

1st july

```
Red Hat Enterprise Linux Server 7.5 (Maipo)
Kernel 3.10.0-862.el7.x86_64 on an x86_64

openstack login: root
Password:
Last login: Fri Jun 26 19:22:56 from laptop-bs1qhhql
[root@openstack ~]# ifconfig
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 192.168.43.186 netmask 255.255.255.0 broadcast 192.168.43.255
        inet6 fe80::a00:27ff:fe04:dd49 prefixlen 64 scopeid 0x20<link>
            ether 08:00:27:04:dd:49 txqueuelen 1000 (Ethernet)
                RX packets 0 bytes 0 (0.0 B)
                RX errors 0 dropped 0 overruns 0 frame 0
                TX packets 14 bytes 1008 (1008.0 B)
                TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
        inet6 ::1 prefixlen 128 scopeid 0x10<host>
            loop txqueuelen 1000 (Local Loopback)
                RX packets 9037 bytes 2836153 (2.7 MiB)
                RX errors 0 dropped 0 overruns 0 frame 0
                TX packets 9037 bytes 2836153 (2.7 MiB)
                TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

[root@openstack ~]# source keystonerc_
-bash: keystonerc_: No such file or directory
[root@openstack ~]# source keystonerc_demo
[root@openstack ~]# nova flavor-list
```



```

+-----+-----+-----+-----+-----+-----+-----+
| ID      | Name     | Memory_MB | Disk | Ephemeral | Swap | UCPU   | R
| XTX_Factor | Is_Public |
+-----+-----+-----+-----+-----+-----+-----+
| 1       | m1.tiny  | 512       | 1    | 0        | 0    | 1      | 1
|.0      | True     |           |      |          |      |          |
| 2       | m1.small  | 2048      | 20   | 0        | 0    | 1      | 1
|.0      | True     |           |      |          |      |          |
| 2f3a3db9-2996-454c-a7fa-43b79842723a | v.image   | 1024     | 10   | 0        | 0    | 2      | 1
|.0      | True     |           |      |          |      |          |
| 3       | m1.medium | 4096      | 40   | 0        | 0    | 2      | 1
|.0      | True     |           |      |          |      |          |
| 4       | m1.large  | 8192      | 80   | 0        | 0    | 4      | 1
|.0      | True     |           |      |          |      |          |
| 5       | m1.xlarge | 16384     | 160  | 0        | 0    | 8      | 1
|.0      | True     |           |      |          |      |          |
| 66      | m1.manila | 512       | 0    | 0        | 0    | 1      | 1
|.0      | True     |           |      |          |      |          |
+-----+-----+-----+-----+-----+-----+-----+
[root@openstack ~ (keystone_demo)]# neutron net-list
neutron CLI is deprecated and will be removed in the future. Use openstack CLI instead.
+-----+-----+
| id      | name     | subnets
|         |
+-----+-----+
| d031d503-dcc4-4ddb-9225-b370fe42da3e | private  | 8048b79f-a38b-46f2-8ee9-67820ffef511 10.0.0.0/24
| ffbbeb13c-2347-4256-b1f5-dfb91307a88d | public   | 2c8c6fdb-defa-43ba-8d72-20f9c5978dee
|         |
+-----+-----+
[root@openstack ~ (keystone_demo)]# _
```

```
Scope for system operations
--os-domain-id OS_DOMAIN_ID    Domain ID to scope to
--os-domain-name OS_DOMAIN_NAME
                                Domain name to scope to
--os-project-id OS_PROJECT_ID, --os-tenant-id OS_PROJECT_ID
                                Project ID to scope to
--os-project-name OS_PROJECT_NAME, --os-tenant-name OS_PROJECT_NAME
                                Project name to scope to
--os-project-domain-id OS_PROJECT_DOMAIN_ID
                                Domain ID containing project
--os-project-domain-name OS_PROJECT_DOMAIN_NAME
                                Domain name containing project
--os-trust-id OS_TRUST_ID      Trust ID
--os-default-domain-id OS_DEFAULT_DOMAIN_ID
                                Optional domain ID to use with v3 and v2
                                parameters. It will be used for both the user
                                and project domain in v3 and ignored in v2
                                authentication.
--os-default-domain-name OS_DEFAULT_DOMAIN_NAME
                                Optional domain name to use with v3 API and v2
                                parameters. It will be used for both the user
                                and project domain in v3 and ignored in v2
                                authentication.
--os-user-id OS_USER_ID        User id
--os-username OS_USERNAME, --os-user-name OS_USERNAME
                                Username
--os-user-domain-id OS_USER_DOMAIN_ID
                                User's domain id
--os-user-domain-name OS_USER_DOMAIN_NAME
                                User's domain name
--os-password OS_PASSWORD      User's password
```

See "nova help COMMAND" for help on a specific command.

```
[root@openstack ~]# openstack service list
```

```
You are not authorized to perform the requested action: identity:list_services. (HTTP 403) (Request-ID: req-cb4d879b-271c-41a6-89f1-3524001ef4d4)
```

```
[root@openstack ~]# _
```

```

See "nova help COMMAND" for help on a specific command.
[root@openstack ~]# openstack service list
You are not authorized to perform the requested action: identity:list_services. (HTTP 403) (Request-ID: req-cb4d879b-271c-41a6-89f1-3524001ef4d4)
[root@openstack ~]# ls
a.txt keystonerc_admin keystonerc_demo
[root@openstack ~]# cat keystonerc_admin
unset OS_SERVICE_TOKEN
export OS_USERNAME=admin
export OS_PASSWORD='87ab6f4ac2094bb0'
export OS_AUTH_URL=http://192.168.43.186:5000/v3
export PS1='[\u001b \W(keystone_admin)]\$ '

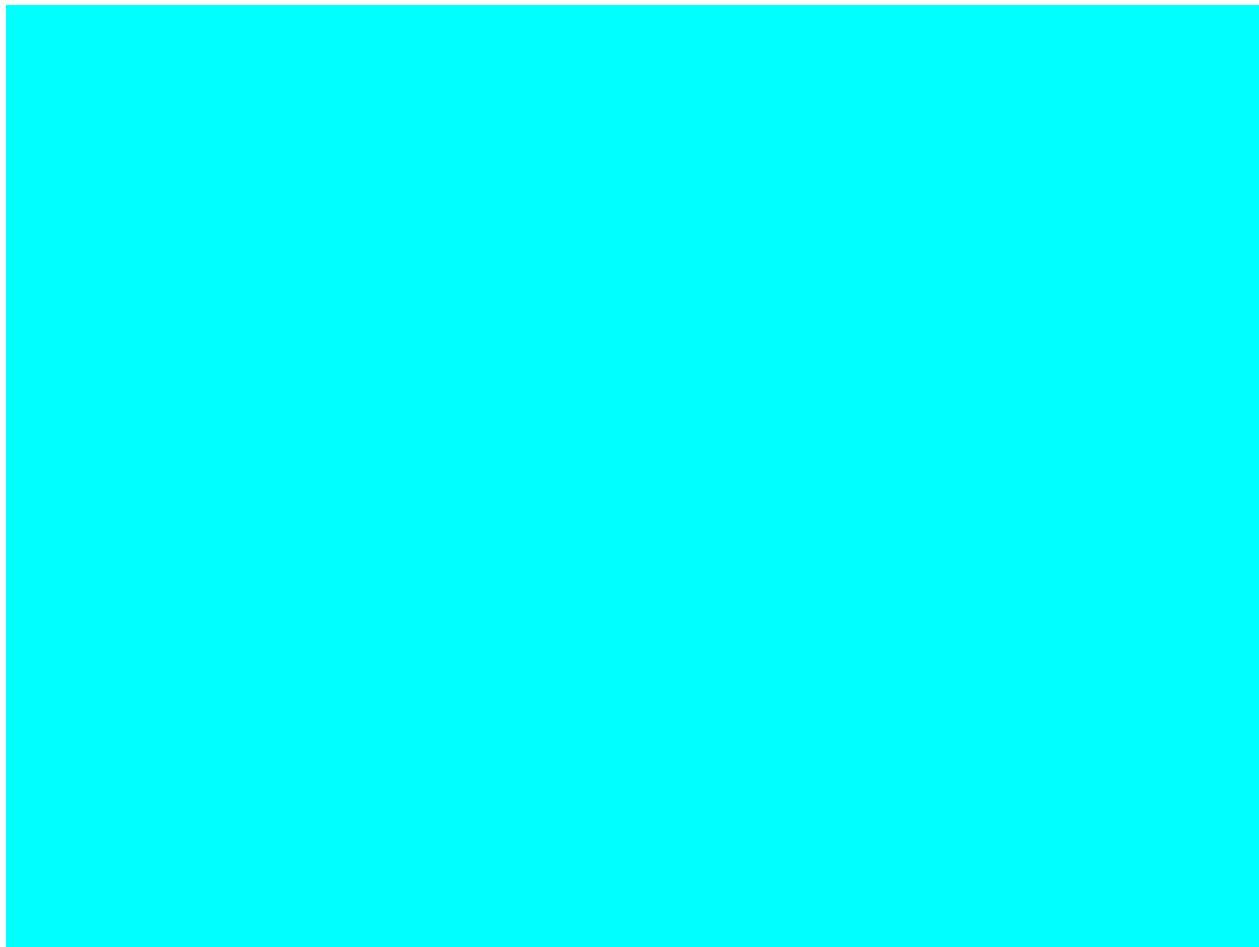
export OS_PROJECT_NAME=admin
export OS_USER_DOMAIN_NAME=Default
export OS_PROJECT_DOMAIN_NAME=Default
export OS_IDENTITY_API_VERSION=3
[root@openstack ~]# openstack service list
You are not authorized to perform the requested action: identity:list_services. (HTTP 403) (Request-ID: req-8857d3a3-d7c7-4df5-a03d-c660f4fc8714)
[root@openstack ~]# source keystonerc_admin
[root@openstack ~]# openstack service list
+-----+-----+-----+
| ID      | Name    | Type   |
+-----+-----+-----+
| 0a6de7b29f174df6a643024d1a696b9d | nova    | compute |
| 154b67cdbbf4a23a707d25de99d6a51 | keystone | identity |
| 161dbed0b08243dbb7a7d1509f171faa | manila_v2 | sharev2  |
| 2c0999696396454ebb7a1fc6b4852e69 | cinder   | volume   |
| 6eadcc8068e347b78409fc6735d2cf52 | neutron  | network  |
| 7fa013d918894e76b9d315e72e53ac86 | placement | placement |
| 804d23b389f14477858c5b05abb1dac5 | manila   | share    |
| 8c05998db2464b76bbf08dc59ddd444 | cinderv3 | volumev3 |
| c736b37ec4e04c5b8c6cb7a3efad6a6a | cinderv2 | volumev2 |
| da8bd3cee35546a1a3e87836f546a95a | glance   | image    |
+-----+-----+-----+
[root@openstack ~]#

