

OpenStack Labs

Lab 09: Customizing Instances

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Introduction

In this lab, you will use the `cloud-init` utility to customize OpenStack instances.

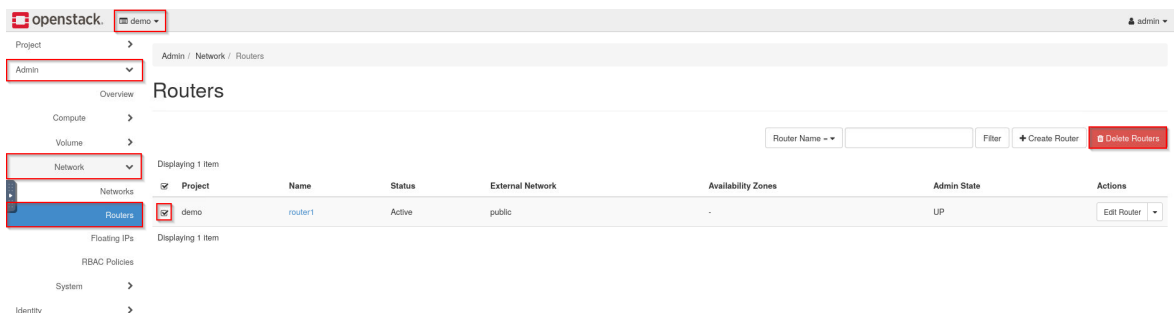
Objectives

- Customize an instance with `cloud-init`.
- Verify instance customization.

1 Creating Customized Instances

In this task, you will customize two instances using cloud-init capabilities and features. You will log into the first instance to confirm cloud-init is up and running.

1. Open the web browser and navigate to **192.168.1.20**. Log into the dashboard as **admin** with the password **secret**.
2. Switch to the **demo** project. Navigate to **Admin**→**Network**→**Routers**. Check the box in the same row as **router1**, then click **Delete Routers**.



openstack demo admin

Project: demo

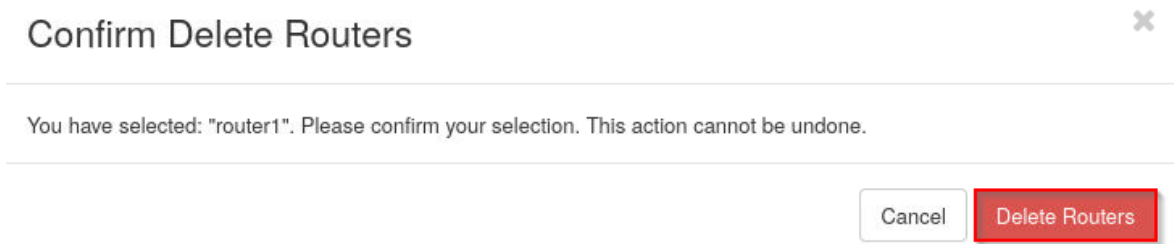
Admin / Network / Routers

Routers

Router Name: Filter + Create Router Delete Routers

Project	Name	Status	External Network	Availability Zones	Admin State	Actions	
<input checked="" type="checkbox"/>	demo	router1	Active	public	-	UP	Edit Router

3. In the *Confirm Delete Routers* dialog box that pops up, click **Delete Routers**.

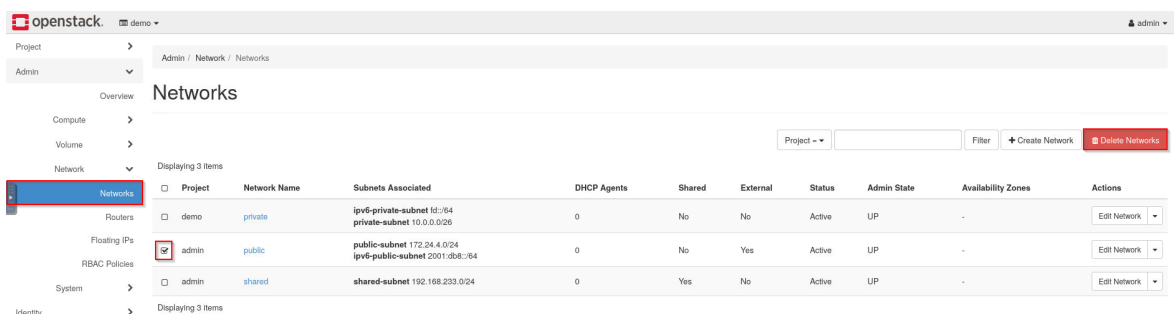


Confirm Delete Routers

You have selected: "router1". Please confirm your selection. This action cannot be undone.

