OpenStack Labs

Lab 01: Launching an Instance

Contents

Introduction

In this lab, you will launch an instance using the *Horizon Dashboard*, launch an instance using the *OpenStack Unified CLI*, and use the *OpenStack Unified CLI*.

Objectives

- Use the *Horizon Dashboard*.
- Launch an instance using the *Horizon Dashboard*.
- Use the *OpenStack Unified CLI*.
- Launch an instance using the *OpenStack Unified CLI*.

Lab Settings

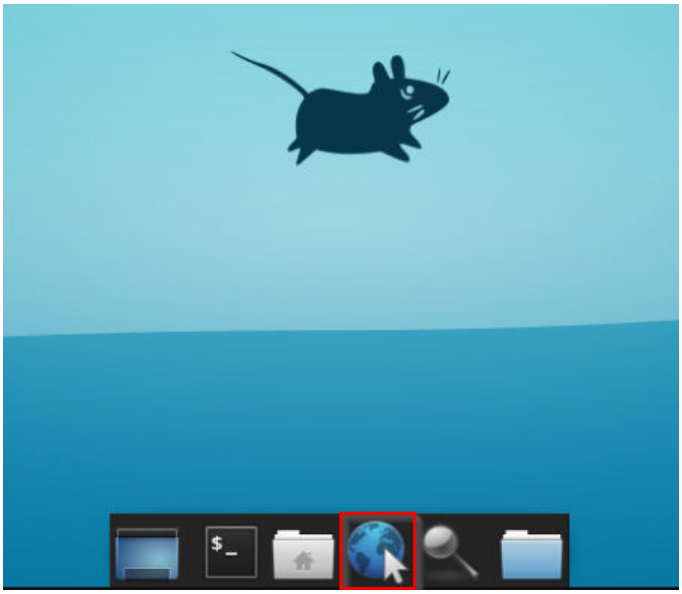
The information in the table below will be needed in order to complete the lab. The task sections below provide details on the use of this information.

Virtual Machine	IP Address	Account	Password
workstation	ens3: 192.168.1.23 ens4: 172.25.250.23	ubuntu	ubuntu
devstack	ens3: 192.168.1.22 ens4: 172.25.250.22	ubuntu	ubuntu

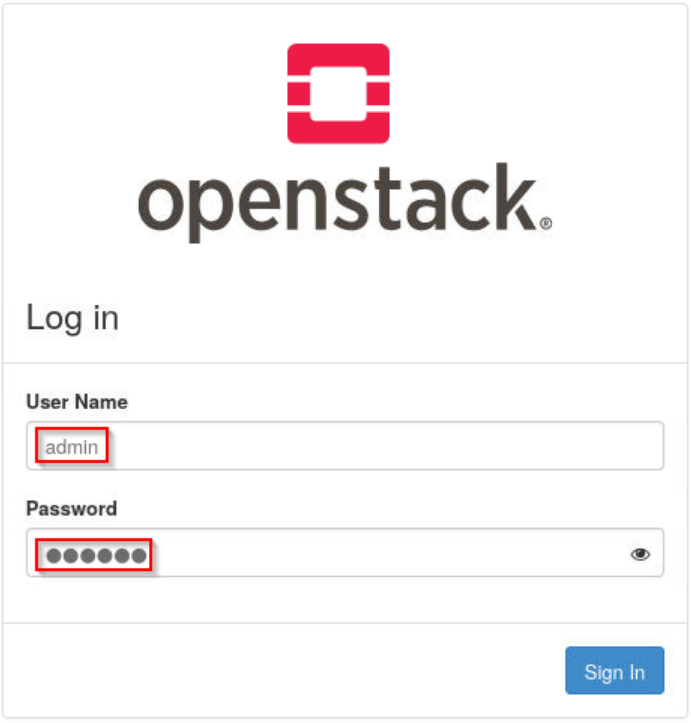
1 Launching an Instance Using the Horizon Dashboard

In this task, you will launch an instance using the *Horizon Dashboard*.

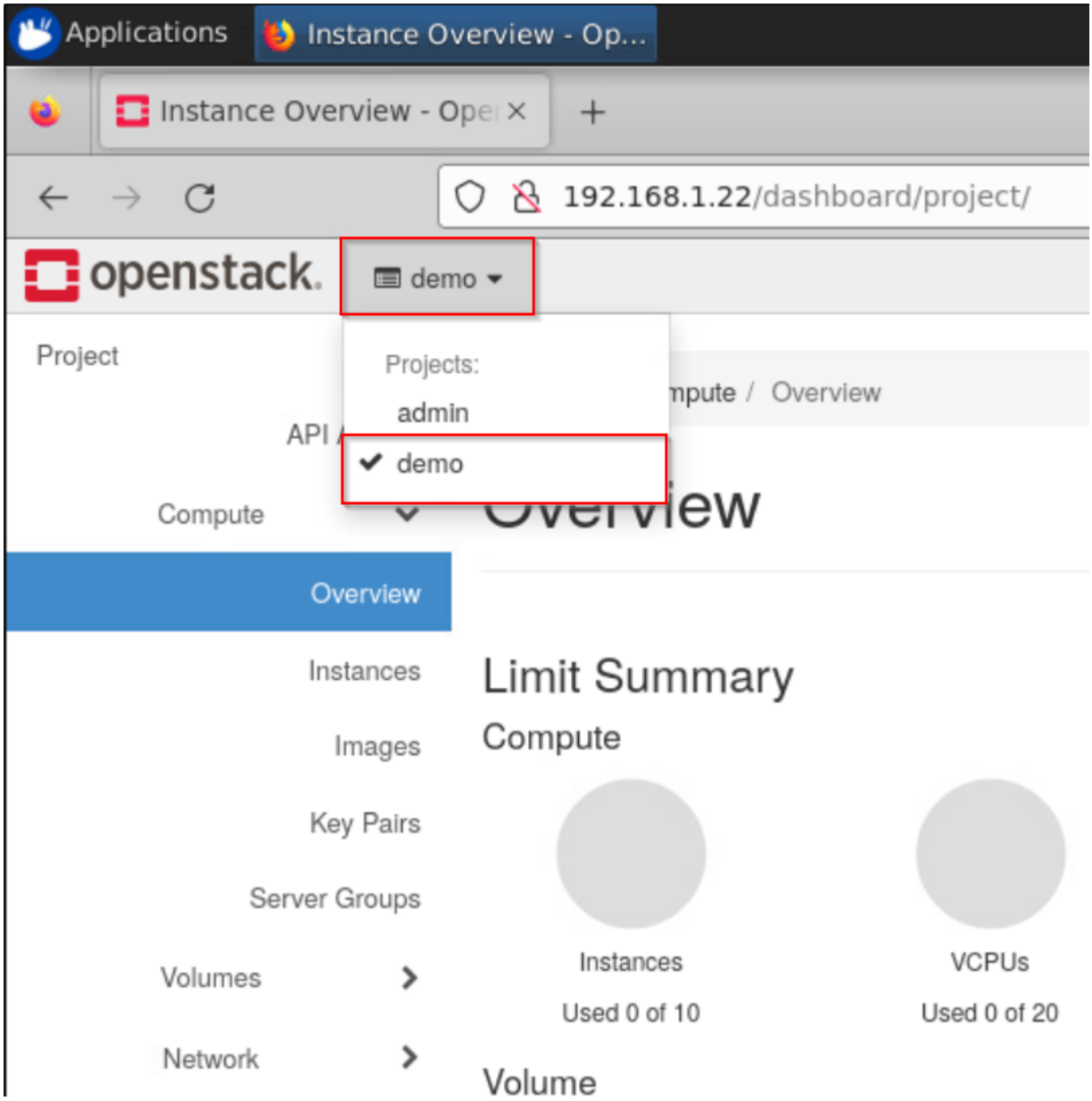
1. Log into the **workstation** machine as the **ubuntu** user with password **ubuntu**.
2. Open the web browser.



