FTTx GPON IPTV Service Troubleshooting

www.huawei.com

Huawei Technologies Co., Ltd. All rights reserved.

This document is Huawei's confidential information. All content is for internal use by Huawei-authorized training customers and is prohibited for any other purpose. Without permission, no one may copy, modify, adapt, or provide this material or any part of it or derivative works based on this material to others.

HUAWEI

Objectives

- Upon completion of this course, you will be able to:
  - List common IPTV service fault category
  - Locate IPTV common faults
  - Complete IPTV service troubleshooting

Huawei Technologies Co., Ltd. All rights reserved.

Contents

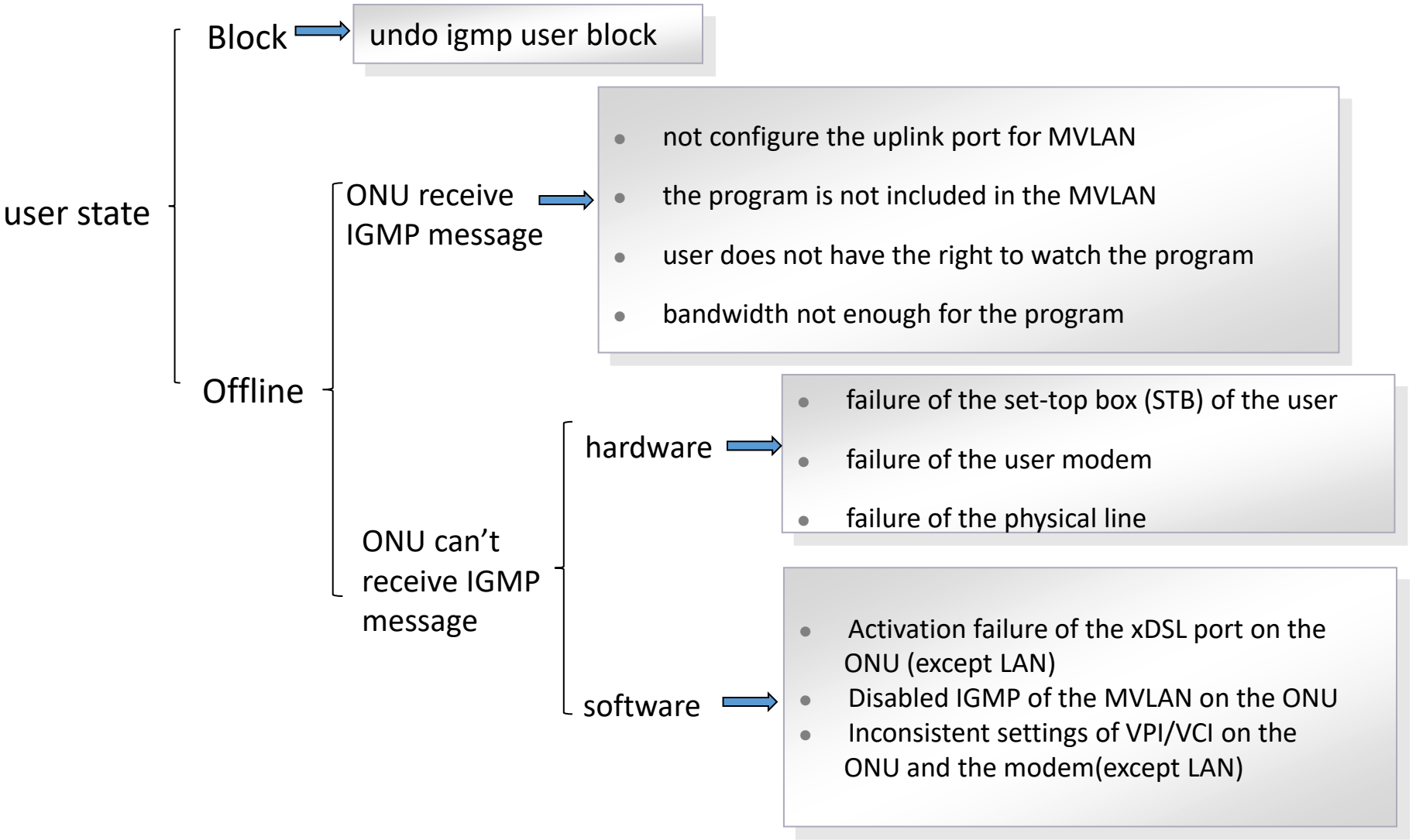
Huawei Technologies Co., Ltd. All rights reserved.

