

更換Ultra-M UCS 240M4伺服器中的主機板 — vEPC

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簡介

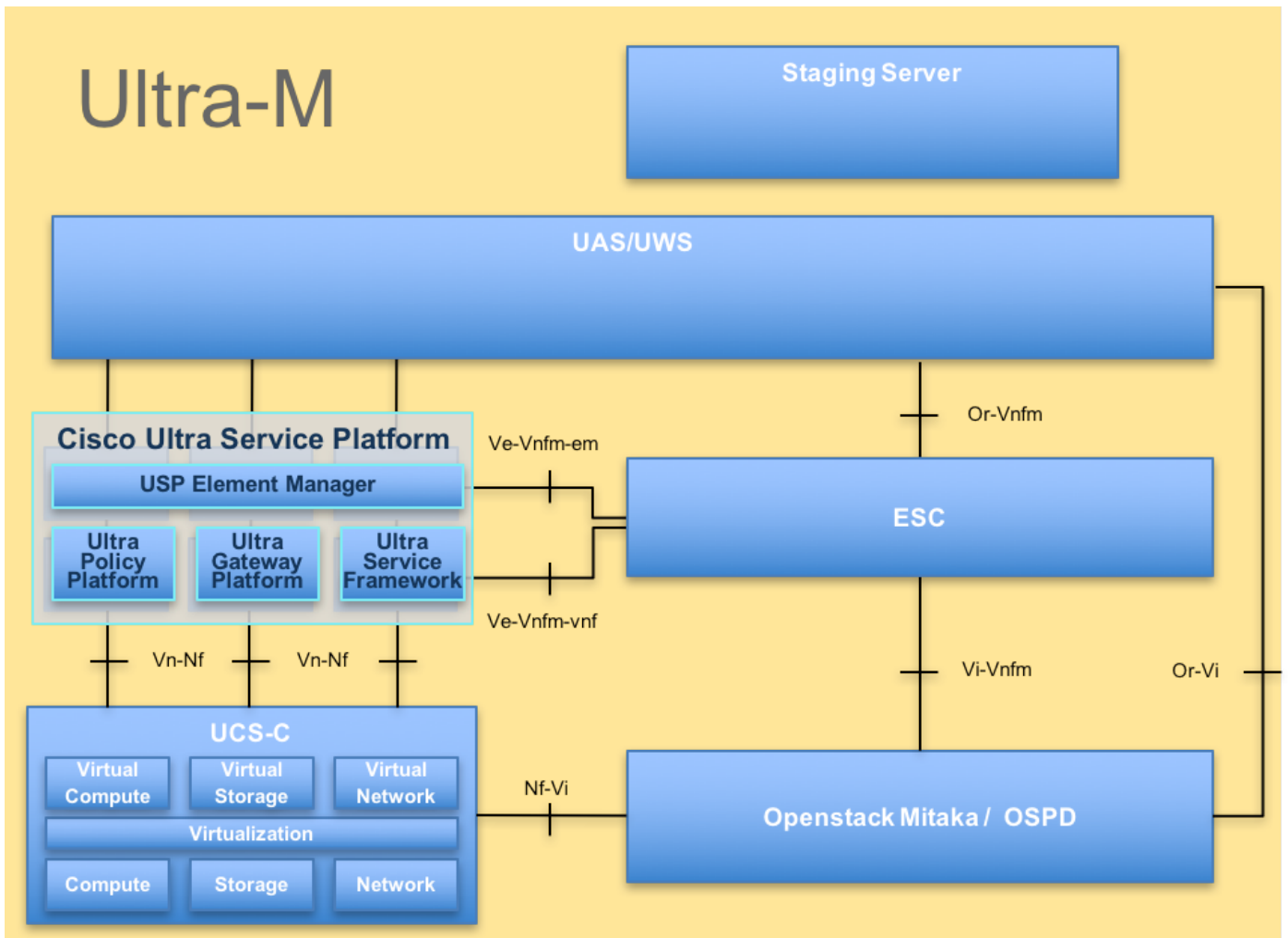
本文檔介紹在託管StarOS虛擬網路功能(VNF)的Ultra-M設定中更換有故障的伺服器的主機板所需的步驟。

背景資訊

Ultra-M是經過預先打包和驗證的虛擬化移動資料包核心解決方案，旨在簡化VNF的部署。OpenStack是適用於Ultra-M的虛擬化基礎架構管理員(VIM)，由以下節點型別組成：

- 計算
- 對象儲存磁碟 — 計算 (OSD — 計算)
- 控制器
- OpenStack平台 — 導向器(OSPD)

