



## Alarm Propagation Scenarios

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In an optical network, alarm propagation defines how different alarms propagate in a larger link during any failure in the network. The alarm correlation algorithm suppresses the lower-priority alarms on each device in the network. Hence, the network administrator can assess the health of the optical network and detect the root cause of the problem by focusing only on the significant alarms on the node.

This chapter covers the alarms that are active and suppressed during the common alarm propagation scenarios when operating the NCS 1020 chassis.

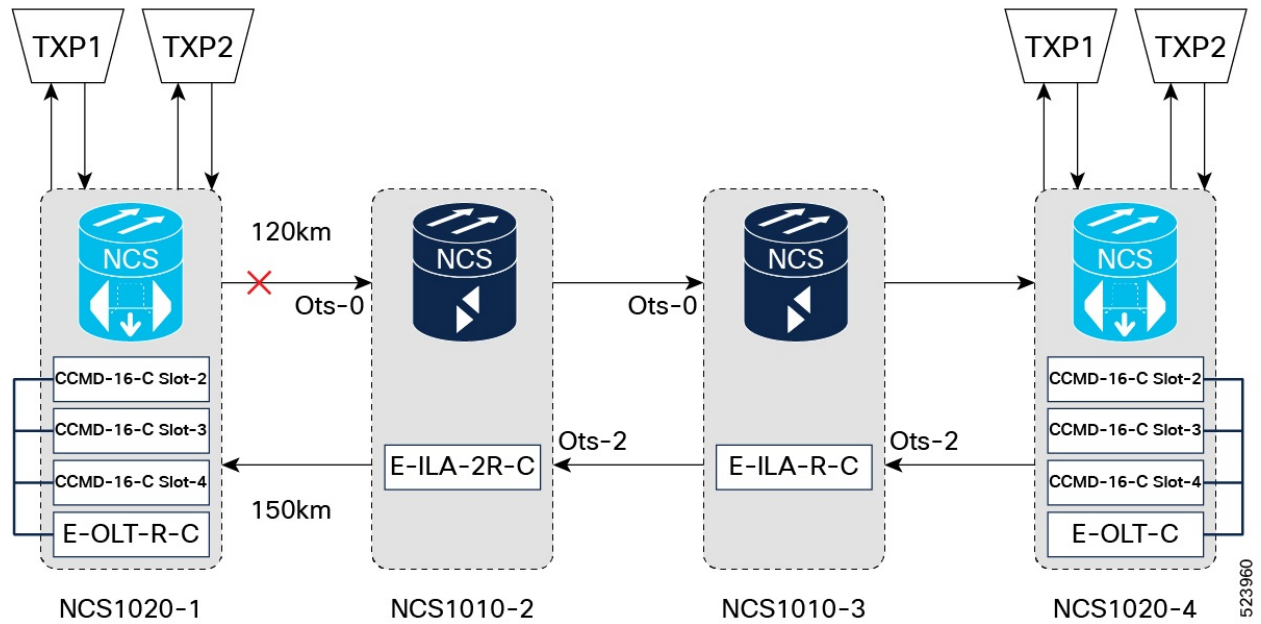
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### Unidirectional Fiber Cut on Line

When there is a line unidirectional fiber cut on a NCS 1020 network, alarms are raised and suppressed at the respective ports of each node.

The following figure displays line unidirectional fiber cut on a NCS 1020:

Figure 1: Unidirectional Fiber Cut on Line



The following table lists the alarms that are raised and suppressed at the respective ports of each node:

Table 1: Active and Suppressed Alarms

| NODE         | Active Alarms                                                                                                                                                                                                                       | Ports where alarms are raised  | Suppressed Alarms | Ports where alarms are suppressed                                                                                                                               |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NCS 1020 - 1 | <ul style="list-style-type: none"> <li>Rx-LOC</li> <li>INGRESS-AUTO-LASER-SHUT</li> <li>EGRESS-AUTO-LASER-SHUT</li> <li>Raman-AUTO-LASER-SHUT</li> <li>APC-BLOCKED-TX</li> <li>APC-BLOCKED-RX</li> <li>RAMAN-TUNE-FAILED</li> </ul> | Line OTS 0/0/0/0               | Rx-LOS-P          | <ul style="list-style-type: none"> <li>Line OTS 0/0/0/0</li> <li>DFB 0/0/0/0</li> <li>OSC 0/0/0/0</li> <li>OTSOCH 0/0/0/0/x</li> <li>x is channel id</li> </ul> |
|              | TX-POWER-FAIL-LOW                                                                                                                                                                                                                   | OTS-OCH 0/0/0/com-port/channel | TX-POWER-FAIL-LOW | OTS-OCH 0/0/0/channel                                                                                                                                           |