```

```
[root@openstack ~ (keystone_demo)]# cat kestonerc_admin
unset OS_SERVICE_TOKEN
export OS_USERNAME=admin
export OS_PASSWORD='87ab6f4ac2094bb0'
export OS_AUTH_URL=http://192.168.43.186:5000/v3
export PS1='[\u@\h \W(keystone_admin)]\$ '

export OS_PROJECT_NAME=admin
export OS_USER_DOMAIN_NAME=Default
export OS_PROJECT_DOMAIN_NAME=Default
export OS_IDENTITY_API_VERSION=3
[root@openstack ~(keystone_demo)]# openstack service list
You are not authorized to perform the requested action: identity:list_services. (HTTP 403) (Request-ID: req-8857d3a3-d7c7-4df5-a03d-c660f4fc8714)
[root@openstack ~(keystone_demo)]# source kestonerc_admin
[root@openstack ~(keystone_admin)]# openstack service list
+----+-----+-----+
| ID | Name | Type |
+----+-----+-----+
| 0a6de7b29f174df6a643024d1a696b9d | nova | compute |
| 154b67cdbbf4a23a707d25de99d6a51 | keystone | identity |
| 161dbed0b08243dbb7a7d1509f171faa | manila-v2 | sharev2 |
| 2c0999696396454ebb7a1fc6b4852e69 | cinder | volume |
| 6eadcc8068e347b78409fc6735d2cf52 | neutron | network |
| 7fa013d918894e76b9d315e72e53ac86 | placement | placement |
| 804d23b309f14477858c5b05abb1dac5 | manila | share |
| 8c05998db2464b76bbf08dc59ddd444 | cinder-v3 | volumev3 |
| c736b37ec4e04c5b8c6cb7a3efad6a6a | cinder-v2 | volumev2 |
| da8bd3ceee35546a1a3e87836f546a95a | glance | image |
+----+-----+-----+
[root@openstack ~(keystone_admin)]# source kestonerc_demo
[root@openstack ~(keystone_demo)]# nova list
+----+-----+-----+-----+-----+-----+
| ID | Name | Status | Task State | Power State | Networks |
+----+-----+-----+-----+-----+-----+
+----+-----+-----+-----+-----+-----+
[root@openstack ~(keystone_demo)]# _
```

nova list -h



```

device of <size> GB and format it to <format>.
--hint <key=value> Send arbitrary key/value pairs to the
scheduler for custom use.

--nic <auto,none,net-id=net-uuid,net-name=network-name,port-id=port-uuid,v4-fixed-ip=ip-addr,v6-fixed-ip=ip-addr,tag=tag> Create a NIC on the server. Specify option
multiple times to create multiple nics unless
using the special 'auto' or 'none' values.
auto: automatically allocate network resources
if none are available. This cannot be
specified with any other nic value and cannot
be specified multiple times. none: do not
attach a NIC at all. This cannot be specified
with any other nic value and cannot be
specified multiple times. net-id: attach NIC
to network with a specific UUID. net-name:
attach NIC to network with this name (either
port-id or net-id or net-name must be
provided). v4-fixed-ip: IPv4 fixed address for
NIC (optional), v6-fixed-ip: IPv6 fixed
address for NIC (optional), port-id: attach
NIC to port with this UUID tag: interface
metadata tag (optional) (either port-id or
net-id must be provided). (Supported by API
versions '2.42' - '2.latest')

--config-drive <value> Enable config drive.
--poll Report the new server boot progress until it
completes.

--admin-pass <value> Admin password for the instance.
--access-ip-v4 <value> Alternative access IPv4 of the instance.
--access-ip-v6 <value> Alternative access IPv6 of the instance.
--description <description> Description for the server. (Supported by API
versions '2.19' - '2.latest')

--tags <tags> Tags for the server.Tags must be separated by
commas: --tags <tag1,tag2> (Supported by API
versions '2.52' - '2.latest')

[root@openstack ~]# nova help boot

```

The screenshot shows a Windows terminal window with a black background and white text. At the top, it displays the command history and output:

```

root@openstack ~]# nova boot --flavor m1.small --image fedoralinux32 --min-count 1 --nic net-name=private myos10
+---+
| Property           | Value
+---+
| os-dcf:diskConfig | MANUAL
| os-ext-az:availability_zone |
| os-ext-sts:power_state | 0
| os-ext-sts:task_state | scheduling
| os-ext-sts:vm_state | building
| os-srv-usg:launched_at | -
| os-srv-usg:terminated_at | -
| accessIPv4          |
| accessIPv6          | gw78rbsMdi6N
| adminPass           | g
| config_drive        | 2020-07-01T13:21:25Z
| created             | -
| description          | 20
| flavor:disk          | 0
| flavor:ephemeral    | {}
| flavor:extra_specs   | m1.small
| flavor:original_name | 2048
| flavor:ram            | 0
| flavor:swap           | 1
| flavor:vcpus         |
| hostId              | f6e8a842-c463-49da-a2db-733981c774b6
| image                | fedoralinux32 (8973f335-c91b-4eca-8055-3d6e9bbca3ee)
| key_name             | -
| locked               | False
| metadata             | {}
| name                 | myos10
| os-extended-volumes:volumes_attached | []
| progress              | 0
| security_groups      | default
| status                | BUILD
| tags                  | []
| tenant_id             | b5a44a86c0b94aceab92aac453f880d

```

At the bottom of the terminal window, there is a taskbar with various icons and a system tray showing the date and time.

```

root@openstack-:~# ssh root@192.168.43.186
root@192.168.43.186's password:
Last login: Wed Jul  1 18:36:54 2020
[root@openstack ~]# source kestonerc_demo
[root@openstack ~](keystone_demo)]#
[root@openstack ~](keystone_demo)]# nova boot --flavor m1.small --image fedorlinux32 --min-count 1 --nic net-name=private myos10
+-----+-----+
| Property | Value |
+-----+-----+
| OS-DCF:diskConfig | MANUAL |
| OS-EXT-AZ:availability_zone | 0 |
| OS-EXT-STS:power_state | scheduling |
| OS-EXT-STS:task_state | building |
| OS-EXT-STS:vm_state | - |
| OS-SRV-USG:launched_at | - |
| OS-SRV-USG:terminated_at | - |
| accessIPv4 | gw78rbsMdi6N |
| accessIPv6 | |
| adminPass | |
| config_drive | |
| created | 2020-07-01T13:21:25Z |
| description | |
| flavor:disk | 20 |
| flavor:ephemeral | 0 |
| flavor:extra_specs | {} |
| flavor:original_name | m1.small |
| flavor:ram | 2048 |
| flavor:swap | 0 |
| flavor:vcpus | 1 |
| hostId | |
| id | f6e8a842-c463-49da-a2db-733981c774b6 |
| image | fedorlinux32 (8973f335-c91b-4eca-8055-3d6e9bbca3ee) |
| key_name | |
| locked | False |

```

Instances - OpenStack Dashboard

Not secure | 192.168.43.186/dashboard/project/instances/

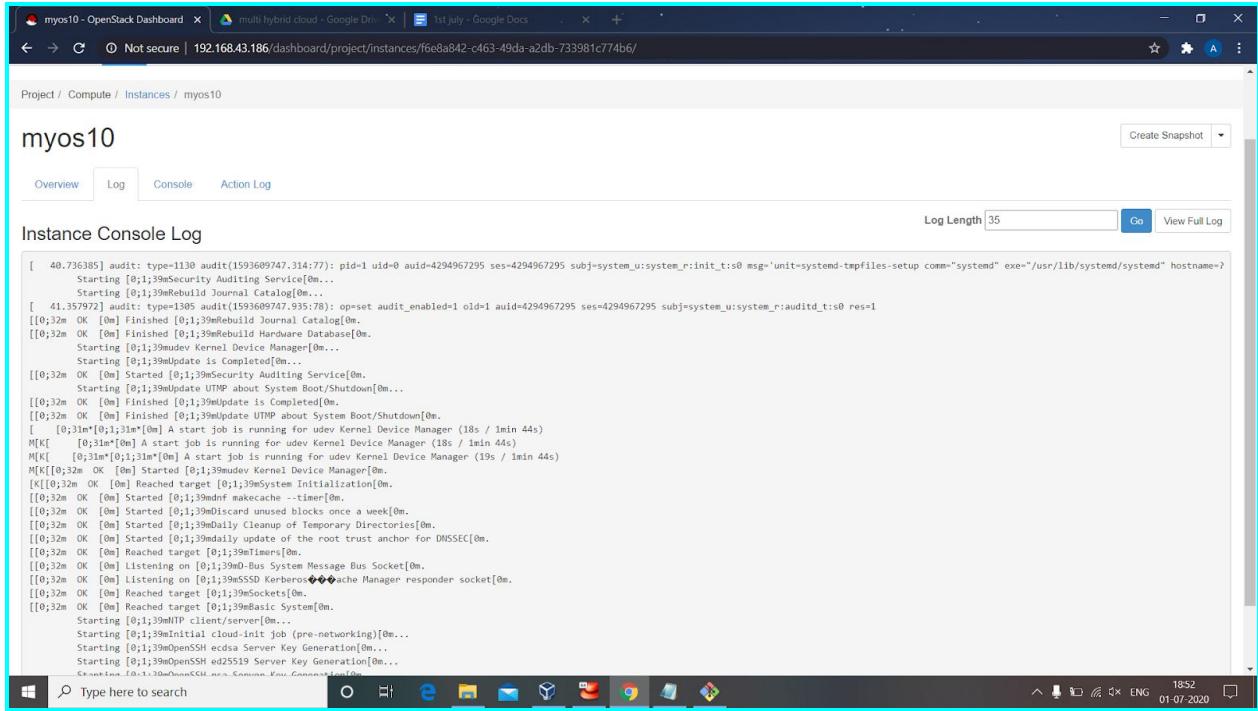
Project / Compute / Instances

Instances

Displaying 1 item

Instance Name	Image Name	IP Address	Flavor	Key Pair	Status	Availability Zone	Task	Power State	Time since created	Actions
myos10	fedorlinux32	10.0.0.9	m1.small	-	Active	nova	None	Running	0 minutes	<button>Create Snapshot</button>

Displaying 1 item



```
[root@openstack ~]# cd /var/log
[root@openstack log]# ls
anaconda      btmp    dmesg.old  grubby_prune_debug  lastlog  mariadb  openvswitch  rhsm
tallylog
audit        cinder   firewalld  horizon          libvirt  messages  puppet    samba  tuned
boot.log     cron     glance    httpd           maillog  neutron  qemu-ga  secure  wtmp
boot.log-20200626 dmesg   glusterfs  keystone       manila  nova    rabbitmq  spooler
yum.log
```

```

root@openstack:~# openstack flavor show myos10
+-----+-----+
| flavor:swap | 0
| flavor:vcpus | 1
| hostId |
| id | f6e8a842-c463-49da-a2db-733981c774b6
| image |
| key_name |
| locked | False
| metadata |
| name | myos10
| os-extended-volumes:volumes_attached | []
| progress | 0
| security_groups | default
| status | BUILD
| tags |
| tenant_id | b5a44a86c0b94aceab92aaac453f880d
| updated | 2020-07-01T13:21:25Z
| user_id | 8d2c9f9220bc44109448523d53ba5ed9
+-----+-----+
[root@openstack ~]#
[root@openstack ~]# free -m
total used free shared buff/cache available
Mem: 7982 7154 204 8 623 479
Swap: 5119 0 5119
[root@openstack ~]# echo 3 > /proc/sys/vm/drop_caches
-bash: /proc/sys/vm/drop_caches: No such file or directory
[root@openstack ~]# echo 3 > /proc/sys/vm/drop_caches
[root@openstack ~]# free -m
total used free shared buff/cache available
Mem: 7982 7094 711 8 177 620
Swap: 5119 0 5119
[root@openstack ~]# cd /var/log
[root@openstack log]# ls
anaconda   btmp  dmesg.old  grubby_prune_debug  lastlog  mariadb  openvswitch  rhsm  tallylog
audit      cinder firewalld horizon    libvirt  messages  puppet  samba  tuned
boot.log   cron  glance   httpd       maillog  neutron  qemu-ga  secure  wtmp
boot.log-20200626 dmesg  glusterfs  keystone   manila  nova    rabbitmq  spooler  yum.log
[root@openstack log]#

