

# 配置備用APIC

## 目錄

[簡介](#)

[必要條件](#)

[需求](#)

[採用元件](#)

[背景資訊](#)

[組態](#)

[附加程式](#)

[驗證](#)

[疑難排解](#)

## 簡介

本檔案將說明如何設定 思科應用政策基礎架構控制器(APIC)上的冷待命功能。 備用APIC集群使您能夠在主用/備用模式下運行集群中的APIC。在APIC集群中，指定的活動APIC共用負載，而指定的備用APIC可以替代活動集群中的任何APIC。

從多瑙河版本 ( ACI 2.2軟體版本 ) 開始新增備用APIC功能。

## 必要條件

### 需求

思科建議您瞭解以下主題：

- 交換矩陣上的帶外管理(OOB)
- Apic集群

### 採用元件

本文檔中的資訊基於運行軟體版本3.1(1i)的ACI交換矩陣。

該文檔是根據特定實驗室環境中的裝置建立的。文中使用到的所有裝置皆從已清除 ( 預設 ) 的組態來啟動。如果您的網路運作中，請確保您瞭解任何指令可能造成的影響。

## 背景資訊

- 它受單個和Multipod設定支援。
- 備用APIC可以連線到交換矩陣中任何POD中的任何枝葉。恢復少數交換矩陣/POD中的編輯功能。
- 備用APIC會自動更新韌體更新，以使備份APIC與活動群集保持相同的韌體版本。
- 在升級過程中，升級所有活動APIC後，也會自動升級備用APIC。

- 臨時ID分配給備用APIC。將待命APIC切換到活動APIC後，分配新的ID。
- 未啟用備用APIC上的管理員登入。
- 要排除冷待機故障，您必須使用SSH作為救援使用者登入到待機。
- 在切換過程中，已更換的活動APIC電源關閉，以防止與已更換的APIC連線。備用APIC不參與策略配置或交換矩陣管理。
- 思科建議備用APIC與其可更換的活動APIC位於同一POD中。沒有資料被複製到備用裝置，甚至管理員憑據也不被複製（修復使用者登入工作）。
- 備用APIC不參與策略配置或管理。
- 沒有資訊被複製到備用控制器，包括管理員憑據。

## 組態

從2.2版開始，初始配置指令碼會提示一個新問題，詢問此APIC是否為待機，預設值為[NO]，一旦答案為[YES]，則必須選擇備用控制器ID（可以是活動APIC的數量+1到29），建議範圍從21到29開始。

- 必須有三個活動APIC才能新增備用APIC。
- 所需的最小群集大小為3 — 數字越大，則可能是「備用」。
- 必須將備用APIC引入與活動APIC版本相同的群集。
- 思科建議將待命APIC與其可替換的活動APIC保留在同一個POD中。

作為發現過程的一部分，備用APIC必須匹配：

Fabric Domain Infra VLAN TEP地址池序列號已批准 — 在嚴格模式證書驗證

```
Cluster configuration ...
Enter the fabric name [POD15]:
Enter the fabric ID (1-128) [11]:
Enter the number of active controllers in the fabric (1-9) [31]:
Enter the POD ID (1-9) [11]:
Is this a standby controller? [YES]:
Enter the standby controller ID (Recommended value > 20) (4-29) [41]:
Enter the controller name [STDBYAPIC21]:
Enter address pool for TEP addresses [15.0.0.0/16]:
Note: The infra VLAN ID should not be used elsewhere in your environment
and should not overlap with any other reserved VLANs on other platforms.
Enter the VLAN ID for infra network (1-4094) [3965]:

Out-of-band management configuration ...
Enable IPv6 for Out of Band Mgmt Interface? [N]:
Enter the IPv4 address [10.48.31.27/24]:
Enter the IPv4 address of the default gateway [10.48.31.1]:
Enter the interface speed/duplex mode [auto]:
```

提交配置後，主用群集會自動發現備用APIC，可以在備用控制器下看到它。

若要將狀態變更為Approve，請單擊Do Something（目前的狀態），然後選擇Accept Controller，如下圖所示。

APIC Admin Interface - Cluster as Seen by Node

Properties: Fabric Name: POD01, Target Size: 3, Current Size: 3. Difference Between Local Time and Unified Cluster Time (ms): 20123. ACI Fabric Internode Secure Authentication Communications: Permissive.

