OLT(GPON) System Troubleshooting In-depth

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Objectives

- Upon completion of this course, you will be able to:
  - Outline the procedure of system troubleshooting
  - Outline the methods of system troubleshooting
  - Troubleshoot the system faults in depth

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GPON System Troubleshooting Overview

System faults mainly refer to the service faults caused by host system failures, registration problems, or upgrade problems.

During the practical application, system faults mainly includes:

Host software fault	Mismatch of software version Failure of version upgrading
Board fault	Service board failed to communicate with the control board Board aging or be damaged
Communication with NMS failed	Incorrect configuration of network management paramaters Uplink fault

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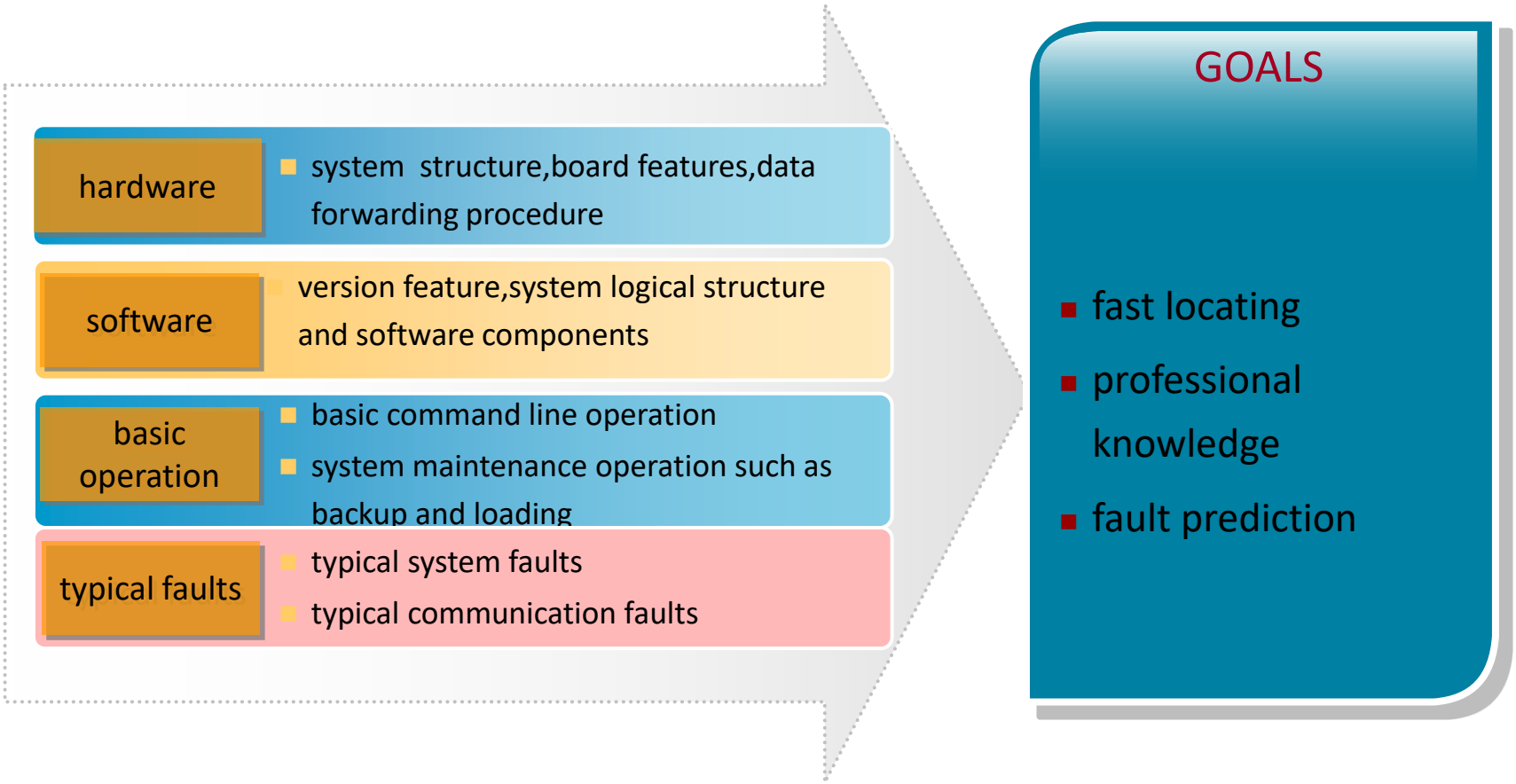
Preparations