HUAWEI

Contents

Huawei Technologies Co., Ltd. All rights reserved.

Multicast User Failing to Go Online



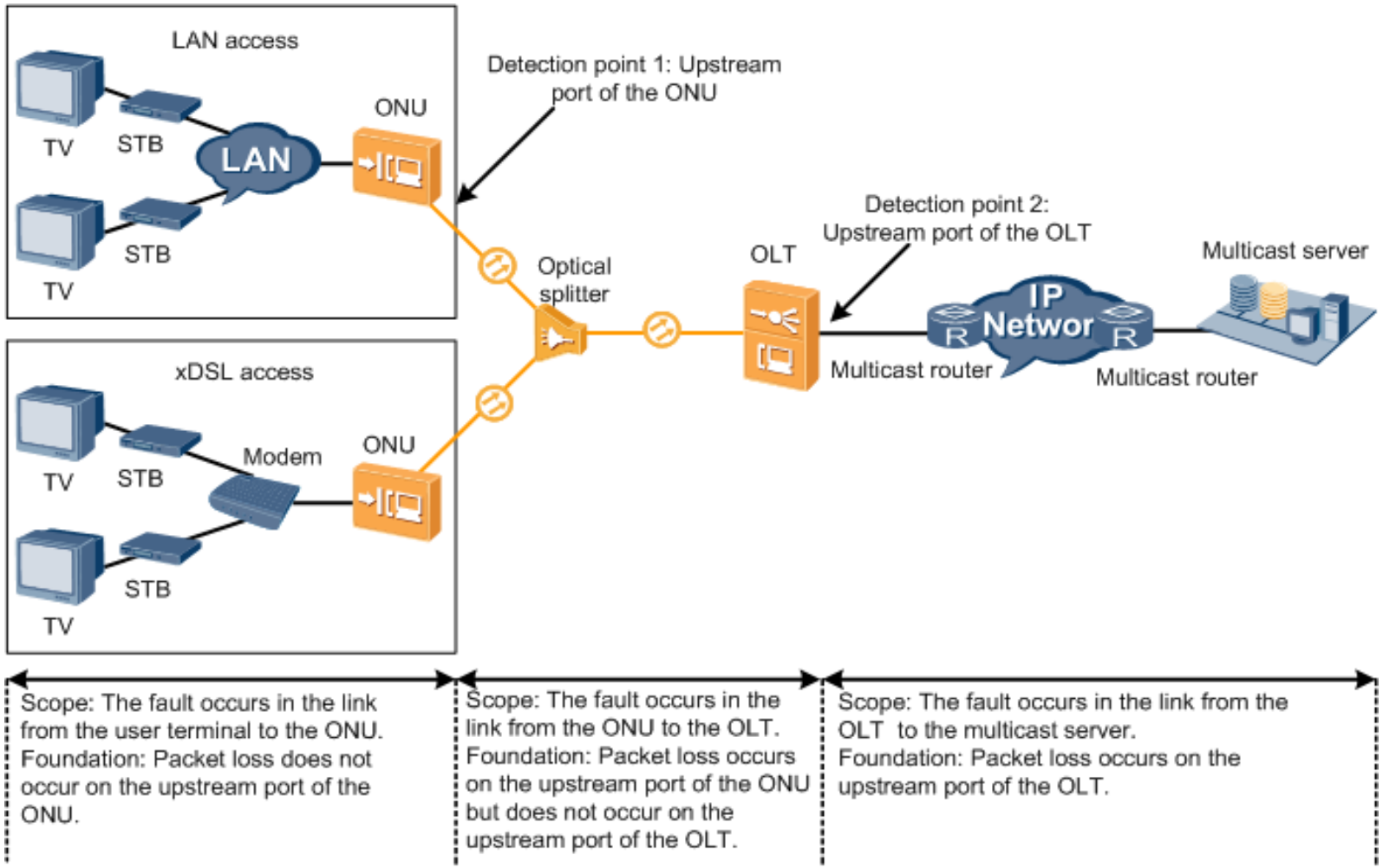
Huawei Technologies Co., Ltd. All rights reserved.

