

# 排除NCS上的介面關閉或擺動問題

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## 簡介

本文說明如何解決介面關閉或介面翻動問題。

本檔案特定於Cisco IOS®XR，但並不限於特定軟體版本。

本文檔專為NCS平台。

## 背景

介面關閉或介面翻動的原因有多種。連結可能會因為多個裝置而關閉，如圖1所示。它顯示了一台NCS路由器，其中一個前面板埠通過PHY（物理層）裝置連線到NPU（網路處理器單元），位於兩者之間（稱為PHY型埠）。有些平台的前面板埠直接連線到NPU（稱為PHYless埠）。一台路由器可以同時具有兩種變體。

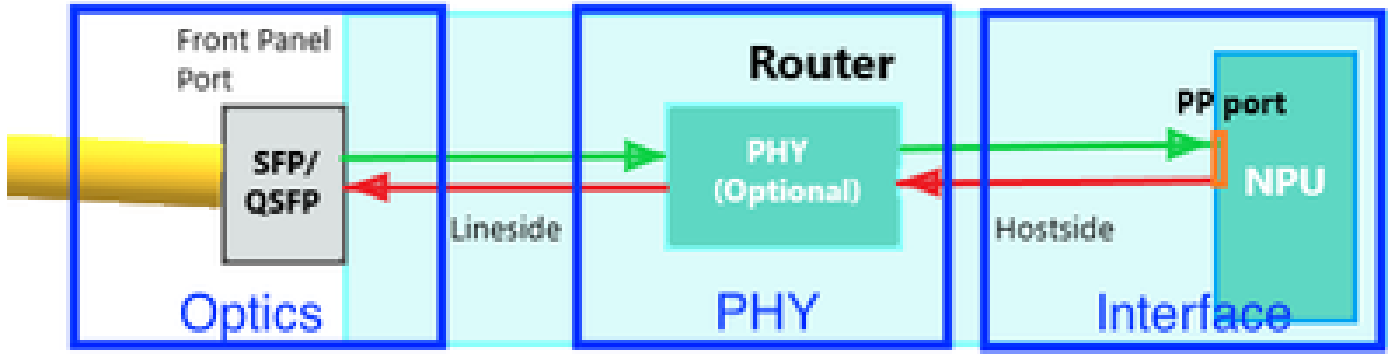


圖1

## 光纖

### 介面

請注意，Cisco IOS XR上總是以這種方式描述介面。

R/S/I/P：機架/插槽/例項/埠/分支

R/S/I/P/B：機架/插槽/例項/埠/

### 連線埠速度

某些平台/線卡在某些埠上支援多種速度。例如：1/10GE、25/40GE、40/100GE、1/10/25GE。

可在每個埠或每組埠上配置速度。檢視NCS上埠對映的硬體文檔。檢查埠速度是否設定正確。有些埠可以自動檢測速度，有些埠需要配置。

有些埠可以按組進行配置（通常為四埠：四埠組）。

舉例來說：

```
<#root>
```

```
(config)#
```

```
hw-module quad 0 location 0/0/CPU0 mode ?
```

```
WORD 10g or 25g
```

某些埠可以單獨配置。這通常是100G埠。100G是預設速度，但您可以配置40G。

舉例來說：

```
<#root>
```

```
(config)#
controller optics 0/0/1/0

(config-Optics)#
speed 40g
```

## 故障信令機制

請注意，排除介面故障時，鏈路故障信令機制可以發揮作用。在10G及更高版本中，PHY層包含鏈路故障信令機制。因此，當檢測到本地故障時，會通知遠端端。

- Reside in Reconciliation Sublayer (RS)
- To monitor link status between local RS & remote RS and perform link status notification
- Sublayers within the PHY are required to detect faults that render a link unreliable