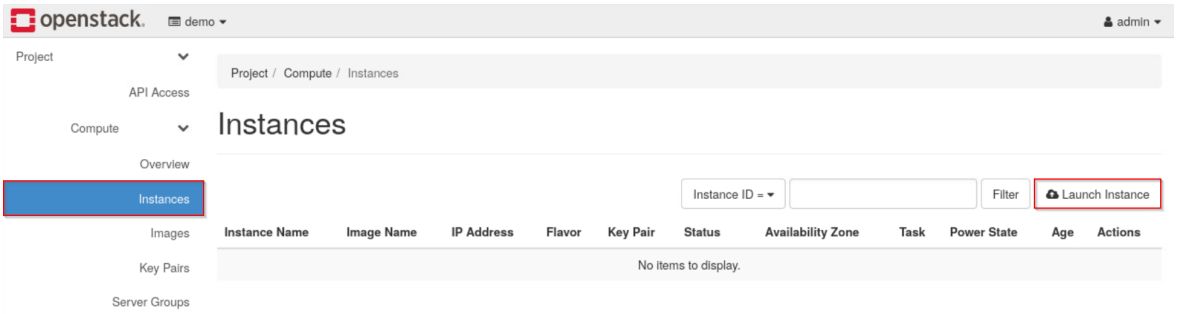
3. Enter the IP address of the **devstack** machine (**192.168.1.22**) into the address bar, and log into the OpenStack Horizon Dashboard. The username is **admin** and the password is **secret**.



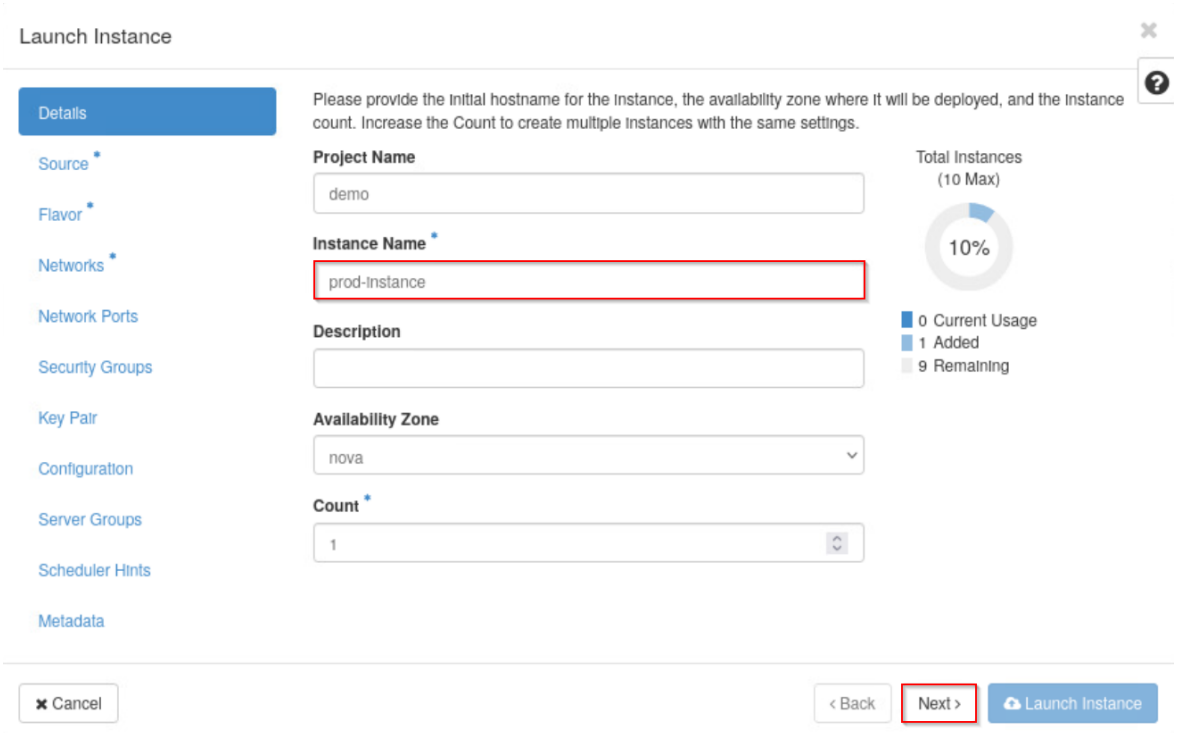
4. Click on the *Project* tab in the top right corner of the webpage, then select **demo** as the project.



