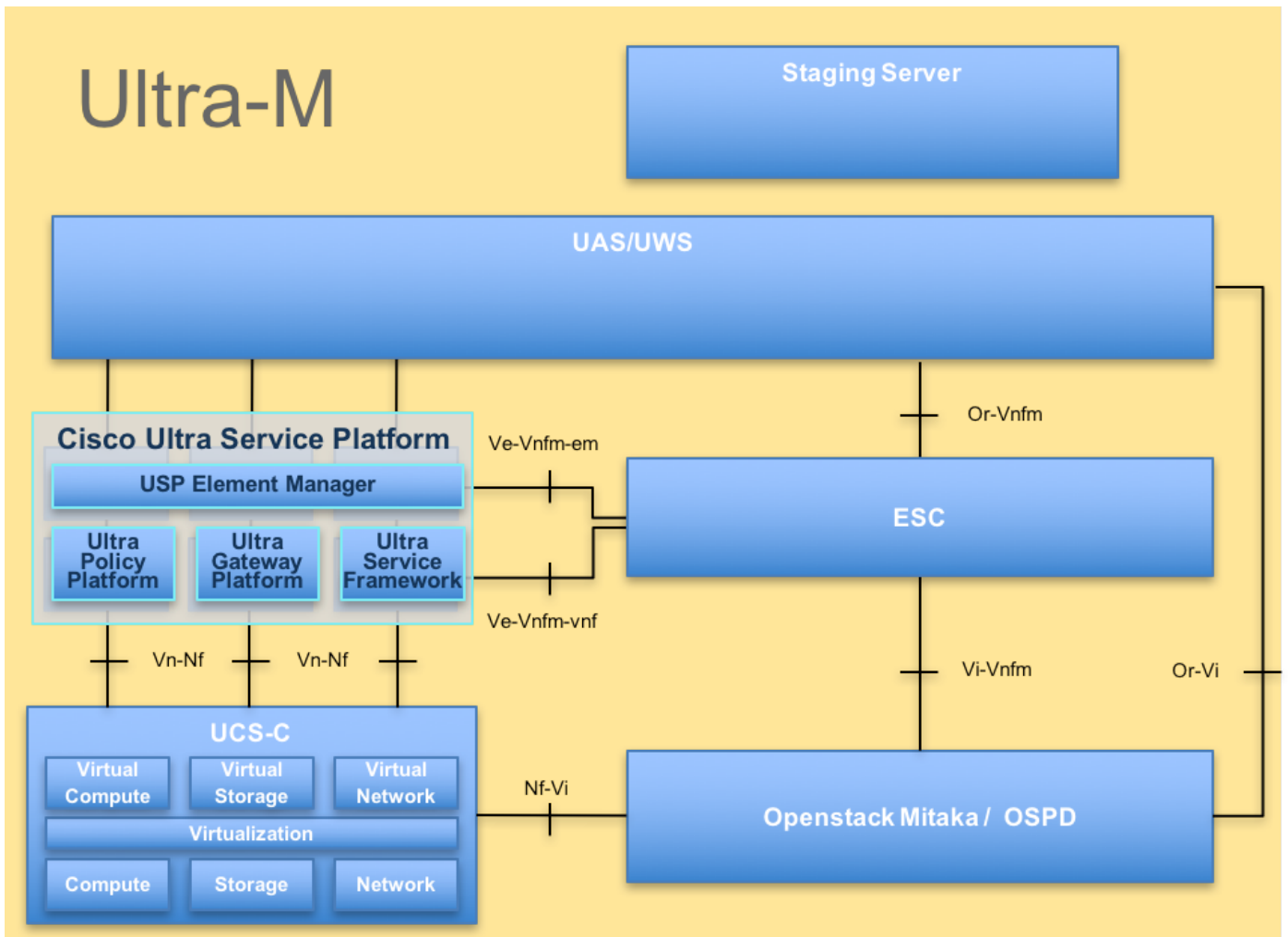# Ultra-M UCS 240M4单硬盘故障 — 热插拔程序 — CPS

目录

简介

本文档介绍在托管思科策略套件(CPS)虚拟网络功能(VNF)的Ultra-M设置中更换服务器中故障硬盘所需的步骤。

背景信息

Ultra-M是预打包和验证的虚拟化移动数据包核心解决方案，旨在简化VNF的部署。OpenStack是Ultra-M的虚拟化基础设施管理器(VIM)，由以下节点类型组成：

