

Debugging the Ethernet optical module



Article Overview

Effective debugging of Ethernet optical modules involves monitoring link status, checking PHY and transceiver parameters, and analyzing error statistics such as BER, SNR, and FEC counts.

Key Steps for Debugging

1. **Verify Physical Layer and Link Status** Start by checking the physical layer (Layer 1) to ensure the optical module is properly connected and the link is active. Use commands like `show interface` to view port negotiation speed, link status, and traffic statistics. Look for indicators such as LinkUp/LinkDown, MAC Rx Local Fault, and MAC Rx Remote Fault to identify signal issues or misconfigurations.
2. **Inspect the Optical Module** Use module-specific debug commands, such as `debug showsfp` on Huawei devices, to display detailed information about the optical module, including module ID, type, and operational status. On Cisco devices, commands like `show inventory` and `show idprom interface` provide transceiver identity, coding compatibility, and EEPROM data.
3. **PHY and Signal Testing** Perform tests at the PHY level to detect errors and signal quality issues. Common tests include PRBS (Pseudo-Random Bit Sequence) across nodes: MAC → PHY, PHY → MAC, and PHY → PHY. Check SNR (Signal-to-Noise Ratio) and BER (Bit Error Rate) using commands like `phy diag dsc` to evaluate signal integrity.
4. **FEC and Error Counters** Monitor FEC RS Bit Error Count and symbol error statistics (`cw_sl_errs`) to detect transmission errors. Pre-FEC and Post-FEC error counts help determine whether errors are correctable. Ensure counters are cleared appropriately to avoid accumulation during extended testing.
5. **Fiber-Specific Considerations** For fiber-based Ethernet (1000BASE-X, 100BASE-FX), ensure proper PHY bootstrapping and correct TX/RX cable connections. Check for Fa...

Article Content

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ethtool (8)

If the driver and module support it, the optical diagnostic information is also read and de-coded. When either one of page, bank or

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This application note discusses the use of the MSO/DPO4000B Series Oscilloscopes with the DPO4ENET Serial Application Module

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How To View Mellanox NIC Port Status And Optical Module

Read Port Status and Optical Module Information Using MST. Run the following command to view detailed interface

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Basic Ethernet Interface Debug With Linux

The following is a summary of the first steps in debugging the Ethernet interface. Perform these steps after the DUT has successfully

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Layer 1 Debug Guide

The very first layer of the OSI model is the physical layer (Layer 1), with Arista's wide portfolio of supported speed and optic types,

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debug showsfp

Specifies the optical module ID. The value is an integer that ranges from 0 to 100. # Display debugging information about a specified

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Ethernet Debugger

The Intona Ethernet Debugger is a device to capture all packets between two Gigabit Ethernet devices. It is able to detect data

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Understanding Optical Modules: Types and Troubleshooting Guide

Optical modules come in various types, and their external structures are not exactly the same. However, their basic compositional

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Optical Module Debugging Guide

1. Document Purpose The purpose of this document is to introduce the debugging steps and commands for optical modules used

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Ethernet Test

Tektronix offers comprehensive, integrated toolsets for validating the physical layer of IEEE 802.3 Ethernet devices, and for

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How to Test an SFP Transceiver and Network Cable

Recently we have been getting questions about how to determine if an SFP (Small Form-factor Pluggable) transceiver

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TCP/IPv4 and Ethernet 10BASE-T/ 100BASE-TX Debugging with

The mixed signal oscilloscope (MSO) is the tool of choice to debug embedded systems that have a mixture of analog and digital

Oct 28, 2025

How To View Port Status And Optical Module Information On Cisco ...

By reading internal parameters of optical transceivers on switches, users can monitor link status, real-time

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Debugs for SFP or Network Module

Debug transceiver detail doesn't seem to be catching anything, and I can't find any debug command for modules. I did

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How Can I Determine Whether an Optical Module Is Officially

Therefore, you can check whether an alarm is generated to determine whether an optical module is officially delivered

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Optical Transceiver Manufacturer,How To Check Optical Module ...

Optical module identification and status monitoring are essential daily tasks for network engineers maintaining Cisco

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View the Optical Module Status on a Switch through the Command

Once the transceiver and fiber optic cable are plugged in properly in the switch optical module, you should be able to view the current

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Ethernet PHY Fiber Debug Guide

The following are configurations for connections between the PHY and fiber module. Between fiber modules, there are typically two

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Ethernet Debug Techniques

Hardware Debug Techniques Ethernet Debug Techniques Power down the board and verify key resistances Verify resistance to

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port is disconnected due to optical module faulty

Use the idle optical module on the storage device to exchange with PO and check whether the fault is rectified. If the

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View the Optical Module Status on a Switch

Objective The Cisco Small Business Series Switches allow you to plug in a Small Form-factor Pluggable (SFP) transceiver in their

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How to check and solve the optical module failure?

Step 3: check whether the optical module itself fails or the adjacent equipment or the intermediate link fails. The port,

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Intel® Ethernet Adapters and Devices User Guide

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Device Features Tools & Apps Troubleshooting

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Troubleshooting Ethernet Problems with your Oscilloscope

Analyzing ethernet traffic, both at the physical and protocol layers, enables
verification of communication between connected

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