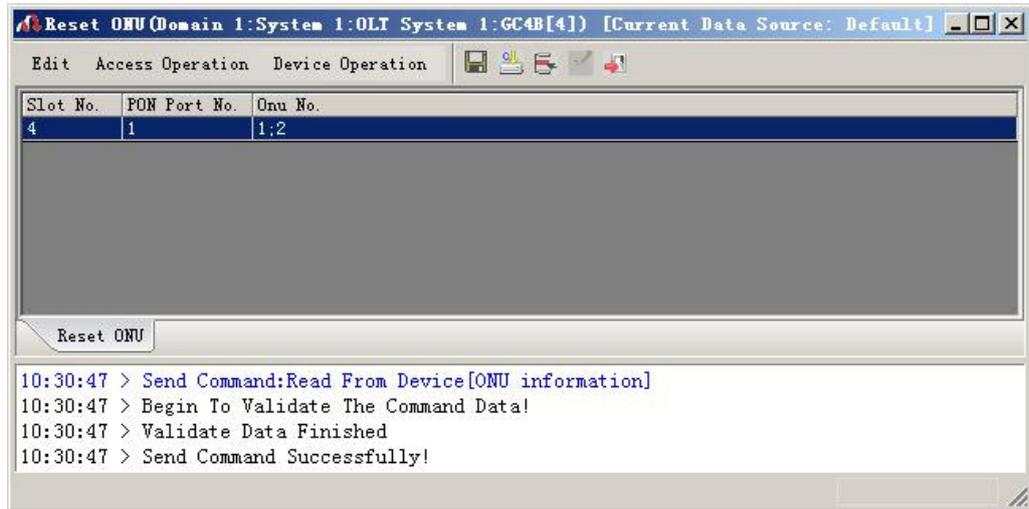


Figure 10-27 Rebooting the specified ONUs

## 10.5.7 Checking the ONU Software Version

Configuration purpose

Check the ONU software version to see if the upgrading is successful.

Operation steps

1. Right-click the **GC4B[4]** card in the **Object Tree** pane, and select **Get Information-> ONU Information** from the shortcut menu.
2. Enter the **ONU information** dialog box, where you can see the software version of the ONUs with the authorization No. 1 and 2 in PON port No.1 is upgraded, as shown in Figure 10-28.

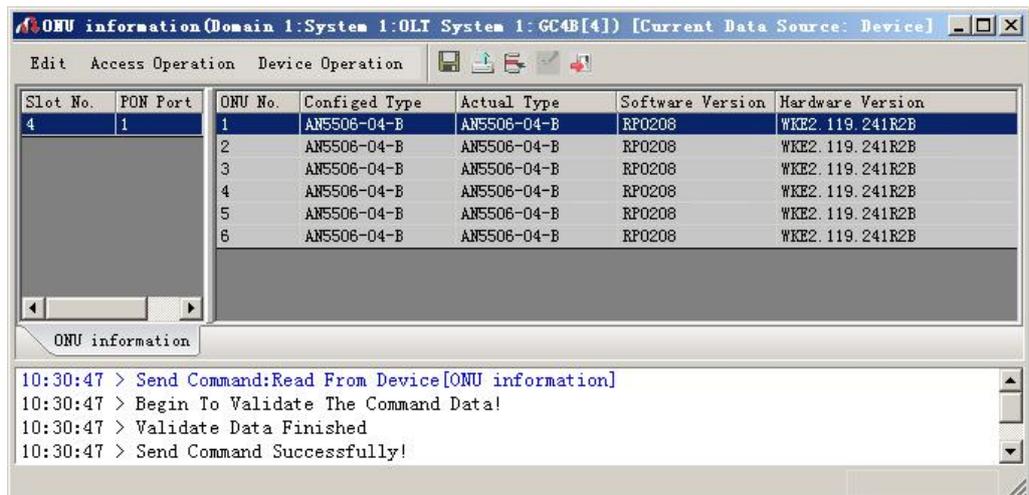


Figure 10-28 Checking the ONU software version

## 10.6 Upgrading the ONU Automatically

### 10.6.1 Upgrade Rules

- ◆ The file name of the upgrade software should be configured in strict accordance with the specified file name list.
- ◆ When performing ONU automatic upgrade, ONUs connected to the PON interface card in the slot cannot be manually upgraded.

### 10.6.2 Planning Data

The planned data for upgrading the ONU automatically are listed in Table 10-5.

Table 10-5 Planned data for upgrading the ONU automatically

Item	Description	Example
Related parameters of the ONU to be upgraded	Configure according to the actual situation	The ONU of type AN5506-04-B in Slot 4
Enabling status	Enable / disable the function of upgrading the ONU automatically	Enable
FTP server IP	Configure according to the actual situation	10.92.20.168
FTP server username	Configure according to the actual situation	1
FTP server password	Configure according to the actual situation	1
File name	Configure according to the actual situation	GPON ONU software (FTTH) → GAPP_04B_40.bin

### 10.6.3 Upgrade Flow Chart

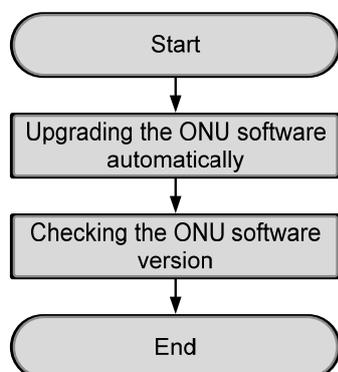


Figure 10-29 Flow chart for upgrading the ONU automatically

### 10.6.4 Upgrading the ONU Software Automatically

Configuration purpose

Upgrade the ONU software automatically.

Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, and select **Config** → **ONU Auto Upgrade** from the shortcut menu.
2. Enter the **ONU Auto Upgrade** dialog box. Select the row with the **Slot No. 4** and configure according to the planned data in Table 10-5.
3. Click the **File Name** column and select the **GPON ONU Software (FTTH)** → **GAPP\_04B\_40.bin** check box from the **ONU Auto Upgrade** list box that appears subsequently, and then click **OK**, as shown in Figure 10-30.

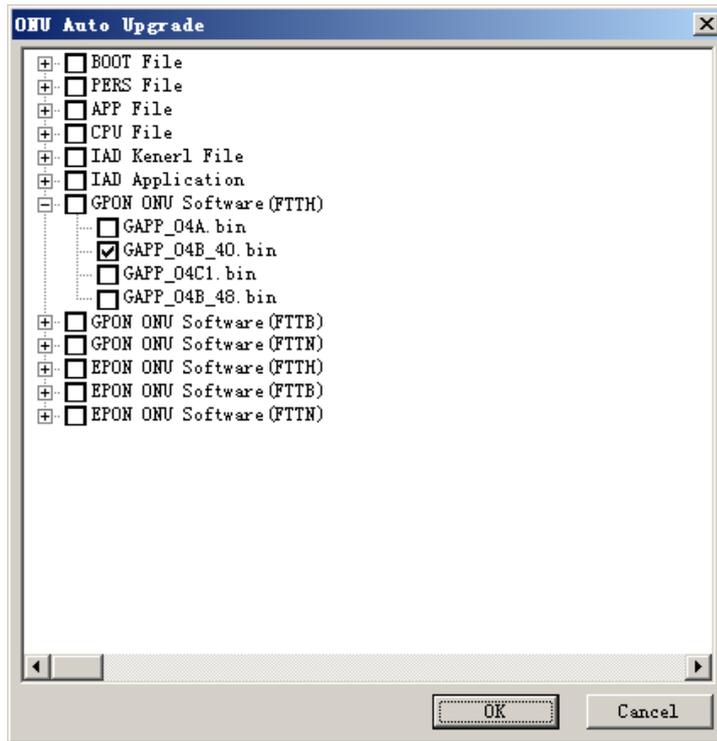


Figure 10-30 The dialog box for selecting file

- Return to the **ONU Auto Upgrade** dialog box. Click , and the lower part of the window as shown in Figure 10-31 displays **Command Succeed**, indicating that the ONU is successfully upgraded automatically.

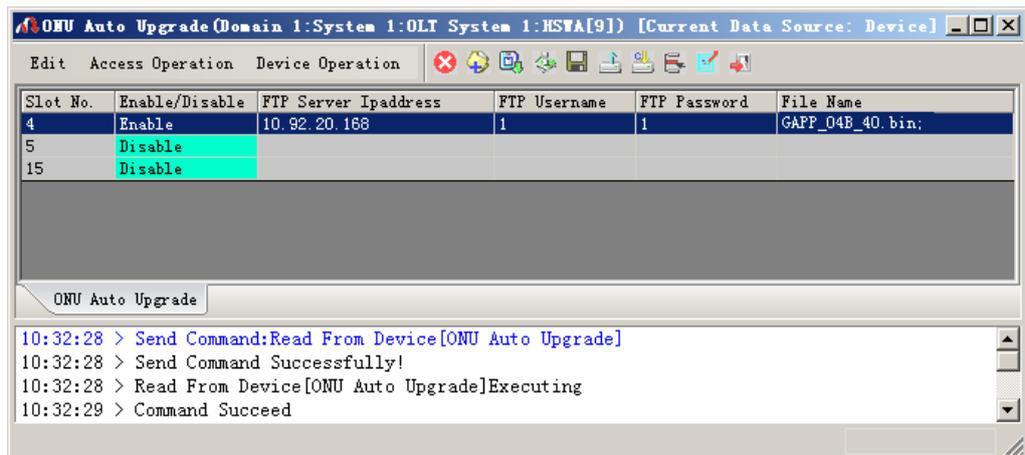


Figure 10-31 Upgrading the ONU automatically

## 10.6.5 Checking the ONU Software Version

### Configuration purpose

Check the ONU software version to see if the upgrading is successful.

### Operation steps

1. Right-click the **GC4B[4]** card in the **Object Tree** pane, and select **Get Information-> ONU Information** from the shortcut menu.
2. Enter the **ONU information** dialog box, where you can see the software version of the ONUs is upgraded, as shown in Figure 10-32.

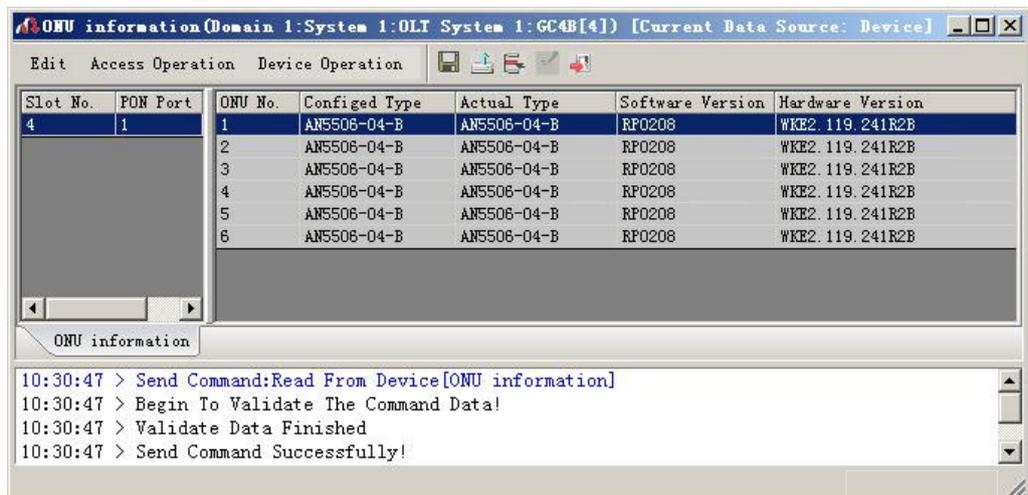


Figure 10-32 Checking the ONU software version



# 11 Configuring the Signal Tracing

---

This chapter introduces how to configure the signal tracing for the AN5116-06B. It includes the following sections:

- Configuration rules
- Network diagram
- Planning data
- Configuration flow chart
- Configuring the signal tracing parameters
- Checking the signal tracing result
- End of configuration

## 11.1 Configuration Rules

- ◆ When the softswitch platform uses the H.248 protocol to control the access terminals, configure both the layer 4 source port number and the destination port number of signal tracing to 2944.
- ◆ When the softswitch platform uses the SIP protocol to control the access terminals, configure both the layer 4 source port No. and destination port No. of signal tracing to 5060.
- ◆ When the softswitch platform uses the MGCP protocol to control the access terminals, configure the signal tracing layer 4 source port No. to 2427 and destination port No. to 2727.
- ◆ When setting the community name of the SNMP and trap receiver, it is recommended to use **adsl** or the default value **public**.



### Note:

The voice signal tracing will cause a heavy load on the system. It is recommended to use it only in voice service troubleshooting.