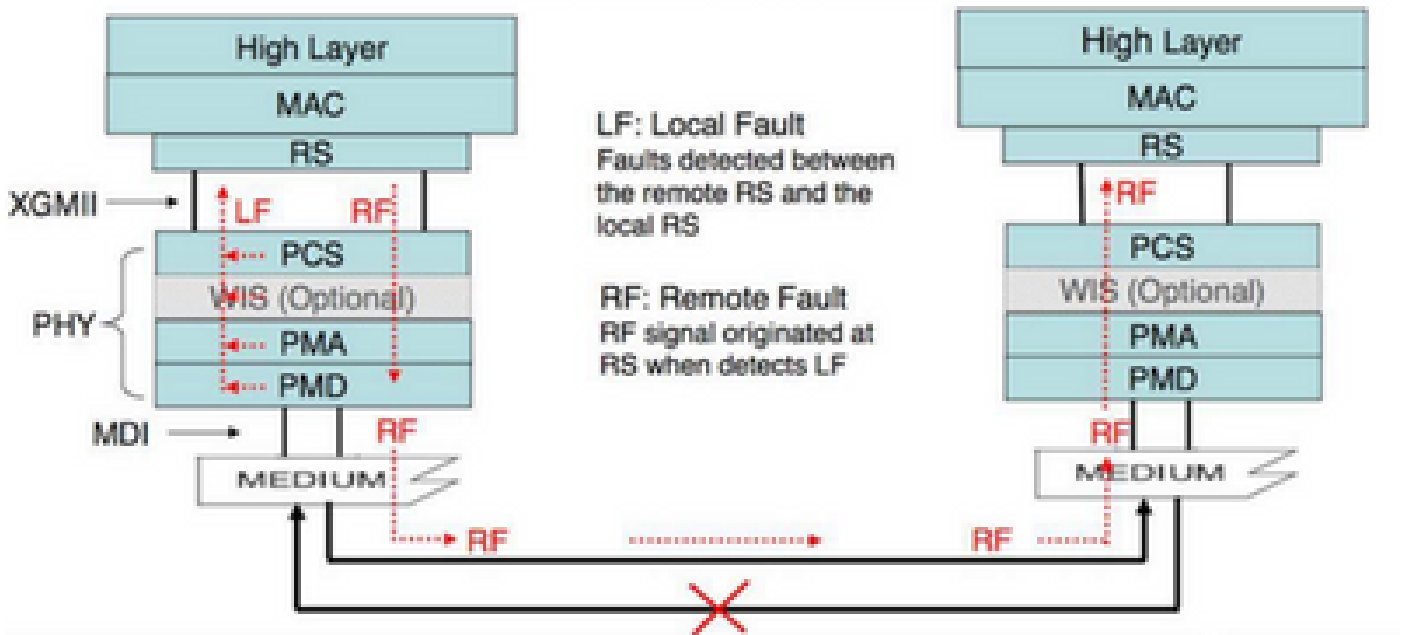


圖2

在GigE介面上，沒有這樣的板載機制。檢查「ethernet oam」是否配置為替代方法。

舉例來說：

```
interface GigabitEthernet0/6/0/2
ethernet oam
uni-directional link-fault detection
action
uni-directional link-fault efd
```

## DWDM可調光纜

在支援頻率調諧的DWDM光纖上，使用此配置設定可使用的頻率（基於電路提供商設定的DWDM電路）：

命令如下：

```
controller optics 0/6/0/2
  dwdm-carrier {100MHz-grid | 50GHz-grid} frequency {frequency}
```

驗證設定：

<#root>

RP/0/RP0/CPU0:NCS-5508#

```
show controllers optics 0/6/0/2 dwdm-carrier-map
```

DWDM Carrier Band:: OPTICS\_C\_BAND

MSA ITU channel range supported: 1~96

DWDM Carrier Map table

ITU Ch Num	G.694.1 Ch Num	Frequency (THz)	Wavelength (nm)
1	-35	191.35	1566.723
2	-34	191.40	1566.314
3	-33	191.45	1565.905
4	-32	191.50	1565.496
...			
95	59	196.05	1529.163
96	60	196.10	1528.773

在DWDM光纖上，所有DWDM特定調諧均在控制器dwdm配置下完成：

<#root>

RP/0/RP0/CPU0:NCS-5508(config)#

```
controller dwdm 0/6/0/2 ?
```

admin-state

Configure the transport admin state of the controller: in-service, out-of-service o

g709	Configure G709 parameters
laser	To be deprecated and removed in 7.5.1 release
log	Proactive log
loopback	Configure loopback mode
network	Configure DWDM network information
pm	Configure pm parameters
proactive	Enable Proactive Protection Feature
rx-los-threshold	Configure transponder receive power LOS threshold
transmit-power	Configure transponder transmit power
vtxp-monitor	Enable VTXP monitoring function
wavelength	Configure ITU Channel, Wavelength and Frequency
<cr>	

RP/0/RP0/CPU0:NCS-5508(config-dwdm)#

g709 fec ?

15sdfec	15%-SD Forward Error Correction
15sdfecde	15%-SD Forward Error Correction with Diff
ci-bch	Continuously Interleaved BCH FEC
disable	Disable FEC
enhanced	Enhanced FEC mode
high-gain	To be deprecated and removed in 7.5.1 release
high-gain-hd-fec	7% HD FEC (Staircase FEC)
high-gain-multivendor-hd-fec	7% HD FEC (Staircase FEC) Multivendor Interoperable
high-gain-sd-fec	7% CISCO SD FEC (Soft-Decision FEC)
long-haul	To be deprecated and removed in 7.5.1 release
long-haul-hd-fec	20% HD FEC (Staircase FEC)
long-haul-sd-fec	20% CISCO SD FEC (Soft-Decision FEC)
standard	Standard FEC mode

## IPoDWDM — 相干DSP

相干DSP支援遠距離高速率(100/200/400G)。DWDM處理由相干DSP (數位訊號處理器) 處理。

此類NCS模組的示例：NC55-6X200-DWDM-S或NC55-MPA-2TH-S (帶CFP2-WDM-D-1HL)

<#root>

RP/0/RP0/CPU0:NCS-5508(config)#

controller coherentDSP 0/6/0/0

RP/0/RP0/CPU0:NCS-5508(config-CoDSP)#

fec ?

CFEC	Forward Error Correction C_FEC
EnhancedHG20	Forward Error Correction Enhanced_HG20
EnhancedHG7	Forward Error Correction Enhanced_HG7
EnhancedI4	Forward Error Correction Enhanced_I_4
EnhancedI7	Forward Error Correction Enhanced_I_7
EnhancedSD15	Forward Error Correction Soft-Decision 15
EnhancedSD15DE	Forward Error Correction Soft-Decision 15 with DE
EnhancedSD20	Forward Error Correction Soft-Decision 20
EnhancedSD27	Forward Error Correction Soft-Decision 27

EnhancedSD7	Forward Error Correction Soft-Decision 7
EnhancedStaircaseDE	Forward Error Correction Enhanced Staircase FEC with DE
EnhancedSwizzle	Forward Error Correction Enhanced_Swizzle
OFEC	Forward Error Correction O_FEC
Standard	Forward Error Correction Standard
none	No Forward Error Correction