ID	Name	IP	Admin State	Operational State	Health State	Fallover Status	Serial Number	SSL Certificate
1	bdsol-ac01-apic1	10.0.0.1	In Service	Available	Fully Fit	idle	FCH1824V2GP	yes
2	bdsol-ac01-apic2	10.0.0.2	In Service	Available	Fully Fit	idle	FCH1825V0QA	yes
3	bdsol-ac01-apic3	10.0.0.3	In Service	Available	Fully Fit	idle	FCH1824V2FL	yes

Serial Number	IP	Mode	State
FCH2226VCHY	10.0.0.5	Standby Apic	Do Something

APIC Admin Interface - Cluster as Seen by Node

Properties: Fabric Name: POD01, Target Size: 3, Current Size: 3. Difference Between Local Time and Unified Cluster Time (ms): 20123. ACI Fabric Internode Secure Authentication Communications: Permissive.

ID	Name	IP	Admin State	Operational State	Health State	Fallover Status	Serial Number	SSL Certificate
1	bdsol-ac01-apic1	10.0.0.1	In Service	Available	Fully Fit	idle	FCH1824V2GP	yes
2	bdsol-ac01-apic2	10.0.0.2	In Service	Available	Fully Fit	idle	FCH1825V0QA	yes
3	bdsol-ac01-apic3	10.0.0.3	In Service	Available	Fully Fit	idle	FCH1824V2FL	yes

Serial Number	IP	Mode	State
FCH2226VCHY	10.0.0.5	Standby Apic	Do Something

Context menu for Standby Controller:

- Accept Controller
- Reject Controller
- Erase/Delete Controller
- Save as ...
- Post ...
- Share
- Open In Object Store Browser

APIC Admin Interface - Cluster as Seen by Node

Properties: Fabric Name: POD01, Target Size: 3, Current Size: 3. Difference Between Local Time and Unified Cluster Time (ms): 20130. ACI Fabric Internode Secure Authentication Communications: Permissive.

ID	Name	IP	Admin State	Operational State	Health State	Fallover Status	Serial Number	SSL Certificate
1	bdsol-ac01-apic1	10.0.0.1	In Service	Available	Fully Fit	idle	FCH1824V2GP	yes
2	bdsol-ac01-apic2	10.0.0.2	In Service	Available	Fully Fit	idle	FCH1825V0QA	yes
3	bdsol-ac01-apic3	10.0.0.3	In Service	Available	Fully Fit	idle	FCH1824V2FL	yes

Serial Number	IP	Mode	State
FCH2226VCHY	10.0.0.5	Standby Apic	Approved

成功發現後，在主用和備用APIC之間交換連續保持連線消息，可以看到新的APIC。

APIC1# show controller

Fabric Name : POD15  
 Operational Size : 3  
 Cluster Size : 3  
 Time Difference : 725204

Fabric Security Mode : permissive

ID	Pod	Address	In-Band IPv4	In-Band IPv6	OoB IPv4	OoB IPv6	Version	Flags	Serial Number	Health
1*	1	15.0.0.1	0.0.0.0	fc00::1	10.48.22.122	fe80::8a1d:fcff:fe99:ec16	3.1(1i)	crva-	FCH1843V022	fully-fit
2	1	15.0.0.2	0.0.0.0	fc00::1	10.48.22.123	fe80::d66d:50ff:feef:5d3c	3.1(1i)	crva-	FCH1846V2XU	fully-fit
3	1	15.0.0.3	0.0.0.0	fc00::1	10.48.22.124	fe80::8a1d:fcff:fe99:ef16	3.1(1i)	crva-	FCH1843V0DK	fully-fit
4~		15.0.0.4						----	FCH2123V17P	

Flags - c:Commissioned | r:Registered | v:Valid Certificate | a:Approved | f/s:Failover fail/success  
 (\*)Current (~)Standby