---

## 11.2 Network diagram

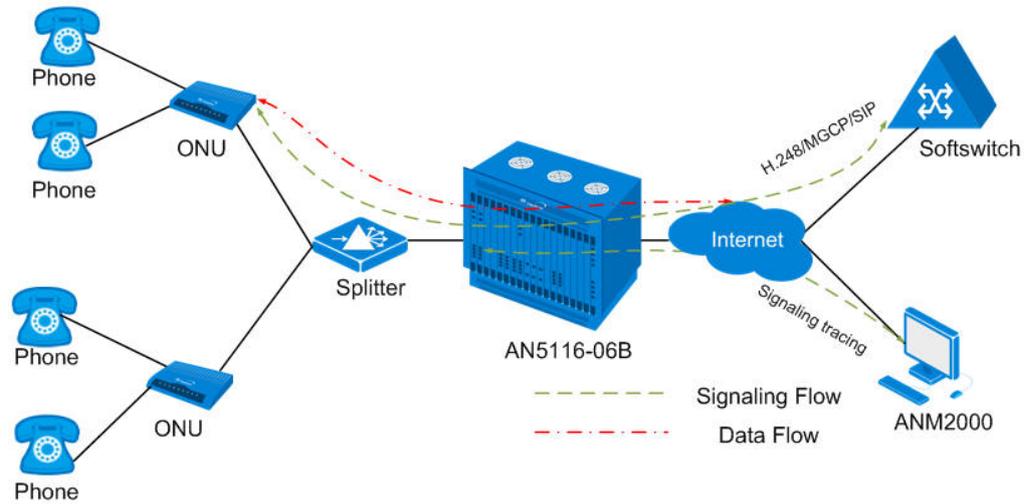


Figure 11-1 Signal tracing network diagram

As shown in Figure 11-1, the GPON system uses the H.248 / MGCP / SIP protocol to interact with the softswitch to perform call control, and meanwhile the OLT send the signaling packet of the H.248 / MGCP / SIP to the ANM2000 server. Thus the signal tracing of the GPON system is realized.

## 11.3 Planning Data

The following takes configuring the H.248 signal tracing for the AN5116-06B and the ANM2000 server as an example to introduce how to configure signal tracing in details. The planned data are listed in Table 11-1.

Table 11-1 Planned data for signal tracing

Item	Description	Example	
Configuring the signal tracing	IP address	Source IP of voice data packets, that is, the equipment IP address that performs signal tracing.	10.90.222.88
	L4 source port No.	The L4 source port number corresponding to the H.248 protocol.	2944
	L4 destination port No.	The L4 destination port number corresponding to the H.248 protocol.	2944
	Enabling status	Signal tracing enable switch	Enable
Viewing the signal tracing result	File path	Select the save path for signal tracing files.	D:
	File type	The save type of signal tracing files.	.txt
	Multiple files	Whether to save the signal tracing logs into multiple files.	Selected
	Single file size	Input size of a single signal tracing file. Once exceeded, another file will be created.	2

## 11.4 Configuration Flow Chart

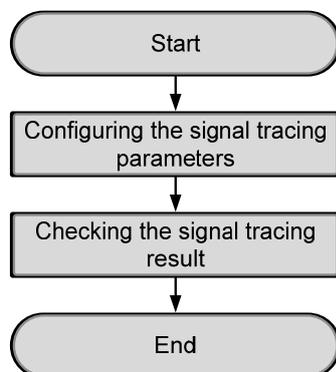


Figure 11-2 Flow chart of configuring the signal tracing

## 11.5 Configuring the Signal Tracing Parameters

### Configuration purpose

Configure the IP address, layer 4 source port No. and destination port No. of the ONU equipment that needs the signal tracing, and enable the signal tracing function.

### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, and select **Config** → **Signal Trace** from the shortcut menu to access the **Signal Trace** window.
2. On the menu bar in the configuration window, select **Edit** → **Append** from the menu bar or click the  button. In the **Please Input the Rows for Add:** dialog box that appears subsequently, type **1** and click **OK**.
3. Configure according to the planned data in Table 11-1.
4. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the configuration of signal tracing parameter is completed. See Figure 11-3.

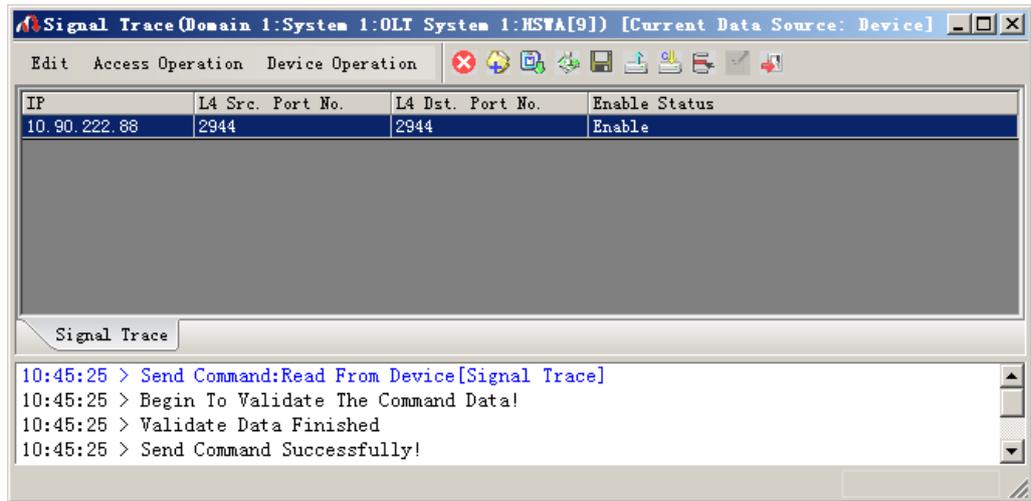


Figure 11-3 Configuring the signal tracing

## 11.6 Checking the Signal Tracing Result

### Configuration purpose

Check the signal tracing result from the ONU to the MGC.

### Operation steps

1. Select **Config** → **Signal Trace** from the menu bar to access the **Signal Trace** window, as shown in Figure 11-4.

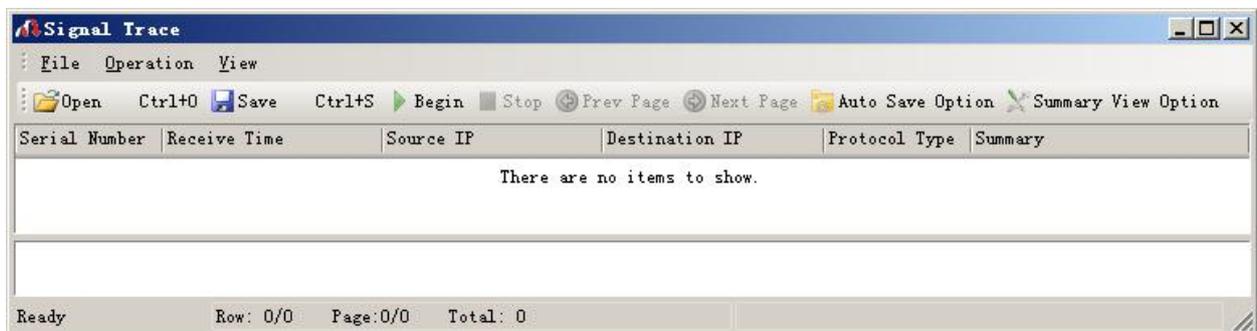


Figure 11-4 Signal tracing

2. Click the  button to bring up the **Auto Save Option** dialog box.
3. Click  and select disk D as the save path.
4. Click the **Multiple Files** check box, and double-click the default value **1** of **Mbytes** and input **2**. Then click **OK** to return to the **Signal Trace** dialog box.

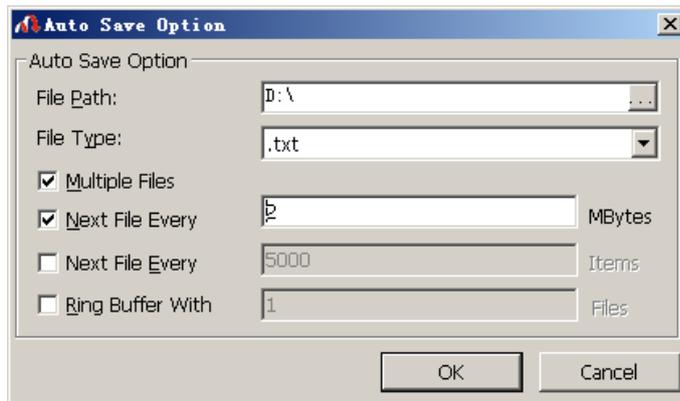


Figure 11-5 The **Auto Save Option** dialog box

- Click the **Begin** button to start the signal tracing. And you can view the information of signal tracing, as shown in Figure 11-6.

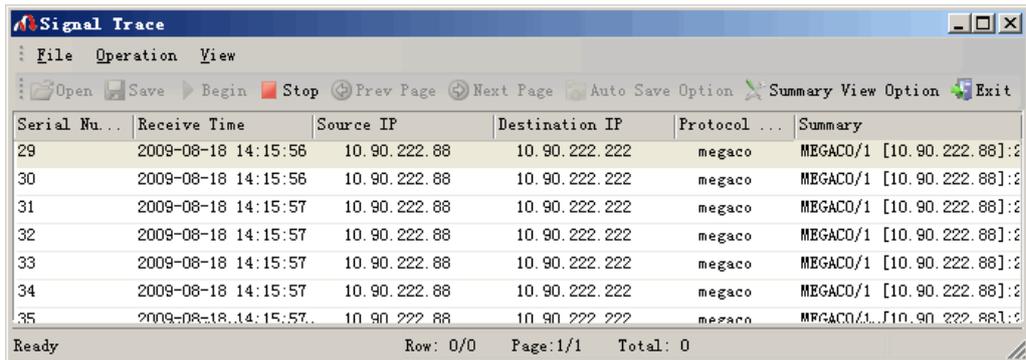


Figure 11-6 Viewing the result of signal tracing

- Click the **Stop** button to stop the signal tracing. The signaling information traced in Figure 11-6 will be saved to disk D automatically.

## 11.7 End of Configuration

Now the configuration of voice signaling tracing of the H.248 protocol is completed. You can view the content of the traced H.248 signaling through the ANM2000.



### Note:

If you need to check previous signaling tracing data, you can view the TXT files under the directory where the signal tracing files are saved.

---



# 12 Flow Classification Configuration

---

This chapter introduces how to configure the flow classification for the AN5116-06B. It includes the following sections:

- Configuration rules
- Configuration flow chart
- Flow classification configuration example – based on MAC address
- Flow classification configuration example – based on IP address

## 12.1 Configuration Rules

- ◆ The AN6116-06B 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.

## 12.2 Configuration Flow Chart

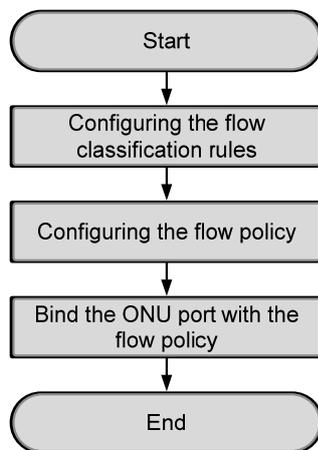


Figure 12-1 Flow chart for flow classification rules

## 12.3 Flow Classification Configuration Example – Based on MAC Address

### 12.3.1 Planning Data

The following takes the ONU with the authorization No.1 under the PON port No.4 of the GC4B card in Slot 5 of the AN5116-06B as an example, binding a flow policy with the No.1 FE port. The planned data is shown in Table 12-1.

Table 12-1 Planned data for flow classification rules – based on MAC address

Item		Description	Example
Flow classification rules	Rule ID	Automatically assigned by the system	4
	Rule Name	Configure according to the network planning of the operator	rule123
	Rule Type	Configure according to the network planning of the operator	Based On SA MAC Exist And Match 12-34-56-78-91-01
Flow policy	Policy ID	Automatically assigned by the system	1
	Policy Name	Configure according to the network planning of the operator	Policy123
	Rule ID	Select the <b>Rule Name</b> from the flow classification rules	rule123
	Precedence	Configure the priority of the flow policy within 1 to 12	1
	ACL Enable	Configure according to the network planning of the operator	Enable
	Forward	Configure according to the network planning of the operator	Allowed, Matched streams would pass
Port Binding Flow Policy	Slot No.	The slot number actually used	15
	PON port No.	The PON port number actually used	1
	ONU No.	The ONU No. actually used	2
	ONU Type	The ONU type actually used	AN5506-10-B1
	Port No.	Configure according to the network planning of the operator.	1

Item		Description	Example
	Ingress Policy ID	The policy ID configured in flow policy	Policy123
	Egress Policy ID	The policy ID configured in flow policy	Policy123

## 12.3.2 Configuring the Flow Classification Rules

### Configuration purpose

This operation is to configure the function of filtering the service flow to the ONU port using the flow rules based on source / destination MAC address classification, source / destination IP address classification, etc.

### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, select **Config** → **Flow Classification Rule** to access the **Flow Classification Rule** window.
2. Select **Edit** → **Append** from the menu bar or click the  button, and input **1** in the **Please Input the Rows for Add:** dialog box that appears subsequently. Then click **OK** to add one rule.
3. Double-click the **Rule Name** column and input **rule123**. Double-click the **Rule Type** column, configure according to the planned data in Table 12-1 in the **Rule Define** dialog box that appears subsequently. After completing the configuration, click **OK** to return to the **Flow Classification Rule** window.

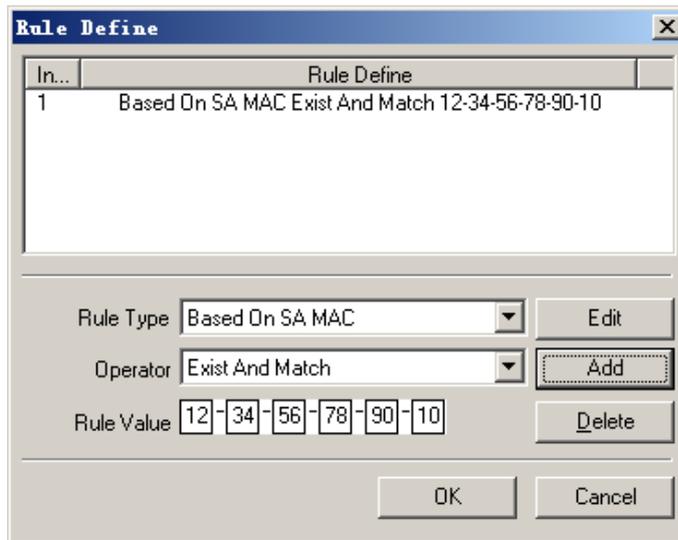


Figure 12-2 The Rule Define dialog box

4. Click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the configuration of flow classification rule is completed. See Figure 12-3.

