

General Troubleshooting

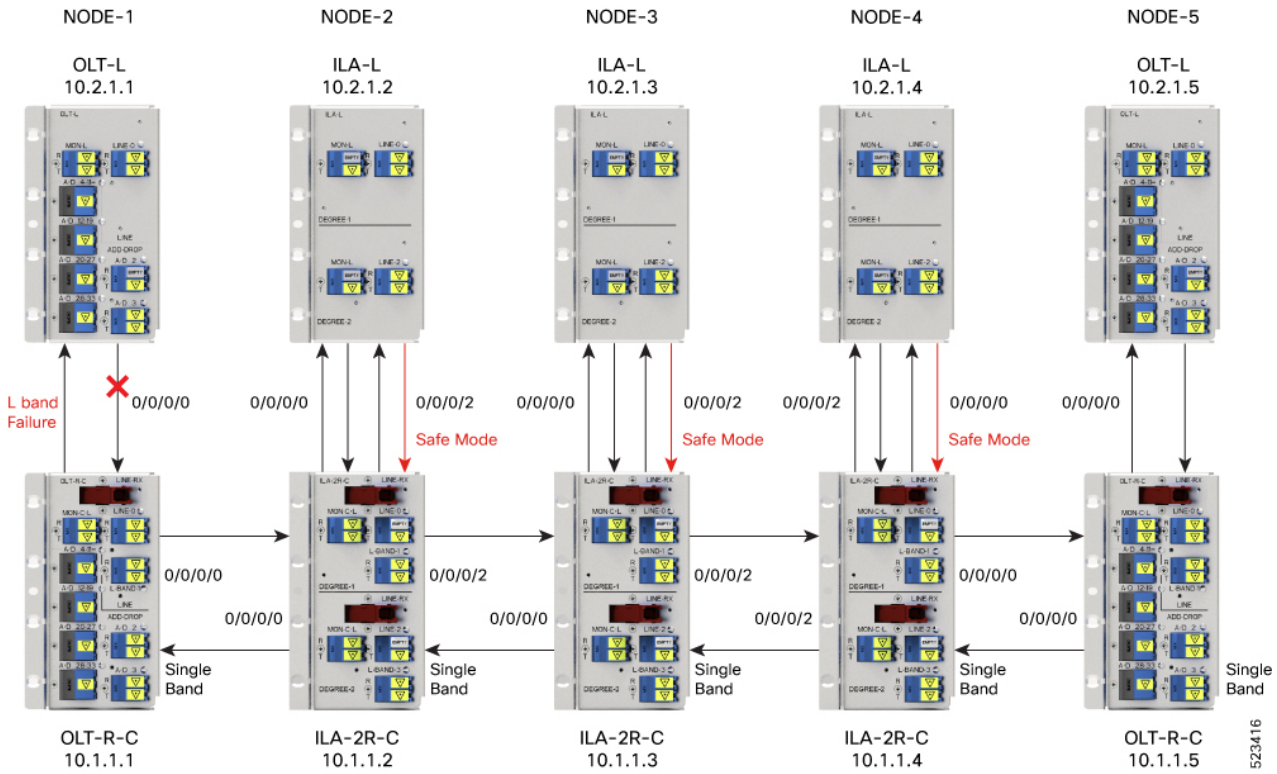
This chapter provides procedures for troubleshooting the most common problems encountered when operating the NCS 1010 chassis.

- Troubleshooting L Band Failure on a C+L Band Network, on page 1
- Troubleshooting C Band Failure on a C+L Band Network, on page 4
- Troubleshooting Span Failure on a C+L Band Network, on page 7
- Troubleshooting RP or LC Warm Reload on a C+L Band Network, on page 10
- Troubleshooting Client-Side Failure, on page 13
- Troubleshooting Line Port SPAN Failure, on page 15
- Troubleshooting Express Connection Failure Between Two Passive Devices, on page 21
- Troubleshooting Power Oscillation in the Network, on page 23

Troubleshooting L Band Failure on a C+L Band Network

In this section, we will troubleshoot L band failure due to connectivity failure between OLT-C and OLT-L nodes. To troubleshoot L-band failure on a C+L band network, start by running the following commands on the manager nodes:

Figure 1: Example of L-band Failure



Procedure

Step 1 Run the **show olc band-status** command on node 10.2.1.1.

Example:

The following command example shows the status of all the L-band nodes as FAILED which indicates that the issue is between the L-band devices of nodes 10.2.1.1 and 10.2.1.2.

```
RP/0/RP0/CPU0#show olc band-status
Fri Dec 16 03:02:07.304 UTC

Controller              : Ots0/0/0/0
Self-Band               : C-Band
BFR status              : Running

Node RID                : 10.2.1.1
Self IP Address         : 192.0.2.1
Self Controller         : Ots0/0/0/0
Partner IP address      : 192.0.2.2
Partner Controller      : Ots0/0/0/0
Partner link status     : UP
C-Band status           : ACTIVE
C-Band PSD              : Single Band
L-Band status         : FAILED
L-Band PSD              : NA

Node RID                : 10.2.1.2
```

```
Self IP Address     : 198.51.100.1
Self Controller         : Ots0/0/0/0
Partner IP address      : 198.51.100.2
Partner Controller      : Ots0/0/0/2
Partner link status     : UP
C-Band status           : ACTIVE
C-Band PSD              : Single Band
L-Band status         : FAILED
L-Band PSD              : NA

Node RID                : 10.2.1.3
Self IP Address     : 203.0.113.1
Self Controller         : Ots0/0/0/0
Partner IP address      : 203.0.113.2
Partner Controller      : Ots0/0/0/2
Partner link status     : UP
C-Band status           : ACTIVE
C-Band PSD              : Single Band
L-Band status           : FAILED
L-Band PSD              : NA

Node RID                : 10.2.1.4
Self IP Address     : 209.165.200.225
Self Controller         : Ots0/0/0/0
Partner IP address      : 209.165.200.226
Partner Controller      : Ots0/0/0/0
Partner link status     : UP
C-Band status           : ACTIVE
C-Band PSD              : Single Band
L-Band status         : FAILED
L-Band PSD           : NA


Node RID                : 10.2.1.5
Self IP Address         : 209.165.201.1
Self Controller         : Ots0/0/0/0
Partner IP address      : 209.165.201.2
Partner Controller      : Ots0/0/0/0
Partner link status     : UP
C-Band status           : ACTIVE
C-Band PSD              : Single Band
L-Band status           : FAILED
L-Band PSD              : NA
```

All the network failure conditions might not reflect in the **show olc band-status** command output. Proceed to the next step to troubleshoot further.

Based on the above output, it appears that all of the C band nodes are currently active, indicating that the span has not been impacted.

Step 2 Run the **show olc apc** command on node 10.2.1.1.

