

# 配置备用APIC

## 目录

[简介](#)

[先决条件](#)

[要求](#)

[使用的组件](#)

[背景信息](#)

[配置](#)

[其他步骤](#)

[验证](#)

[故障排除](#)

## 简介

本文档介绍如何配置 思科应用策略基础设施控制器(APIC)上的冷备用功能。 备用APIC集群使您能够在主用/备用模式下在集群中运行APIC。在APIC集群中，指定的主用APIC共享负载，而指定的备用APIC可作为主用集群中任何APIC的替换。

从多瑙河版本 ( ACI 2.2软件版本 ) 开始，添加了备用APIC功能。

## 先决条件

### 要求

Cisco 建议您了解以下主题：

- 交换矩阵带外管理(OOB)
- APIC集群

### 使用的组件

本文档中的信息基于运行软件版本3.1(1i)的ACI交换矩阵。

该文档是从特定实验环境中的设备创建的。本文档中使用的所有设备最初均采用原始（默认）配置。如果您的网络处于活动状态，请确保您了解所有命令的潜在影响。

## 背景信息

- 它受单个和多Pod设置支持。
- 备用APIC可以连接到交换矩阵中任何POD中的任何枝叶。恢复少数交换矩阵/POD中的编辑功能。
- 备用APIC会自动更新固件更新，以使备用APIC与活动集群的固件版本保持相同。
- 在升级过程中，升级所有活动APIC后，备用APIC也会自动升级。

- 临时ID分配给备用APIC。备用APIC切换到活动APIC后，会分配新ID。
- 备用APIC上未启用管理登录。
- 要排除冷备用故障，您必须使用SSH作为救援用户登录到备用。
- 在切换期间，已更换的主用APIC断电，以防与已更换的APIC连接。备用APIC不参与策略配置或交换矩阵管理。
- 思科建议在与可替换的主用APIC相同的POD中使用备用APIC。不会将任何数据复制到备用设备，甚至不会复制管理员凭证(Rescue-user log in works)。
- 备用APIC不参与策略配置或管理。
- 不会将任何信息复制到备用控制器，包括管理员凭证。

## 配置

从版本2.2开始，初始配置脚本会提示一个新问题，询问此APIC是否为备用，默认值为[NO]，一旦回答为[YES]，必须选择备用控制器ID，该ID可以是活动APIC+1到29的数量，建议的范围从21到29开始。

- 必须有三个活动APIC才能添加备用APIC。
- 所需的最小集群大小为3 — 一个更大的数字可以是Standby。
- 必须将备用APIC引入与主用APIC版本相同的集群。
- 思科建议将备用APIC与可替换的主用APIC保留在同一POD中。

作为发现过程的一部分，备用APIC必须匹配：

交换矩阵域基础设施VLAN TEP地址池序列号已批准 — 在严格模式证书验证中

```
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]:
```

提交配置后，主用集群会自动发现备用APIC，并在备用控制器下可以看到它。

要将状态更改为“批准”，请单击“执行某项操作（当前状态）”，然后选择“接受控制器”，如图所示。

APIC Admin Dashboard - 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 Dashboard - 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 Dashboard - 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

成功发现后，主用和备用APIC之间会交换连续的保持连接消息，并且可以看到新的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:fcfc: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-f058-11e7-8775-2197757b8829 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