```

```

root@openstack:~# openstack user show 8d2c9f9220bc44109448523d53ba5ed9
+-----+-----+
| user_id | 8d2c9f9220bc44109448523d53ba5ed9
+-----+-----+
[root@openstack ~]#
[root@openstack ~]# free -m
total used free shared buff/cache available
Mem: 7982 7154 204 8 623 479
Swap: 5119 0 5119
[root@openstack ~]# echo 3 > /proc/sys/vm/drop_caches
-bash: /proc/sys/vm/drop_caches: No such file or directory
[root@openstack ~]# echo 3 > /proc/sys/vm/drop_caches
[root@openstack ~]# free -m
total used free shared buff/cache available
Mem: 7982 7094 711 8 177 620
Swap: 5119 0 5119
[root@openstack ~]# cd /var/log
[root@openstack log]# ls
anaconda   btmp  dmesg.old  grubby_prune_debug  lastlog  mariadb  openvswitch  rhsm  tallylog
audit      cinder firewalld horizon    libvirt  messages  puppet  samba  tuned
boot.log   cron  glance   httpd       maillog  neutron  qemu-ga  secure  wtmp
boot.log-20200626 dmesg  glusterfs  keystone   manila  nova    rabbitmq  spooler  yum.log
[root@openstack log]# cd nova
-bash: cd: nova: No such file or directory
[root@openstack log]# cd nova/
[root@openstack nova]# ls
nova-api.log  nova-conductor.log  nova-manage.log  nova-placement-api.log  privsep-helper.log
nova-compute.log  nova-consoleauth.log  nova-novncproxy.log  nova-scheduler.log
[root@openstack nova]# cat nova-compute.log
2020-06-25 22:15:32.482 1788 INFO os_vif [-] Loaded VIF plugins: ovs, linux_bridge
2020-06-25 22:15:32.598 1788 INFO nova.virt.driver [req-3a1da08c-7ef4-4c5c-953f-96981c91ead0 - - - - -] Loading compute driver 'libvirt.LibvirtDriver'
2020-06-25 22:15:32.725 1788 WARNING oslo_config.cfg [req-3a1da08c-7ef4-4c5c-953f-96981c91ead0 - - - - -] option "firewall_driver" from group "DEFAULT" is deprecated for removal (
nova-network is deprecated, as are any related configuration options.
). Its value may be silently ignored in the future.
2020-06-25 22:15:32.730 1788 WARNING os_brick.initiator.connectors.remoteefs [req-3a1da08c-7ef4-4c5c-953f-96981c91ead0 - - - - -] Connection details not present. RemoteFsClient may not initialize properly.
2020-06-25 22:15:32.783 1788 WARNING oslo_config.cfg [req-3a1da08c-7ef4-4c5c-953f-96981c91ead0 - - - - -] option "dhcp_domain"

```

```

[root@openstack log]# cd nova/
[root@openstack nova]# ls
nova-api.log  nova-conductor.log  nova-manage.log  nova-placement-api.log
privsep-helper.log
nova-compute.log  nova-consoleauth.log  nova-novncproxy.log  nova-scheduler.log
[root@openstack nova]# cat nova-compute.log
2020-06-25 22:15:32.482 1788 INFO os_vif [-] Loaded VIF plugins: ovs, linux_bridge

```

```
2020-06-25 22:15:32.598 1788 INFO nova.virt.driver  
[req-3a1da08c-7ef4-4c5c-953f-96981c91ead0 -----] Loading compute driver  
'libvirt.LibvirtDriver'
```

```
2020-06-25 22:15:32.725 1788 WARNING oslo_config.cfg  
[req-3a1da08c-7ef4-4c5c-953f-96981c91ead0 -----] Option "firewall_driver" from group  
"DEFAULT" is deprecated for removal (
```

The screenshot shows a Windows desktop environment with two main windows open:

- Terminal Window:** An Untitled - Notepad window containing the following command and its output:

```
nova boot --flavor m1.small --image fedoralinux32  
--min-count 1 --nic net-name=private myos10
```
- Dashboard Window:** A browser window showing the Red Hat OpenStack Platform dashboard at 192.168.43.186/dashboard/project/instances/. The dashboard displays a list of instances, with one instance named "myos10" selected. A modal dialog titled "Flavor Details: m1.small" is open, showing the following details for the selected instance:

ID	2
VCPUs	1
RAM	2GB
Size	20GB

```

root@openstack:~# Swap: 5119 0 5119
[root@openstack nova(keystone_demo)]# vim a.txt
[root@openstack nova(keystone_demo)]# ls
a.txt  nova-compute.log  nova-consoleauth.log  nova-novncproxy.log  nova-scheduler.log
nova-api.log  nova-conductor.log  nova-manage.log  nova-placement-api.log  privsep-helper.log
[root@openstack nova(keystone_demo)]# cat a.txt
[root@openstack nova(keystone_demo)]# cd ..
[root@openstack log(keystone_demo)]# cd ..
[root@openstack var(keystone_demo)]# cd ..
[root@openstack /keystone_demo)]# cd ..
[root@openstack /keystone_demo)]# ls
bin  dev  etc  iso  iso2  lib64  mnt  proc  run  software  sys  usr
boot  dvd  home  isol  lib  media  opt  root  sbin  srv  tmp  var
[root@openstack /keystone_demo)]# pwd
/
[root@openstack /keystone_demo)]# cd /openstack
-bash: cd: /openstack: No such file or directory
[root@openstack /keystone_demo)]# cd /openstack/
-bash: cd: /openstack/: No such file or directory
[root@openstack /keystone_demo)]# ls
bin  dev  etc  iso  iso2  lib64  mnt  proc  run  software  sys  usr
boot  dvd  home  isol  lib  media  opt  root  sbin  srv  tmp  var
[root@openstack /keystone_demo)]# cd /root
[root@openstack ~keystone_demo)]# ls
a.txt  keystonec_admin  keystonec_demo
[root@openstack ~keystone_demo)]# source keystonec_demo
[root@openstack ~keystone_demo)]# nova list
+-----+-----+-----+-----+-----+
| ID      | Name   | Status | Task State | Power State | Networks |
+-----+-----+-----+-----+-----+
| f6e8a842-c463-49da-a2db-733981c774b6 | myos10 | ACTIVE | -          | Running    | private=10.0.0.9 |
+-----+-----+-----+-----+-----+
[root@openstack ~keystone_demo)]# 

Windows Taskbar: Type here to search, File Explorer, Mail, Edge, File History, Task View, Taskbar icons, ENG 1904 01-07-2020

root@openstack:~# [root@openstack /keystone_demo)]# cd ..
[root@openstack /keystone_demo)]# ls
bin  dev  etc  iso  iso2  lib64  mnt  proc  run  software  sys  usr
boot  dvd  home  isol  lib  media  opt  root  sbin  srv  tmp  var
[root@openstack /keystone_demo)]# pwd
/
[root@openstack /keystone_demo)]# cd /openstack
-bash: cd: /openstack: No such file or directory
[root@openstack /keystone_demo)]# cd /openstack/
-bash: cd: /openstack/: No such file or directory
[root@openstack /keystone_demo)]# ls
bin  dev  etc  iso  iso2  lib64  mnt  proc  run  software  sys  usr
boot  dvd  home  isol  lib  media  opt  root  sbin  srv  tmp  var
[root@openstack /keystone_demo)]# cd /root
[root@openstack ~keystone_demo)]# ls
a.txt  keystonec_admin  keystonec_demo
[root@openstack ~keystone_demo)]# source keystonec_demo
[root@openstack ~keystone_demo)]# nova list
+-----+-----+-----+-----+-----+
| ID      | Name   | Status | Task State | Power State | Networks |
+-----+-----+-----+-----+-----+
| f6e8a842-c463-49da-a2db-733981c774b6 | myos10 | ACTIVE | -          | Running    | private=10.0.0.9 |
+-----+-----+-----+-----+-----+
[root@openstack ~keystone_demo)]# df -h
Filesystem            Size  Used Avail Use% Mounted on
/dev/mapper/rhel_openstack-root  44G  15G  30G  32% /
devtmpfs              3.9G   0  3.9G  0% /dev
tmpfs                3.9G   0  3.9G  0% /dev/shm
tmpfs                3.9G  8.8M  3.9G  1% /run
tmpfs                3.9G   0  3.9G  0% /sys/fs/cgroup
/dev/sda1             1014M 131M  884M 13% /boot
/dev/sr0               4.4G  4.4G   0 100% /dvd
tmpfs                799M   0  799M  0% /run/user/0
[root@openstack ~keystone_demo)]# 

Windows Taskbar: Type here to search, File Explorer, Mail, Edge, File History, Task View, Taskbar icons, ENG 1906 01-07-2020

```

Google search results for "terraform openstack":

- [www.terraform.io](#) › docs › providers › openstack
- Provider: OpenStack - Terraform by HashiCorp**
- yaml files. If omitted, the OS_CLOUD environment variable is used. region - (Optional) The region of the OpenStack cloud to use ...
- [Instance With Personality](#) | [Openstack_lb_loadbalancer_v2](#) | [Object Storage](#)
- [www.terraform.io](#) › openstack › compute_instance_v2
- OpenStack: openstack_compute_instance_v2 - Terraform by ...**
- Manages a V2 VM instance resource within OpenStack. » Example Usage. » Basic Instance. resource "openstack_compute_instance_v2" "basic" { ... }
- » Argument Reference; » Multiple Ephemeral Disks; »
- [platform9.com](#) › blog › how-to-use-terraform-with-ope...
- How to Use Terraform with OpenStack | Platform9**
- Jul 22, 2016 - HashiCorp Terraform is a tool used to deploy and manage your cloud infrastructure. Terraform with OpenStack supports resources such as ...
- [galaxyproject.github.io](#) › tutorials › terraform › tutorial
- Deploying a compute cluster in OpenStack via Terraform**
- Feb 28, 2020 - This tutorial uses the OpenStack provider for Terraform. Other Cloud providers are available, but their invocation will be different from that which ...

https://www.google.com/search?q=terraform+openstack&oq=terraform+openstack&gsq=chrome.8957j0l7.7528j0j7&sourceid=chrome&ie=UTF-8#

Terraform documentation for the OpenStack Provider:

OpenStack Provider

The OpenStack provider is used to interact with the many resources supported by OpenStack. The provider needs to be configured with the proper credentials before it can be used.

Use the navigation to the left to read about the available resources.

Example Usage

```
# Configure the OpenStack Provider
provider "openstack" {
  user_name  = "admin"
  tenant_name = "admin"
  password   = "pwd"
  auth_url   = "http://myauthurl:5000/v2.0"
  region     = "RegionOne"
}

# Create a web server
resource "openstack_compute_instance_v2" "test-server" {
  # ...
}
```

```
[root@openstack ~(keystone_demo)]# cd /root
[root@openstack ~ (keystone_demo)]# ls
a.txt kestonerc_admin kestonerc_demo
[root@openstack ~ (keystone_demo)]# source kestonerc_demo
[root@openstack ~ (keystone_demo)]# nova list
+-----+-----+-----+-----+-----+
| ID   | Name  | Status | Task State | Power State | Networks |
+-----+-----+-----+-----+-----+
| f6e8a842-c463-49da-a2db-733981c774b6 | myos10 | ACTIVE | -          | Running    | private=10.0.0.9 |
+-----+-----+-----+-----+-----+
[root@openstack ~ (keystone_demo)]# df -h
Filesystem      Size  Used Avail Use% Mounted on
/dev/mapper/rhel_openstack-root  44G   15G   30G  32% /
devtmpfs        3.9G    0    3.9G  0% /dev
tmpfs           3.9G    0    3.9G  0% /dev/shm
tmpfs           3.9G   8.8M  3.9G  1% /run
tmpfs           3.9G    0    3.9G  0% /sys/fs/cgroup
/dev/sda1       1014M  131M  884M 13% /boot
/dev/sr0         4.4G  4.4G    0 100% /dvd
tmpfs           799M    0   799M  0% /run/user/0
[root@openstack ~ (keystone_demo)]# ls
a.txt kestonerc_admin kestonerc_demo
[root@openstack ~ (keystone_demo)]# cat kestonerc_demo
unset OS_SERVICE_TOKEN
export OS_USERNAME=demo
export OS_PASSWORD='9a649b0b4d4d46ef'
export PS1='[\u@\h \W(keystone_demo)]\$ '
export OS_AUTH_URL=http://192.168.43.186:5000/v3

export OS_PROJECT_NAME=demo
export OS_USER_DOMAIN_NAME=Default
export OS_PROJECT_DOMAIN_NAME=Default
export OS_IDENTITY_API_VERSION=3
[root@openstack ~ (keystone_demo)]#
```

C:\Users\user\Desktop\terraform>mkdir open1

C:\Users\user\Desktop\terraform>cd open1

C:\Users\user\Desktop\terraform\open1>terraform init

Initializing the backend...