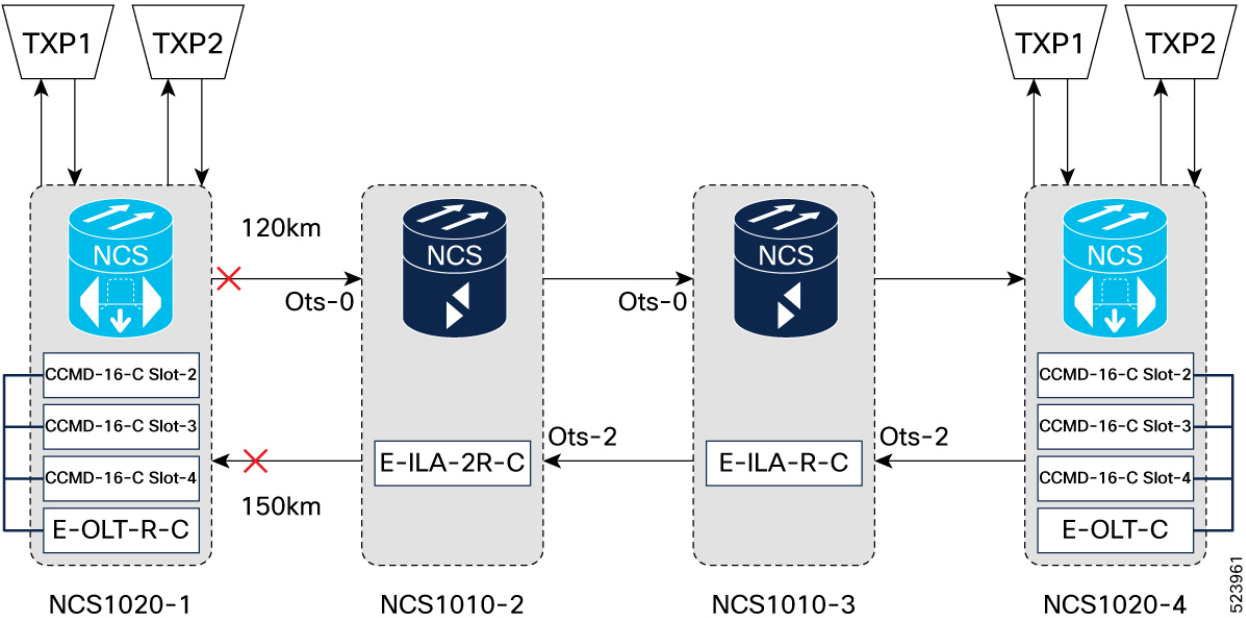
| NODE                        | Active Alarms                                                                                                                                                                | Ports where alarms are raised     | Suppressed Alarms | Ports where alarms are suppressed          |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-------------------|--------------------------------------------|
| NCS1020<br>– 2 (ots<br>- 0) | <ul style="list-style-type: none"> <li>Rx-LOS-P</li> <li>EGRESS-AUTO-LASER-SHUT</li> <li>Raman-AUTO-LASER-SHUT</li> <li>APC-BLOCKED-TX</li> <li>RAMAN-TUNE-FAILED</li> </ul> | Line OTS 0/0/0/0                  | Rx-LOS-P          | OTS-OCH<br>0/0/0/0/x<br>x is channel<br>id |
|                             |                                                                                                                                                                              |                                   | TX-POWER-FAIL-LOW | OTS-OCH<br>0/0/0/0/channel                 |
| NCS1020<br>– 2 (ots<br>- 2) | <ul style="list-style-type: none"> <li>EGRESS-AUTO-LASER-SHUT</li> <li>APC-BLOCKED-TX</li> </ul>                                                                             | Line OTS 0/0/0/2                  | TX-POWER-FAIL-LOW | OTS-OCH<br>0/0/0/2/channel                 |
| NCS1020<br>– 3 (ots<br>- 0) | Rx-LOS-P                                                                                                                                                                     | Line OTS 0/0/0/0                  | Rx-LOS-P          | OTS-OCH<br>0/0/0/0/x<br>x is channel<br>id |
| NCS1020<br>– 3 (ots -<br>2) | <ul style="list-style-type: none"> <li>EGRESS-AUTO-LASER-SHUT</li> <li>APC-BLOCKED-TX</li> </ul>                                                                             | Line OTS 0/0/0/2                  | TX-POWER-FAIL-LOW | OTS-OCH<br>0/0/0/0/2                       |
| NCS1020<br>– 4              | <ul style="list-style-type: none"> <li>INGRESS-AUTO-LASER-SHUT</li> <li>APC-BLOCKED-RX</li> <li>Rx-LOS-P</li> </ul>                                                          | Line OTS 0/0/0/0                  | Rx-LOS-P          | OTS-OCH<br>0/0/0/0/x<br>x is channel<br>id |
|                             | TX-POWER-FAIL-LOW                                                                                                                                                            | OTS-OCH<br>0/0/0/com-port/channel |                   |                                            |
| NCS1020                     | Rx-LOS-P                                                                                                                                                                     | OMS 0/0/slot/0                    |                   |                                            |

## Bidirectional Fiber Cut on Line

When there is a line bidirectional fiber cut on a NCS 1020 network, alarms are raised and suppressed at the respective ports of each node.