Ultra-M的高級體系結構及涉及的元件如下圖所示：



UltraM體系結構

本文檔面向熟悉Cisco Ultra-M平台的思科人員，詳細介紹在伺服器更換主機板時在OpenStack和StarOS VNF級別上需要執行的步驟。

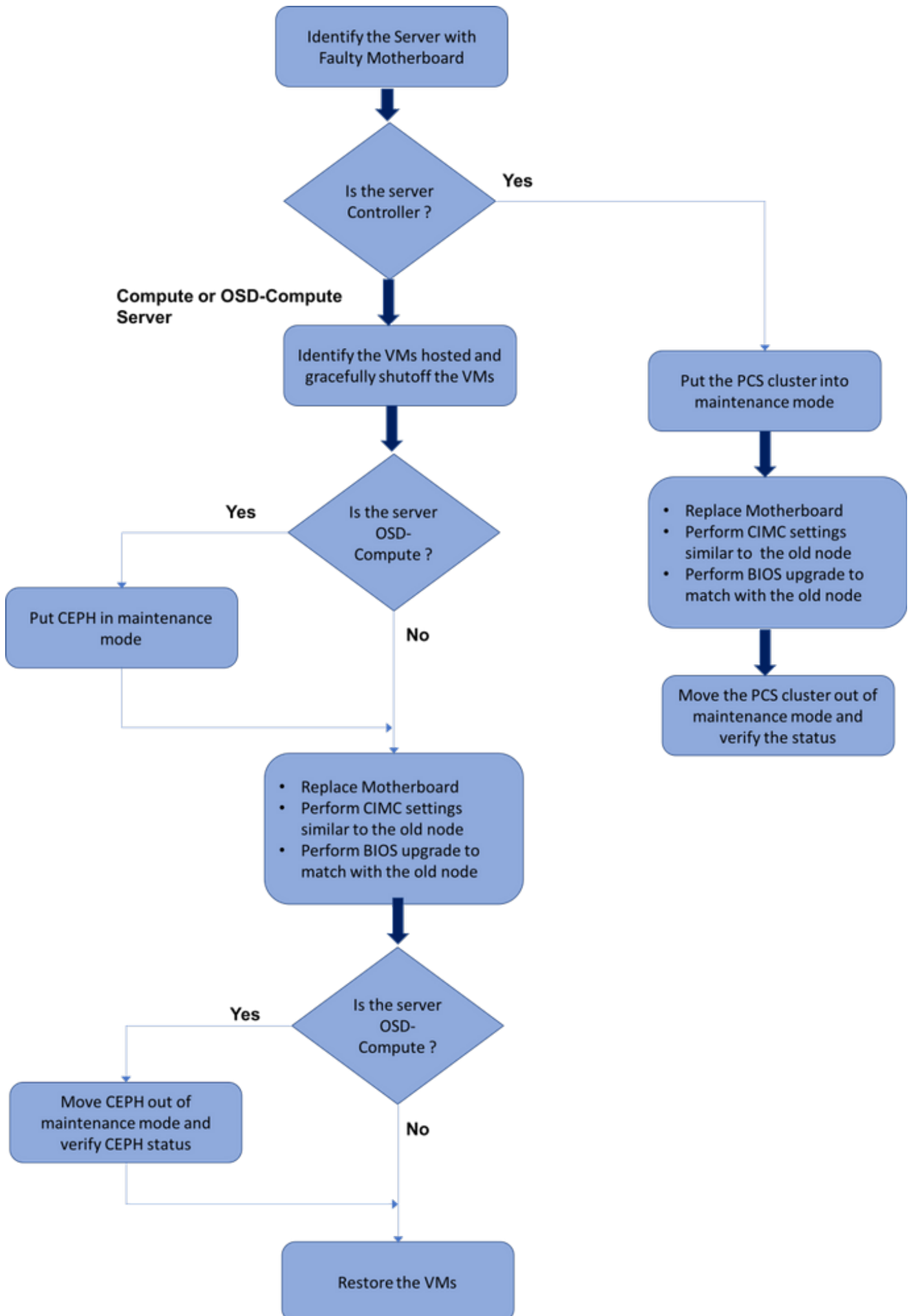
附註：Ultra M 5.1.x版本用於定義本文檔中的過程。

縮寫

VNF 虛擬網路功能
CF 控制功能

SF	服務功能
ESC	彈性服務控制器
澳門幣	程式方法
OSD	對象儲存磁碟
硬碟	硬碟驅動器
固態硬碟	固態驅動器
VIM	虛擬基礎架構管理員
虛擬機器	虛擬機器
EM	元素管理器
UAS	Ultra自動化服務
UUID	通用唯一識別符號

MoP的工作流程



Ultra-M設定中的主機板更換

在Ultra-M設定中，在以下伺服器型別中可能需要更換主機板：計算、OSD計算和控制器。

附註：更換主機板後，會更換安裝有OpenStack的啟動盤。因此，無需將節點重新新增到超雲中。更換活動結束後，一旦伺服器接通電源，它將自行註冊回重疊雲堆疊。

計算節點中的主機板更換

在活動之前，託管在「計算」節點中的VM會正常關閉。更換主機板後，VM將恢復回來。

確定計算節點中託管的VM

確定託管在Compute Server上的VM。可能發生兩種情況：

計算伺服器僅包含SF VM:

```
[stack@director ~]$ nova list --field name,host | grep compute-10
| 49ac5f22-469e-4b84-badc-031083db0533 | VNF2-DEPLOYM_s9_0_8bc6cc60-15d6-4ead-8b6a-
10e75d0e134d |
pod1-compute-10.localdomain |
```

計算伺服器包含虛擬機器的CF/ESC/EM/UAS組合：

```
[stack@director ~]$ nova list --field name,host | grep compute-8
| 507d67c2-1d00-4321-b9d1-da879af524f8 | VNF2-DEPLOYM_XXXX_0_c8d98f0f-d874-45d0-af75-
88a2d6fa82ea | pod1-compute-8.localdomain |
| f9c0763a-4a4f-4bbd-af51-bc7545774be2 | VNF2-DEPLOYM_c1_0_df4be88d-b4bf-4456-945a-
3812653ee229 | pod1-compute-8.localdomain |
| 75528898-ef4b-4d68-b05d-882014708694 | VNF2-ESC-ESC-
0 | pod1-compute-8.localdomain |
| f5bd7b9c-476a-4679-83e5-303f0aae9309 | VNF2-UAS-uas-
0 | pod1-compute-8.localdomain |
```

附註：此處顯示的輸出中，第一列與UUID相對應，第二列是VM名稱，第三列是存在VM的主機名。此輸出的引數將用於後續部分。

正常斷電

案例1.計算節點僅承載SF VM

登入到StarOS VNF並確定與SF VM對應的卡。使用從識別計算節點中託管的VM部分識別的SF VM的UUID，並識別與UUID對應的卡：

```
[local]VNF2# show card hardware
```

Tuesday night 08 16:49:42 UTC 2018

<snip>

Card 8:

```

Card Type           : 4-Port Service Function Virtual Card
CPU Packages        : 26 [#0, #1, #2, #3, #4, #5, #6, #7, #8, #9, #10, #11, #12, #13, #14,
#15, #16, #17, #18, #19, #20, #21, #22, #23, #24, #25]
CPU Nodes           : 2
CPU Cores/Threads   : 26
Memory              : 98304M (qvpc-di-large)
UUID/Serial Number  : 49AC5F22-469E-4B84-BADC-031083DB0533

```

<snip>

檢查卡的狀態：

[local]VNF2# show card table

Tuesday night 08 16:52:53 UTC 2018

Slot	Card Type	Oper State	SPOF	Attach
1: CFC	Control Function Virtual Card	Active	No	
2: CFC	Control Function Virtual Card	Standby	-	
3: FC	4-Port Service Function Virtual Card	Active	No	
4: FC	4-Port Service Function Virtual Card	Active	No	
5: FC	4-Port Service Function Virtual Card	Active	No	
6: FC	4-Port Service Function Virtual Card	Active	No	
7: FC	4-Port Service Function Virtual Card	Active	No	
8: FC	4-Port Service Function Virtual Card	Active	No	
9: FC	4-Port Service Function Virtual Card	Active	No	
10: FC	4-Port Service Function Virtual Card	Standby	-	

如果卡處於活動狀態，請將卡移至備用狀態：

[local]VNF2# card migrate from 8 to 10

登入到與VNF對應的ESC節點並檢查SF VM的狀態：

```

[admin@VNF2-esc-esc-0 ~]$ cd /opt/cisco/esc/esc-confd/esc-cli
[admin@VNF2-esc-esc-0 esc-cli]$ ./esc_nc_cli get esc_datamodel | egrep --color
"<state>|<vm_name>|<vm_id>|<deployment_name>"
<snip>
<state>SERVICE_ACTIVE_STATE</state>
    <vm_name>VNF2-DEPLOYM_c1_0_df4be88d-b4bf-4456-945a-3812653ee229</vm_name>
    <state>VM_ALIVE_STATE</state>
    <vm_name> VNF2-DEPLOYM_s9_0_8bc6cc60-15d6-4ead-8b6a-10e75d0e134d</vm_name>
    <state>VM_ALIVE_STATE</state>

```

<snip>

使用其VM名稱停止SF VM。(VM名稱，請參閱識別計算節點中託管的VM部分)

```

[admin@VNF2-esc-esc-0 esc-cli]$ ./esc_nc_cli vm-action STOP VNF2-DEPLOYM_s9_0_8bc6cc60-15d6-4ead-8b6a-10e75d0e134d

```

停止後，VM必須進入SHUTOFF狀態：

```

[admin@VNF2-esc-esc-0 ~]$ cd /opt/cisco/esc/esc-confd/esc-cli
[admin@VNF2-esc-esc-0 esc-cli]$ ./esc_nc_cli get esc_datamodel | egrep --color
"<state>|<vm_name>|<vm_id>|<deployment_name>"
<snip>
<state>SERVICE_ACTIVE_STATE</state>
    <vm_name>VNF2-DEPLOYM_c1_0_df4be88d-b4bf-4456-945a-3812653ee229</vm_name>

```

```

<state>VM_ALIVE_STATE</state>
<vm_name>VNF2-DEPLOYM_c3_0_3e0db133-c13b-4e3d-ac14-
<state>VM_ALIVE_STATE</state>
<vm_name>VNF2-DEPLOYM_s9_0_8bc6cc60-15d6-4ead-8b6a-10e75d0e134d</vm_name>
<state>VM_SHUTOFF_STATE</state>

```

<snip>

案例2.計算節點主機CF/ESC/EM/UAS

登入到StarOS VNF並確定與CF VM對應的卡。使用識別計算節點中託管的VM部分中標識的CF VM的UUID，並查詢與UUID對應的卡：

```

[local]VNF2# show card hardware
Tuesday night 08 16:49:42 UTC 2018
<snip>
Card 2:
Card Type           : Control Function Virtual Card
CPU Packages        : 8 [#0, #1, #2, #3, #4, #5, #6, #7]
CPU Nodes           : 1
CPU Cores/Threads   : 8
Memory              : 16384M (qvp-c-di-large)
UUID/Serial Number  : F9C0763A-4A4F-4BBD-AF51-BC7545774BE2
<snip>