Initializing provider plugins...

- Checking for available provider plugins...

- Downloading plugin for provider "openstack" (terraform-providers/openstack) 1.29.0...

The screenshot shows a web browser window with the URL terraform.io/docs/providers/openstack/index.html. The page title is "Provider: OpenStack - Terraform". On the left, there's a sidebar with a tree view of resources under "OpenStack Provider": Data Sources, Block Storage Resources, Compute Resources (including openstack_compute_flavor_v2, openstack_compute_floatingip_v2, openstack_compute_floatingip_associate_v2, openstack_compute_instance_v2, openstack_compute_interface_attach_v2, openstack_compute_keypair_v2, openstack_compute_secgroup_v2, openstack_compute_servergroup_v2, openstack_compute_quotaset_v2, openstack_compute_volume_attach_v2). Below the sidebar, a section titled "Example Usage" contains a code snippet:

```
# Configure the OpenStack Provider
provider "openstack" {
  user_name = "admin"
  tenant_name = "admin"
  password = "pwd"
  auth_url = "http://myauthurl:5000/v2.0"
  region = "RegionOne"
}

# Create a web server
resource "openstack_compute_instance_v2" "test-server" {
  # ...
}
```

The screenshot shows a web browser window with the URL terraform.io/docs/providers/openstack/r/compute_instance_v2.html. At the top, there's a purple header bar with the HashiCorp logo and a "NEW" button. The main content area has a purple header with the Terraform logo. Below it, there's a navigation bar with links for Intro, Learn, Docs, Community, Enterprise, Download, GitHub, Sign In, and Create Account.

The main content area is titled "openstack_compute_instance_v2" and describes it as "Manages a V2 VM instance resource within OpenStack". A "Example Usage" section contains a code snippet:

```
resource "openstack_compute_instance_v2" "basic" {
  name      = "basic"
  image_id  = "ad091b52-742f-469e-8f3c-fd81cadf0743"
  flavor_id = "3"
  key_pair  = "my_key_pair_name"
  security_groups = ["default"]
}
```

Volumes – OpenStack Dashboard | multi hybrid cloud – Google Drive | 1st July – Google Docs | OpenStack: openstack_compute | +

[terraform.io/docs/providers/openstack/r/compute_instance_v2.html](#)

EXPAND ALL | FILTER JUMP TO SECTION ▾

- All Providers
- OpenStack Provider
- ▼ Data Sources
 - openstack_blockstorage_availability_zones_v3
 - openstack_blockstorage_snapshot_v2
 - openstack_blockstorage_snapshot_v3
 - openstack_blockstorage_volume_v2
 - openstack_blockstorage_volume_v3
 - openstack_compute_availability_zones_v2
 - openstack_compute_flavor_v2
 - openstack_compute_keypair_v2
 - openstack_containerinfra_cluster_v1
 - openstack_containerinfra_template_v1
 - openstack_dns_zone_v2

Manages a V2 VM instance resource within OpenStack.

Example Usage

Basic Instance

```
resource "openstack_compute_instance_v2" "basic" {
  name          = "basic"
  image_id     = "ad091b52-742f-469e-0f3c-fd81cadf0743"
  flavor_id    = "3"
  key_pair     = "my_key_pair_name"
  security_groups = ["default"]

  metadata = {
    this = "that"
  }

  network {
    name = "my_network"
  }
}
```

Instance With Attached Volume

Type here to search

O E M S C R ENG 19:13 01-07-2020

```
root@openstack:~# glance image-list
+----+-----+
| ID | Name |
+----+-----+
| 9a4fb1f2-cc9d-4d0f-8383-6122cac3b648 | cirros |
| 8973f335-c91b-4eca-8055-3d6e9bca3ee | fedorinux32 |
| 57a13fd9-548a-442f-a4b4-c4eefbe35047 | manila-service-image |
| 9ad616c4-5302-459c-a879-cb4999b759a5 | manila-service-image |
+----+-----+
[root@openstack ~]# |
```

Type here to search

O E M S C R ENG 19:14 01-07-2020

```
[root@openstack ~]# glance image-list
+-----+-----+
| ID      | Name   |
+-----+-----+
| 9a4fb1f2-cc9d-4d0f-8383-6122cac3b648 | cirros
| 8973f335-c91b-4eca-8055-3d6e9bbca3ee | fedorinux32
| 57a13fd9-548a-442f-a4b4-c4eefbe35047 | manila-service-image
| 9ad616c4-5302-459c-a879-cb4999b759a5 | manila-service-image
+-----+-----+
[root@openstack ~]# nova flavor-list
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| ID           | Name     | Memory_MB | Disk | Ephemeral | Swap | VCPUs | RXTX_Factor |
| Is_Public   |           |           |       |           |       |       |           |
+-----+-----+-----+-----+-----+-----+-----+-----+
| 1            | m1.tiny  | 512       | 1    | 0         |      | 1     | 1.0        |
| 2            | m1.small | 2048      | 20   | 0         |      | 1     | 1.0        |
| 2f3a3db9-2996-454c-a7fa-43b79842723a | v.image  | 1024      | 10   | 0         |      | 2     | 1.0        |
| 3            | m1.medium | 4096      | 40   | 0         |      | 2     | 1.0        |
| 4            | m1.large  | 8192      | 80   | 0         |      | 4     | 1.0        |
| 5            | m1.xlarge | 16384     | 160  | 0         |      | 8     | 1.0        |
| 66           | m1.manila | 512       | 0    | 0         |      | 1     | 1.0        |
| True         |           |           |       |           |       |       |           |
+-----+-----+-----+-----+-----+-----+-----+-----+
[root@openstack ~]#

```

*myos.tf - Notepad

```
File Edit Format View Help
```

```
region      = "RegionOne"
}

resource "openstack_compute_instance_v2" "myos10" {
  name        = "myos10"
  image_id    = "8973f335-c91b-4eca-8055-3d6e9bbca3ee"
  flavor_id   = "2"
  flavor_name = "m1.small"
  key_pair    = "my_key_pair_name"
  security_groups = ["default"]

  metadata = {
    this = "that"
  }

  network {
    name = "my_network"
  }
}
```

```
*myos.tf - Notepad
File Edit Format View Help
provider "openstack" {
  user_name      = "demo"
  tenant_name    = "demo"
  password       = "9a649b0b4d4d46ef"
  auth_url       = "http://192.168.43.186:5000/v3"
  region         = "RegionOne"
}
resource "openstack_compute_instance_v2" "myos10" {
  name           = "myos10"
  image_id       = "8973f335-c91b-4eca-8055-3d6e9bbca3ee"
  flavor_name    = "m1.small"

  network {
    name = "private"
  }
}
```

```
[root@openstack ~]# nova flavor-list
+----+-----+-----+-----+-----+-----+-----+-----+
| ID | Name | Memory_MB | Disk | Ephemeral | Swap | VCPUs | RXTX_Factor |
| Is_Public |-----+-----+-----+-----+-----+-----+-----+
+----+
| 1 | m1.tiny | 512 | 1 | 0 | 1 | 1.0 |
| 2 | m1.small | 2048 | 20 | 0 | 1 | 1.0 |
| True |-----+-----+-----+-----+-----+-----+-----+
| 3 | v.image | 1024 | 10 | 0 | 2 | 1.0 |
| 4 | m1.medium | 4096 | 40 | 0 | 2 | 1.0 |
| 5 | m1.large | 8192 | 80 | 0 | 4 | 1.0 |
| 6 | m1.xlarge | 16384 | 160 | 0 | 8 | 1.0 |
| 66 | m1.manila | 512 | 0 | 0 | 1 | 1.0 |
| True |-----+-----+-----+-----+-----+-----+-----+
+----+
[root@openstack ~]# nova list
+----+-----+-----+-----+-----+
| ID | Name | Status | Task State | Power State | Networks |
+----+-----+-----+-----+-----+-----+
+----+
[root@openstack ~]# nova volume
usage: nova [--version] [--debug] [--os-cache] [--timings]
```

C:\Users\user\Desktop\terraform\open1>terraform validate

Success! The configuration is valid.

C:\Users\user\Desktop\terraform\open1>terraform apply

An execution plan has been generated and is shown below.

Resource actions are indicated with the following symbols:

+ create

Terraform will perform the following actions:

```
# openstack_compute_instance_v2.myos10 will be created
+ resource "openstack_compute_instance_v2" "myos10" {
    + access_ip_v4      = (known after apply)
    + access_ip_v6      = (known after apply)
    + all_metadata      = (known after apply)
    + all_tags          = (known after apply)
    + availability_zone = (known after apply)
    + flavor_id         = (known after apply)
    + flavor_name       = "m1.small"
    + force_delete      = false
    + id                = (known after apply)
    + image_id          = "8973f335-c91b-4eca-8055-3d6e9bbca3ee"
    + image_name        = (known after apply)
    + name              = "myos10"
    + power_state       = "active"
    + region            = (known after apply)
    + security_groups   = (known after apply)
    + stop_before_destroy = false

    + network {
        + access_network = false
        + fixed_ip_v4   = (known after apply)
        + fixed_ip_v6   = (known after apply)
        + floating_ip   = (known after apply)
        + mac           = (known after apply)
        + name          = "private"
        + port          = (known after apply)
        + uuid          = (known after apply)
    }
}
```

Plan: 1 to add, 0 to change, 0 to destroy.

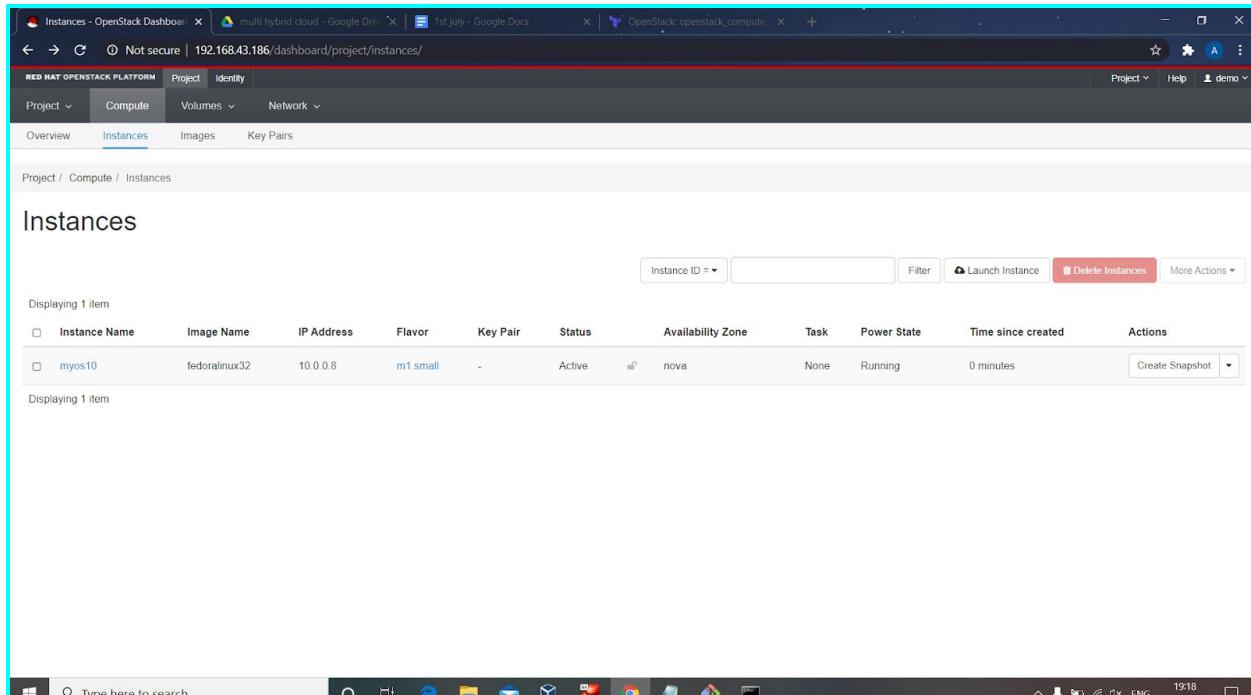
Do you want to perform these actions?