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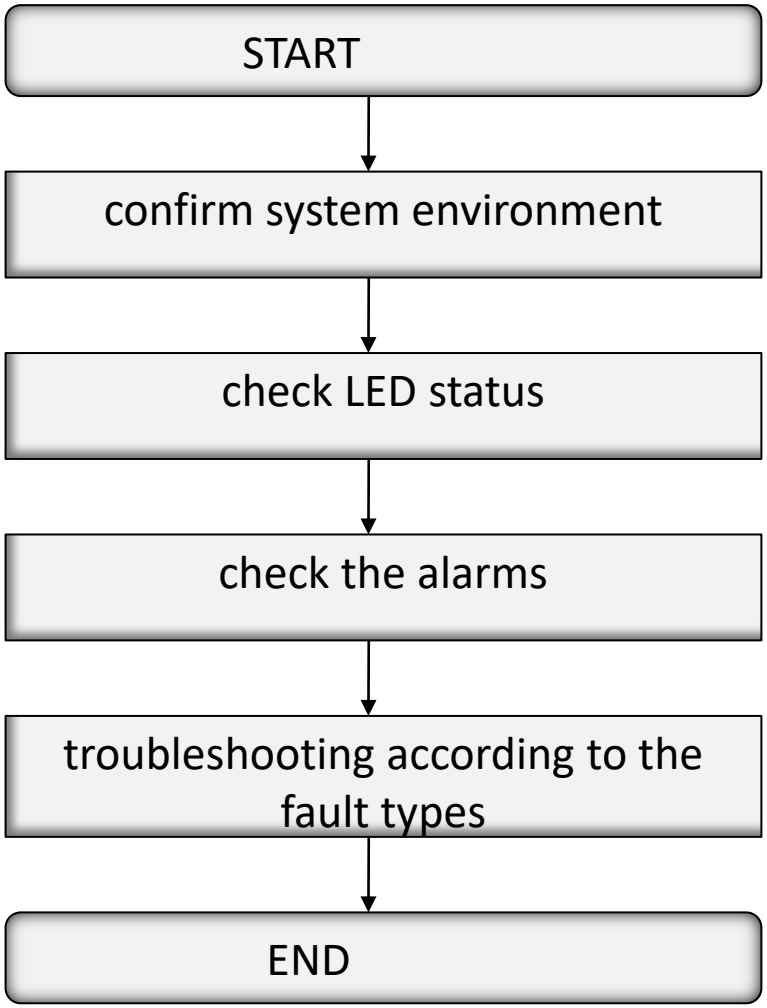
System Troubleshooting Procedure



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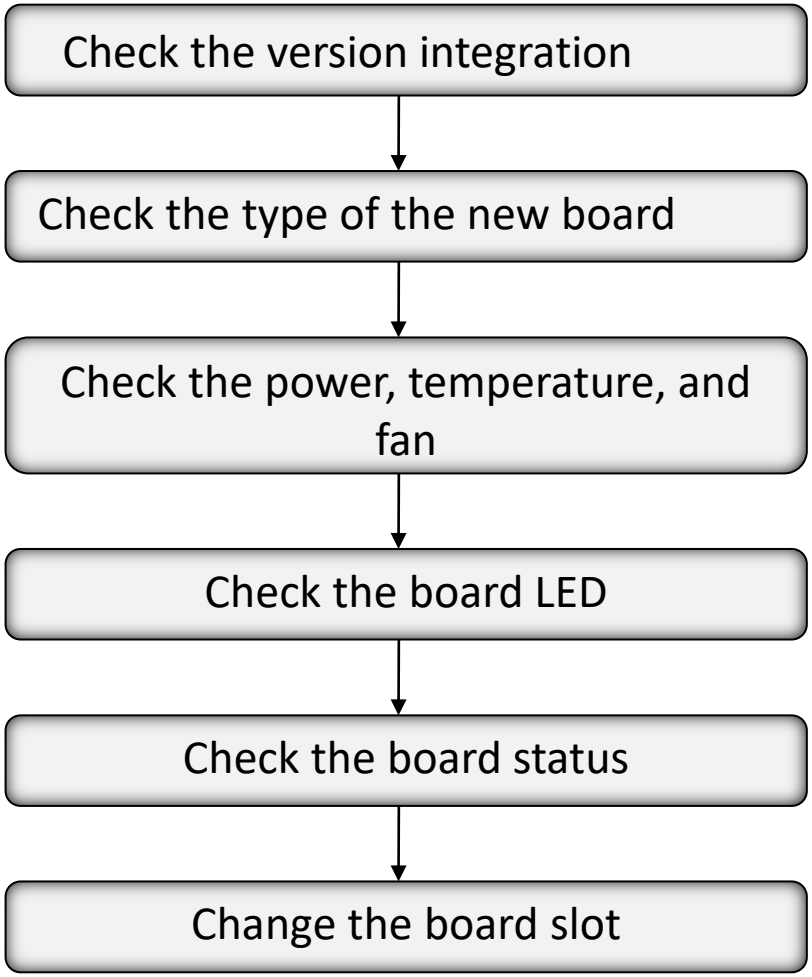
Category and Cause of Common Faults

S/N	Fault Category	Possible Cause
1	Board registration failure	The board version and the host version do not match. The slot has been registered with board, and does not support upgrade between the two boards. The slot of the board is loose.
2	Inband NMS disconnection	The NMS version and the device version do not match. The upper layer device is faulty. The upstream board is faulty. The NMS data configuration is incorrect (such as community name, access list, MTU). There is no router between the device and NMS.