Cancel Delete Routers

4. Now, navigate to **Networks**. Check the box in the same row as **public**, then click **Delete Networks**.



openstack demo admin

Project: demo

Admin / Network / Networks

Networks

Project: Filter + Create Network Delete Networks

Project	Network Name	Subnets Associated	DHCP Agents	Shared	External	Status	Admin State	Availability Zones	Actions	
<input type="checkbox"/>	demo	private	ipv6-private-subnet 1d:164 private-subnet 10.0.0.0/26	0	No	No	Active	UP	-	Edit Network
<input checked="" type="checkbox"/>	admin	public	public-subnet 172.24.4.0/24 ipv6-public-subnet 2001:db8::/64	0	No	Yes	Active	UP	-	Edit Network
<input type="checkbox"/>	admin	shared	shared-subnet 192.168.233.0/24	0	Yes	No	Active	UP	-	Edit Network

5. In the *Confirm Delete Networks* dialog box that pops up, click **Delete Networks**.

Confirm Delete Networks



You have selected: "public". Please confirm your selection. This action cannot be undone.

Cancel

Delete Networks

6. Leave the web browser open and open a terminal window. Source the keystone credentials for the **admin** user.

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

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

7. A few resources need to be created to help with customizing the instances. First, create an external network named **external**. Set the network type to **flat** and the physical network to **public**. Set the network as shared and external.

```
ubuntu@workstation:~$ openstack network create external \
> --external --share \
> --provider-network-type flat \
> --provider-physical-network public
```

```
ubuntu@workstation:~$ openstack network create external \
> --external --share \
> --provider-network-type flat \
> --provider-physical-network public
```

Field	Value
admin_state_up	UP
availability_zone_hints	
availability_zones	
created_at	2023-11-28T22:04:20Z
description	
dns_domain	None
id	9413be91-6d77-4bd3-a206-d4b0d51e107a
ipv4_address_scope	None
ipv6_address_scope	None
is_default	False
is_vlan_transparent	None
mtu	1500
name	external
port_security_enabled	True
project_id	c524eaead1f74d4f9141f71b280e0237
provider:network_type	flat
provider:physical_network	public
provider:segmentation_id	None
qos_policy_id	None
revision_number	1
router:external	External
segments	None
shared	True
status	ACTIVE
subnets	
tags	
updated_at	2023-11-28T22:04:20Z

```
ubuntu@workstation:~$
```

Tip

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

8. Create a subnet named **subext** in the **external** network. Give the subnet a range of **172.25.250.60** to **172.25.250.80**. Disable DHCP services for the subnet and use the address **172.25.250.254** as the gateway as well as the DNS name server.

```
ubuntu@workstation:~$ openstack subnet create \
> --subnet-range 172.25.250.0/24 \
> --no-dhcp \
> --gateway 172.25.250.254 \
> --dns-nameserver 172.25.250.254 \
> --allocation-pool start=172.25.250.60,end=172.25.250.80 \
> --network external \
> subext
```

```
ubuntu@workstation:~$ openstack subnet create \
> --subnet-range 172.25.250.0/24 \
> --no-dhcp \
> --gateway 172.25.250.254 \
> --dns-nameserver 172.25.250.254 \
> --allocation-pool start=172.25.250.60,end=172.25.250.80 \
> --network external \
> subext
```

Field	Value
allocation_pools	172.25.250.60-172.25.250.80
cidr	172.25.250.0/24
created_at	2023-11-28T22:06:04Z
description	
dns_nameservers	172.25.250.254
enable_dhcp	False
gateway_ip	172.25.250.254
host_routes	
id	1fc4acf4-704b-4a61-bbf3-cc8db40497ec
ip_version	4
ipv6_address_mode	None
ipv6_ra_mode	None
name	subext
network_id	9413be91-6d77-4bd3-a206-d4b0d51e107a
project_id	c524eaead1f74d4f9141f71b280e0237
revision_number	0
segment_id	None
service_types	
subnetpool_id	None
tags	
updated_at	2023-11-28T22:06:04Z

```
ubuntu@workstation:~$
```

- From the floating IP pool in the **external** network, create a floating IP.

```
ubuntu@workstation:~$ openstack floating ip create external
```



```
ubuntu@workstation:~$ openstack floating ip create external
```