Example:

The following example shows the APC status as BLOCKED with the *Blocked Reason* as PARTIAL-TOPOLOGY. As the APC manager discovers only node 10.2.1.1 and the rest nodes are not discovered. This clearly indicates that the neighbour node of 10.2.1.1 is not reachable. This indicates hence connectivity failure is between the OLT-C node 10.1.1.1 and OLT-L node 10.1.1.2.

```
RP/0/RP0/CPU0:P1BL_DT_07#show olc apc
Mon Dec 26 09:32:23.624 UTC

Controller      : Ots0/0/0/0
APC Status      : BLOCKED
```

```
Blocked Reason  : [ PARTIAL-TOPOLOGY  NODE-BLOCKED ]

Node RID        : 10.2.1.1
Internal State  : BLOCKED
Blocked Reason  : [ AMPLI-SHUT ]
```

Step 3 Run the **show alarms brief system active** command.

Example:

The following example shows the *Loss Of Continuity* alarm which confirms the fiber failure between the the OLT-L node 10.2.1.1 and ILA-L node 10.2.1.2.

```
RP/0/RP0/CPU0:P1BL_DT_07#show alarms brief system active


0/0/NXR0        Minor        Software         12/26/2022 09:27:47 UTC    Ots0/0/0/0 - APC Partial
topology

0/0             Major        Ethernet         12/26/2022 09:27:47 UTC    GigabitEthernet0/0/0/0 -
Loss of Synchronization The Data Interface

0/0/NXR0        Minor        Software         12/26/2022 09:32:15 UTC    Ots0/0/0/0 - APC blocked

0/0           Critical     Controller      12/26/2022 09:32:16 UTC    Ots0/0/0/0 - Loss Of Continuity

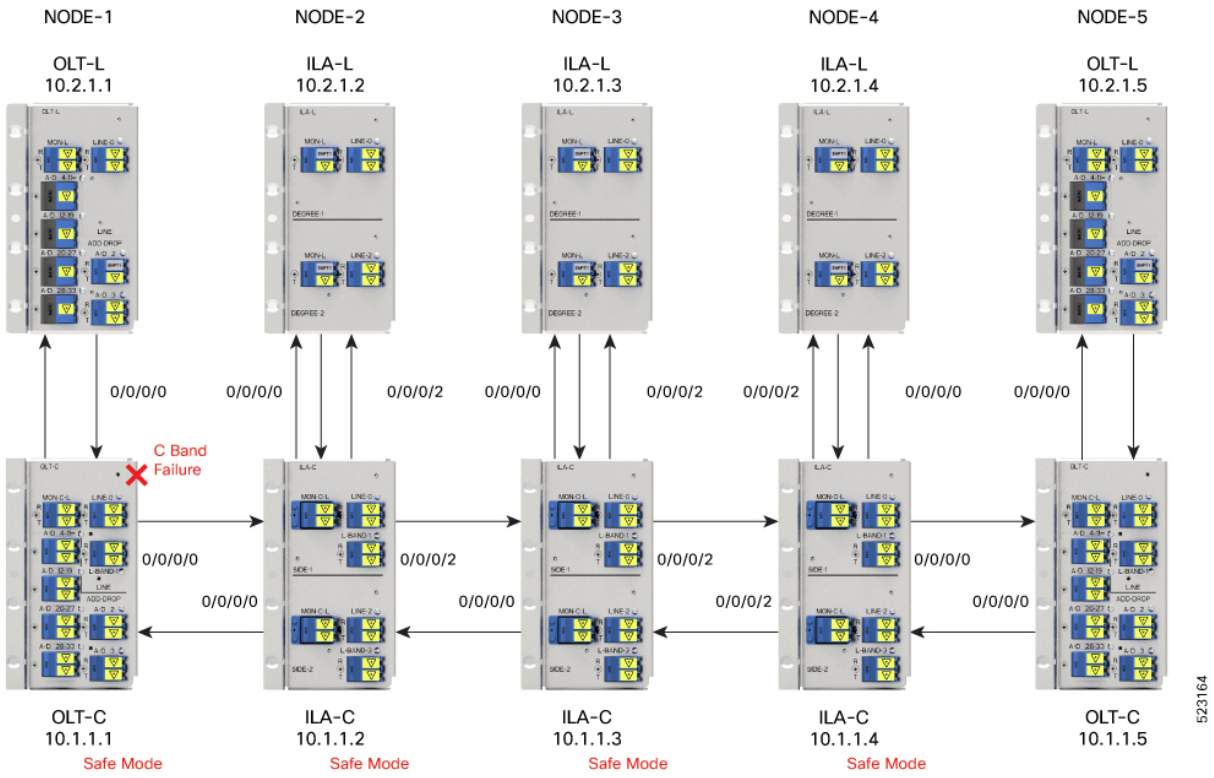
0/0           Not Alarmed  Controller       12/26/2022 09:32:16 UTC    Ots0/0/0/0 - Egress Amplifier
 OFF for Safety Reasons
```

Hence, from steps 2 and 3 outputs, we can conclude that the connectivity failure is between the OLT-L node10.2.1.1 and ILA-L node 10.2.1.2, and the *Loss Of Continuity* alarm confirms the fiber failure between the nodes 10.2.1.1 and 10.2.1.2.

Troubleshooting C Band Failure on a C+L Band Network

In this section, we will troubleshoot C band failure due to amplifier shutdown or failure. To troubleshoot C-band failure on a C+L band network, start by running the following commands on the manager nodes in the same order:

Figure 2: Example of C-band Failure on a C+L Band Network



Procedure

Step 1 Run the **show olc band-status** command on node 10.1.1.1.

Example:

The following command example shows the status of all the C-band nodes as FAILED which indicates that the issue is between the C-band devices of nodes 10.1.1.1 and 10.1.1.2.

```
RP/0/RP0/CPU0:#sh olc band-status
Tue Feb  7 13:37:38.618 UTC

Controller              : Ots0/0/0/0
Self-Band               : C-Band
BFR status              : Running

Node RID                : 10.1.1.1
Self IP address         : 10.9.1.1
Self Controller         : Ots0/0/0/0
Partner IP address      : 192.0.2.1
Partner Controller      : Ots0/0/0/0
Partner link status     : UP
C-Band status           : FAILED
C-Band PSD              : NA
L-Band status           : ACTIVE
L-Band PSD              : Single Band

Node RID                : 10.1.1.2
```

```
Self IP address         : 192.0.2.8
Self Controller         : Ots0/0/0/2
Partner IP address      : 192.0.2.2
Partner Controller      : Ots0/0/0/2
Partner link status     : UP
C-Band status           : FAILED
C-Band PSD              : NA
L-Band status           : ACTIVE
L-Band PSD              : Single Band

Node RID                : 10.1.1.3
Self IP address         : 198.51.100.1
Self Controller         : Ots0/0/0/2
Partner IP address      : 192.0.2.3
Partner Controller      : Ots0/0/0/2
Partner link status     : UP
C-Band status           : FAILED
C-Band PSD              : NA
L-Band status           : ACTIVE
L-Band PSD              : Single Band

Node RID                : 10.1.1.4
Self IP address         : 203.0.113.1
Self Controller         : Ots0/0/0/0
Partner IP address      : 192.0.2.4
Partner Controller      : Ots0/0/0/0
Partner link status     : UP
C-Band status           : FAILED
C-Band PSD              : NA
L-Band status           : ACTIVE
L-Band PSD              : Single Band

Node RID                : 10.1.1.5
Self IP address         : 209.165.200.225
Self Controller         : Ots0/0/0/0
Partner IP address      : 192.0.2.5
Partner Controller      : Ots0/0/0/0
Partner link status     : UP
C-Band status           : FAILED
C-Band PSD              : NA
L-Band status           : ACTIVE
L-Band PSD              : Single Band
```

All the network failure conditions might not reflect in the **show olc band-status** command output. Proceed to the next step to troubleshoot further.