APIC2# acidiag avread

Local appliance ID=2 ADDRESS=15.0.0.2 TEP ADDRESS=15.0.0.0/16 CHASSIS\_ID=3a248ab6-f54a-11e7-8e54-afbc07c905f6  
 Cluster of 3 lm(t):2(2018-01-09T14:47:58.704+00:00) appliances (out of targeted 3 lm(t):2(2018-01-09T14:49:26.223+00:00)) with FABRIC\_DOMAIN name=POD15 set to version=apic-3.1(1i)  
 lm(t):2(2018-01-09T14:48:06.897+00:00); discoveryMode=PERMISSIVE lm(t):0(1970-01-01T00:00:00.003+00:00)  
 appliance id=1 address=15.0.0.1 lm(t):2(2018-01-09T14:35:38.982+00:00) tep address=15.0.0.0/16 lm(t):1(2018-01-03T07:34:33.587+00:00) oob address=10.48.22.122/24  
 lm(t):2(2018-01-09T14:57:56.857+00:00) version=3.1(1i) lm(t):1(2018-01-09T14:57:55.508+00:00) chassisId=6e1d8cec-f058-11e7-b798-953038fb2c3c lm(t):1(2018-01-09T14:57:55.508+00:00)  
 capabilities=0X7FFFFFFF~0X2020~0X3 lm(t):1(2018-01-09T14:48:05.476+00:00) rK=(stable,present,0X206173722D687373) lm(t):2(2018-01-09T14:57:56.857+00:00)  
 aK=(stable,present,0X206173722D687373) lm(t):2(2018-01-09T14:57:56.857+00:00) cntrlSbst=(APPROVED, FCH1843V022) lm(t):1(2018-01-03T11:43:44.155+00:00) (targetMbSn=  
 lm(t):0(zeroTime), failoverStatus=0 lm(t):0(zeroTime)) podId=1 lm(t):1(2018-01-05T14:31:24.921+00:00) commissioned=YES lm(t):2(2018-01-09T14:35:38.804+00:00) registered=YES  
 lm(t):2(2018-01-09T14:35:38.804+00:00) standby=NO lm(t):3(2018-01-09T14:35:38.804+00:00) active=YES(2018-01-09T14:48:01.004+00:00) health={applnc:255 lm(t):1(2018-01-09T14:48:54.48  
 +00:00) svc's)  
 appliance id=2 address=15.0.0.2 lm(t):2(2018-01-09T14:35:30.447+00:00) tep address=15.0.0.0/16 lm(t):2(2018-01-09T14:35:30.447+00:00) oob address=10.48.22.123/24  
 lm(t):2(2018-01-09T14:35:35.348+00:00) version=3.1(1i) lm(t):2(2018-01-09T14:57:55.423+00:00) chassisId=3a248ab6-f54a-11e7-8e54-afbc07c905f6 lm(t):2(2018-01-09T14:57:55.423+00:00)  
 capabilities=0X7FFFFFFF~0X2020~0X7 lm(t):2(2018-01-09T14:53:05.175+00:00) rK=(stable,present,0X206173722D687373) lm(t):2(2018-01-09T14:35:35.351+00:00)  
 aK=(stable,present,0X206173722D687373) lm(t):2(2018-01-09T14:35:35.351+00:00) cntrlSbst=(APPROVED, FCH1846V2XU) lm(t):2(2018-01-09T14:57:55.423+00:00) (targetMbSn=  
 lm(t):0(zeroTime), failoverStatus=0 lm(t):1(2018-01-09T14:42:04.461+00:00)) podId=1 lm(t):2(2018-01-09T14:35:30.447+00:00) commissioned=YES lm(t):2(2018-01-09T14:35:30.447+00:00)  
 lm(t):2(2018-01-09T14:35:30.447+00:00) standby=NO lm(t):2(2018-01-09T14:35:30.447+00:00) active=YES(2018-01-09T14:35:30.447+00:00) health={applnc:255 lm(t):2(2018-01-09T14:48:54.39  
 +00:00) svc's)  
 appliance id=3 address=15.0.0.3 lm(t):2(2018-01-09T14:35:38.982+00:00) tep address=15.0.0.0/16 lm(t):3(2018-01-05T14:45:24.749+00:00) oob address=10.48.22.124/24  
 lm(t):2(2018-01-09T14:57:56.858+00:00) version=3.1(1i) lm(t):3(2018-01-09T14:57:55.461+00:00) chassisId=c4c33538-f058-11e7-8775-219757b8829 lm(t):3(2018-01-09T14:57:55.461+00:00)  
 capabilities=0X7FFFFFFF~0X2020~0X5 lm(t):3(2018-01-09T14:48:05.684+00:00) rK=(stable,present,0X206173722D687373) lm(t):2(2018-01-09T14:57:56.858+00:00)  
 aK=(stable,present,0X206173722D687373) lm(t):2(2018-01-09T14:57:56.858+00:00) cntrlSbst=(APPROVED, FCH1843V0DK) lm(t):3(2018-01-09T14:41:22.331+00:00) (targetMbSn=  
 lm(t):0(zeroTime), failoverStatus=0 lm(t):0(zeroTime)) podId=1 lm(t):3(2018-01-05T14:45:24.749+00:00) commissioned=YES lm(t):2(2018-01-09T14:35:38.792+00:00) registered=YES  
 lm(t):2(2018-01-09T14:35:38.804+00:00) standby=NO lm(t):1(2018-01-09T14:35:38.804+00:00) active=YES(2018-01-09T14:47:58.730+00:00) health={applnc:255 lm(t):3(2018-01-09T14:48:54.42  
 +00:00) svc's)

