

# ASR 9900系列交換矩陣說明和故障排除示例

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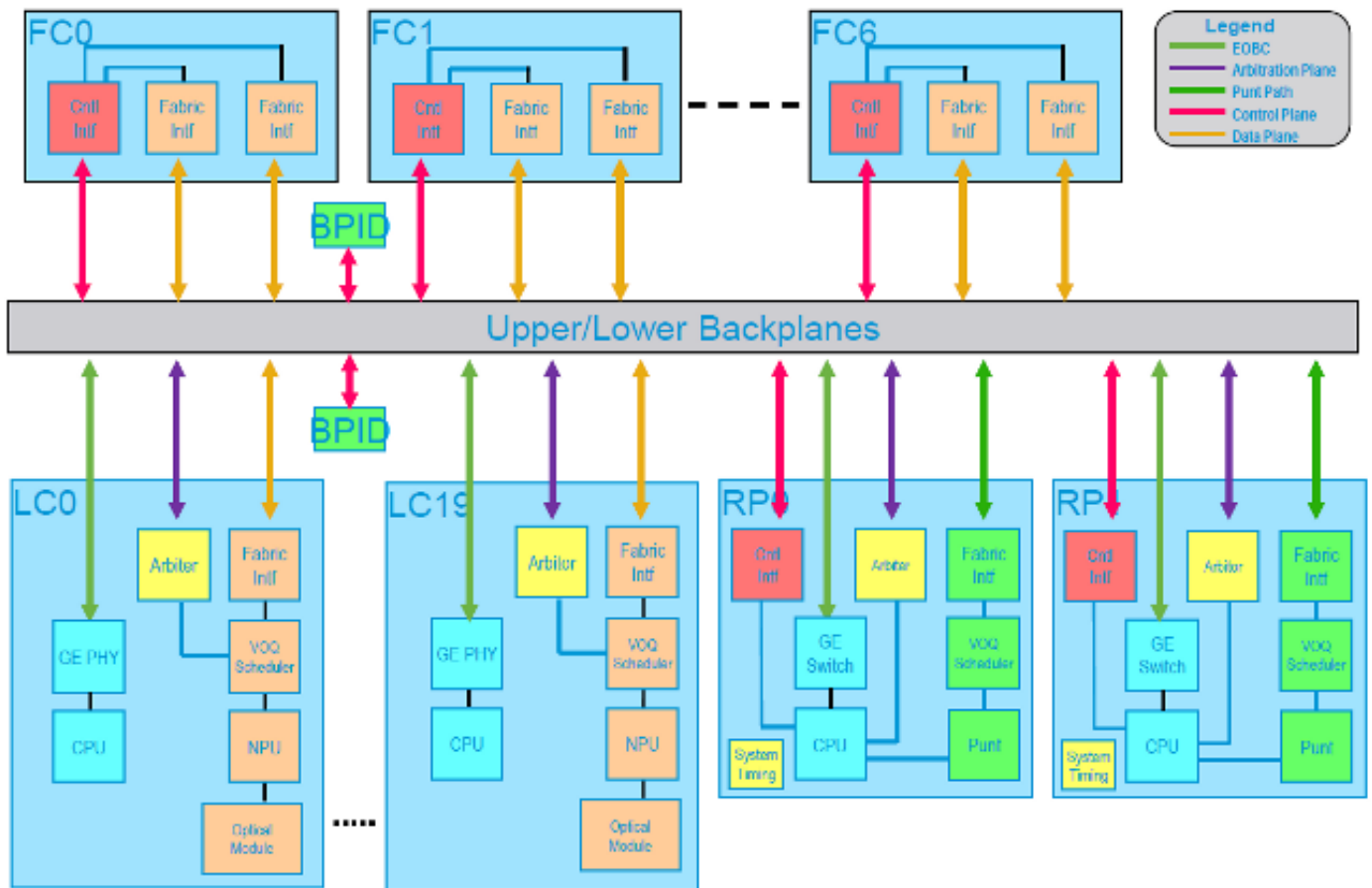
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## 簡介