Step 2 Run the **show olc apc** command on node 10.1.1.1.

Example:

The following command output shows APC status of Manager node as NODE-BLOCKED. As the APC manager shows the *Blocked Reason* of the agent node 10.1.1.1 as AMPLI-SHUT, it clearly indicates that amplifier is set to OFF state between the manager node 10.1.1.1 and the agent node 10.1.1.2.

```
RP/0/RP0/CPU0:# show olc apc
Tue Feb  7 13:37:40.146 UTC

Controller      : Ots0/0/0/0
APC Status      : BLOCKED
Blocked Reason  : [ NODE-BLOCKED ]

Node RID        : 10.1.1.1
Internal State  : BLOCKED
Blocked Reason  : [ AMPLI-SHUT ]
```

```
Node RID        : 10.1.1.2
Internal State  : BLOCKED
Blocked Reason  : [ BAND-FAILURE ]

Node RID        : 10.1.1.3
Internal State  : BLOCKED
Blocked Reason  : [ BAND-FAILURE ]

Node RID        : 10.1.1.4
Internal State  : BLOCKED
Blocked Reason  : [ BAND-FAILURE ]

Node RID        : 10.1.1.5
Internal State  : BLOCKED
Blocked Reason  : [ AMPLI-SHUT ]
```

Step 3 Run the **show alarms brief system active** command.

Example:

The following example shows APC output as BLOCKED but without any partial topology alarm which indicates that the span is intact.

```
RP/0/RP0/CPU0:#show alarms b s a

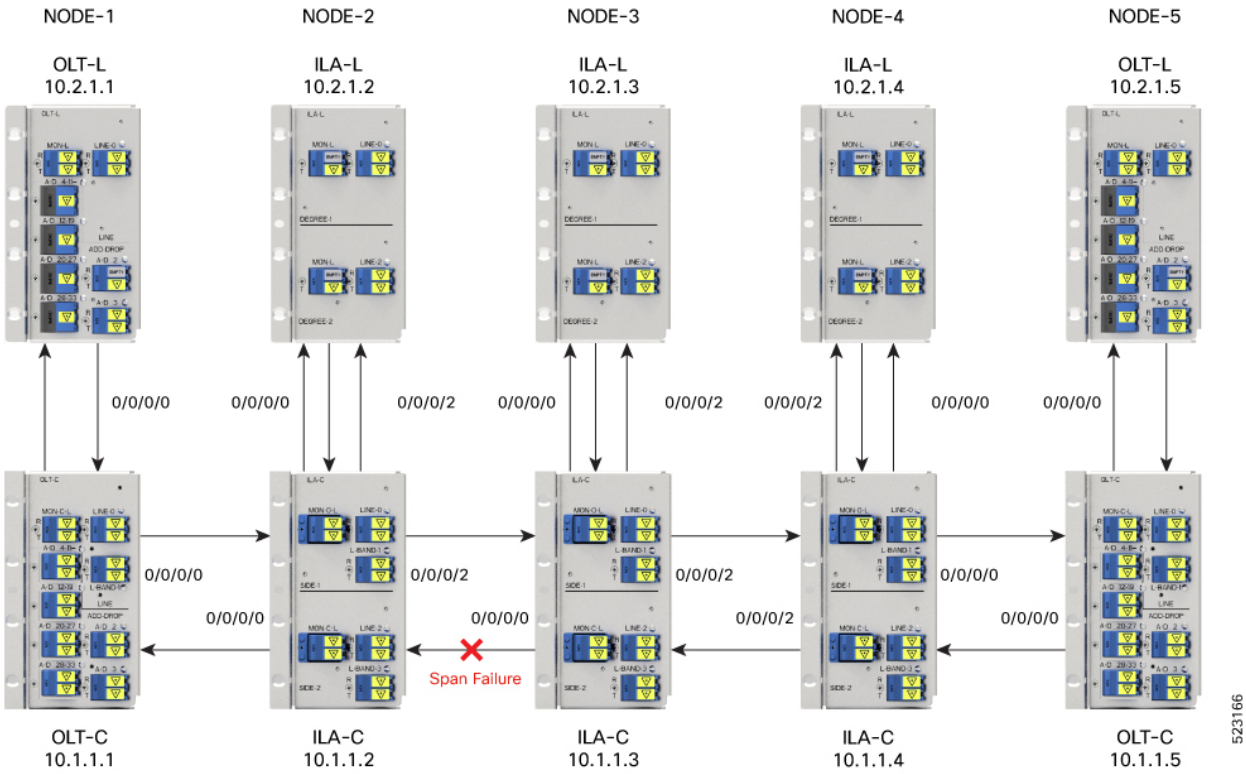

0/0/NXR0        Minor        Software         02/07/2023 13:37:16 UTC    Ots0/0/0/0 - APC blocked
```

Based on the analysis of steps 2 and 3 we can conclude that the amplifier between the manager node 10.1.1.1 and the agent node 10.1.1.2 is shut down which has caused the C-band 10.1.1.1 to fail.

Troubleshooting Span Failure on a C+L Band Network

To troubleshoot span failure on a C+L band network, start by running the following commands on the manager nodes in the same order:

Figure 3: Example of Span Failure



Procedure

Step 1 Run the **show olc band-status** command on node 10.1.1.1.

Example:

The following command output shows that the C and L-band devices from the nodes 10.1.1.2 to 10.1.1.5 are FAILED, there is a possibility of span failure.

```
RP/0/RP0/CPU0:#sh olc band-status
Tue Feb  7 13:55:21.265 UTC

Controller              : Ots0/0/0/0
Self-Band               : C-Band
BFR status              : Running

Node RID                : 10.1.1.1
Self IP Address         : 192.0.2.1
Self Controller         : Ots0/0/0/0
Partner IP address      : 192.0.2.2
Partner Controller      : Ots0/0/0/0
Partner link status     : UP
C-Band status           : ACTIVE
C-Band PSD              : Dual Band
L-Band status           : ACTIVE
L-Band PSD              : Dual Band

Node RID                : 10.1.1.2
```

```
Self IP address         : 198.51.100.1
Self Controller         : Ots0/0/0/2
Partner IP address      : 198.51.100.2
Partner Controller      : Ots0/0/0/2
Partner link status     : UP
C-Band status           : FAILED
C-Band PSD              : NA
L-Band status           : FAILED
L-Band PSD              : NA

Node RID                : 10.1.1.3
Self IP address         : 203.0.113.1
Self Controller         : Ots0/0/0/2
Partner IP address      : 203.0.113.2
Partner Controller      : Ots0/0/0/2
Partner link status     : NA
C-Band status           : FAILED
C-Band PSD              : NA
L-Band status           : FAILED
L-Band PSD              : NA

Node RID                : 10.1.1.4
Self IP address         : 209.165.200.225
Self Controller         : Ots0/0/0/0
Partner IP address      : 209.165.200.226
Partner Controller      : Ots0/0/0/0
Partner link status     : NA
C-Band status           : FAILED
C-Band PSD              : NA
L-Band status           : FAILED
L-Band PSD              : NA

Node RID                : 10.1.1.5
Self IP address         : 209.165.201.1
Self Controller         : Ots0/0/0/0
Partner IP address      : 209.165.201.2
Partner Controller      : Ots0/0/0/0
Partner link status     : NA
C-Band status           : FAILED
L-Band status           : FAILED
```

All the network failure conditions might not reflect in the **show olc band-status** command output. Proceed to the next step to troubleshoot further.