- 计算
- 对象存储磁盘 — 计算（OSD — 计算）
- 控制器
- OpenStack平台 — 导向器(OSPD)

Ultra-M的高级体系结构和涉及的组件如下图所示：
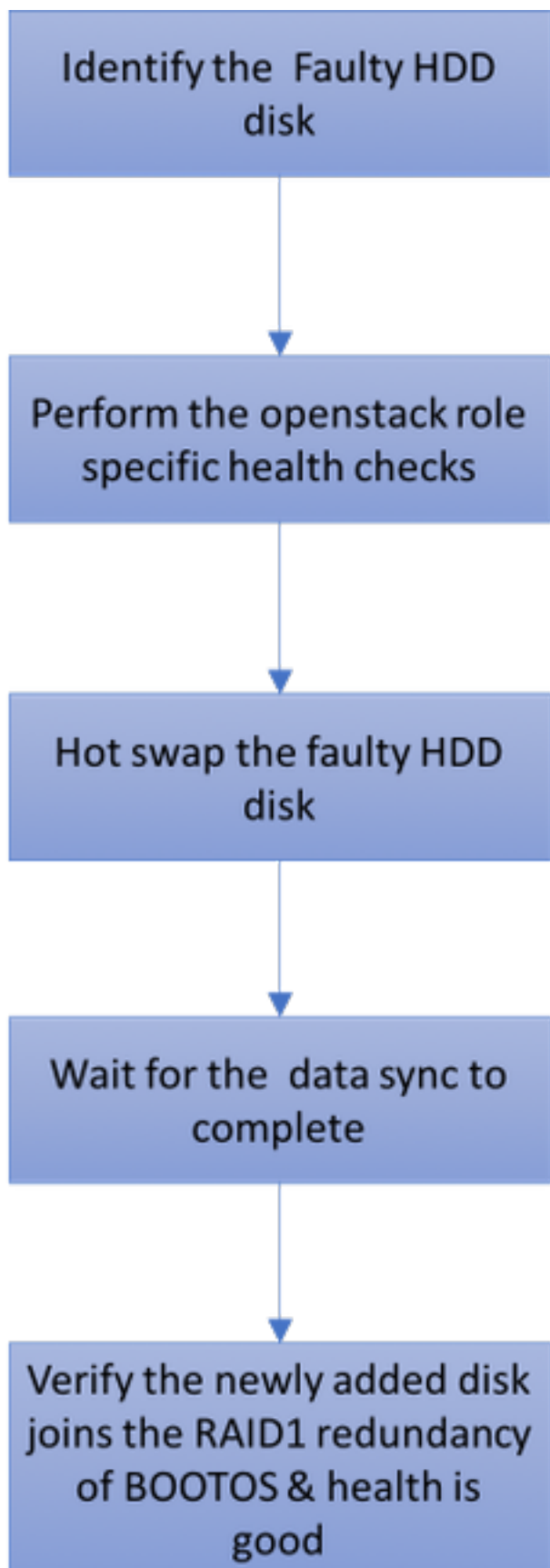
UltraM架构

> **注意**：考虑Ultra M 5.1.x版本以定义本文档中的步骤。本文档面向熟悉Cisco Ultra-M平台的思科人员，并详细介绍在更换OSPD服务器时在OpenStack级别执行所需的步骤。

缩写

VNF	虚拟网络功能
ESC	弹性服务控制器
MOP	程序方法
OSD	对象存储磁盘
硬盘	硬盘驱动器
SSD	固态驱动器
VIM	虚拟基础设施管理器
虚拟机	虚拟机
EM	元素管理器
UAS	超自动化服务
UUID	通用唯一IDentifier

MoP的工作流

```
┌─────────────────────────┐
│  Identify the  Faulty HDD │
│          disk            │
└─────────────────────────┘
            │
            ▼
┌─────────────────────────┐
│  Perform the openstack role │
│   specific health checks  │
└─────────────────────────┘
            │
            ▼
┌─────────────────────────┐
│   Hot swap the faulty HDD │
│          disk            │
└─────────────────────────┘
            │
            ▼
┌─────────────────────────┐
│  Wait for the  data sync to │
│        complete          │
└─────────────────────────┘
            │
            ▼
┌─────────────────────────┐
│ Verify the newly added disk │
│ joins the RAID1 redundancy │
│   of BOOTOS & health is   │
│          good            │
└─────────────────────────┘
```