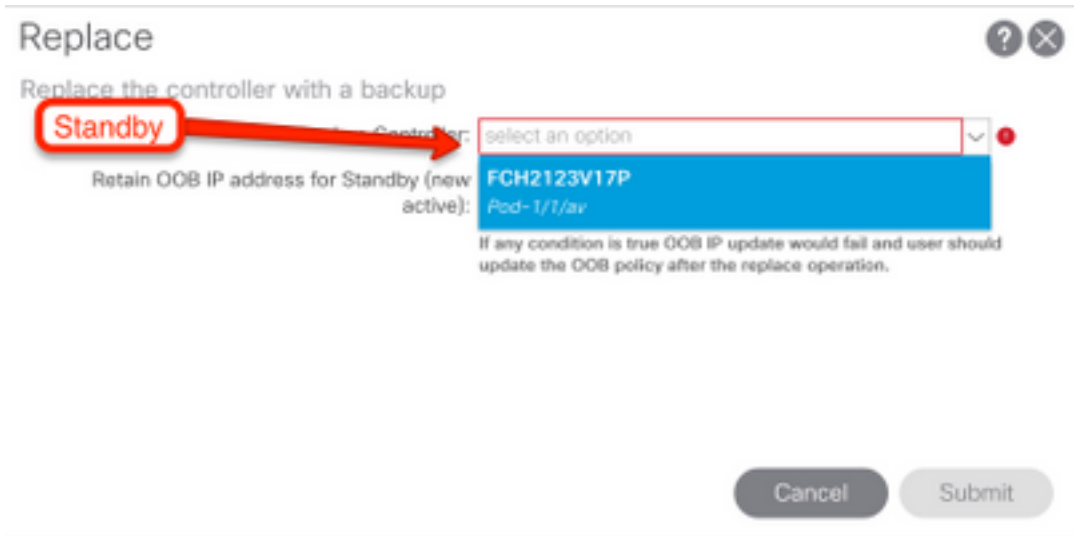
The screenshot shows a web interface for managing a cluster. The 'Properties' section displays: Fabric Name: POD15, Target Size: 3, Current Size: 3, and a time difference of 725292 ms. The 'Active Controllers' table lists three controllers (APIC1, APIC2, APIC3) all in 'In Service' and 'Available' states. A context menu is open over the APIC2 row, with 'Replace' highlighted in red. 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

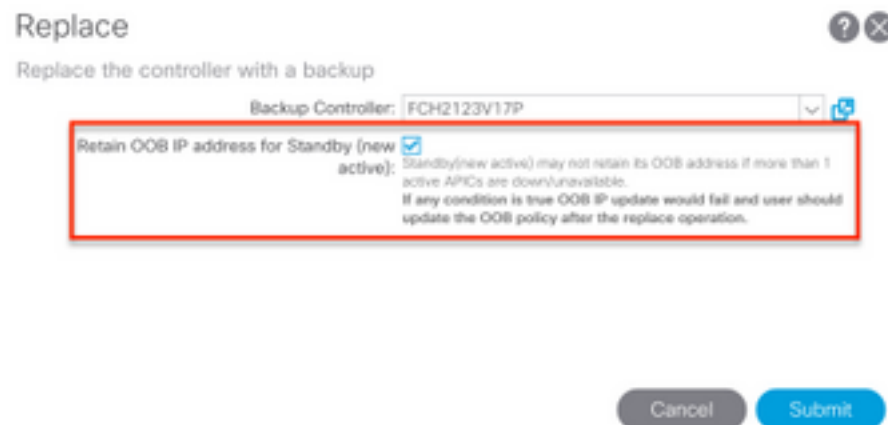
Serial Number	IP	Mode
FCH2123V17P	15.0.0.4	Standby Apic

在多个备用APIC的情况下，您可以根据序列号选择所需的备用APIC，在执行更换过程时，已提交ID为CSCvh49791的增强请求，以显示备用APIC ID和序列号。

如果您有多个备用设备，您需要知道他要用于更换的设备的序列号，这一点非常重要，特别是如果APIC位于不同的POD/站点，并且在某些情况下，设备的位置非常重要。



作为更换操作的一部分，有一个选项可以使用备用APIC OOB IP地址和详细信息更新带外(OOB)策略，这在备用设备位于不同的Pod中时是有益的，在该Pod中，原始POD IP地址在第二个POD中不可路由。



