



Troubleshooting Trunk Side Interfaces

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

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Note

For a description of the mux/demux motherboards and modules, slot assignments, and detailed cabling information, refer to the *Cisco ONS 15540 ESP Hardware Installation Guide*. For information on configuration and protection modes, refer to the *Cisco ONS 15540 ESP Configuration Guide and Command Reference*.

Troubleshooting Trunk Side Interfaces

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

Use the following commands to display the status and configuration of the trunk side interfaces:

Command	Purpose
<code>show interfaces wave slot/subcard</code>	Displays the status and configuration of the wave interface on the transponder module.
<code>show interfaces wavepatch slot/subcard/port</code>	Displays the status and configuration of the wavepatch interface.
<code>show interfaces thru slot/subcard</code>	Displays the status and configuration of the thru interface.

Command	Purpose
show interfaces wdm slot/subcard	Displays the status and configuration of the wdm interface.
show interfaces wave {0 1}	Displays the status and configuration of the OSC wave interface on the mux/demux motherboard.

Follow these steps to check the status and configuration of the trunk side interface:

- Step 1** Use the **show interfaces wave slot/subcard** command to display information about a specific wavelength generated by a transponder module. This is the most useful trunk side interface troubleshooting command. The **show interfaces wave slot/subcard** command displays the status of the entire connection from the optical backplane side of the transponder module to the next DWDM node interface connection. If this command indicates the connection is up, the connection is up the entire length of the connection to the next node. If this connection is down, then use the subsequent commands to confirm the individual connections across the system.

```
Switch# show interfaces wave 5/0
Wave5/0 is up, line protocol is up
  Channel: 13   Frequency: 193.6 Thz   Wavelength: 1548.51 nm
  Active Wavepatch : Wavepatch5/0/0
  Splitter Protected: No
→ Receiver power level: -17.68 dBm
  Forward laser control: Off
  Laser safety control: Off
  Osc physical port: No
  Wavelength used for inband management: No
  Configured threshold Group: None
  Code violation and running disparity error count(cvr): 0
  Number of times SF threshold exceeded: 0
  Number of times SD threshold exceeded: 0
  Loopback not set
  Last clearing of "show interface" counters 14:12:36
  Hardware is data_only_port
Switch#
```

- 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.
- Ensure that the proper type of cables have been installed correctly. Refer to the cabling information in the *Cisco ONS 15540 ESP Hardware Installation Guide*.



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 mux/demux motherboards and the mux/demux 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 reenble the interface if the interface is administratively down.
- Step 4** Check additional fields in the display to help you troubleshoot the connection if the interface continues to be down. See [Table 4-1](#).

Table 4-1 *Signal Quality Fields and Errors in the Configuration*

Configuration Fields and Errors	Indication
Receive power level	Power level at the connection to within +/- 1 dBm. Check the power levels and attenuation.
Signal quality: <ul style="list-style-type: none"> • LOS (loss of signal) • LOL (loss of lock) • Good 	<p>Attenuation or absence of signal as it propagates through the fiber.</p> <p>Attenuation or decay of signal strength as it propagates through the fiber.</p> <p>Acceptable signal levels.</p>
BIP-1 field	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, note the BIP-1 value, wait a few seconds, redisplay the wave interface. If there are interleave parity errors, the BIP-1 count increments

- Step 5** Use the **show interfaces wavepatch** command to display information about the receive light path on the transponder motherboard.

```
Switch# show interface Wavepatch10/0/0
Wavepatch10/0/0 is up, line protocol is up
  Hardware is passive_port
Switch#
```

- Step 6** Check the Wavepatch field to see if the connection across the backplane is up.

- Step 7** Use the **show interfaces thru** command to display information about the thru interface to the next mux/demux module.

```
Switch# show interfaces thru 0/1
Thru0/1 is up, line protocol is up
  Patched Interface: Wdm0/2
  Hardware is thru_port
Switch#
```

- Step 8** Check the Thru field to see if the interface is up. This interface should never be down.

- Step 9** Use the **show interfaces wdm** command to display information about the wdm interface to the neighbor node.

```
Switch# show interfaces wdm 0/1
Wdm0/1 is up, line protocol is up
  Patched Interface: Thru0/0
  Wdm Hw capability: N/A
  Num of Wavelengths Add/Dropped: 8
  List of Wavelengths: 9, 10, 11, 12, 13, 14, 15, 16
  Hardware is wavelength_add_drop
```