```

檢查卡的狀態：

```

[local]VNF2# show card table
Tuesday night 08 16:52:53 UTC 2018
Slot      Card Type                               Oper State   SPOF  Attach
-----
1: CFC    Control Function Virtual Card             Standby      -
2: CFC    Control Function Virtual Card             Active       No
3: FC     4-Port Service Function Virtual Card      Active       No
4: FC     4-Port Service Function Virtual Card      Active       No
5: FC     4-Port Service Function Virtual Card      Active       No
6: FC     4-Port Service Function Virtual Card      Active       No
7: FC     4-Port Service Function Virtual Card      Active       No
8: FC     4-Port Service Function Virtual Card      Active       No
9: FC     4-Port Service Function Virtual Card      Active       No
10: FC    4-Port Service Function Virtual Card      Standby      -

```

如果卡處於活動狀態，請將卡移至備用狀態：

```
[local]VNF2# card migrate from 2 to 1
```

登入到與VNF對應的ESC節點並檢查VM的狀態：

```

[admin@VNF2-esc-esc-0 ~]$ cd /opt/cisco/esc/esc-confd/esc-cli
[admin@VNF2-esc-esc-0 esc-cli]$ ./esc_nc_cli get esc_datamodel | egrep --color
"<state>|<vm_name>|<vm_id>|<deployment_name>"
<snip>
<state>SERVICE_ACTIVE_STATE</state>
  <vm_name>VNF2-DEPLOYM_c1_0_df4be88d-b4bf-4456-945a-3812653ee229</vm_name>
  <state>VM_ALIVE_STATE</state>
  <vm_name>VNF2-DEPLOYM_c3_0_3e0db133-c13b-4e3d-ac14-
  <state>VM_ALIVE_STATE</state>
<deployment_name>VNF2-DEPLOYMENT-em</deployment_name>
  <vm_id>507d67c2-1d00-4321-b9d1-da879af524f8</vm_id>

```

```
<vm_id>dc168a6a-4aeb-4e81-abd9-91d7568b5f7c</vm_id>
<vm_id>9ffec58b-4b9d-4072-b944-5413bf7fcf07</vm_id>
<state>SERVICE_ACTIVE_STATE</state>
  <vm_name>VNF2-DEPLOYM_XXXX_0_c8d98f0f-d874-45d0-af75-88a2d6fa82ea</vm_name>
  <state>VM_ALIVE_STATE</state>
```

<snip>

使用其VM名稱逐一停止CF和EM VM。(VM名稱，請參閱識別計算節點中託管的VM部分❖❖)

```
[admin@VNF2-esc-esc-0 esc-cli]$ ./esc_nc_cli vm-action STOP VNF2-DEPLOYM_c1_0_df4be88d-b4bf-4456-945a-3812653ee229
```

```
[admin@VNF2-esc-esc-0 esc-cli]$ ./esc_nc_cli vm-action STOP VNF2-DEPLOYM_XXXX_0_c8d98f0f-d874-45d0-af75-88a2d6fa82ea
```

停止後，VM必須進入SHUTOFF狀態：

```
[admin@VNF2-esc-esc-0 ~]$ cd /opt/cisco/esc/esc-confd/esc-cli
[admin@VNF2-esc-esc-0 esc-cli]$ ./esc_nc_cli get esc_datamodel | egrep --color
"<state>|<vm_name>|<vm_id>|<deployment_name>"
<snip>
<state>SERVICE_ACTIVE_STATE</state>
  <vm_name>VNF2-DEPLOYM_c1_0_df4be88d-b4bf-4456-945a-3812653ee229</vm_name>
  <state>VM_SHUTOFF_STATE</state>
  <vm_name>VNF2-DEPLOYM_c3_0_3e0db133-c13b-4e3d-ac14-
  <state>VM_ALIVE_STATE</state>
<deployment_name>VNF2-DEPLOYMENT-em</deployment_name>
  <vm_id>507d67c2-1d00-4321-b9d1-da879af524f8</vm_id>
  <vm_id>dc168a6a-4aeb-4e81-abd9-91d7568b5f7c</vm_id>
  <vm_id>9ffec58b-4b9d-4072-b944-5413bf7fcf07</vm_id>
  <state>SERVICE_ACTIVE_STATE</state>
  <vm_name>VNF2-DEPLOYM_XXXX_0_c8d98f0f-d874-45d0-af75-88a2d6fa82ea</vm_name>
```

<snip>

登入到計算節點中託管的ESC並檢查它是否處於主狀態。如果是，將ESC切換到備用模式：

```
[admin@VNF2-esc-esc-0 esc-cli]$ escadm status
0 ESC status=0 ESC Master Healthy
```

```
[admin@VNF2-esc-esc-0 ~]$ sudo service keepalived stop
Stopping keepalived: [ OK ]
```

```
[admin@VNF2-esc-esc-0 ~]$ escadm status
1 ESC status=0 In SWITCHING_TO_STOP state. Please check status after a while.
```

```
[admin@VNF2-esc-esc-0 ~]$ sudo reboot
Broadcast message from admin@vnf1-esc-esc-0.novalocal
(/dev/pts/0) at 13:32 ...
The system is going down for reboot NOW!
```

更換主機板

有關更換UCS C240 M4伺服器主機板的步驟，請參閱：[Cisco UCS C240 M4伺服器安裝和服務指南](#)

使用CIMC IP登入到伺服器。

如果韌體與以前使用的推薦版本不一致，請執行BIOS升級。此處提供了BIOS升級步驟：[Cisco UCS C系列機架式伺服器BIOS升級指南](#)

恢復虛擬機器

案例1.計算節點僅承載SF VM

SF VM在新星清單中處於錯誤狀態：

```
[stack@director ~]$ nova list |grep VNF2-DEPLOYM_s9_0_8bc6cc60-15d6-4ead-8b6a-10e75d0e134d
| 49ac5f22-469e-4b84-badc-031083db0533 | VNF2-DEPLOYM_s9_0_8bc6cc60-15d6-4ead-8b6a-10e75d0e134d
| ERROR | - | NOSTATE |
```

從ESC恢復SF VM:

```
[admin@VNF2-esc-esc-0 ~]$ sudo /opt/cisco/esc/esc-confd/esc-cli/esc_nc_cli recovery-vm-action DO
VNF2-DEPLOYM_s9_0_8bc6cc60-15d6-4ead-8b6a-10e75d0e134d
[sudo] password for admin:
```

Recovery VM Action

```
/opt/cisco/esc/confd/bin/netconf-console --port=830 --host=127.0.0.1 --user=admin --
privKeyFile=/root/.ssh/confd_id_dsa --privKeyType=dsa --rpc=/tmp/esc_nc_cli.ZpRCGiieuW
<?xml version="1.0" encoding="UTF-8"?>
<rpc-reply xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="1">
  <ok/>
</rpc-reply>
```

監控yangesc.log:

```
admin@VNF2-esc-esc-0 ~]$ tail -f /var/log/esc/yangesc.log
...
14:59:50,112 07-Nov-2017 WARN Type: VM_RECOVERY_COMPLETE
14:59:50,112 07-Nov-2017 WARN Status: SUCCESS
14:59:50,112 07-Nov-2017 WARN Status Code: 200
14:59:50,112 07-Nov-2017 WARN Status Msg: Recovery: Successfully recovered VM [VNF2-
DEPLOYM_s9_0_8bc6cc60-15d6-4ead-8b6a-10e75d0e134d].
```

