8

Troubleshooting 2.5-Gbps ITU Trunk Card Problems

This chapter describes how to troubleshoot 2.5-Gbps ITU trunk card problems. This chapter includes the following sections:
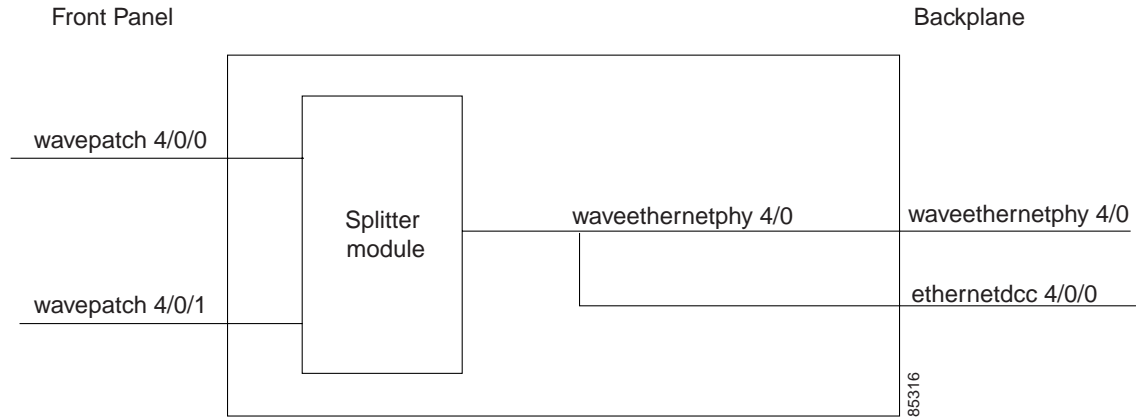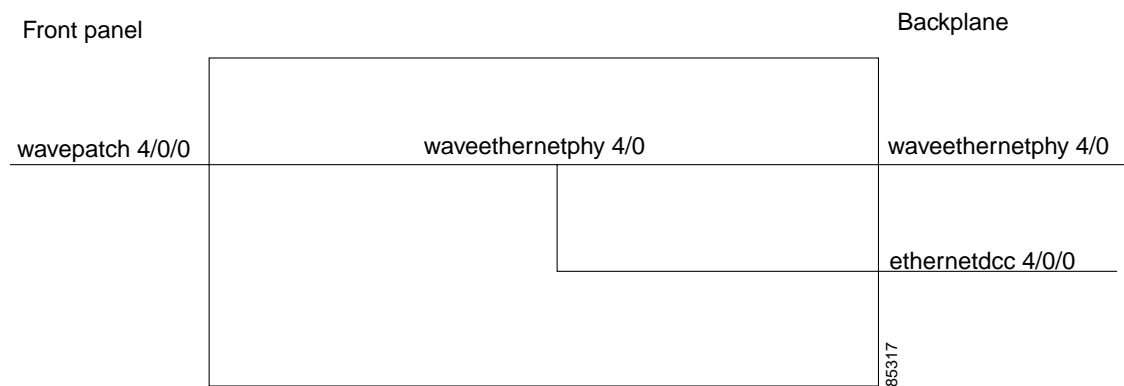
8.1 Overview

The 2.5-Gbps ITU trunk card converts an aggregated 2.5-Gbps signal to an ITU-compliant wavelength, or channel. The Cisco ONS 15530 supports two types of 2.5-Gbps ITU trunk cards:

- Splitter—Sends the channels to two OADM modules.
- Nonsplitter—Sends the channel to only one OADM module.

Figure 8-1 and Figure 8-2 show the interface models for the two versions of the 2.5-Gbps ITU trunk card, splitter and nonsplitter.

Figure 8-1   Splitter 2.5-Gbps ITU Trunk Card Interfaces

Front Panel   Backplane

wavepatch 4/0/0

Splitter
module   waveethernetphy 4/0   waveethernetphy 4/0

wavepatch 4/0/1   ethernetdcc 4/0/0

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Figure 8-2   Nonsplitter 2.5-Gbps ITU Trunk Card Interfaces

Front panel   Backplane

wavepatch 4/0/0   waveethernetphy 4/0   waveethernetphy 4/0

ethernetdcc 4/0/0

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8.2 Initial Troubleshooting Checklist

Follow this initial checklist before proceeding with the troubleshooting procedures:

- Check that the receive signal power level is between –28 dBm and –8 dBm.