\*\*\*\*\*Additional elements outside of cluster\*\*\*\*\*

appliance id=4 address=15.0.0.4 lm(t):101(2018-01-09T14:57:54.426+00:00) tep address=15.0.0.0/16 lm(t):21(2018-01-09T14:57:47.378+00:00) oob address=10.48.31.27/24  
 lm(t):2(2018-01-09T14:57:55.201+00:00) version=3.1(1i) lm(t):21(2018-01-09T14:57:55.606+00:00) chassisId=5846ced4-f54d-11e7-a3dd-5f76b808dca3 lm(t):21(2018-01-09T14:57:55.606+00:00)  
 capabilities=0X7FFFFFFF~0X2020~0X100000 lm(t):21(2018-01-09T14:57:55.606+00:00) rK=(stable,absent,0) lm(t):0(zeroTime) aK=(stable,absent,0) lm(t):0(zeroTime) cntrlSbst=(APPROVED,  
 FCH2123V17P) lm(t):3(2018-01-09T14:57:54.473+00:00) (targetMbSn= lm(t):0(zeroTime), failoverStatus=0 lm(t):0(zeroTime)) podId=1 lm(t):101(2018-01-09T14:57:54.426+00:00)  
 commissioned=YES lm(t):3(2018-01-09T14:57:54.469+00:00) registered=YES lm(t):3(2018-01-09T14:57:54.469+00:00) standby=YES lm(t):101(2018-01-09T14:57:54.426+00:00) active=YES gw ad  
 dress=10.48.31.1 lm(t):2(2018-01-09T14:57:55.201+00:00) oob address v6=:/64 lm(t):2(2018-01-09T14:57:55.201+00:00) oob gw address v6=: lm(t):2(2018-01-09T14:57:55.201+00:00)  
 (2018-01-09T14:57:55.355+00:00) health={applnc:112 lm(t):21(2018-01-09T14:58:03.355+00:00) svc's'3} 1 lm(t):21(2018-01-09T14:57:51.483+00:00)[6]; 1 lm(t):21(2018-01-09T14:57:51.483+  
 00:00)[9]; 1 lm(t):21(2018-01-09T14:57:51.483+00:00)[10]; 1 lm(t):21(2018-01-09T14:57:51.483+00:00)[11]; 1 lm(t):21(2018-01-09T14:57:51.483+00:00)[14]; 1 lm(t):21(2018-01-09T14:57:51.483+  
 00:00)[16]; 1 lm(t):21(2018-01-09T14:57:51.483+00:00)[22]; 1 lm(t):21(2018-01-09T14:57:51.483+00:00)[23]; 1 lm(t):21(2018-01-09T14:57:51.483+00:00)[34]; 1 lm(t):21(2018-01-09T14:57:51.483  
 +00:00)[35]; 1 lm(t):21(2018-01-09T14:57:51.483+00:00))

clusterTime=<diff=739781 common=2018-01-09T14:58:14.989+00:00 local=2018-01-09T14:45:55.208+00:00 pF=<displForm=0 offsSt=0 offsVlu=0 lm(t):2(2018-01-09T14:49:26.492+00:00)>>