本文檔介紹在ASR 9922和ASR 9912中使用單獨的交換矩陣卡，類似於使用思科運營商路由系統(CRS)實施的交換矩陣架構。

思科的ASR 9000(ASR9K)採用三級交換矩陣系統。在其他機箱型別中(例如，9006和9010)，三階交換矩陣線上卡(LC)上分為第一級和第三級，在路由交換處理器(RSP)上分為第二級。隨著9922和9912的出現，交換矩陣的第二階段已經從RSP移動到專用交換矩陣卡，並且使用路由處理器(RP)卡來代替RSP。

每個交換矩陣卡(FC)都是其自己的主幹。這些術語可以互換使用，也可用於CRS術語中使用的術語「平面」。下面是系統的高級檢視，縱橫線標籤為「交換矩陣介面」。



## 交換矩陣概述

每個FC具有兩個交換矩陣ASIC (通常稱為交叉開關ASIC)，它們對映為例項0和1，而每個LC和RP具有一個交叉開關介面 (例項0)。

在每個LC上都有兩個連線到每個FC的序列化程式/反序列化程式(SerDes)介面，每個FC交叉欄 (0和1) 有一個SerDes介面。這些FC交叉開關用作三級交換矩陣中的第二級，而第一級和第三級則作為LC的交叉開關存在。此外，每個RP都有一個SerDes介面，此連線始終位於FC交叉開關例項0上。

## 交換矩陣詳細資訊

網路處理器(NP)和光纖介面ASIC(FIA)與跨欄連結的排程無關，流量會在組成SerDes介面的所有8個連結上進行負載平衡。如果SerDes介面內的單個鏈路出現問題，則整個介面將關閉。檢測到此故障後，交換矩陣驅動程式會發出重新訓練以嘗試修復鏈路。

## 颱風

在當前颱風架構下，支援五個FC。這些卡為每個SerDes介面提供8x7.5 G鏈路，這等於編碼計算後55 G的可用頻寬。對於所有五個FC，每個LC將有2x55x5 = 550 Gbps的可用頻寬。當計算出4+1交換矩陣冗餘時，每個LC可提供440 Gbps的冗餘。

註：在帶有RSP-440和Typed LC的9000系列機箱中，每個RSP有4x8x7.5 G鏈路，另外還有

兩條鏈路。每個RSP的四個鏈路提供每個LC的完整440 Gbps可用頻寬。

## 戰斧

下一代卡支援115 Gbps的SerDes連線。由於增加了對7個交換矩陣卡的支援，這可以提供 $2 \times 115 \times 7 = 1.61$  Tbps的頻寬/插槽。考慮到6+1交換矩陣冗餘，這可提供每插槽1.38 Tbps。

## 交換矩陣卡要求

由於交叉開關上的頻寬在所有FIA和NP之間共用，因此需要進行一些計算來確定真正的頻寬和交換矩陣冗餘。

要計算特定LC所需的最小FC數量，請使用以下公式：

$$(\text{num\_ports\_used} * \text{port\_bandwidth}) / (\text{FC\_bandwidth})$$

對於具有30個埠的36x10 GigE卡，此值為 $(30 * 10) / (110) = 2.72$  FC，或四捨五入三個FC。

要計算n+1冗餘，請使用以下公式：

$$(\text{num\_ports\_used} * \text{port\_bandwidth}) / (\text{FC\_bandwidth}) + 1$$

對於36x10 GigE卡，如果使用全部36個埠，則此值將為5。

此表概述了全線速率所需的FC數量。

LC型別	最小機箱中需要FC	n+1冗餘所需的光纖通道數量
A9K-MOD80	1	2
A9K-MOD160	2	3
A9K-2x100GE	2	3
A9K-24x10GE	3	4
A9K-36x10GE	4	5

## 檢查交換矩陣卡

### 縱橫制連結狀態

首先要檢查的是，所有平面(FC)上的所有SerDes鏈路是否都已啟動。若要檢查這一點，請輸入 **show controller fabric plane [all | [0-6]]** 命令。在本例中，由於有兩個RP和三個LC，因此有 $(1 \times 2) + (2 \times 3) = 8$ 條鏈路，並且所有鏈路都連線到所有平面。

