Span Loss

Table 1: Feature History

Feature Name	Release Information	Feature Description
Span loss measurement	Cisco IOS XR Release 25.1.1	NCS 1014 measures span loss between two nodes. The measurement is performed using the OSC links created between the nodes by configuring the OSC pluggable to be operational and OSPFv2 protocol on the EDFA2 card on the nodes. These measurements are essential during network changes, like equipment installation or fiber repairs. You can configure both minimum and maximum span loss thresholds. If the received span loss exceeds the maximum threshold or falls below the minimum threshold, the system will trigger a SPAN-LOSS-OUT-OF-RANGE alarm. CLI commands are: • **optical-line-control** • **controller Ots** *R/S/I/P* **span-loss min** *value* • **controller Ots** *R/S/I/P* **span-loss min** *value*

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Span loss

Span loss is the optical signal loss over a fiber span between two network nodes. It is measured by comparing power levels at the transmitting (Tx) and receiving (Rx) ports, typically in decibels (dB). If span loss exceeds thresholds, alarms like "Span Loss Value Out Of Range" are triggered.

Span loss calculations

The span loss calculation is an automatic process for determining span losses between NCS 1014 nodes. The span loss verification algorithm calculates span loss by comparing power measurements at the line TX/RX port at the far-end and the line RX/TX port at the near end. If the span loss is not within configured thresholds, the algorithm raises the "Span Loss Value Out Of Range" alarm.

Span loss reporting

The span loss application periodically reports the span loss value for a span every few seconds. If there are changes in span loss, such as those caused by variations in fiber loss, the application typically updates the span loss value between 10 to 30 seconds after the value has stabilized.

Span loss verification reports these values:

- **OSC span loss**
- **Signal span loss**
- **Span loss**

OSC span loss

RX OSC span loss: This is the difference between the received OSC signal power at the near end and the transmitted OSC signal power at the far-end. It refers to the fiber entering the LINE RX port.

TX OSC span loss: This is the difference between the transmitted OSC signal power at the near end and the received OSC signal power at the far-end. It refers to the fiber exiting the LINE TX port.

Signal span loss

RX signal span loss: This is the difference between the received C-band signal power at the near end and the transmitted C-band signal power at the far-end. It refers to the fiber entering the LINE RX port.

TX signal span loss: This is the difference between the transmitted C-band signal power at the near end and the received C-band signal power at the far-end. It refers to the fiber exiting the LINE TX port.

Span loss

RX span loss: This measurement is the difference between the received total power at near-end and transmitted total power at far-end.

TX span loss: This measurement is the difference between the transmitted total power at near-end and received total power at far-end.

Configure span loss thresholds

Use this task to configure span loss thresholds

Before you begin

Establish the OSC link using OSPFv2.`

Procedure

Step 1 Use the commands **optical-line-control** and **controller ots** *R/S.I/P* to enter the optical applications configuration mode and select the controller on which the span loss thresholds need to be configured.

The span loss can be configured only controller ots on R/S/I/0.

Example:

```
RP/0/RP0/CPU0:ios(config)#optical-line-control
                        RP/0/RP0/CPU0:ios(config-olc)#controller ots 0/0/0/0
```

Step 2 Use the keywords **span-loss min** *value* and **span-loss max** *value*, to configure the minimum and maximum span loss threshold values.

Example:

```
RP/0/RP0/CPU0:ios(config-olc-ots)#span-loss min 0
                        RP/0/RP0/CPU0:ios(config-olc-ots)#span-loss max 420
```

The example sets the minimum threshold to 0.0 dB and the maximum threshold to 42.0 dB.

The system raises a SPAN-LOSS-OUT-OF-RANGE alarm when 'Rx span loss' is greater than the maximum threshold or lesser than the minimum threshold.

Step 3 Commit the changes and exit all the configuration modes.

Example:

```
RP/0/RP0/CPU0:ios(config-olc-ots)#commit
                        RP/0/RP0/CPU0:ios(config-olc-ots)#exit
                        RP/0/RP0/CPU0:ios(config-olc)#exit
                        RP/0/RP0/CPU0:ios(config)#
```

View the span loss measurements

Use this task to view the various span loss measurements.

Procedure

Use the **show olc span-loss** command to view the various span loss measurements.

Example:

```
RP/0/RP0/CPU0:ios#show olc span-loss
                        Wed Feb 19 14:20:12.542 IST
```

```
Controller                                      : Ots0/0/0/0
Neighbour RID                                   : 192.0.2.20
    Rx Span Loss                                    : 12.92 dB
    Rx OSC Span Loss                                : 13.41 dB
    Rx Signal Span Loss                             : 12.95 dB
    Tx Span Loss                                    : 13.67 dB
    Tx OSC Span Loss                                : 14.52 dB
    Tx Signal Span Loss                             : 13.65 dB
```

The entries, highlighted in bold, show the span loss measurements.

Verify span loss configurations

Use this task to verify the span loss configurations.

Procedure

Verify the configured values using the **show running-config optical-line-control controller ots** command.

Example:

```
RP/0/RP0/CPU0:ios##show running-config optical-line-control controller ots 0/0/0/0
                      Wed Oct  2 15:57:22.576 UTC
                      optical-line-control
                      controller ots 0/0/0/0
                      span-loss max 420
                          span-loss min 0
                      !
                      !
```

The entries, highlighted in bold, show the values of span loss thresholds configured.