Troubleshooting Client Side Interfaces

This chapter provides troubleshooting information on connectivity and performance problems in the client side interfaces of the Cisco ONS 15540.

This chapter includes the following sections:

Note For a description of the transponder modules, slot assignments, and detailed cabling information, refer to the *Cisco ONS 15540 ESP Hardware Installation Guide.*
For default configuration of the various modules, refer to the
Cisco ONS 15540 ESP Configuration Guide and Command Reference.

Troubleshooting Client Side Transparent Interfaces

This section outlines the steps for performing basic interface checks and for verifying that a client side interface is enabled and functioning correctly.

Use the following command to check the optical interface configuration:

Command	Purpose
show interfaces transparent *slot/subcard/0*	Displays the status of the physical interface.

Follow these steps to troubleshoot the transparent interface connections:

Step 1 Use the **show interfaces transparent** *slot/subcard/0* command to display the configuration of a transparent interface:

```
Switch# show interfaces transparent 2/0/0
Transparent2/0/0 is up, line protocol is up
  Encapsulation: GigabitEthernet
  Signal monitoring: on
  Time of last "monitor" state change 14:01:43
  Time of last "encapsulation" change 14:01:43
  Forward laser control: Off
```

```
Configured threshold Group: None
Code violation and running disparity error count(cvrd): 0
Number of times SF threshold exceeded: 0
Number of times SD threshold exceeded: 0
Loopback not set
Last clearing of "show interface" counters 14:01:43
Hardware is transparent
```

Step 2   Check for the following, if the interface is down:

- Confirm the integrity of the hardware and its installation. See the "Initial Troubleshooting" section on page 1-3. In case of hardware failure, swap the hardware. Refer to the *Cisco ONS 15540 ESP Hardware Installation Guide* for hardware information.

> **Note**   Just because the connector fits does not mean the cable is connected correctly or that the cable is the correct type.

- Check the status of the LEDs on the line card motherboards and the transponder modules.

- Make sure that the interfaces on both sides of the cables are enabled and in no-shutdown mode.

- Check the configuration of the interfaces (for example, check the framing, line coding, and scrambling).

- Ensure that the interfaces at both ends of the cable match.

Step 3   Use the **no shutdown** interface configuration command to reenable the interface, if the interface is administratively down.

If the interface continues to be down, check additional fields in the display to help you troubleshoot the connection.

```
Switch# show interfaces transparent 10/1/0
Transparent2/1/0 is down, line protocol is down
  Encapsulation: GigabitEthernet
  Signal monitoring: on
  Time of last "monitor" state change 14:04:26
  Time of last "encapsulation" change 14:04:26
  Forward laser control: Off
  Configured threshold Group: None
  Code violation and running disparity error count(cvrd): 0
  Number of times SF threshold exceeded: 0
  Number of times SD threshold exceeded: 0
  Loopback not set
  Last clearing of "show interface" counters 14:04:26
  Hardware is transparent
```

> **Note**   Not all of the fields listed in the steps may appear in every display and are dependent on the interface configuration and status.

If the interface is failing, check the configuration fields and errors that appear in the display. See Table 3-1.

Table 3-1   Signal Quality Fields and Errors in the Configuration

Configuration Fields and Errors	Indication
Signal quality:	
• LOL (Loss of light)	Attenuation or absence of signal as it propagates through the fiber.
• LOS (Loss of signal)	Attenuation or decay of signal strength as it propagates through the fiber.
Encapsulation field	Encapsulation field should match the actual interface on the client side.
Transmit and receive side errors:	Errors on the transmit side.
• Line code error count	
• Loss of sync error count	
• Clock count	
Encapsulation field errors:	
• Ingress line code error count	A loss of packet delineation.
• Ingress loss-of-sync error count	An optical module has lost clock synchronization.
• Ingress SONET BIP-1 error count	The bit interleaved parity error report calculated by comparing the BIP-8 code with the BIP-8 code extracted from the B1 byte of the following frame. Differences indicate that section level bit errors have occurred. To check if the BIP-1 value is incrementing, check the BIP-1 value, wait a few seconds, and redisplay the transparent interface. If there are interleave parity errors, the number increments.
• Ingress SONET OOF error count	OOF (out of frame) error.
• Ingress SONET SEF error count	SEF (severely errored frame) count.
• Ingress clock count	Alarms associated with the primary or secondary clock source.

