

更換伺服器UCS C240 M4上的故障元件 — vEPC

目錄

[簡介](#)

[背景資訊](#)

[縮寫](#)

[MoP的工作流程](#)

[必要條件](#)

[備份](#)

[元件RMA — 計算/OSD — 計算節點](#)

[確定在計算/OSD — 計算節點中託管的VM](#)

[正常斷電](#)

[案例1.計算節點僅承載SF VM](#)

[案例2.計算/OSD — 計算節點主機CF/ESC/EM/UAS](#)

[從Compute/OSD-Compute節點替換故障元件](#)

[恢復虛擬機器](#)

[案例1.計算節點僅承載SF VM](#)

[案例2.計算/OSD — 計算節點主機CF、ESC、EM和UAS](#)

[處理ESC恢復失敗](#)

[自動部署配置更新](#)

[元件RMA — 控制器節點](#)

[預檢查](#)

[將控制器群集移至維護模式](#)

[從控制器節點更換故障元件](#)

[開啟伺服器電源](#)

簡介

本文檔介紹在託管StarOS虛擬網路功能(VNF)的Ultra-M設定中，替換此處提到的統一計算系統(Unified Computing System, UCS)伺服器中的故障元件所需的步驟。

- 雙列直插式記憶體模組(DIMM)更換拖把
- FlexFlash控制器故障
- 固態驅動器(SSD)故障
- 可信平台模組(TPM)故障
- Raid快取故障
- Raid控制器/熱匯流排介面卡(HBA)故障
- PCI Riser卡故障
- PCIe介面卡Intel X520 10G故障
- 模組化主機板上區域網(MLOM)故障
- 風扇托架RMA
- CPU故障

背景資訊

Ultra-M是經過預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器(VIM)，包含以下節點型別：

- 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：

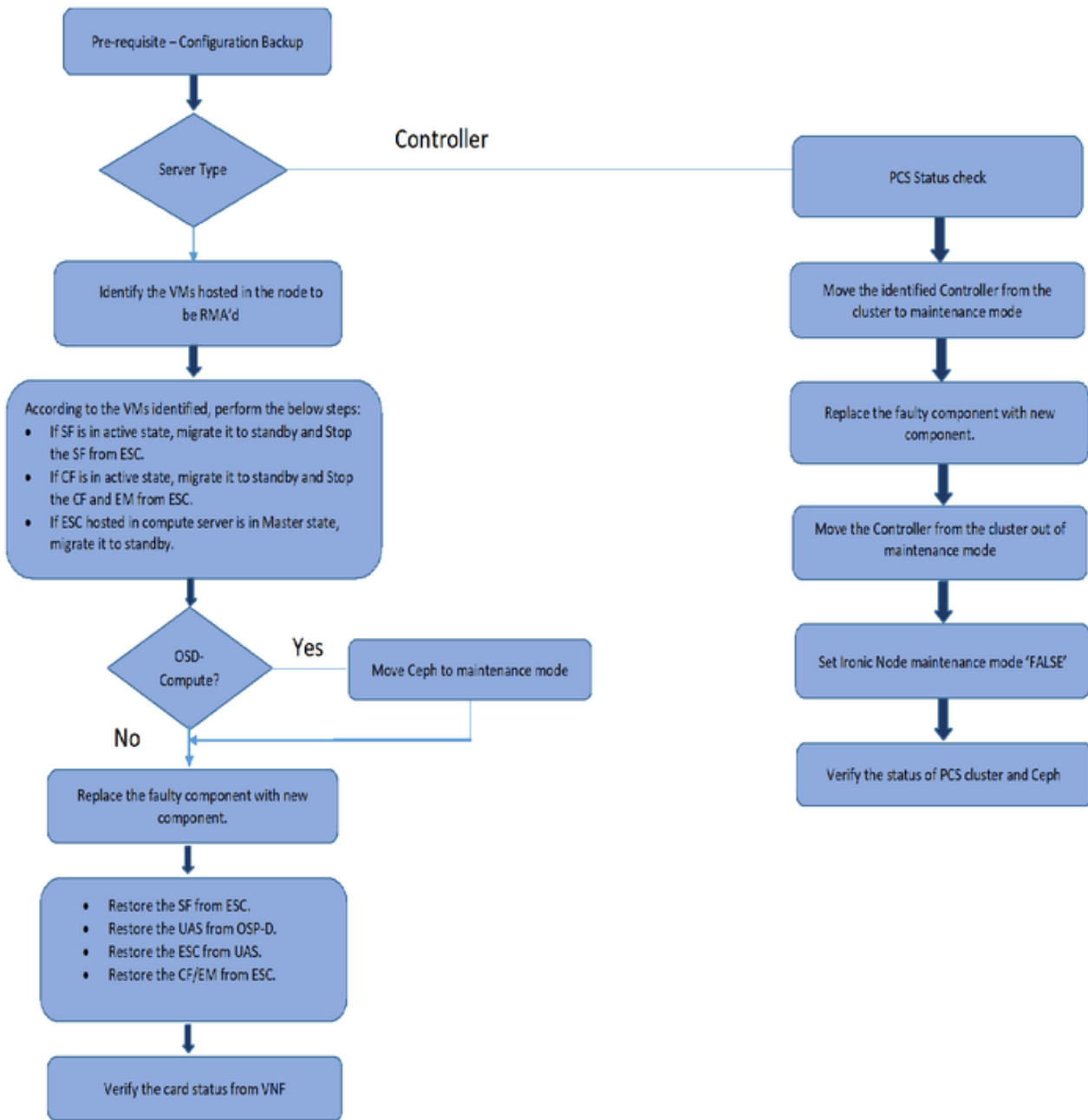
本文檔面向熟悉Cisco Ultra-M平台的思科人員，詳細介紹在伺服器進行元件更換時，在OpenStack和StarOS VNF級別需要執行的步驟。