Terraform will perform the actions described above.

Only 'yes' will be accepted to approve.

Enter a value: yes

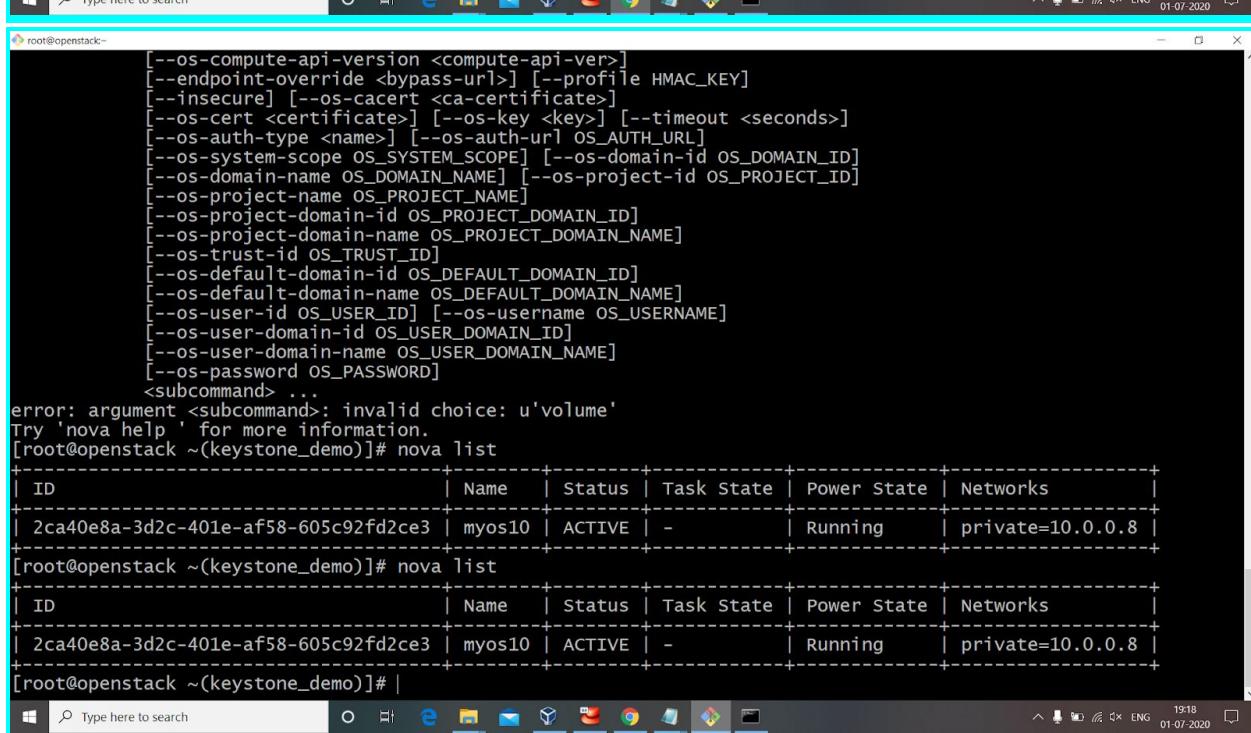
openstack_compute_instance_v2.myos10: Creating...



Instances

Instance Name	Image Name	IP Address	Flavor	Key Pair	Status	Availability Zone	Task	Power State	Time since created	Actions
myos10	fedoralinux32	10.0.0.8	m1 small	-	Active	nova	None	Running	0 minutes	<button>Create Snapshot</button>

Displaying 1 item



```
--os-compute-api-version <compute-api-ver>
[--endpoint-override <bypass-url>] [--profile HMAC_KEY]
[--insecure] [--os-cacert <ca-certificate>]
[--os-cert <certificate>] [--os-key <key>] [--timeout <seconds>]
[--os-auth-type <name>] [--os-auth-url OS_AUTH_URL]
[--os-system-scope OS_SYSTEM_SCOPE] [--os-domain-id OS_DOMAIN_ID]
[--os-domain-name OS_DOMAIN_NAME] [--os-project-id OS_PROJECT_ID]
[--os-project-name OS_PROJECT_NAME]
[--os-project-domain-id OS_PROJECT_DOMAIN_ID]
[--os-project-domain-name OS_PROJECT_DOMAIN_NAME]
[--os-trust-id OS_TRUST_ID]
[--os-default-domain-id OS_DEFAULT_DOMAIN_ID]
[--os-default-domain-name OS_DEFAULT_DOMAIN_NAME]
[--os-user-id OS_USER_ID] [--os-username OS_USERNAME]
[--os-user-domain-id OS_USER_DOMAIN_ID]
[--os-user-domain-name OS_USER_DOMAIN_NAME]
[--os-password OS_PASSWORD]
<subcommand> ...
error: argument <subcommand>: invalid choice: u'volume'
Try 'nova help' for more information.
[root@openstack ~]# nova list
+-----+-----+-----+-----+-----+-----+
| ID      | Name   | Status | Task State | Power State | Networks |
+-----+-----+-----+-----+-----+-----+
| 2ca40e8a-3d2c-401e-af58-605c92fd2ce3 | myos10 | ACTIVE | -          | Running     | private=10.0.0.8 |
+-----+-----+-----+-----+-----+-----+
[root@openstack ~]# nova list
+-----+-----+-----+-----+-----+-----+
| ID      | Name   | Status | Task State | Power State | Networks |
+-----+-----+-----+-----+-----+-----+
| 2ca40e8a-3d2c-401e-af58-605c92fd2ce3 | myos10 | ACTIVE | -          | Running     | private=10.0.0.8 |
+-----+-----+-----+-----+-----+-----+
```

C:\Users\user\Desktop\terraform\open1>terraform destroy

openstack_compute_instance_v2.myos10: Refreshing state...

[id=2ca40e8a-3d2c-401e-af58-605c92fd2ce3]

An execution plan has been generated and is shown below.

Resource actions are indicated with the following symbols:

- destroy

Terraform will perform the following actions:

```
# openstack_compute_instance_v2.myos10 will be destroyed
- resource "openstack_compute_instance_v2" "myos10" {
  - access_ip_v4      = "10.0.0.8" -> null
  - all_metadata      = {} -> null
  - all_tags          = [] -> null
  - availability_zone = "nova" -> null
  - flavor_id         = "2" -> null
  - flavor_name       = "m1.small" -> null}
```

>> we can use remote execute provisioner (in case some terraform version doesn't support few services of aws so we can use remote execute provisioner)

>>NOVA

```
[root@openstack ~]# source keystonerc_admin
[root@openstack ~]# nova service-list
+-----+-----+-----+-----+-----+
| Id      | Binary     | Host    | Zone   | Status | State | Updated_at
| Disabled Reason | Forced down |
+-----+-----+-----+-----+-----+
| bbff2405-fcd6-40fe-a8de-2dbdbc75e9c3 | nova-conductor | openstack | internal | enabled | up
| 2020-07-01T13:58:16.000000 | -           | False   |
| e59a57cd-dcac-4916-a41d-eb1c33faef6a | nova-scheduler | openstack | internal | enabled | up
| 2020-07-01T13:58:17.000000 | -           | False   |
| 986f4dd7-5a74-4c03-a51e-2416e596c85f | nova-consoleauth | openstack | internal | enabled | up
| 2020-07-01T13:58:18.000000 | -           | False   |
| 8e5ecc5c-2341-4e66-ae7e-d3fc9fbb25b7 | nova-compute   | openstack | nova    | enabled | up
| 2020-07-01T13:58:18.000000 | -           | False   |
```

```

+-----+-----+-----+-----+-----+
| ID           | Name   | Status | Task State | Power State | Networks |
+-----+-----+-----+-----+-----+
| 2ca40e8a-3d2c-401e-af58-605c92fd2ce3 | myos10 | ACTIVE | -          | Running     | private=10.0.0.8 |
+-----+-----+-----+-----+-----+
[root@openstack ~]# nova list
+-----+-----+-----+-----+-----+
| ID           | Name   | Status | Task State | Power State | Networks |
+-----+-----+-----+-----+-----+
| 2ca40e8a-3d2c-401e-af58-605c92fd2ce3 | myos10 | ACTIVE | -          | Running     | private=10.0.0.8 |
+-----+-----+-----+-----+-----+
[root@openstack ~]# nova service-list
ERROR (Forbidden): Policy doesn't allow os_compute_api:os-services to be performed. (HTTP 403) (Request-ID: req-845aa062-18eb-457a-9d61-4c91add76616)
[root@openstack ~]# source keystonerc_admin
[root@openstack ~]# nova service-list
+-----+-----+-----+-----+-----+-----+-----+-----+
| Id           | Binary      | Host     | Zone    | Status  | State  | Updated_at |
| Disabled Reason | Forced down |
+-----+-----+-----+-----+-----+-----+-----+-----+
| bbff2405-fcd6-40fe-a8de-2dbdbc75e9c3 | nova-conductor | openstack | internal | enabled | up      | 2020-07-01T13:58:16.000000 |
| e59a57cd-dcac-4916-a41d-eb1c33faef6a | nova-scheduler | openstack | internal | enabled | up      | 2020-07-01T13:58:17.000000 |
| 986f4dd7-5a74-4c03-a51e-2416e596c85f | nova-consoleauth | openstack | internal | enabled | up      | 2020-07-01T13:58:18.000000 |
| 8e5ecc5c-2341-4e66-ae7e-d3fc9fb25b7 | nova-compute    | openstack | nova     | enabled | up      | 2020-07-01T13:58:18.000000 |
+-----+-----+-----+-----+-----+-----+-----+-----+
[root@openstack ~]#

```

Concept of hypervisor :

Os has 1 internal program kernel

Kernel controls the entire hardware

Install os on the top os vm

Kernel interact with the layer(hardware) and provides the resources as allocated

Manager manages the resources

The layer is hypervisor(it helps to launch multiple vm)

Two types of virtualisation

Type 1 and type 2

If u install hyper-v directly over the program (type 1)

And if u install hyper-v directly over top of windows and over it if u launch the vm (type 2)

Hosted hyper-v (type 2) is not so good

Type 1 is used in real data centre

Example of type1: vmware(exxi) {hardware-virtualisation world}

In linux we have KVM

Or qemu KVM

It is like a quick emulator

Google search results for "hypervisor types". The page displays two diagrams: one for "Hypervisor Types" (Type 1 and Type 2) and another for "Hypervisor or Virtual Machine Monitor (VMM)" (Type 1 and Type 2). The text below the diagrams states: "There are two types of hypervisors: • Type 1 hypervisor: hypervisors run directly on the system hardware – A 'bare metal' embedded hypervisor. • Type 2 hypervisor: hypervisors run on a host operating system that provides virtualization services, such as I/O device support and memory management." A date of Oct 26, 2016, is shown. A sidebar titled "People also ask" includes a question about what a hypervisor is.

one more hypervisor is available type 0

In type 0 we dont need any os and hypervisor

On the top of physical hardware we can build the machine(launch installed and boot)

Eg. finux

Google search results for "type 0 hypervisor example". The page displays a snippet from astroarch.com explaining Type 0 hypervisors: "For example, a Windows 7™ user can install a hypervisor application like VMware Workstation™, to run a Windows XP™ guest OS on top of their Windows 7 host OS. ... The hosted hypervisor incurs performance hits because it competes with other user applications like web browsers and e-mail clients for system resources." A date of Jul 26, 2012, is shown. A sidebar titled "People also ask" includes questions about examples of hypervisors, Type 1 vs Type 2, VMware, and KVM.