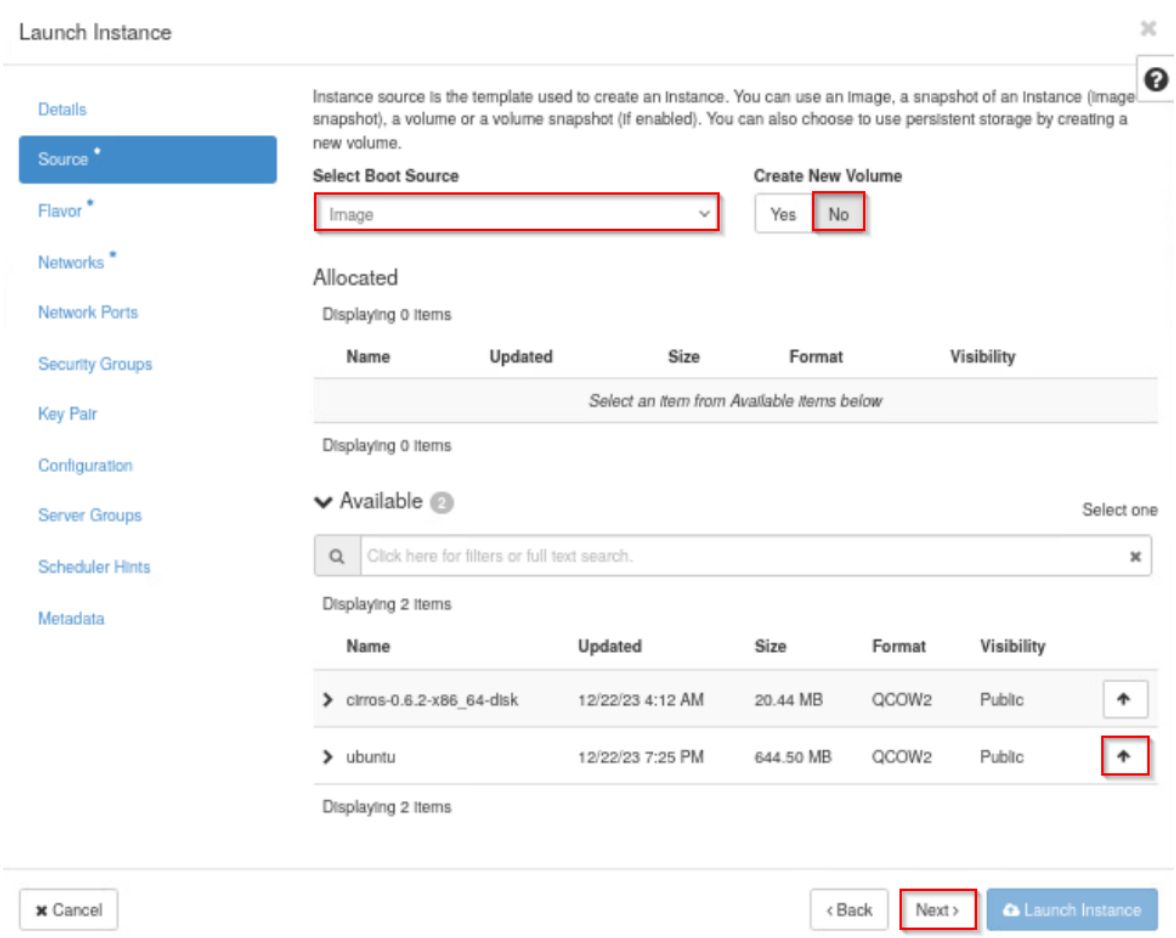
5. Navigate to the *Instances* panel and click **Launch Instance** in the top right corner.



6. In the *Instance Name* field, type **prod-instance**, and leave the other fields with their default values. Click **Next**.



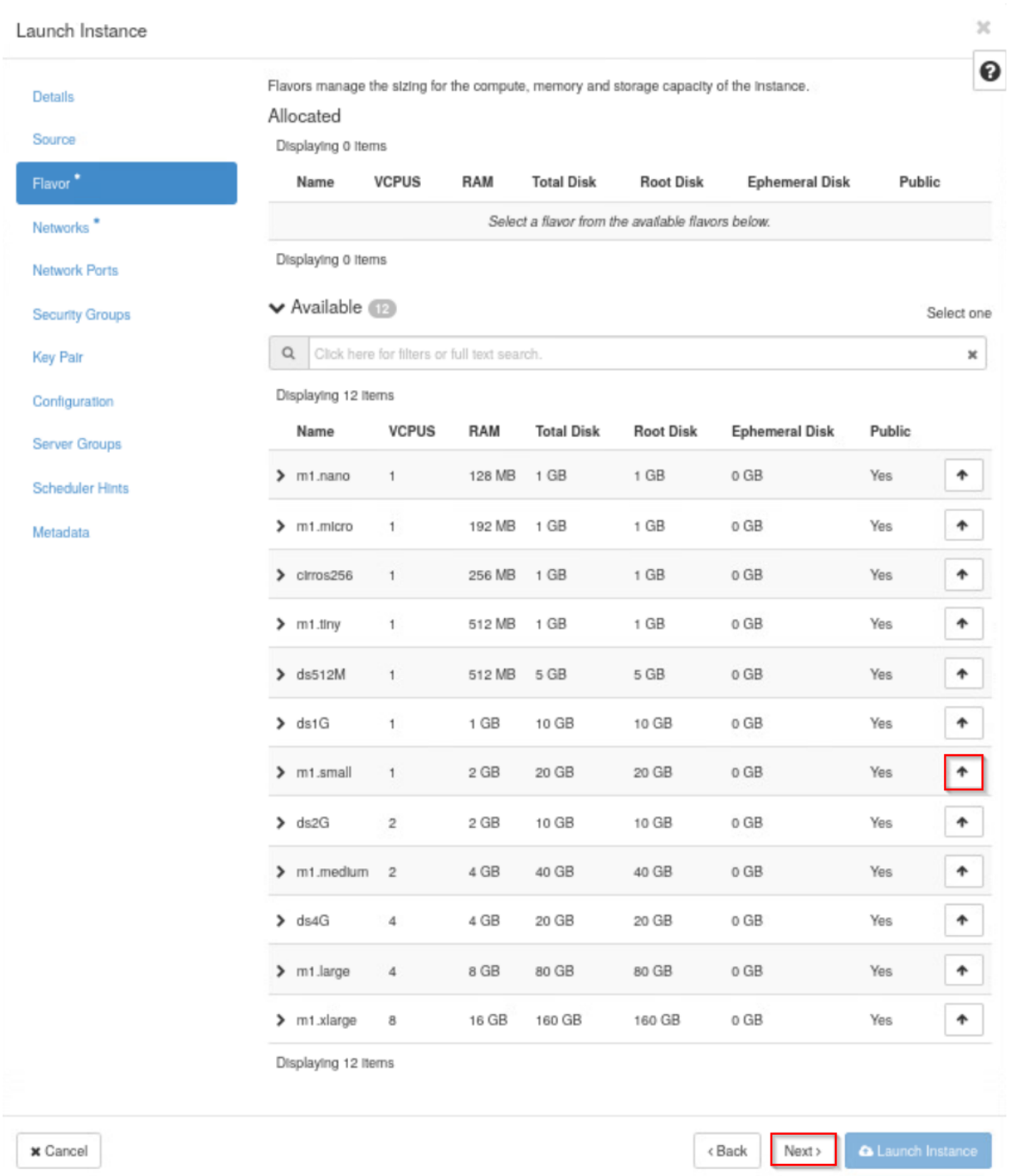
7. In the *Select Boot Source* drop dow, select **Image**, set *Create New Volume* to **No** and scroll down (if needed) to click the ↑ icon beside of **ubuntu** to use **ubuntu** as the image. Click **Next**.



Stop

Before proceeding to the next step, confirm that **ubuntu** appears underneath the *Allocated* section.