確保SF卡在VNF中作為備用SF啟動。

案例2.計算節點承載UAS、ESC、EM和CF

恢復UAS虛擬機器

檢查UAS VM在新星清單中的狀態並將其刪除：

```
[stack@director ~]$ nova list | grep VNF2-UAS-uas-0
| 307a704c-a17c-4cdc-8e7a-3d6e7e4332fa | VNF2-UAS-uas-0
| ACTIVE | - | Running | VNF2-UAS-uas-
orchestration=172.168.11.10; VNF2-UAS-uas-management=172.168.10.3
[stack@tb5-ospd ~]$ nova delete VNF2-UAS-uas-0
Request to delete server VNF2-UAS-uas-0 has been accepted.
```

要恢復AutoVNF-UAS虛擬機器，請運行UAS-check指令碼以檢查狀態。它必須報告錯誤。然後使用— fix選項再次運行，以重新建立缺失的UAS VM:

```
[stack@director ~]$ cd /opt/cisco/usp/uas-installer/scripts/
[stack@director scripts]$ ./uas-check.py auto-vnf VNF2-UAS
2017-12-08 12:38:05,446 - INFO: Check of AutoVNF cluster started
2017-12-08 12:38:07,925 - INFO: Instance 'vnf1-UAS-uas-0' status is 'ERROR'
2017-12-08 12:38:07,925 - INFO: Check completed, AutoVNF cluster has recoverable errors

[stack@director scripts]$ ./uas-check.py auto-vnf VNF2-UAS --fix
2017-11-22 14:01:07,215 - INFO: Check of AutoVNF cluster started
2017-11-22 14:01:09,575 - INFO: Instance VNF2-UAS-uas-0' status is 'ERROR'
2017-11-22 14:01:09,575 - INFO: Check completed, AutoVNF cluster has recoverable errors
2017-11-22 14:01:09,778 - INFO: Removing instance VNF2-UAS-uas-0'
2017-11-22 14:01:13,568 - INFO: Removed instance VNF2-UAS-uas-0'
2017-11-22 14:01:13,568 - INFO: Creating instance VNF2-UAS-uas-0' and attaching volume 'VNF2-
UAS-uas-vol-0'
2017-11-22 14:01:49,525 - INFO: Created instance 'VNF2-UAS-uas-0'
```

登入到AutoVNF-UAS。等待幾分鐘，然後您會看到UAS返回正常狀態：

```
VNF2-autovnf-uas-0#show uas
uas version 1.0.1-1
uas state ha-active
uas ha-vip 172.17.181.101
INSTANCE IP STATE ROLE
-----
172.17.180.6 alive CONFD-SLAVE
172.17.180.7 alive CONFD-MASTER
172.17.180.9 alive NA
```

恢復ESC虛擬機器

從新星清單中檢查ESC VM的狀態並將其刪除：

```
stack@director scripts]$ nova list |grep ESC-1
| c566efbf-1274-4588-a2d8-0682e17b0d41 | VNF2-ESC-ESC-
1 | ACTIVE | - | Running | VNF2-
UAS-uas-orchestration=172.168.11.14; VNF2-UAS-uas-
management=172.168.10.4

[stack@director scripts]$ nova delete VNF2-ESC-ESC-1
Request to delete server VNF2-ESC-ESC-1 has been accepted.
```

在AutoVNF-UAS中查詢ESC部署事務，並在事務的日誌中查詢boot_vm.py命令列以建立ESC例項：

```
ubuntu@VNF2-uas-uas-0:~$ sudo -i
root@VNF2-uas-uas-0:~# confd_cli -u admin -C
Welcome to the ConfD CLI
admin connected from 127.0.0.1 using console on VNF2-uas-uas-0
```

VNF2-uas-uas-0#show transaction

TX ID	TX TYPE	DEPLOYMENT ID	TIMESTAMP	STATUS
35eefc4a-d4a9-11e7-bb72-fa163ef8df2b	vnf-deployment	VNF2-DEPLOYMENT	2017-11-29T02:01:27.750692-00:00	deployment-success
73d9c540-d4a8-11e7-bb72-fa163ef8df2b	vnfm-deployment	VNF2-ESC	2017-11-29T01:56:02.133663-00:00	deployment-success

VNF2-uas-uas-0#show logs 73d9c540-d4a8-11e7-bb72-fa163ef8df2b | display xml

```
<config xmlns="http://tail-f.com/ns/config/1.0">
  <logs xmlns="http://www.cisco.com/usp/nfv/usp-autovnf-oper">
    <tx-id>73d9c540-d4a8-11e7-bb72-fa163ef8df2b</tx-id>
    <log>2017-11-29 01:56:02,142 - VNFM Deployment RPC triggered for deployment: VNF2-ESC,
deactivate: 0
2017-11-29 01:56:02,179 - Notify deployment
..
2017-11-29 01:57:30,385 - Creating VNFM 'VNF2-ESC-ESC-1' with [python //opt/cisco/vnf-
staging/bootvm.py VNF2-ESC-ESC-1 --flavor VNF2-ESC-ESC-flavor --image 3fe6b197-961b-4651-af22-
dfd910436689 --net VNF2-UAS-uas-management --gateway_ip 172.168.10.1 --net VNF2-UAS-uas-
orchestration --os_auth_url http://10.1.2.5:5000/v2.0 --os_tenant_name core --os_username *****
--os_password ***** --bs_os_auth_url http://10.1.2.5:5000/v2.0 --bs_os_tenant_name core --
bs_os_username ***** --bs_os_password ***** --esc_ui_startup false --esc_params_file
/tmp/esc_params.cfg --encrypt_key ***** --user_pass ***** --user_confid_pass ***** --kad_vif
eth0 --kad_vip 172.168.10.7 --ipaddr 172.168.10.6 dhcp --ha_node_list 172.168.10.3 172.168.10.6
--file root:0755:/opt/cisco/esc/esc-
scripts/esc_volume_em_staging.sh:/opt/cisco/usp/uas/autovnf/vnfms/esc-
scripts/esc_volume_em_staging.sh --file root:0755:/opt/cisco/esc/esc-
scripts/esc_vpc_chassis_id.py:/opt/cisco/usp/uas/autovnf/vnfms/esc-scripts/esc_vpc_chassis_id.py
--file root:0755:/opt/cisco/esc/esc-scripts/esc-vpc-di-internal-
keys.sh:/opt/cisco/usp/uas/autovnf/vnfms/esc-scripts/esc-vpc-di-internal-keys.sh
```

將boot_vm.py行儲存到shell指令碼檔案(esc.sh)，並使用正確的資訊(通常為core/<PASSWORD>)更新所有使用者名稱*****和密碼*****行。也需要刪除—encrypt_key選項。對於user_pass和user_confid_pass，您需要使用格式—username:密碼(示例—admin:<PASSWORD>)。

從running-config查詢bootvm.py的URL，並獲取bootvm.py檔案到AutoVNF UAS VM。在這種情況下，10.1.2.3是AutoIT VM的IP:

```
root@VNF2-uas-uas-0:~# confd_cli -u admin -C
Welcome to the ConfD CLI
admin connected from 127.0.0.1 using console on VNF2-uas-uas-0
VNF2-uas-uas-0#show running-config autovnf-vnfm:vnfm
...
configs bootvm
  value http:// 10.1.2.3:80/bundles/5.1.7-2007/vnfm-bundle/bootvm-2_3_2_155.py
!

root@VNF2-uas-uas-0:~# wget http://10.1.2.3:80/bundles/5.1.7-2007/vnfm-bundle/bootvm-
2_3_2_155.py
--2017-12-01 20:25:52-- http://10.1.2.3 /bundles/5.1.7-2007/vnfm-bundle/bootvm-2_3_2_155.py
Connecting to 10.1.2.3:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 127771 (125K) [text/x-python]
Saving to: 'bootvm-2_3_2_155.py'
100%[=====]
127,771 --.-K/s in 0.001s
2017-12-01 20:25:52 (173 MB/s) - 'bootvm-2_3_2_155.py' saved [127771/127771]
```