## 詳細故障排除

本節從光學角度介紹基本的調試/技術。

### 首先要檢查的事項

檢查光學器件是否顯示在清單中。如果未顯示光纖，請檢查是否將光纖正確插入到R/S/I/P中，並且使用的電纜沒有問題。

```
+++++++ show inventory details [18:06:56.572 UTC Thu Apr 06 2023] +++++++
```

```
NAME: "0/RP0", DESCR: "NC55A1 24Q6H SS Route Processor Card"  
PID: NCS-55A1-24Q6H-SS , VID: V01, SN: FOC2528002Q  
MFG_NAME: Cisco Systems, Inc., SNMP_IDX: 1 , Type: Module  
PN: 73-20057-02
```

```
NAME: "TenGigE0/0/0/0", DESCR: "Cisco SFP+ 10G ZR Pluggable Optics Module"  
PID: SFP-10G-ZR , VID: V02, SN: BD211218N1T  
MFG_NAME: CISCO-PRE , SNMP_IDX: 2129921 , Type: Module  
PN: TSFP10G-1558.17
```

```
NAME: "TenGigE0/0/0/1", DESCR: "Cisco SFP+ 10G ZR Pluggable Optics Module"  
PID: SFP-10G-ZR , VID: V02, SN: BD211218N3K  
MFG_NAME: CISCO-PRE , SNMP_IDX: 2134017 , Type: Module  
PN: TSFP10G-1557.36
```

```
<#root>
```

```
RP/0/RP0/CPU0:NCS-5501#
```

```
show controllers te0/0/0/14 internal
```

```
Internal data for interface: TenGigE0/0/0/14
```

```
Subport Number      : 255  
Port Number         : 14 *  
Bay Number          : 0 *  
Board Type           : 0x60020201 *  
  
Port Type           : 10GE *
```

```
Bandwidth(Kbps)     : 10000000 *  
Transport mode       : LAN *  
BIA MAC addr        : 008a:9617:4838  
Oper. MAC addr      : 008a:9617:4838
```

```
Egress MAC addr      : 008a:9617:4838
Port Available       : true *

Status polling is    : disabled *
Status events are    : disabled
I/F Handle           : 0x00000158 *
Cfg Link Enabled     : enabled

H/W Tx Enable       : yes

MTU                  : 1514 *
H/W Speed            : 10 Gbps *
H/W Duplex           : Full *
H/W Loopback Type    : None *
FEC                  : Not Configured *
H/W FlowCtrl Type    : Disabled *
H/W AutoNeg Enable   : Off *
H/W Link Defects     : No Fault *

Link Up              : yes *

Link Led Status      : Green ON *

Pluggable Present    : Yes *

Pluggable Type       : SFP+ 10G CU3M

Pluggable PID        : SFP-H10GB-CU3M *

Pluggable Compl.     : Failed - Bad Vendor CRC
```

如果無法識別收發器，請在此處檢查是否支援收發器型別：<https://tmgmatrix.cisco.com/>。

供應商CRC應正確。

檢查訊號強度。

要求收發器支援DOM ( 數字光纖監控 ) !

```
<#root>
```

```
RP/0/RP0/CPU0:BRU-SPCORE-P2#
```

```
show controllers hundredGigE0/0/0/10 phy
```

```
QSFP8636 EEPROM port: 10
```

Xcvr Type: QSFP28

Ext Type: 3.5W, CLEI, TX CDR, RX CDR,  
Connector Type: MPO  
Ethernet Compliance Codes: 100G BASE-SR4,  
BR, nominal: 25500 Mbps  
Length SMF: 0KM, OM3: 70M, OM2: 0M, OM1: 0M, Cable: 50M  
Deice Tech: 850nm VCSEL,  
Vendor Name: CISCO-FINISAR  
Vendor OUI: 00.90.65  
Vendor Part Number: FTLC9555REPM-C1 (rev.: A )  
Wavelength: 850.000 nm  
Wavelength Tolerance: 10.000 nm  
Vendor Serial Number: FIW2638016W  
Date Code (yy/mm/dd): 22/09/13 lot code:  
Diagnostic Monitoring Type: RX Avg, TX,  
Enhanced Options: Init Complete Flag Impl,  
Extended Module Codes:  
Options:  
L-Tx/Rx LOS:  
L-Tx Fault:  
L-Tx/Rx LOL:  
Module DDM: Volt, Temp, TX Power, TX Bias, RX Power,

MSA Data (Lower Memory)

0x0000: 11 07 00 00 00 00 00 00 : 00 00 00 00 00 00 00 00  
0x0010: 00 00 00 00 00 00 1d 75 : 00 00 81 2f 00 00 00 00  
0x0020: 00 00 20 b6 2e 9a 2d ba : 27 44 0d ed 0e 0c 0e 0c  
0x0030: 0e 0c 28 46 2a dc 29 1f : 2a 72 00 00 00 00 00 00  
0x0040: 00 00 00 00 00 00 00 00 : 00 00 00 00 00 00 00 00  
0x0050: 00 00 00 00 00 00 00 00 : 00 00 00 00 00 01 00 00  
0x0060: 00 00 ff 00 00 00 00 00 : 00 01 1f 00 00 00 00 00  
0x0070: 00 00 00 00 00 00 00 00 : 00 00 00 00 00 00 00 00

MSA Data (Upper Memory Page 00)

0x0080: 11 dc 0c 80 00 00 00 00 : 00 00 00 05 ff 00 00 23  
0x0090: 00 00 32 00 43 49 53 43 : 4f 2d 46 49 4e 49 53 41  
0x00a0: 52 20 20 20 00 00 90 65 : 46 54 4c 43 39 35 35 35  
0x00b0: 52 45 50 4d 2d 43 31 20 : 41 20 42 68 07 d0 46 ef  
0x00c0: 02 07 ff f6 46 49 57 32 : 36 33 38 30 31 36 57 20  
0x00d0: 20 20 20 20 32 32 30 39 : 31 33 20 20 0c 10 68 3a  
0x00e0: 00 00 02 3c c0 ff c6 b6 : 3b 05 e6 30 86 bb 80 05  
0x00f0: df 65 71 00 00 00 00 00 : 00 00 00 00 79 eb c1 06