The following figure displays line bidirectional fiber cut on a NCS 1020 network:

Figure 2: Bidirectional Fiber Cut on Line



The following table lists the alarms that are raised and suppressed at the respective ports of each node:

Table 2: Active and Suppressed Alarms

| NODE      | Active Alarms                                                                                                                                                                                                               | Ports where alarms are raised | Suppressed Alarms | Ports where alarms are suppressed                                                                                                            |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| NCS1020-1 | <ul style="list-style-type: none"><li>Rx-LOC</li><li>INGRESS-AUTO-LASER-SHUT</li><li>EGRESS-AUTO-LASER-SHUT</li><li>Raman-AUTO-LASER-SHUT</li><li>APC-BLOCKED-TX</li><li>APC-BLOCKED-RX</li><li>RAMAN-TUNE-FAILED</li></ul> | Line OTS 0/0/0/0              | Rx-LOS-P          | <ul style="list-style-type: none"><li>Line OTS 0/0/0/0</li><li>DFB0/0/0/0</li><li>OSC0/0/0/0</li><li>OTS-OCH0000/x</li></ul> x is channel id |
|           | TX-POWER-FAIL-LOW                                                                                                                                                                                                           | OTS-OCH 0/0/0/com-port        | TX-POWER-FAIL-LOW | OTS-OCH 0/0/0/0/channel                                                                                                                      |

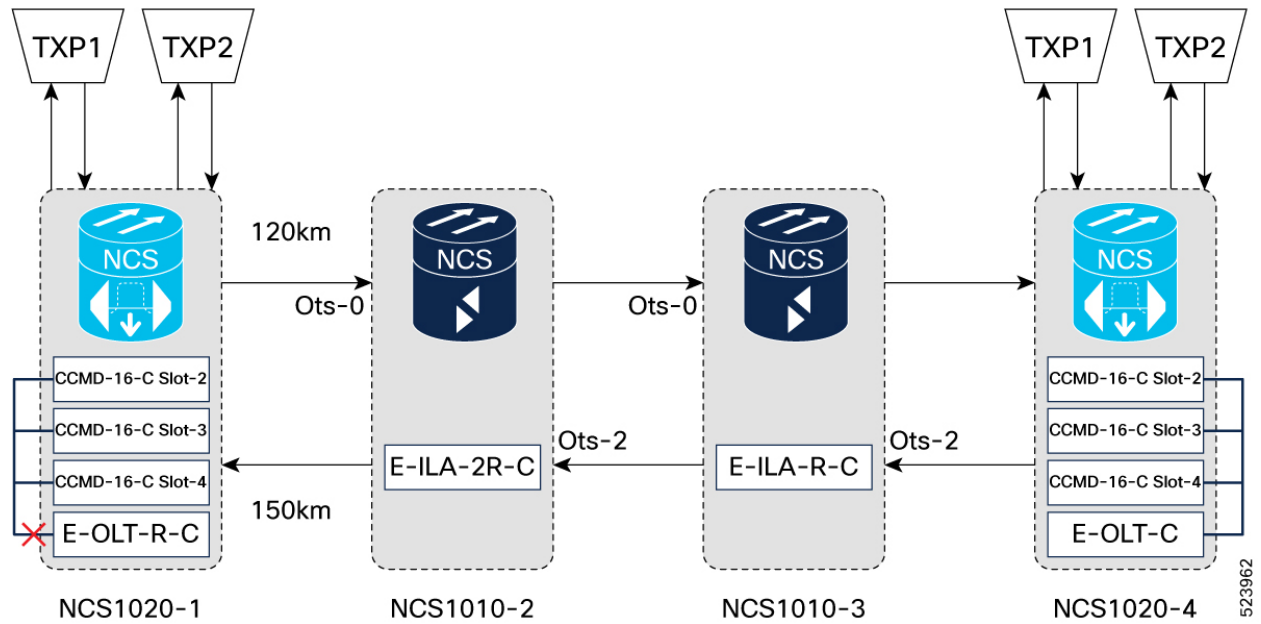
| NODE                     | Active Alarms                                                                                                                                                              | Ports where alarms are raised  | Suppressed Alarms | Ports where alarms are suppressed                                                                                                                     |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| NCS1020<br>– 2 (ots - 0) | <ul style="list-style-type: none"> <li>Rx-LOC</li> <li>EGRESS-AUTO-LASER-SHUT</li> <li>Raman-AUTO-LASER-SHUT</li> <li>APC-BLOCKED-TX</li> <li>RAMAN-TUNE-FAILED</li> </ul> | Line OTS 0/0/0/0               | Rx-LOS-P          | <ul style="list-style-type: none"> <li>Line OTS 0/0/0/0</li> <li>DFB 0/0/0/0</li> <li>OSC 0/0/0/0</li> <li>OTS-OCH 0/0/0/x</li> </ul> x is channel id |
|                          |                                                                                                                                                                            |                                | TX-POWER-FAIL-LOW | OTS-OCH 0/0/0/0/channel                                                                                                                               |
| NCS1020<br>– 2 (ots - 2) | <ul style="list-style-type: none"> <li>EGRESS-AUTO-LASER-SHUT</li> <li>APC-BLOCKED-TX</li> </ul>                                                                           | Line OTS 0/0/0/2               | TX-POWER-FAIL-LOW | OTS-OCH 0/0/0/2/channel                                                                                                                               |
| NCS1020<br>– 3 (ots - 0) | Rx-LOS-P                                                                                                                                                                   | Line OTS 0/0/0/0               | Rx-LOS-P          | OTS-OCH 0/0/0/0/x<br>x is channel id                                                                                                                  |
| NCS1020<br>– 3 (ots - 2) | <ul style="list-style-type: none"> <li>EGRESS-AUTO-LASER-SHUT</li> <li>APC-BLOCKED-TX</li> </ul>                                                                           | Line OTS 0/0/0/2               | TX-POWER-FAIL-LOW | OTS-OCH 0/0/0/2/channel                                                                                                                               |
| NCS1020<br>– 4           | <ul style="list-style-type: none"> <li>INGRESS-AUTO-LASER-SHUT</li> <li>APC-BLOCKED-RX</li> <li>Rx-LOS-P</li> </ul>                                                        | Line OTS 0/0/0/0               | Rx-LOS-P          | OTS-OCH 0/0/0/0/x<br>x is channel id                                                                                                                  |
|                          | TX-POWER-FAIL-LOW                                                                                                                                                          | OTS-OCH 0/0/0/com-port/channel |                   |                                                                                                                                                       |
| NCS1020                  | Rx-LOS-P                                                                                                                                                                   | OMS 0/0/slot/0                 |                   |                                                                                                                                                       |