建立/tmp/esc_params.cfg檔案：

```
root@VNF2-uas-uas-0:~# echo "openstack.endpoint=publicURL" > /tmp/esc_params.cfg
```

執行shell指令碼以便從UAS節點部署ESC:

```
root@VNF2-uas-uas-0:~# /bin/sh esc.sh
+ python ./bootvm.py VNF2-ESC-ESC-1 --flavor VNF2-ESC-ESC-flavor --image 3fe6b197-961b-4651-af22-dfd910436689
--net VNF2-UAS-uas-management --gateway_ip 172.168.10.1 --net VNF2-UAS-uas-orchestration --os_auth_url
http://10.1.2.5:5000/v2.0 --os_tenant_name core --os_username core --os_password <PASSWORD> --bs_os_auth_url
http://10.1.2.5:5000/v2.0 --bs_os_tenant_name core --bs_os_username core --bs_os_password <PASSWORD>
--esc_ui_startup false --esc_params_file /tmp/esc_params.cfg --user_pass admin:<PASSWORD> --user_confid_pass
admin:<PASSWORD> --kad_vif eth0 --kad_vip 172.168.10.7 --ipaddr 172.168.10.6 dhcp --ha_node_list 172.168.10.3
172.168.10.6 --file root:0755:/opt/cisco/esc/esc-scripts/esc_volume_em_staging.sh:/opt/cisco/usp/uas/autovnf/vnfms/esc-scripts/esc_volume_em_staging.sh
--file root:0755:/opt/cisco/esc/esc-scripts/esc_vpc_chassis_id.py:/opt/cisco/usp/uas/autovnf/vnfms/esc-scripts/esc_vpc_chassis_id.py
--file root:0755:/opt/cisco/esc/esc-scripts/esc-vpc-di-internal-keys.sh:/opt/cisco/usp/uas/autovnf/vnfms/esc-scripts/esc-vpc-di-internal-keys.sh
```

登入到新的ESC並驗證備份狀態：

```
ubuntu@VNF2-uas-uas-0:~$ ssh admin@172.168.11.14
...
#####
#   ESC on VNF2-esc-esc-1.novalocal is in BACKUP state.
#####

[admin@VNF2-esc-esc-1 ~]$ escadm status
0 ESC status=0 ESC Backup Healthy

[admin@VNF2-esc-esc-1 ~]$ health.sh
===== ESC HA (BACKUP) =====
ESC HEALTH PASSED
```

從ESC恢復CF和EM虛擬機器

從新星清單中檢查CF和EM VM的狀態。它們必須處於ERROR狀態：

```
[stack@director ~]$ source corerc
[stack@director ~]$ nova list --field name,host,status |grep -i err
| 507d67c2-1d00-4321-b9d1-da879af524f8 | VNF2-DEPLOYM_XXXX_0_c8d98f0f-d874-45d0-af75-88a2d6fa82ea | None | ERROR|
| f9c0763a-4a4f-4bbd-af51-bc7545774be2 | VNF2-DEPLOYM_c1_0_df4be88d-b4bf-4456-945a-3812653ee229 |None | ERROR
```

登入到ESC主伺服器，為每個受影響的EM和CF VM運行recovery-vm-action。耐心點。ESC會安排恢復操作，此操作可能在幾分鐘內不會發生。監控yangesc.log:

```
sudo /opt/cisco/esc/esc-confd/esc-cli/esc_nc_cli recovery-vm-action DO
```

```
[admin@VNF2-esc-esc-0 ~]$ sudo /opt/cisco/esc/esc-confd/esc-cli/esc_nc_cli recovery-vm-action DO
VNF2-DEPLOYMENT-_VNF2-D_0_a6843886-77b4-4f38-b941-74eb527113a8
[sudo] password for admin:
```

Recovery VM Action

```
/opt/cisco/esc/confd/bin/netconf-console --port=830 --host=127.0.0.1 --user=admin --
privKeyFile=/root/.ssh/confd_id_dsa --privKeyType=dsa --rpc=/tmp/esc_nc_cli.ZpRCGiieuW
<?xml version="1.0" encoding="UTF-8"?>
<rpc-reply xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="1">
  <ok/>
</rpc-reply>
```

```
[admin@VNF2-esc-esc-0 ~]$ tail -f /var/log/esc/yangesc.log
```

```
...
14:59:50,112 07-Nov-2017 WARN Type: VM_RECOVERY_COMPLETE
14:59:50,112 07-Nov-2017 WARN Status: SUCCESS
14:59:50,112 07-Nov-2017 WARN Status Code: 200
14:59:50,112 07-Nov-2017 WARN Status Msg: Recovery: Successfully recovered VM [VNF2-DEPLOYMENT-
_VNF2-D_0_a6843886-77b4-4f38-b941-74eb527113a8]
```

登入到新EM並驗證EM狀態是否為up:

```
ubuntu@VNF2vnfddeploymentem-1:~$ /opt/cisco/ncs/current/bin/ncs_cli -u admin -C
admin connected from 172.17.180.6 using ssh on VNF2vnfddeploymentem-1
admin@scm# show ems
EM          VNFM
ID  SLA  SCM  PROXY
-----
2   up   up   up
3   up   up   up
```

登入到StarOS VNF並驗證CF卡是否處於備用狀態。

處理ESC恢復失敗

如果ESC由於意外狀態而無法啟動VM，建議通過重新啟動主ESC執行ESC切換。ESC切換大約需要一分鐘。在新的主ESC上運行health.sh指令碼以檢查狀態是否為up。主ESC啟動VM並修復VM狀態。完成此恢復任務最多需要5分鐘。

您可以監控/var/log/esc/yangesc.log和/var/log/esc/escmanager.log。如果您在5-7分鐘之後沒有看到虛擬機器被恢復，則使用者需要手動恢復受影響的虛擬機器。

OSD計算節點中的主機板更換

在活動之前，託管在「計算」節點中的VM將正常關閉，並且Ceph將進入維護模式。更換主機板後，VM會恢復回來，Ceph會移出維護模式。

將Ceph置於維護模式

驗證伺服器中的ceph osd樹狀態是否為up。

```
[heat-admin@pod1-osd-compute-1 ~]$ sudo ceph osd tree
```

ID	WEIGHT	TYPE	NAME	UP/DOWN	REWEIGHT	PRIMARY-AFFINITY
-1	13.07996	root	default			
-2	4.35999	host	pod1-osd-compute-0			
0	1.09000		osd.0	up	1.00000	1.00000
3	1.09000		osd.3	up	1.00000	1.00000
6	1.09000		osd.6	up	1.00000	1.00000
9	1.09000		osd.9	up	1.00000	1.00000
-3	4.35999	host	pod1-osd-compute-2			
1	1.09000		osd.1	up	1.00000	1.00000
4	1.09000		osd.4	up	1.00000	1.00000
7	1.09000		osd.7	up	1.00000	1.00000
10	1.09000		osd.10	up	1.00000	1.00000
-4	4.35999	host	pod1-osd-compute-1			
2	1.09000		osd.2	up	1.00000	1.00000
5	1.09000		osd.5	up	1.00000	1.00000
8	1.09000		osd.8	up	1.00000	1.00000
11	1.09000		osd.11	up	1.00000	1.00000