Step 2 Run the **show olc apc** command on node 10.1.1.1.

Example:

The following command output shows the APC status as BLOCKED with the reason as PARTIAL-TOPOLOGY on both C and L-band OLT devices. This indicates that there is a span failure.

```
RP/0/RP0/CPU0:# show olc apc

Controller      : Ots0/0/0/0
APC Status      : BLOCKED
Blocked Reason  : [ PARTIAL-TOPOLOGY  NODE-BLOCKED ]

Node RID        : 10.1.1.1
Internal State  : IDLE

Node RID        : 10.1.1.2
Internal State  : BLOCKED
Blocked Reason  : [ AMPLI-SHUT ]
```

Step 3 Run the **show alarms brief system active** command.

Example:

The following example shows the *Loss Of Signal* alarm which confirms the span failure.

```
RRP/0/RP0/CPU0:3#sh alarms breif system active

0/0/NXR0        Minor        Software         02/07/2023 13:52:44 UTC    Ots0/0/0/0 - APC Partial
topology

0/0/NXR0        Minor        Software         02/07/2023 14:01:39 UTC    Ots0/0/0/0 - APC blocked

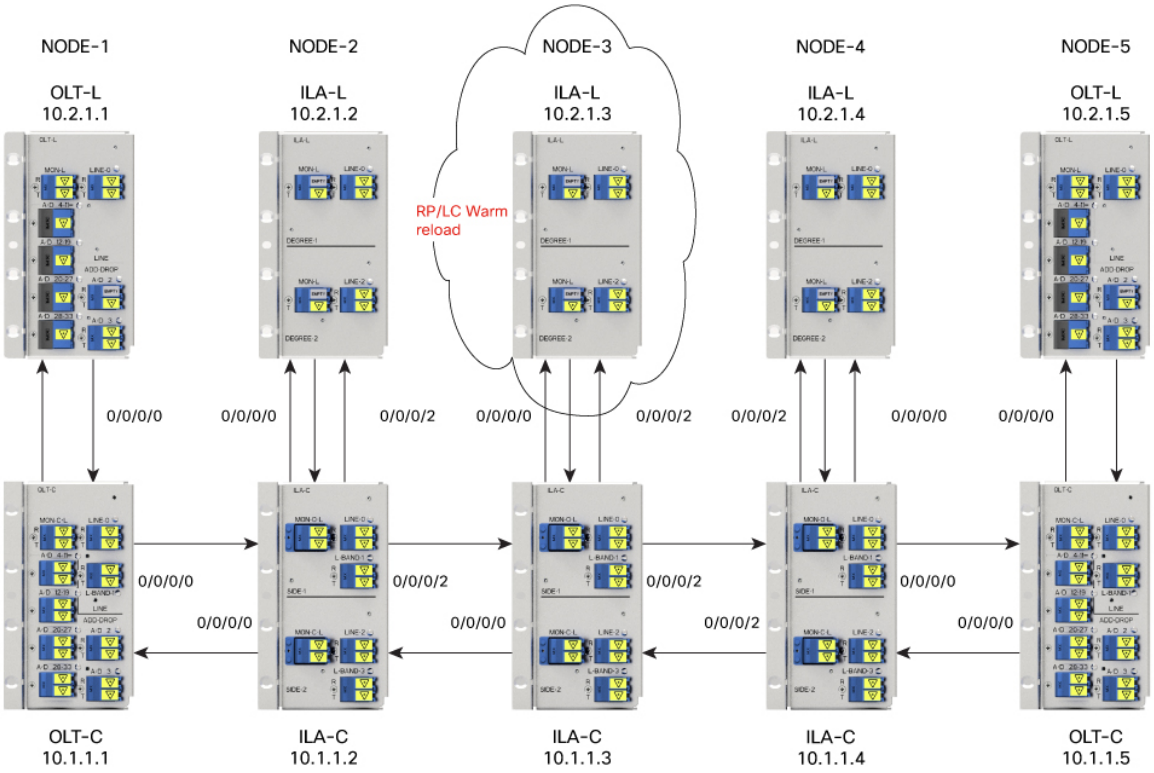

0/0             Critical     Controller       02/07/2023 13:55:00 UTC    Ots0/0/0/0 - Loss of Signal
 - Payload
```

Hence, from steps 2 and 3 outputs, we can conclude that the PARTIAL-TOPOLOGY status on the OLT devices and the *Loss Of Signal* alarm confirmed the span failure.

Troubleshooting RP or LC Warm Reload on a C+L Band Network

On a C+L band network, RP or LC warm reload on a C or L band device might affect the partner band connectivity. In this case, traffic is not impacted. To troubleshoot a RP or LC warm reload on a C+L band network, following these steps:

Figure 4: Example RP or LC Warm Reload Troubleshooting on C+L Band Network



Procedure

Step 1 Run the **show olc band-status** command on node 10.1.1.1.

Example:

The following example shows the *Partner link status* at node 10.1.1.3 is DOWN. *Partner link status* can be down due to communication failure between C and L-band devices at the node which can be due to RP reload, power cycle event or LC cold reload.

```
RP/0/RP0/CPU0:#sh olc band-status
Tue Feb  7 14:14:40.933 UTC

Controller              : Ots0/0/0/0
Self-Band               : C-Band
BFR status              : Running

Node RID                : 10.1.1.1
Self IP address         : 192.0.2.1
Self Controller         : Ots0/0/0/0
Partner IP address      : 198.51.100.2
Partner Controller      : Ots0/0/0/0
Partner link status     : UP
C-Band status           : ACTIVE
C-Band PSD              : Dual Band
L-Band status           : ACTIVE
L-Band PSD              : Dual Band

Node RID                : 10.1.1.2
Self IP address         : 192.0.2.2
Self Controller         : Ots0/0/0/2
Partner IP address      : 198.51.100.1
Partner Controller      : Ots0/0/0/2
Partner link status     : UP
C-Band status           : ACTIVE
C-Band PSD              : Dual Band
L-Band status           : ACTIVE
L-Band PSD              : Dual Band

Node RID                : 10.1.1.3
Self IP address         : 192.0.2.3
Self Controller         : Ots0/0/0/2
Partner IP address      : 203.0.113.1
Partner Controller      : Ots0/0/0/2
Partner link status     : DOWN
C-Band status           : ACTIVE
C-Band PSD              : Dual Band
L-Band status           : ACTIVE
L-Band PSD              : Dual Band

Node RID                : 10.1.1.4
Self IP address         : 192.0.2.4
Self Controller         : Ots0/0/0/0
Partner IP address      : 209.165.200.225
Partner Controller      : Ots0/0/0/0
Partner link status     : UP
C-Band status           : ACTIVE
C-Band PSD              : Dual Band
L-Band status           : ACTIVE
L-Band PSD              : Dual Band
```

```
Node RID                : 10.1.1.5
Self IP address         : 192.0.2.5
Self Controller         : Ots0/0/0/0
Partner IP address      : 209.165.201.1
Partner Controller      : Ots0/0/0/0
Partner link status     : UP
C-Band status           : ACTIVE
L-Band status           : ACTIVE
```

All the network failure conditions might not reflect in the **show olc band-status** command output. Proceed to the next step to troubleshoot further.