In data centre we have heterogenous env

We created a program (simple webui) which interact with the developer

And launch the instance

Compute as a service (in openstack it is nova)

Nova providers driver

It knows how to communicate with the drivers

>>> nova boot

Horizon also provide the portal

Nova knows how to launch the instance

In amazon we use zen hyper-v

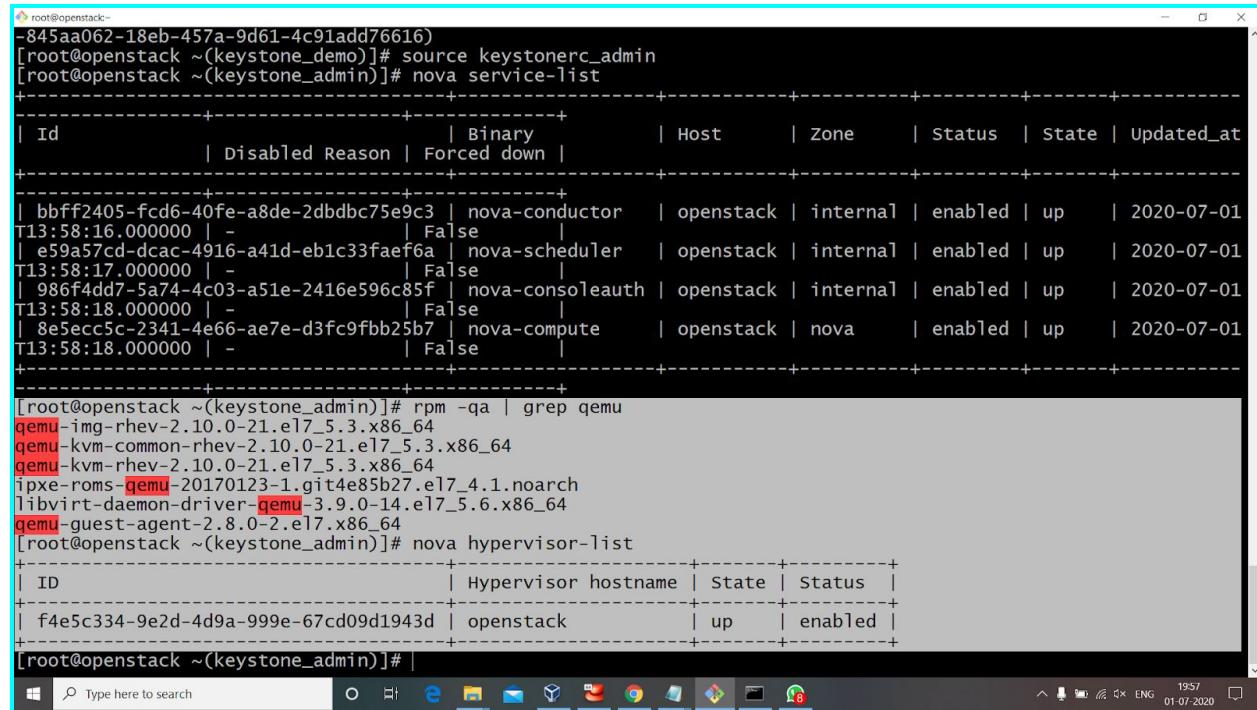
```
[root@openstack ~]# rpm -qa | grep qemu
qemu-img-rhev-2.10.0-21.el7_5.3.x86_64
qemu-kvm-common-rhev-2.10.0-21.el7_5.3.x86_64
qemu-kvm-rhev-2.10.0-21.el7_5.3.x86_64
ipxe-roms-qemu-20170123-1.git4e85b27.el7_4.1.noarch
libvirt-daemon-driver-qemu-3.9.0-14.el7_5.6.x86_64
qemu-guest-agent-2.8.0-2.el7.x86_64
```

Nova

>horizon(webui)

>cli

>terraform



```
-845aa062-18eb-457a-9d61-4c91add76616)
[root@openstack ~]# source keystonerc_admin
[root@openstack ~]# nova service-list
+-----+-----+-----+-----+-----+-----+-----+
| Id           | Binary      | Host       | Zone     | Status   | State    | Updated_at
+-----+-----+-----+-----+-----+-----+-----+
| bbff2405-fcd6-40fe-a8de-2dbdbc75e9c3 | nova-conductor | openstack | internal | enabled | up      | 2020-07-01
T13:58:16.000000 | -           | False      |
| e59a57cd-dcac-4916-a41d-eb1c33faef6a | nova-scheduler | openstack | internal | enabled | up      | 2020-07-01
T13:58:17.000000 | -           | False      |
| 986f4dd7-5a74-4c03-a51e-2416e596c85f | nova-consoleauth | openstack | internal | enabled | up      | 2020-07-01
T13:58:18.000000 | -           | False      |
| 8e5ecc5c-2341-4e66-ae7e-d3fc9fb25b7 | nova-compute   | openstack | nova     | enabled | up      | 2020-07-01
T13:58:18.000000 | -           | False      |
+-----+-----+-----+-----+-----+-----+-----+
[root@openstack ~]# rpm -qa | grep qemu
qemu-img-rhev-2.10.0-21.el7_5.3.x86_64
qemu-kvm-common-rhev-2.10.0-21.el7_5.3.x86_64
qemu-kvm-rhev-2.10.0-21.el7_5.3.x86_64
ipxe-roms-qemu-20170123-1.git4e85b27.el7_4.1.noarch
libvirt-daemon-driver-qemu-3.9.0-14.el7_5.6.x86_64
qemu-guest-agent-2.8.0-2.el7.x86_64
[root@openstack ~]# nova hypervisor-list
+-----+-----+-----+
| ID           | Hypervisor hostname | State | Status |
+-----+-----+-----+
| f4e5c334-9e2d-4d9a-999e-67cd09d1943d | openstack        | up    | enabled |
+-----+-----+-----+
[root@openstack ~]#
```

```
[root@openstack ~]# hostname
```

```
openstack
```

```
[root@openstack ~]# nova hypervisor-show  
f4e5c334-9e2d-4d9a-999e-67cd09d1943d  
+-----+-----+  
| Property | Value |  
+-----+-----+  
| cpu_info_arch | x86_64 |  
| cpu_info_features | ["pge", "avx", "clflush", "sep",  
| | "syscall", "vme", "invpcid", "tsc", |  
| | "fsbsbase", "xsave", "cmov", "fpu", |  
| | "clflushopt", "pat", "arch-facilities", |  
| | "lm", "msr", "3dnowprefetch", "nx", |  
| | "fxsr", "sse4.1", "pae", "sse4.2", |  
| | "pclmuldq", "pcid", "mmx", "osxsave", |  
| | "cx8", "mce", "de", "aes", "ht", "pse", |  
| | "lahf_lm", "abm", "rdseed", "popcnt", |  
| | "mca", "apic", "sse", "invts", "pni", |  
| | "rdtscp", "avx2", "sse2", "hypervisor", |  
| | "ssse3", "cx16", "pse36", "mtrr", |  
| | "movbe", "rdrand", "x2apic"] |  
| cpu_info_model | Westmere |  
| cpu_info_topology_cells | 1 |  
| cpu_info_topology_cores | 4 |  
| cpu_info_topology_sockets | 1 |  
| cpu_info_topology_threads | 1 |  
| cpu_info_vendor | Intel |  
| current_workload | 0 |  
| disk_available_least | 30 |  
| free_disk_gb | 43 |  
| free_ram_mb | 7679 |  
| host_ip | 192.168.43.186 |  
| hypervisor_hostname | openstack |  
| hypervisor_type | QEMU |  
| hypervisor_version | 2010000 |  
| id | f4e5c334-9e2d-4d9a-999e-67cd09d1943d |  
| local_gb | 43 |  
| local_gb_used | 0 |  
| memory_mb | 8191 |  
| memory_mb_used | 512 |  
| running_vms | 0 |  
| service_disabled_reason | None |  
| service_host | openstack |  
| service_id | 8e5ecc5c-2341-4e66-ae7e-d3fc9fbb25b7 |  
| state | up |
```

status	enabled
vcpus	4
vcpus_used	0

```
root@openstack:~#
mca", "apic", "sse", "invts", "pni",
"rdtscp", "avx2", "sse2", "hypervisor",
"ssse3", "cx16", "pse36", "mtrr",
"movbe", "rdrand", "x2apic"]
Westmere
1
4
1
1
cpu_info_model
cpu_info_topology_cells
cpu_info_topology_cores
cpu_info_topology_sockets
cpu_info_topology_threads
cpu_info_vendor
current_workload
disk_available_least
free_disk_gb
free_ram_mb
host_ip
hypervisor_hostname
hypervisor_type
hypervisor_version
id
local_gb
local_gb_used
memory_mb
memory_mb_used
running_vms
service_disabled_reason
service_host
service_id
state
status
vcpus
vcpus_used
+
[root@openstack ~](keystone_admin)]#
```

```
root@openstack:~#
mca", "apic", "sse", "invts", "pni",
"rdtscp", "avx2", "sse2", "hypervisor",
"ssse3", "cx16", "pse36", "mtrr",
"movbe", "rdrand", "x2apic"]
Westmere
1
4
1
1
cpu_info_model
cpu_info_topology_cells
cpu_info_topology_cores
cpu_info_topology_sockets
cpu_info_topology_threads
cpu_info_vendor
current_workload
disk_available_least
free_disk_gb
free_ram_mb
host_ip
hypervisor_hostname
hypervisor_type
hypervisor_version
id
local_gb
local_gb_used
memory_mb
memory_mb_used
running_vms
service_disabled_reason
service_host
service_id
state
status
vcpus
vcpus_used
+
[root@openstack ~](keystone_admin)]#
```

```

root@openstack-
qemu-kvm-common-rhev-2.10.0-21.el7_5.3.x86_64
qemu-kvm-rhev-2.10.0-21.el7_5.3.x86_64
ipxe-roms-qemu-20170123-1.git4e85b27.el7_4.1.noarch
libvirt-daemon-driver-qemu-3.9.0-14.el7_5.6.x86_64
qemu-guest-agent-2.8.0-2.el7.x86_64
[root@openstack ~]# nova hypervisor-list
+-----+-----+-----+
| ID | Hypervisor hostname | State | Status |
+-----+-----+-----+
| f4e5c334-9e2d-4d9a-999e-67cd09d1943d | openstack | up | enabled |
+-----+-----+-----+
[root@openstack ~]# hostname
openstack
[root@openstack ~]# nova hypervisor-show f4e5c334-9e2d-4d9a-999e-67cd09d1943d
+-----+
| Property | value |
+-----+
| cpu_info_arch | x86_64 |
| cpu_info_features | ["pge", "avx", "clflush", "sep", "syscall", "vme", "invpcid", "tsc", "fsgsbase", "xsav", "cmov", "fpu", "clflushopt", "pat", "arch-facilities", "lm", "msr", "3dnopprefetch", "nx", "fxsr", "sse4_1", "pae", "sse4_2", "pclmuldq", "pcid", "mmx", "osxsave", "cx8", "mce", "de", "aes", "ht", "pse", "lahf_lm", "abm", "rdseed", "popcnt", "mca", "apic", "sse", "invts", "pni", "rdtscp", "avx2", "sse2", "hypervisor", "ssse3", "cx16", "pse36", "mtrr", "movbe", "rdrand", "x2apic"] |
| cpu_info_mode | Westmere |
| cpu_info_topology_cells | 1 |
+-----+