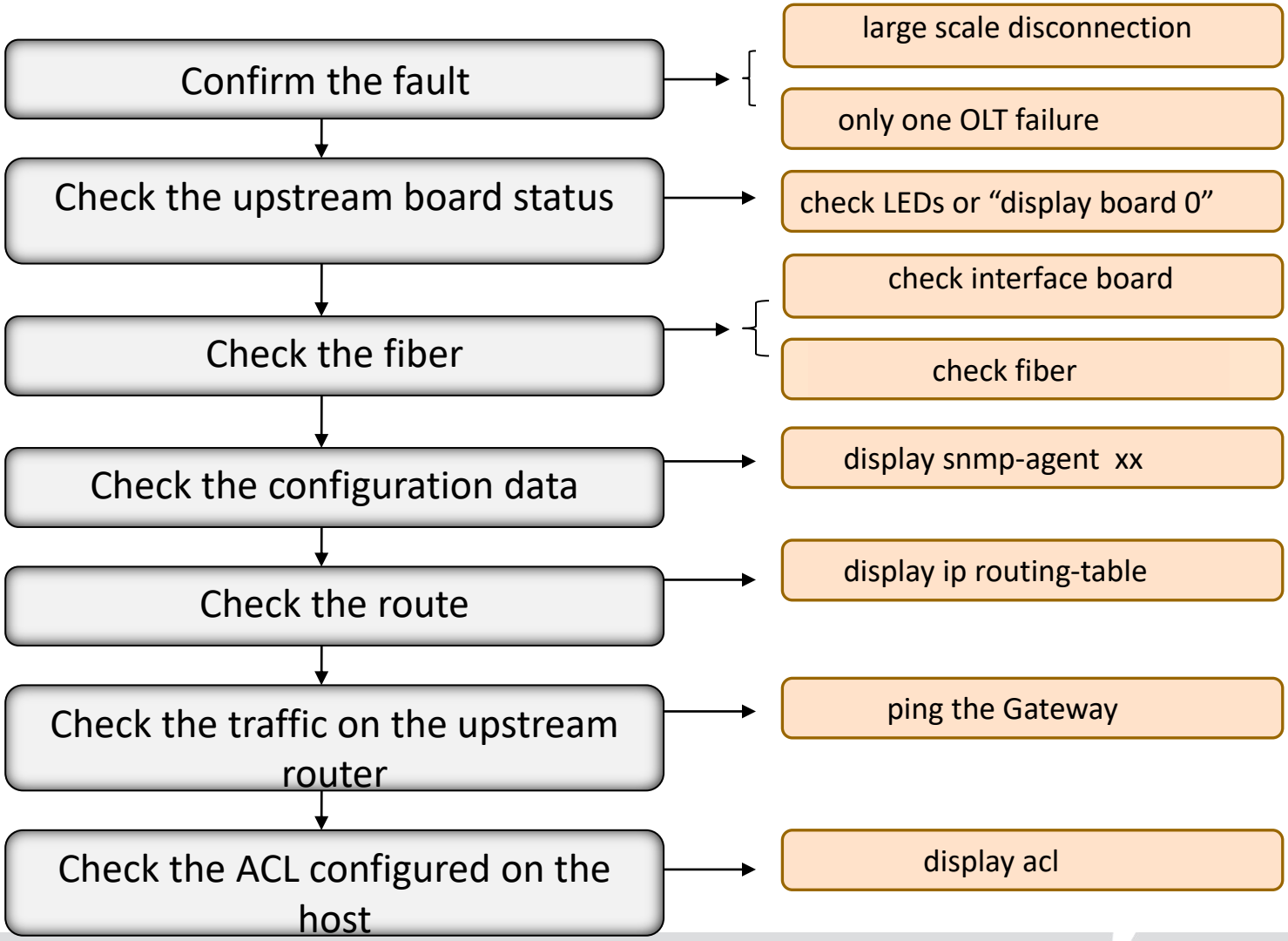
Category and Cause of Common Faults

S/N	Fault Category	Possible Cause
3	Repeated reboot of the control board	The components of the control board are damaged. The backplane pins are damaged. The environment and the fan are faulty. The control board is not inserted tightly. The CPLD, BIOS and the programs are loaded incorrectly.
4	Switchover failure	The active/standby software versions do not match. The active/standby hardware versions do not match. The standby board or the upstream port is faulty. The data between the active/standby control boards is not synchronized sufficiently.

Board Registration Failure



Inband NMS Disconnection



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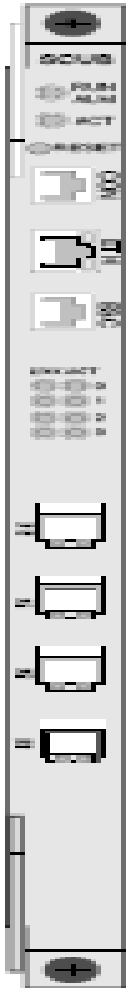
Repeated Reboot of the Control Board

- **The possible causes are as follows:**
  - The components of the control board are damaged
  - The backplane pins are damaged
  - The environment and the fan are abnormal
  - The subscriber ring network is faulty
  - The control board is not inserted tightly
  - The loaded version is incorrect