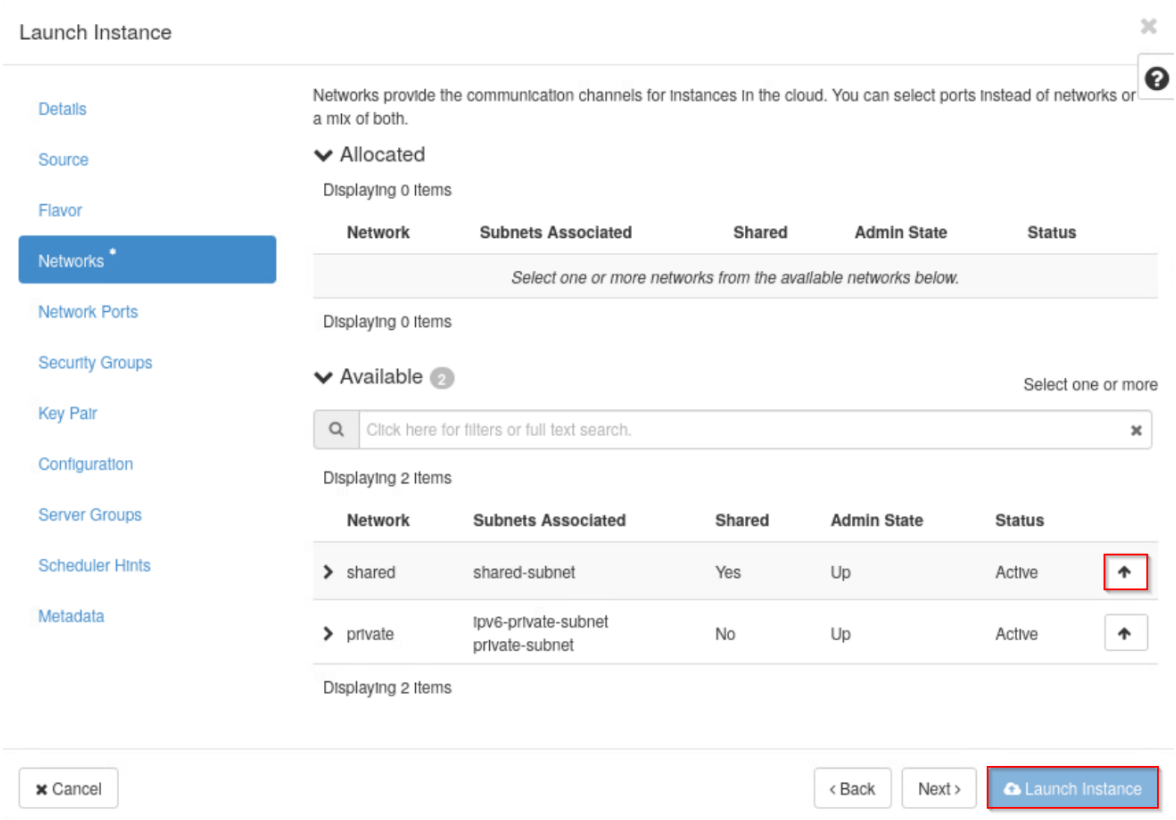
8. Scroll down (if needed) and click the ↑ icon beside the **m1.small** flavor. Click **Next**.



Stop

Before proceeding to the next step, confirm that **m1.small** appears underneath the *Allocated* section.

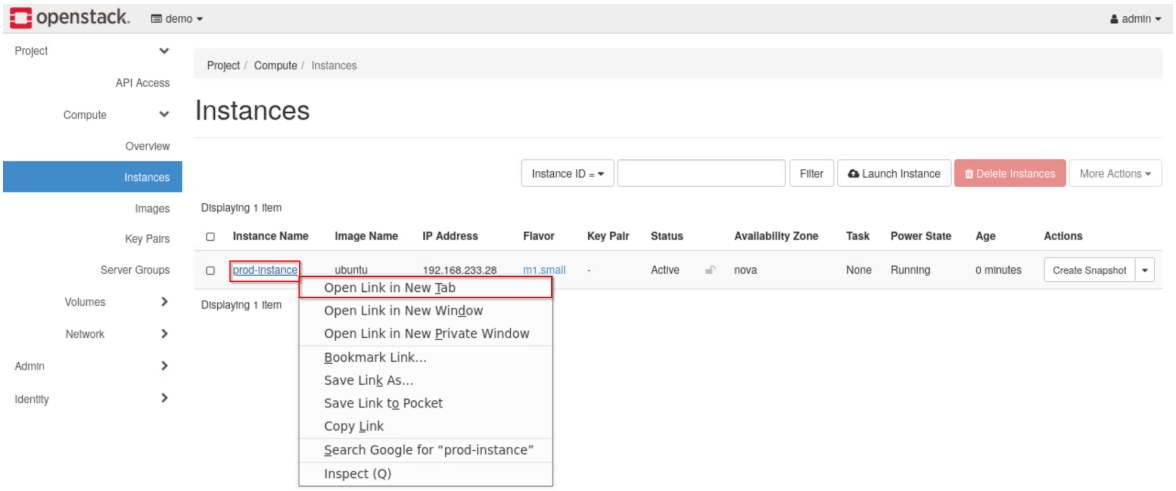
9. Click the ↑ icon beside the **shared** network. If all required fields have been set, the **Launch Instance** button in the bottom right corner should now be clickable. Click **Launch Instance**.



Stop

Before proceeding to the next step, confirm that **shared** appears underneath the *Allocated* section.

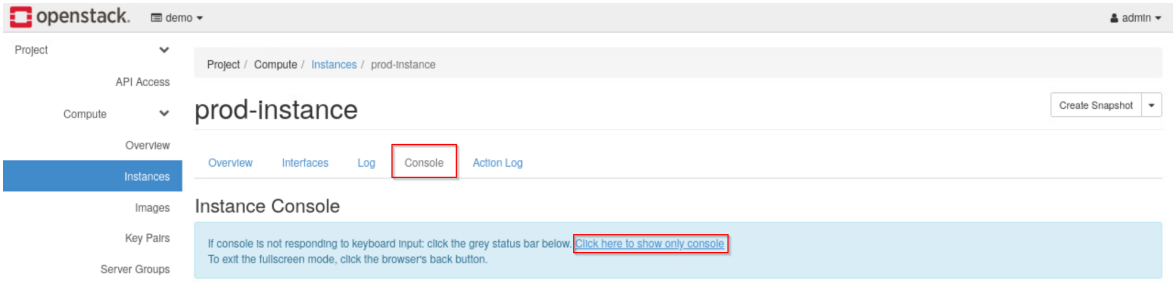
10. To open the conosle of **prod-instance** in a new tab, right-click on the name **prod-instance** and select **Open Link in New Tab**, or middle-click the name **prod-instance**.



Stop

Wait for the *Power State* of **prod-instance** to display the status of *Running* before continuing to the next step.

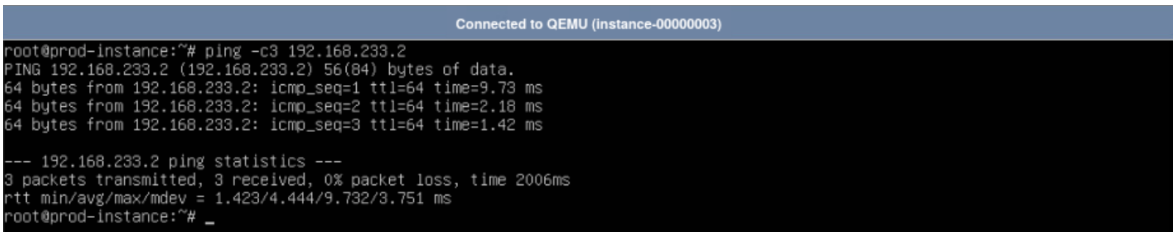
11. In the new tab, click the *Console* tab. Optionally, to make the console take up the whole tab, click the **Click here to show only console** link.