Cluster as Seen by Node

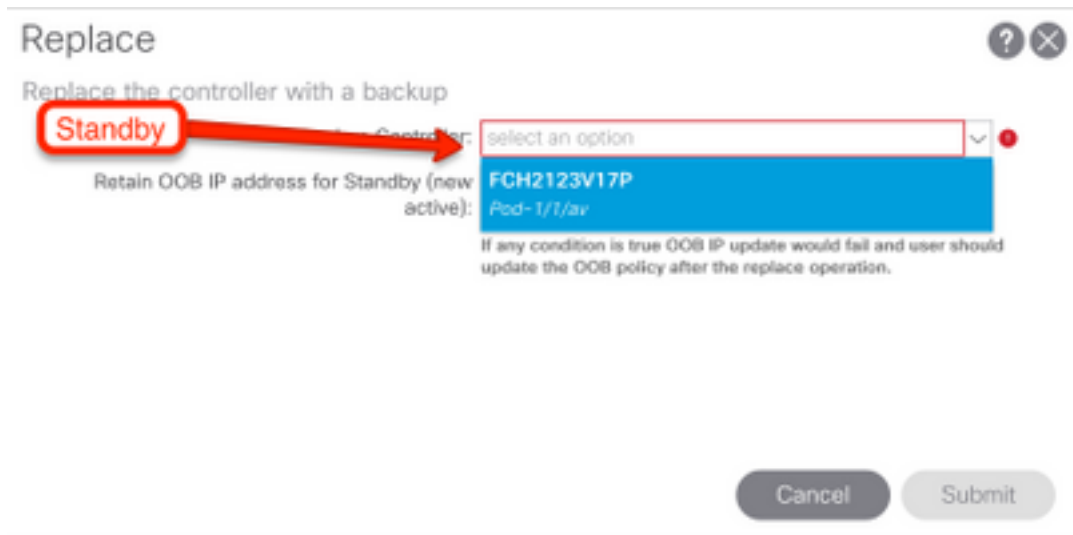
The screenshot shows a web interface for managing a cluster. The 'Properties' section displays: Fabric Name: POD15, Target Size: 3, Current Size: 3, and a time difference of 725292 ms. Under 'Active Controllers', there is a table with columns for ID, Name, IP, Admin State, Operational State, Health State, Failover Status, Serial Number, and SSL Certificate. Three controllers (APIC1, APIC2, APIC3) are listed as 'In Service' and 'Available'. A context menu is open over the 'Replace' button for APIC2. Below this, the 'Standby Controllers' section shows one controller (FCH2123V17P) in 'Standby Apic' mode.

ID	Name	IP	Admin State	Operational State	Health State	Failover Status	Serial Number	SSL Certificate
1	APIC1	15.0.0.1	In Service	Available	Fully Fit	idle	FCH1843V022	yes
2	APIC2	15.0.0.2	In Service	Available	Fully Fit	idle	FCH1846V2...	yes
3	APIC3	15.0.0.3	In Service	Available	Fully Fit	idle	H1843V0...	yes

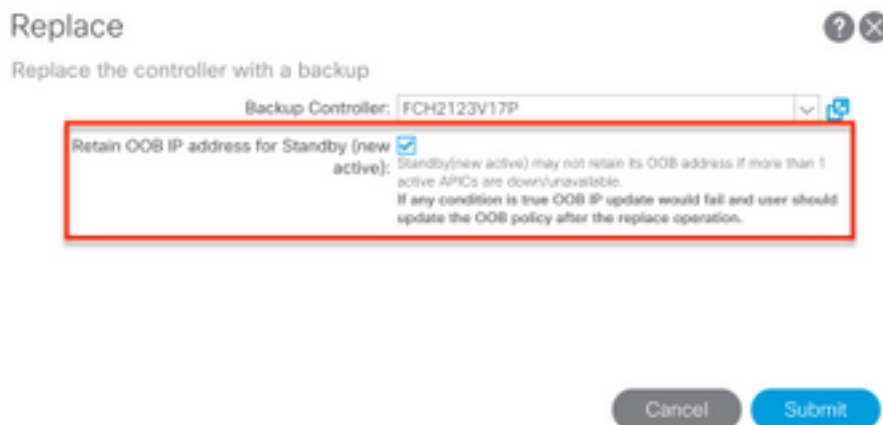
Serial Number	IP	Mode
FCH2123V17P	15.0.0.4	Standby Apic

對於多個備用APIC，您可以根據序列號選擇所需的備用APIC，在您執行更換過程時，已歸檔一個具有ID [CSCvh49791](#)的增強請求，以顯示備用APIC ID以及序列號。

如果您擁有多個備用裝置，則需要知道要用於更換的裝置的序列號，這很重要，尤其是當APIC位於不同的POD/站點時，並且在某些情況下，裝置的位置也很重要。



作為更換操作的一部分，可以選擇使用備用APIC OOB IP地址和詳細資訊更新帶外(OOB)策略，當備用裝置位於其他Pod中而原始POD IP地址不可在第二個POD中路由時，該選項會很有用。