```



```

root@openstack-
CONFIG_VNC_SSL_CERT=
# SSL keyfile corresponding to the certificate if one was entered. If
# CONFIG_HORIZON_SSL is set to 'n' this parameter is ignored.
CONFIG_VNC_SSL_KEY=

# Enter the PCI passthrough array of hash in JSON style for
# controller eg. [{"vendor_id": "1234", "product_id": "5678",
# "name": "default"}, {...}]
CONFIG_NOVA_PCI_ALIAS=

# Enter the PCI passthrough whitelist array of hash in JSON style for
# controller eg. [{"vendor_id": "1234", "product_id": "5678",
# "name": "default"}, {...}]
CONFIG_NOVA_PCI_PASSTHROUGH_WHITELIST=

# The hypervisor driver to use with Nova. Can be either 'qemu' or
# 'kvm'. Defaults to 'qemu' on virtual machines and 'kvm' on bare
# metal hardware. For nested KVM set it explicitly to 'kvm'.
CONFIG_NOVA_LIBVIRT_VIRT_TYPE=%{::default_hypervisor}

# Password to use for OpenStack Networking (neutron) to authenticate
# with the Identity service.
CONFIG_NEUTRON_KS_PW=1d21209370ae4574

# The password to use for OpenStack Networking to access the
# database.
CONFIG_NEUTRON_DB_PW=60d0c362f8af43b8

# The name of the open vswitch bridge (or empty for linuxbridge) for
# the OpenStack Networking L3 agent to use for external traffic.
# Specify 'provider' if you intend to use a provider network to handle

```

nova-api are the ones who take the req frm the user

And they snd the req to other program

> we r running on a single-node cluster

Nova-scheduler decides we have to launch the vm where node-2 or node-3

Nova-compute take the req for the scheduler(whenever the scheduler take req compute req)

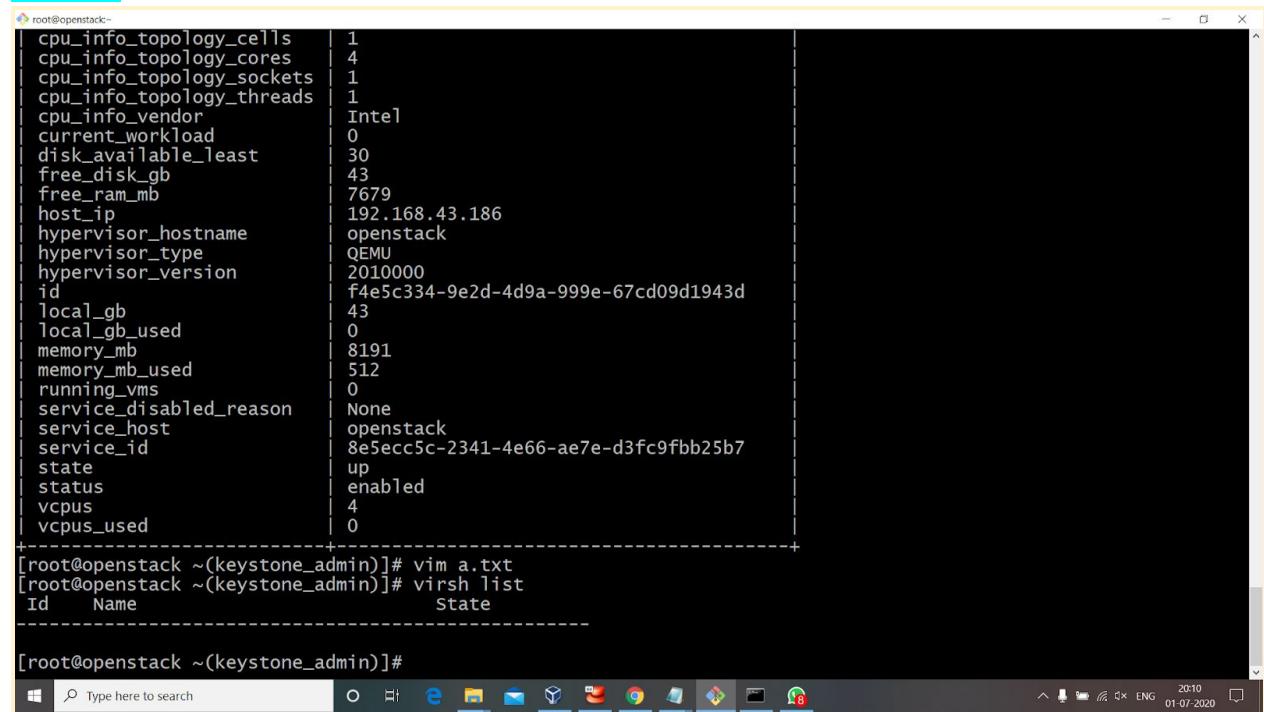
We have filter to specify the nodes or the platform

Compute is the main prgrm which knows how to contact to the nova

> it is known as multi nova cluster

Virsh list

```
root@openstack:~# virsh list
  Id  Name      State
-----+
[root@openstack ~]# vim a.txt
[root@openstack ~]# virsh list
```



```
root@openstack~#
| flavor:ram          | 2048
| flavor:swap         | 0
| flavor:vcpus        | 1
|
| hostId              |
| host_status          |
| id                  | f975efc1-d941-40fc-bb06-e4b4bb397ae8
| image               | fedoralinux32 (8973f335-c91b-4eca-8055-3d6e9bbca3ee)
| key_name             |
| locked               | -
| metadata              | False
| name                 | {}
| os-extended-volumes:volumes_attached | myos10
| progress              | []
| security_groups       | default
| status                | BUILD
| tags                 | []
| tenant_id             | ca8a1f044fae436fbc0c8a4faff6321e
| updated               | 2020-07-01T14:41:43Z
| user_id               | e9119d2a3bcb4cbcba97519266628832
+-----+
[root@openstack ~](keystone_admin)]# nova list
+-----+-----+-----+-----+-----+
| ID      | Name   | Status | Task State | Power State | Networks |
+-----+-----+-----+-----+-----+
| f975efc1-d941-40fc-bb06-e4b4bb397ae8 | myos10 | BUILD  | spawning   | NOSTATE    | private=10.0.0.8 |
+-----+
[root@openstack ~](keystone_admin)]# nova list
+-----+-----+-----+-----+-----+
| ID      | Name   | Status | Task State | Power State | Networks |
+-----+-----+-----+-----+-----+
| f975efc1-d941-40fc-bb06-e4b4bb397ae8 | myos10 | ACTIVE | -           | Running    | private=10.0.0.8 |
+-----+
[root@openstack ~](keystone_admin)]#

```



```
root@openstack~#
| id                  | f975efc1-d941-40fc-bb06-e4b4bb397ae8
| image               | fedoralinux32 (8973f335-c91b-4eca-8055-3d6e9bbca3ee)
| key_name             |
| locked               | -
| metadata              | False
| name                 | {}
| os-extended-volumes:volumes_attached | myos10
| progress              | []
| security_groups       | default
| status                | BUILD
| tags                 | []
| tenant_id             | ca8a1f044fae436fbc0c8a4faff6321e
| updated               | 2020-07-01T14:41:43Z
| user_id               | e9119d2a3bcb4cbcba97519266628832
+-----+
[root@openstack ~](keystone_admin)]# nova list
+-----+-----+-----+-----+-----+
| ID      | Name   | Status | Task State | Power State | Networks |
+-----+-----+-----+-----+-----+
| f975efc1-d941-40fc-bb06-e4b4bb397ae8 | myos10 | BUILD  | spawning   | NOSTATE    | private=10.0.0.8 |
+-----+
[root@openstack ~](keystone_admin)]# nova list
+-----+-----+-----+-----+-----+
| ID      | Name   | Status | Task State | Power State | Networks |
+-----+-----+-----+-----+-----+
| f975efc1-d941-40fc-bb06-e4b4bb397ae8 | myos10 | ACTIVE | -           | Running    | private=10.0.0.8 |
+-----+
[root@openstack ~](keystone_admin)]# virsh list
 Id  Name           State
-----+
 3  instance-00000004  running

```

```
root@openstack:~# user_id          | e9119d2a3bcb4cbcba97519266628832 |
+[root@openstack ~ (keystone_admin)]# nova list
+-----+-----+-----+-----+-----+-----+
| ID      | Name   | Status | Task State | Power State | Networks |
+-----+-----+-----+-----+-----+-----+
| f975efc1-d941-40fc-bb06-e4b4bb397ae8 | myos10 | BUILD  | spawning   | NOSTATE    | private=10.0.0.8 |
+-----+-----+-----+-----+-----+-----+
[root@openstack ~ (keystone_admin)]# nova list
+-----+-----+-----+-----+-----+-----+
| ID      | Name   | Status | Task State | Power State | Networks |
+-----+-----+-----+-----+-----+-----+
| f975efc1-d941-40fc-bb06-e4b4bb397ae8 | myos10 | ACTIVE | -           | Running     | private=10.0.0.8 |
+-----+-----+-----+-----+-----+-----+
[root@openstack ~ (keystone_admin)]# virsh list
 Id   Name           State
-----+
 3   instance-00000004 running

[root@openstack ~ (keystone_admin)]# nova stop myos10
Request to stop server myos10 has been accepted.
[root@openstack ~ (keystone_admin)]# virsh list
 Id   Name           State
-----+
 3   instance-00000004 running

[root@openstack ~ (keystone_admin)]# nova list
+-----+-----+-----+-----+-----+-----+
| ID      | Name   | Status | Task State | Power State | Networks |
+-----+-----+-----+-----+-----+-----+
| f975efc1-d941-40fc-bb06-e4b4bb397ae8 | myos10 | ACTIVE | powering-off | Running    | private=10.0.0.8 |
+-----+-----+-----+-----+-----+-----+
[root@openstack ~ (keystone_admin)]#