- Issue **show interfaces** commands to ensure that the waveethernetphy and wavepatch interfaces are administratively up, that there are no errors on the interfaces, and that the laser frequency is correctly configured.

- Issue a **show connect** command to verify the status of the cross connections to the aggregation card.

- Check that the LEDs on the cards show the proper state.

- Issue a **show facility-alarm status** command to display the alarms on the interfaces.

- Issue the **show hardware linecard** command to verify the 2.5-Gbps ITU trunk card functional image.

- Check that the 2.5-Gbps ITU trunk cards are patched to the correct OADM ports. Issue a **show patch** command to verify that there are no frequency mismatches.

- Ensure that all optical connectors are clean. Refer to the *Cisco ONS 15530 Cleaning Procedures for Fiber Optic Connections* document.

8.3 Troubleshooting 2.5-Gbps ITU Trunk Card Interface Problems

This section contains troubleshooting procedures for 2.5-Gbps ITU trunk card interface problems.

8.3.1 Waveethernetphy Interface Down and Shows Loss of Lock

Symptom   The waveethernetphy interface is in a down state and the signal quality shows a Loss of Lock.

Table 8-1 describes the potential causes of the symptom and the solutions.

Table 8-1   Waveethernetphy Interface Down and Shows Loss of Lock

Possible Problem	Solution
The laser frequency is not correctly configured.	Check the configured laser frequency in the **show interfaces waveethernetphy** command output. If it is incorrect, issue the **laser frequency** command to configure the correct frequency.
The patch cables are incorrectly connected to the OADM module.	Check the patch error status in the **show patch** command output. If it shows a mismatch, connect the 2.5-Gbps ITU trunk card to the correct filter ports on the OADM module.
The optical connectors are dirty.	Refer to the *Cisco ONS 15530 Cleaning Procedures for Fiber Optic Connections* document.
The protocol traffic is incorrect.	Compare the remote traffic source on the channel with the local destination. If the cards or protocol encapsulations are different, correct the problem.
The patch cables are faulty.	Check the local patch cables between the 2.5-Gbps ITU trunk card and the OADM module for breaks. If there is a break, replace the patch cable.
The trunk cables are broken.	Check the incoming signal power level. Fix any problems with the fiber.

8.3.2 Waveethernetphy Interface Down and Shows Loss of Sync

Symptom   The waveethernetphy interface is in a down state and the signal quality shows a Loss of Sync. Also, the **show facility-alarm status** command output shows an alarm message.

Table 8-2 describes the potential causes of the symptom and the solutions.

Table 8-2   *Waveethernetphy Interface Down and Shows Loss of Sync*

Possible Problem	Solution
The ITU signal power is too high or too low.	Check the signal power from the OADM module. Ensure that it is between –28 dBm and –8 dBm. If not, adjust the attenuation.
The remote client interface reported errors.	Verify that the client interface on the remote system is not reporting errors. Resolve any error conditions.
An interface in the signal path has errors.	Issue the **show interfaces** commands for the interfaces in the signal path to determine if errors are occurring.
The optical connectors are dirty.	Refer to the *Cisco ONS 15530 Cleaning Procedures for Fiber Optic Connections* document.
The patch cables are faulty.	Check the local patch cables between the 2.5-Gbps ITU trunk card and the OADM module for breaks. If there is a break, replace the patch cable.
The trunk cables are faulty.	Check the incoming signal power level. Fix any problems with the fiber.

8.3.3 CVRD Errors on the Waveethernetphy Interface

Symptom The waveethernetphy interface is in a down state and in the **show interfaces** command output the Code violation and running disparity error count (64b66b CVRD) field are increasing and the Signal Condition field shows "Signal Fail Threshold exceeded."

Table 8-3 describes the potential causes of the symptom and the solutions.