登入到OSD Compute節點，並將Ceph置於維護模式。

```
[root@pod1-osd-compute-1 ~]# sudo ceph osd set norebalance
[root@pod1-osd-compute-1 ~]# sudo ceph osd set noout
```

```
[root@pod1-osd-compute-1 ~]# sudo ceph status
```

```
cluster eb2bb192-b1c9-11e6-9205-525400330666
health HEALTH_WARN
noout,norebalance,sortbitwise,require_jewel_osds flag(s) set
monmap e1: 3 mons at {pod1-controller-0=11.118.0.40:6789/0,pod1-controller-1=11.118.0.41:6789/0,pod1-controller-2=11.118.0.42:6789/0}
election epoch 58, quorum 0,1,2 pod1-controller-0,pod1-controller-1,pod1-controller-2
osdmap e194: 12 osds: 12 up, 12 in
flags noout,norebalance,sortbitwise,require_jewel_osds
pgmap v584865: 704 pgs, 6 pools, 531 GB data, 344 kobjects
1585 GB used, 11808 GB / 13393 GB avail
704 active+clean
client io 463 kB/s rd, 14903 kB/s wr, 263 op/s rd, 542 op/s wr
```

附註：刪除Ceph後，VNF HD RAID進入「降級」狀態，但HDD必須仍然可以訪問。

確定Osd-Compute節點中託管的VM

確定OSD計算伺服器上託管的VM。可能發生兩種情況：

osd-compute伺服器包含VM的元素管理器(EM)/UAS/自動部署/自動IT組合：

```
[stack@director ~]$ nova list --field name,host | grep osd-compute-0
| c6144778-9afd-4946-8453-78c817368f18 | AUTO-DEPLOY-VNF2-uas-0 | pod1-osd-compute-0.localdomain
```

```
|
| 2d051522-bce2-4809-8d63-0c0e17f251dc | AUTO-IT-VNF2-uas-0 | pod1-osd-compute-0.localdomain |
| 507d67c2-1d00-4321-b9d1-da879af524f8 | VNF2-DEPLOYM_XXXX_0_c8d98f0f-d874-45d0-af75-
88a2d6fa82ea | pod1-osd-compute-0.localdomain |
| f5bd7b9c-476a-4679-83e5-303f0aae9309 | VNF2-UAS-uas-0 | pod1-osd-compute-0.localdomain |
```

計算伺服器包含控制功能(CF)/彈性服務控制器(ESC)/元素管理器(EM)/(UAS)組合VM:

```
[stack@director ~]$ nova list --field name,host | grep osd-compute-1
| 507d67c2-1d00-4321-b9d1-da879af524f8 | VNF2-DEPLOYM_XXXX_0_c8d98f0f-d874-45d0-af75-
88a2d6fa82ea | pod1-compute-8.localdomain |
| f9c0763a-4a4f-4bbd-af51-bc7545774be2 | VNF2-DEPLOYM_c1_0_df4be88d-b4bf-4456-945a-
3812653ee229 | pod1-compute-8.localdomain |
| 75528898-ef4b-4d68-b05d-882014708694 | VNF2-ESC-ESC-
0 | pod1-compute-8.localdomain |
| f5bd7b9c-476a-4679-83e5-303f0aae9309 | VNF2-UAS-uas-
0 | pod1-compute-8.localdomain |
```

附註：此處顯示的輸出中，第一列與UUID相對應，第二列是VM名稱，第三列是存在VM的主機名。此輸出的引數將在後續章節中使用。

正常斷電

案例1. OSD計算節點主機CF/ESC/EM/UAS

無論CF/ESC/EM/UAS VM是託管在Compute節點還是OSD-Compute節點中，其優雅的強大功能的過程都是相同的。按照Compute Node中的Motherboard Replacement中的步驟正常關閉VM。

案例2. OSD計算節點託管自動部署/自動執行/EM/UAS

備份自動部署的CDB

定期或在每次啟用/取消啟用後備份autodeploy confd cdb資料並將檔案儲存到備份伺服器。自動部署不是冗餘的，如果此資料丟失，您將無法正常停用部署。

登入到AutoDeploy VM並備份confd cdb目錄。

```
ubuntu@auto-deploy-iso-2007-uas-0:~ $sudo -i
```

```
root@auto-deploy-iso-2007-uas-0:~#service uas-confd stop
uas-confd stop/waiting
```

```
root@auto-deploy-iso-2007-uas-0:~# cd /opt/cisco/usp/uas/confd-6.3.1/var/confd
root@auto-deploy-iso-2007-uas-0:/opt/cisco/usp/uas/confd-6.3.1/var/confd#tar cvf
autodeploy_cdb_backup.tar cdb/
cdb/
cdb/O.cdb
cdb/C.cdb
cdb/aaa_init.xml
cdb/A.cdb
```

```
root@auto-deploy-iso-2007-uas-0:~# service uas-confd start
uas-confd start/running, process 13852
```

註:opy autodeploy_cdb_backup.tar用於備份伺服器。

從自動IT備份System.cfg

備份system.cfg檔案以備份伺服器：

```
Auto-it = 10.1.1.2
Backup server = 10.2.2.2

[stack@director ~]$ ssh ubuntu@10.1.1.2
ubuntu@10.1.1.2's password:
Welcome to Ubuntu 14.04.3 LTS (GNU/Linux 3.13.0-76-generic x86_64)

* Documentation:  https://help.ubuntu.com/

System information as of Wed Jun 13 16:21:34 UTC 2018

System load:  0.02                Processes:            87
Usage of /:   15.1% of 78.71GB     Users logged in:     0
Memory usage: 13%                 IP address for eth0: 172.16.182.4
Swap usage:   0%

Graph this data and manage this system at:
  https://landscape.canonical.com/

Get cloud support with Ubuntu Advantage Cloud Guest:
  http://www.ubuntu.com/business/services/cloud

Cisco Ultra Services Platform (USP)
  Build Date: Wed Feb 14 12:58:22 EST 2018
  Description: UAS build assemble-uas#1891
  sha1: bf02ced

ubuntu@auto-it-vnf-uas-0:~$ scp -r /opt/cisco/usp/uploads/system.cfg root@10.2.2.2:/home/stack
root@10.2.2.2's password:
system.cfg

          100% 565      0.6KB/s   00:00
ubuntu@auto-it-vnf-uas-0:~$
```

附註：無論VM是託管在Compute節點還是OSD-Compute節點中，EM/UAS虛擬機器正常運行的過程都是相同的。

按照Compute Node中的Motherboard Replacement中的步驟，正常關閉這些VM的電源。

更換主機板

有關更換UCS C240 M4伺服器主機板的步驟，請參閱：[Cisco UCS C240 M4伺服器安裝和服務指南](#)

使用CIMC IP登入到伺服器。

如果韌體與以前使用的推薦版本不一致，請執行BIOS升級。此處提供了BIOS升級步驟：[Cisco UCS C系列機架式伺服器BIOS升級指南](#)

將Ceph移出維護模式

登入到OSD Compute節點，並將Ceph從維護模式中移出。

```
[root@pod1-osd-compute-1 ~]# sudo ceph osd unset norebalance
[root@pod1-osd-compute-1 ~]# sudo ceph osd unset noout

[root@pod1-osd-compute-1 ~]# sudo ceph status

cluster eb2bb192-b1c9-11e6-9205-525400330666
health HEALTH_OK
monmap e1: 3 mons at {pod1-controller-0=11.118.0.40:6789/0,pod1-controller-1=11.118.0.41:6789/0,pod1-controller-2=11.118.0.42:6789/0}
election epoch 58, quorum 0,1,2 pod1-controller-0,pod1-controller-1,pod1-controller-2
osdmap e196: 12 osds: 12 up, 12 in
flags sortbitwise,require_jewel_osds
pgmap v584954: 704 pgs, 6 pools, 531 GB data, 344 kobjects
1585 GB used, 11808 GB / 13393 GB avail
704 active+clean
client io 12888 kB/s wr, 0 op/s rd, 81 op/s wr
```

恢復虛擬機器

案例1. OSD計算節點主機CF、ESC、EM和UAS

CF/ESC/EM/UAS VM的恢復過程是相同的，無論這些VM是託管在Compute節點還是OSD-Compute節點中。按照案例2中的步驟。計算節點主機CF/ESC/EM/UAS以還原虛擬機器。