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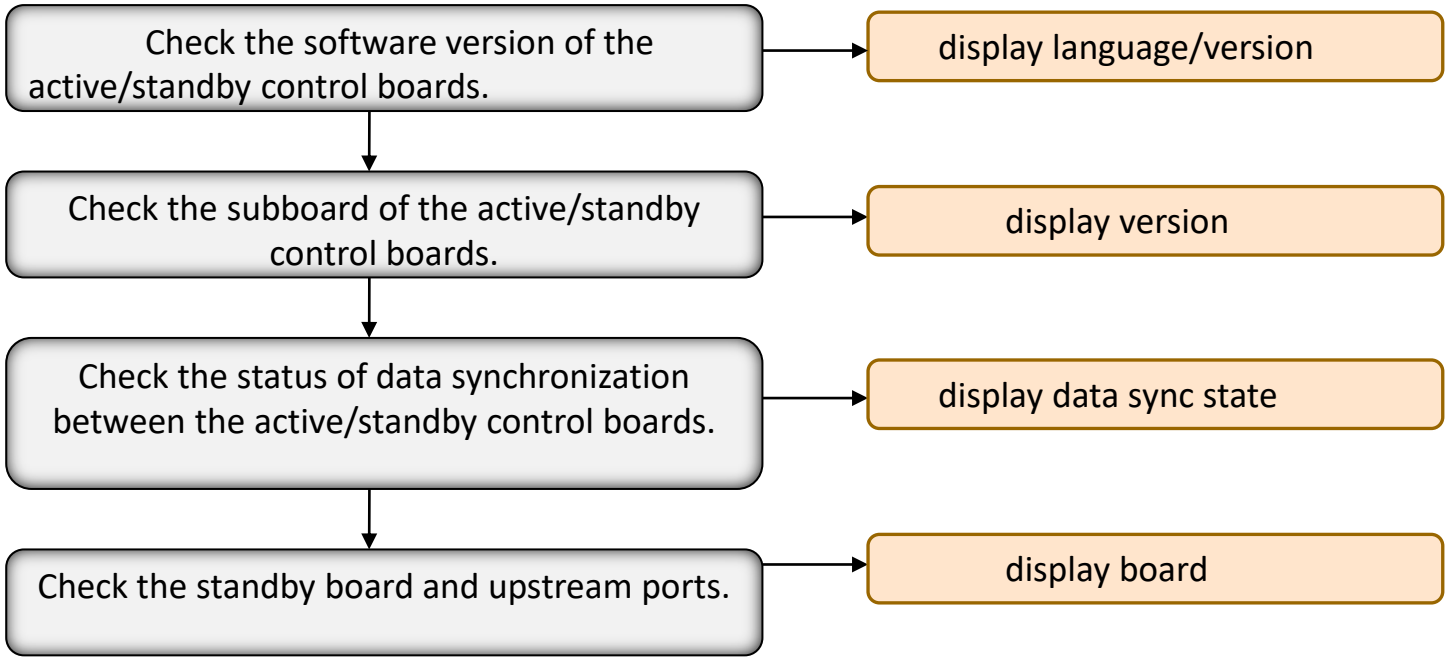
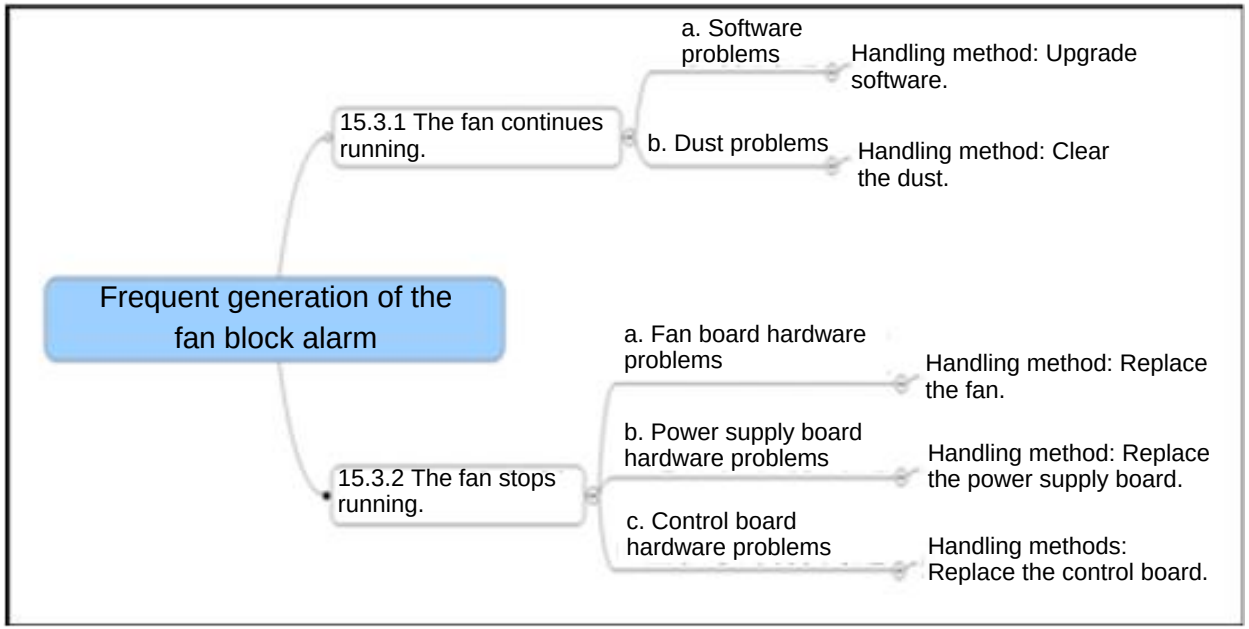
Switchover Failure



Fan Block Alarm Is Generated Frequently



Frequent generation of the fan block alarm

Check whether the software version is too early.

↓

Check whether the fan is dusty.

↓

Check whether other hardware devices are faulty.