## Fiber Cut Between CCMD and OLT

When a fiber cut occurs between CCMD and OLT, alarms are raised and suppressed at the respective ports of each node.

The following figure displays fiber cut between CCMD and OLT:

Figure 3: Fiber Cut Between CCMD and OLT



The following table lists the alarms that are raised and suppressed at the respective ports of each node:

Table 3: Active and Suppressed Alarms

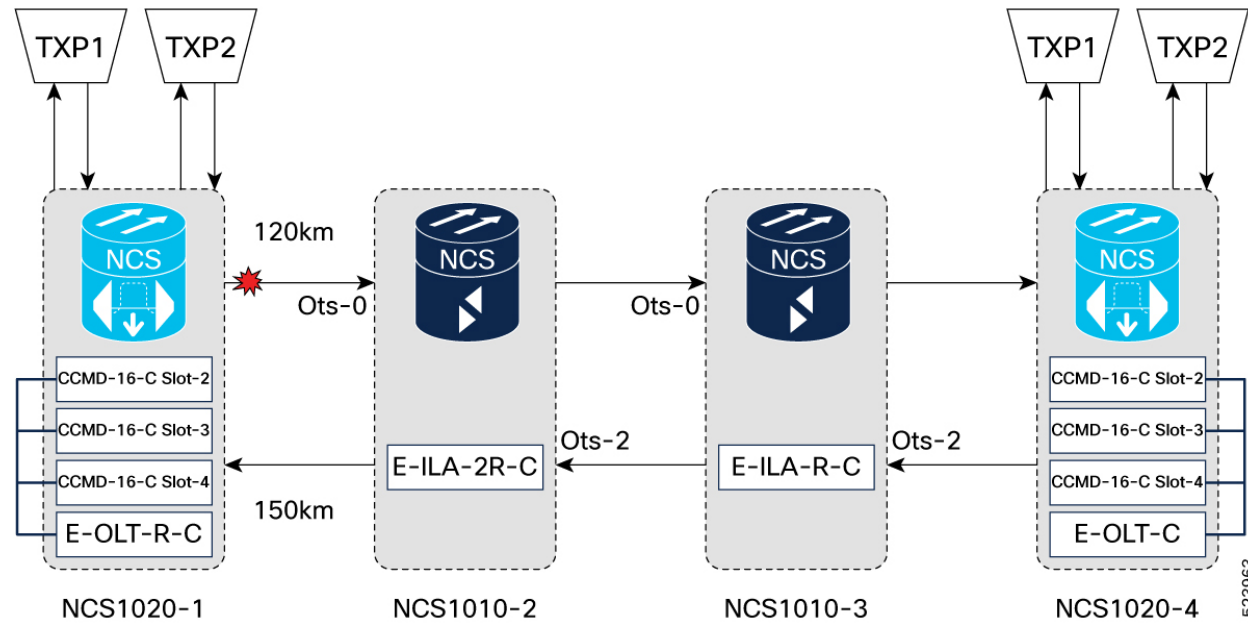
| Condition         | NODE        | Active Alarms        | Ports where alarms are raised        | Suppressed Alarms | Ports where alarms are suppressed                     |
|-------------------|-------------|----------------------|--------------------------------------|-------------------|-------------------------------------------------------|
| CCMD Rx Fiber Cut | NCS1020     | Rx-LOS-P             | OMS 0/0/slot/0                       |                   |                                                       |
| CCMD Tx Fiber Cut | NCS1020 - 1 | Rx-LOS-P             | Line OTS 0/0/0/x<br>x is a com port  | Rx-LOS-P          | OTS-OCH 0/0/0/x/y<br>x is com port<br>y is channel id |
|                   |             | CHANNEL-NOISE-LOADED | OTS-OCH 0/0/0/0/y<br>y is channel id |                   |                                                       |

## High Back Reflection Condition on Line Tx Port

When there is a high back reflection condition on the line Tx port, Egress EDFA goes into Automatic Power Reduction (APR) mode, and alarms are raised at the respective ports of each node.