案例2. OSD計算節點託管自動it、自動部署、EM和UAS

恢復自動部署VM

在OSPD中，如果自動部署虛擬機器受影響，但仍顯示活動/正在運行，則需要首先將其刪除。如果自動部署未受影響，請跳至自動it虛擬機器的恢復：

```
[stack@director ~]$ nova list |grep auto-deploy
| 9b55270a-2dcd-4ac1-aba3-bf041733a0c9 | auto-deploy-ISO-2007-uas-
0 | ACTIVE | - | Running | mgmt=172.16.181.12,
10.1.2.7 [stack@director ~]$ cd /opt/cisco/usp/uas-installer/scripts
```

```
[stack@director ~]$ ./auto-deploy-booting.sh --floating-ip 10.1.2.7 --delete
刪除自動部署後，使用相同的floatingip地址重新創建它：
```

```
[stack@director ~]$ cd /opt/cisco/usp/uas-installer/scripts
```

```
[stack@director scripts]$ ./auto-deploy-booting.sh --floating-ip 10.1.2.7
```

```
2017-11-17 07:05:03,038 - INFO: Creating AutoDeploy deployment (1 instance(s)) on
'http://10.84.123.4:5000/v2.0' tenant 'core' user 'core', ISO 'default'
2017-11-17 07:05:03,039 - INFO: Loading image 'auto-deploy-ISO-5-1-7-2007-usp-uas-1.0.1-
```

```

1504.qcow2' from '/opt/cisco/usp/uas-installer/images/usp-uas-1.0.1-1504.qcow2'
2017-11-17 07:05:14,603 - INFO: Loaded image 'auto-deploy-ISO-5-1-7-2007-usp-uas-1.0.1-1504.qcow2'
2017-11-17 07:05:15,787 - INFO: Assigned floating IP '10.1.2.7' to IP '172.16.181.7'
2017-11-17 07:05:15,788 - INFO: Creating instance 'auto-deploy-ISO-5-1-7-2007-uas-0'
2017-11-17 07:05:42,759 - INFO: Created instance 'auto-deploy-ISO-5-1-7-2007-uas-0'
2017-11-17 07:05:42,759 - INFO: Request completed, floating IP: 10.1.2.7

```

從備份伺服器複製Autodeploy.cfg檔案、ISO和confd_backup tar檔案以自動部署VM，並從備份tar檔案中還原confd cdb檔案：

```
ubuntu@auto-deploy-iso-2007-uas-0:~# sudo -i
```

```
ubuntu@auto-deploy-iso-2007-uas-0:# service uas-confd stop
uas-confd stop/waiting
```

```
root@auto-deploy-iso-2007-uas-0:# cd /opt/cisco/usp/uas/confd-6.3.1/var/confd
root@auto-deploy-iso-2007-uas-0:/opt/cisco/usp/uas/confd-6.3.1/var/confd# tar xvf
/home/ubuntu/ad_cdb_backup.tar
```

```

cdb/
cdb/O.cdb
cdb/C.cdb
cdb/aaa_init.xml
cdb/A.cdb

```

```
root@auto-deploy-iso-2007-uas-0~# service uas-confd start
uas-confd start/running, process 2036
```

通過檢查以前的事務來驗證confd是否已正確載入。使用新的osd-compute名稱更新autodeploy.cfg。請參閱部分 — 最後步驟：更新自動部署配置。

```
root@auto-deploy-iso-2007-uas-0:~# confd_cli -u admin -C
```

```

Welcome to the ConfD CLI
admin connected from 127.0.0.1 using console on auto-deploy-iso-2007-uas-0

```

```
auto-deploy-iso-2007-uas-0#show transaction
```

SITE		SERVICE				DEPLOYMENT	
SITE	TX	AUTOVNF	VNF	AUTOVNF	ID	DATE AND TIME	
TX ID	TX TYPE	ID	ID	ID	ID	TX ID	
1512571978613	service-deployment				tb5bxb	2017-12-06T14:52:59.412+00:00	deployment-success

```
auto-deploy-iso-2007-uas-0# exit
```

恢復自動IT虛擬機器

在OSPD中，如果自動轉換虛擬機器受到影響，但仍顯示為活動/運行，則需要將其刪除。如果auto-it未受影響，請跳至下一個：

```

[stack@director ~]$ nova list |grep auto-it
| 580faf80-1d8c-463b-9354-781ea0c0b352 | auto-it-vnf-ISO-2007-uas-0
| ACTIVE | - | Running | mgmt=172.16.181.3,
10.1.2.8 [stack@director ~]$ cd /opt/cisco/usp/uas-installer/scripts

```

```
[stack@director ~]$ ./ auto-it-vnf-staging.sh --floating-ip 10.1.2.8 --delete
```

通過運行自動IT-VNF暫存指令碼重新建立自動IT:

```
[stack@director ~]$ cd /opt/cisco/usp/uas-installer/scripts
```

```
[stack@director scripts]$ ./auto-it-vnf-staging.sh --floating-ip 10.1.2.8
```

```
2017-11-16 12:54:31,381 - INFO: Creating StagingServer deployment (1 instance(s)) on
'http://10.84.123.4:5000/v2.0' tenant 'core' user 'core', ISO 'default'
2017-11-16 12:54:31,382 - INFO: Loading image 'auto-it-vnf-ISO-5-1-7-2007-usp-uas-1.0.1-
1504.qcow2' from '/opt/cisco/usp/uas-installer/images/usp-uas-1.0.1-1504.qcow2'
2017-11-16 12:54:51,961 - INFO: Loaded image 'auto-it-vnf-ISO-5-1-7-2007-usp-uas-1.0.1-
1504.qcow2'
2017-11-16 12:54:53,217 - INFO: Assigned floating IP '10.1.2.8' to IP '172.16.181.9'
2017-11-16 12:54:53,217 - INFO: Creating instance 'auto-it-vnf-ISO-5-1-7-2007-uas-0'
2017-11-16 12:55:20,929 - INFO: Created instance 'auto-it-vnf-ISO-5-1-7-2007-uas-0'
2017-11-16 12:55:20,930 - INFO: Request completed, floating IP: 10.1.2.8
```

重新載入ISO映像。在這種情況下，自動IT IP位址為10.1.2.8。這將需要幾分鐘來載入：

```
[stack@director ~]$ cd images/5_1_7-2007/isos
```

```
[stack@director isos]$ curl -F file=@usp-5_1_7-2007.iso http://10.1.2.8:5001/isos
```

```
{
  "iso-id": "5.1.7-2007"
}
```

to check the ISO image:

```
[stack@director isos]$ curl http://10.1.2.8:5001/isos
```

```
{
  "isos": [
    {
      "iso-id": "5.1.7-2007"
    }
  ]
}
```

將VNF **system.cfg**檔案從OSPD自動部署目錄複製到自動IT虛擬機器：

```
[stack@director autodeploy]$ scp system-vnf* ubuntu@10.1.2.8:.
```

```
ubuntu@10.1.2.8's password:
```

```
system-
vnf1.cfg
```

```
100% 1197 1.2KB/s 00:00
```

```
system-vnf2.cfg
```

```
100% 1197 1.2KB/s 00:00
```

```
ubuntu@auto-it-vnf-iso-2007-uas-0:~$ pwd
```

```
/home/ubuntu
```

```
ubuntu@auto-it-vnf-iso-2007-uas-0:~$ ls
```

```
system-vnf1.cfg system-vnf2.cfg
```

附註：無論虛擬機器是託管在電腦中還是託管在OSD-Compute中，EM和UAS虛擬機器的恢復過程都是相同的。按照**Replace Motherboard in Compute Node**中的步驟，正常關閉這些