Dark Screen After Going Online and Demanding a Program

Fault Scope		Possible Cause
User terminal		The modem, STB, or video cable is abnormal.
ONU	user offline	troubleshoot according to Multicast User Failing to Go Online
	user online	•the program is not included in the MVLAN •the multicast user does not have the right to watch •The number of programs reaches the maximum value •The available maximum multicast bandwidth of the multicast user is smaller than the required bandwidth of the demanded program. •The rate of the traffic profile is excessively smaller than the multicast program bandwidth.
OLT		The program demanded by a multicast user is not included in the MVLAN configured on the OLT.
Multicast server		•The program is not configured on the multicast server. •The network between the multicast server and the OLT is faulty.

Huawei Technologies Co., Ltd. All rights reserved.

Erratic Display (Mosaic) in a Multicast Program



Huawei Technologies Co., Ltd. All rights reserved.

Erratic Display (Mosaic) in a Multicast Program

Fault Scope	Possible Cause
User terminal to the ONU	The activation rate of the xDSL port is excessively low. When a user is connected to the ONU through a LAN, this cause is excluded. The rate of the traffic profile bound to the traffic streams is smaller than the multicast program bandwidth. The QoS rate limitation on the port is excessively low. If erratic display (mosaic) occurs only when programs are switched, the cause may be that the available maximum multicast bandwidth of the user is greater than the downstream line rate and the quick leave function is not enabled. The processing capability of the modem is insufficient.
ONU to the OLT	Packet loss occurs over the line between the OLT and the ONU.
OLT to the multicast server	The multicast source is abnormal. The quality of the network between the OLT and the multicast server is poor.

Huawei Technologies Co., Ltd. All rights reserved.

Abnormal Interruption of a Multicast Program

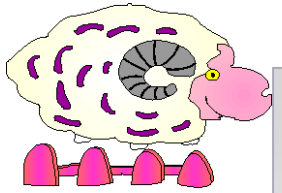
- When abnormal multicast program interruption occurs in an FTTx network, generally locate the fault from upper-layer devices to lower-layer devices, that is, in the sequence of multicast server -> OLT -> ONU -> user terminal section by section. The following table lists the NEs that may be affected by this fault and the possible causes.

Fault Scope	Possible Cause
Multicast server	The multicast source is abnormal. The network between the OLT and the multicast server is faulty.
OLT	The configuration of the multicast subtending port on the OLT does not match the configuration of the multicast mode on the ONU. **quick leave** **igmp proxy** **display igmp config vlan**
ONU	The line from the ONU to the user terminal is faulty. The watching duration of the user reaches the maximum preview duration.
User terminal	The modem or set-top box (STB) is faulty.

Huawei Technologies Co., Ltd. All rights reserved.

Long Time in Switching Programs

- When the fault of long time in switching programs occurs in an FTTx network, check the quick-leave attribute of the OLT and ONU.



If the multicast user is not configured with the quick-leave attribute, the ONU sends a group-specific query to the multicast group. The ONT deletes the multicast user from the multicast group only when it does not receive the response from the multicast user within a period of time. Before the previous program stops, the user may not be able to demand a new program because the multicast bandwidth is insufficient or the number of programs that can be watched concurrently is limited. As a result, switching programs takes a long time.

btv
igmp user
port
quick leave

run the ***igmp user modify*** *user-index* ***quickleave*** command to change the quick leave attribute of the user

define new igmp user
to modify a igmp user

Huawei Technologies Co., Ltd. All rights reserved.

Contents

Huawei Technologies Co., Ltd. All rights reserved.

HUAWEI

Multicast User Can’t Watch Program

- Enable the IGMP debug function on OLT：
  - MA5800(config)#**terminal debugging**
  - MA5800(config)#**terminal monitor**
  - MA5800(config)#**debugging igmp all**
- Check whether IGMP report message
- Check whether the reason of configuration, bandwidth, right which lead the fault of host processing.

Huawei Technologies Co., Ltd. All rights reserved.