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



必要條件

備份

在更換故障元件之前，請務必檢查Red Hat OpenStack平台環境的當前狀態。建議您檢查當前狀態，以避免更換過程開啟時出現問題。通過這種更換流程可以實現這一點。

在進行恢復時，思科建議使用以下步驟備份OSPD資料庫：

```
[root@director ~]# mysqldump --opt --all-databases > /root/undercloud-all-databases.sql
[root@director ~]# tar --xattrs -czf undercloud-backup-`date +%F`.tar.gz /root/undercloud-all-
```

```
databases.sql
/etc/my.cnf.d/server.cnf /var/lib/glance/images /srv/node /home/stack
tar: Removing leading `/' from member names
```

此過程確保可以替換節點而不影響任何例項的可用性。此外，建議備份StarOS配置，尤其是要替換的計算/OSD計算節點承載控制功能(CF)虛擬機器(VM)時。

附註：如果伺服器是控制器節點，請繼續執行「」部分，否則繼續下一部分。

元件RMA — 計算/OSD — 計算節點

確定在計算/OSD — 計算節點中託管的VM

確定伺服器上託管的VM。可能發生兩種情況：

- 伺服器僅包含服務功能(SF)虛擬機器：

```
[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 |
```

- 伺服器包含控制功能(CF)/彈性服務控制器(ESC)/元素管理器(EM)/Ultra自動化服務(UAS)組合VM:

```
[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 |
```

註：此處顯示的輸出中，第一列對應於通用唯一識別符號(UUID)，第二列為VM名稱，第三列為VM所在的主機名。此輸出的引數將在後續章節中使用。

正常斷電

案例1.計算節點僅承載SF VM

將SF卡遷移到備用狀態

- 登入到StarOS VNF並確定與SF VM對應的卡。使用從「識別在計算/OSD — 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 might 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 (qvpv-di-large)
UUID/Serial Number  : 49AC5F22-469E-4B84-BADC-031083DB0533
```

- 檢查卡的狀態：

```
[local]VNF2# show card table
Tuesday might 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
```

ESCSF VM

- 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>
      VNF2-DEPLOYM_c1_0_df4be88d-b4bf-4456-945a-3812653ee229
      VM_ALIVE_STATE
      VNF2-DEPLOYM_s9_0_8bc6cc60-15d6-4ead-8b6a-10e75d0e134d
      VM_ALIVE_STATE</state>
<snip>
```

- 使用其VM名稱停止SF VM。（在「識別在計算/OSD — 計算節點中託管的VM」部分中註明的VM名稱）：

```
[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>
    VNF2-DEPLOYM_c1_0_df4be88d-b4bf-4456-945a-3812653ee229
    VM_ALIVE_STATE
    VNF2-DEPLOYM_c3_0_3e0db133-c13b-4e3d-ac14-
    VM_ALIVE_STATE
    VNF2-DEPLOYM_s9_0_8bc6cc60-15d6-4ead-8b6a-10e75d0e134d
    VM_SHUTOFF_STATE</state>
```