单硬盘故障

1.每台裸机服务器将配置两个HDD驱动器，以在Raid 1配置中充当引导磁盘。如果单个HDD发生故障，由于存在Raid 1级冗余，故障HDD驱动器可以热插拔。

2.请参阅以下步骤以更换UCS C240 M4服务器上的故障组件：更换服务器组件

3.如果单个HDD出现故障，则仅热交换故障HDD，因此更换新磁盘后无需BIOS升级过程。

4.更换磁盘后，请等待磁盘之间的数据同步。可能需要几个小时才能完成。

5.在基于OpenStack(Ultra-M)的解决方案中，UCS 240M4裸机服务器可承担以下角色之一：计算、OSD — 计算、控制器和OSPD。

6.在这些服务器角色中处理单个HDD故障所需的步骤相同，本节介绍在磁盘热插拔之前要执行的运行状况检查。

计算服务器上的单硬盘故障

1.如果UCS 240M4（充当计算节点）中发现HDD驱动器故障，请在启动故障磁盘的热插拔过程之前执行这些运行状况检查。

2.确定此服务器上运行的VM，并验证功能状态是否正常。

确定托管在计算节点中的虚拟机

确定托管在计算服务器上的VM，并验证它们是否处于活动状态并正在运行。

计算服务器包含CPS VM/弹性服务控制器(ESC)虚拟机组合：

```
[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     | ACTIVE |
| f9c0763a-4a4f-4bbd-af51-bc7545774be2 | VNF2-DEPLOYM_c2_0_df4be88d-b4bf-4456-945a-
3812653ee229    | pod1-compute-8.localdomain     | ACTIVE |
| 75528898-ef4b-4d68-b05d-882014708694 | VNF2-ESC-ESC-
0                                        | pod1-compute-8.localdomain     | ACTIVE |
```

> **注意**：在此处显示的输出中，第一列对应于通用唯一IDentifier(UUID)，第二列是VM名称，第三列是VM所在的主机名。

运行状况检查

1.登录计算节点中托管的ESC并检查状态。

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

2.登录计算节点中托管的UAS并检查状态。

```
ubuntu@autovnf2-uas-1:~$ sudo su
root@autovnf2-uas-1:/home/ubuntu# confd_cli -u admin -C
Welcome to the ConfD CLI
admin connected from 127.0.0.1 using console on autovnf2-uas-1
autovnf2-uas-1#show uas ha
uas ha-vip 172.18.181.101
autovnf2-uas-1#
autovnf2-uas-1#
```

```
autovnf2-uas-1#show uas
uas version 1.0.1-1
uas state ha-active
uas ha-vip 172.18.181.101
INSTANCE IP    STATE  ROLE
---------------------------------
172.18.180.4   alive  CONFD-SLAVE
172.18.180.5   alive  CONFD-MASTER
172.18.180.8   alive  NA


autovnf2-uas-1#show errors
% No entries found.
```
3.如果运行状况检查正常,请继续执行故障磁盘热插拔过程,并等待数据同步,因为可能需要几个小时才能完成。请参阅:更换服务器组件