Field	Value
created_at	2023-11-28T22:06:29Z
description	
fixed_ip_address	None
floating_ip_address	172.25.250.78
floating_network_id	9413be91-6d77-4bd3-a206-d4b0d51e107a
id	dea3c2c7-fd39-4d9a-9835-2444cf2dfa7e
name	172.25.250.78
port_id	None
project_id	c524eaead1f74d4f9141f71b280e0237
qos_policy_id	None
revision_number	0
router_id	None
status	DOWN
subnet_id	None
updated_at	2023-11-28T22:06:29Z

```
ubuntu@workstation:~$
```

10. Create a router named **exercise-router**.

```
ubuntu@workstation:~$ openstack router create exercise-router
```

```
ubuntu@workstation:~$ openstack router create exercise-router
```

Field	Value
admin_state_up	UP
availability_zone_hints	
availability_zones	
created_at	2023-11-29T19:33:59Z
description	
distributed	False
external_gateway_info	None
flavor_id	None
ha	False
id	c8ed3b3a-f70c-418e-a00f-1a8f8dca6161
name	exercise-router
project_id	c524eaead1f74d4f9141f71b280e0237
revision_number	1
routes	
status	ACTIVE
tags	
updated_at	2023-11-29T19:33:59Z

```
ubuntu@workstation:~$
```

11. Connect the router to the **shared-subnet** subnet.

```
ubuntu@workstation:~$ openstack router add subnet \  
> exercise-router shared-subnet
```

```
ubuntu@workstation:~$ openstack router add subnet \  
> exercise-router shared-subnet  
ubuntu@workstation:~$
```

12. Set the **external** network as the gateway for the router.

```
ubuntu@workstation:~$ openstack router set \  
> --external-gateway external \  
> exercise-router
```

```
ubuntu@workstation:~$ openstack router set \  
> --external-gateway external \  
> exercise-router  
ubuntu@workstation:~$
```

13. Create the key pair **dev-keypair** and save the private key to the file **~/Downloads/dev-keypair.pem**.

```
ubuntu@workstation:~$ openstack keypair create \  
> dev-keypair > ~/Downloads/dev-keypair.pem
```

```
ubuntu@workstation:~$ openstack keypair create \  
> dev-keypair > ~/Downloads/dev-keypair.pem  
ubuntu@workstation:~$
```

14. the **chmod** command with a mode of **600** to make it so that the **ubuntu** user has read/write permissions on the file, and groups and other users have no permissions to the file.

```
ubuntu@workstation:~$ chmod 600 ~/Downloads/dev-keypair.pem
```

```
ubuntu@workstation:~$ chmod 600 ~/Downloads/dev-keypair.pem  
ubuntu@workstation:~$
```

15. Create the **dev-secgroup** security group.

```
ubuntu@workstation:~$ openstack security group \
> create dev-secgroup
```

```
ubuntu@workstation:~$ openstack security group \
> create dev-secgroup
+-----+-----+
| Field | Value |
+-----+-----+
| created_at | 2023-11-28T22:07:57Z |
| description | dev-secgroup |
| id | bf6127bb-edab-44c8-a470-20cc9c3c4f6c |
| name | dev-secgroup |
| project_id | c524eaead1f74d4f9141f71b280e0237 |
| revision_number | 1 |
| rules | created_at='2023-11-28T22:07:57Z', direction='egress', ethertype='IPv6', id='93666585-0b16-4dee-9afc-797bd77935a9', standard_attr_id='61', updated_at='2023-11-28T22:07:57Z' |
| updated_at | 2023-11-28T22:07:57Z |
+-----+-----+
ubuntu@workstation:~$
```

16. Add a security rule in the **dev-secgroup** security group to allow remote ICMP traffic.

```
ubuntu@workstation:~$ openstack security group \
> rule create \
> --protocol icmp \
> dev-secgroup
```

```
ubuntu@workstation:~$ openstack security group \
> rule create \
> --protocol icmp \
> dev-secgroup
+-----+-----+
| Field | Value |
+-----+-----+
| created_at | 2023-11-28T22:09:51Z |
| description | None |
| direction | ingress |
| ether_type | IPv4 |
| id | d38364cb-c1ba-4710-8561-3243de310569 |
| name | None |
| port_range_max | None |
| port_range_min | None |
| project_id | c524eaead1f74d4f9141f71b280e0237 |
| protocol | icmp |
| remote_group_id | None |
| remote_ip_prefix | 0.0.0.0/0 |
| revision_number | 0 |
| security_group_id | bf6127bb-edab-44c8-a470-20cc9c3c4f6c |
| updated_at | 2023-11-28T22:09:51Z |
+-----+-----+
ubuntu@workstation:~$
```