To investigate further, run the command in step 2.

Step 2 Run the **show olc apc** command on node 10.1.1.1 and 10.2.1.1.

Example:

The following command example on node 10.1.1.1 shows APC status on OLT-C device as IDLE as the APC manager discovers all the C-band nodes. This clearly indicates all the C-Band nodes are active.

```
RP/0/RP0/CPU0:#show olc apc

Controller      : Ots0/0/0/0
APC Status      : IDLE

Node RID        : 10.1.1.1
Internal State  : IDLE

Node RID        : 10.1.1.2
Internal State  : IDLE

Node RID        : 10.1.1.3
Internal State  : IDLE

Node RID        : 10.1.1.4
Internal State  : IDLE

Node RID        : 10.1.1.5
Internal State  : IDLE
```

Example:

The following command example on 10.2.1.1 shows APC manager discovers only nodes 10.2.1.1 and 10.2.1.2. This indicates that the L-Band device 10.2.1.3 is not reachable to the manager node 10.2.1.1.

```
RP/0/RP0/CPU0:#show olc apc
Tue Feb  7 14:16:46.264 UTC

Controller      : Ots0/0/0/0
APC Status      : BLOCKED
Blocked Reason  : [ PARTIAL-TOPOLOGY ]

Node RID        : 10.2.1.1
Internal State  : IDLE

Node RID        : 10.2.1.2
Internal State  : IDLE
```

Step 3 Run the **show alarms brief system active** command on 10.2.1.1.

Example:

The following command example shows the *Node is unpaired from band partner node* alarm which confirms connection between node 10.2.1.3 is not paired with 10.1.1.3.

```
RP/0/RP0/CPU0:P1BL_DT_07#show alarms brief system active


RP/0/RP0/CPU0:P1BL_DT_07#show alarms brief system active     0/0/NXR0        NotAlarmed   Software
        02/07/2023 14:13:01 UTC    Node is unpaired from band partner node
```

The analysis of steps 2 and 3 confirm that node 10.2.1.3 is not available due to RP or LC warm reload.

Troubleshooting Client-Side Failure

Problem

This problem occurs when there is a signal payload loss in the following conditions:

- If the fiber cut occurs at the client-side in the direction from the client to the , the LOS-P alarm is raised at the AD port controller OTS.
- If the fiber cut occurs at the client-side in the direction from the to the client, the LOS-P alarm is raised at the Passive device controller OMS.

Topology and Components

To build this topology, you need the following hardware:

-
- QDD-400G-ZR-S transceiver

The following figure displays client-side failure due to fiber cut:

Example 1

The following example shows how to determine LOS-P failure at the AD port controller OTS:

```
RP/0/RP0/CPU0:ios#show controllers ots0/0/0/3
Tue Mar 28 15:58:12.210 UTC

Controller State: Down

Transport Admin State: Automatic In Service

LED State: Red

        Alarm Status:
        -------------
        Detected Alarms:
                RX-LOS-P

        Alarm Statistics:
        -----------------
        RX-LOS-P = 2
        RX-LOC = 0
        TX-POWER-FAIL-LOW = 0
        INGRESS-AUTO-LASER-SHUT = 0
        INGRESS-AUTO-POW-RED = 0
```

```
INGRESS-AMPLI-GAIN-LOW = 0
INGRESS-AMPLI-GAIN-HIGH = 0
EGRESS-AUTO-LASER-SHUT = 0
EGRESS-AUTO-POW-RED = 0
EGRESS-AMPLI-GAIN-LOW = 0
EGRESS-AMPLI-GAIN-HIGH = 0
HIGH-TX-BR-PWR = 0
HIGH-RX-BR-PWR = 0
SPAN-TOO-SHORT-TX = 0
SPAN-TOO-SHORT-RX = 0

Parameter Statistics:
---------------------
Total Rx Power = -50.00 dBm
Total Tx Power = -50.00 dBm
Ingress Ampli Mode = Gain
Ingress Ampli Gain = 0.0 dB
Ingress Ampli Tilt = 0.0 dB



Configured Parameters:
----------
Ingress Ampli Mode = Gain
Ingress Ampli Gain = 16.0 dB
Ingress Ampli Power = -3.0 dBm
Ingress Ampli Tilt = 0.0 dB
Rx Low Threshold = -3276.8 dBm
Tx Low Threshold = -3276.8 dBm
```

Example 2

The following example shows how to determine LOS-P failure at the passive device controller OMS:

```
RP/0/RP0/CPU0:P2A_DT_07#sh controllers oms 0/1/0/8
Tue Mar 28 16:00:33.685 UTC

Controller State: Down

Transport Admin State: Automatic In Service

LED State: Red

        Alarm Status:
        -------------
        Detected Alarms:
                RX-LOS-P

        Alarm Statistics:
        -----------------
        RX-LOS-P = 1
        TX-POWER-FAIL-LOW = 0

        Parameter Statistics:
        ---------------------
        Tx Power = -50.00 dBm
        Rx Power = -50.00 dBm
```

Solution

See to resolve this alarm.

Troubleshooting Line Port SPAN Failure

Problem

This problem occurs when there is a loss of fiber connection at the Line port due to fiber cut. As a result, the LOC alarm is raised at the Line OTS controller.

Topology and Components

To build this point-to-point topology, you need the following hardware:

-
- NCS1K-MD32E-C modules
- NCS1K-MD32O-C modules
- QDD-400G-ZR-S transceiver

The following figure shows loss of fiber connection continuity at the Line port:

Example 1

The following example shows how to determine a span failure. Look for the higlighted alarms in the **show controllers** output.