12. Log into the console as **root** with the password **secret**.

13. In the console, ping **192.168.233.2** (DHCP server) to verify connectivity.

```
$ ping -c3 192.168.233.2
```

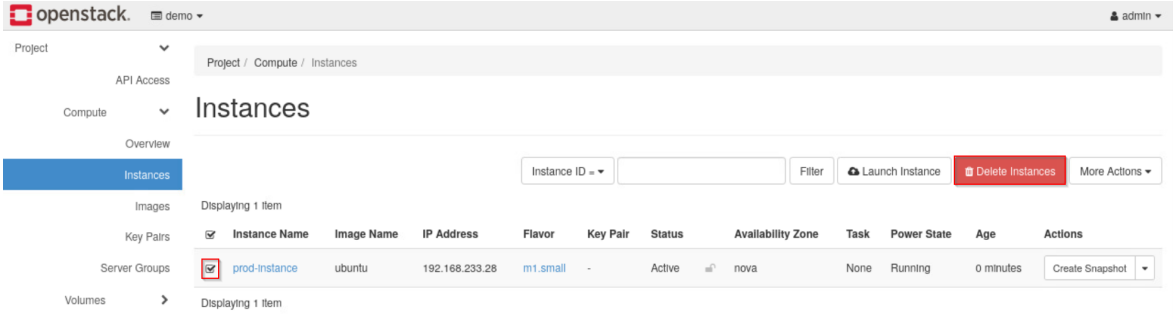


Note

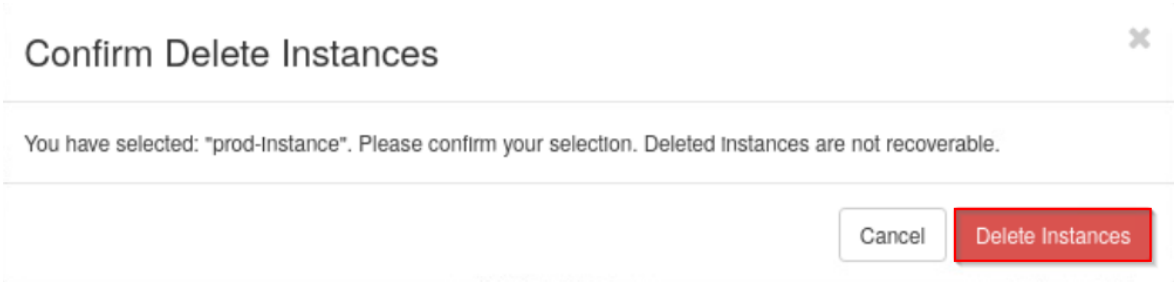
You should have received three successful ping replies.

14. Close the console tab for **prod-instance**.

15. Focus back on the tab showing instances and delete **prod-instance**. Select the checkbox for **prod-instance** and click the **Delete Instances** button.



16. Confirm the deletion by clicking the **Delete Instances** button.

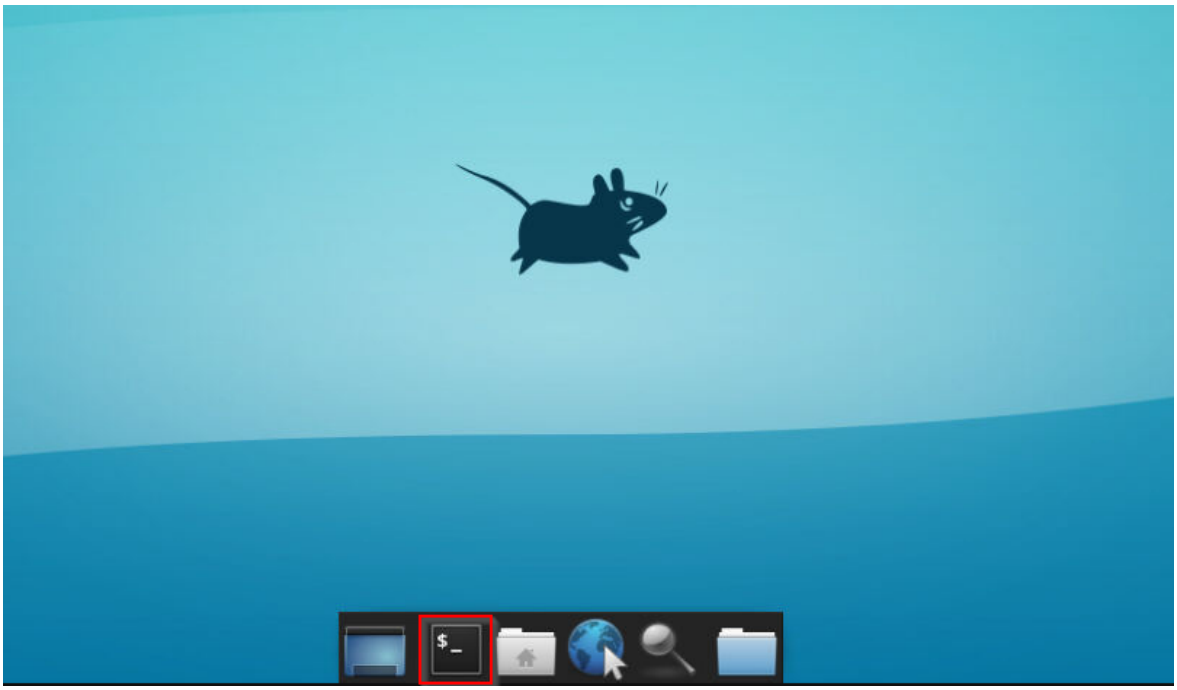


17. Close the web browser.

2 Running the OpenStack Unified CLI

In this task, you will use the *OpenStack Unified command-line interface (CLI)* to list and check the details of existing projects, users, flavors, images, and instances, and to launch an instance.

1. Open a terminal, either by right-clicking the desktop and selecting **Open Terminal Here**, by clicking the terminal icon in the icon bar at the bottom of the screen, or by selecting **Applications** at the top left of the screen, then selecting **Terminal Emulator**.