**注意：**在4.3.0及更高版本中，可以一次檢查所有平面的狀態。以前，必須逐個指定每個檔案。

Tue Apr 15 14:24:00.935 UTC

Node	Type	State	Config State
0/RP0/CPU0	ASR-9922-RP-SE(Standby)	IOS XR RUN	PWR,NSHUT,MON
0/RP1/CPU0	ASR-9922-RP-SE(Active)	IOS XR RUN	PWR,NSHUT,MON
0/0/CPU0	A9K-2x100GE-SE	IOS XR RUN	PWR,NSHUT,MON
0/2/CPU0	A9K-36x10GE-SE	IOS XR RUN	PWR,NSHUT,MON
0/3/CPU0	A9K-MOD160-TR	IOS XR RUN	PWR,NSHUT,MON
0/3/1	A9K-MPA-4X10GE	OK	PWR,NSHUT,MON

RP/0/RP1/CPU0:ASR9922-B#show controller fabric plane all

Mon Apr 14 14:37:00.116 UTC

Flags: Admin State: 1-Up 2-Down 12-UnPowered 16-Shutdown

Oper State: 1-Up 2-Down 3-Admin Down

Summary for All Fabric Planes:

Plane Id	Admin State	Oper State	Links Up	Links Down	In Pkt Count	Out Pkt count
0	01	01	08	00	346770	431250
1	01	01	08	00	44397	44397
2	01	01	08	00	44459	44459
3	01	01	08	00	94005	94005
4	01	01	08	00	73814	73814

如果連結顯示為關閉，**show controller fabric crossbar link-status instance <0-1> spine <FC\_num>**指令可用於確切識別哪個連結。在本示例中，有五個通向FC4例項0的縱橫制鏈路和三個通向FC4例項1的縱橫制鏈路(5+3=8 from before)。由於RP，例項0上還有兩個例項。

註：有關邏輯到物理插槽對映的詳細資訊，請參閱附錄。

RP/0/RP1/CPU0:ASR9922-B#show controllers fabric crossbar link-status instance 0 spine 4

Fri Apr 18 18:08:31.953 UTC

PORT	Remote Slot	Remote Inst	Logical ID	Status
01	05	00	0	Up
04	04	00	0	Up
05	02	00	0	Up
08	00	00	0	Up
09	01	00	0	Up

RP/0/RP1/CPU0:ASR9922-B#show controllers fabric crossbar link-status instance 1 spine 4

Fri Apr 18 18:09:13.637 UTC

PORT	Remote Slot	Remote Inst	Logical ID	Status
00	05	00	0	Up
04	04	00	0	Up
05	02	00	0	Up

## 縱橫制統計

使用在前一個輸出中收集的鏈路狀態作為對映和這些統計資訊，可以很容易地縮小存在流量問題的任何元件的範圍。對於每個縱橫制連線埠 ( SerDes介面 )，都會有輸入 ( 從LC ) 和輸出 ( 指向 LC ) 統計資料。每個FC交叉開關例項收集這些資料。

RP/0/RP1/CPU0:ASR9922-B#show controller fabric crossbar statistics instance 0 spine 4

Tue Apr 22 16:52:23.162 UTC

Port statistics for xbar:0 port:0

=====

Hi priority stats (unicast)

=====

Low priority stats (multicast)

=====

Port statistics for xbar:0 port:1

=====

Hi priority stats (unicast)

=====

Ingress Packet Count Since Last Read : 14016

Egress Packet Count Since Last Read : 24971

Low priority stats (multicast)

=====

Port statistics for xbar:0 port:2

=====

Hi priority stats (unicast)

=====

Low priority stats (multicast)

=====

Port statistics for xbar:0 port:4

=====

Hi priority stats (unicast)

=====

Ingress Packet Count Since Last Read : 21056

Egress Packet Count Since Last Read : 32195

Low priority stats (multicast)

=====

Port statistics for xbar:0 port:5

=====

Hi priority stats (unicast)

=====

Ingress Packet Count Since Last Read : 7024

Egress Packet Count Since Last Read : 10477

Low priority stats (multicast)

=====

Port statistics for xbar:0 port:6

=====

Hi priority stats (unicast)

=====

Low priority stats (multicast)

=====

Port statistics for xbar:0 port:7

=====

Hi priority stats (unicast)

=====

Low priority stats (multicast)

=====

Port statistics for xbar:0 port:8

=====

Hi priority stats (unicast)  
=====

Low priority stats (multicast)  
=====

Ingress Packet Count Since Last Read : 37388  
Egress Packet Count Since Last Read : 37388