4.重复这些运行状况检查步骤,以确认托管在计算节点上的虚拟机的运行状况已恢复。

控制器服务器上的单硬盘故障

1.如果UCS 240M4(充当控制器节点)中发现HDD驱动器故障,请在启动故障磁盘的热插拔过程之前执行这些运行状况检查。

2.检查控制器上的Pace maker状态。

3.登录其中一个活动控制器并检查Pacemaker状态。所有服务必须在可用控制器上运行,并在故障控制器上停止。

```
[heat-admin@pod1-controller-0 ~]$ sudo pcs status
Cluster name: tripleo_cluster
Stack: corosync
Current DC: pod1-controller-0 (version 1.1.15-11.el7_3.4-e174ec8) - partition with quorum
Last updated: Thu Jun 28 07:53:06 2018        Last change: Wed Jan 17 11:38:00 2018 by root
via cibadmin on pod1-controller-0


3 nodes and 22 resources conimaged


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


Full list of resources:

 ip-10.2.2.2      (ocf::heartbeat:IPaddr2):      Started pod1-controller-0
 ip-11.120.0.42 (ocf::heartbeat:IPaddr2):        Started pod1-controller-1
 ip-11.119.0.42 (ocf::heartbeat:IPaddr2):        Started pod1-controller-2
 ip-11.120.0.50 (ocf::heartbeat:IPaddr2):        Started pod1-controller-0
 ip-11.118.0.48 (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 ]
 Clone Set: rabbitmq-clone [rabbitmq]
    Started: [ pod1-controller-0 pod1-controller-1 pod1-controller-2 ]
 Master/Slave Set: redis-master [redis]
    Masters: [ pod1-controller-0 ]
    Slaves: [ pod1-controller-1 pod1-controller-2 ]
 openstack-cinder-volume        (systemd:openstack-cinder-volume):     Started pod1-controller-
0
 my-ipmilan-for-controller-0    (stonith:fence_ipmilan):       Started pod1-controller-1
 my-ipmilan-for-controller-1    (stonith:fence_ipmilan):       Started pod1-controller-2
```

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

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

4.检查活动控制器中的MariaDB状态。

```
[stack@director] nova list | grep control
| 4361358a-922f-49b5-89d4-247a50722f6d | pod1-controller-0 | ACTIVE | - | Running |
ctlplane=192.200.0.102 |
| d0f57f27-93a8-414f-b4d8-957de0d785fc | pod1-controller-1 | ACTIVE | - | Running |
ctlplane=192.200.0.110 |

[stack@director ~]$ for i in 192.200.0.102 192.200.0.110 ; do echo "*** $i ***" ; ssh heat-
admin@$i "sudo mysql --exec=\"SHOW STATUS LIKE 'wsrep_local_state_comment'\" ; sudo mysql --
exec=\"SHOW STATUS LIKE 'wsrep_cluster_size'\""; done
*** 192.200.0.152 ***
Variable_name     Value
wsrep_local_state_comment  Synced
Variable_name     Value
wsrep_cluster_size        2
*** 192.200.0.154 ***
Variable_name     Value
wsrep_local_state_comment  Synced
Variable_name     Value
wsrep_cluster_size        2
```

验证每个活动控制器都存在以下线路：

```
wsrep_local_state_comment: Synced

wsrep_cluster_size: 2
```

5.检查活动控制器中的Rabbitmq状态。

```
[heat-admin@pod1-controller-0 ~]$ sudo rabbitmqctl cluster_status
Cluster status of node 'rabbit@pod1-controller-0' ...
[{nodes,[{disc,['rabbit@pod1-controller-0','rabbit@pod1-controller-1',
            'rabbit@pod1-controller-2']}]},
 {running_nodes,['rabbit@pod1-controller-2',
             'rabbit@pod1-controller-1',
             'rabbit@pod1-controller-0']},
 {cluster_name,<<"rabbit@pod1-controller-0.localdomain">>},
 {partitions,[]},
 {alarms,[{'rabbit@pod1-controller-2',[]},
       {'rabbit@pod1-controller-1',[]},
       {'rabbit@pod1-controller-0',[]}]}]
```

6.如果运行状况检查正常，请继续执行故障磁盘热插拔过程，并等待数据同步，因为可能需要几个小时才能完成。请参阅：更换服务器组件

7.重复这些运行状况检查步骤，以确认控制器上的运行状况已恢复。

OSD-Compute服务器上的单硬盘故障

如果UCS 240M4中发现HDD驱动器故障，它充当OSD计算节点，请在启动故障磁盘的热插拔过程之前执行这些运行状况检查。

识别OSD计算节点中托管的虚拟机

1.计算服务器包含ESC 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    | ACTIVE |
| f9c0763a-4a4f-4bbd-af51-bc7545774be2 | VNF2-DEPLOYM_c1_0_df4be88d-b4bf-4456-945a-
3812653ee229    | pod1-compute-8.localdomain    | ACTIVE |
| 75528898-ef4b-4d68-b05d-882014708694 | VNF2-ESC-ESC-
0                                       | pod1-compute-8.localdomain    | ACTIVE |
| f5bd7b9c-476a-4679-83e5-303f0aae9309 | VNF2-UAS-uas-
0                                       | pod1-compute-8.localdomain    | ACTIVE |
```

注意： 在此处显示的输出中，第一列与(UUID)对应，第二列是VM名称，第三列是VM所在的主机名。

2. OSD-Compute服务器上的Ceph进程处于活动状态。