17. Add another security rule to allow remote connection using SSH on the default port 22.

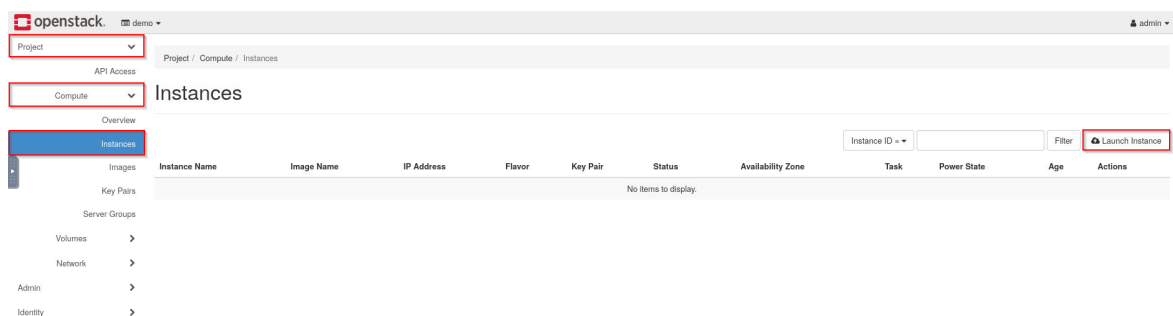
```
ubuntu@workstation:~$ openstack security group \
> rule create \
> --protocol tcp \
> --dst-port 22 \
> dev-secgroup
```

```
ubuntu@workstation:~$ openstack security group \
> rule create \
> --protocol tcp \
> --dst-port 22 \
> dev-secgroup
```

Field	Value
created_at	2023-11-28T22:10:34Z
description	
direction	ingress
ether_type	IPv4
id	ae97b392-7583-4f00-8cde-c544fd4b8195
name	None
port_range_max	22
port_range_min	22
project_id	c524eaead1f74d4f9141f71b280e0237
protocol	tcp
remote_group_id	None
remote_ip_prefix	0.0.0.0/0
revision_number	0
security_group_id	bf6127bb-edab-44c8-a470-20cc9c3c4f6c
updated_at	2023-11-28T22:10:34Z

```
ubuntu@workstation:~$
```

18. Now that the necessary resources have been created, focus back to the web browser. Navigate to **Project**→**Compute**→**Instances**, then click **Launch Instance**.



19. In the *Details* tab, enter **instance1** in the *Instance Name* field and click **Next**.

Launch Instance ✕

Please provide the initial hostname for the instance, the availability zone where it will be deployed, and the instance count. Increase the Count to create multiple instances with the same settings. ?

Details

Source *

Flavor *

Networks *

Network Ports

Security Groups

Key Pair

Configuration

Server Groups

Scheduler Hints

Metadata

Project Name

Instance Name *

Description

Availability Zone

Count *

Total Instances (10 Max)

10%

0 Current Usage
1 Added
9 Remaining

✕ Cancel

< Back

Next >

Launch Instance

20. In the *Source* tab, make sure **Image** is selected in the *Select Boot Source* dropdown and click **No** under *Create New Volume*. Select the **ubuntu** image by clicking the ↑ symbol in the same row. Click **Next**.

Launch Instance

Details
Source *
Flavor *
Networks *
Network Ports
Security Groups
Key Pair
Configuration
Server Groups
Scheduler Hints
Metadata

Instance source is the template used to create an instance. You can use an image, a snapshot of an instance (image snapshot), a volume or a volume snapshot (if enabled). You can also choose to use persistent storage by creating a new volume.

Select Boot Source

Image

Create New Volume

Yes

No

Allocated

Displaying 0 items

Name	Updated	Size	Format	Visibility
Select an item from Available items below				

Displaying 0 items

Available 2 Select one

Click here for filters or full text search.

Displaying 2 items

Name	Updated	Size	Format	Visibility
➤ cirros-0.6.2-x86_64-disk	11/8/23 9:23 PM	20.44 MB	QCOW2	Public
➤ ubuntu	11/8/23 10:23 PM	642.75 MB	QCOW2	Public

Displaying 2 items

Cancel

Back
Next >
Launch Instance

Stop

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

- In the *Flavor* tab, click the ↑ symbol in the same row as **m1.small**. Click **Next**.