Switch#

- Step 10 Check the Wdm field to see if the interface is up.
- Step 11 Check the line protocol field to see if the status is up.
- Step 12 Use the **show interfaces wave 0 or 1** command to display information about the OSC interface on the mux/demux motherboard to the OSC connection on the mux/demux module.

```
Switch# show interfaces wave 0
→ Wave0 is up, line protocol is up
  Channel: 0      Frequency: 191.9 Thz      Wavelength: 1562.24 nm
  Signal quality: Good
  Laser safety control: Off
  Osc physical port: Yes
  Wavelength used for inband management: No
  Configured threshold Group: None
  CDL HEC error count: 0
  Number of times SF threshold exceeded: 0
  Number of times SD threshold exceeded: 0
  Last clearing of "show interface" counters never
  Hardware is OSC_phy_port
  Interface is unnumbered. Using address of Loopback1 (1.1.1.2)
  MTU 1492 bytes, BW 10000000 Kbit, DLY 0 usec,
    reliability 0/255, txload 1/255, rxload 1/255
  Encapsulation SNAP, loopback not set
  Last input never, output never, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
    0 packets input, 0 bytes, 0 no buffer
    Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
    0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
    0 packets output, 0 bytes, 0 underruns
    0 output errors, 0 collisions, 0 interface resets
    0 output buffer failures, 0 output buffers swapped out
Switch#
```

- Step 13 Check the Wave field to see if the interface is up.
- Step 14 Check the line protocol field to see if the status is up.



Note

In Steps 5 to 14, if the interface is down where the line protocol software process might have determined that the line is unusable, go through the items listed in Step 2. If you determine that the connection is configured incorrectly, refer to the *Cisco ONS 15540 ESP Configuration Guide and Command Reference*.

Determining Trunk Side Connectivity

To check trunk side connectivity in the network, use the **show connect** command.

Command	Purpose
show connect [edges intermediate]	Displays the interface cross connection configuration.

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

- Step 1** Use the EXEC **show connect** command to display the interface cross connection configuration:

```
Switch# show connect intermediate
client/      wave      wave      wdm
wave         client    patch    filter    trk  channel
-----
Trans2/0/0   Wave2/0   2/0/0*   0/0/0     0/0   1
              2/0/1
Trans2/1/0   Wave2/1   2/1/0*   0/0/1     0/0   2
              2/1/1
Trans2/2/0   Wave2/2   2/2/0*   0/0/2     0/0   3
              2/2/1
```

- Step 2** Use the EXEC **show connect edges** 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
```

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

Troubleshooting OSCP Connections

The OSCP (Optical Supervisory Channel Protocol) Hello protocol is used between the OSC wave interface on the Cisco ONS 15540 and the OSC wave interface on the next connected node. Use the following commands to display the status and configuration of the OSCP connections:

Command	Purpose
show oscp info	Displays the status and configuration of the OSCP for the switch.
show oscp interface	Displays the status and configuration of the local and remote interfaces running the OSCP.
show oscp neighbor	Displays information about the identity of the neighbors communicating with the system through the OSCP.
show oscp statistics [wave slot]	Displays OSCP Hello statistics for an OSC interface.
show oscp traffic [wave slot]	Displays OSCP control traffic for an OSC interface.

Use the following steps to check the status and configuration of the OSCP connection:

- Step 1** Use the **show oscp info** command to display information about the OSCP configuration.

```
Switch# show oscp info

OSCP protocol version 1, Node ID      0202.0304.0506
No. of interfaces 0, No. of neighbors 0
Hello interval 50 tenth of sec, inactivity factor 5,

Hello hold-down 1 tenth of sec
Supported OSCP versions:newest 1, oldest 1
```

- Step 2** Use the **show oscp interface** command for status information for the local and remote interfaces running OSCP.

```
Switch# show oscp interface

OSC Interface(s)
Local Port      Port ID  Status  OSC St  Rem Port ID  Rem Node Id
-----
wave0           1010000 Active   2way    1010000      0061.3a7b.4b00
wave1           0010000 Active   2way    0010000      0061.3a7b.4b01
```

- Step 3** Use the **show osp neighbor** command to display information on the identity of the neighbors communicating with the system through the OSC.

```
Switch# show osp neighbor

OSC Neighbor(s)

Neighbor Node Id:0061.3a7b.4b00
Port list:
Local Port      Port ID  Rem Port ID  OSC state
-----
wave0           1010000    1010000      2way
wave1           0010000    0010000      2way
```

- Step 4** Use the **show oscp statistics** command to display OSCP statistics, which can be used to debug OSCP.

```
Switch# show oscp statistics hello wave 1

OSC Hello Statistics:

int wave1

Event              Count
-----
hold down          2
Hello Tx           345
Hello Rx           347
Hello discards     0
OSC go down        0
```

- Step 5** Use the **show oscp traffic** command to display OSCP control traffic statistics, which show the count of different protocol packets that were transmitted over the OSC channel.

```
Switch# show oscp traffic

OSC Traffic Statistics:

interface Wave1
Description      Count
-----
Tx IP pkt        0
```

```

Rx IP pkt          0
Tx CDP pkt         0
Rx CDP pkt         0
Tx OSCP pkt        0
Rx OSCP pkt        0
Rx pkt dropped     0

```

```
Switch#
```

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

Using the debug Commands to Troubleshoot Trunk 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 Cisco ONS 15540. 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 fiber optic connections 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 ports {errors events} wave <i>number</i>	Starts debugging the wave interface.
debug ports {errors events} wdm <i>slot/subcard/0</i>	Starts debugging the wdm interface.

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