Port statistics for xbar:0 port:9  
=====

Hi priority stats (unicast)  
=====

Ingress Packet Count Since Last Read : 72882  
Egress Packet Count Since Last Read : 47335

Low priority stats (multicast)  
=====

Ingress Packet Count Since Last Read : 37386  
Egress Packet Count Since Last Read : 37386

Port statistics for xbar:0 port:10  
=====

Hi priority stats (unicast)  
=====

Low priority stats (multicast)  
=====

Port statistics for xbar:0 port:11  
=====

Hi priority stats (unicast)  
=====

Low priority stats (multicast)  
=====

Port statistics for xbar:0 port:12  
=====

Hi priority stats (unicast)  
=====

Low priority stats (multicast)  
=====

Port statistics for xbar:0 port:13  
=====

Hi priority stats (unicast)  
=====

Low priority stats (multicast)  
=====

Port statistics for xbar:0 port:14  
=====

Hi priority stats (unicast)  
=====

Low priority stats (multicast)  
=====

Port statistics for xbar:0 port:15  
=====

Hi priority stats (unicast)  
=====

Low priority stats (multicast)  
=====

Port statistics for xbar:0 port:16  
=====  
Hi priority stats (unicast)  
=====

Low priority stats (multicast)  
=====

Port statistics for xbar:0 port:17  
=====  
Hi priority stats (unicast)  
=====

Low priority stats (multicast)  
=====

Port statistics for xbar:0 port:18  
=====  
Hi priority stats (unicast)  
=====

Low priority stats (multicast)  
=====

Port statistics for xbar:0 port:19  
=====  
Hi priority stats (unicast)  
=====

Low priority stats (multicast)  
=====

Port statistics for xbar:0 port:20  
=====  
Hi priority stats (unicast)  
=====

Low priority stats (multicast)  
=====

Port statistics for xbar:0 port:22  
=====  
Hi priority stats (unicast)  
=====

Low priority stats (multicast)  
=====

Port statistics for xbar:0 port:24  
=====  
Hi priority stats (unicast)  
=====

Low priority stats (multicast)  
=====

Total Unicast In: 114978  
Total Unicast Out: 114978  
Total Multicast In: 74774

## 檢查線路卡

在LC本身上，在交叉開關和每個FIA之間，有2x8x6.25條鏈路，可為每個FIA提供100 G原始頻寬。每個NP和FIA之間有一個8x6.25鏈路，每個NP提供50 G原始頻寬。

**注意：**引用的頻寬是原始頻寬。考慮開銷後，實際頻寬略低。

## 縱橫制連結狀態

LC的交叉開關連結狀態的集合與FC的相似，但在這種情況下，將看到從FC交叉開關到LC交叉開關的連結以及LC交叉開關到FIA的連結。如前所述，每個FIA通過兩條鏈路連線到交叉開關。在本例中，埠00和24都連線到FIA 2。與前面的示例一樣，遠端插槽22-26是FC，0/2/CPU0與插槽4本身對應。

```
RP/0/RP1/CPU0:ASR9922-B#show controller fabric crossbar link-status inst 0 loc 0/2/CPU0
Wed Apr 23 14:22:42.250 UTC
```

PORT	Remote Slot	Remote Inst	Logical ID	Status
00	04	02	1	Up
01	04	01	1	Up
02	04	01	0	Up
03	04	00	0	Up
04	04	00	1	Up
05	04	03	1	Up
06	04	05	1	Up
07	25	01	0	Up
08	04	03	0	Up
09	25	00	0	Up
10	04	05	0	Up
11	26	01	0	Up
12	26	00	0	Up
14	24	00	0	Up
15	24	01	0	Up
16	23	00	0	Up
17	23	01	0	Up
20	22	00	0	Up
22	22	01	0	Up
23	04	04	1	Up
24	04	02	0	Up
25	04	04	0	Up

## 縱橫制統計

使用在前一個輸出中收集的鏈路狀態作為參考對映，可以使用下面的統計資訊輸出作為縮小表現出通訊量丟失的所有元件的範圍的簡單方法。

```
RP/0/RP1/CPU0:ASR9922-B#show controller fabric crossbar statistics instance 0 loc 0/2/CPU0
Wed Apr 23 15:53:41.955 UTC
Port statistics for xbar:0 port:0
=====
Hi priority stats (unicast)
```



```
=====
Ingress Packet Count Since Last Read      : 15578
Egress Packet Count Since Last Read       : 11957
```