CLEI Code: CMUIATKCAA  
Part Number: FTLC9555REPM-C1 (ver.: V03)  
Product Id: QSFP-100G-SR4-S

MSA Data (Upper Memory Page 02)

0x0180: 43 4d 55 49 41 54 4b 43 : 41 41 31 30 2d 33 31 34  
0x0190: 32 2d 30 33 56 30 33 20 : 01 00 00 31 20 20 20 20  
0x01a0: 20 66 00 00 00 00 00 00 : 00 00 00 00 00 00 00 00  
0x01b0: 00 00 00 00 00 00 00 00 : 00 00 00 00 00 00 aa aa  
0x01c0: 51 53 46 50 2d 31 30 30 : 47 2d 53 52 34 2d 53 20  
0x01d0: 20 20 20 20 00 00 00 00 : 00 00 00 00 00 00 00 65  
0x01e0: 31 33 33 39 39 37 31 36 : 31 d8 00 00 00 00 00 00  
0x01f0: 00 00 00 00 00 00 00 00 : 00 00 00 00 00 00 00 00

Module

Thresholds:	Alarm High	Warning High	Warning Low
Temperature:	+75.000 C	+70.000 C	+0.000 C
Voltage:	3.630 Volt	3.465 Volt	3.135 Volt

AT



Temperature: +29.457 C  
 Voltage: 3.315 Volt

Lanes

Thresholds:	Alarm High	Warning High	Warning Low	AL
Bias:	15.000 mAmps	14.000 mAmps	3.000 mAmps	2
Transmit Power:	3.46740 mW (5.40004 dBm)	1.73780 mW (2.40000 dBm)	0.14450 mW (-8.40132 dBm)	
Receive Power:	3.46740 mW (5.40004 dBm)	1.73780 mW (2.40000 dBm)	0.09330 mW (-10.30118 dBm)	

TxRxIOMagId:

RxOpAmpSupprt:

Lane	Temp	Bias	Tx Power	Rx Power
0	N/A	7.130 mAmps	1.03100 mW (0.13259 dBm)	1.18990 mW (0.75510 dBm)
1	N/A	7.192 mAmps	1.09760 mW (0.40444 dBm)	1.19300 mW (0.76640 dBm)
2	N/A	7.192 mAmps	1.05440 mW (0.23005 dBm)	1.17110 mW (0.68594 dBm)
3	N/A	7.192 mAmps	1.08020 mW (0.33504 dBm)	1.00480 mW (0.02080 dBm)

MSA Data (Upper Memory Page 03)

```

0x0200: 4b 00 fb 00 46 00 00 00 : 00 00 00 00 00 00 00 00
0x0210: 8d cc 74 04 87 5a 7a 76 : 00 00 00 00 00 00 00 00
0x0220: 00 00 00 00 00 00 00 00 : 00 00 00 00 00 00 00 00
0x0230: 87 72 01 74 43 e2 03 a5 : 1d 4c 03 e8 1b 58 05 dc
0x0240: 87 72 02 3f 43 e2 05 a5 : 00 00 00 00 00 00 00 00
0x0250: 00 00 00 00 00 00 00 00 : 00 00 00 00 00 00 00 00
0x0260: a6 0f 00 00 00 00 00 00 : 00 00 66 66 00 00 33 33
0x0270: 00 00 00 00 00 00 00 00 : 00 00 00 00 00 00 00 00
  
```

使用此命令驗證是否有任何問題。

<#root>

RP/0/RP0/CPU0:BRU-SPCORE-P2#

show controllers optics 0/0/0/10 summary

Port	Controller State	Admin State	LED State	Lane	Laser Bias
------	------------------	-------------	-----------	------	------------

-----  
Optics 0/0/0/10

Up	In Service						
Green	0	7.1mA	0.12	0.75	850.00		QSFP28-100G
						1	7.2mA
						2	7.2mA
						3	7.2mA

## 警報

檢查主題條目的警報。

<#root>

RP/0/RP0/CPU0:NCS#

show alarms brief

-----  
Active Alarms for 0/0

Location	Severity	Group	Set Time	Description
0/0/CPU0	Major	Software	04/26/2023 15:50:19 CEST	Optics0/0/0/35 - hw_optics:
0/0/CPU0	Major	Software	04/26/2023 15:50:19 CEST	Optics0/0/0/35 - hw_optics:
0/0/CPU0	Major	Software	04/26/2023 15:50:19 CEST	Optics0/0/0/35 - hw_optics:
0/0/CPU0	Major	Software	04/26/2023 15:50:19 CEST	Optics0/0/0/35 - hw_optics:
0/0/CPU0	Major	Software	04/26/2023 15:50:19 CEST	Optics0/0/0/35 - hw_optics:
0/0/CPU0	Major	Software	04/26/2023 15:50:19 CEST	Optics0/0/0/35 - hw_optics:
0/0/CPU0	Major	Software	04/26/2023 15:50:19 CEST	Optics0/0/0/35 - hw_optics:
0/0/CPU0	Major	Software	04/26/2023 15:50:19 CEST	Optics0/0/0/35 - hw_optics:
0/0/CPU0	Major	Software	04/26/2023 15:50:19 CEST	Optics0/0/0/35 - hw_optics:
0/0/CPU0	Major	Software	04/26/2023 15:50:19 CEST	Optics0/0/0/35 - hw_optics:
0/0/CPU0	Major	Software	04/26/2023 15:50:19 CEST	Optics0/0/0/35 - hw_optics:
0/0/CPU0	Major	Software	04/26/2023 15:50:19 CEST	Optics0/0/0/35 - hw_optics:
0/0/CPU0	Major	Software	04/26/2023 15:50:19 CEST	Optics0/0/0/35 - hw_optics:
0/0/CPU0	Major	Software	04/26/2023 15:50:19 CEST	Optics0/0/0/35 - hw_optics:
0/0/CPU0	Major	Software	04/26/2023 15:50:19 CEST	Optics0/0/0/35 - hw_optics:
0/0/CPU0	Major	Software	04/26/2023 15:50:19 CEST	Optics0/0/0/35 - hw_optics:
0/0/CPU0	Major	Software	05/02/2023 11:18:17 CEST	Optics0/0/0/26 - hw_optics:
0/0/CPU0	Major	Software	05/02/2023 11:18:17 CEST	Optics0/0/0/26 - hw_optics: P
0/0/CPU0	Major	Software	05/02/2023 11:18:23 CEST	Optics0/0/0/26 - hw_optics:
0/0/CPU0	Major	Software	05/02/2023 11:18:23 CEST	Optics0/0/0/26 - hw_optics:

## 顯示控制器光纖

使用「show controller optics </s/i/p>」命令檢查是否檢測到SFP/QSFP。

檢查以下專案：

- 檢查是否正確顯示插入的光纖 ( 檢查PID和VID )。
- 檢查是否已啟用鐳射。
- 檢查電源級別是否正常。
- 檢查是否出現任何警報/故障。

如果檢測到光纖並已投入使用，則這是輸出示例。

檢查「Controller State ( 控制器狀態 )」是「Up or Down ( 開啟或關閉 )」。

檢查鐳射狀態是否為「On ( 開啟 )」或「Off ( 關閉 )」。當介面關閉時，會看到狀態Off。如果情況並非如此，請收集以下內容：

- show tech-support optics
- show tech-support of

<#root>

RP/0/RP0/CPU0:ios#

show controllers optics 0/0/0/12

```
Controller State: Up
Transport Admin State: In Service
Laser State: Off
```

檢查LED狀態。當介面關閉時，會看到狀態Off。當介面未關閉時，狀態可以是Down-Yellow或Up-Green。

如果存在埠斷開：即使有一個子埠處於開啟狀態，所有子埠都顯示綠色。如果至少一個子埠為admin up(no shut)，則所有子埠都顯示黃色。如果所有子埠均為管理員關閉 ( 關閉 )，則Led狀態為關閉。

檢查FEC狀態。某些平台型別可能禁用了FEC。則不顯示FEC部分。如果在PHY上啟用了FEC，則它應顯示PHY FEC狀態而不是NPU。如果FEC狀態不正確，請檢查「show controller <speed> <r/s/i/p>」中的FEC狀態。

閱讀本文以瞭解有關FEC的更多資訊：[瞭解FEC及其在思科光纖中的實施](#)

下載此表，瞭解每種思科光纖的FEC型別的更多詳細資訊

：<https://www.cisco.com/c/dam/en/us/products/se/2022/4/Collateral/fec-summary-table.pdf>

檢查「Detected Alarms」( 檢測到的警報 ) 旁邊是否出現警報。如果出現鏈路問題，請檢查此處是否顯示任何RX-LOS/RX-LOL/TX-LOS/TX-LOL警報，或檢查鏈路交換時是否顯示在「show alarms brief/history」的介面和時間戳中。在出現RX警報的情況下，檢查對等裝置是否有TX警報。如果對等點有TX警報，請轉至下一步。如果沒有對等TX警報，請嘗試重新連線電纜和/或可插拔專案。如果需要，請嘗試用其他裝置替換它們。

檢查TX電源。如果埠預期為Up，但電源為-40 Tx，請轉至下一步。檢查RX電源如果埠預期為

Up, 但具有-40dBm Rx功率, 請檢查對等體是否有TX警報。如果對等路由器沒有TX警報, 請嘗試重新連線電纜和/或可插拔專案。如果需要, 請嘗試用其他裝置替換它們。

<#root>

RP/0/RP0/CPU0:ios#

show controllers optics 0/0/0/13

Controller State: Down  
Transport Admin State: In Service  
Laser State: Off

Optics not present

Optics Type: Unavailable

DWDM Carrier Info: Unavailable, MSA ITU Channel= Unavailable, Frequency= Unavailable , Wavelength= Unavailable  
TX Power = Unavailable  
RX Power = Unavailable

LED State: Off

FEC State: FEC ENABLED

Optics Status

Optics Type: SFP28 25G SR-S  
Wavelength = 850.00 nm

Alarm Status:

-----

Detected Alarms: None

LOS/LOL/Fault Status:

Laser Bias Current = 0.0 mA Actual

TX Power = -40.00 dBm

RX Power = -0.93

Performance Monitoring: Disable

THRESHOLD VALUES

-----

Parameter	High Alarm	Low Alarm	High Warning	Low Warning
Rx Power Threshold(dBm)	5.4	-14.2	2.3	-10.3
Tx Power Threshold(dBm)	5.4	-12.4	2.3	-8.4

LBC Threshold(mA)	10.00	2.00	8.00	3.00
Temp. Threshold(celsius)	75.00	-5.00	70.00	0.00
Voltage Threshold(volt)	3.63	2.97	3.46	3.13
Polarization parameters not supported by optics				
Temperature = 28.00 Celsius	Voltage = 3.28 V			

Transceiver Vendor Details

```

Form Factor           : SFP28
Optics type           : SFP28 25G SR-S
Name                  : CISCO-AVAGO
OUI Number            : 00.17.6a
Part Number           : SFBR-725SMZ-CS1
Rev Number            : 01
Serial Number         : AVD2227E1FU
PID                   : SFP-25G-SR-S
VID                   : V01
Date Code(yy/mm/dd)  : 18/07/07

```

如果未檢測到光纖或未在運行，則這是輸出示例。

<#root>

RP/0/RP0/CPU0:ios# RP/0/RP0/CPU0:ios#

show controllers optics 0/0/0/13

```

UTC Controller State: Down
Transport Admin State: In Service
Laser State: Off