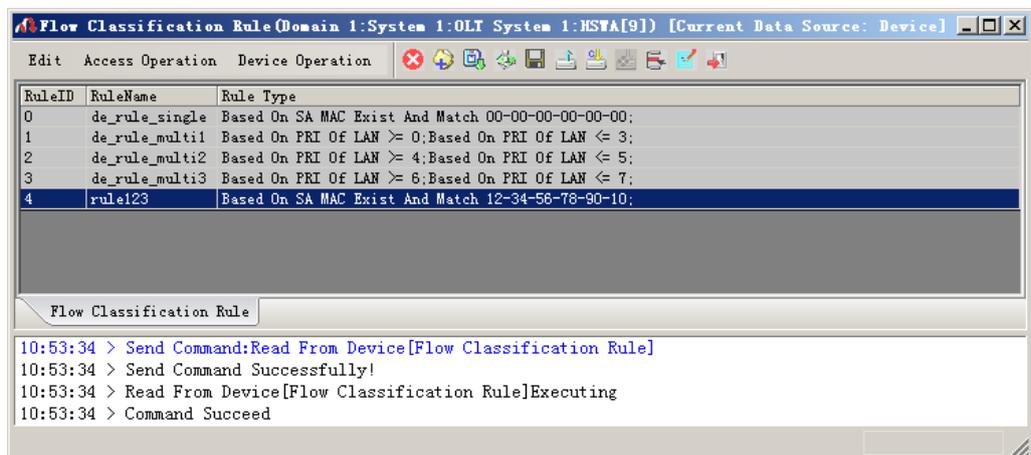


Figure 12-3 Flow classification rule

**Note:**

The rules 0 to 3 are the default flow classification rules of the equipment, which cannot be deleted or modified.

### 12.3.3 Configuring the Flow Policy

#### Configuration purpose

This operation is to configure the flow policy of the AN5116-06B, applying the defined flow classification rule to the flow policy to bind the ONU port.

#### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, select **Config** → **Flow Policy** to access the **Flow Policy** window.
2. Select **Edit** → **Append** from the menu bar or click the  button, and input **1** in the **Please Input the Rows for Add:** dialog box that appears subsequently. Then click **OK** to add one flow policy.
3. Configure according to the planned data in Table 12-1. Click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the configuration of flow policy is completed. See Figure 12-4.

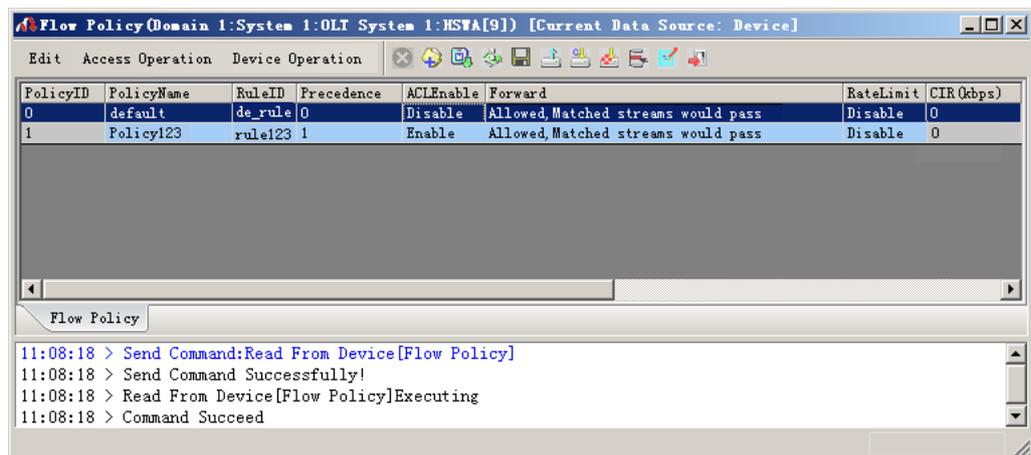


Figure 12-4 Configuring the flow policy

**Note:**

The policy 0 is the default flow policy, which cannot be deleted or modified.

---

## 12.3.4 Binding the ONU Port with the Flow Policy

### Configuration purpose

This operation is to bind the specified port of the ONU with the defined flow policy. After completing the binding, this port will process data according to the specified flow rules.

### Operation steps

1. Click the **GC8B[15]** card in the **Object Tree** pane to display the ONUs under this card in the right pane. Then right-click the ONU of PON1-AN5506-10-B1[2] and select **Config** → **Port Binding Flow Policy** from the shortcut menu to access the bandwidth allocation configuration window.
2. Select port No.1 from the 24 FE ports of the AN5506-10-B1 shown in the left pane.
3. Click the blank in the right pane, double-click the **Ingress Policy ID** column, and select **Policy 123** from the drop-down list; double-click the **Egress Policy ID** column, and select **Policy 123** from the drop-down list.
4. Click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the configuration of binding the ONU port with the flow policy is successful. See Figure 12-5.

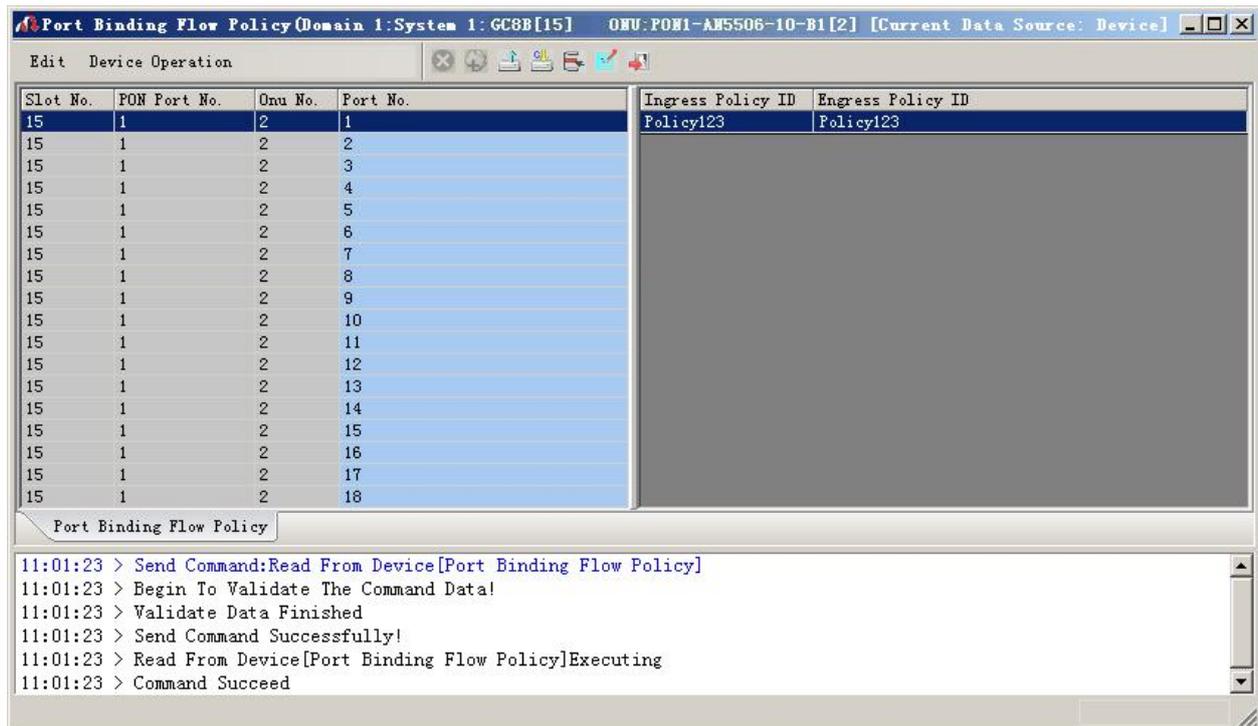


Figure 12-5 Binding the ONU port with flow policy

## 12.3.5 End of Configuration

The above operations complete the flow classification rule configuration. The FE1 port of the AN5506-10-B1 will only forward the data flow with the MAC address 12-34-56-78-90-10 according to the rule defined in flow policy.

## 12.4 Flow Classification Configuration Example – Based on IP Address

### 12.4.1 Planning Data

The following takes the ONU with the authorization No.2 under the PON port No.4 of the GC4B card in Slot 5 of the AN5116-06B as an example, binding a flow policy with the No.1 FE port. The planned data is shown in Table 10-2.

Table 12-2 Planned data for flow classification rules – based on IP address

Item		Description	Example
Flow classification rules	Rule ID	Automatically assigned by the system	4
	Rule Name	Configure according to the network planning of the operator	rule456
	Rule Type	Configure according to the network planning of the operator	Based On SA IP =10.10.10.10
Flow policy	Policy ID	Automatically assigned by the system	1
	Policy Name	Configure according to the network planning of the operator	Policy456
	Rule ID	Select the <b>Rule Name</b> from the flow classification rules	rule456
	Precedence	Configure the priority of the flow policy within 1 to 12	1
	ACL Enable	Configure according to the network planning of the operator	Enable
	Forward	Configure according to the network planning of the operator	Forbidden, Matched streams would be dropped.
Port Binding Flow Policy	Slot No.	The slot number actually used	15
	PON port No.	The PON port number actually used	1
	ONU No.	The ONU number actually used	2
	ONU Type	The ONU type actually used	AN5506-10-B1
	Port No.	Configure according to the network planning of the operator.	1
	Ingress Policy ID	The policy ID configured in flow policy	Policy456
	Engress Policy ID	The policy ID configured in flow policy	Policy456

## 12.4.2 Configuring the Flow Classification Rules

### Configuration purpose

This operation is to configure the function of filtering the service flow to the ONU port using the flow rules based on source / destination MAC address classification, source / destination IP address classification, etc.

### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, select **Config** → **Flow Classification Rule** to access the **Flow Classification Rule** window.
2. Select **Edit** → **Append** from the menu bar or click the  button, and input **1** in the **Please Input the Rows for Add:** dialog box that appears subsequently. Then click **OK** to add one rule.
3. Double-click the **Rule Name** column and input **rule456**. Double-click the **Rule Type** column, configure according to the planned data in Table 12-2 in the **Rule Define** dialog box that appears subsequently. After completing the configuration, click **OK** to return to the **Flow Classification Rule** window.

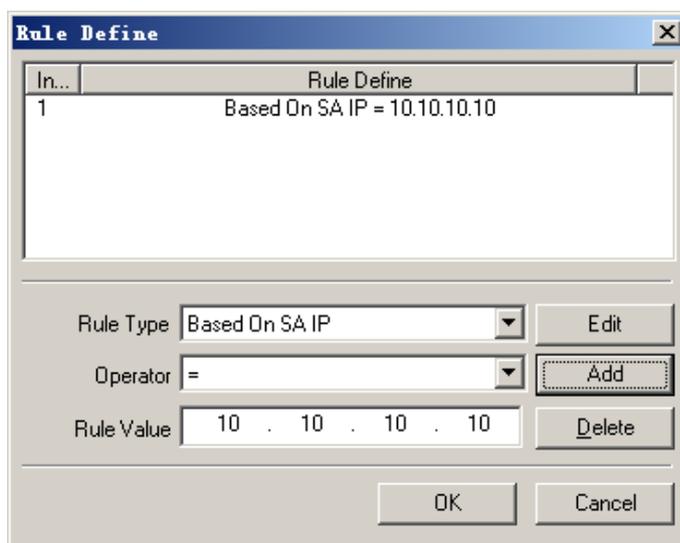


Figure 12-6 The **Rule Define** dialog box

- Click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the configuration of flow classification rule is completed. See Figure 12-7.

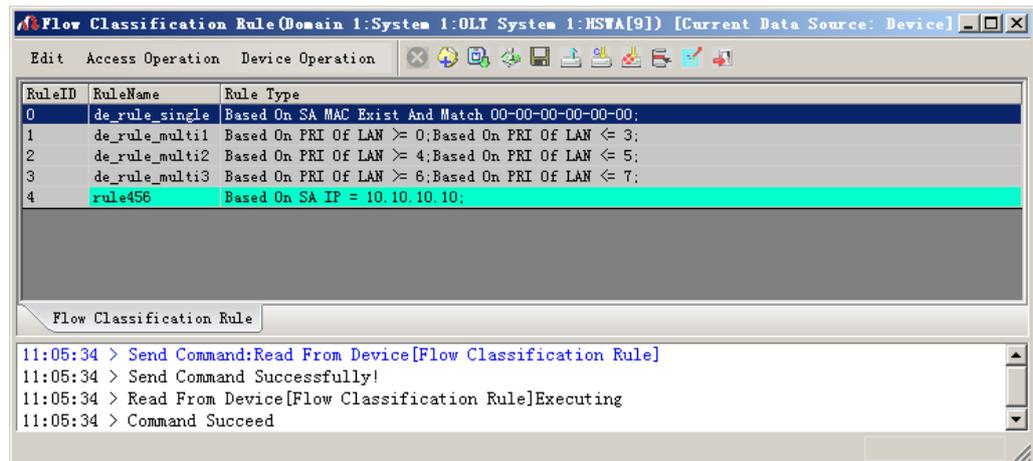


Figure 12-7 Flow classification rule

**Note:**

The rules 0 to 3 are the default flow classification rules of the equipment, which cannot be deleted or modified.