Command Query

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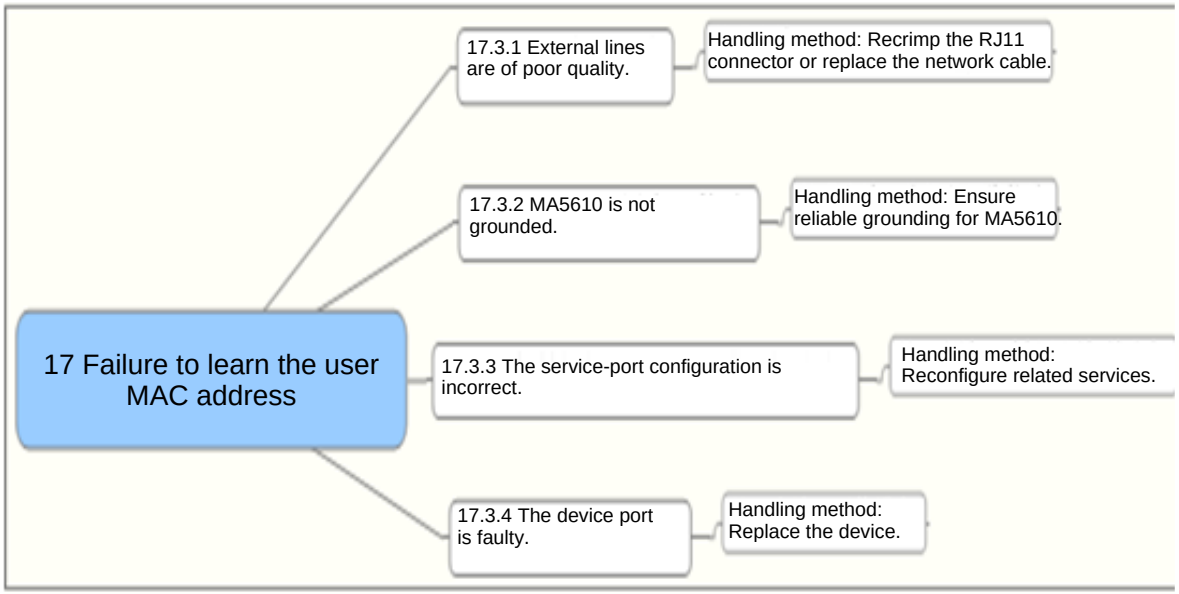
Failure to Learn the User MAC Address



Failure to learn the user MAC address

Check whether the line quality is poor.

↓

Check whether MA5610 has proper grounding.

↓

Check whether the device port is faulty.

Command Query

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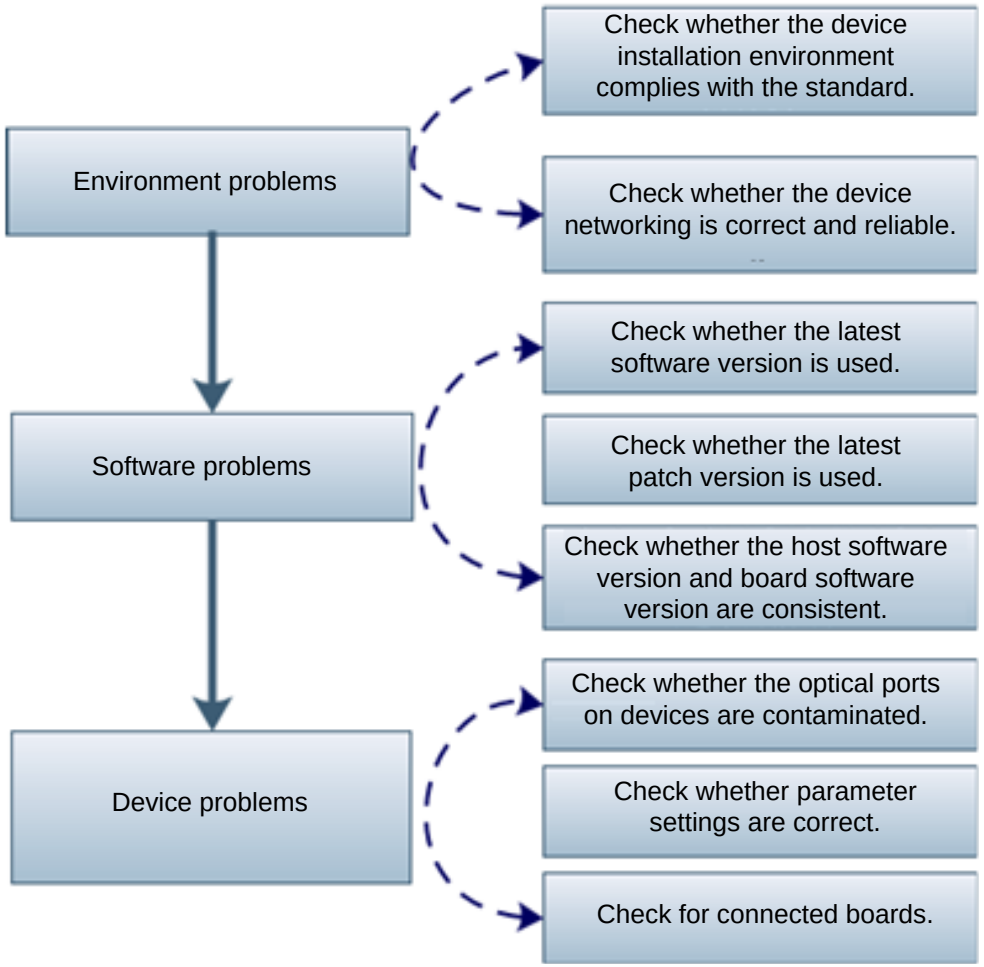
Verifying Causes for Fault Reproduction Failure During Device Repair



The check items listed in the figure on the left are used to verify only possible causes for fault reproduction failure during device repair, not all causes. For details about the cause verification standard, see related documents.