Launch Instance ✕

[Details](#)

[Source](#)

Flavor *

[Networks *](#)

[Network Ports](#)

[Security Groups](#)

[Key Pair](#)

[Configuration](#)

[Server Groups](#)

[Scheduler Hints](#)

[Metadata](#)

Flavors manage the sizing for the compute, memory and storage capacity of the instance.

Allocated

Displaying 0 items

Name	VCPUS	RAM	Total Disk	Root Disk	Ephemeral Disk	Public
Select a flavor from the available flavors below.						

Displaying 0 items

Available 12 Select one

✕

Displaying 12 items

Name	VCPUS	RAM	Total Disk	Root Disk	Ephemeral Disk	Public
➤ m1.nano	1	128 MB	1 GB	1 GB	0 GB	Yes ↑
➤ m1.micro	1	192 MB	1 GB	1 GB	0 GB	Yes ↑
➤ cirros256	1	256 MB	1 GB	1 GB	0 GB	Yes ↑
➤ m1.tiny	1	512 MB	1 GB	1 GB	0 GB	Yes ↑
➤ ds512M	1	512 MB	5 GB	5 GB	0 GB	Yes ↑
➤ ds1G	1	1 GB	10 GB	10 GB	0 GB	Yes ↑
➤ m1.small	1	2 GB	20 GB	20 GB	0 GB	Yes ↑
➤ ds2G	2	2 GB	10 GB	10 GB	0 GB	Yes ↑
➤ m1.medium	2	4 GB	40 GB	40 GB	0 GB	Yes ↑
➤ ds4G	4	4 GB	20 GB	20 GB	0 GB	Yes ↑
➤ m1.large	4	8 GB	80 GB	80 GB	0 GB	Yes ↑
➤ m1.xlarge	8	16 GB	160 GB	160 GB	0 GB	Yes ↑

Displaying 12 items

✕ Cancel < Back **Next >** Launch Instance

Stop

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

22. In the *Networks* tab, click the ↑ symbol in the same row as **shared**. Click **Next**.

Launch Instance

Details

Source

Flavor

Networks *

Network Ports

Security Groups

Key Pair

Configuration

Server Groups

Scheduler Hints

Metadata

Networks provide the communication channels for instances in the cloud. You can select ports instead of networks or a mix of both.

▼ Allocated

Displaying 0 items

Network	Subnets Associated	Shared	Admin State	Status
Select one or more networks from the available networks below.				

Displaying 0 items

▼ Available 3

Select one or more

Q

Click here for filters or full text search.

×

Displaying 3 items

Network	Subnets Associated	Shared	Admin State	Status	
external	subext	Yes	Up	Active	↑
shared	shared-subnet	Yes	Up	Active	↑
private	ipv6-private-subnet private-subnet	No	Up	Active	↑

Displaying 3 items

✕ Cancel

< Back

Next >

Launch Instance

Stop

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

23. In the *Network Ports* tab, click **Next**.

Launch Instance

Details

Source

Flavor

Networks

Network Ports

Security Groups

Key Pair

Configuration

Server Groups

Scheduler Hints

Metadata

Ports provide extra communication channels to your instances. You can select ports instead of networks or a mix of both.

▼ Allocated

Displaying 0 items

Name	IP	Admin State	Status
Select one or more ports from the available ports below.			

Displaying 0 items

▼ Available 0

Select one or more

Displaying 0 items

Name	IP	Admin State	Status
No items to display.			

Displaying 0 items

✕ Cancel

< Back

Next >

Launch Instance

24. In the *Security Groups* tab, click the ↓ symbol in the same row as **default**, and click the ↑ symbol in the same row as **dev-secgroup**. Click **Next**.

Launch Instance

Details

Source

Flavor

Networks

Network Ports

Security Groups

Key Pair

Configuration

Server Groups

Scheduler Hints

Metadata

Select the security groups to launch the instance in.

▼ Allocated 1

Displaying 1 item

Name	Description
> default	Default security group

Displaying 1 item

▼ Available 1

Select one or more

Displaying 1 item

Name	Description
> dev-secgroup	dev-secgroup

Displaying 1 item

✕ Cancel

< Back

Next >

Launch Instance

Stop

Before proceeding to the next step, confirm that only **dev-secgroup** appears underneath the *Allocated* section.