On OLT 1

```
RP/0/RP0/CPU0:ios#show controllers ots 0/0/0/0
Tue Feb 18 16:03:51.365 IST

 Controller State: Up

 Transport Admin State: In Service

 LED State: Red

         Alarm Status:
         -------------
         Detected Alarms:
                 RX-LOS-P
                 EGRESS-AUTO-LASER-SHUT
                 INGRESS-AMPLI-LASER-OFF

         Alarm Statistics:
         -----------------
         RX-LOS-P = 8
         RX-LOC = 1
         TX-POWER-FAIL-LOW = 3
         INGRESS-AUTO-LASER-SHUT = 0
         INGRESS-AUTO-POW-RED = 0
         INGRESS-AMPLI-GAIN-LOW = 0
         INGRESS-AMPLI-GAIN-HIGH = 0
         EGRESS-AUTO-LASER-SHUT = 2
         EGRESS-AUTO-POW-RED = 0
         EGRESS-AMPLI-GAIN-LOW = 0
         EGRESS-AMPLI-GAIN-HIGH = 0
         HIGH-TX-BR-PWR = 0
         HIGH-RX-BR-PWR = 0
```

```
        SPAN-TOO-SHORT-TX = 0
        SPAN-TOO-SHORT-RX = 0
        INGRESS-AMPLI-LASER-OFF = 8
        EGRESS-AMPLI-LASER-OFF = 1

        Parameter Statistics:
        ---------------------
        Total Rx Power(C+L) = -14.21 dBm
        Total Tx Power(C+L) = 3.33 dBm
        Total Rx Power = -14.21 dBm
        Total Tx Power = 3.33 dBm
        Rx Signal Power = -50.00 dBm
        Tx Signal Power = -50.00 dBm
        Tx Voa Attenuation = 5.3 dB
        Ingress Ampli Mode = Gain
        Ingress Ampli Gain = -1.2 dB
        Ingress Ampli Tilt = 0.0 dB
        Ingress Ampli Gain Range = Extended
        Ingress Ampli Safety Control mode = auto
        Ingress Ampli OSRI = OFF
        Ingress Ampli Force Apr = OFF
        Egress Ampli Mode = Gain
        Egress Ampli Gain = -0.6 dB
        Egress Ampli Tilt = 0.0 dB
        Egress Ampli Safety Control mode = auto
        Egress Ampli OSRI = OFF
        Egress Ampli Force APR = OFF
        Egress Ampli BR = ENABLE
        Egress Ampli BR Power = -50.00 dBm
        Egress Ampli BR Ratio = -90.00 dB



        Configured Parameters:
        ----------
        Tx Voa Attenuation = 2.6 dB
        Ingress Ampli Mode = Gain
        Ingress Ampli Gain = 24.4 dB
        Ingress Ampli Power = -1.0 dBm
        Ingress Ampli Tilt = 0.0 dB
        Ingress Ampli Gain Range = Extended
        Ingress Ampli Safety Control mode = auto
        Ingress Ampli OSRI = OFF
        Ingress Ampli Force Apr = OFF
        Egress Ampli Mode = Gain
        Egress Ampli Gain = 20.0 dB
        Egress Ampli Power = 4.4 dBm
        Egress Ampli Tilt = -2.3 dB
        Egress Ampli Safety Control mode = auto
        Egress Ampli OSRI = OFF
        Egress Ampli Force APR = OFF
        Egress Ampli BR = ENABLE
        BR High Threshold = -17.0 dBm

RP/0/RP0/CPU0:ios#show alarms brief system active
Tue Feb 18 16:05:40.709 IST

------------------------------------------------------------------------------------
Active Alarms
------------------------------------------------------------------------------------
Location        Severity     Group            Set Time                    Description
```

```
--------------------------------------------------------------------------------
0/0            NotAlarmed   Controller       02/18/2025 16:03:04 IST    Ots0/0/0/0 - Egress
 Amplifier OFF for Safety Reasons


0/0            NotAlarmed   Controller       02/18/2025 16:03:04 IST    Ots0/0/0/0 - Ingress
 Amplifier OFF for Fail Low Input Power


0/0             Major        Controller       02/18/2025 16:03:07 IST
GigabitEthernet0/0/0/0 - Far End Fault Indication
```

On ILA (node 2)

```
RP/0/RP0/CPU0:ios#show controllers ots 0/0/0/0
Tue Feb 18 16:04:19.948 IST

 Controller State: Down

 Transport Admin State: In Service

 LED State: Red

         Alarm Status:
         -------------
         Detected Alarms:
                 RX-LOS-P
                 RX-LOC
                 EGRESS-AUTO-LASER-SHUT

         Alarm Statistics:
         -----------------
         RX-LOS-P = 4
         RX-LOC = 2
         TX-POWER-FAIL-LOW = 3
         INGRESS-AUTO-LASER-SHUT = 0
         INGRESS-AUTO-POW-RED = 0
         INGRESS-AMPLI-GAIN-LOW = 0
         INGRESS-AMPLI-GAIN-HIGH = 0
         EGRESS-AUTO-LASER-SHUT = 1
         EGRESS-AUTO-POW-RED = 0
         EGRESS-AMPLI-GAIN-LOW = 0
         EGRESS-AMPLI-GAIN-HIGH = 0
         HIGH-TX-BR-PWR = 0
         HIGH-RX-BR-PWR = 0
         SPAN-TOO-SHORT-TX = 0
         SPAN-TOO-SHORT-RX = 0
         INGRESS-AMPLI-LASER-OFF = 0
         EGRESS-AMPLI-LASER-OFF = 5

         Parameter Statistics:
         ---------------------
         Total Rx Power(C+L) = -50.00 dBm
         Total Tx Power(C+L) = 3.15 dBm
         Total Rx Power = -50.00 dBm
         Total Tx Power = 3.15 dBm
         Rx Signal Power = -50.00 dBm
         Tx Signal Power = -50.00 dBm
         Tx Voa Attenuation = 5.2 dB
         Egress Ampli Mode = Gain
         Egress Ampli Gain = -1.5 dB
         Egress Ampli Tilt = 0.0 dB
         Egress Ampli Gain Range = Extended
```

```
        Egress Ampli Safety Control mode = auto
        Egress Ampli OSRI = OFF
        Egress Ampli Force APR = OFF
        Egress Ampli BR = ENABLE
        Egress Ampli BR Power = -50.00 dBm
        Egress Ampli BR Ratio = -90.00 dB


        Configured Parameters:
        ----------
        Tx Voa Attenuation = 2.9 dB
        Egress Ampli Mode = Gain
        Egress Ampli Gain = 24.8 dB
        Egress Ampli Power = -3.5 dBm
        Egress Ampli Tilt = -2.2 dB
        Egress Ampli Gain Range = Extended
        Egress Ampli Safety Control mode = auto
        Egress Ampli OSRI = OFF
        Egress Ampli Force APR = OFF
        Egress Ampli BR = ENABLE
        BR High Threshold = -17.0 dBm
```

```
RP/0/RP0/CPU0:ios#show controllers ots 0/0/0/2
Tue Feb 18 16:04:38.210 IST

 Controller State: Up

 Transport Admin State: In Service

 LED State: Red

        Alarm Status:
        -------------
        Detected Alarms:
                EGRESS-AMPLI-LASER-OFF

        Alarm Statistics:
        -----------------
        RX-LOS-P = 5
        RX-LOC = 1
        TX-POWER-FAIL-LOW = 3
        INGRESS-AUTO-LASER-SHUT = 0
        INGRESS-AUTO-POW-RED = 0
        INGRESS-AMPLI-GAIN-LOW = 0
        INGRESS-AMPLI-GAIN-HIGH = 0
        EGRESS-AUTO-LASER-SHUT = 1
        EGRESS-AUTO-POW-RED = 0
        EGRESS-AMPLI-GAIN-LOW = 2
        EGRESS-AMPLI-GAIN-HIGH = 0
        HIGH-TX-BR-PWR = 0
        HIGH-RX-BR-PWR = 0
        SPAN-TOO-SHORT-TX = 0
        SPAN-TOO-SHORT-RX = 0
        INGRESS-AMPLI-LASER-OFF = 0
        EGRESS-AMPLI-LASER-OFF = 4

        Parameter Statistics:
        ---------------------
        Total Rx Power(C+L) = -4.49 dBm
        Total Tx Power(C+L) = 2.86 dBm
```

```
        Total Rx Power = -4.49 dBm
        Total Tx Power = 2.86 dBm
        Rx Signal Power = -4.55 dBm
        Tx Signal Power = -50.00 dBm
        Tx Voa Attenuation = 3.5 dB
        Egress Ampli Mode = Gain
        Egress Ampli Gain = -2.2 dB
        Egress Ampli Tilt = 0.0 dB
        Egress Ampli Gain Range = Extended
        Egress Ampli Safety Control mode = auto
        Egress Ampli OSRI = OFF
        Egress Ampli Force APR = OFF
        Egress Ampli BR = ENABLE
        Egress Ampli BR Power = -50.00 dBm
        Egress Ampli BR Ratio = -90.00 dB



        Configured Parameters:
        ----------
        Tx Voa Attenuation = 2.3 dB
        Egress Ampli Mode = Gain
        Egress Ampli Gain = 22.9 dB
        Egress Ampli Power = -3.8 dBm
        Egress Ampli Tilt = -2.4 dB
        Egress Ampli Gain Range = Extended
        Egress Ampli Safety Control mode = auto
        Egress Ampli OSRI = OFF
        Egress Ampli Force APR = OFF
        Egress Ampli BR = ENABLE
        BR High Threshold = -17.0 dBm

RP/0/RP0/CPU0:ios#show alarms brief system active
Tue Feb 18 16:05:40.709 IST

------------------------------------------------------------------------------------
Active Alarms
------------------------------------------------------------------------------------
Location        Severity     Group            Set Time                    Description



------------------------------------------------------------------------------------
0/0            NotAlarmed   Controller      02/18/2025 16:03:04 IST    Ots0/0/0/0 - Egress
 Amplifier OFF for Safety Reasons


0/0            NotAlarmed   Controller      02/18/2025 16:03:04 IST    Ots0/0/0/2 - Egress
 Amplifier OFF for Fail Low Input Power
0/0             Critical     Controller       02/18/2025 16:03:05 IST    Ots0/0/0/0 - Loss
 Of Continuity
```