Low priority stats (multicast)

```
=====
```

Port statistics for xbar:0 port:1

```
=====
```

Hi priority stats (unicast)

```
=====
```

```
Ingress Packet Count Since Last Read      : 15775
Egress Packet Count Since Last Read       : 11647
```

Low priority stats (multicast)

```
=====
```

Port statistics for xbar:0 port:2

```
=====
```

Hi priority stats (unicast)

```
=====
```

```
Ingress Packet Count Since Last Read      : 15646
Egress Packet Count Since Last Read       : 19774
```

Low priority stats (multicast)

```
=====
```

```
Ingress Packet Count Since Last Read      : 31424
Egress Packet Count Since Last Read       : 188544
```

Port statistics for xbar:0 port:3

```
=====
```

Hi priority stats (unicast)

```
=====
```

```
Ingress Packet Count Since Last Read      : 15663
Egress Packet Count Since Last Read       : 15613
```

Low priority stats (multicast)

```
=====
```

```
Ingress Packet Count Since Last Read      : 31424
Egress Packet Count Since Last Read       : 188547
```

Port statistics for xbar:0 port:4

```
=====
```

Hi priority stats (unicast)

```
=====
```

```
Ingress Packet Count Since Last Read      : 15758
Egress Packet Count Since Last Read       : 15813
```

Low priority stats (multicast)

```
=====
```

Port statistics for xbar:0 port:5

```
=====
```

Hi priority stats (unicast)

```
=====
```

```
Ingress Packet Count Since Last Read      : 15742
Egress Packet Count Since Last Read       : 15628
```

Low priority stats (multicast)

```
=====
```

Port statistics for xbar:0 port:6

```
=====
```

Hi priority stats (unicast)

```
=====
Ingress Packet Count Since Last Read      : 15773
Egress Packet Count Since Last Read       : 13687
```

Low priority stats (multicast)

```
=====
Ingress Packet Count Since Last Read      : 78666
```

Port statistics for xbar:0 port:7

```
=====
```

Hi priority stats (unicast)

```
=====
```

Low priority stats (multicast)

```
=====
```

Port statistics for xbar:0 port:8

```
=====
```

Hi priority stats (unicast)

```
=====
```

```
Ingress Packet Count Since Last Read      : 15679
```

```
Egress Packet Count Since Last Read       : 15793
```

Low priority stats (multicast)

```
=====
```

```
Ingress Packet Count Since Last Read      : 31424
```

```
Egress Packet Count Since Last Read       : 188544
```

Port statistics for xbar:0 port:9

```
=====
```

Hi priority stats (unicast)

```
=====
```

```
Ingress Packet Count Since Last Read      : 72826
```

```
Egress Packet Count Since Last Read       : 58810
```

Low priority stats (multicast)

```
=====
```

Port statistics for xbar:0 port:10

```
=====
```

Hi priority stats (unicast)

```
=====
```

```
Ingress Packet Count Since Last Read      : 15653
```

```
Egress Packet Count Since Last Read       : 23041
```

Low priority stats (multicast)

```
=====
```

```
Egress Packet Count Since Last Read       : 188544
```

Port statistics for xbar:0 port:11

```
=====
```

Hi priority stats (unicast)

```
=====
```

Low priority stats (multicast)

```
=====
```

Port statistics for xbar:0 port:12

```
=====
```

Hi priority stats (unicast)

```
=====
```

```
Ingress Packet Count Since Last Read      : 54172
```

```
Egress Packet Count Since Last Read       : 35440
```

Low priority stats (multicast)  
=====

Port statistics for xbar:0 port:14  
=====

Hi priority stats (unicast)  
=====

Ingress Packet Count Since Last Read : 15161  
Egress Packet Count Since Last Read : 17790

Low priority stats (multicast)  
=====

Port statistics for xbar:0 port:15  
=====

Hi priority stats (unicast)  
=====

Low priority stats (multicast)  
=====

Port statistics for xbar:0 port:16  
=====

Hi priority stats (unicast)  
=====

Ingress Packet Count Since Last Read : 15220  
Egress Packet Count Since Last Read : 17790

Low priority stats (multicast)  
=====

Port statistics for xbar:0 port:17  
=====

Hi priority stats (unicast)  
=====

Ingress Packet Count Since Last Read : 1  
Egress Packet Count Since Last Read : 1