案例2.計算/OSD — 計算節點主機CF/ESC/EM/UAS

將CF卡遷移至備用狀態

- 登入到StarOS VNF並確定與CF VM對應的卡。使用從「標識節點中託管的VM」部分中標識的CF VM的UUID，並找到與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 (qvpc-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
```

從ESC關閉CF和EM VM

- 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>
    VNF2-DEPLOYM_c1_0_df4be88d-b4bf-4456-945a-3812653ee229
    VM_ALIVE_STATE</state>
    VNF2-DEPLOYM_c3_0_3e0db133-c13b-4e3d-ac14-
    VM_ALIVE_STATE
<deployment_name>VNF2-DEPLOYMENT-em</deployment_name>
    507d67c2-1d00-4321-b9d1-da879af524f8
    dc168a6a-4aeb-4e81-abd9-91d7568b5f7c
    9ffec58b-4b9d-4072-b944-5413bf7fcf07
    SERVICE_ACTIVE_STATE
    VNF2-DEPLOYM_XXXX_0_c8d98f0f-d874-45d0-af75-88a2d6fa82ea
    VM_ALIVE_STATE</state>
<snip>
```

- 使用其VM名稱逐一停止CF和EM VM。（在「識別在計算/OSD — 計算節點中託管的VM」部分中註明的VM名稱）：

```
[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>
    VNF2-DEPLOYM_c1_0_df4be88d-b4bf-4456-945a-3812653ee229</vm_name>
    VM_SHUTOFF_STATE</state>
    VNF2-DEPLOYM_c3_0_3e0db133-c13b-4e3d-ac14-
    VM_ALIVE_STATE
<deployment_name>VNF2-DEPLOYMENT-em</deployment_name>
    507d67c2-1d00-4321-b9d1-da879af524f8
    dc168a6a-4aeb-4e81-abd9-91d7568b5f7c
    9ffec58b-4b9d-4072-b944-5413bf7fcf07
    SERVICE_ACTIVE_STATE
    VNF2-DEPLOYM_XXXX_0_c8d98f0f-d874-45d0-af75-88a2d6fa82ea</vm_name>
```

<snip>

將ESC遷移到備用模式

- 登入到節點中託管的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!
```

附註：如果要在OSD-Compute節點上更換故障元件，請在繼續更換元件之前將Ceph置於伺服器的維護中。

```
[admin@osd-compute-0 ~]$ sudo ceph osd set norebalance
set norebalance
```

```
[admin@osd-compute-0 ~]$ sudo ceph osd set noout
set noout
```

```
[admin@osd-compute-0 ~]$ 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 {tb3-ultram-pod1-controller-0=11.118.0.40:6789/0,tb3-ultram-pod1-
controller-1=11.118.0.41:6789/0,tb3-ultram-pod1-controller-2=11.118.0.42:6789/0}
election epoch 58, quorum 0,1,2 tb3-ultram-pod1-controller-0,tb3-ultram-pod1-
controller-1,tb3-ultram-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
```

從Compute/OSD-Compute節點替換故障元件

關閉指定伺服器的電源。有關更換UCS C240 M4伺服器上故障元件的步驟，請參閱：

[更換伺服器元件](#)

恢復虛擬機器

案例1.計算節點僅承載SF VM

從ESC恢復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/OSD — 計算節點主機CF、ESC、EM和UAS

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 VM，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，UAS必須返回正常狀態：

```
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
```

附註：如果uas-check.py —fix失敗，則可能需要複製此檔案並再次運行。

```
[stack@director ~]$ mkdir -p /opt/cisco/usp/apps/auto-it/common/uas-deploy/
[stack@director ~]$ cp /opt/cisco/usp/uas-installer/common/uas-deploy/userdata-uas.txt
/opt/cisco/usp/apps/auto-it/common/uas-deploy/
```

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 vnfms-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 - VNFMS 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 VNFMS '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。也需要移除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>)。

- 查詢URL，以便從running-configbootvm.py並將bootvm.py檔案獲取到autovnf-uas VM。在這種情況下，10.1.2.3是自動IT虛擬機器的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-vnfms:vnfms
...
configs bootvm
  value http:// 10.1.2.3:80/bundles/5.1.7-2007/vnfms-bundle/bootvm-2_3_2_155.py
!

root@VNF2-uas-uas-0:~# wget http://10.1.2.3:80/bundles/5.1.7-2007/vnfms-bundle/bootvm-
2_3_2_155.py
--2017-12-01 20:25:52-- http://10.1.2.3 /bundles/5.1.7-2007/vnfms-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，但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.ZpRCGieUW
<?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，Cisco建議如何通過重新啟動主ESC執行ESC切換。ESC切換將需要大約一分鐘。在新的主ESC上運行指令碼「**health.sh**」，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，則使用者將需要執行受影響虛擬機器的手動恢復。

自動部署配置更新

- 在AutoDeploy VM中，編輯autodeploy.cfg並用新伺服器替換舊計算伺服器。然後在confd_cli中載入替換。以後成功停用部署需要此步驟：