Table 8-3   *CVRD Errors on the Waveethernetphy Interface*

Possible Problem	Solution
The ITU signal power is too high or too low.	Check the signal power from the OADM module. Ensure that it is between –28 dBm and –8 dBm. If not, adjust the attenuation.
The optical connectors are dirty.	Refer to the *Cisco ONS 15530 Cleaning Procedures for Fiber Optic Connections* document.
The patch cables are faulty.	Check the local patch cables between the 2.5-Gbps ITU trunk card and the OADM module for pinches or breaks.Correct any problems with the fiber.
The trunk cables are faulty.	Check the trunk fiber for pinches or breaks. Correct any problems with the fiber.

8.3.4 CRC and CDL HEC Errors on the Waveethernetphy Interface

Symptom The waveethernetphy interface is in a down state, the CRC error count and the CDL HEC error counts in the **show interfaces** command output is increasing, and the Signal Condition field shows "Signal Fail Threshold exceeded" or "Signal Degrade Threshold exceeded."

Table 8-3 describes the potential causes of the symptom and the solutions.

Table 8-4   *CRC and CDL HEC Errors on the Waveethernetphy Interface*

Possible Problem	Solution
The data is corrupted somewhere in the data path.	1. Perform a loopback on the signal path to isolate the area where the data is corrupted. For information on performing loopbacks, see the "8.4 Troubleshooting 2.5-Gbps ITU Trunk Card Problems Using Loopbacks" section on page 8-5. 2. Issue **show interfaces** commands for all the interfaces in the signal path. Resolve any error conditions or configuration problems encountered.

8.3.5 Ethernetdcc Interface Down

Symptom The ethernetdcc interface is down and pings across the interface fail.

Table 8-5 describes the potential cause of the symptom and the solution.

Table 8-5   *Ethernetdcc Interface Down*

| Possible Problem	Solution
The ethernetdcc interface is administratively shut down.	1. Issue a **show interfaces** command to determine the administrative status of the ethernetdcc interface. 2. Issue a **no shutdown** command to bring it up, if necessary.

8.4 Troubleshooting 2.5-Gbps ITU Trunk Card Problems Using Loopbacks

This section describes how to use software loopbacks to perform fault isolation for signals on 2.5-Gbps ITU trunk cards. The 2.5-Gbps ITU trunk card supports two types of software loopbacks:

• Facility loopbacks

• Terminal loopbacks

8.4.1 Facility Loopbacks

A facility loopback verifies the functioning of the 2.5-Gbps ITU trunk card from the trunk side (see Figure 8-3).

Figure 8-3   Facility Loopback Example on a 2.5-Gbps ITU Trunk Card
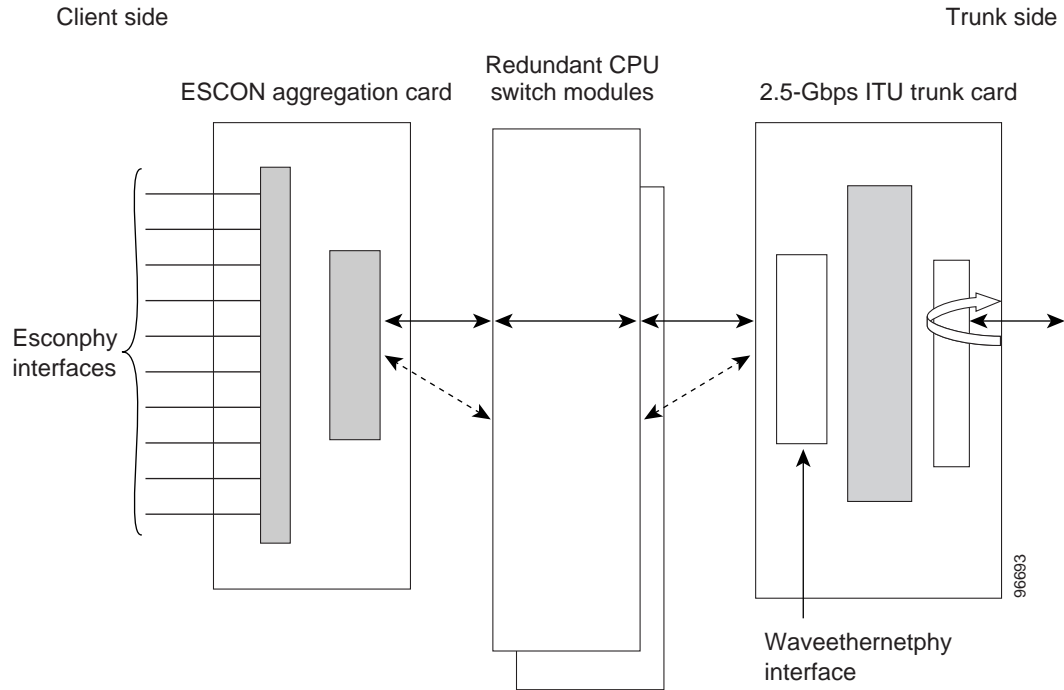
Procedure: Create a Facility Loopback