提交配置後，更換過程即可開始重新調配備用裝置。

## Cluster as Seen by Node

### Properties

Fabric Name: POD15

Target Size: 3

Current Size: 3

Difference Between Local Time and Unified Cluster Time (ms): 725340

ACI Fabric Internode Secure Authentication Communications:

### Active Controllers

ID	Name	IP	Admin State	Operational State	Health State	Failover Status	Serial Number	SSL Certificate
1	APIC1	15.0.0.1	In Service	Available	Fully Fit	idle	FCH1843V022	yes
2	APIC2	15.0.0.2	In Service	Unavailable	Unknown	working-on-reprovisioning-standby	FCH1846V2...	yes
3	APIC3	15.0.0.3	In Service	Available	Fully Fit	idle	FCH1843V0...	yes

### Standby Controllers

Serial Number	IP	Mode	State
FCH2123V17P	15.0.0.4	Standby Apic	Approved

Reset

Submit



## Cluster as Seen by Node

### Properties

Fabric Name: POD15

Target Size: 3

Current Size: 3

Difference Between Local Time and Unified Cluster Time (ms): 725356

ACI Fabric Internode Secure Authentication Communications:

### Active Controllers

ID	Name	IP	Admin State	Operational State	Health State	Failover Status	Serial Number	SSL Certificate
1	APIC1	15.0.0.1	In Service	Available	Fully Fit	idle	FCH1843V022	yes
2	APIC2	0.0.0.0	In Service	Unregistered	Not Created	waiting-for-new-apic		yes
3	APIC3	15.0.0.3	In Service	Available	Fully Fit	idle	FCH1843V0...	yes

### Standby Controllers

Serial Number	IP	Mode	State
---------------	----	------	-------

No items have been found.  
Select Actions to create a new item.

Reset

Submit

**附註：**更換所需的時間是可變的，因為它取決於需要同步的配置/資料量，在空的配置實驗環境中，備用裝置完全複製並進入「完全適合」狀態大約需要10分鐘。

## Cluster as Seen by Node

Properties

Fabric Name: POD15  
 Target Size: 3  
 Current Size: 3  
 Difference Between Local Time and Unified Cluster Time (ms): 725790  
 ACI Fabric Internode Secure Authentication Communications:

Active Controllers

ID	Name	IP	Admin State	Operational State	Health State	Fallover Status	Serial Number	SSL Certificate
1	APIC1	15.0.0.1	In Service	Available	Fully Fit	idle	FCH1843V022	yes
3	APIC3	15.0.0.3	In Service	Available	Fully Fit	idle	FCH1843V0DK	yes
2	STDBYAPIC21	15.0.0.2	In Service	Available	Fully Fit	completed	FCH2123V17P	yes

## 附加程式

如果更換的APIC可以運行，可以將其置於「關閉」狀態以重新啟用它，需要通過思科整合管理控制器(CIMC)來完成。

The screenshot shows the Cisco Integrated Management Controller (CIMC) interface. On the left, there is a navigation menu with options like Summary, Inventory, Sensors, etc. The main area is titled 'Server Summary' and contains several sections:

- Overall Server Status:** Shows a 'Moderate Fault' warning.
- Actions:** A list of server management actions, with 'Power On Server' highlighted by a red box.
- Server Properties:** Displays details for a server, including Product Name (Not Available), Serial Number (FCH1846V2XU), PID (APIC-SERVER-M1), UUID, BIOS Version, and Description.
- Server Status:** Shows the current power state as 'Off'.

舊APIC無法訪問交換矩陣。

```

APIC2# acidiag fnvread
      ID  Pod ID      Name      Serial Number      IP Address      Role      State      LastUpdMsgId
-----
  101    1          LEAF101    SAL19069COL        15.0.88.64/32   leaf      inactive  0x100000000040c
  102    1          LEAF102    SAL19079J4L        15.0.240.65/32   leaf      inactive  0x100000000040d
  103    1          LEAF3     FDO20392L8S        15.0.240.66/32   leaf      inactive  0x100000000040e
  104    1          LEAF4     FDO20400M25        15.0.56.64/32    leaf      inactive  0x100000000040f
  201    1          SPINE1    SAL1925H0L8        15.0.88.65/32    spine     inactive  0x1000000000410
  202    1          SPINE2    SAL1925H0M4        15.0.240.64/32    spine     inactive  0x1000000000411

Total 6 nodes
APIC2#
    
```



## 驗證

目前沒有適用於此組態的驗證程序。

## 疑難排解

目前尚無適用於此組態的具體疑難排解資訊。