### 12.4.3 Configuring the Flow Policy

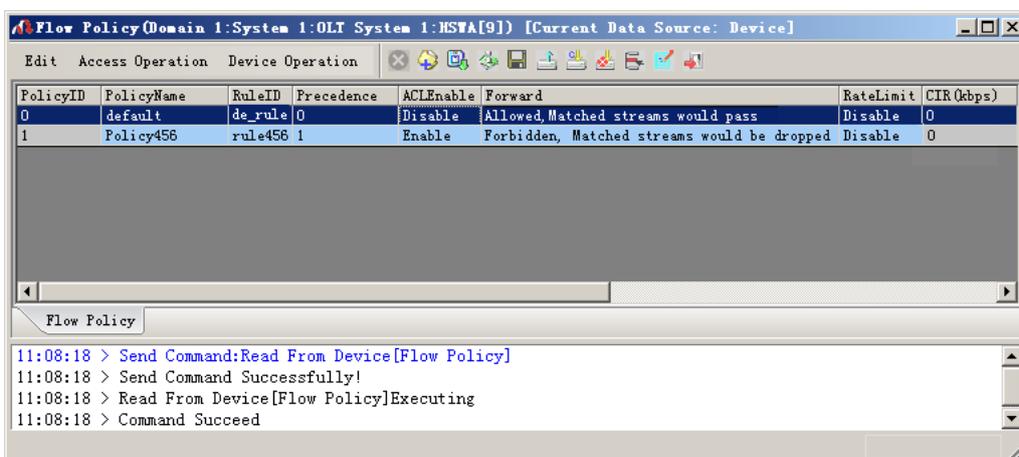
#### Configuration purpose

This operation is to configure the flow policy of the AN5116-06B, applying the defined flow classification rule to the flow policy to bind the ONU port.

#### Operation steps

- Right-click the **HSWA[9]** card in the **Object Tree** pane, select **Config** → **Flow Policy** to access the **Flow Policy** window.

2. Select **Edit** → **Append** from the menu bar or click the  button, and input **1** in the **Please Input the Rows for Add:** dialog box that appears subsequently. Then click **OK** to add one flow policy.
3. Configure according to the planned data in Table 12-2. Click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the configuration of flow policy is completed. See Figure 12-8.



PolicyID	PolicyName	RuleID	Precedence	ACLEnable	Forward	RateLimit	CIR (kbps)
0	default	de_rule	0	Disable	Allowed, Matched streams would pass	Disable	0
1	Policy456	rule456	1	Enable	Forbidden, Matched streams would be dropped	Disable	0

```

11:08:18 > Send Command:Read From Device[Flow Policy]
11:08:18 > Send Command Successfully!
11:08:18 > Read From Device[Flow Policy]Executing
11:08:18 > Command Succeed

```

Figure 12-8 Configuring the flow policy

**Note:**

The policy 0 is the default flow policy, which cannot be deleted or modified.

## 12.4.4 Binding the ONU Port with the Flow Policy

### Configuration purpose

This operation is to bind the specified port of the ONU with the defined flow policy. After completing the binding, this port will process data according to the specified flow rules.

## Operation steps

1. Click the **GC8B[15]** card in the **Object Tree** pane to display the ONUs under this card in the right pane. Then right-click the ONU of PON1-AN5506-10-B1[2] and select **Config** → **Port Binding Flow Policy** from the shortcut menu to access the bandwidth allocation configuration window.
2. Select port No.1 from the 24 FE ports of the AN5506-10-B1 shown in the left pane.
3. Click the blank in the right pane, double-click the **Ingress Policy ID** column, and select **Policy 456** from the drop-down list; double-click the **Egress Policy ID** column, and select **Policy 456** from the drop-down list.
4. Click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the configuration of binding the ONU port with the flow policy is successful. See Figure 12-9.

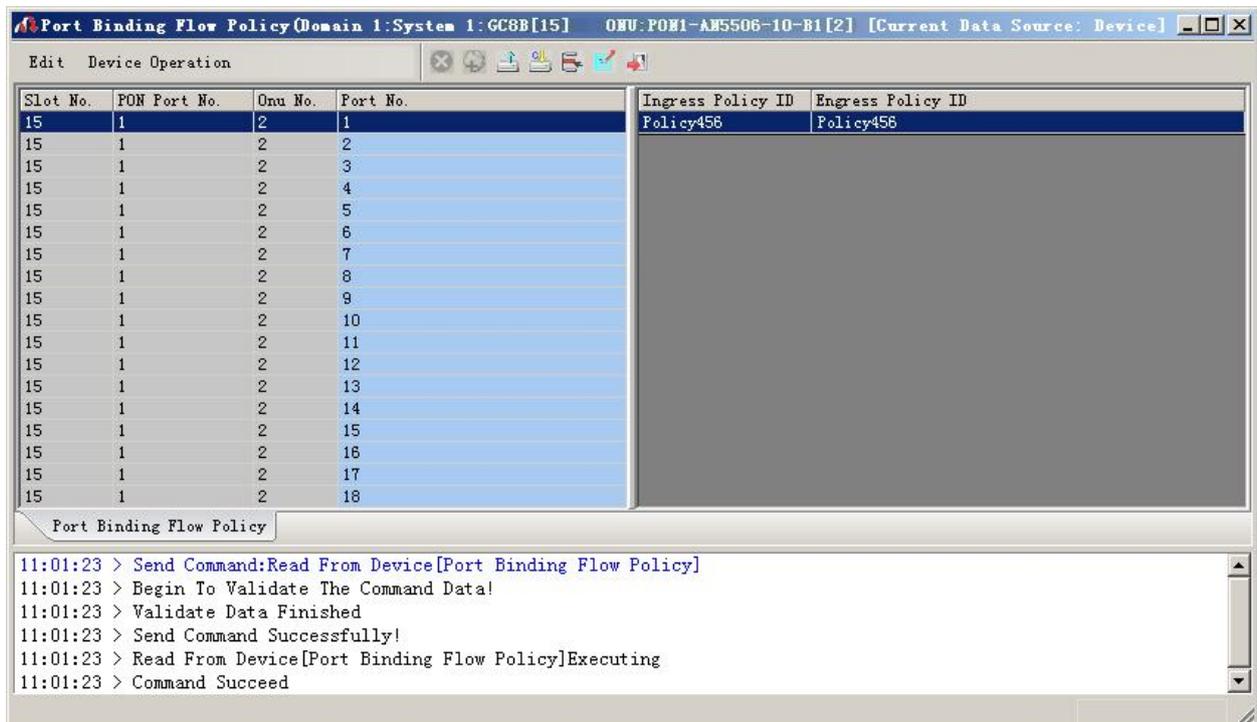


Figure 12-9 Binding the ONU port with flow policy

## **12.4.5 End of Configuration**

The above operations complete the flow classification rule configuration. The FE1 port of the AN5506-10-B1 will forbid the data flow with the IP address 10.10.10.10 according to the rule defined in flow policy.

# 13 Configuring the QoS

---

This chapter introduces the start-up of the AN5116-06B's QoS service. It includes the following sections:

- Configuration rules
- QoS start-up example – based on VLAN mode
- QoS start-up example – based on MAC address
- Unbinding the object and QoS profile

## 13.1 Configuration Rules

- ◆ When configuring the classification parameters of the QoS profile for IP traffic, you can specify combinations of parameters, but limited to certain parameter groups. Within the following parameter groups, combinations can be made arbitrarily.
  - ▶ Source IP, destination IP, protocol type, TCP / UDP source port No, and TCP / UDP destination port No;
  - ▶ 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 line card or uplink port can be bound with up to 1024 QoS profiles.
- ◆ Bind of line 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. A value of 2 means  $2 \times 64$  kbit/s.
- ◆ After data flow 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 port or slot, 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.

## 13.2 QoS Start-up Example – Based on VLAN Mode

### 13.2.1 Planning Data

The following introduces an example in which a QoS profile is bound to the GC4B card in Slot 5. After the profile is bound, the GC4B card in Slot 5 can only forward data packets with VLAN ID 3000. The planned data are listed in the table below:

Table 13-1 Planned data for QoS service—based on VLAN mode

Item	Description		Example
QoS profile	QoS profile name	Configure according to the planned data of the operator	qos1
	VLAN ID	Configure the flow rules based on VLAN ID according to the planned data of the operator	3000
	Command code	Forward or discard the data packets that comply with the current flow rules according to the planned data of the operator	Forward
Binding interface card and QoS profile	Slot No.	Configure according to the planned data of the operator	5
	Bind / Unbind	Bind the QoS profile	Bind
	Profile name	The QoS profile that can be bound	qos1

## 13.2.2 Configuration Flow Chart

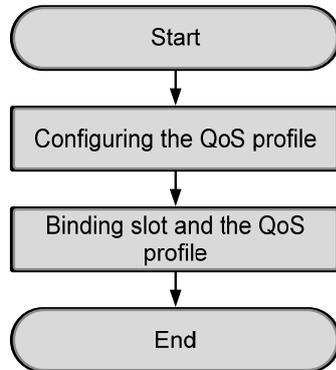


Figure 13-1 Configuration flow chart for QoS service - based on VLAN mode

## 13.2.3 Configuring QoS Profiles

### Configuration purpose

Configure the QoS profile for the AN5116-06B, which control data flow based on VLAN ID, port, ethernet protocol type, priority queue, DSCP value, etc.

### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, and select **Config** → **QoS Profiles**. Then select the **QoS profile** tab to access the **Qos Profiles** window.
2. Select **Edit** → **Append** from the menu bar or click  and input **1** in the **Please Input the Rows for Add:** dialog box that appears subsequently. Then click **OK** to add one QoS profile.
3. Configure the parameters according to the planned data in Table 13-1.
4. Click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. See Figure 13-2.

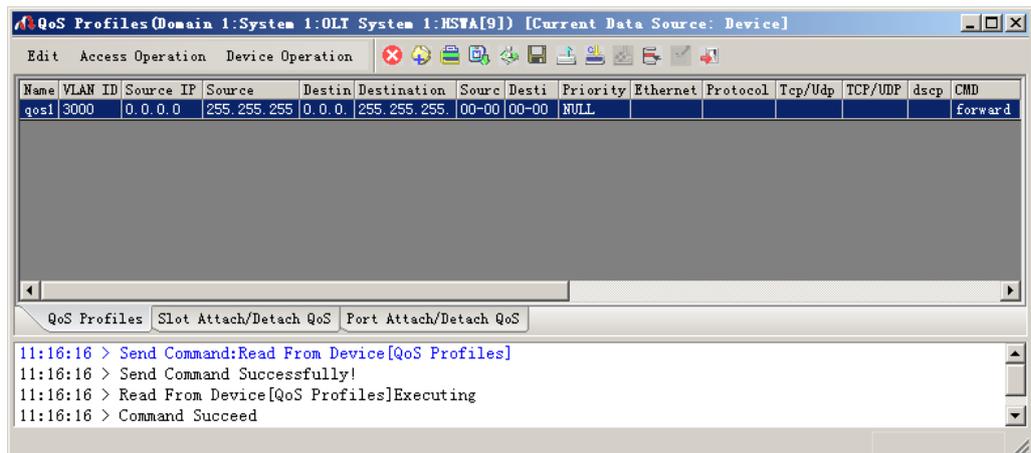


Figure 13-2 QoS profile – based on VLAN

## 13.2.4 Binding the Slot and the QoS Profile

### Configuration purpose

This operation is to bind the line card and QoS profile. Only after the QoS profile is bound, the uplink flow passing this line card will be processed according to this QoS profile.

### Operation steps

1. Right-click the **HWSA[9]** card in the **Object Tree** pane, and select **Config** → **QoS Profiles**. Then select the **Slot Attach/Detach QoS** tab to access the **Slot Attach/Detach QoS** window.
2. Select **Edit** → **Append** from the menu bar or click the  button, and input **1** in the **Please Input the Rows for Add:** dialog box that appears subsequently. Then click **OK** to add one rule.
3. Configure the parameters according to the planned data in Table 13-1.
4. Click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the configuration of flow classification rule is completed. See Figure 13-3.

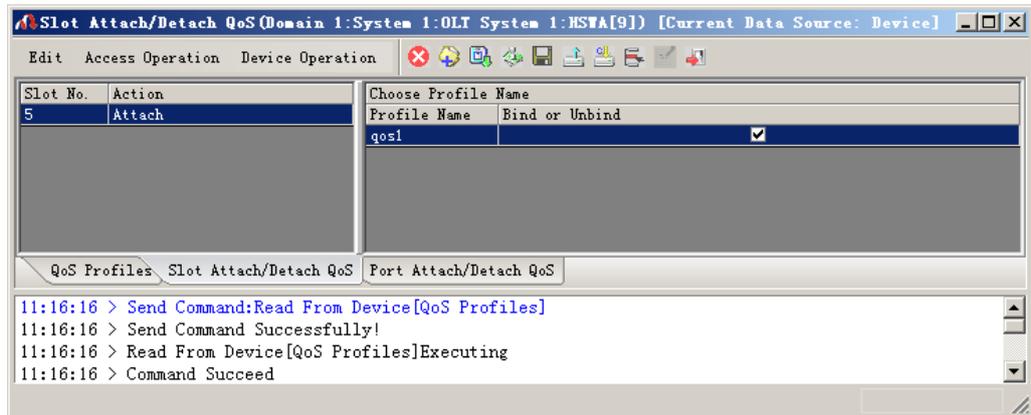


Figure 13-3 Binding slot and the QoS profile

## 13.2.5 End of Configuration

After the above settings, the configuration of QoS service is completed. A QoS profile is bound to the AN5116-06B in Slot 5, and the card in the slot can only forward data flow with the VLAN ID 3000.