VM的電源。

更換控制器節點中的主機板

驗證控制器狀態並將群集置於維護模式

在OSPD中，登入到控制器並驗證PC是否處於正常狀態 — 所有三個控制器都處於聯機狀態，Galera會將所有三個控制器顯示為主控制器。

```
[heat-admin@pod1-controller-0 ~]$ sudo pcs status
Cluster name: tripleo_cluster
Stack: corosync
Current DC: pod1-controller-2 (version 1.1.15-11.e17_3.4-e174ec8) - partition with quorum
Last updated: Mon Dec 4 00:46:10 2017 Last change: Wed Nov 29 01:20:52 2017 by hacluster via
crmd on pod1-controller-0
```

```
3 nodes and 22 resources configured
```

```
Online: [ pod1-controller-0 pod1-controller-1 pod1-controller-2 ]
```

```
Full list of resources:
```

```
ip-11.118.0.42 (ocf::heartbeat:IPaddr2): Started pod1-controller-1
ip-11.119.0.47 (ocf::heartbeat:IPaddr2): Started pod1-controller-2
ip-11.120.0.49 (ocf::heartbeat:IPaddr2): Started pod1-controller-1
ip-192.200.0.102 (ocf::heartbeat:IPaddr2): Started pod1-controller-2
Clone Set: haproxy-clone [haproxy]
Started: [ pod1-controller-0 pod1-controller-1 pod1-controller-2 ]
Master/Slave Set: galera-master [galera]
Masters: [ pod1-controller-0 pod1-controller-1 pod1-controller-2 ]
ip-11.120.0.47 (ocf::heartbeat:IPaddr2): Started pod1-controller-2
Clone Set: rabbitmq-clone [rabbitmq]
Started: [ pod1-controller-0 pod1-controller-1 pod1-controller-2 ]
Master/Slave Set: redis-master [redis]
Masters: [ pod1-controller-2 ]
Slaves: [ pod1-controller-0 pod1-controller-1 ]
ip-10.84.123.35 (ocf::heartbeat:IPaddr2): Started pod1-controller-1
openstack-cinder-volume (systemd:openstack-cinder-volume): Started pod1-controller-2
my-ipmilan-for-controller-0 (stonith:fence_ipmilan): Started pod1-controller-0
my-ipmilan-for-controller-1 (stonith:fence_ipmilan): Started pod1-controller-0
my-ipmilan-for-controller-2 (stonith:fence_ipmilan): Started pod1-controller-0
```

```
Daemon Status:
```

```
corosync: active/enabled
pacemaker: active/enabled
pcsd: active/enabled
```

將群集置於維護模式：

```
[heat-admin@pod1-controller-0 ~]$ sudo pcs cluster standby
```

```
[heat-admin@pod1-controller-0 ~]$ sudo pcs status
Cluster name: tripleo_cluster
Stack: corosync
Current DC: pod1-controller-2 (version 1.1.15-11.e17_3.4-e174ec8) - partition with quorum
Last updated: Mon Dec 4 00:48:24 2017 Last change: Mon Dec 4 00:48:18 2017 by root via
crm_attribute on pod1-controller-0
```

3 nodes and 22 resources configured

Node pod1-controller-0: standby

Online: [pod1-controller-1 pod1-controller-2]

Full list of resources:

```
ip-11.118.0.42 (ocf::heartbeat:IPaddr2): Started pod1-controller-1
ip-11.119.0.47 (ocf::heartbeat:IPaddr2): Started pod1-controller-2
ip-11.120.0.49 (ocf::heartbeat:IPaddr2): Started pod1-controller-1
ip-192.200.0.102 (ocf::heartbeat:IPaddr2): Started pod1-controller-2
Clone Set: haproxy-clone [haproxy]
Started: [ pod1-controller-1 pod1-controller-2 ]
Stopped: [ pod1-controller-0 ]
Master/Slave Set: galera-master [galera]
Masters: [ pod1-controller-1 pod1-controller-2 ]
Slaves: [ pod1-controller-0 ]
ip-11.120.0.47 (ocf::heartbeat:IPaddr2): Started pod1-controller-2
Clone Set: rabbitmq-clone [rabbitmq]
Started: [ pod1-controller-0 pod1-controller-1 pod1-controller-2 ]
Master/Slave Set: redis-master [redis]
Masters: [ pod1-controller-2 ]
Slaves: [ pod1-controller-1 ]
Stopped: [ pod1-controller-0 ]
ip-10.84.123.35 (ocf::heartbeat:IPaddr2): Started pod1-controller-1

openstack-cinder-volume (systemd:openstack-cinder-volume): Started pod1-controller-2
my-ipmilan-for-controller-0 (stonith:fence_ipmilan): Started pod1-controller-1
my-ipmilan-for-controller-1 (stonith:fence_ipmilan): Started pod1-controller-1
my-ipmilan-for-controller-2 (stonith:fence_ipmilan): Started pod1-controller-2
```

更換主機板

有關更換UCS C240 M4伺服器主機板的步驟，請參閱：[Cisco UCS C240 M4伺服器安裝和服務指南](#)

使用CIMC IP登入到伺服器。

如果韌體與以前使用的推薦版本不一致，請執行BIOS升級。此處提供了BIOS升級步驟：[Cisco UCS C系列機架式伺服器BIOS升級指南](#)

還原群集狀態

登入已受影響的控制器，通過設定**unstandby**來移除待機模式。驗證控制器是否與群集聯機，Galera將全部三個控制器顯示為主控制器。這可能需要幾分鐘時間。

```
[heat-admin@pod1-controller-0 ~]$ sudo pcs cluster unstandby
```

```
[heat-admin@pod1-controller-0 ~]$ sudo pcs status
```

```
Cluster name: tripleo_cluster
```

```
Stack: corosync
```

```
Current DC: pod1-controller-2 (version 1.1.15-11.e17_3.4-e174ec8) - partition with quorum
```

```
Last updated: Mon Dec 4 01:08:10 2017 Last change: Mon Dec 4 01:04:21 2017 by root via
```

```
crm_attribute on pod1-controller-0
```

3 nodes and 22 resources configured

Online: [pod1-controller-0 pod1-controller-1 pod1-controller-2]

Full list of resources:

ip-11.118.0.42 (ocf::heartbeat:IPaddr2): Started pod1-controller-1
ip-11.119.0.47 (ocf::heartbeat:IPaddr2): Started pod1-controller-2
ip-11.120.0.49 (ocf::heartbeat:IPaddr2): Started pod1-controller-1
ip-192.200.0.102 (ocf::heartbeat:IPaddr2): Started pod1-controller-2
Clone Set: haproxy-clone [haproxy]
Started: [pod1-controller-0 pod1-controller-1 pod1-controller-2]
Master/Slave Set: galera-master [galera]
Masters: [pod1-controller-0 pod1-controller-1 pod1-controller-2]
ip-11.120.0.47 (ocf::heartbeat:IPaddr2): Started pod1-controller-2
Clone Set: rabbitmq-clone [rabbitmq]
Started: [pod1-controller-0 pod1-controller-1 pod1-controller-2]
Master/Slave Set: redis-master [redis]
Masters: [pod1-controller-2]
Slaves: [pod1-controller-0 pod1-controller-1]
ip-10.84.123.35 (ocf::heartbeat:IPaddr2): Started pod1-controller-1
openstack-cinder-volume (systemd:openstack-cinder-volume): Started pod1-controller-2
my-ipmilan-for-controller-0 (stonith:fence_ipmilan): Started pod1-controller-1
my-ipmilan-for-controller-1 (stonith:fence_ipmilan): Started pod1-controller-1
my-ipmilan-for-controller-2 (stonith:fence_ipmilan): Started pod1-controller-2

Daemon Status:

corosync: active/enabled
pacemaker: active/enabled
pcsd: active/enabled