2. The **keystonerc-admin** file in the home directory defines several `OS_*` environment variables that allow you to use the OpenStack platform on the **devstack** server through the OpenStack Unified CLI. The username will be **admin**, the password will be be **secret**, the project will be **demo**, and the IP address for `OS_AUTH_URL` is the IP address of the **devstack** server, **192.168.1.22**. You can run `cat` on the file to view its contents.

```
ubuntu@workstation:~$ cat ~/keystonerc-admin
```

```
ubuntu@workstation:~$ cat ~/keystonerc-admin
unset OS_SERVICE_TOKEN
unset OS_TENANT_ID
unset OS_TENANT_NAME
export OS_USERNAME=admin
export OS_PASSWORD=secret
export OS_AUTH_URL=http://192.168.1.22/identity
export OS_REGION_NAME=RegionOne
export OS_PROJECT_NAME=demo
export OS_INTERFACE=public
export OS_IDENTITY_API_VERSION=3
ubuntu@workstation:~$
```

3. Use the `source` command with the **keystonerc-admin** argument to enable all the `OS_*` environment variables included in the **keystonerc-admin** file.

```
ubuntu@workstation:~$ source ~/keystonerc-admin
```

```
ubuntu@workstation:~$ source ~/keystonerc-admin
ubuntu@workstation:~$
```

4. Verify that the `OS_*` environment variables have been exported to the shell environment.

```
ubuntu@workstation:~$ env | grep OS_
```

```
ubuntu@workstation:~$ env | grep OS_
OS_AUTH_URL=http://192.168.1.22/identity
OS_REGION_NAME=RegionOne
OS_PROJECT_NAME=demo
OS_IDENTITY_API_VERSION=3
OS_INTERFACE=public
OS_PASSWORD=secret
OS_USERNAME=admin
ubuntu@workstation:~$
```

Tip

Use the `openstack help project show` command to determine how to display the details of a particular project.

5. Enter the command below to gather additional information about the **admin** user's current project, **demo**.

```
ubuntu@workstation:~$ openstack project show demo
```

```
ubuntu@workstation:~$ openstack project show demo
+-------------+----------------------------------+
| Field       | Value                            |
+-------------+----------------------------------+
| description |                                  |
| domain_id   | default                          |
| enabled     | True                             |
| id          | ac77ab3519ac4a588dfefcb7d7c31085 |
| is_domain   | False                            |
| name        | demo                             |
| options     | {}                               |
| parent_id   | default                          |
| tags        | []                               |
+-------------+----------------------------------+
ubuntu@workstation:~$
```

Note

he ID value for **demo** may differ from above since it is a unique ID.

Tip

Use the `openstack help user show` command to determine how to display details of a specific user account.

6. Enter the command below to check the details of **admin**.

```
ubuntu@workstation:~$ openstack user show admin
```

```
ubuntu@workstation:~$ openstack user show admin
+---------------------+----------------------------------+
| Field               | Value                            |
+---------------------+----------------------------------+
| domain_id           | default                          |
| enabled             | True                             |
| id                  | d20b6b5676724f12b891563fee6b62fd |
| name                | admin                            |
| options             | {}                               |
| password_expires_at | None                             |
+---------------------+----------------------------------+
ubuntu@workstation:~$
```

Tip

Use the `openstack help flavor list` command to determine how to display all available flavors.

7. Enter the command below to list all available flavors.

```
ubuntu@workstation:~$ openstack flavor list
```

```
ubuntu@workstation:~$ openstack flavor list
+----+-----------+-------+------+-----------+-------+-----------+
| ID | Name      |   RAM | Disk | Ephemeral | VCPUs | Is Public |
+----+-----------+-------+------+-----------+-------+-----------+
| 1  | m1.tiny   |   512 |    1 |         0 |     1 | True      |
| 2  | m1.small  |  2048 |   20 |         0 |     1 | True      |
| 3  | m1.medium |  4096 |   40 |         0 |     2 | True      |
| 4  | m1.large  |  8192 |   80 |         0 |     4 | True      |
| 42 | m1.nano   |   128 |    1 |         0 |     1 | True      |
| 5  | m1.xlarge | 16384 |  160 |         0 |     8 | True      |
| 84 | m1.micro  |   192 |    1 |         0 |     1 | True      |
| c1 | cirros256 |   256 |    1 |         0 |     1 | True      |
| d1 | ds512M    |   512 |    5 |         0 |     1 | True      |
| d2 | ds1G      |  1024 |   10 |         0 |     1 | True      |
| d3 | ds2G      |  2048 |   10 |         0 |     2 | True      |
| d4 | ds4G      |  4096 |   20 |         0 |     4 | True      |
+----+-----------+-------+------+-----------+-------+-----------+
ubuntu@workstation:~$
```

8. Enter the command below to display the details specifically for the **m1.small** flavor.

```
ubuntu@workstation:~$ openstack flavor show m1.small
```

```
ubuntu@workstation:~$ openstack flavor show m1.small
+----------------------------+-----------------------+
| Field                      | Value                 |
+----------------------------+-----------------------+
| OS-FLV-DISABLED:disabled   | False                 |
| OS-FLV-EXT-DATA:ephemeral  | 0                     |
| access_project_ids         | None                  |
| disk                       | 20                    |
| id                         | 2                     |
| name                       | m1.small              |
| os-flavor-access:is_public | True                  |
| properties                 | hw_rng:allowed='True' |
| ram                        | 2048                  |
| rxtx_factor                | 1.0                   |
| swap                       |                       |
| vcpus                      | 1                     |
+----------------------------+-----------------------+
ubuntu@workstation:~$
```

Tip

Use the `openstack help image` command to determine how to list all images.

9. Enter the command below to list all available images.

```
ubuntu@workstation:~$ openstack image list
```

```
ubuntu@workstation:~$ openstack image list
+--------------------------------------+--------------------------+--------+
| ID                                   | Name                     | Status |
+--------------------------------------+--------------------------+--------+
| 2c57a4c3-1681-433d-a0f0-091fa99057ad | cirros-0.6.2-x86_64-disk | active |
| b6e959dd-7ad1-409f-966c-9c34eee29b36 | ubuntu                   | active |
+--------------------------------------+--------------------------+--------+
ubuntu@workstation:~$
```

Tip

Use the `openstack help network` command to determine how to list all networks.

10. Enter the command below to list all available networks.

```
ubuntu@workstation:~$ openstack network list
```

```
ubuntu@workstation:~$ openstack network list
+--------------------------------------+---------+--------------------------------------------------------------------------+
| ID                                   | Name    | Subnets                                                                  |
+--------------------------------------+---------+--------------------------------------------------------------------------+
| c2b73520-f786-4891-85d7-5474ff485db6 | private | 5073e887-6c34-4018-9023-19ab46028a6c, 64e819da-079c-4cff-8f54-2bc03c26f95e |
| d787b1d5-d630-4c1d-9274-4d4fd092223b | shared  | eaefc117-3488-4d12-884f-13e77b53cae3                                     |
| ea56d8cd-a775-40f6-8806-6a34c80488e2 | public  | 041271d7-5c3b-4c84-a058-f0e8d705a5d1, eef4a8c1-8a72-45e2-8c3a-4ad48797d8c3 |
+--------------------------------------+---------+--------------------------------------------------------------------------+
ubuntu@workstation:~$
```

