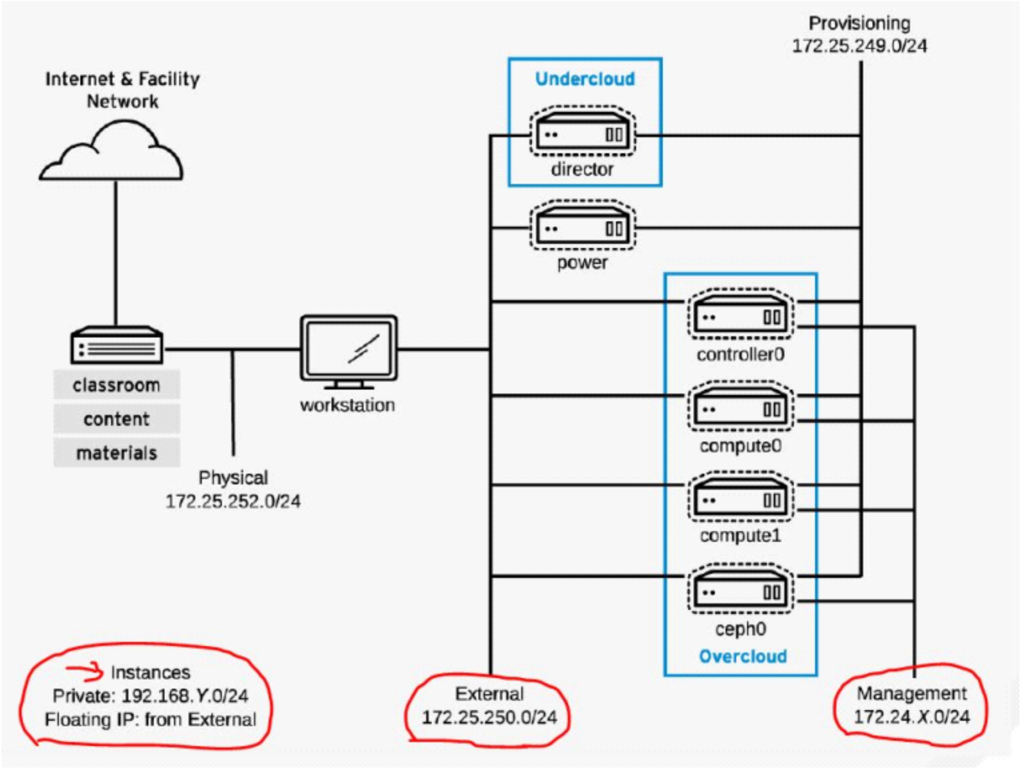
Openstack_v10(CL-210课程)_01

2018年3月6日 15:50



Openstack10实验环境拓扑图

环境中包括一个UnderCloud云下平台和一个Overcloud云上平台

UnderCloud中包括一个director（一台部署主机），通过该主机部署所有Overcloud中的Openstack环境。

Director本身也是一台all in one的Openstack。

通过**真实主机**执行如下命令可以远程该主机：

```
# ssh stack@director
```

OverCloud是Openstack云平台：

Controller0是云控制台节点（Web登陆界面在该节点）

Compute0和compute1是计算节点（所有虚拟机运行在计算节点）

通过在**director**主机执行如下命令可以远程这些主机：

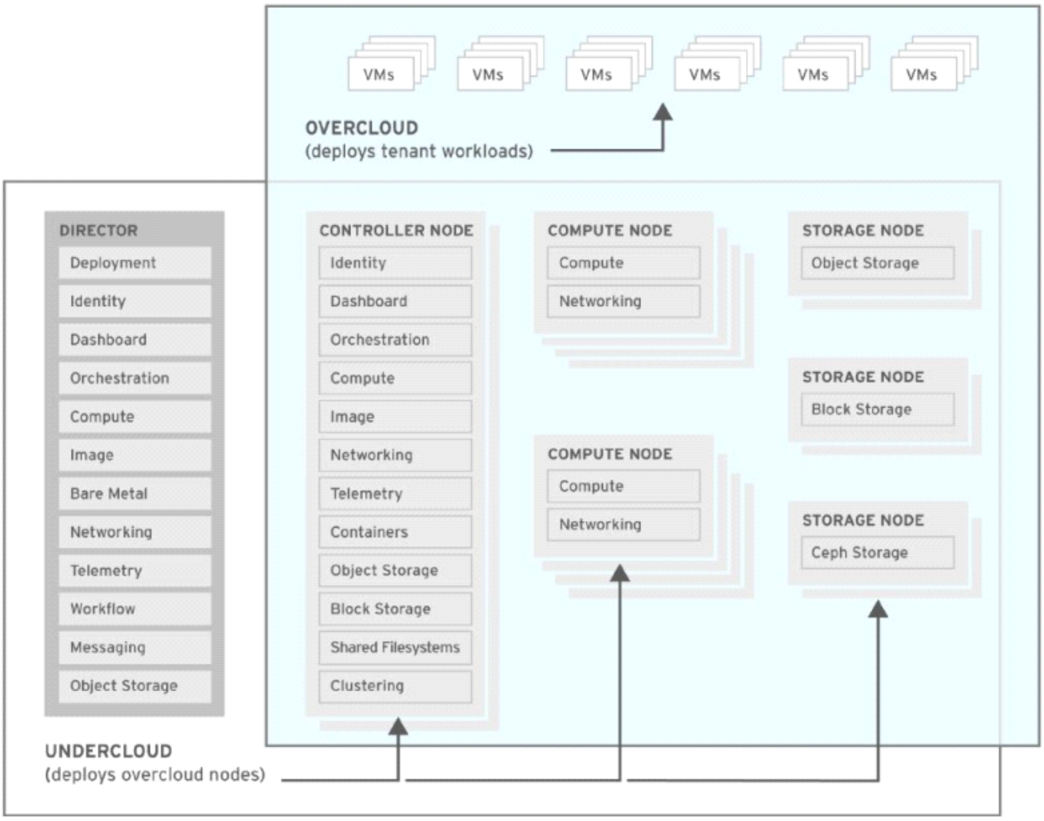
```
# ssh controller0                    //默认登陆账户为heat-admin
# ssh compute0
# ssh compute1
# ssh ceph0
```

classroom主机为讲师机，为环境中提供共享服务（如DNS，DHCP等），实验过程中此主机必须开启。

power电源管理虚拟机，通过该主机可以远程给OverCloud中的主机开机或关机，实验过程中此主机必须开启。

workstation是有图形的一台客户端主机（帐户名：student，密码：student）（账户：root，密码：redhat）。

组件拓扑图：



Director主机是一台All in One 的Openstack，该主机安装了Openstack所需的所有组建：

Identity(Keystone）用户认证与授权组件；

Dashboard(Horizon) Web控制台组件；

Orchestration(Heat) 使用模板批量部署虚拟机的组件；

Compute(Nova) 计算组件，提供虚拟机的管理功能；

Networking(Neutron) 网络管理组件；

Image(Glance): 虚拟机镜像管理组件；

Telemetry 测量计费组件；

Bare Metal(Ironic) 裸机部署，允许将openstack组件安装在裸机上；

Messaging(RabbitMQ) 消息队列组件（为Openstack所有组件之间提供通信平台）；

Object Storage（Swift） 对象存储组件。

director基于TripleO项目（openstack on Openstack)