## 13.3 QoS Start-up Example – Based on MAC Address

### 13.3.1 Planning Data

The following introduces an example in which a QoS profile is bound to an uplink port. After the profile is bound, the uplink port will discard the data packets with the source MAC address 200000000001 and the destination MAC address 100000000001. The planned data are listed in Table 13-2:

Table 13-2 Planned data for QoS service—based on MAC address

Item		Description	Example
Configuring the QoS profiles	QoS profile name	Configure according to the planned data of the operator	qos2
	Source MAC address	Configure the flow rule based on the source MAC address. Configure according to the planned data of the operator	200000000001
	Destination MAC address	Configure the flow rule based on the destination MAC address. Configure according to the planned data of the operator	100000000001
	Command code	Forward or discard the data packets that comply with the current flow rule. Configure according to the planned data of the operator	Discard
Binding / unbinding slot and QoS profile	Uplink port No.	Configure according to the planned data of the operator	20:SFP1
	Bind / unbind	Select to bind	Bind
	Profile name	Select a profile name	qos2

## 13.3.2 Configuration Flow Chart

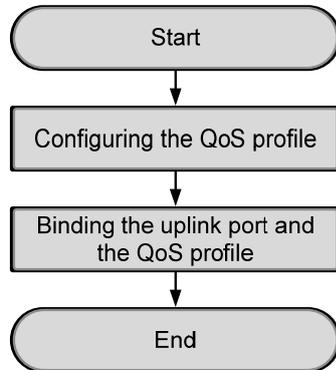


Figure 13-4 Configuration flow chart for QoS service - based on MAC address

## 13.3.3 Configuring the QoS Profiles

### Configuration purpose

Configure the QoS service profiles, which control data flow based on VLAN ID, port, ethernet protocol type, priority queue, DSCP value, etc.

### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, and select **Config** → **QoS Profiles**. Then select the **QoS profile** tab to access the **QoS profile** window.
2. Select **Edit** → **Append** from the menu bar or click  and input **1** in the **Please Input the Rows for Add:** dialog box that appears subsequently. Then click **OK** to add one QoS profile.
3. Configure the parameters according to the planned data in Table 13-2.
4. Click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. See Figure 13-5.

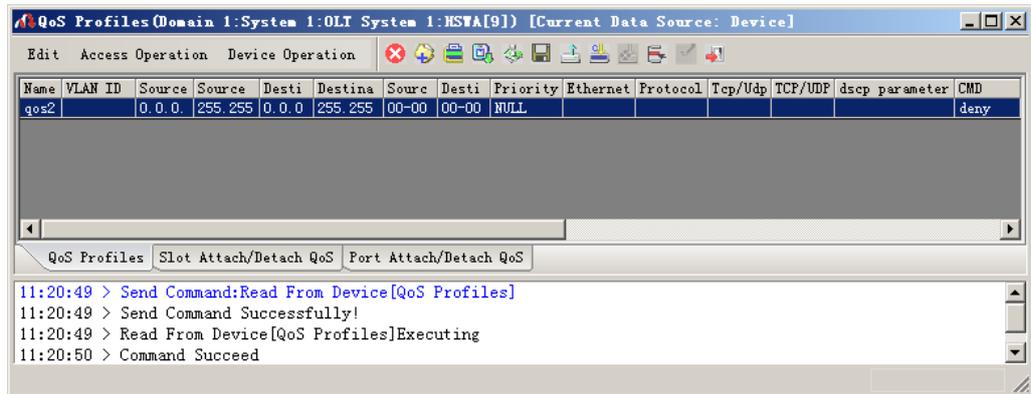


Figure 13-5 Configuring the QoS profile – based on MAC address

### 13.3.4 Binding the Uplink Port and the QoS Profile

#### Configuration purpose

This operation is to bind the uplink port and QoS profile. Only after the QoS profile is bound, the downlink flow passing this uplink port will be processed according to the QoS profile.

#### Operation steps

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, and select **Config** → **QoS Profiles**. Then select the **Port Attach/Detach QoS** tab to access the **Port Attach/Detach QoS** window.
2. Select **Edit** → **Append** from the menu bar or click  in the left pane and input **1** in the **Please Input the Rows for Add:** dialog box that appears subsequently. Then click **OK** to add one binding rule.
3. Configure the parameters according to the planned data in Table 13-2.
4. Click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the configuration of flow policy is completed. See Figure 13-6.

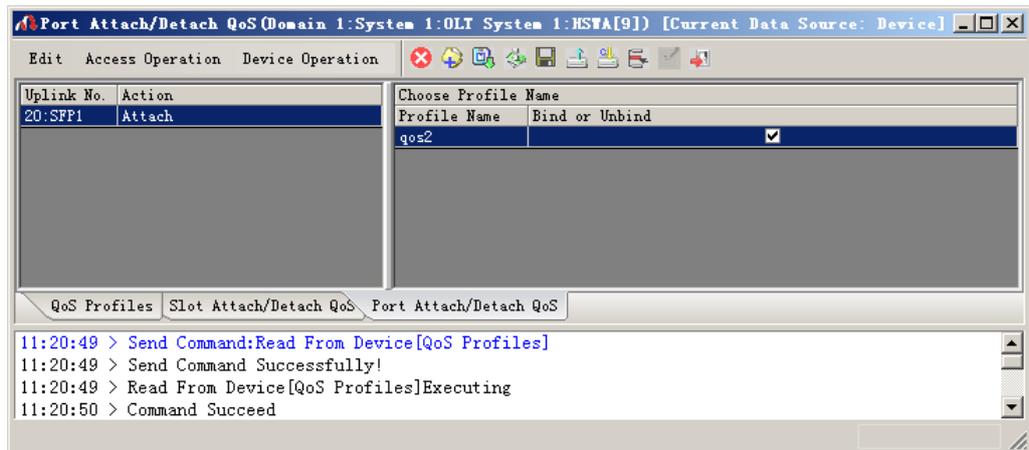


Figure 13-6 Binding the uplink port and the QoS profile

### 13.3.5 End of Configuration

After the above settings, the configuration of QoS service is completed. A QoS profile is bound to the uplink port 20:SFP1 of the AN5116-06B, and the port will discard the data packets with the source MAC address 200000000001 and the destination MAC address 100000000001.

## 13.4 Unbinding the Object and the QoS Profile

### 13.4.1 Unbinding the Slot and the QoS Profile

Configuration purpose

This operation is to unbind the line card and the QoS profile.

Operation steps

To unbind the GC4B card in Slot 5 and the QoS profile named qos1, the detailed steps are as follows:

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, and select **Config** → **QoS Profiles**. Then select the **Slot Attach/Detach QoS** tab to access the **Slot Attach/Detach QoS** window.
2. Input **5** in the **Slot No.** column, select **Detach** in the drop-down list of the **Action** column, and select the check box of **Bind or Unbind**, as shown in Figure 13-7.

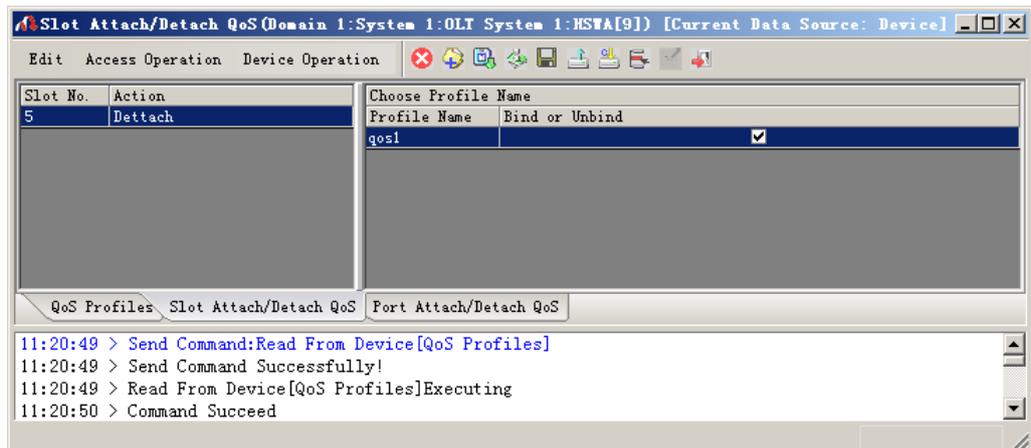


Figure 13-7 Unbinding the slot and the QoS profile

3. When the configuration is completed, click  to apply the configuration to the device. After unbinding, the command pane in the lower part of this window will display **The Slot Attach / Detach QoS In Device Is NULL!** as shown in Figure 13-8.

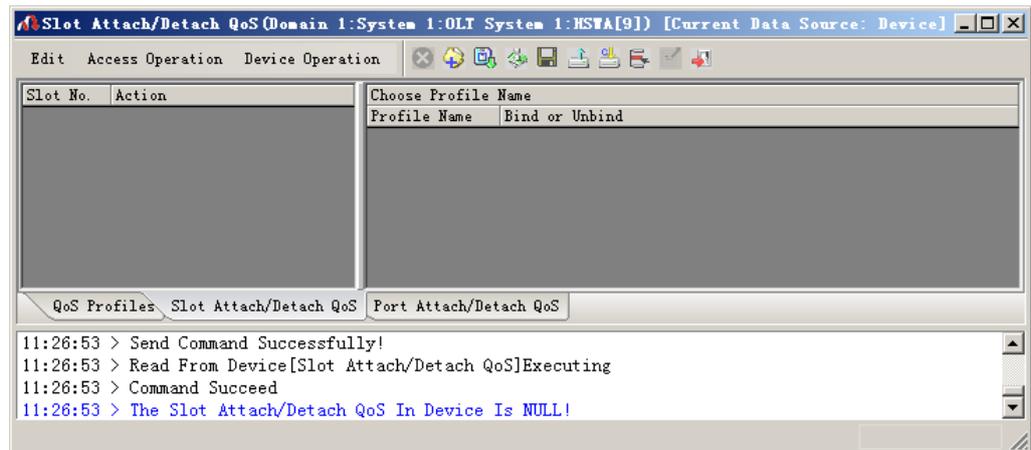


Figure 13-8 Unbinding the slot and the QoS profile successfully

## 13.4.2 Unbinding the Uplink Port and the QoS Profile

### Configuration purpose

This operation is to unbind the uplink port and the QoS profile.

### Operation steps

To unbind the uplink port 20:SFP1 and the QoS profile named qos2, the detailed steps are as follows:

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, and select **Config** → **QoS Profiles**. Then select the **Port Attach/Detach QoS** tab to access the **Port Attach/Detach QoS** window.
2. Select **20:SFP1** in the drop-down list of the **Uplink No.** column, select **Detach** in the drop-down list of the **Action** column, and select the check box of **Bind or Unbind**, as shown in Figure 13-9.

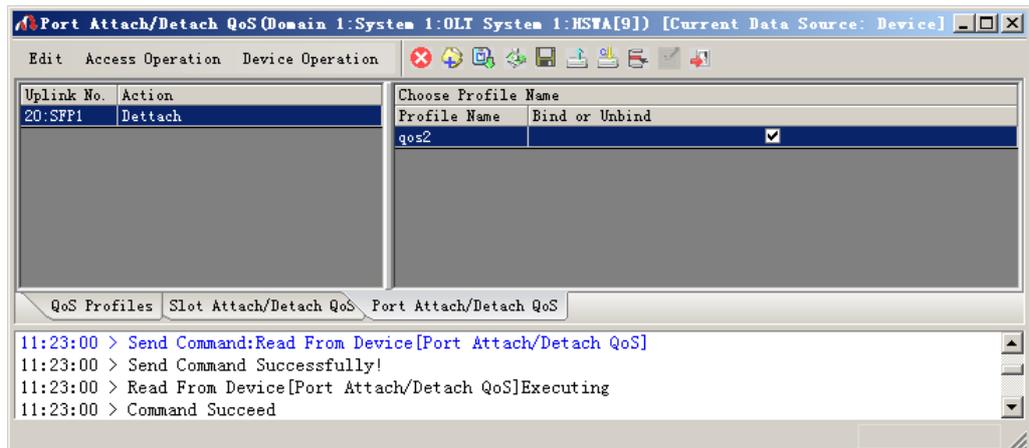


Figure 13-9 Unbinding the uplink port and the QoS profile

- When the configuration is completed, click  to send the configuration to the device. After unbinding, the command pane in the lower part of this window will display **The Slot Attach / Detach QoS In Device Is NULL!** as shown in Figure 13-10.

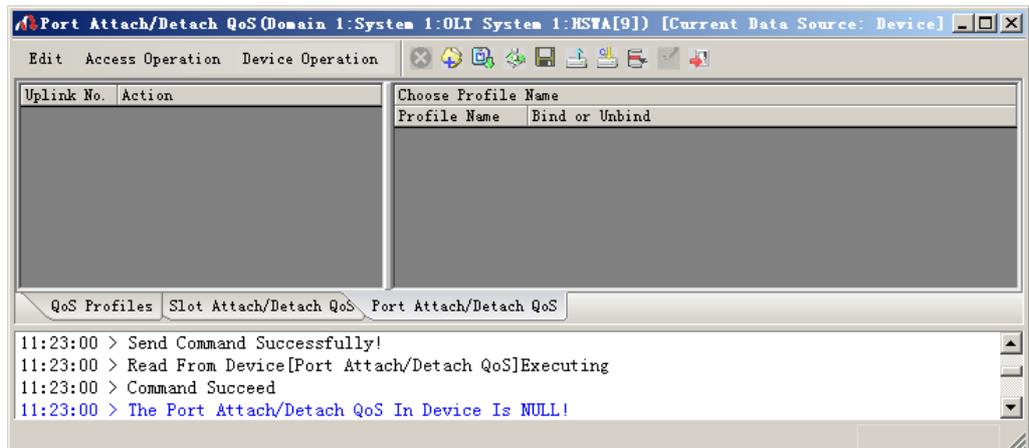


Figure 13-10 Unbinding the uplink port and the QoS profile successfully



# 14 Configuring the PON Protection

---

This chapter introduces how to configure the PON protection for the AN5116-06B in details. It includes the following sections:

- Background information
- Configuration rules
- PON protection configuration example

## 14.1 Background Information

The AN5116-06B provides double PON ports and fiber links to connect with the downlink subscriber devices. This can avoid traffic interruption caused by failure of one of the two links, and increase the system reliability and guarantee a non-interrupted traffic.