Low priority stats (multicast)  
=====

Port statistics for xbar:0 port:20  
=====

Hi priority stats (unicast)  
=====

Ingress Packet Count Since Last Read : 36457  
Egress Packet Count Since Last Read : 58699

Low priority stats (multicast)  
=====

Ingress Packet Count Since Last Read : 188549  
NULL FPOE Drop Count : 2  
Egress Packet Count Since Last Read : 235786

Port statistics for xbar:0 port:22  
=====

Hi priority stats (unicast)  
=====

Ingress Packet Count Since Last Read : 1  
Egress Packet Count Since Last Read : 1

Low priority stats (multicast)  
=====

```

Port statistics for xbar:0 port:23
=====
Hi priority stats (unicast)
=====
    Ingress Packet Count Since Last Read      : 15775
    Egress Packet Count Since Last Read       : 15835

Low priority stats (multicast)
=====
    Ingress Packet Count Since Last Read      : 31424

Port statistics for xbar:0 port:24
=====
Hi priority stats (unicast)
=====
    Ingress Packet Count Since Last Read      : 15843
    Egress Packet Count Since Last Read       : 19464

Low priority stats (multicast)
=====
    Ingress Packet Count Since Last Read      : 31424
    Egress Packet Count Since Last Read       : 188544

Port statistics for xbar:0 port:25
=====
Hi priority stats (unicast)
=====
    Ingress Packet Count Since Last Read      : 15646
    Egress Packet Count Since Last Read       : 15586

Low priority stats (multicast)
=====
    Egress Packet Count Since Last Read       : 188544

```

```

Total Unicast In:      382369
Total Unicast Out:     382369
Total Multicast In:    424335
Total Multicast Out:   1367053

```

## 疑難排解

### Crossbar埠關閉

第一個輸出表示有兩個RP和兩個LC。第二個輸出表明從FC4到遠端插槽0(RP0)的鏈路已關閉。

```
RP/0/RP0/CPU0:ASR9k-1#show controllers fabric plane all
```

Plane Id	Admin State	Oper State	Links Up	Links Down	In Pkt Count	Out Pkt count
0	01	01	06	00	62266063301	62266209776
1	01	01	06	00	18730254608	18730254616
2	01	01	06	00	18730354183	18730354187
3	01	01	06	00	62257126982	62257127007
4	01	01	<b>05</b>	<b>01</b>	37448788006	37448788023

```
RP/0/RP0/CPU0:ASR9k-1#show controllers fabric crossbar link-status instance 0 spine 4
```

PORT	Remote Slot	Remote Inst	Logical ID	Status
04	04	00	0	Up
<b>08</b>	<b>00</b>	<b>00</b>	<b>0</b>	<b>Down</b>
09	01	00	0	Up
10	03	00	0	Up

由於當交叉開關鍵路斷開時，來自FC的頻寬在LC上的所有FIA和NP之間共用，因此在Typed系統中，LC的淨頻寬將減少55 G。在出現系統冗餘的情況下，系統可以在鏈路中斷的情況下運行，但應立即進行調查。

當交叉開關鍵路斷開時，可能會出現短暫的流量下降，交換矩陣驅動程式會重新訓練該鏈路以嘗試自動恢復。如果此操作失敗，則聯機插入和刪除(OIR)也可能會恢復問題。有關任何其他問題，請聯絡技術支援中心(TAC)。

## 主幹不可用的系統日誌

這些消息表明系統運行在建議的五個FC以下。雖然建議始終運行五個FC，但這並不一定表示系統中LC的任何頻寬損失。有關詳細資訊，請參閱[光纖卡要求](#)部分。

```
RP/0/RP1/CPU0:May 13 14:42:22.810 : pfm_node_rp[353]:
%PLATFORM-FABMGR-1-SPINE_UNAVAILABLE : Set|fabmgr[303204]|Fabric Manager(0x1032000)|
Number of active spines has dropped below the recommended number 5

RP/0/RP1/CPU0:May 13 14:53:18.897 : pfm_node_rp[353]:
%PLATFORM-FABMGR-1-SPINE_UNAVAILABLE : Clear|fabmgr[303204]|Fabric Manager(0x1032000)|
Number of active spines has dropped below the recommended number 5
```