The following figure displays high back reflection condition on the line Tx port:

Figure 4: High Back Reflection Condition on the Line Tx port



The following table lists the alarms that are raised at the respective ports of each node:

Table 4: Active Alarms

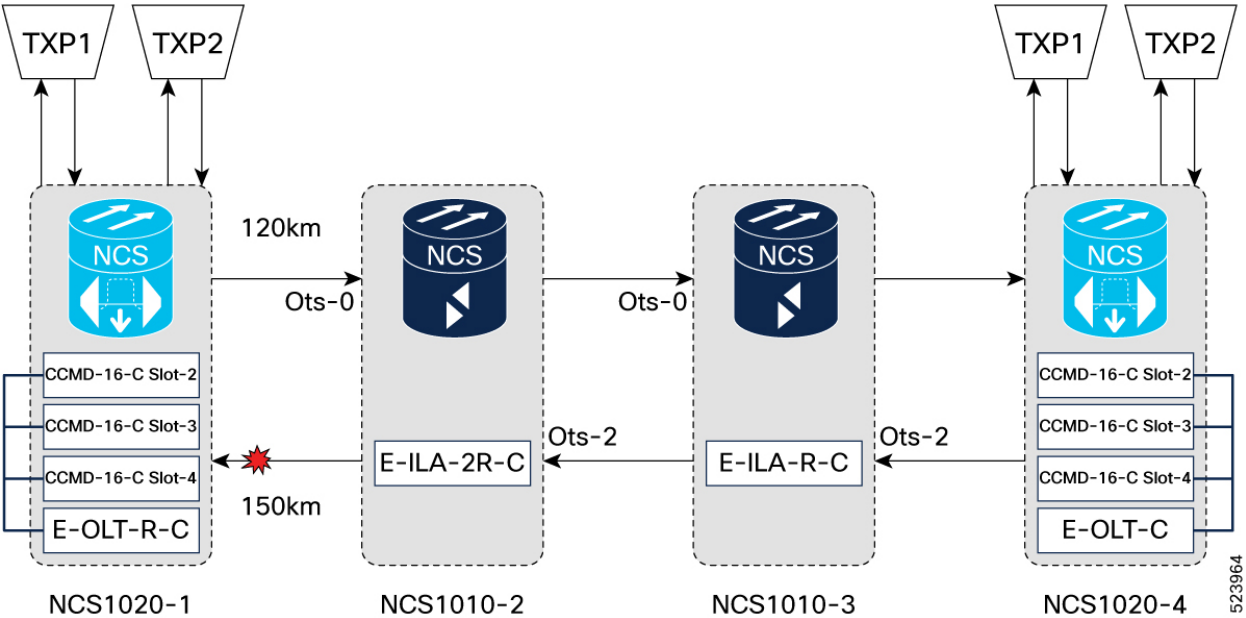
| NODE                  | Active Alarms                                                                                                             | Ports where alarms are raised |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| NCS1020 - 1           | <ul style="list-style-type: none"> <li>• TX-POWER-FAIL-LOW</li> <li>• High-TX-BR-PWR</li> <li>• APC-BLOCKED-TX</li> </ul> | Line OTS 0/0/0/0              |
| NCS1020 – 2 (ots - 2) | APC-TARGET-PSD-NOT-MET-TX                                                                                                 | Line OTS 0/0/0/2              |
| NCS1020 – 3 (ots - 2) | APC-TARGET-PSD-NOT-MET-TX                                                                                                 | Line OTS 0/0/0/2              |
| NCS1020 – 4           | APC-TARGET-PSD-NOT-MET-RX                                                                                                 | Line OTS 0/0/0/0              |

## High Back Reflection Condition on Line Rx RAMAN Port

When there is a high back reflection on the Line Rx Raman port, RAMAN pumps goes into Automatic Power Reduction (APR) mode, and alarms are raised at the respective ports of each node.

The following figure displays high back reflection condition on the line Rx RAMAN port:

Figure 5: High Back Reflection Condition on the Line Rx RAMAN Port



The following table lists the alarms that are raised at the respective ports of each node:

Table 5: Active Alarms

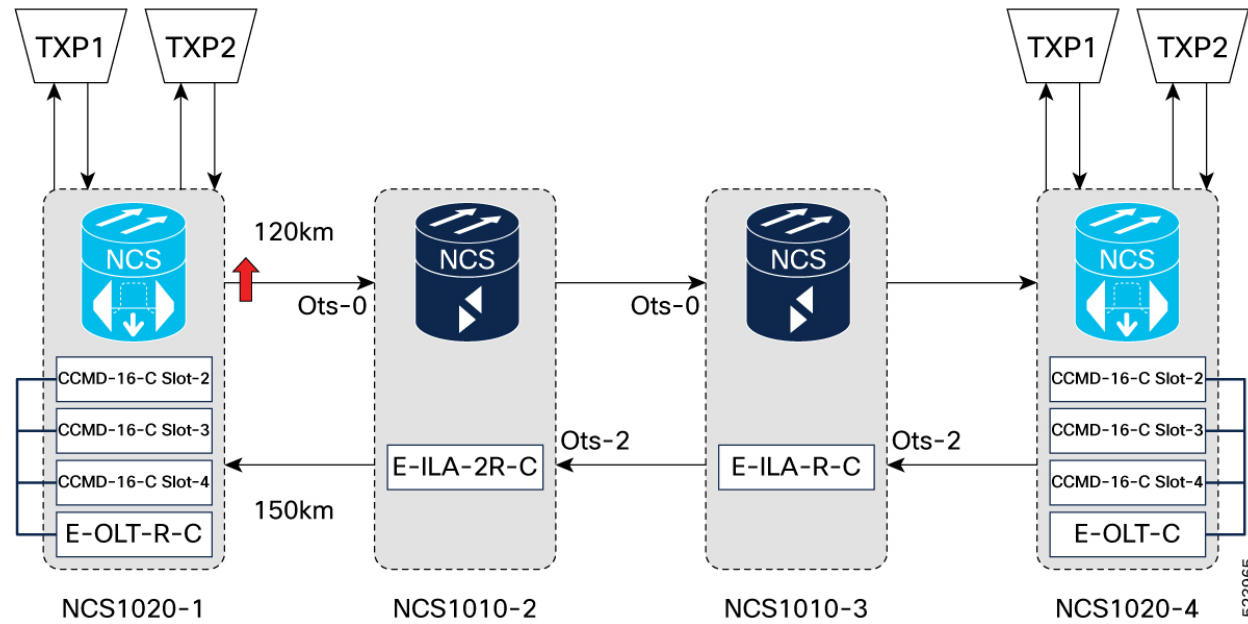
| NODE        | Active Alarms                                                                                                      | Ports where alarms are raised |
|-------------|--------------------------------------------------------------------------------------------------------------------|-------------------------------|
| NCS1020     | Rx-LOS-P                                                                                                           | OMS 0/0/x/0<br>x is slot id   |
| NCS1020 - 1 | <ul style="list-style-type: none"> <li>High-RX-BR-PWR</li> <li>APC-OUT-OF-RANGE-RX</li> <li>RT- BLOCKED</li> </ul> | Line OTS 0/0/0/0              |

# High Span Loss on Line Tx Port

When high span loss occurs on the line Tx port, alarms are raised at the respective ports of each node.

The following figure displays high span loss on line Tx port:

Figure 6: High span loss on Line Tx Port



The following table lists the alarms that are raised at the line Tx port:

Table 6: Active Alarms

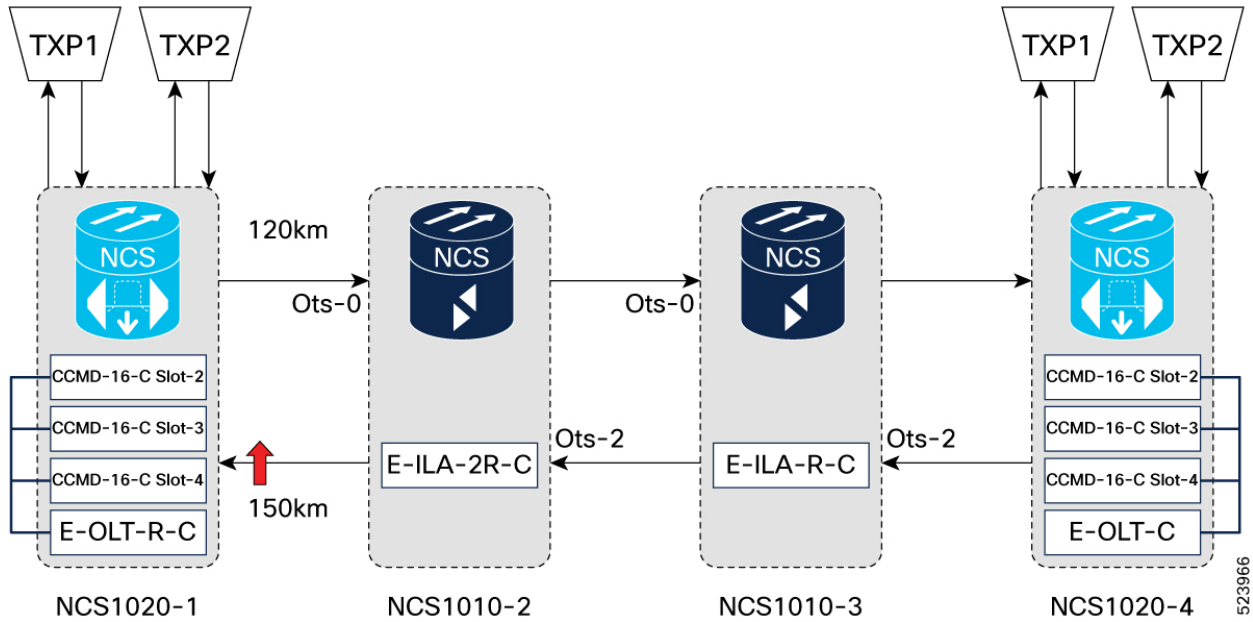
| NODE                  | Active Alarms                | Ports where alarms are raised |
|-----------------------|------------------------------|-------------------------------|
| NCS1020 – 2 (ots - 0) | Span Loss Value Out Of Range | Line OTS 0/0/0/0              |
| NCS1020 – 2 (ots - 2) | APC-OUT-OF-RANGE-TX          | Line OTS 0/0/0/2              |

## High Span Loss on Line Rx Port

When high span loss occurs on the line Rx, alarms are raised at the respective ports of each node.