Controller节点（Openstack的控制端，是Openstack的用户入口，安装了与Director类似的组件，但不是必须都要安装在该主机）

Compute节点（通过安装Nova组件管理虚拟机，为整个Openstack提供计算能力）

为了提供更好的性能，计算节点仅需要安装Nova和Neutron组件即可。

实验前比做的环境检查工作：

# ssh statck@director

[stack@director ~]$ openstack compute service list

```
+----+----------------+----------------------+----------+---------+-------+----------------------------+
| ID | Binary         | Host                 | Zone     | Status  | State | Updated At                 |
+----+----------------+----------------------+----------+---------+-------+----------------------------+
|  1 | nova-cert      | director.lab.example.com | internal | enabled | up    | 2018-03-05T23:01:18.000000 |
|  2 | nova-scheduler | director.lab.example.com | internal | enabled | up    | 2018-03-05T23:01:18.000000 |
|  3 | nova-conductor | director.lab.example.com | internal | enabled | up    | 2018-03-05T23:01:16.000000 |
|  4 | nova-compute   | director.lab.example.com | nova     | enabled | down  | 2018-03-05T23:01:20.000000 |
+----+----------------+----------------------+----------+---------+-------+----------------------------+
```

每次环境重置后，nova-compute服务有可能未启动（不是每次）。

使用如下命令，重启nova-compute服务即可解决该问题：

```
[stack@director ~]$ sudo openstack-service restart nova-compute
+----+-----------------------+------------------------------------+------------+------------+-----------+
| ID | Binary                | Host                               | Zone       | Status     | State     |
+----+-----------------------+------------------------------------+------------+------------+-----------+
|  1 | nova-cert             | director.lab.example.com           | internal   | enabled    | up        |
|  2 | nova-scheduler        | director.lab.example.com           | internal   | enabled    | up        |
|  3 | nova-conductor        | director.lab.example.com           | internal   | enabled    | up        |
|  4 | nova-compute          | director.lab.example.com           | nova       | enabled    | up        |
+----+-----------------------+------------------------------------+------------+------------+-----------+
```

或者是使用systemctl命令也可以，速度会更快，因为该命令更底层：

```
[stack@director ~]$ sudo systemctl status openstack-nova-compute.service
```

提示：如果nova-compute服务未启动，不要继续后面的实验！

启动实验环境虚拟机：

检查是否所有实验虚拟机都已经正常开启。

使用rht-vmctl可以快速启动虚拟机：

```
#rht-vmctl start all
```

使用该命令后controller0、compute0、ceph0依然未启动。

此时可以使用rht-vmctl start 虚拟机名称，启动虚拟机（如:rht-vmctl start controller0)

或者通过在director主机执行如下命令亦可，如：

```
[stack@director ~]$ openstack server start overcloud-cephstorage-0
[stack@director ~]$ openstack server list -c ID -c Name -c Status
+--------------------------------------+-------------------------+---------+
| ID                                   |          Name           | Status  |
+--------------------------------------+-------------------------+---------+
| c3cc04ff-3a5e-47e9-afad-09e417ab47c4 | overcloud-compute-0     | SHUTOFF |
| 2799c626-db04-4d63-b875-a96006a02de9 | overcloud-cephstorage-0 | ACTIVE  |
| 9d03a91b-96cc-441e-af96-6e7343e6db92 | overcloud-controller-0  | ACTIVE  |
+--------------------------------------+-------------------------+---------+
```

关闭实验环境虚拟机：

1. 先关闭Overcloud中的虚拟机（controller0,compute0,ceph0)
2. 再关闭其他虚拟机rht-vmctl stop all

如果没有安装前面的要求顺序关闭虚拟机，就有可能导致虚拟机状态的不同步！

使用物理机使用rht-vmctl 命令查看的状态与director主机使用openstack server list查看的状态不一致！

如果不一致，下面表格中的命令很重要！

rht-vmctl状态	openstack状态: **SHUTOFF**	openstack状态: **ACTIVE**
DEFINED	openstack server start <node>	openstack server reboot <node>
RUNNING	nova reset-state --active <node>	无需任何操作