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 requirements.

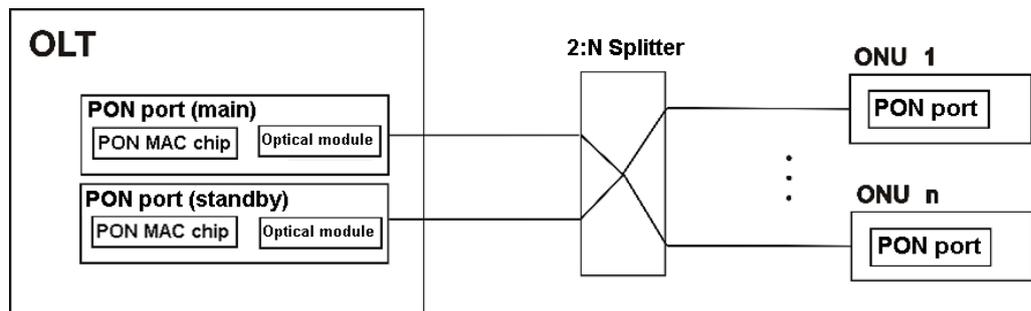


Figure 14-1 Schematic diagram of the PON port protection

## 14.2 Configuration Rules

- ◆ 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.
- ◆ When the PON protection switch is realized by hardware, the protection within the card does not restrain the PON port selecting; the protection between cards is limited to the cards of adjacent slot, such as Slots 1 and 2, Slots 3 and 4, Slots 5 and 6, etc, and also does not restrain the PON port selecting.
- ◆ When the PON protection switch is realized by software, there is no limitation for the protection within the card and the protection between cards.

## 14.3 PON Protection Configuration Example

### 14.3.1 Prerequisites

When using PON protection, the two PON ports inside one line card or between two line cards of the AN5116-06B access the 2:N optical splitter via fibers, and then access the ONU.

### 14.3.2 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 planned data are listed in Table 14-1.

Table 14-1 Planned data for configuring PON port protection

Item		Description	Example	
Setting the PON port protection groups	Group No.	The PON port protection group No.; configure according to the planned data of the operator.	1	
	Slot No.	The slot number actually used.	5	5
	PON port No.	The PON port number actually used.	1 (active)	2 (standby)
Configuring the PON port protection group mode	Group No.	Set the group No. configured in the PON port protection group.	1	
	Protection group mode	The protection type of the protection group	Type B	

### 14.3.3 Configuring the PON Port Protection Groups

Configuration purpose

Set the members of the PON protection group. The members can be two PON ports of one interface card, or two PON ports of two interface cards.

## Operation steps

The detailed steps for configuring the PON port 1 of the GC4B card in Slot 5 and the PON port 2 of the GC4B card in Slot 5 as one PON port protection group are listed below:

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, and select **Config** → **PON protection group** → **PON protection group config** to access the **PON protection group config** window.
2. Select **Edit** → **Append** from the menu bar or click , and input **1** in the **Please Input the Rows for Add:** dialog box that appears subsequently. Then click **OK** to add one PON protection group.
3. Input **1** in the **Group No.** column.
4. In the right pane, double-click the PON port No. 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 14-2.

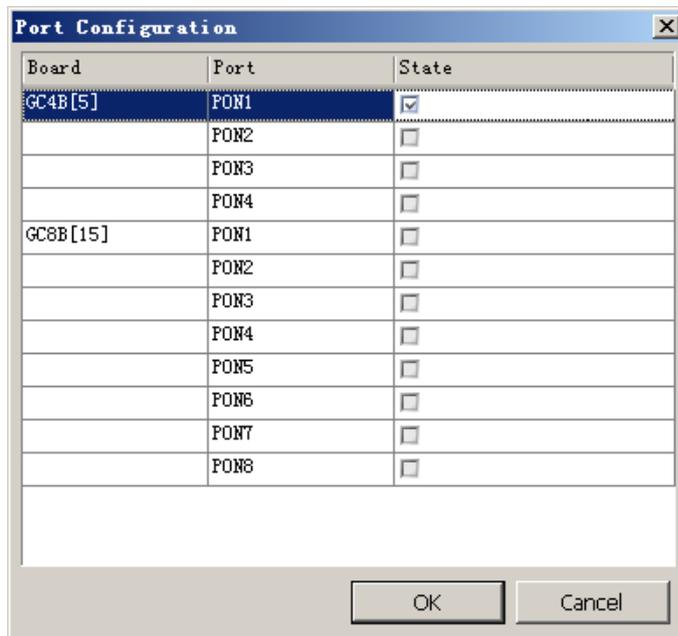


Figure 14-2 Configuring the main port

5. Double-click the PON port No. in the second row to bring up the **Port Configuration** dialog box. Select **PON2** of the GC4B card in Slot 5 and click **OK**, as shown in Figure 14-3.

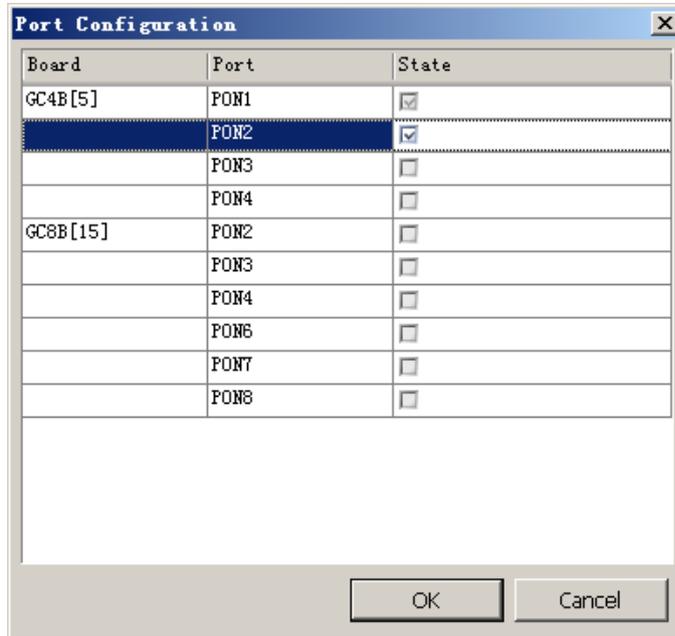


Figure 14-3 Configuring the standby port

6. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the configuration of PON port protection group is completed. See Figure 14-4.

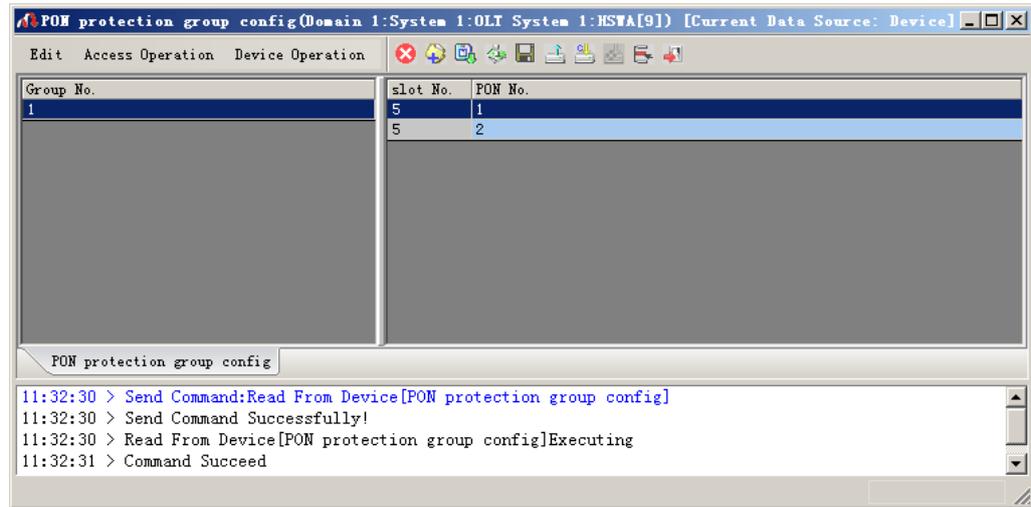


Figure 14-4 Configuring the PON port protection groups

## 14.3.4 Configuring PON Port Protection Group Mode

### Configuration purpose

Configure the PON protection group mode according to the network pattern, and set the link to automatically restore to the main link after the traffic of the main port is restored.

### Configuration example

Configure the protection group mode of PON protection group 1 to type B and auto restore of the main port to be disabled. The detailed steps are as follows:

1. Right-click the **HSWA[9]** card in the **Object Tree** pane, and select **Config** → **PON protection group** → **PON Protection Group Mode** to access the **PON Protection Group Mode** window.
2. Select **Edit** → **Append** from the menu bar or click , and input **1** in the **Please Input the Rows for Add:** dialog box that appears subsequently. Then click **OK** to add a row.
3. Configure the parameters of PON port protection group mode according to the planned data.

- When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the configuration of PON port protection group mode is completed. See Figure 14-5.

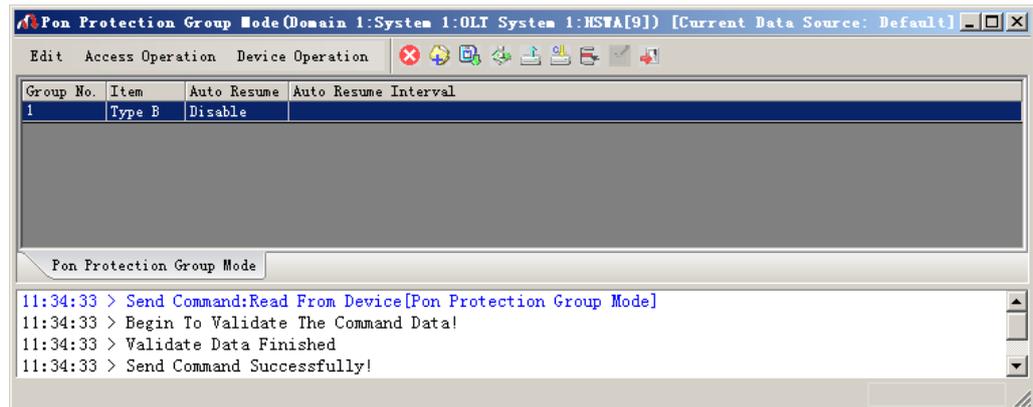


Figure 14-5 Configuring the PON port protection group mode

### 14.3.5 End of Configuration

Now the configuration of PON port protection is completed.

If the link of the PON port 1 of the GC4B card in Slot 5 fails, the traffic will be switched to the PON port 2 of the EC4B card in Slot 5.

# 15 Detecting the Optical Power

---

This chapter introduces how to detect the optical power for the AN5116-06B. It includes the following sections:

- Viewing the optical module parameter information of the GC4B / GC8B card
- Viewing optical module parameter information of the ONU

## 15.1 Viewing the Optical Module Parameter Information of the GC4B / GC8B Card

### Configuration purpose

Detect the optical module in the PON port of the GC4B/GC8B card, and read the parameter information of the optical module, such as the transmitting and receiving optical power, temperature, power supply voltage, bias current, etc.

### Operation steps

Taking viewing the optical module parameters of the PON port No.5 of the GC8B card in Slot No.15 as an example, the detailed steps are as follows:

1. Right-click the **GC8B[15]** card in the **Object Tree** pane, and select **Get Information** → **OptModule Para Information** to access the **OptModule Para Information** window.
2. Input the PON port No. to be viewed in the **PON Port No.** column. In this example, input **5**.
3. Click **Device Operation** → **Read Device** from the menu bar or click the  button to read the parameter information of this optical module, as shown in Figure 15-1.