11. Enter the command below to create a new instance with the name **prod-instance**, using **ubuntu** as the image, **m1.small** as the flavor, and **shared** as the network.

```
ubuntu@workstation:~$ openstack server create \
> --image ubuntu \
> --flavor m1.small \
> --network shared \
> --wait prod-instance
```

```
ubuntu@workstation:~$ openstack server create \
> --image ubuntu \
> --flavor m1.small \
> --network shared \
> --wait prod-instance

+-------------------------------------+------------------------------------------------------------+
| Field                               | Value                                                      |
+-------------------------------------+------------------------------------------------------------+
| OS-DCF:diskConfig                   | MANUAL                                                     |
| OS-EXT-AZ:availability_zone         | nova                                                       |
| OS-EXT-SRV-ATTR:host                | devstack                                                   |
| OS-EXT-SRV-ATTR:hypervisor_hostname | devstack                                                   |
| OS-EXT-SRV-ATTR:instance_name       | instance-00000002                                          |
| OS-EXT-STS:power_state              | Running                                                    |
| OS-EXT-STS:task_state               | None                                                       |
| OS-EXT-STS:vm_state                 | active                                                     |
| OS-SRV-USG:launched_at              | 2024-01-06T21:19:00.000000                                 |
| OS-SRV-USG:terminated_at            | None                                                       |
| accessIPv4                          |                                                            |
| accessIPv6                          |                                                            |
| addresses                           | shared=192.168.233.116                                     |
| adminPass                           | H9LirHpuhpJN                                               |
| config_drive                        |                                                            |
| created                             | 2024-01-06T21:18:57Z                                       |
| flavor                              | m1.small (2)                                               |
| hostId                              | 60247dd563bf84b4d3dc4347fff74576a6541e87f7393d5deaa75690    |
| id                                  | 14bce2df-cb40-4ce5-8f4b-2daff2cc8b99                       |
| image                               | ubuntu (b6e959dd-7ad1-409f-966c-9c34eee29b36)              |
| key_name                            | None                                                       |
| name                                | prod-instance                                              |
| progress                            | 0                                                          |
| project_id                          | c50851c6559442df92e0e0799376a84f                           |
| properties                          |                                                            |
| security_groups                     | name='default'                                             |
| status                              | ACTIVE                                                     |
| updated                             | 2024-01-06T21:19:01Z                                       |
| user_id                             | be70ca5c1a9e46eb8be7b25a6cd18fba                           |
| volumes_attached                    |                                                            |
+-------------------------------------+------------------------------------------------------------+
ubuntu@workstation:~$
```

Tip

When typing the command, make sure there is a space between `ubuntu` and the \, and press **Enter** to get the > and continue typing the rest of the command.

12. Use the **openstack server list** command to list all the available instances.

```
ubuntu@workstation:~$ openstack server list
```

```
ubuntu@workstation:~$ openstack server list
+--------------------------------------+--------------+--------+-----------------------+--------+----------+
| ID                                   | Name         | Status | Networks              | Image  | Flavor   |
+--------------------------------------+--------------+--------+-----------------------+--------+----------+
| 14bce2df-cb40-4ce5-8f4b-2daff2cc8b99 | prod-instance | ACTIVE | shared=192.168.233.116 | ubuntu | m1.small |
+--------------------------------------+--------------+--------+-----------------------+--------+----------+
ubuntu@workstation:~$
```

Note

The UUID in the *ID* field and the IP address in the *Networks* field may differ from the screenshot provided.

13. Enter the command below to display more details about the instance **prod-instance**.

```
ubuntu@workstation:~$ openstack server show prod-instance
```

```
ubuntu@workstation:~$ openstack server show prod-instance
+-------------------------------------+-------------------------------------------------------------+
| Field                               | Value                                                       |
+-------------------------------------+-------------------------------------------------------------+
| OS-DCF:diskConfig                   | MANUAL                                                      |
| OS-EXT-AZ:availability_zone         | nova                                                        |
| OS-EXT-SRV-ATTR:host                | devstack                                                    |
| OS-EXT-SRV-ATTR:hypervisor_hostname | devstack                                                    |
| OS-EXT-SRV-ATTR:instance_name       | instance-00000002                                           |
| OS-EXT-STS:power_state              | Running                                                     |
| OS-EXT-STS:task_state               | None                                                        |
| OS-EXT-STS:vm_state                 | active                                                      |
| OS-SRV-USG:launched_at              | 2024-01-06T21:19:00.000000                                  |
| OS-SRV-USG:terminated_at            | None                                                        |
| accessIPv4                          |                                                             |
| accessIPv6                          |                                                             |
| addresses                           | shared=192.168.233.116                                      |
| config_drive                        |                                                             |
| created                             | 2024-01-06T21:18:57Z                                        |
| flavor                              | m1.small (2)                                                |
| hostId                              | 60247dd563bf84b4d3dc4347fff74576a6541e87f7393d5deaa75690    |
| id                                  | 14bce2df-cb40-4ce5-8f4b-2daff2cc8b99                        |
| image                               | ubuntu (b6e959dd-7ad1-409f-966c-9c34eee29b36)               |
| key_name                            | None                                                        |
| name                                | prod-instance                                               |
| progress                            | 0                                                           |
| project_id                          | c50851c6559442df92e0e0799376a84f                            |
| properties                          |                                                             |
| security_groups                     | name='default'                                              |
| status                              | ACTIVE                                                      |
| updated                             | 2024-01-06T21:19:01Z                                        |
| user_id                             | be70ca5c1a9e46eb8be7b25a6cd18fba                            |
| volumes_attached                    |                                                             |
+-------------------------------------+-------------------------------------------------------------+
ubuntu@workstation:~$
```

Tip

The UUID for the instance **prod-instance** can be used in place of **prod-instance** in the above command to identify the instance.