On the far end OLT

```
RP/0/RP0/CPU0:ios#show controllers ots 0/0/0/0
Tue Feb 18 16:04:58.387 IST

 Controller State: Up

 Transport Admin State: In Service

 LED State: Red
```

```
Alarm Status:
-------------
Detected Alarms:
        RX-LOS-P
        INGRESS-AMPLI-LASER-OFF

Alarm Statistics:
-----------------
RX-LOS-P = 11
RX-LOC = 0
TX-POWER-FAIL-LOW = 2
INGRESS-AUTO-LASER-SHUT = 0
INGRESS-AUTO-POW-RED = 0
INGRESS-AMPLI-GAIN-LOW = 0
INGRESS-AMPLI-GAIN-HIGH = 0
EGRESS-AUTO-LASER-SHUT = 1
EGRESS-AUTO-POW-RED = 0
EGRESS-AMPLI-GAIN-LOW = 0
EGRESS-AMPLI-GAIN-HIGH = 0
HIGH-TX-BR-PWR = 0
HIGH-RX-BR-PWR = 0
SPAN-TOO-SHORT-TX = 0
SPAN-TOO-SHORT-RX = 0
INGRESS-AMPLI-LASER-OFF = 11
EGRESS-AMPLI-LASER-OFF = 1

Parameter Statistics:
---------------------
Total Rx Power(C+L) = -13.94 dBm
Total Tx Power(C+L) = 13.15 dBm
Total Rx Power = -13.94 dBm
Total Tx Power = 13.16 dBm
Rx Signal Power = -50.00 dBm
Tx Signal Power = 13.12 dBm
Tx Voa Attenuation = 9.7 dB
Ingress Ampli Mode = Gain
Ingress Ampli Gain = 0.0 dB
Ingress Ampli Tilt = 0.0 dB
Ingress Ampli Gain Range = Normal
Ingress Ampli Safety Control mode = auto
Ingress Ampli OSRI = OFF
Ingress Ampli Force Apr = OFF
Egress Ampli Mode = Gain
Egress Ampli Gain = 19.0 dB
Egress Ampli Tilt = -0.4 dB
Egress Ampli Safety Control mode = auto
Egress Ampli OSRI = OFF
Egress Ampli Force APR = OFF
Egress Ampli BR = ENABLE
Egress Ampli BR Power = -19.89 dBm
Egress Ampli BR Ratio = -33.00 dB



Configured Parameters:
----------
Tx Voa Attenuation = 6.8 dB
Ingress Ampli Mode = Gain
Ingress Ampli Gain = 15.5 dB
Ingress Ampli Power = -1.0 dBm
Ingress Ampli Tilt = 0.0 dB
Ingress Ampli Gain Range = Normal
Ingress Ampli Safety Control mode = auto
Ingress Ampli OSRI = OFF
```

```
        Ingress Ampli Force Apr = OFF
        Egress Ampli Mode = Gain
        Egress Ampli Gain = 20.0 dB
        Egress Ampli Power = 5.0 dBm
        Egress Ampli Tilt = -0.4 dB
        Egress Ampli Safety Control mode = auto
        Egress Ampli OSRI = OFF
        Egress Ampli Force APR = OFF
        Egress Ampli BR = ENABLE
        BR High Threshold = -17.0 dBm


RP/0/RP0/CPU0:ios#show alarms brief system active
Tue Feb 18 16:05:40.709 IST

------------------------------------------------------------------------------------
Active Alarms
------------------------------------------------------------------------------------
Location        Severity     Group            Set Time                    Description



------------------------------------------------------------------------------------
0/0            NotAlarmed   Controller      02/18/2025 16:03:05 IST    Ots0/0/0/0 - Ingress
 Amplifier OFF for Fail Low Input Power
```

Solution

See to resolve this problem.

Troubleshooting Express Connection Failure Between Two Passive Devices

Problem

This problem occurs when there is a signal payload loss in the express connections between two passive devices due to a fiber cut. As a result, the LOS-P alarm is raised at the passive device controller OCH.