The following figure displays high span loss on the line Rx port:

Figure 7: High span loss on Line Rx port



The following table lists the alarms that are raised at the line Rx port:

Table 7: Active Alarms

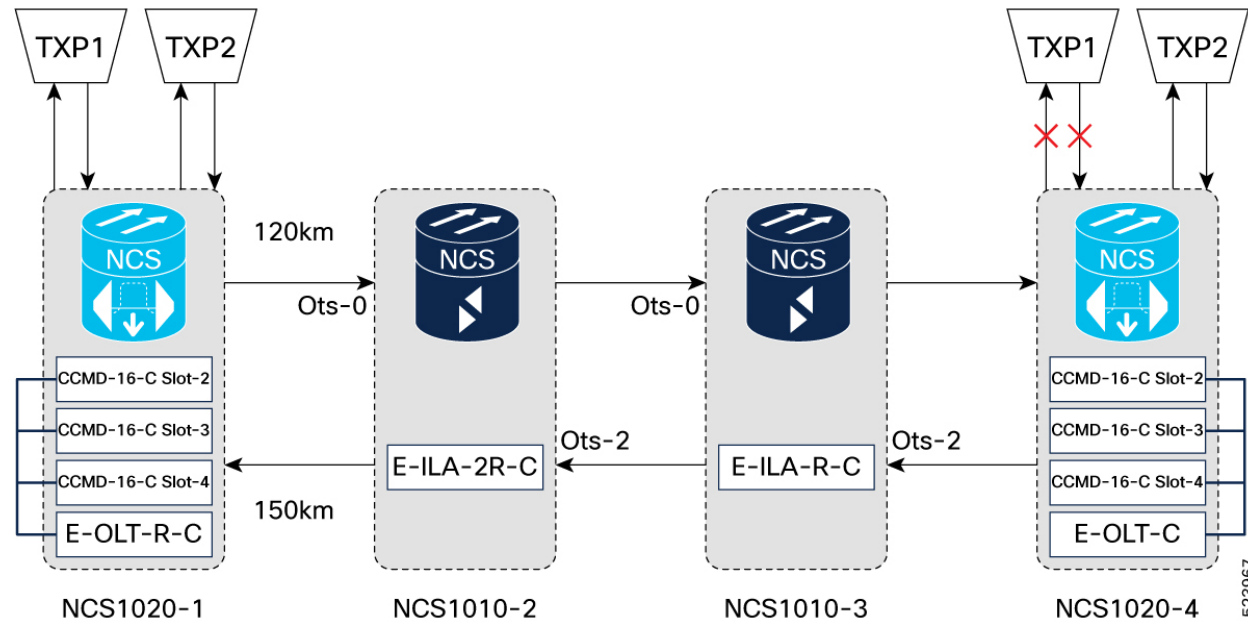
| NODE        | Active Alarms                                                                                       | Ports where alarms are raised |
|-------------|-----------------------------------------------------------------------------------------------------|-------------------------------|
| NCS1020 - 1 | <ul style="list-style-type: none"><li>Span Loss Value Out Of Range</li><li>APC-BLOCKED-RX</li></ul> | Line OTS 0/0/0/0              |

# Single Channel Failure due to Bidirectional Fiber Cut on Line

When there is a bidirectional fiber cut on the line, single channel failure occurs, and alarms are raised at each node's port.

The following figure displays single channel failure due to bidirectional fiber cut on line:

Figure 8: Single Channel Failure due to Bidirectional Fiber Cut on Line



The following table lists the alarms that are raised at the respective ports of each node:

Table 8: Active Alarms

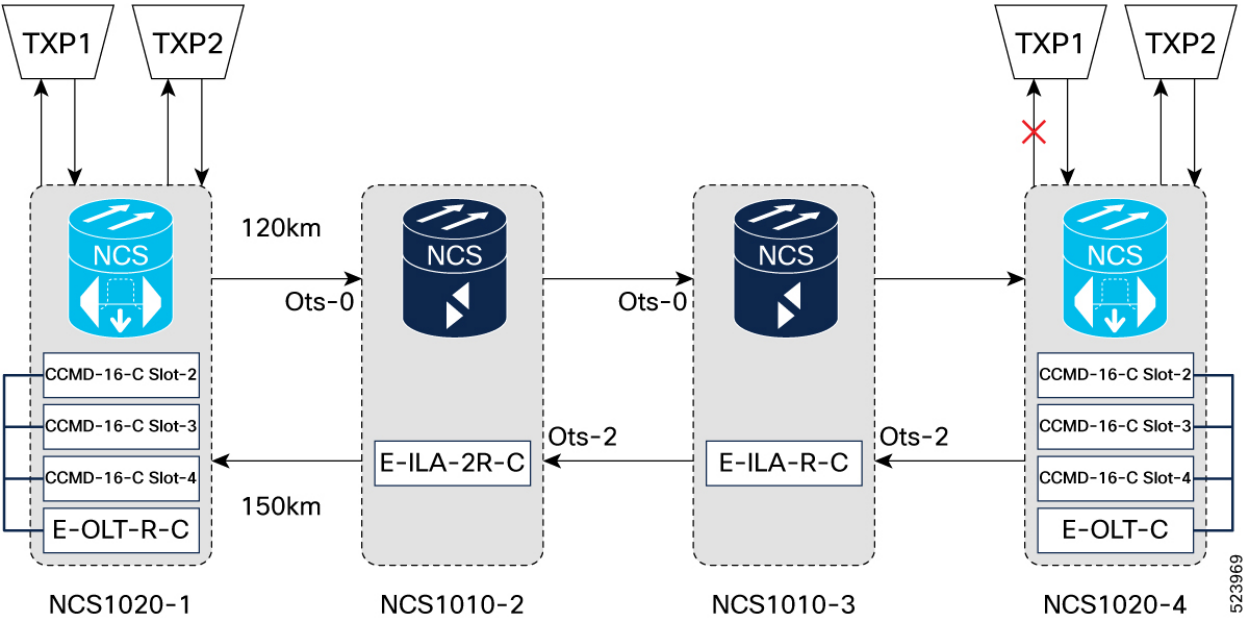
| NODE        | Active Alarms        | Ports where alarms are raised                             |
|-------------|----------------------|-----------------------------------------------------------|
| NCS1020 - 4 | Rx-LOS-P             | OTS-OCH 0/0/0/x/y<br>x is com port<br>y is channel number |
|             | CHANNEL-NOISE-LOADED | OTS-OCH 0/0/0/0/y<br>y is channel id                      |
| NCS1020 - 1 | Rx-LOS-P             | OCH 0/0/0/x/y<br>x is slot id<br>y is port number         |