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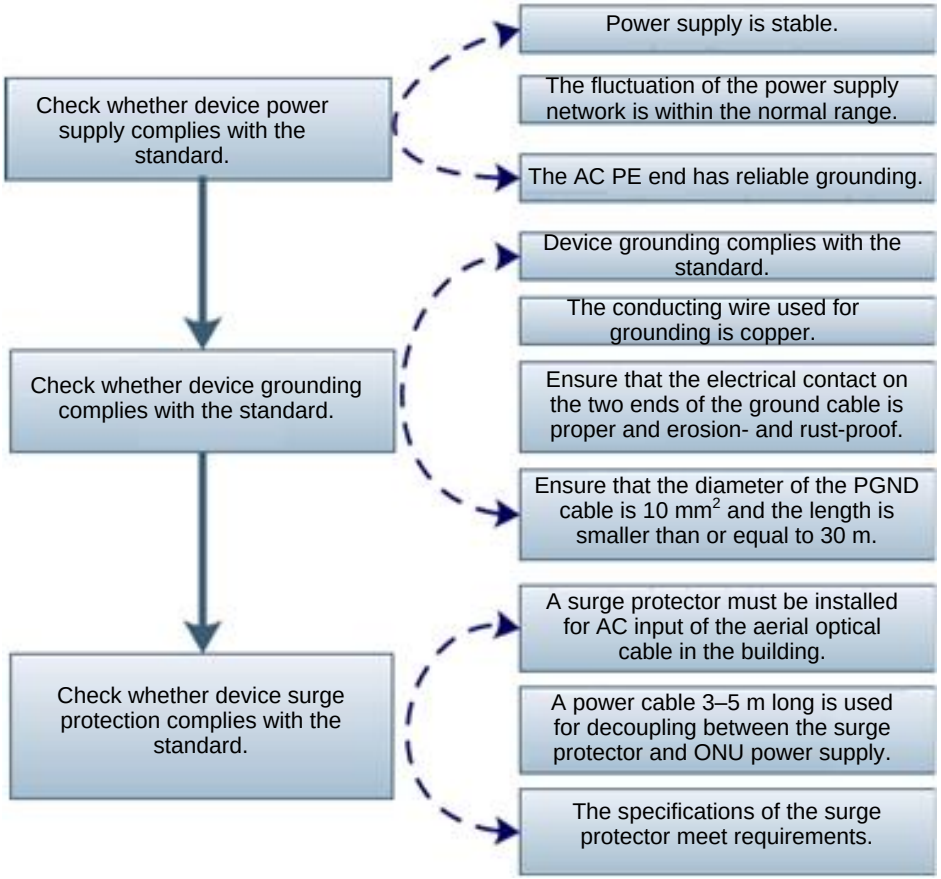
Verifying Causes for Electrical Burning on Devices



The check items listed in the figure on the left cover device power supply, lightning protection, and grounding, and are applicable in the installation scenarios such as corridors, telecom risers, and basements. The check items in other installation scenarios are similar. For details about specific check items and parameters, see related installation guides.


Check Item Description

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categories the faults

Questions

- What's the procedure of common system troubleshooting?

- How to realize the switchover of active/standby control board? And what we need to pay attention to?

- How to set the auto display of alarms? How to change the threshold of an alarm?

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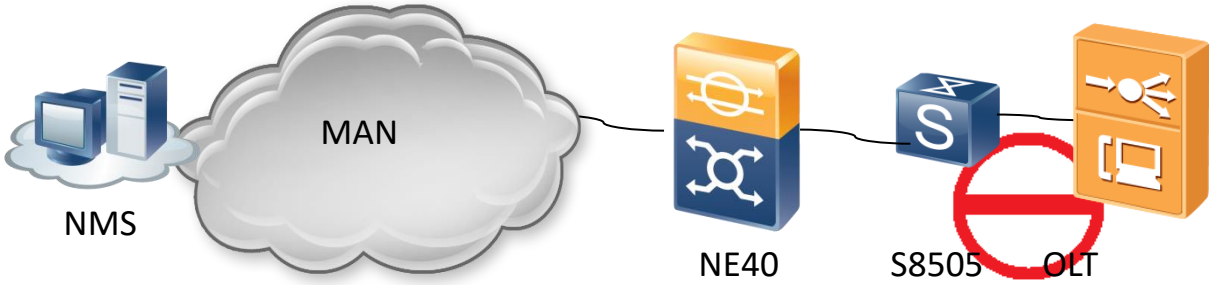
Case1 Interconnection Between the OLT and the Switch



- Fault description:

  The OLT is connected to a certain type of switch of another vendor in the lacp-static aggregation mode in the upstream direction. After lacp-static is configured, an alarm is generated, and the related service is unavailable.