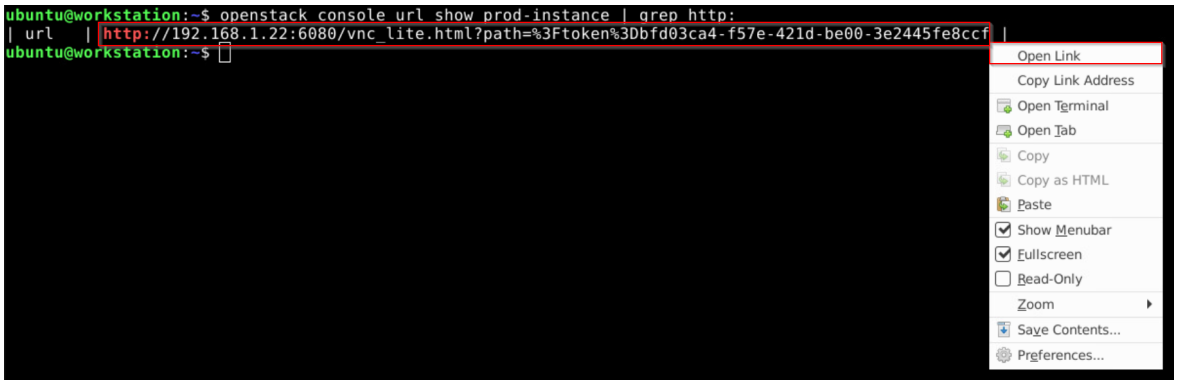
14. Enter the command below to verify the log for the instance.

```
ubuntu@workstation:~$ openstack console log show prod-instance
```

```
ubuntu@workstation:~$ openstack console log show prod-instance
[    0.000000] Linux version 5.15.0-91-generic (buildd@lcy02-amd64-045) (gcc (Ubuntu 11.4.0-1ubuntu1~22.04) 11.4.0, GNU ld (GN
U Binutils for Ubuntu) 2.38) #101-Ubuntu SMP Tue Nov 14 13:30:08 UTC 2023 (Ubuntu 5.15.0-91.101-generic 5.15.131)
[    0.000000] Command line: BOOT_IMAGE=/boot/vmlinuz-5.15.0-91-generic root=LABEL=cloudimg-rootfs ro console=tty1 console=tty
S0
[    0.000000] KERNEL supported cpus:
[    0.000000]   Intel GenuineIntel
[    0.000000]   AMD AuthenticAMD
[    0.000000]   Hygon HygonGenuine
[    0.000000]   Centaur CentaurHauls
[    0.000000]   zhaoxin   Shanghai
[    0.000000] BIOS-provided physical RAM map:
[    0.000000] BIOS-e820: [mem 0x0000000000000000-0x000000000009fbff] usable
[    0.000000] BIOS-e820: [mem 0x000000000009fc00-0x000000000009ffff] reserved
[    0.000000] BIOS-e820: [mem 0x00000000000f0000-0x00000000000fffff] reserved
[    0.000000] BIOS-e820: [mem 0x0000000000100000-0x000000007ffdcfff] usable
[    0.000000] BIOS-e820: [mem 0x000000007ffdd000-0x000000007fffffff] reserved
[    0.000000] BIOS-e820: [mem 0x00000000fffc0000-0x00000000ffffffff] reserved
[    0.000000] NX (Execute Disable) protection: active
[    0.000000] SMBIOS 2.8 present.
[    0.000000] DMI: OpenStack Foundation OpenStack Nova, BIOS 1.15.0-1 04/01/2014
[    0.000000] tsc: Fast TSC calibration using PIT
[    0.000000] tsc: Detected 2095.077 MHz processor
[    0.017659] last_pfn = 0x7ffdd max_arch_pfn = 0x400000000
[    0.018870] x86/PAT: Configuration [0-7]: WB  WC  UC- UC  WB  WP  UC- WT
[    0.040867] found SMP MP-table at [mem 0x000f5b80-0x000f5b8f]
[    0.048240] RAMDISK: [mem 0x34381000-0x361b7fff]
[    0.048821] ACPI: Early table checksum verification disabled
[    0.049466] ACPI: RSDP 0x00000000000F5990 000014 (v00 BOCHS )
[    0.049915] ACPI: RSDT 0x000000007FFE18B3 000034 (v01 BOCHS  BXPC     00000001 BXPC 00000001)
[    0.050741] ACPI: FACP 0x000000007FFE1767 000074 (v01 BOCHS  BXPC     00000001 BXPC 00000001)
[    0.051695] ACPI: DSDT 0x000000007FFE0040 001727 (v01 BOCHS  BXPC     00000001 BXPC 00000001)
[    0.051848] ACPI: FACS 0x000000007FFE0000 000040
[    0.051952] ACPI: APIC 0x000000007FFE17DB 000078 (v01 BOCHS  BXPC     00000001 BXPC 00000001)
[    0.052016] ACPI: HPET 0x000000007FFE1853 000038 (v01 BOCHS  BXPC     00000001 BXPC 00000001)
[    0.052075] ACPI: WAET 0x000000007FFE188B 000028 (v01 BOCHS  BXPC     00000001 BXPC 00000001)
[    0.052224] ACPI: Reserving FACP table memory at [mem 0x7ffe1767-0x7ffe17da]
[    0.052268] ACPI: Reserving DSDT table memory at [mem 0x7ffe0040-0x7ffe1766]
[    0.052289] ACPI: Reserving FACS table memory at [mem 0x7ffe0000-0x7ffe003f]
```

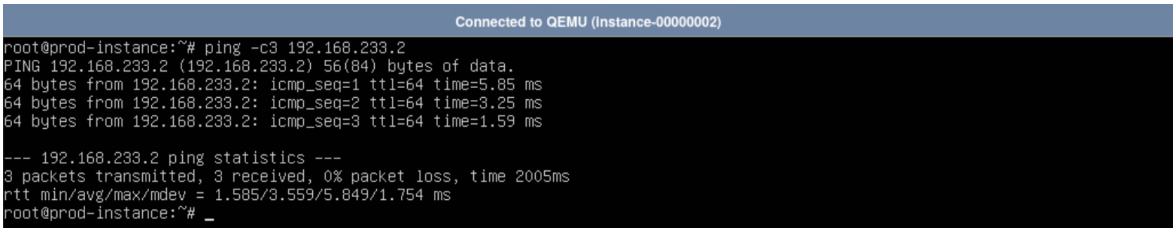
15. Enter the command below to display the instance's console URL. Pipe the command to `grep` so that you will get a link in the terminal you can clikc on. Then right click on the URL and select **Open Link**.

```
ubuntu@workstation:~$ openstack console url show prod-instance grep https:
```



16. The web browser will open directly to the instance's console through noVNC. Log into **prod-instance** using **root** as the username and **secret** as the password. Then use the `ping` command to verify connectivity with the DHCP server (**192.168.233.2**).

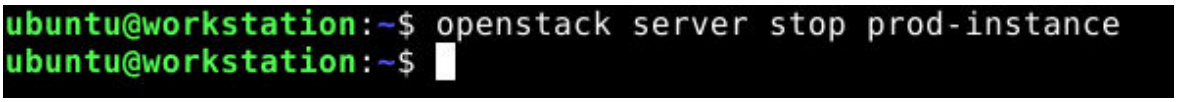
```
$ ping -c3 192.168.233.2
```



17. Close the web browser and change focus back to the previous terminal window.

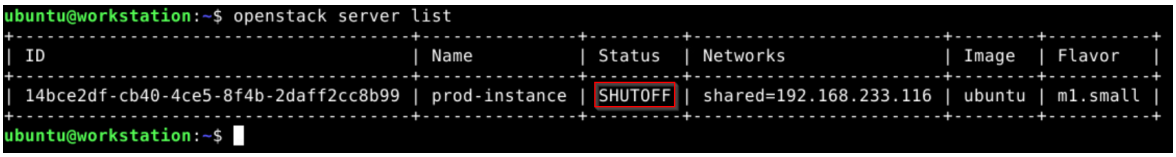
18. Enter the command below to stop the instance

```
ubuntu@workstation:~$ openstack server stop prod-instance
```



19. **prod-instance** should now be in the SHUTOFF state. Enter the command below to verify this.

```
ubuntu@workstation~$: openstack server list
```



20. Enter the command below to delete the instance.

```
ubuntu@workstation:~$ openstack server delete prod-instance
```

21. The lab is now complete.