## Single Channel Failure due to Unidirectional Fiber Cut at TXP-Tx

When there is a unidirectional fiber cut at TXP-Tx, single channel failure occurs, and alarms are raised at each node's port.

The following figure displays single channel failure due to unidirectional fiber cut at TXP-Tx:

Figure 9: Single Channel Failure due to Unidirectional Fiber Cut at TXP-Tx



The following table lists the alarms that are raised at the respective ports of each node:

Table 9: Active Alarms

| NODE        | Active Alarms        | Ports where alarms are raised                             |
|-------------|----------------------|-----------------------------------------------------------|
| NCS1020 - 4 | Rx-LOS-P             | OTS-OCH 0/0/0/x/y<br>x is com port<br>y is channel number |
|             | CHANNEL-NOISE-LOADED | OTS-OCH 0/0/0/0/y<br>y is channel id                      |
| NCS1020     | Rx-LOS-P             | OCH 0/0/x/y<br>x is slot id<br>y is port number           |

# Single Channel Failure due to Unidirectional Fiber Cut at TXP-Rx

When there is a unidirectional fiber cut at TXP-Rx, a single channel failure occurs, and no alarms are raised at each node's port.

The following figure displays single channel failure due to unidirectional fiber cut at TXP-Rx:

Figure 10: Single Channel Failure due to Unidirectional Fiber Cut at TXP-Tx

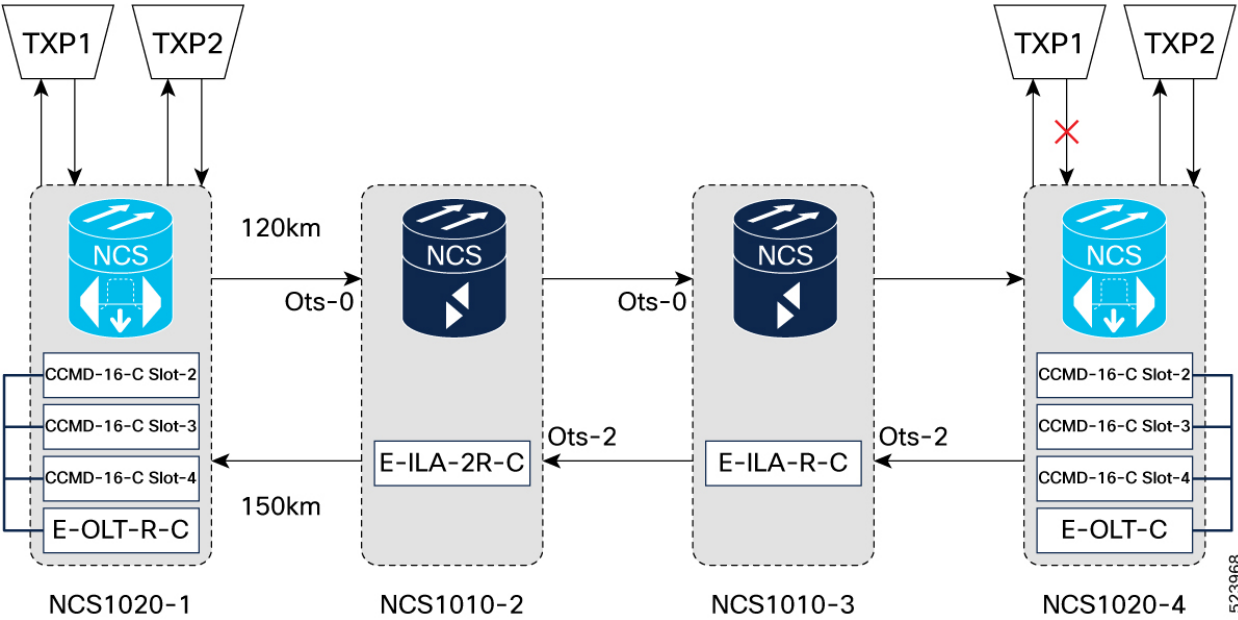


Table 10: Alarms

| NODE        | Active Alarms |
|-------------|---------------|
| NCS1020 - 4 | No Alarm      |
| NCS1020     | No Alarm      |