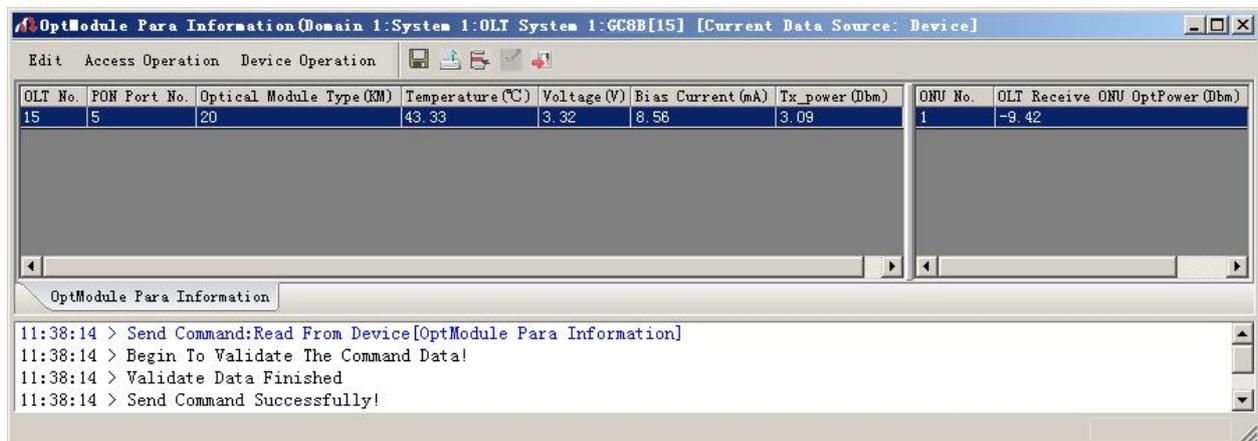


Figure 15-1 The optical module parameter information in the PON port of the GC8B card

## Result description

Optical Module Parameter	Normal Range	Related Alarm
Temperature	-25°C to +75°C	Optical module temperature crosses the threshold.
Voltage	-0.5V to 6V	Optical module voltage crosses the threshold.
Transmit optical power	When using 1000BASE –PX10: -3 to +2dBm. When using 1000BASE –PX20: +2 to +7dBm.	Transmit optical power crosses the threshold; optical power is too low.
Receive optical power	Overload optical power When using 1000BASE –PX10: -3dBm. When using 1000BASE –PX20: -6dBm.	Receive optical power crosses the threshold.
Bias Current	-128mA to 131mA	Bias current crosses the threshold.

## 15.2 Viewing Optical Module Parameter Information of the ONU

### Configuration purpose

Detect the optical module at the PON port of the ONU to view the parameter information of the optical module, such as the transmitting and receiving optical power, temperature, power supply voltage, bias current, etc.

### Operation steps

Taking viewing the optical module parameters of AN5506-09-A1 with the authorization No. 1 under the PON port No.5 of the GC8B card in Slot 15 as an example, the detailed steps are as follows:

1. Click the **GC8B[15]** card in the **Object Tree** pane, and the ONU information will display in the right pane. Right-click the ONU of PON5-AN5506-09-A1[1] in the ONU list, and then select **Get Information** → **OptModule Para Information** from the shortcut menu.
2. View the parameter information of the optical module in this PON port, as shown in Figure 15-2.

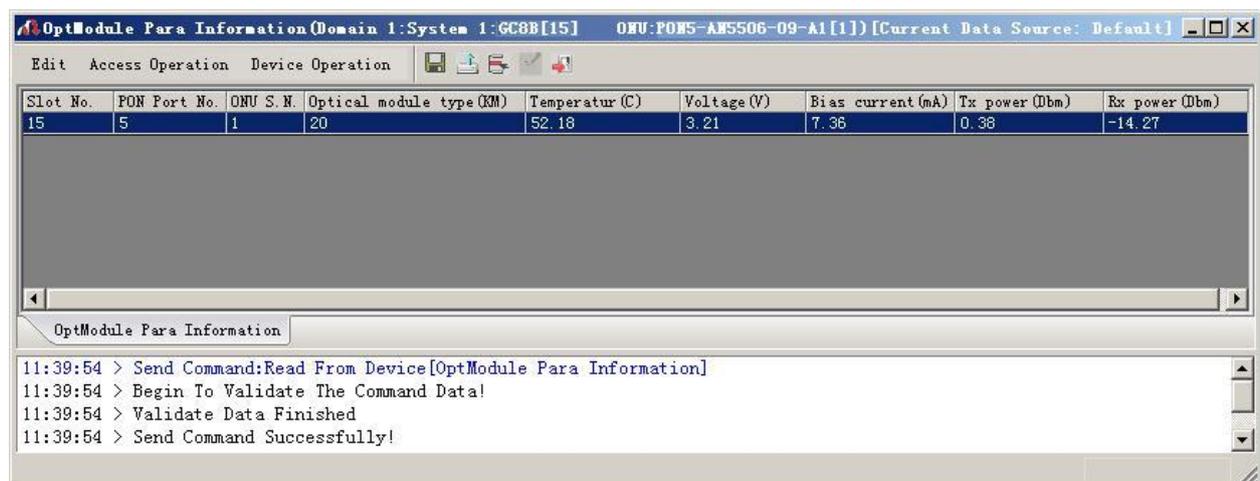


Figure 15-2 The optical module parameter information of the ONU PON port

## Result description

Optical Module Parameter	Normal Range	Related Alarm
Temperature	-25°C to +75°C	Optical module temperature crosses the threshold.
Voltage	-0.5 to 6 V	Optical module voltage crosses the threshold.
Transmit optical power	ONU side When using 1000BASE – PX10: -1 to +4 dBm. When using 1000BASE – PX20: -1 to +4 dBm.	Transmit optical power crosses the threshold; optical power is too low.
Receive optical power	Overload optical power When using 1000BASE – PX10: -1dBm. When using 1000BASE – PX20:-3dBm.	Receive optical power crosses the threshold.
Bias current	-128mA to 131mA	Bias current crosses the threshold.

**Note:**

PX-10 is a 10 km module and PX-20 a 20 km 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.



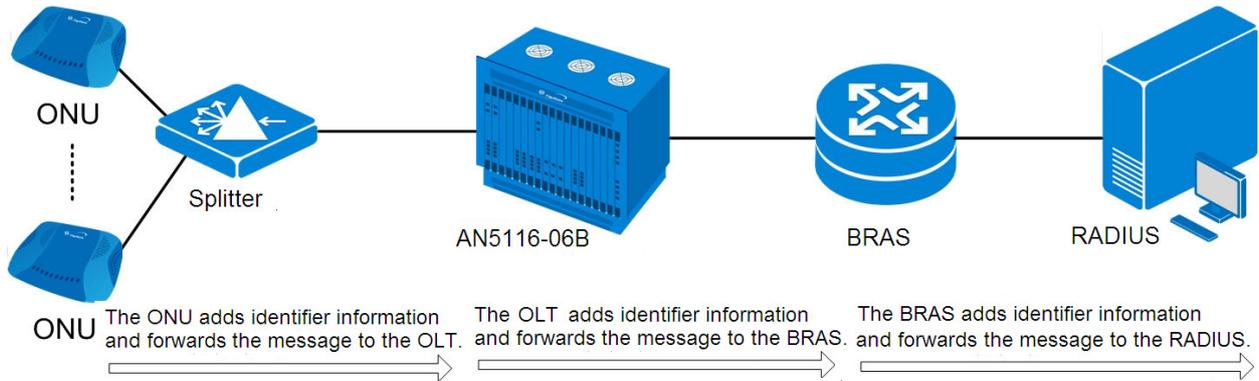
# 16 Configuring Line Identifier Management

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This chapter introduces the line identifier management of the AN5116-06B in details and it includes the following sections:

- Background knowledge
- Configuration rules
- Line identifier management example

## 16.1 Background Knowledge



The AN5116-06B 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. Then the ONU and the OLT forward 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. Finally, the RADIUS will perform the AAA (Authentication, Authorization and Accounting) function based on the identifier information.

## 16.2 Configuration Rules

- ◆ 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	Outer Service-VLAN	%o	ONU No.
%c	Inner Customer-VLAN	%n	ONU Type
%a	Access Node Identifier	%T	MDU ONU Slot No.
%r	ANI Rack No.	%M	MDU ONU Sub Slot No.
%f	ANI Frame No.	%P	MDU ONU UNI Port No.
%S	ANI Slot No.	%t	ONU User Port Type
%p	PON No.	%X	Port VPI or SVLAN
%m	ONU Identifier (MAC)	%x	Port VCI or CVLAN
%u	Uplink Port Type	%l	IAD IP
%L	Service Unit Type	%A	IAD MAC
%O	OLT management 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 Delimiter list

Delimiter	Description
	Space
.	Period
/	Slash
;	Semicolon
:	Colon
{	Open curly bracket
}	Close curly bracket
<	Open angle bracket
>	Close angle bracket

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 Line Identifier Management Example

### 16.3.1 Planning Data

See Table 16-3 for the planned data of the line identifier management.

Table 16-3 Planned data for line identifier management

Item	Description	Example	
Line identifier management	Option82 Switch	Enable or disable the Option82 function. Configured according to the network planning of the operator.	Enable
	Option18 Switch	Enable or disable the Option18 function. Configured according to the network planning of the operator.	Enable
	PPPoE+ Switch	Enable or disable the PPPoE+ function. Configured according to the network planning of the operator.	Enable
	Access Node Identifier	The identifier of the node. Configured according to the network planning of the operator.	AN5116-06B
	ANI_rack	The subrack number of the node. Configured according to the network planning of the operator.	1
	ANI_frame	The shelf number of the node. Configured according to the network planning of the operator.	1
Circuit ID Format	Use CTC Format / CNC Format / Custom Format	Select one from the three formats.	Custom Format
	Custom String	Configurable only in the custom format.	—
	Circuit ID Variable	Configurable only in the custom format.	SVLAN
			CVLAN
			Access type
			Access Node Identifier
		ANI Rack No.	
		ANI Frame No.	

Item	Description	Example
		ANI Slot No.
		PON No.
		ONU Identifier (MAC)
		Uplink port type
		ONU No.
		ONU Type
		MDU ONU UNI port No.
Delimiter	Configurable only in the custom format.	/

### 16.3.2 Configuration Flow Chart

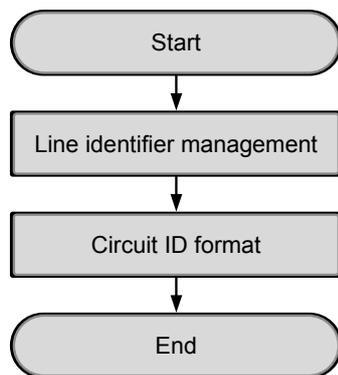


Figure 16-1 Configuration flow chart of line identifier management

### 16.3.3 Line Identifier Management

#### Purpose

Configure relevant parameters of the line identifier management and add the access node identifier, subrack number and shelf number of the OLT into the DHCP request packet using the DHCP Option82, Option18 or PPPoE+ mode.

## Operation steps

1. Right-click the HSWA[9] card in the **Object Tree** pane and select **Config** → **DHCP** → **Line Identifier Management** from the shortcut menu to access the **Line Identifier Management** window.
2. Configure the parameters according to the planned data in Table 16-3.
3. When the configuration is completed, click the  button and apply the configuration to the equipment. **Command succeed** will appear in the command pane in the lower part of the window, indicating that writing configuration to the device and reading configuration from the device are both successful. And the configuration of line identifier management is completed. See Figure 16-2.

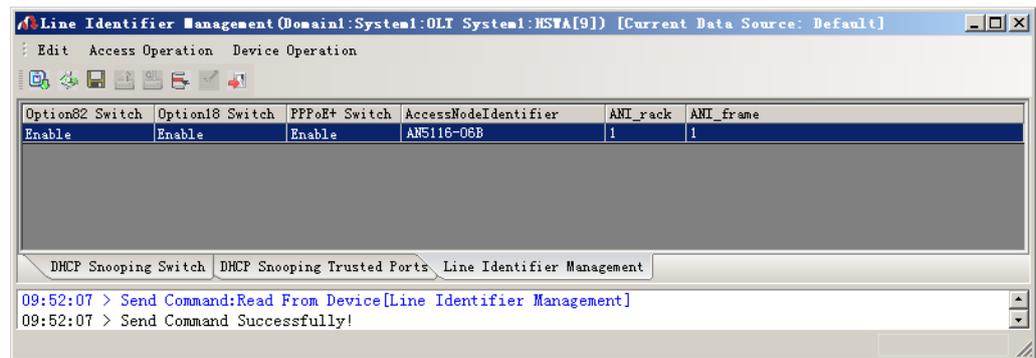


Figure 16-2 Configuring line identifier management

### 16.3.4 Circuit ID Format

#### Purpose

Configure the circuit ID format and add user information and equipment information into the packet, facilitating the management of the upper layer BRAS equipment.

#### Operation steps

1. Right-click the HSWA[9] card in the **Object Tree** pane and select **Config** → **DHCP** → **Circuit ID Format** from the shortcut menu to access the **Circuit ID Format** dialog box. See Figure 16-3.

2. Configure the parameters according to Table 16-3.
3. Click **OK** after completing the configuration. See Figure 16-3.