```



```
root@openstack:~# nova list
+-----+-----+-----+-----+-----+-----+
| ID      | Name   | Status | Task State | Power State | Networks |
+-----+-----+-----+-----+-----+-----+
| f975efc1-d941-40fc-bb06-e4b4bb397ae8 | myos10 | ACTIVE | powering-off | Running    | private=10.0.0.8 |
+-----+-----+-----+-----+-----+-----+
[root@openstack ~ (keystone_admin)]# nova list
+-----+-----+-----+-----+-----+-----+
| ID      | Name   | Status | Task State | Power State | Networks |
+-----+-----+-----+-----+-----+-----+
| f975efc1-d941-40fc-bb06-e4b4bb397ae8 | myos10 | SHUTOFF | -           | Shutdown    | private=10.0.0.8 |
+-----+-----+-----+-----+-----+-----+
[root@openstack ~ (keystone_admin)]# nova service-list
+-----+-----+-----+-----+-----+-----+-----+-----+
| Id      | Binary          | Host       | Zone     | Status  | State | Updated_at |
|        | Disabled Reason | Forced down |          |          |        |            |
+-----+-----+-----+-----+-----+-----+-----+-----+
| bffff2405-fcd6-40fe-a8de-2dbdbc75e9c3 | nova-conductor | openstack | internal | enabled | up    | 2020-07-01T14:43:36.000000 |
| e59a57cd-dcac-4916-a41d-eb1c33faef6a | nova-scheduler  | openstack | internal | enabled | up    | 2020-07-01T14:43:39.000000 |
| 986f4dd7-5a74-4c03-a51e-2416e596c85f | nova-consoleauth | openstack | internal | enabled | up    | 2020-07-01T14:43:39.000000 |
| 8e5ecc5c-2341-4e66-ae7e-d3fc9fb25b7 | nova-compute    | openstack | nova     | enabled | up    | 2020-07-01T14:43:39.000000 |
+-----+-----+-----+-----+-----+-----+-----+-----+
[root@openstack ~ (keystone_admin)]#
[root@openstack ~ (keystone_admin)]#
```

```

root@openstack:~#
+-----+-----+-----+-----+-----+-----+
| bbff2405-fcd6-40fe-a8de-2dbdbc75e9c3 | nova-conductor | openstack | internal | enabled | up | 2020-07-01
T14:43:36.000000 | - | False | openstack | internal | enabled | up | 2020-07-01
| e59a57cd-dcac-4916-a41d-eb1c33faef6a | nova-scheduler | openstack | internal | enabled | up | 2020-07-01
T14:43:39.000000 | - | False | openstack | internal | enabled | up | 2020-07-01
| 986f4dd7-5a74-4c03-a51e-2416e596c85f | nova-consoleauth | openstack | internal | enabled | up | 2020-07-01
T14:43:39.000000 | - | False | openstack | internal | enabled | up | 2020-07-01
| 8e5ecc5c-2341-4e66-ae7e-d3fc9fb25b7 | nova-compute | openstack | nova | enabled | up | 2020-07-01
T14:43:39.000000 | - | False | openstack | nova | enabled | up | 2020-07-01
+-----+-----+-----+-----+-----+-----+
[root@openstack ~]# [keystone_admin]# ps -aux | grep nova
nova 1191 0.1 1.1 379252 96700 ? Ss 18:36 0:10 /usr/bin/python2 /usr/bin/nova-consoleauth
nova 1197 1.0 1.4 429256 121080 ? Ss 18:36 1:00 /usr/bin/python2 /usr/bin/nova-api
nova 1198 0.1 1.0 404848 85288 ? Ss 18:36 0:06 /usr/bin/python2 /usr/bin/novncproxy --we
b /usr/share/novnc/
nova 1205 0.1 1.2 382384 99824 ? Ss 18:36 0:10 /usr/bin/python2 /usr/bin/nova-scheduler
nova 1228 0.9 1.1 373008 90608 ? Ss 18:36 0:57 /usr/bin/python2 /usr/bin/nova-conductor
nova 1954 0.3 1.5 2072344 128580 ? Ss 18:36 0:19 /usr/bin/python2 /usr/bin/nova-compute
nova 2061 0.1 1.2 391468 105064 ? S 18:36 0:08 /usr/bin/python2 /usr/bin/nova-conductor
nova 2062 0.1 1.2 390780 104440 ? S 18:36 0:07 /usr/bin/python2 /usr/bin/nova-conductor
nova 2063 0.1 1.2 388452 102472 ? S 18:36 0:07 /usr/bin/python2 /usr/bin/nova-conductor
nova 2064 0.1 1.2 391088 104956 ? S 18:36 0:08 /usr/bin/python2 /usr/bin/nova-conductor
nova 2162 0.0 1.6 450408 137688 ? S 18:36 0:02 /usr/bin/python2 /usr/bin/nova-api
nova 2163 0.0 1.7 457112 144564 ? S 18:36 0:03 /usr/bin/python2 /usr/bin/nova-api
nova 2164 0.0 1.7 457440 144904 ? S 18:36 0:02 /usr/bin/python2 /usr/bin/nova-api
nova 2165 0.0 1.8 465356 152608 ? S 18:36 0:04 /usr/bin/python2 /usr/bin/nova-api
nova 2177 0.0 1.5 442812 129888 ? S 18:36 0:00 /usr/bin/python2 /usr/bin/nova-api
nova 2178 0.0 1.5 442808 129880 ? S 18:36 0:00 /usr/bin/python2 /usr/bin/nova-api
nova 2179 0.0 1.5 442808 129808 ? S 18:36 0:00 /usr/bin/python2 /usr/bin/nova-api
nova 2180 0.0 1.5 442808 130008 ? S 18:36 0:00 /usr/bin/python2 /usr/bin/nova-api
[keystone_admin]# [root@openstack ~]# ps -aux | grep nova
nova 2162 0.0 1.6 450408 137688 ? S 18:36 0:02 /usr/bin/python2 /usr/bin/nova-api
nova 2163 0.0 1.7 457112 144564 ? S 18:36 0:03 /usr/bin/python2 /usr/bin/nova-api
nova 2164 0.0 1.7 457440 144904 ? S 18:36 0:02 /usr/bin/python2 /usr/bin/nova-api
nova 2165 0.0 1.8 465356 152608 ? S 18:36 0:04 /usr/bin/python2 /usr/bin/nova-api
nova 2177 0.0 1.5 442812 129888 ? S 18:36 0:00 /usr/bin/python2 /usr/bin/nova-api
nova 2178 0.0 1.5 442808 129880 ? S 18:36 0:00 /usr/bin/python2 /usr/bin/nova-api
nova 2179 0.0 1.5 442808 129808 ? S 18:36 0:00 /usr/bin/python2 /usr/bin/nova-api
nova 2180 0.0 1.5 442808 130008 ? S 18:36 0:00 /usr/bin/python2 /usr/bin/nova-api
[keystone_admin]# [root@openstack ~]# rpm -qa | grep nova
openstack-nova-conductor-17.0.3-0.20180420001141.el7ost.noarch
openstack-nova-migration-17.0.3-0.20180420001141.el7ost.noarch
openstack-nova-common-17.0.3-0.20180420001141.el7ost.noarch
openstack-nova-console-17.0.3-0.20180420001141.el7ost.noarch
python-novaclient-9.1.1-1.el7ost.noarch
openstack-nova-api-17.0.3-0.20180420001141.el7ost.noarch
openstack-nova-placement-api-17.0.3-0.20180420001141.el7ost.noarch
openstack-nova-compute-17.0.3-0.20180420001141.el7ost.noarch
python-nova-17.0.3-0.20180420001141.el7ost.noarch
openstack-nova-novncproxy-17.0.3-0.20180420001141.el7ost.noarch
openstack-nova-scheduler-17.0.3-0.20180420001141.el7ost.noarch
puppet-nova-12.4.0-3.el7ost.noarch
[keystone_admin]# [root@openstack ~]#

```

```
# Defines which driver to use for controlling virtualization.
#
# Possible values:
#   libvirt.LibvirtDriver
#   xenapi.XenAPIDriver
#   fake.FakeDriver
#   ironic.IronicDriver
#   vmwareapi.VMwareVCDriver
#   hyperv.HyperVDriver
#   powervm.PowerVMDriver
# (string value)
#compute_driver=libvirt.LibvirtDriver
compute_driver=libvirt.LibvirtDriver

#
# Allow destination machine to match source for resize. Useful when
# testing in single-host environments. By default it is not allowed
# to resize to the same host. Setting this option to true will add
# the same host to the destination options. Also set to true
# if you allow the ServerGroupAffinityFilter and need to resize.
# (boolean value)
#allow_resize_to_same_host=false
allow_resize_to_same_host=True

#
# Image properties that should not be inherited from the instance
# when taking a snapshot.
#
# This option gives an opportunity to select which image-properties
154,1 1%

```

```
[root@openstack ~]# vim /etc/nova/nova.conf
[root@openstack ~]# cd
[root@openstack ~]# ls
a.txt kestonerc_admin kestonerc_demo
```

```
root@openstack~-
CONFIG_NOVA_PCI_ALIAS=-
# Enter the PCI passthrough whitelist array of hash in JSON style for
# controller eg. [{"vendor_id": "1234", "product_id": "5678",
# "name": "default"}, {...}]
CONFIG_NOVA_PCI_PASSTHROUGH_WHITELIST=-
# The hypervisor driver to use with Nova. Can be either 'qemu' or
# 'kvm'. Defaults to 'qemu' on virtual machines and 'kvm' on bare
# metal hardware. For nested KVM set it explicitly to 'kvm'.
CONFIG_NOVA_LIBVIRT_VIRT_TYPE=%{::default_hypervisor}
# Password to use for OpenStack Networking (neutron) to authenticate
# with the Identity service.
CONFIG_NEUTRON_KS_PW=1d21209370ae4574
# The password to use for OpenStack Networking to access the
# database.
CONFIG_NEUTRON_DB_PW=60d0c362f8af43b8
# The name of the Open vswitch bridge (or empty for linuxbridge) for
# the OpenStack Networking L3 agent to use for external traffic.
# Specify 'provider' if you intend to use a provider network to handle
# external traffic.
CONFIG_NEUTRON_L3_EXT_BRIDGE=br-ex
# Password for the OpenStack Networking metadata agent.
CONFIG_NEUTRON_METADATA_PW=0df4632826454b60
# Specify 'y' to install OpenStack Networking's Load-Balancing-
# as-a-Service (LBaaS). ['y', 'n']
CONFIG_LBAAS_INSTALL=n
753,1 56%
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```

```
root@openstack~-
root      5360  0.0  0.4 292648 35428 ?      S    18:51  0:00 /usr/bin/python2 /bin/privsep-helper --config-
file /usr/share/nova/nova-dist.conf --config-file /etc/nova/nova.conf --privsep_context nova.privsep.sys_admin_
pctxt --privsep_sock_path /tmp/tmp_M_Bfi/privsep.sock
root      5393  0.0  0.3 287792 30552 ?      S    18:51  0:00 /usr/bin/python2 /bin/privsep-helper --config-
file /usr/share/nova/nova-dist.conf --config-file /etc/nova/nova.conf --privsep_context vif_plug_ovs.privsep.vi_
f_plug --privsep_sock_path /tmp/tmpj5T3h9/privsep.sock
root     19598  0.0  0.0 112708   976 pts/0   S+   20:16  0:00 grep --color=auto nova
[root@openstack ~]# rpm -qa | grep nova
openstack-nova-conductor-17.0.3-0.20180420001141.el7ost.noarch
openstack-nova-migration-17.0.3-0.20180420001141.el7ost.noarch
openstack-nova-common-17.0.3-0.20180420001141.el7ost.noarch
openstack-nova-console-17.0.3-0.20180420001141.el7ost.noarch
python-novaclient-9.1.1-1.el7ost.noarch
openstack-nova-api-17.0.3-0.20180420001141.el7ost.noarch
openstack-nova-placement-api-17.0.3-0.20180420001141.el7ost.noarch
openstack-nova-compute-17.0.3-0.20180420001141.el7ost.noarch
python-nova-17.0.3-0.20180420001141.el7ost.noarch
openstack-nova-novncproxy-17.0.3-0.20180420001141.el7ost.noarch
openstack-nova-scheduler-17.0.3-0.20180420001141.el7ost.noarch
puppet-nova-12.4.0-3.el7ost.noarch
[root@openstack ~]# vim /etc/nova/nova.conf
[root@openstack ~]# cd
[root@openstack ~]# ls
a.txt keystonerc_admin keystonerc_demo
[root@openstack ~]# vim a.txt
[root@openstack ~]# vim /etc/nova/nova.conf
[root@openstack ~]# openstack hypervisor list
+---+-----+-----+-----+
| ID | Hypervisor Hostname | Hypervisor Type | Host IP | State |
+---+-----+-----+-----+
| 1 | openstack           | QEMU          | 192.168.43.186 | up    |
+---+-----+-----+-----+
[root@openstack ~]#
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```