检查整个OverCloud环境的健康状态：

登陆workstation主机，执行lab脚本，执行如下命令，可以检查实验环境的健康状态：

```
[student@workstation ~]$ lab overcloud-health-check setup
 Check the overcloud environment? (y|N)....................  Y
Verifying overcloud nodes

 · Retrieving state for overcloud-compute-0...................     SUCCESS
 · Retrieving state for overcloud-cephstorage-0...............     SUCCESS
 · Retrieving state for overcloud-controller-0................     SUCCESS
 · Waiting for overcloud-compute-0 to be available............     SUCCESS
 · Waiting for overcloud-cephstorage-0 to be available.........  SUCCESS
 · Waiting for overcloud-controller-0 to be available..........   SUCCESS
 · Verifying ceph0 access.....................................    SUCCESS
 · Starting ceph0 disk arrays and restarting ceph.target.......   SUCCESS
 · Checking RabbitMQ (5m timer)...............................    SUCCESS
 · Ensuring the Downloads directory exists....................    SUCCESS
 · Ensuring OpenStack services are running, please wait........  SUCCESS
```

查看Openstack相关服务是否启动（在controller0执行）：

```
[heat-admin@overcloud-controller-0 ~]$ systemctl -t service list-units open* neutron*
```

使用脚本创建资源验证环境：

登陆workstation主机执行如下命令：

```
[student@workstation ~]$ lab deployment-review setup
```

该脚本会创建如下资源：

创建<production>项目，创建<operator1>用户,密码:redhat

创建network网络与subnet子网（provider-172.25.250）

创建image虚拟机镜像

创建Flavor主机箱

使用命令行手动创建资源：

登陆workstation主机执行如下命令：

```
[student@workstation ~]$ cat admin-rc                              //该文件中有Openstack的账户与密码
unset OS_SERVICE_TOKEN
export OS_AUTH_URL=http://172.25.250.50:5000/v2.0
export OS_PASSWORD=favmvajW7WEh7MwEnUKnB4MkB
export OS_REGION_NAME=regionOne
export OS_TENANT_NAME=admin
export OS_USERNAME=admin
export PS1='[\u@\h \W(admin-admin)]\$ '
[student@workstation ~]$ source admin-rc                           //加载账户文件
```

```
[student@workstation ~(admin-admin)]$ openstack project create --description Production production
```

//创建项目，项目名称为production

```
[student@workstation ~(admin-admin)]$ openstack project list
+----------------------------------+------------+
| ID                               | Name       |
+----------------------------------+------------+
| 1febd350c5994e53a0d5aec224f30d96 | service    |
| de8ae5483fad465f8ef6caa8f30f4719 | admin      |
| ff8e4c69cd0f4167afc2fa1e7c8f46ac | production |
+----------------------------------+------------+
[student@workstation ~(admin-admin)]$ openstack project show production     //显示项目信息

[student@workstation ~(admin-admin)]$ openstack user list                   //显示用户列表
+----------------------------------+----------+
| ID                               | Name     |
+----------------------------------+----------+
| f599788fec954a3298edd2ecd1003352 | admin    |
| de3b2c86585f4fcca2a8de1df60348aa | neutron  |
| e5a6b8abe19d43a89185b269264e7c5e | heat     |
----------------------------------------------------
[student@workstation ~(admin-admin)]$ openstack help user create
usage: openstack user create [-h] [-f {json,shell,table,value,yaml}]
                             [-c COLUMN] [--max-width <integer>] [--noindent]
                             [--prefix PREFIX] [--project <project>]
                             [--password <password>] [--password-prompt]
                             [--email <email-address>] [--enable | --disable]
                             [--or-show]
                             <name>
[student@workstation ~(admin-admin)]$ openstack user create --project production \
>  --password redhat --email student@example.com operation1
```

//创建用户operation1，密码:redhat，该用户输入production项目组

```
[student@workstation ~(admin-admin)]$ openstack user list
```

//查看账户列表

```
[student@workstation ~(admin-admin)]$ cp admin-rc operation-rc
```

//拷贝环境变量并修改

文件修改后，内容如下

```
[student@workstation ~(admin-admin)]$ cat operation-rc
unset OS_SERVICE_TOKEN
export OS_AUTH_URL=http://172.25.250.50:5000/v2.0
export OS_PASSWORD=redhat
export OS_REGION_NAME=regionOne
export OS_TENANT_NAME=production
export OS_USERNAME=operation1
export PS1='[\u@\h \W(operation-production)]\$ '
```

```
[student@workstation ~(admin-admin)]$ source operation-rc
```