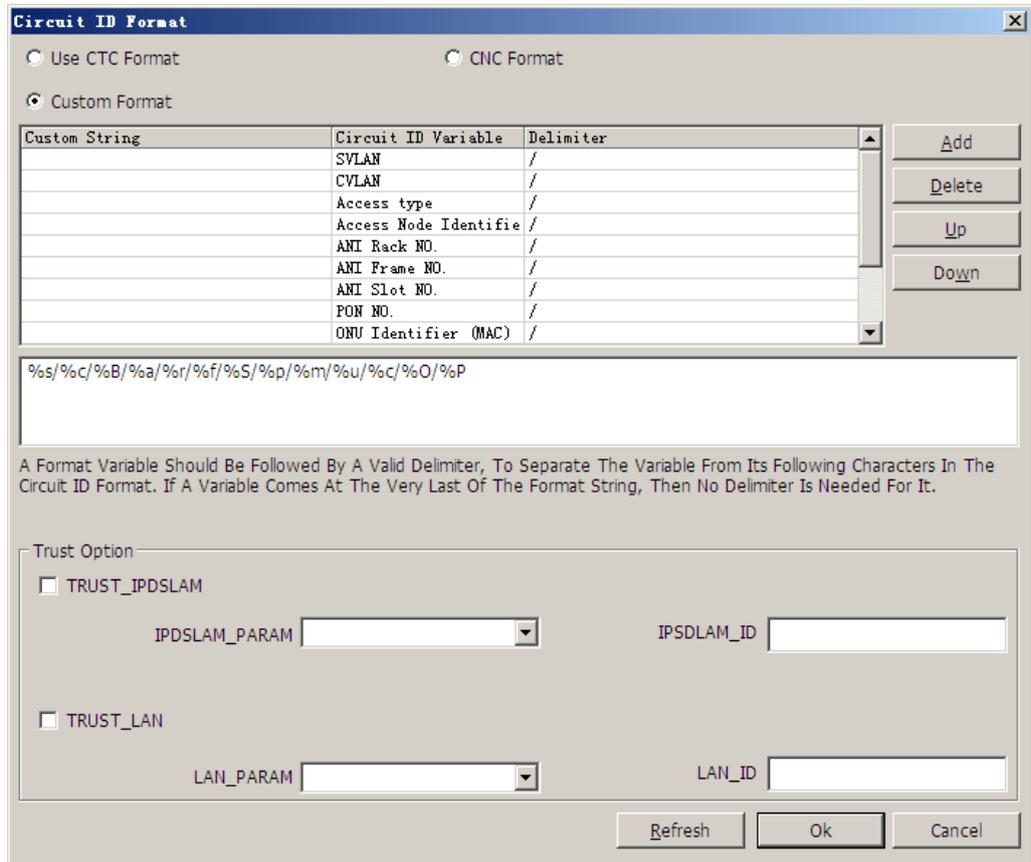


Figure 16-3 Configuring the circuit ID format

### 16.3.5 End of Configuration

The analysis result of the line identifier field using packet capture software is 1000/100/olt/AN5116-06B/1/1/13/1/FHTT00030405/+GU6F/2/5506-04-B2G/1.



# 17 POTS Internal Line and External Line Test

---

This chapter introduces the POTS external line and internal line tests of the AN5116-06B in details. It includes the following contents:

- POTS internal line test
- POTS external line test

## 17.1 POTS Internal Line Test

### 17.1.1 Test Rules

- ◆ 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.
- ◆ 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.

### 17.1.2 Planning Data

Table 17-1 Planned data for voice internal line test

Item		Description	Example
ONU information	Slot No.	The actually used slot number of the GC8B of the ONU.	6
	PON No.	The actual PON number of the ONU.	1
	ONU authorization No.	Configured according to the network planning of the operator.	1
	ONU type	The type of the ONU.	AN5506-04-G1
POTS internal line test	POTS No.	The actually used POTS port number.	1
	Test type	The non-forcible test is recommended.	no force test

### 17.1.3 Internal Line Test Example

#### Purpose

Configure the voice internal line test parameters. The user can check the test results after issuing the test command and ascertain whether the voice fault is caused by the ONU.

## Operation steps

1. Click the GC8B[6] card in the **Object Tree** pane and all ONUs listed under the GC8B[6] card are displayed in the right pane. Right-click the AN5506-04-G1 ONU and select **Get Information** → **Line Test** from the shortcut menu. Click the **POTS Inline Test** tab to access the **POTS Inline Test** window.
2. Configure the parameters according to Table 17-1. When completing the configuration, click the  button on the toolbar to issue the test command. The internal test result will be displayed after the test is completed. See Figure 17-1.

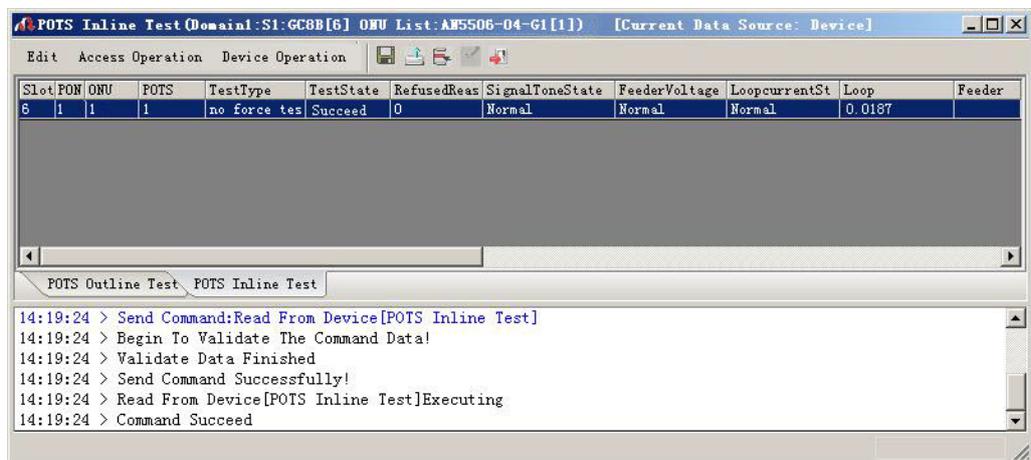


Figure 17-1 The **POTS Inline Test** window

## 17.2 POTS External Line Test

### 17.2.1 Test Rules

- ◆ 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.

### 17.2.2 Planning Data

Table 17-2 Planned data for voice external line test

Item		Description	Example
ONU information	Slot No.	The actually used slot number of the GC8B of the ONU.	6
	PON No.	The actual PON number of the ONU.	1
	ONU authorization No.	Configured according to the network planning of the operator.	1
	ONU type	The type of the ONU.	AN5506-04-G1
POTS internal line test	POTS No.	The actually used POTS port number.	1
	Test type	The non-forcible test is recommended.	no force test

### 17.2.3 External Line Test Example

#### Purpose

Configure the voice external line test parameters. The user can check the test results after issuing the test command and ascertain whether the voice fault is caused by the ONU.

## Operation steps

1. Click the GC8B[6] card in the **Object Tree** pane and all ONUs listed under the GC8B[6] card are displayed in the right pane. Right-click the AN5506-04-G1 ONU and select **Get Information** → **Line Test** from the shortcut menu. Click the **POTS Outline Test** tab and access the **POTS Outline Test** window.
2. Configure the parameters according to Table 17-2. When completing the configuration, click the  button on the toolbar to issue the test command. The external test result will be displayed after the test is completed. See Figure 17-2.

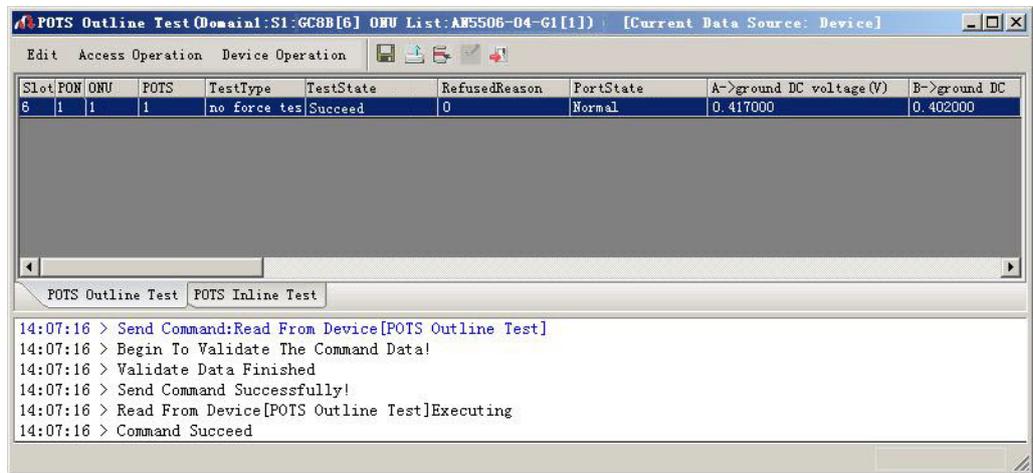


Figure 17-2 The **POTS Outline Test** window



# Appendix A FTP Operation Guide

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## A.1 Overview of the FTP

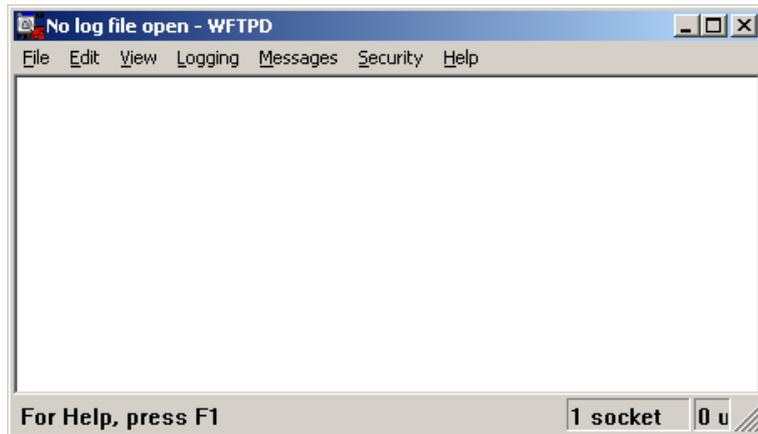
A computer is connected with the equipment via the network cable. Set up the ftp server end on the computer; that is, install the wftp software.

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 Steps

In the following, we will instruct the operation steps of the wftp software, using an example: creating an ftp user with the name **1** and password **1**, and setting the path **d:\ftp** for saving the upgrade / backup package.

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.



3. Click **Security** → **Users/Rights** in the menu bar to start user setting, as shown in the following figure.



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 **1** for the **User Name**, 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.

---



5. Click the **OK** button and go on to input **1** for both **New Password:** and **Verify Password.** And then, click the **OK** button to complete the new user creation, as shown in the following figure.

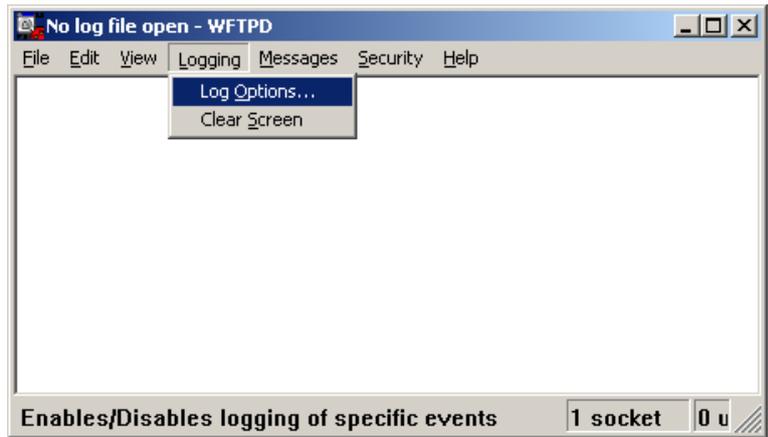


6. In the **User/Rights Security Dialog** window, input the path in which the upgrade / backup package locates in the **Home Directory:** item. According to the setting in the first step, here input **d:\ftp**, as shown in the following figure.

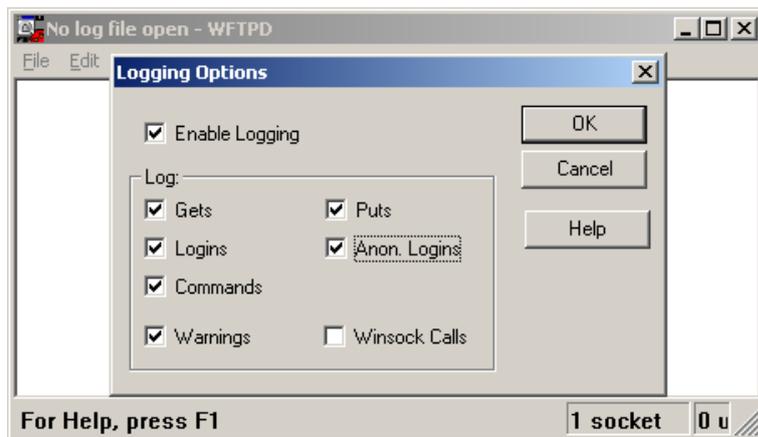


Click the **Done** button to complete the setting.

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.



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.



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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To help us better understand your needs, please focus your answers on a single documentation or a complete documentation set.

Documentation Name	
Code and Version	

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Frequently  Rarely  Never  Other (please specify) \_\_\_\_\_

2. When do you use the documentation?

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

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5. Which documentation form do you prefer?

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2. How do you like the language style of the documentation?

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3. Are any contents in the documentation inconsistent with the product?

\_\_\_\_\_

4. Is the information complete in the documentation?

Yes

No (please specify) \_\_\_\_\_

5. Are the product working principles and the relevant technologies covered in the documentation sufficient for you to get known and use the product?

Yes

No (please specify)\_\_\_\_\_

6. Can you successfully implement a task following the operation steps given in the documentation?

Yes (please give an example)\_\_\_\_\_

No (please specify the reason)\_\_\_\_\_

7. Which parts of the documentation are you satisfied with?

\_\_\_\_\_

8. Which parts of the documentation are you unsatisfied with? Why?

\_\_\_\_\_

9. What is your opinion on the Figures in the documentation?

Beautiful  Unbeautiful (your advice) \_\_\_\_\_

Practical  Unpractical (your advice) \_\_\_\_\_

10. What is your opinion on the layout of the documentation?

Beautiful  Unbeautiful (your advice) \_\_\_\_\_

11. Thinking of the documentations you have ever read offered by other companies, how would you compare our documentation to them?

Product documentations from other companies: \_\_\_\_\_

Satisfied (please specify) \_\_\_\_\_

Unsatisfied (please specify) \_\_\_\_\_

12. Additional comments about our documentation or suggestions on how we can improve:

\_\_\_\_\_

\_\_\_\_\_

Thank you for your assistance. Please fax or send the completed survey to us at the contact information included in the documentation. If you have any questions or concerns about this survey please email at [edit@fiberhome.com.cn](mailto:edit@fiberhome.com.cn).