- Alarm information
  - The alarm generated on the OLT is as follows:huawei(config)#**link-aggregation 0/17 0-1 egress-ingress workmode lacp-static** huawei(config)# ! EVENT MAJOR 2008-07-15 13:42:03 ALARM NAME :Port is forbidden to transfer the service packets PARAMETERS :FrameID: 0, SlotID: 17, PortID: 0 huawei(config)# ! EVENT MAJOR 2008-07-15 13:42:03 ALARM NAME :Port is forbidden to transfer the service packets PARAMETERS :FrameID: 0, SlotID: 17, PortID: 1

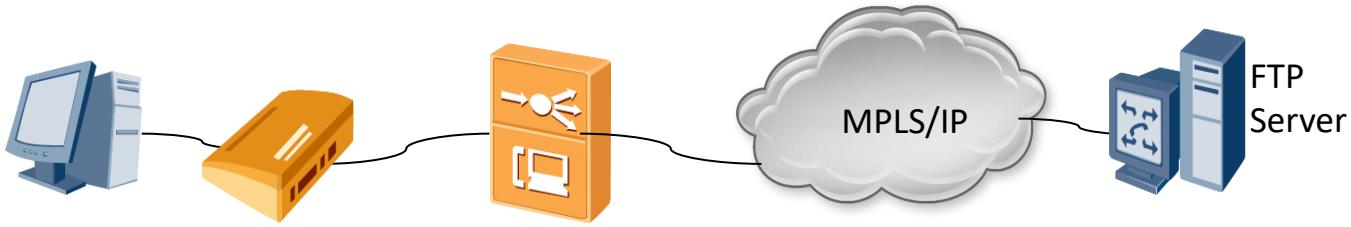
Case1 Interconnection Between the OLT and the Switch

- Cause analysis:
  - The upstream optical path of the OLT is faulty.
  - The data configuration of the upstream port on the OLT is incorrect.
  - The LACP configuration is incorrect.
  - The configuration of the peer switch of this vendor is incorrect.
- Troubleshooting:
  - Check the configuration of the upstream board on the OLT and the configuration of the switch. It is found that the interconnected optical ports on the OLT and the switch are configured as forced 1000 Mbit/s and full duplex, and are in the up state. Therefore, it can be determined that the fault is not caused by the optical path.
  - Disable the aggregation function. It is found that the upstream service of a single link is normal. Therefore, it can be determined that the data configuration of the upstream port on the OLT is correct.

Case1 Interconnection Between the OLT and the Switch

- Configure the aggregation manually, and do not run the LACP protocol. It is found that the services are normal. Therefore, it can be determined that the fault is caused by the LACP interconnection.
- The switch of this vendor supports both the Port Aggregation Control Protocol (PAgP) and LACP, and uses PAgP by default. It is preliminarily suspected that the default protocol PAgP runs on the switch, which causes interconnection failure. After check, however, it is found that LACP runs on the switch.
- Configure the switch to be in the active LACP mode. The fault then is rectified.

Case2 The Downloading Bandwidth Cannot Reach Expected Values



- Fault Description

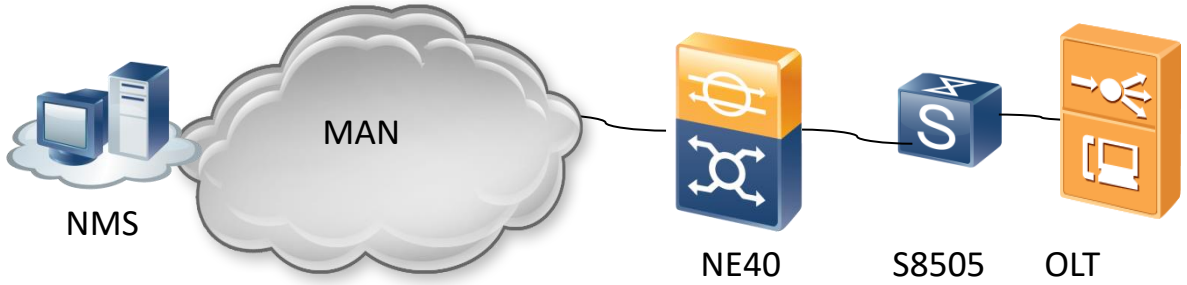
  The GPON downloading rate is tested in an office. The downloading rates are tested when the bandwidths are 100 Mbit/s, 80 Mbit/s, 60 Mbit/s, 40 Mbit/s, 20 Mbit/s, and 10 Mbit/s. When the bandwidths are 40 Mbit/s and 60 Mbit/s, the downloading rates cannot reach the expected values (bandwidth x 80%).

- Alarm
  - No
- Cause analysis
  - **The flow control configuration is incorrect.**
  - **The network transmission is faulty.**

Case2 The Downloading Bandwidth Cannot Reach Expected Values

- Troubleshooting
  - Check whether the fault is caused by the improper settings of the flow control. Check the settings of the traffic-table, ont gemport bind, tcont bind-profile, and DBA-profile parameters of the service stream. It is found that the flow control is set correctly.
  - Check whether a network bottleneck exists on the MPLS/IP network or whether packet loss occurs on a node. Simulate a local FTP server to conduct a test. It is found that the fault persists.
  - Analysis: FTP is based on the CS model and the application layer protocol of TCP. According to the features of the protocol, the buffer size must be set differently for different downloading bandwidths on the server and client so that expected downloading rates can be reached.
  - Retest whether the downloading rates reach the expected values. As a result, the fault is rectified.

Case3 Failure to Start the Upgraded Standby Control Board



- Fault description:

  The OLT is configured with active and standby control boards. After the active and standby control boards are upgraded through command lines, the active control board can start, but the standby control board is reset repeatedly. Run the display board 0 command to check the board status. It is found that the standby control board is in the "Failed" state.