If you determine that the interface is configured incorrectly, refer to the
Cisco ONS 15540 ESP Configuration Guide and Command Reference.

Determining Transparent Interface Connectivity

To check transparent interface reachability to the mux/demux module and network connectivity, use the following commands:

Command	Purpose
**show connect [edges	intermediate]**	Displays the interface cross-connect configuration.
show topology	Displays the remote network connections.

Follow these steps to check the connectivity of a transparent interface through the system:

Step 1   Use the privileged EXEC **show connect intermediate** command to display the cross connection configuration for all interfaces or a single interface.

```
Switch# show connect intermediate
client/         wave            wave                     wdm
wave            client          patch    filter   trk    channel
------------    ------------    -------  ------   ---    -------
Trans10/0/0     Wave10/0        10/0/0*  0/3/0    0/2    25
                                10/0/1
Trans10/1/0     Wave10/1        10/1/0   0/3/1    0/2    26
                                10/1/1*
Trans10/2/0     Wave10/2        10/2/0*  0/3/2    0/2    27
                                10/2/1
Trans10/3/0     Wave10/3        10/3/0   0/3/3    0/2    28
                                10/3/1*

Switch#
```

Note   The asterisk (*) next to the wavepatch interface number indicates the active wavepatch interface in the receive direction on the splitter protected line card motherboard.

```
Switch# show connect intermediate interface transparent 10/0/0
Client       : Transparent10/0/0
Wave         : Wave10/0
Wavepatch    : Wavepatch10/0/0 (active)  Wavepatch   : Wavepatch10/0/1
Filter       : Filter0/3/0               Filter      : Filter1/3/0
Wdm          : Wdm0/3                    Wdm         : Wdm1/3
Thru         : Thru0/0                   Thru        : Thru1/0
Wdm          : Wdm0/0                    Wdm         : Wdm1/0
Thru         : Thru0/1                   Thru        : Thru1/1
Wdm          : Wdm0/1                    Wdm         : Wdm1/1
Thru         : Thru0/2                   Thru        : Thru1/2
Wdm (trunk) : Wdm0/2                     Wdm         : Wdm1/2
Switch#
```

Step 2   Use the privileged EXEC **show connect edge** command to display the edge interface connections for all interfaces.

```
Switch# show connect edges
client/
wave            wdm   channel
------------    ---   -------
Trans10/0/0     0/3   25
Trans10/1/0     0/3   26
Trans10/2/0     0/3   27
Trans10/3/0     0/3   28
```

Step 3   Use the **show topology** command to display the connections to the neighbor nodes.

```
Switch# show topology

Physical Topology:

Local Port    Neighbor Node      Neighbor Port
----------    -------------      -------------
   2          Node2                 wdm0/0
   4          Node4                 wdm1/1
```

To continue troubleshooting the trunk side connections, see Chapter 2, "Troubleshooting Network Connections" and Chapter 4, "Troubleshooting Trunk Side Interfaces."

If you determine that the interface is configured incorrectly, refer to the *Cisco ONS 15540 ESP Configuration Guide and Command Reference*.

Using the debug Commands to Troubleshoot Client Side Interfaces

The debug privileged EXEC commands can provide a wealth of information about the traffic being seen (or *not* seen) on an interface.

⚠️

Caution   Exercise care when using **debug** commands. Many of these commands are processor intensive and can cause serious network problems (such as degraded performance or loss of connectivity) if they are enabled on an already heavily loaded system. When you finish using a **debug** command, remember to disable it with its specific **no debug** command (or use the **no debug all** command to turn off all debugging).

To isolate problems and troubleshoot the client side interfaces of the Cisco ONS 15540, use the following **debug** commands in privileged EXEC mode. Use the **no** form of these commands to disable debugging.

Command	Purpose
debug aps	Starts debugging APS[1] operation.
debug cdp	Starts debugging CDP[2] information.
debug lcmdc	Starts debugging optical LC/MDC[3].
debug ports	Starts debugging port connections.
debug oscp	Starts debugging OSCP[4].

1. APS = Automatic Protection Switching
2. CDP = Cisco Discovery Protocol
3. LC/MDC = line card/mux-demux card
4. OSCP = Optical Supervisory Channel Protocol

If you determine that the connection is configured incorrectly, refer to the *Cisco ONS 15540 ESP Configuration Guide and Command Reference*.