Query whether OLT receive IGMP message

- MA5800(config)#display igmp statistic global
  - The data of global IGMP statistic:
  - ----------
  - Receive V1 general query number : 0
  - Receive V2 general query number : 0
  - Receive V3 general query number : 0
  - Receive V2 specific query number : 0
  - Receive V3 specific query number : 0
  - Receive V1 total report packets number : 0
  - Receive V2 total report packets number : 3192
  - Receive V3 total report packets number : 68
  - Receive V2 leave packets number : 2
  - Receive V2 global leave packets number : 0
  - Receive invalid igmp packets : 0
  - Send V2 general query number: 667
  - Send V3 general query number : 15
  - Send V2 specific query number : 0
  - Send V3 specific query number : 0
  - Send V2 report packets number : 0
  - Send V3 report packets number : 33
  - Send V2 leave packets number : 0
  - Send V2 global leave packets number : 0
  - ----------

Huawei Technologies Co., Ltd. All rights reserved.

Query whether OLT Uplink port send IGMP message

- capture the packets on the uplink port
- V2 message:
  - MA5800(config)#**acl 3000**
  - MA5800(config-acl-adv-3000) **rule 1 permit ip destination 224.1.1.1 0** //program IP
  - MA5800(config)#**traffic-statistic inbound ip-group 3000 port 0/19/0**
- V3 message:
  - MA5800(config)#**acl 5000**
  - MA5800(config-acl-user-5000)#**rule 1 permit e0010101 ffffffff 50**
  - MA5800(config-acl-user-5000)#**rule 1 permit e0010101 ffffffff 54**
  - MA5800(config)#**traffic-statistic inbound ip-group 5000 port 0/19/0**

Huawei Technologies Co., Ltd. All rights reserved.

Query whether OLT Uplink port send IGMP message

- Query whether the igmp message increase on uplink port:
  - MA5800(config)#**display qos-info all port 0/19/0**
    - traffic-statistic:
    - port 0/19/0:
    - Inbound:
    - Matches: Acl 5000 rule 1 running
    - 0 packet
    - Matches: Acl 5000 rule 2 running
    - 6 packets

Huawei Technologies Co., Ltd. All rights reserved.

Fault Prompt List

- Which information can we obtain by debugging?
  - 1. match program fail
  - 2. the user has no right
  - 3. the number of program that the user is allowed to watch has reached maximum
  - 4. the number of the grade program that the user is allowed to watch has reached maximum
  - 5. the BTV user fails to join the program
  - 6. the user fails to pass bandwidth CAC
  - 7. Multicast group IP address conflict

Huawei Technologies Co., Ltd. All rights reserved.

HUAWEI

Failure To Match The Program

- Query whether the user join MVLAN:
  - MA5800(config-mvlan200)#**display igmp multicast-vlan member port 0/8/0 gemport 1**
    - Multicast vlan(s) the user joined :
    - ----------
    - 200
    - ----------
    - Total: 1
- When the multicast user hasn’t joined the corresponding MVLAN, run the command:
  - MA5800(config-mvlan200)#**igmp multicast-vlan member port**

Huawei Technologies Co., Ltd. All rights reserved.

Failure To Match The Program

- Query the configuration of MVLAN：
  - MA5800(config-mvlan200)#**display igmp config vlan 200**
    - ----------
    - IGMP mode : proxy
    - Program match mode : enable
    - Program match group : -
    - ----------
    - If IGMP mode if off, enable IGMP
- Check whether add program to MVLAN?
  - MA5800(config-mvlan200)#**display igmp program vlan 200**
    - When “Program match mode” is enable, must add programs
- Check whether add uplink port for the MVLAN?
    - Check whether add the uplink port for MVLAN
  - MA5800(config-mvlan200)# **display igmp uplink-port all**

Huawei Technologies Co., Ltd. All rights reserved.

No Right To Watch Program

- Query whether the user has right
  - MA5800(config-btv)#**display igmp user port 0/8/0 gemport 1**
    - ----------
    - User : 0/8/0
    - State : offline
    - Authentication : auth
    - Bind profile list
    - ----------
    - index Profile name Program number
    - ----------
    - 0 Profile0 1
    - ----------
  - When the user's type is "auth", check whether the user is bound with proper profile.

Huawei Technologies Co., Ltd. All rights reserved.

User Reach The Maximum Permit Program Number

- Query the maximum permit program number:
  - MA5800(config-btv)#**display igmp user port 0/8/0 gemport 1**
  - MA5800(config-btv)#**display igmp user extended-attributes service-port 0**
    - BTV user(Frame/Slot/Port/FlowID) : 0/8/0/0
    - HDTV watch limit : 1
    - SDTV watch limit : 3
    - Streaming-Video watch limit : 4

Huawei Technologies Co., Ltd. All rights reserved.