```
[root@pod1-osd-compute-1 ~]# systemctl list-units *ceph*

UNIT                           LOAD   ACTIVE SUB     DESCRIPTION

var-lib-ceph-osd-ceph\x2d11.mount loaded active mounted /var/lib/ceph/osd/ceph-11

var-lib-ceph-osd-ceph\x2d2.mount  loaded active mounted /var/lib/ceph/osd/ceph-2

var-lib-ceph-osd-ceph\x2d5.mount  loaded active mounted /var/lib/ceph/osd/ceph-5

var-lib-ceph-osd-ceph\x2d8.mount  loaded active mounted /var/lib/ceph/osd/ceph-8

ceph-osd@11.service            loaded active running Ceph object storage daemon

ceph-osd@2.service             loaded active running Ceph object storage daemon

ceph-osd@5.service             loaded active running Ceph object storage daemon

ceph-osd@8.service             loaded active running Ceph object storage daemon

system-ceph\x2ddisk.slice      loaded active active  system-ceph\x2ddisk.slice

system-ceph\x2dosd.slice       loaded active active  system-ceph\x2dosd.slice

ceph-mon.target                loaded active active  ceph target allowing to start/stop all
ceph-mon@.service instances at once

ceph-osd.target                loaded active active  ceph target allowing to start/stop all
ceph-osd@.service instances at once

ceph-radosgw.target            loaded active active  ceph target allowing to start/stop all
ceph-radosgw@.service instances at once

ceph.target                    loaded active active  ceph target allowing to start/stop all
ceph*@.service instances at once
```

3.验证OSD（硬盘）到日志(SSD)的映射是否正常。

```
[heat-admin@pod1-osd-compute-3 ~]$ sudo ceph-disk list
/dev/sda :
 /dev/sda1 other, iso9660
 /dev/sda2 other, xfs, mounted on /
/dev/sdb :
 /dev/sdb1 ceph journal, for /dev/sdc1
 /dev/sdb3 ceph journal, for /dev/sdd1
 /dev/sdb2 ceph journal, for /dev/sde1
 /dev/sdb4 ceph journal, for /dev/sdf1
/dev/sdc :
 /dev/sdc1 ceph data, active, cluster ceph, osd.1, journal /dev/sdb1
/dev/sdd :
 /dev/sdd1 ceph data, active, cluster ceph, osd.7, journal /dev/sdb3
/dev/sde :
 /dev/sde1 ceph data, active, cluster ceph, osd.4, journal /dev/sdb2
/dev/sdf :
 /dev/sdf1 ceph data, active, cluster ceph, osd.10, journal /dev/sdb4
```

4.验证Ceph运行状况和OSD树映射是否良好。

```
[heat-admin@pod1-osd-compute-3 ~]$ sudo ceph -s
   cluster eb2bb192-b1c9-11e6-9205-525400330666
    health HEALTH_OK
           1 mons down, quorum 0,1 pod1-controller-0,pod1-controller-1
     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 28, quorum 0,1 pod1-controller-0,pod1-controller-1
     osdmap e709: 12 osds: 12 up, 12 in
           flags sortbitwise,require_jewel_osds
      pgmap v941813: 704 pgs, 6 pools, 490 GB data, 163 kobjects
           1470 GB used, 11922 GB / 13393 GB avail
                704 active+clean
  client io 58580 B/s wr, 0 op/s rd, 7 op/s wr
```

```
[heat-admin@pod1-osd-compute-3 ~]$ 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

-4  4.35999     host pod1-osd-compute-2
 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
-5  4.35999     host pod1-osd-compute-3
 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
```

5.如果运行状况检查正常，请继续执行故障磁盘热插拔过程，并等待数据同步，因为可能需要几个小时才能完成。请参阅更换服务器组件

6.重复这些运行状况检查步骤，以确认托管在OSD-Compute节点上的虚拟机的运行状况已恢复。

OSPD服务器上的单硬盘故障

1.如果UCS 240M4（充当OSPD节点）中观察到HDD驱动器故障，建议在启动故障磁盘的热插拔过程之前执行这些检查。

2.检查OpenStack堆栈和节点列表的状态。