//加载新的账户信息

```
[student@workstation ~]$ openstack keypair --help
Command "keypair" matches:
  keypair create
  keypair delete
  keypair list
  keypair show
```

```
[student@workstation ~(operation-production)]$ openstack keypair create operation1-keypair1 > operation1-keypair1.key
```

//创建密钥，并导出到文件

```
[student@workstation ~(operation-production)]$ openstack keypair list
+--------------------+-------------------------------------------------+
| Name               |                   Fingerprint                   |
+--------------------+-------------------------------------------------+
| operation1-keypair1 | 93:37:3b:4e:12:22:25:3d:b4:7b:4b:2a:77:a9:ec:8a |
+--------------------+-------------------------------------------------+
[student@workstation ~(operation-production)]$ chmod 600 operation1-keypair1.key
```

//修改密钥权限

```
[student@workstation ~(operation-production)]$ openstack --help |grep security
[student@workstation ~(operation-production)]$ openstack  security group create production-ssh
```

//创建安全组

```
[student@workstation ~(operation-production)]$ openstack help security group rule create
usage: openstack security group rule create [-h]
                                            [-f {json,shell,table,value,yaml}]
                                            [-c COLUMN]
                                            [--max-width <integer>]
                                            [--noindent] [--prefix PREFIX]
                                            [--src-ip <ip-address> | --src-group <group>]
                                            [--dst-port <port-range>]
                                            [--icmp-type <icmp-type>]
                                            [--icmp-code <icmp-code>]
                                            [--protocol <protocol>]
                                            [--ingress | --egress]
                                            [--ethertype <ethertype>]
```

```
                        [--project <project>]
                        [--project-domain <project-domain>]
                        <group>
[student@workstation ~(operation-production)]$ openstack  security group rule create \
> --protocol tcp --dst-port 22   production-ssh
```

//创建安全组规则，允许ssh

```
[student@workstation ~(operation-production)]$ openstack  security group rule create \
> --protocol icmp   production-ssh
```

//创建安全组规则，允许icmp

```
[student@workstation ~(operation-production)]$ openstack  network list
```

//查看网络与子网

```
[student@workstation ~(operation-production)]$ openstack network create production-network1
```

//创建网络

```
[student@workstation ~(operation-production)]$ openstack help subnet create
usage: openstack subnet create [-h] [-f {json,shell,table,value,yaml}]
                [-c COLUMN] [--max-width <integer>]
                [--noindent] [--prefix PREFIX]
                [--project <project>]
                [--project-domain <project-domain>]
                [--subnet-pool <subnet-pool> | --use-default-subnet-pool]
                [--prefix-length <prefix-length>]
                [--subnet-range <subnet-range>]
                [--dhcp | --no-dhcp] [--gateway <gateway>]
                [--ip-version {4,6}]
                [--ipv6-ra-mode {dhcpv6-stateful,dhcpv6-stateless,slaac}]
                [--ipv6-address-mode {dhcpv6-stateful,dhcpv6-stateless,slaac}]
                --network <network>
                [--allocation-pool start=<ip-address>,end=<ip-address>]
                [--dns-nameserver <dns-nameserver>]
                [--host-route destination=<subnet>,gateway=<ip-address>]
                name
[student@workstation ~(operation-production)]$ openstack  subnet create  \
> --subnet-range 192.168.0.0/24 \
>  --dhcp \
>  --dns-nameserver 172.25.250.254 \
>  --network production-network1  \
>  production-subnet1
```

//在production-network1网络中创建一个子网

```
[student@workstation ~(operation-production)]$ openstack router create production-router1
```

//创建路由器

```
[student@workstation ~(operation-production)]$ neutron --help |grep route
[student@workstation ~(operation-production)]$ neutron router-gateway-set production-router1  provider-172.25.250
```