Check Available Bandwidth Left And Multicast IP Address Conflict

- Query whether the user's available bandwidth is not enough
  - MA5800(config-btv)#**display igmp user port 0/8/0 gemport 1**
    - User MaxBandWidth : no-limit
    - Used bandwidth(kbps) : 10000
- Query whether there is multicast ip address conflict
  - MA5800(config-btv)#**display alarm history alarmid 0x2b100004**

Huawei Technologies Co., Ltd. All rights reserved.

Check Whether The Multicast Flow Arrive At The Uplink Port

- Query the status of programs:
  - MA5800(config)#**display igmp program current-status**
    - ----------
    - IP Address |UpTime |Expires | Last Reporter | VLAN
    - ----------
    - 224.1.1.1 00:00:03 00:04:17 3.3.3.1 3
    - ----------
    - Total: 1 IGMP Program(s) run status data

Huawei Technologies Co., Ltd. All rights reserved.

Check Whether The Multicast Flow Arrive At The Uplink Port

- Check Whether The Multicast Flow Arrive At The Uplink Port
  - MA5800(config)#**display multicast flow-statistic vlan 3 ip 224.1.1.1**
    - Please waitting...
    - Multicast flow statistic result: 3624(kbps)
      - If the result is not 0, indicate there is flow
      - If the result is 0, execute the operation below
  - MA5800(config)#**display multicast flow-statistic uplink-port 0/19/0**
    - Multicast flow statistic result: 3560(kbps)
      - If the result is not 0, check the native vlan of the uplink port
      - If the result is 0, continue to check the network side

Huawei Technologies Co., Ltd. All rights reserved.

Q&A

1. What the common categories of FTTx IPTV service fault?
2. What's the function of "quick leave"? What's the possible problem by improper configuration?

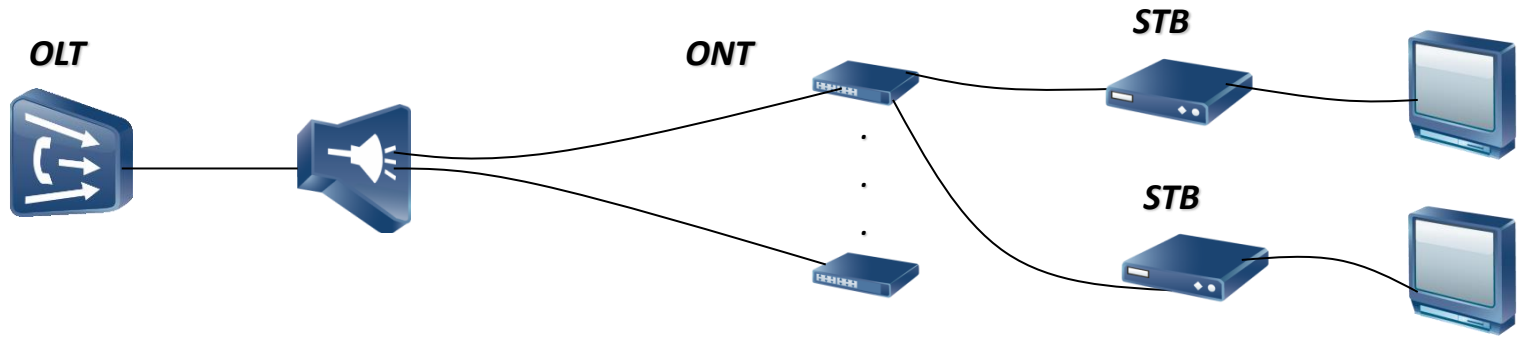
Huawei Technologies Co., Ltd. All rights reserved.

Contents

Huawei Technologies Co., Ltd. All rights reserved.

Case1 Program Stops For A While When Switching Channel

- Description:
  - User’s ONT connect to two STB, the program stops for a while(2 to 3 seconds) when switching channel.



- Alarm:
  - open “debugging igmp” to trace report, find warning message:

    “Warning: the number of program that the user is allowed to watch has reached maximum”.

Huawei Technologies Co., Ltd. All rights reserved.