## FC非活動系統日誌

執行FC的OIR時，有兩個機械按鈕必須按下，然後卡才能部分卸下，這需要OIR才能恢復。出現這些按鈕的原因是允許正常關閉FC。

在9922路由器上，上按鈕完全是機械式的，而下按鈕向系統傳送訊號，使卡正常關閉。將看到此格式的系統日誌。如果未按下按鈕，且OIR無法恢復問題，請與TAC聯絡。

```
RP/0/RP0/CPU0:Dec 24 10:45:27.108 MST: fab_xbar_sp3[220]: FC3 Inactive due to
Front Panel Switch Press. Please OIR to recover.
```

## 相關資訊

- [ASR9000/XR瞭解和排除A9K中的交換矩陣問題](#)
- [技術支援與文件 - Cisco Systems](#)

## 附錄

### 邏輯插槽到物理插槽的對映

這些輸出是9922和9912路由器的邏輯插槽到物理插槽的對映。檢視fabric show命令時需要此資訊。

## 9922

slot 00 -> 0/RP0/CPU0 (0x1)  
slot 01 -> 0/RP1/CPU0 (0x11)  
slot 02 -> 0/0/CPU0 (0x821)  
slot 03 -> 0/1/CPU0 (0x831)  
slot 04 -> 0/2/CPU0 (0x841)  
slot 05 -> 0/3/CPU0 (0x851)  
slot 06 -> 0/4/CPU0 (0x861)  
slot 07 -> 0/5/CPU0 (0x871)  
slot 08 -> 0/6/CPU0 (0x881)  
slot 09 -> 0/7/CPU0 (0x891)  
slot 10 -> 0/8/CPU0 (0x8a1)  
slot 11 -> 0/9/CPU0 (0x8b1)  
slot 12 -> 0/10/CPU0 (0x8c1)  
slot 13 -> 0/11/CPU0 (0x8d1)  
slot 14 -> 0/12/CPU0 (0x8e1)  
slot 15 -> 0/13/CPU0 (0x8f1)  
slot 16 -> 0/14/CPU0 (0x901)  
slot 17 -> 0/15/CPU0 (0x911)  
slot 18 -> 0/16/CPU0 (0x921)  
slot 19 -> 0/17/CPU0 (0x931)  
slot 20 -> 0/18/CPU0 (0x941)  
slot 21 -> 0/19/CPU0 (0x951)  
slot 22 -> 0/FC0/SP (0x1960)  
slot 23 -> 0/FC1/SP (0x1970)  
slot 24 -> 0/FC2/SP (0x1980)  
slot 25 -> 0/FC3/SP (0x1990)  
slot 26 -> 0/FC4/SP (0x19a0)  
slot 27 -> 0/FC5/SP (0x19b0)  
slot 28 -> 0/FC6/SP (0x19c0)  
slot 34 -> 0/BPID0/SP (0x1220)  
slot 35 -> 0/BPID1/SP (0x1230)  
slot 36 -> 0/FT0/SP (0x640)  
slot 37 -> 0/FT1/SP (0x650)  
slot 38 -> 0/FT2/SP (0x660)  
slot 39 -> 0/FT3/SP (0x670)  
slot 40 -> 0/PM0/SP (0xe80)  
slot 41 -> 0/PM1/SP (0xe90)  
slot 42 -> 0/PM2/SP (0xea0)  
slot 43 -> 0/PM3/SP (0xeb0)  
slot 44 -> 0/PM4/SP (0xec0)  
slot 45 -> 0/PM5/SP (0xed0)  
slot 46 -> 0/PM6/SP (0xee0)  
slot 47 -> 0/PM7/SP (0xef0)  
slot 48 -> 0/PM8/SP (0xf00)  
slot 49 -> 0/PM9/SP (0xf10)  
slot 50 -> 0/PM10/SP (0xf20)  
slot 51 -> 0/PM11/SP (0xf30)  
slot 52 -> 0/PM12/SP (0xf40)  
slot 53 -> 0/PM13/SP (0xf50)  
slot 54 -> 0/PM14/SP (0xf60)  
slot 55 -> 0/PM15/SP (0xf70)

## 9912

slot 00 -> 0/RP0/CPU0 (0x1)  
slot 01 -> 0/RP1/CPU0 (0x11)



## 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）。