```

Optics not present

Optics Type: Unavailable

```

DWDM Carrier Info: Unavailable, MSA ITU Channel= Unavailable, Frequency= Unavailable , Wavelength= Unavailable
TX Power = Unavailable          RX Power = Unavailable

```

## 相干DSP

如果QDD-400G-ZR-S / QDD-400G-ZRP-S的鏈路斷開，同時驗證來自「show controller optics」的警報和資料，請檢查「show controller coherentDSP <R/S/I/P>」中的警報。

<#root>

RP/0/RP0/CPU0:ios#

show controllers coherentDSP 0/0/1/0

```

Port : CoherentDSP 0/0/1/0
Controller State : Up
Inherited Secondary State : Normal

```

Configured Secondary State : Normal  
Derived State : In Service  
Loopback mode : None  
BER Thresholds : SF = 1.0E-5 SD = 1.0E-7  
Performance Monitoring : Enable  
Bandwidth : 400.0Gb/s

Alarm Information:LOS = 0 LOF = 0 LOM = 0  
OOF = 0 OOM = 0 AIS = 0IAE = 0 B  
IAE = 0 SF\_BER = 0  
SD\_BER = 0 BDI = 0 TIM = 0  
FECMISMATCH = 0 FEC-UNC = 0 FLEXO\_GIDM = 0  
FLEXO-MM = 0 FLEXO-LOM = 0 FLEXO-RDI = 0  
FLEXO-LOF = 0  
Detected Alarms : None

如果看到LOS/LOF/BER，則檢查光纖連線、遠端端TX值以及本地端和對等端ZR/ZRP的操作模式。

ZR/ZRP支援多種操作模式。檢視此連結[配置指南](#)。

配置模式、FEC、DAC和調制需要與介面配置和對等配置匹配。

使用以下命令：show optics-driver debug optics port <fp\_port> instance <bayinst> location <LC>。

<#root>

RP/0/RP0/CPU0:ios#

show optics-driver debug optics port 0 instance 0 location 0/0/CPU0

flexcoh\_hdlr : [0x0]

R\_S\_I\_P : [0.0.1.0]

module\_type : [400G-ZRPLUS:Cisco-Qualified-Module]

Traffic-Setup : [Requested/Programmed]

client\_rate : [100\_GAUI\_2\_KP4\_FEC/100\_GAUI\_2\_KP4\_FEC]

<- needs to match the configured interface speed

trunk\_rate : [400G Muxponder/400G Muxponder] line\_fec\_mode : [oFEC/oFEC]

<- needs to match the peer end for link up

dac\_rate : [1x1.25 => pulse\_shaping On/1x1.25 => pulse\_shaping On]

<- needs to match the peer end for link up

modulation : [16QAM/16QAM]

<- needs to match the peer end for link up

framing\_format : [400G\_ZR/400G\_ZR]

framing\_mode : [Enhanced/Enhanced]

hw\_cfg\_in\_progress : [False]

hw transactions : [3]

polling enabled : [True]

pm\_notify enabled : [True]

alarms\_notify enabled : [True]

sdk laser oper state : [Enabled]

sdk hw laser oper state : [Enabled]

hw laser oper state : [Enabled]

```
sdk channel-frequency : [1931000]
hw channel-frequency : [1931000]
sdk tx-power : [-100 0.1dBm]
hw tx-power : [-113 0.1dBm]
hw tx-power-range : [-2289, -65135 0.01dBm]
sdk cd-min : [-13000]hw cd-min : [-13000]
sdk cd-max : [13000]hw cd-max : [13000]
sdk baud-rate : [60.138546]
hw baud-rate : [60.138546]
sdk hw thresholds : [Valid]
config-thresh-flags : [0x0]
trf-cfg-lsr-pm-flags : [0x0]
polling_mask : [0xf]
is_fw_dl_in_progress : [False]
is_fw_commit_in_progress: [False]
sdk dsp-internal-loopback: [Disabled]
hw dsp-internal-loopback: [Disabled]
sdk dsp-line-loopback : [Disabled]
hw dsp-line-loopback : [Disabled]
Flexcoh SDK API execution status
```

```
-----
traffic | tx-power | cd-min | cd-max | frequency | laser-set | pm-set | alarm-set | poll_set |
=====
Success | Success  | Success| Success| Success  | Success  | Success| Success  | Success  |
<- No failure to be seen in any of the status
-----
```

## Show Controllers PHY

收集正確介面的資訊。此命令轉儲EEPROM資訊。

<#root>

RP/0/RP0/CPU0:ios#

```
show controllers tenGigE 0/0/1/0 phy
```

```
SFP EEPROM port: 32
Xcvr Type: SFP
Xcvr Code: SFP+ 10G SR
Encoding: 64B66B
Bit Rate: 10300 Mbps
Link Reach 50u fiber: 80 meter
Link Reach 62.5u fiber: 20 meter
Vendor Name: CISCO-SUMITOMO
Vendor OUI: 00.00.5f
Vendor Part Number: SPP5100SR-C5 (rev.: A )
Laser wavelength: 850 nm (fraction: 0.00 nm)
Optional SFP Signal: Tx_Disable, Tx_Fault, LOS
Vendor Serial Number: SPC17050AZ0
Date Code (yy/mm/dd): 13/01/31 lot code: MA
Diagnostic Monitoring: DOM, Int. Cal.,
Enhanced Options: SW RX LOS Mon., SW TX Fault Mon, SW TX Disable, Alarm/Warning Flags
```