Case1 Program Stops For A While When Switching Channel

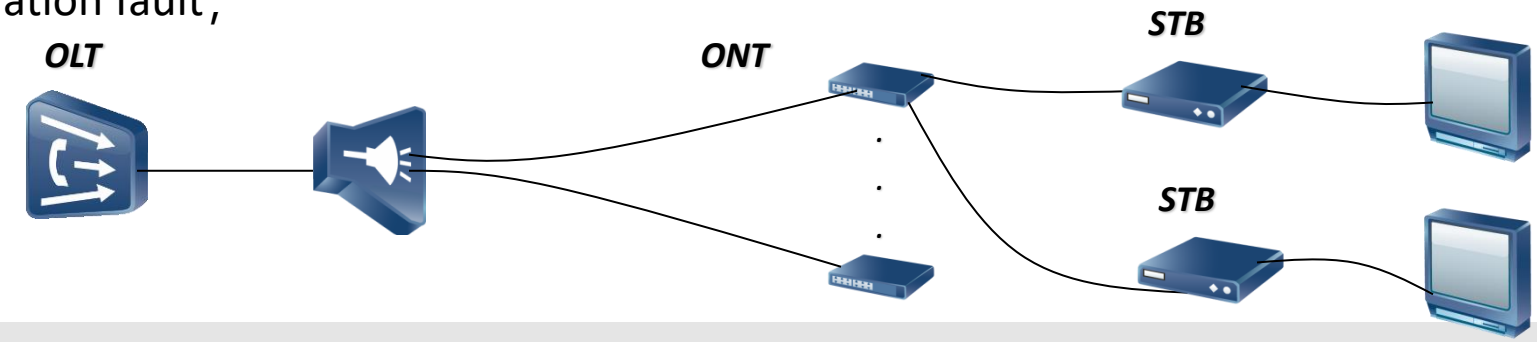
- Cause analysis:
  - When STB switch from program 1 to program 2, it send “leave” message for program 1 and “join” message for program 2. When the quick-leave-time >5, OLT send “specify group query” message upon receiving the “leave” message. OLT delete program 1 in 0.5 minute without response.
  - When the interval time between the “leave” and “join” message less than 0.5 minute, program have not been deleted and program 2 refused because of maximum program restriction. This lead to stop for a while when switching channel.
- Troubleshooting:
  - Enable the “quick-leave” function for the programs.

Huawei Technologies Co., Ltd. All rights reserved.

HUAWEI

Case2 Multicast Service Fails

- Fault description:
  - A new site
  - Networking： TV —>STB —> ONT —> OLT—> BRAS —> multicast router —> multicast server
  - Multicast subscribers of the OLT can’t watch program
- Fault analysis:
  - subscriber side fault；
  - upper layer fault；
  - data configuration fault；



Huawei Technologies Co., Ltd. All rights reserved.

Case2 Multicast Service Fails

- Troubleshooting:
  - Open “IGMP Debugging” to trace the igmp message, find that OLT can receive igmp packet from user side;
  - Check the subscriber’s state, it is online when opening the STB;
  - Check the data configuration, find that the version of IGMP is V3 but not specify the program source ip address;
  - After add the source ip address for the programs, fault clear.

Experience & Conclusion:

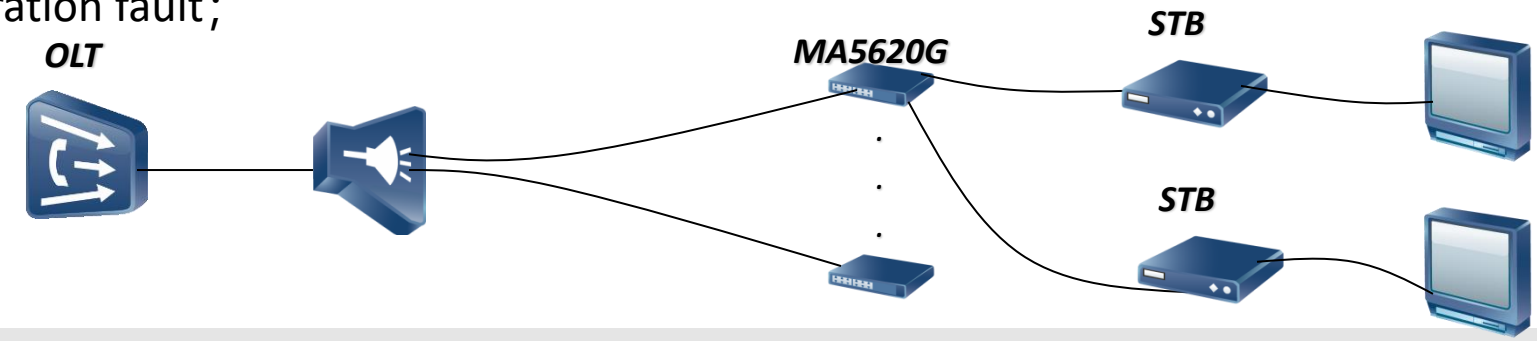
If the multicast protocol adopt IGMP V3, the ip address of multicast server must be specified for the program, otherwise the service is fault.