提交配置后，更换流程即可开始重新调配备用设备。

## 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

**注意：**更换所需的时间是可变的，因为它取决于需要同步的配置/数据量，在空的配置实验环境中，备用设备完全复制并进入完全适合状态可能需要大约10分钟。

Cluster as Seen by Node

Properties

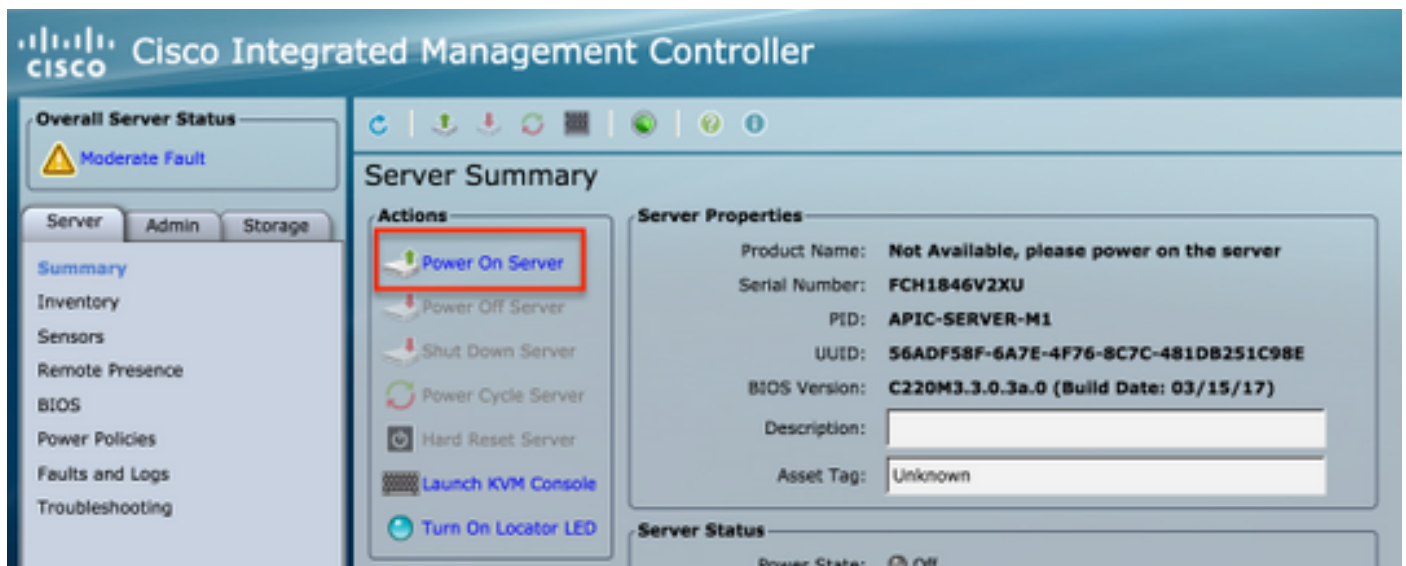
Fabric Name: POD15  
 Target Size: 3  
 Current Size: 3  
 Difference Between Local Time and Unified Cluster Time (ms): 725790  
 ACI Fabric Internode Secure Authentication Communications:

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

### 其他步骤

如果更换的APIC运行正常，可将其置于关闭状态，要重新启用它，需要通过思科集成管理控制器 (CIMC)完成。

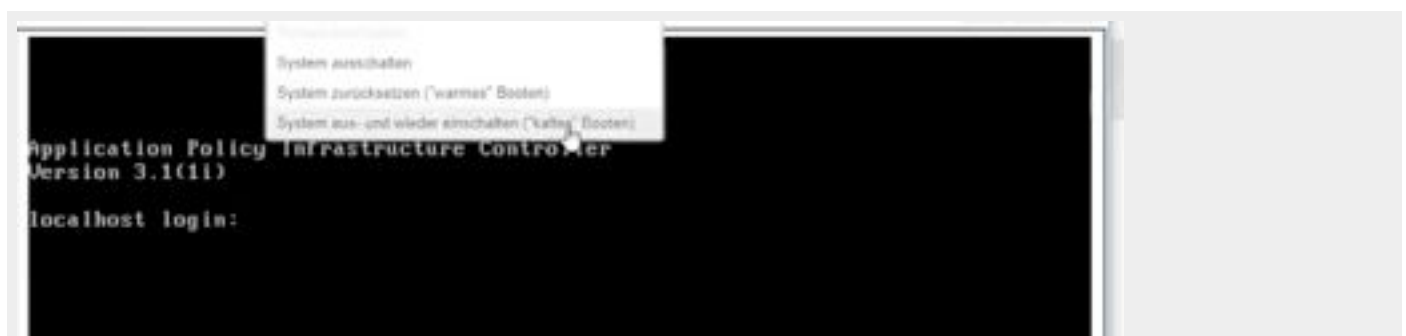


旧APIC无法访问交换矩阵。

```

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#
  
```



## 验证

当前没有可用于此配置的验证过程。

## 故障排除

目前没有针对此配置的故障排除信息。