MSA Data

```
0x0000: 03 04 07 10 00 00 00 00 : 00 00 00 06 67 00 00 00
```

0x0010: 08 02 00 1e 43 49 53 43 : 4f 2d 53 55 4d 49 54 4f  
0x0020: 4d 4f 20 20 00 00 00 5f : 53 50 50 35 31 30 30 53  
0x0030: 52 2d 43 35 20 20 20 20 : 41 20 20 20 03 52 00 e6  
0x0040: 00 1a 00 00 53 50 43 31 : 37 30 35 30 41 5a 30 20  
0x0050: 20 20 20 20 31 33 30 31 : 33 31 4d 41 68 f0 03 7a  
0x0060: 00 00 0b ea 11 8a 3a 43 : 9d 9c 2b 0d 84 89 fd c5  
0x0070: a4 0e 5b 00 00 00 00 00 : 00 00 00 00 8b 64 8d fc

Thresholds: Alarm High Warning High Warning Low Alarm Low

Temperature: +75.000 C +70.000 C +0.000 C -5.000 C

Voltage: 3.630 Volt 3.465 Volt 3.135 Volt 2.970 Volt

Bias: 10.500 mAmps 9.000 mAmps 2.500 mAmps 2.000 mAmps

Transmit Power: 1.47910 mW (1.69998 dBm) 0.74130 mW (-1.30006 dBm) 0.18620 mW (-7.30020 dBm) 0.07410 mW

Receive Power: 1.58490 mW (2.00002 dBm) 0.79430 mW (-1.00015 dBm) 0.10230 mW (-9.90124 dBm) 0.04070 mW

Temperature: 24.012

Voltage: 3.304 Volt

Tx Bias: 0.000 mAmps

Tx Power: 0.000 mW (<-40.00 dBm)

Rx Power: 0.000 mW (<-40.00 dBm)

Oper. Status/Control: Tx Disabled, Rx Rate Select, LOS,

EEPROM Memory (A2 lower)

0x0100: 4b 00 fb 00 46 00 00 00 : 8d cc 74 04 87 5a 7a 75  
0x0110: 14 82 03 e8 11 94 04 e2 : 39 c7 02 e5 1c f5 07 46  
0x0120: 3d e9 01 97 1f 07 03 ff : 00 00 00 00 00 00 00 00  
0x0130: 00 00 00 00 00 00 00 00 : 00 00 00 00 00 00 00 00  
0x0140: 00 00 00 00 3f 80 00 00 : 00 00 00 00 01 00 00 00  
0x0150: 01 00 00 00 01 00 00 00 : 01 00 00 00 00 00 00 27  
0x0160: 18 03 81 13 00 00 00 00 : 00 00 00 00 00 00 b2 00  
0x0170: 00 40 00 00 00 40 00 00 : 00 00 00 00 00 00 00 00

CLEI Code: COUIA8NCAA

Part Number: 10-2415-03 (ver.: V03 )

Temp/Alarm/Power Flags: COM, commercial 0C to 70C

Minimum Temperature: 0

Maximum Temperature: 70

Calibration Constants: LBC Scale, Temperature, Laser bias current, Output power,

Product Id: SFP-10G-SR

EEPROM Memory (A2 upper)

0x0180: 43 4f 55 49 41 38 4e 43 : 41 41 31 30 2d 32 34 31  
0x0190: 35 2d 30 33 56 30 33 20 : 01 00 46 00 00 00 00 c6  
0x01a0: 00 00 00 00 00 00 00 00 : 00 00 85 99 8f 00 a8 3b  
0x01b0: d4 4b 00 00 1e 00 0a ff : 16 93 0f 8e 00 00 aa aa  
0x01c0: 53 46 50 2d 31 30 47 2d : 53 52 20 20 20 20 20 20  
0x01d0: 20 20 20 20 32 33 00 00 : 00 00 00 00 00 00 00 35  
0x01e0: 14 1b 20 20 20 26 20 26 : 00 00 00 00 00 00 00 00  
0x01f0: 00 00 00 00 00 fb 00 00 : ff ff ff ff 00 00 00 aa

MSA Data LOWER PAGE (QSA)

0x0000: 0d 00 02 01 00 00 01 00 : 00 00 00 00 00 00 00 00  
0x0010: 00 00 00 00 00 01 00 00 : 00 00 00 00 00 00 00 00  
0x0020: 00 00 00 00 00 00 00 00 : 00 00 00 00 00 00 00 00  
0x0030: 00 00 00 00 00 00 00 00 : 00 00 00 00 00 00 00 00  
0x0040: 00 00 00 00 00 00 00 00 : 00 00 00 00 00 00 00 00  
0x0050: 00 00 44 32 50 30 0f 00 : 00 00 00 00 00 00 00 00  
0x0060: 00 00 00 00 01 01 00 00 : 00 00 00 00 00 00 00 00  
0x0070: 00 00 00 00 00 00 00 00 : 00 00 00 00 00 00 00 00

MSA Data UPPER PAGE (QSA)

0x0080: 0d 9b 80 00 00 00 00 00 : 00 00 00 00 00 00 00 00  
0x0090: 00 00 00 00 43 49 53 43 : 4f 2d 44 4e 49 20 20 20  
0x00a0: 20 20 20 20 00 30 30 30 : 43 41 5a 41 44 45 52 4f



```
0x00b0: 2d 30 32 20 20 20 20 20 : 30 33 00 00 00 00 46 32
0x00c0: 00 00 00 00 44 54 59 32 : 32 32 31 30 36 47 38 20
0x00d0: 20 20 20 20 32 30 31 38 : 30 35 33 30 00 00 f2 c2
0x00e0: f2 00 07 d0 45 c2 18 57 : 2b 29 67 3f 51 03 49 be
0x00f0: 37 c4 da 00 00 00 00 00 : 00 00 00 00 81 96 b0 b1
```