```
root@auto-deploy-iso-2007-uas-0:/home/ubuntu# 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#config
Entering configuration mode terminal
auto-deploy-iso-2007-uas-0(config)#load replace autodeploy.cfg
Loading.      14.63 KiB parsed in 0.42 sec (34.16 KiB/sec)

auto-deploy-iso-2007-uas-0(config)#commit
Commit complete.
auto-deploy-iso-2007-uas-0(config)#end
```

- 在配置更改後重新啟動 **uas-confd**和**autodeploy**服務：

```
root@auto-deploy-iso-2007-uas-0:~# service uas-confd restart
uas-confd stop/waiting
uas-confd start/running, process 14078
```

```
root@auto-deploy-iso-2007-uas-0:~# service uas-confd status
uas-confd start/running, process 14078
```

```
root@auto-deploy-iso-2007-uas-0:~# service autodeploy restart
autodeploy stop/waiting
autodeploy start/running, process 14017
root@auto-deploy-iso-2007-uas-0:~# service autodeploy status
autodeploy start/running, process 14017
```

元件RMA — 控制器節點

預檢查

- 在OSPD中，登入控制器並驗證pc是否處於正常狀態 — 所有三個控制器聯機，Galera將所有三個控制器顯示為主控制器。

附註：健康的群集需要2個活動控制器，因此請檢驗其餘的兩個控制器是否處於聯機狀態且處於活動狀態。

```
[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-pod1-controller-0 (stonith:fence_ipmilan): Started pod1-controller-0
my-ipmilan-for-pod1-controller-1 (stonith:fence_ipmilan): Started pod1-controller-0
my-ipmilan-for-pod1-controller-2 (stonith:fence_ipmilan): Started pod1-controller-0

```

Daemon Status:

```

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

```

將控制器群集移至維護模式

- 使用控制器上在待機狀態下更新的pc群集:

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

- 再次檢查pc status，並確保pc群集已在此節點上停止：

```
[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-pod1-controller-0 (stonith:fence_ipmilan): Started pod1-controller-1
my-ipmilan-for-pod1-controller-1 (stonith:fence_ipmilan): Started pod1-controller-1
my-ipmilan-for-pod1-controller-2 (stonith:fence_ipmilan): Started pod1-controller-2

```

Daemon Status:

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

此外，其他2個控制器上的pc狀態應將該節點顯示為備用。

從控制器節點更換故障元件

關閉指定伺服器的電源。要更換UCS C240 M4伺服器上有故障的元件，可從以下站點參閱步驟：

[更換伺服器元件](#)

開啟伺服器電源

- 開啟伺服器電源並驗證伺服器是否啟動：

```
[stack@tb5-ospd ~]$ source stackrc
[stack@tb5-ospd ~]$ nova list |grep pod1-controller-0
| 1ca946b8-52e5-4add-b94c-4d4b8a15a975 | pod1-controller-0 | ACTIVE | - | Running
| ctlplane=192.200.0.112 |
```

- 登入受影響的控制器，使用**unstandby**刪除備用模式。驗證控制器是否與群集一起聯機，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-pod1-controller-0 (stonith:fence_ipmilan): Started pod1-controller-1
my-ipmilan-for-pod1-controller-1 (stonith:fence_ipmilan): Started pod1-controller-1
my-ipmilan-for-pod1-controller-2 (stonith:fence_ipmilan): Started pod1-controller-2
```

Daemon Status:


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

- 您可以檢查某些監控器服務(例如**ceph**)是否處於正常狀態：

```
[heat-admin@pod1-controller-0 ~]$ sudo ceph -s
cluster eb2bb192-b1c9-11e6-9205-525400330666
health HEALTH_OK
monmap e1: 3 mons at {pod1-controller-0=11.118.0.10:6789/0,pod1-controller-
1=11.118.0.11:6789/0,pod1-controller-2=11.118.0.12:6789/0}
election epoch 70, quorum 0,1,2 pod1-controller-0,pod1-controller-1,pod1-controller-2
osdmap e218: 12 osds: 12 up, 12 in
flags sortbitwise,require_jewel_osds
pgmap v2080888: 704 pgs, 6 pools, 714 GB data, 237 kobjects
2142 GB used, 11251 GB / 13393 GB avail
704 active+clean
client io 11797 kB/s wr, 0 op/s rd, 57 op/s wr
```