- Alarm information
  - No

Case3 Failure to Start the Upgraded Standby Control Board

- **Cause Analysis:**
  - The version of the upgrade program does not match.
  - The versions do not match
- Troubleshooting
  - Check the active control board. It is found that the active control board is in the normal state. This ensures that the fault is not caused by the upgrading program.
  - Check the standby control board. It is found that the standby control board is reset repeatedly. Therefore, the fault may be caused by the versions. Check the version configuration table. It is found that the extended BIOS version does not match the current host version.

Case3 Failure to Start the Upgraded Standby Control Board

- Connect the serial port on the maintenance terminal to the standby control board. When "Press <D> key to stop auto-boot" is displayed during the starting of the standby control board, press D to enter the startup option, or select 3 to erase the extended BIOS.

  - System is booting from extended BIOS... The last update date of extended BIOS is : May 16 2005, 10:37:33 Extended BIOS version is 108 Press <D> key to stop auto-boot 5 Main Menu ========== 0. Boot from flash 1. Boot from serial port by Xmodem 2. Boot from ethernet port by TFTP 3. Erase extended BIOS and reboot Please enter a choice : **3**

- Load the BIOS again through TFTP after the standby control board is reset.

Case3 Failure to Start the Upgraded Standby Control Board

- Base BIOS version is 108 Check spare extended BIOS...OK! Press <D> in three seconds to download extended BIOS, press <C> to restore main extended BIOS from spare BIOS area... Now system will load extended BIOS from Xmodem/TFTP. Please select load mode: 0 -- Xmodem , 1 -- TFTP , Q -- QUIT[default: 1]: **1** Extended BIOS will be downloaded by TFTP. Board IP address : [10.11.104.226] **10.11.104.2** Board Mask address : [255.255.252.0] Host IP address : [10.11.104.1] **10.11.104.226** Download filename : [scuextbios.bin] You will download file 'scuextbios.bin' from TFTP server 10.11.104.226 Are you sure?(y/n) : [y] **y** Downloading file, please wait...download 258176 bytes OK! Begin to save extended BIOS to spare area... 100% Save spare extended BIOS to flash area successfully. Begin to save extended BIOS to main area... 100% Save main extended BIOS to flash area successfully. Saving extended BIOS disable start flag...OK! Check main extended BIOS...OK!Load the BIOS again through TFTP after the standby control board is reset.

console

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Case4 The Root Password of a Device is lost

- Description

  After using the device, the user may change the default user name and password and the users forget their password.

- Alarm

  change root passw by initial connection

  - No

- Cause Analysis

  The possible causes are as follows:

  - The number of remote login users has exceeded the system limitation
  - The system software is faulty
  - The hardware such as the control board is faulty
  - Virus attacks
  - Other causes

Case4 The Root Password of a Device is lost

- Troubleshooting
  - Method 1: Load the empty database matched the device again. After restarting the device, log in to the system by using the default root password admin(OLT) or mduadmin(MDU). This method will lead to loss of data configurations and the user needs to configure the data again.
  - Method 2: If the device is managed by the NMS (Network Management Server), modify the configuration file on the NMS as follows:
    - Back up the configuration file of the device on the NMS.
    - Open the configuration file and find out the record of changing the root password, as shown in boldface in the following display.
    - [MA5600V800R005: 6833] # [global-config] <global-config> terminal user name buildrun_new lww231 *[)!AAYS*Y&aU86K;V-a@AUA!!* 1 2009:06:04 :17:07:25 2009:06:04:17:07:25 root 2 6 ----- terminal user name buildrun_new bmsmpls *[4P]`OUIa%=[G]0U3=OWJY1!!* 0 2009:06: 08:15:01:02 2009:06:08:15:01:02 root 3 65535 ----- adsl mode switch-to ADSL vdsl mode switch-to normal
    - Delete the boldface part and then save the configuration file.
    - Load the modified configuration file to the system through the NMS and activate the configuration file.
    - Log in to the device by using the default root password admin(OLT) or mduadmin(MDU).

Discussing

- What are the possible causes that the service board can not be registered?

the cant communicate

- What are the possible causes that the main control boards repeated reboot?

they have different software type

the software must be competable

always make a backup of data configuration.

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Summary

- PON system troubleshooting procedure
- Categorized common system fault and processing methods
- Typical system faults and troubleshooting

Glossary

- ACL: Access Control List
- SNMP: Simple Network Management Protocol
- BIOS: Basic Input Output System
- LED: Low Emitting Diode

uefi= ubified extendable firmware interface

UEFI offers a graphical UI and allows users to navigate the software using the mouse and keyboard. This GUI immediately provides a system state overview from the included graphs and charts. On the other hand, BIOS offers a basic UI that can be navigated only by using the keyboard

Thank you

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Appendix: Consult Huawei technical support

- After the analysis of the fault, troubleshoot it according to the classification and execute correct procedure, to ensure the system run normally. Suppose the problem still there, contact HUAWEI supporting.

  - Customer Service TEL: (+86)0755-28560000 4008302118
  - Email：support@huawei.com
  - Technical website：http://support.huawei.com
    - Meanwhile，Please collect and provide the following information：
      - detailed name of the fault site （full name）
      - your name,telephone number
      - concrete time of the fault happened
      - detailed description of the fault
      - host software version
      - what have been done after the fault and the corresponding results