```
[stack@director ~]$ source stackrc
[stack@director ~]$ openstack stack list --nested
[stack@director ~]$ ironic node-list
[stack@director ~]$ nova list
```

3.检查OSPD节点中是否所有下云服务都处于加载、活动和运行状态。

```
[stack@director ~]$ systemctl list-units "openstack*" "neutron*" "openvswitch*"

UNIT                                       LOAD   ACTIVE SUB     DESCRIPTION

neutron-dhcp-agent.service                 loaded active running OpenStack Neutron DHCP Agent
neutron-openvswitch-agent.service          loaded active running OpenStack Neutron Open vSwitch
Agent
neutron-ovs-cleanup.service                loaded active exited  OpenStack Neutron Open vSwitch
Cleanup Utility
neutron-server.service                     loaded active running OpenStack Neutron Server
openstack-aodh-evaluator.service           loaded active running OpenStack Alarm evaluator
service
openstack-aodh-listener.service            loaded active running OpenStack Alarm listener
service
openstack-aodh-notifier.service            loaded active running OpenStack Alarm notifier
service
openstack-ceilometer-central.service       loaded active running OpenStack ceilometer central
agent
openstack-ceilometer-collector.service     loaded active running OpenStack ceilometer collection
service
openstack-ceilometer-notification.service  loaded active running OpenStack ceilometer
notification agent
openstack-glance-api.service               loaded active running OpenStack Image Service (code-
named Glance) API server
openstack-glance-registry.service          loaded active running OpenStack Image Service (code-
named Glance) Registry server
openstack-heat-api-cfn.service             loaded active running Openstack Heat CFN-compatible
API Service
openstack-heat-api.service                 loaded active running OpenStack Heat API Service
openstack-heat-engine.service              loaded active running Openstack Heat Engine Service
openstack-ironic-api.service               loaded active running OpenStack Ironic API service
openstack-ironic-conductor.service         loaded active running OpenStack Ironic Conductor
service
openstack-ironic-inspector-dnsmasq.service loaded active running PXE boot dnsmasq service for
Ironic Inspector
openstack-ironic-inspector.service         loaded active running Hardware introspection service
for OpenStack Ironic
openstack-mistral-api.service              loaded active running Mistral API Server
openstack-mistral-engine.service           loaded active running Mistral Engine Server
openstack-mistral-executor.service         loaded active running Mistral Executor Server
openstack-nova-api.service                 loaded active running OpenStack Nova API Server
openstack-nova-cert.service                loaded active running OpenStack Nova Cert Server
openstack-nova-compute.service             loaded active running OpenStack Nova Compute Server
openstack-nova-conductor.service           loaded active running OpenStack Nova Conductor Server
openstack-nova-scheduler.service           loaded active running OpenStack Nova Scheduler Server
openstack-swift-account-reaper.service     loaded active running OpenStack Object Storage
```

```
(swift) - Account Reaper
openstack-swift-account.service          loaded active running OpenStack Object Storage
(swift) - Account Server
openstack-swift-container-updater.service  loaded active running OpenStack Object Storage
(swift) - Container Updater
openstack-swift-container.service         loaded active running OpenStack Object Storage
(swift) - Container Server
openstack-swift-object-updater.service    loaded active running OpenStack Object Storage
(swift) - Object Updater
openstack-swift-object.service            loaded active running OpenStack Object Storage
(swift) - Object Server
openstack-swift-proxy.service             loaded active running OpenStack Object Storage
(swift) - Proxy Server
openstack-zaqar.service                   loaded active running OpenStack Message Queuing
Service (code-named Zaqar) Server
openstack-zaqar@1.service                 loaded active running OpenStack Message Queuing
Service (code-named Zaqar) Server Instance 1
openvswitch.service                       loaded active exited  Open vSwitch

LOAD   = Reflects whether the unit definition was properly loaded.
ACTIVE = The high-level unit activation state, i.e. generalization of SUB.
SUB    = The low-level unit activation state, values depend on unit type.

37 loaded units listed. Pass --all to see loaded but inactive units, too.
To show all installed unit files use 'systemctl list-unit-files'.
```

4.如果运行状况检查正常，请继续执行故障磁盘热插拔过程，并等待数据同步，因为可能需要几个小时才能完成。请参阅更[换服务器组件](#)

5.重复这些运行状况检查步骤，以确认OSPD节点的运行状况已恢复。