Huawei Technologies Co., Ltd. All rights reserved.

HUAWEI

Case3 Multicast Service Fails Because Of ONU Incorrect Configuration

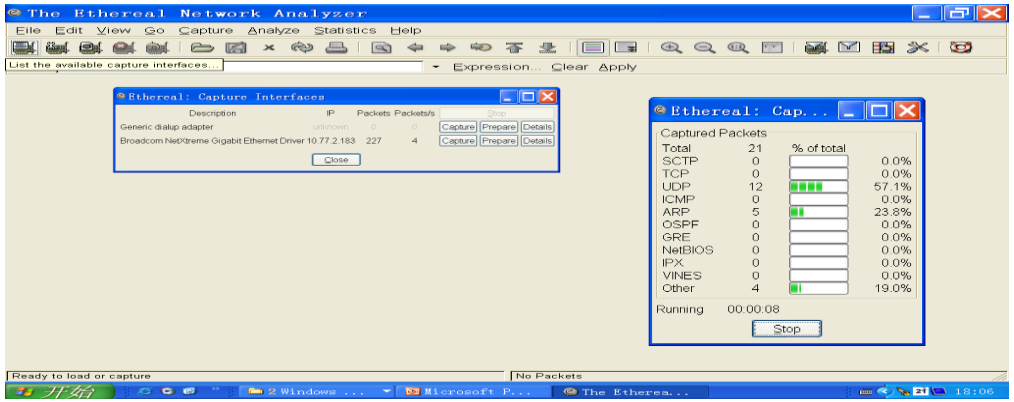
- Description:
  - A new site
  - Networking： TV —>STB —>MA5620G—> OLT—> BRAS —> multicast router —> multicast server
  - Multicast subscribers of the OLT can’t watch program
- Fault analysis:
  - subscriber side fault；
  - upper layer fault；
  - data configuration fault；



Huawei Technologies Co., Ltd. All rights reserved.

Case3 Multicast Service Fails Because Of ONU Incorrect Configuration

- Troubleshooting procedure:
  - Open “IGMP Debugging” to trace the igmp message, find that OLT can receive igmp packet from user side;
  - Check the subscriber’s state, it is online when opening the STB;
  - Check the LED status on MA5620, it blinking quickly, indicate the multicast flow arrive at ONU;
  - Capture packet through FE port of MA5620, find that the packet with VLAN tag.



Huawei Technologies Co., Ltd. All rights reserved.

Case3 Multicast Service Fails Because Of ONU Incorrect Configuration

- STB can’t recognize any data that with VLAN tag
- Modify the data configuration of ONU, remove the VLAN tag of video stream.
  - MA5620 (config-btv)#igmp user modify port 0/2 video vlan 2
  - MA5620 (config-btv)#igmp user modify port 0/2 video untag

Experience & Conclusion:

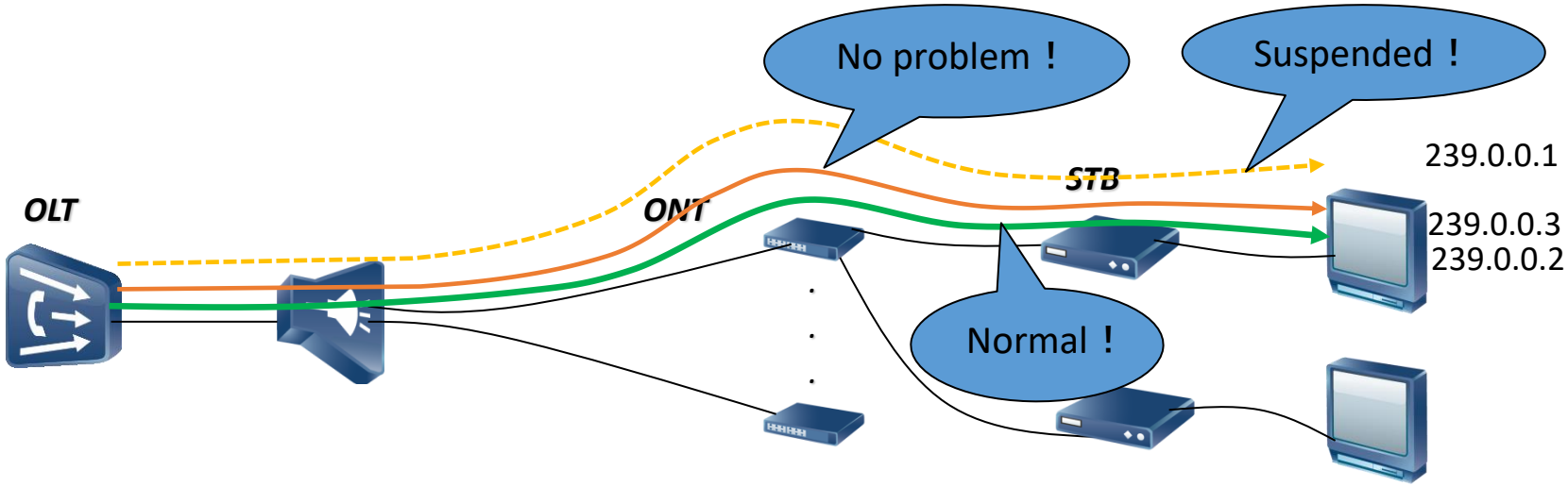
Subscriber side terminals including TV, PC, STB can’t send any packet with vlan tag, also not recognize any packet with vlan tag. So the multicast VLAN tag of video flow must be removed by ONU or other device connect to ONU, otherwise the multicast service fault.

Huawei Technologies Co., Ltd. All rights reserved.

HUAWEI

Case4 A Multicast Program Is Suspended

- Fault description:
  - Networking: PTV—>STB —> MA5620—> MA5800—> BRAS —> multicast router —> multicast server
  - When a multicast user of the ONU watches multicast programs, program 239.0.0.1 is suspended but the other programs are normal.
- Alarm:
  - No



Huawei Technologies Co., Ltd. All rights reserved.

Case4 A Multicast Program Is Suspended

- Cause analysis:
  - In the networking, the OLT is the multicast duplication point. If a multicast program is suspended but the others are normal, the multicast source may be faulty or the ONU fails to forward a multicast group.
- Troubleshooting procedure:
  - Check the OLT. It is found that configurations of the OLT are correct.
  - Use another multicast source to play the multicast program that encounters the fault. It is found that the fault persists. This indicates that the multicast source is normal.
  - When the multicast user of the ONU watches multicast program 239.128.0.1, if other multicast users of the ONU watch multicast program 239.0.0.1, program 239.0.0.1 is suspended.

Huawei Technologies Co., Ltd. All rights reserved.

Case4 A Multicast Program Is Suspended

- Troubleshooting procedure:
  - According to the mapping relation between the multicast IP address and the multicast MAC address defined in the protocol, programs 239.0.0.1 and 239.128.0.1 map the same multicast MAC address.
  - Change the multicast MAC address and the multicast IP address of either of the two programs. As a result, the fault is rectified.

Experience & Conclusion:
When such a collision occurs, an STB may receive unrequired multicast traffic. Then, the STB discards the unrequired multicast traffic based on the multicast IP address.In this case, it is recommended that you plan one IP address to map one MAC address uniquely in planning the multicast IP addresses.

Huawei Technologies Co., Ltd. All rights reserved.

Summary

- GPON multicast service common fault category
- Troubleshoot multicast service fault

Huawei Technologies Co., Ltd. All rights reserved.

Acronyms and Abbreviations

- STB: Set Top Box
- IGMP: Internet Group Management Protocol
- AAA: Authorization Authentication Accounting
- SW: Service Switch
- PPPoE: PPP over Ethernet
- DSLAM: Digital Subscriber Line Access Multiplexer
- IAD: Integrated Access Device

Huawei Technologies Co., Ltd. All rights reserved.

Thank You

www.huawei.com