Topology and Component

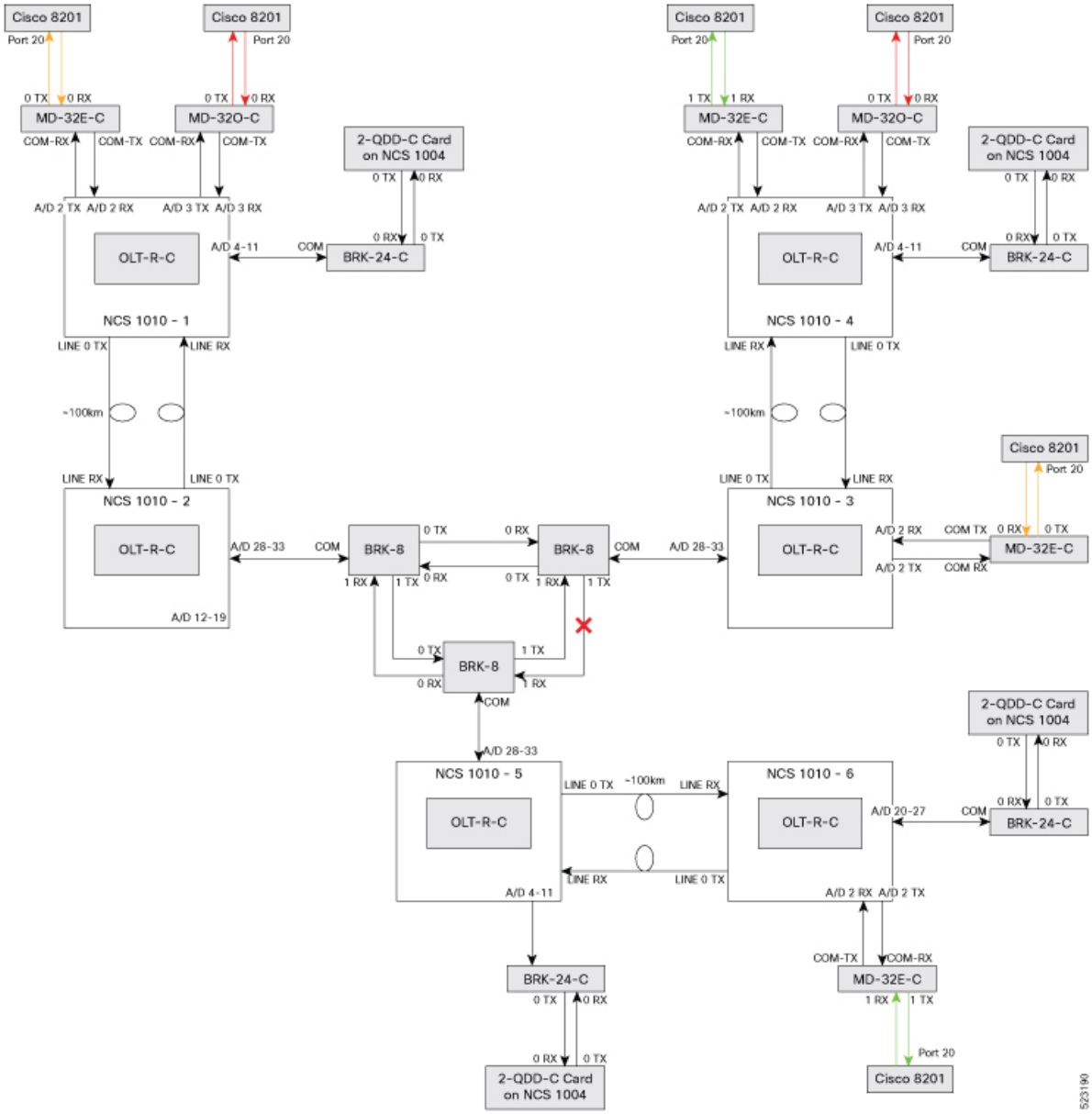
To build this topology, you need the following hardware.

-
- NCS1K-MD32E-C modules
- NCS1K-MD32O-C modules
- NCS1K-BRK-8 modules
- NCS1K-BRK-24 modules
- Cisco 8201 routers
- QDD-400G-ZR-S transceivers
- CFP2-400G-DCO transceivers

- Cisco NCS 1004 devices
- NCS1K4-2-QDD-C-K9 line card
- LC/LC cables
- MPO cables

The following figure displays the fiber cut between two passive devices:

Figure 5: Fiber Cut Between Two Passive Devices



Example 1

The following example shows how to determine the fiber cut between two passive devices:

```
RP/0/RP0/CPU0:OLT-C-SITE-2#sh controllers och 0/3/0/0
Wed Apr 12 10:25:27.139 IST

 Controller State: Down

 Transport Admin State: In Service

 LED State: Red

        Alarm Status:
        -------------
        Detected Alarms:
                RX-LOS-P

        Alarm Statistics:
        -----------------
        RX-LOS-P = 1
        TX-POWER-FAIL-LOW = 0

        Parameter Statistics:
        ---------------------
        Tx Power = 13.09 dBm
        Rx Power = -50.00 dBm
```

Note The slot number 3 in the preceding show controller command is the USB cable port number to which BRK8 is connected (This USB number is derived from the show platform output).

Solution

See to resolve this alarm.

Troubleshooting Power Oscillation in the Network

Problem

This problem occurs when there is a power oscillation in the network.

Example 1

The following example shows the power fluctuation in the network:

```
RP/0/RP0/CPU0:ios#show controllers ots0/0/0/0 pm current 30-sec optics 1
Tue Mar 28 16:02:22.332 UTC

Optics in the current interval [16:02:00 - 16:02:22 Tue Mar 28 2023]

Optics current bucket type : Valid
              MIN        AVG      MAX      Operational    Configured      TCA   Operational
     Configured     TCA
```

```
                                                Threshold(min)  Threshold(min) (min) Threshold(max)
   Threshold(max) (max)
OPT[dBm]       : -50.00   -7.32    6.10     -20.00            NA              NO   40.00
         NA               NO
OPR[dBm]       : -50.00   -50.00   -50.00   -30.00            NA              NO   18.00
         NA               NO
OPT(C+L)[dBm] : 19.50    19.51    19.70    -20.00            NA              NO   60.85
         NA               NO
OPR(C+L)[dBm] : 10.60    10.64    10.70    -30.00            NA              NO   36.00
         NA               NO
OPT(S)[dBm]    : -50.00   -50.00   -50.00   -5.00             NA              NO   28.00
         NA               NO
OPR(S)[dBm]    : -50.00   -50.00   -50.00   -30.00            NA              NO   18.00
         NA               NO
 OPBR[dBm]     : -50.00   -50.00   -50.00   -30.00            NA              NO   -14.09
         NA               NO
EAGN[dB]       : 0.00     0.00     0.00     16.00             NA              NO   31.00
         NA               NO
EATL[dB]       : 0.00     0.00     0.00     -5.00             NA              NO   5.00
         NA               NO
IAGN[dB]       : 0.00     0.00     0.00     12.00             NA              NO   25.00
         NA               NO
IATL[dB]       : 0.00     0.00     0.00     -5.00             NA              NO   5.00
         NA               NO

Last clearing of "show controllers OPTICS" counters never
```

Solution

You need to monitor the performance monitor statistics of the corresponding OTS and OTS-OCH controllers to determine where the power oscillation occurs in the network. Check for the transient alarms on the node, such as RX-LOC and RX-LOS-P. See and to resolve this problem.