Step 1   Issue a **loopback facility** command on the waveethernetphy interface.

Step 2   Check that the signal reaches the system at the far end.

Step 3   If the signal does not reach the far end, check the trunk fiber and the interfaces along the signal path. If the fiber is intact, replace the card.

8.4.2 Terminal Loopbacks

A terminal loopback verifies the functioning of the 2.5-Gbps ITU trunk card from the switch fabric side (see Figure 8-4).

Figure 8-4   Terminal Loopback Example on a 2.5-Gbps ITU Trunk Card
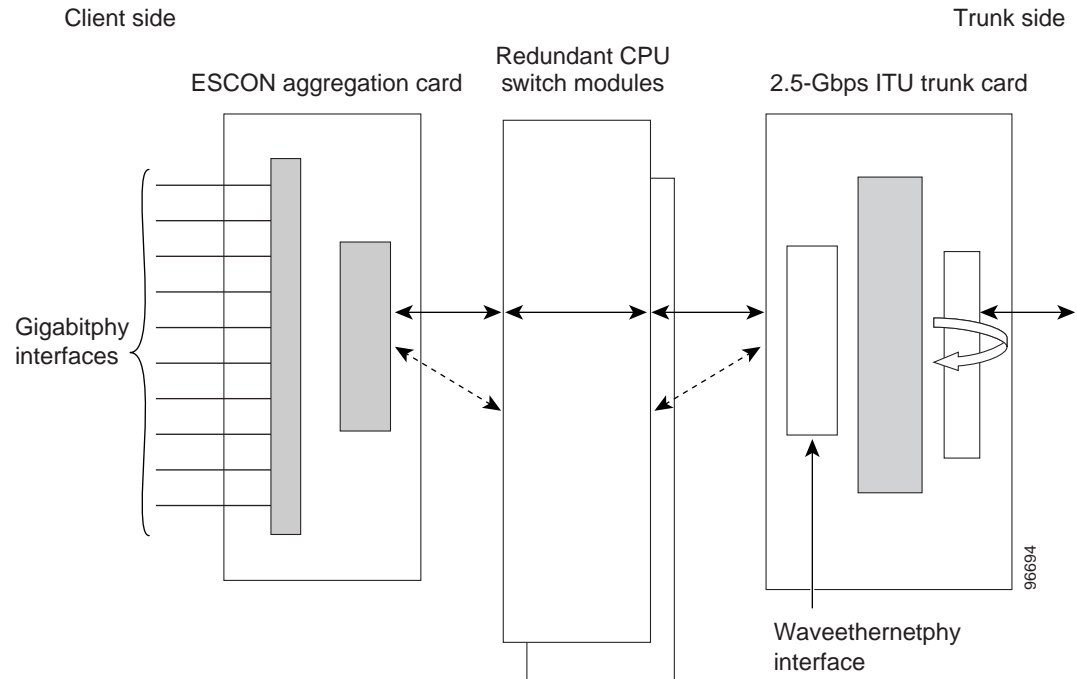
To create a terminal loopback:

Step 1   Issue a **loopback terminal** command on the waveethernetphy interface.

Step 2   Check that the traffic is reaching the client equipment.

Step 3   If the signal does not reach the client equipment, replace the card.

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8.4.2   Terminal Loopbacks