//将路有器外网的接口，连接到环境提前准备好的外部网络中

```
[student@workstation ~(operation-production)]$ openstack help router add subnet
usage: openstack router add subnet [-h] <router> <subnet>
[student@workstation ~(operation-production)]$ openstack router add subnet production-router1  production-subnet1
```

//为路有器连接内外接口，连接production-subnet1这个网络

//此时，可以通过登陆Web控制台，看看网络拓扑图（用户operation1,密码:redhat)

//Project-->Network-->Network Topology

```
[student@workstation ~(operation-production)]$ openstack help floating ip create
usage: openstack floating ip create [-h] [-f {json,shell,table,value,yaml}]
                    [-c COLUMN] [--max-width <integer>]
                    [--noindent] [--prefix PREFIX]
                    [--subnet <subnet>] [--port <port>]
                    [--floating-ip-address <floating-ip-address>]
                    [--fixed-ip-address <fixed-ip-address>]
                    <network>
[student@workstation ~(operation-production)]$ openstack network list
+--------------------------------------+---------------------+--------------------------------------+
| ID                                   |        Name         |               Subnets                |
+--------------------------------------+---------------------+--------------------------------------+
| 213cda9b-5df3-4c53-abeb-4995f565564a | provider-172.25.250  | d344e1ee-90af-4ebb-85fd-8b53c807710f |
| 6aa0085c-645c-4df7-9892-2e5f4f68fd77  | production-network1 | 6532fe51-ca0a-4aff-ad96-e0f82ea7de23  |
+--------------------------------------+---------------------+--------------------------------------+
[student@workstation ~(operation-production)]$ openstack floating ip create provider-172.25.250
```

//创建浮动IP

```
[student@workstation ~(operation-production)]$ openstack security group list
[student@workstation ~(operation-production)]$ openstack image list
[student@workstation ~(operation-production)]$ openstack  network list
[student@workstation ~(operation-production)]$ openstack flavor list
[student@workstation ~(operation-production)]$ openstack keypair list
```

```
[student@workstation ~(operation-production)]$ openstack help server create
usage: openstack server create [-h] [-f {json,shell,table,value,yaml}]
                    [-c COLUMN] [--max-width <integer>]
                    [--noindent] [--prefix PREFIX]
                    (--image <image> | --volume <volume>) --flavor
                    <flavor>
                    [--security-group <security-group-name>]
                    [--key-name <key-name>]
                    [--property <key=value>]
                    [--file <dest-filename=source-filename>]
                    [--user-data <user-data>]
                    [--availability-zone <zone-name>]
                    [--block-device-mapping <dev-name=mapping>]
                    [--nic <net-id=net-uuid,v4-fixed-ip=ip-addr,v6-fixed-ip=ip-addr,port-id=port-uuid>]
                    [--hint <key=value>]
                    [--config-drive <config-drive-volume>|True]
                    [--min <count>] [--max <count>] [--wait]
                    <server-name>
[student@workstation ~(operation-production)]$ openstack  server create \
> --image rhel7 \
> --flavor m1.web \
> --security-group production-ssh \
> --nic net-id=production-network1 \
> --key-name operation1-keypair1 \
> --wait  production-web1
```

//创建虚拟机实例

```
[student@workstation ~(operation-production)]$ openstack  server show production-web1
```

//查看虚拟机状态

```
[student@workstation ~(operation-production)]$ openstack  server add floating ip production-web1 172.25.250.N
```

//为虚拟主机分配浮动IP（浮动IP可以连接外网）

```
[student@workstation ~(operation-production)]$ ping 172.25.250.N
```

//ping浮动IP，检查虚拟机连通性

```
[student@workstation ~(operation-production)]$ ssh -i operation1-keypair1.key cloud-user@172.25.250.N
```

//通过浮动IP，远程虚拟机

登陆workstation主机执行如下命令，可以清除前面的实验：

```
[student@workstation ~]$ lab deployment-review cleanup
```