## NPU

本節介紹當介面直接連線到NPU時的具體情況。所以，沒有PHY。這些連線埠是無PHY連線埠。

```
<#root>
```

```
RP/0/RP0/CPU0:ios#
```

```
show controllers twentyFiveGigE 0/0/0/12 (partial output)
```

```
Operational data for interface TwentyFiveGigE0/0/0/12:
```

```
State:      Administrative state: disabled
```

```
==> Check if admin state display is correct
```

```
Operational state: Down (Reason: Link is shutdown)
```

```
==> Check if link state display is correct. If interface is down with Remote fault/Link Loss (local fault)
```

```
MAC address information:
```

```
Operational address: fc58.9a01.8e10
```

```
Burnt-in address: fc58.9a01.8e10
```

```
Autonegotiation disabled.
```

```
Priority flow control information for interface TwentyFiveGigE0/0/0/12:
```

```
Forward error correction: Standard (Reed-Solomon)
```

```
==> Check if FEC status is correct.
```

```
<#root>
```

```
RP/0/RP0/CPU0:ios#
```

```
show controllers tenGigE 0/0/0/14
```

```
Operational data for interface TenGigE0/0/0/14:
```

```
State:      Administrative state: enabled
```

```
Operational state: Down (Reason: Link loss or low light, no loopback)
```

```
==> This router has a Local Fault/Down.
```

```
LED state: Yellow On
```

```
<#root>
```

```

RP/0/RP0/CPU0:ios#
show controllers tenGigE 0/0/0/15

Operational data for interface TenGigE0/0/0/15:
State:
  Administrative state: enabled
  Operational state:

Down (Reason: Remote Fault)

==> The peer has a Fault

LED state: Yellow On

```

## 摘要

- 檢查介面的管理狀態是否為down。如果是，則使用命令「no shut」在介面上使其進入管理開啟狀態。
- 檢查路由器和對等裝置上的FEC狀態。如果存在任何不匹配，請嘗試更正它們。
- 檢查路由器和對等裝置上的自動交涉狀態。如果存在任何不匹配，請嘗試更正它們。
- 如果正確設定了FEC和自動交涉，請在「show controller optics」輸出中檢查路由器和對等體上的警報狀態。

RX-LOS、RX-LOL：訊號接收方向的問題。

TX-LOS、TX-LOL:SFP/QSFP從NPU或PHY接收的訊號存在問題。

如果存在具有RX-LOL/RX-LOS的鏈路關閉/翻動：

- 檢查對等點是否具有TX-LOS/TX-LOL。
- 如果沒有TX警報，請嘗試更改電纜/可插拔(SFP/QSFP)。

如果有使用TX-LOL/TX-LOS的連結關閉/翻動：

您可以應用外部環回來排除遠端對等體，並將光纖應用到遠端對等體。在本地使用光纖纜線將傳輸(Tx)訊號實際回送到接收(Rx)連線埠。可選地使用衰減器來實現此目的：

```

<#root>
RP/0/RSP0/CPU0:NCS(config)#
int Hu0/3/0/31

RP/0/RSP0/CPU0:NCS(config-if)#
loopback ?

external Enable external loopback (requires loopback connector)
internal Enable internal loopback
line Enable line loopback

```

```
RP/0/RSP0/CPU0:NCS(config-if)#
loopback external ?

<Cr>
RP/0/RSP0/CPU0:NCS(config-if)#
loopback external

RP/0/RSP0/CPU0:NCS(config-if)#
commit
```

您可以在路由器和對等裝置上應用環回內部配置，以通過光纖/光纖的旁路來檢驗光纖。這表示如果介面仍未啟動，則表明問題不是與光纖部件有關！

```
<#root>
RP/0/RP0/CPU0:BRU-SPCORE-P2(config)#
int hundredGigE 0/0/0/10

RP/0/RP0/CPU0:BRU-SPCORE-P2(config-if)#
loopback internal ?

<Cr>
RP/0/RP0/CPU0:BRU-SPCORE-P2(config-if)#
loopback internal

RP/0/RP0/CPU0:BRU-SPCORE-P2(config-if)#
commit
```

## 收集日誌

路由器和對等路由器上的這些命令都可能提供問題的原因。

- show ip interface brief
- show alarms brief
- show controller optics `<r/s/i/p>`與問題相關的介面
- show tech-support optics

這將顯示警報、LED狀態、鐳射狀態和其他光學資訊

- show controller `<tengige/hundredgige/other>` `<r/s/i/p>`介面內部出現問題。

顯示FEC、AN、Up/Down、本地故障/遠端故障等。

- show controllers npu voq-usage interface all instance all location all

提供前面板埠到pp埠、npu和核心對映。

介面問題的完整日誌集合：

- 顯示版本
- show running-config
- show install active
- show platform
- show tech-support ethernet platform location 0/x/CPU0
- show tech-support ethernet interface
- show tech-support ethernet controllers location 0/x/CPU0
- show tech-support dpa location 0/x/CPU0
- 顯示位置0/x/CPU0的技術支援
- show tech-support optics location 0/x/CPU0
- show tech-support coherent location 0/x/CPU0
- show tech-support pfi location all
- show tech-support qos platform location 0/x/CPU0
- 顯示技術支援交換矩陣
- show controllers npu voq-usage interface all instance 0 location all
- show optics trace all
- show ethernet infra trace location 0/x/cpu0
- show ethernet v-ether trace location 0/x/CPU0
- show vether-ea trace all location 0/x/CPU0
- show portmapper trace all location 0/0/CPU0

## 關於此翻譯

思科已使用電腦和人工技術翻譯本文件，讓全世界的使用者能夠以自己的語言理解支援內容。請注意，即使是最佳機器翻譯，也不如專業譯者翻譯的內容準確。Cisco Systems, Inc. 對這些翻譯的準確度概不負責，並建議一律查看原始英文文件（提供連結）。