25. In the *Key Pair* tab, ensure that the key pair **dev-keypair** has been selected and is underneath the *Allocated* section. Click **Next**.

Launch Instance ×

Details

Source

Flavor

Networks

Network Ports

Security Groups

Key Pair

Configuration

Server Groups

Scheduler Hints

Metadata

A key pair allows you to SSH into your newly created instance. You may select an existing key pair, import a key pair, or generate a new key pair.

[+ Create Key Pair](#) [Import Key Pair](#)

Allocated

Displaying 1 item

Name	Type	Fingerprint
> dev-keypair	ssh	bc:c6:93:d6:a8:71:08:bc:9d:e1:74:6e:e8:8f:b5:2b

Displaying 1 item

Available 0

Select one

Click here for filters or full text search.

Displaying 0 items

Name	Type	Fingerprint
No items to display.		

Displaying 0 items

✕ Cancel < Back **Next >** Launch Instance

26. In the *Configuration* tab, populate the **Customization Script** field with the content below. Once finished, click **Launch Instance**.

```
#!/bin/bash
echo 'Hello, world!' > /root/hello.txt
```

Launch Instance ✕

Details

You can customize your instance after it has launched using the options available here. "Customization Script" is analogous to "User Data" in other systems.

Load Customization Script from a file

No file selected.

Customization Script (Modified) Content size: 50 bytes of 16.00 KB

```
#!/bin/bash
echo 'Hello, world!' > /root/hello.txt
```

Disk Partition

Automatic

☐ Configuration Drive

Tip

A customization script can be used to perform many commands automatically upon instance creation, such as installing packages, configuring a host name, etc. The simple script above is just an example.

27. Once the status for **instance1** is **Active**, attach a floating IP address to it. Select **Associate Floating IP** from the dropdown menu next to **Create Snapshot** in the row for the instance.

Project / Compute / Instances

Instances

Instance ID ▾Filter

Launch Instance

Delete Instances

More Actions ▾

Displaying 1 item

<input type="checkbox"/>	Instance Name	Image Name	IP Address	Flavor	Key Pair	Status	Availability Zone	Task	Power State	Age	Actions	
<input type="checkbox"/>	instance1	ubuntu	192.168.233.5	m1.small	dev-keypair	Active	us-east-1a	nova	None	Running	0 minutes	<div><div>Create Snapshot</div><div>Associate Floating IP</div><div>Attach Interface</div><div>Detach Interface</div><div>Edit Instance</div></div>

Displaying 1 item

28. Select any one of the IP addresses from the *IP Address* dropdown and select **instance1: 192.168.233.XYZ** as the *Port to be associated*. Click **Associate**.

Manage Floating IP Associations ✕

IP Address *

172.25.250.78 ▼ +

Select the IP address you wish to associate with the selected instance or port.

Port to be associated *

instance1: 192.168.233.5 ▼

Cancel
Associate

29. To verify that the customization script worked, first click on **instance1** under the *Instance Name* column, then navigate to the *Console* tab if you are not directed there automatically. Log into the instance as **root** with the password **secret**.

```

Connected to QEMU (Instance-00000009)

Ubuntu 22.04.3 LTS instance1 tty1
instance1 login: root
Password:
Welcome to Ubuntu 22.04.3 LTS (GNU/Linux 5.15.0-87-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:   https://landscape.canonical.com
 * Support:      https://ubuntu.com/advantage

System information as of Thu Nov 30 17:42:55 UTC 2023

System load:  0.0927734375   Processes:            81
Usage of /:   15.0% of 9.51GB   Users logged in:      0
Memory usage: 17%           IPv4 address for ens3: 192.168.233.250
Swap usage:   0%

Expanded Security Maintenance for Applications is not enabled.

0 updates can be applied immediately.

Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status

The list of available updates is more than a week old.
To check for new updates run: sudo apt update
Failed to connect to https://changelogs.ubuntu.com/meta-release-lts. Check your Internet connection or proxy settings

Last login: Wed Nov 29 22:05:32 UTC 2023 on tty1
root@instance1:~#

```

30. Check **/var/log/cloud-init.log** to confirm that **cloud-init** ran. Use the **tail** command to print the last 10 lines of the log.

```
root@instance:~# tail /var/log/cloud-init.log
```

```

Connected to QEMU (Instance-00000009)
root@instance1:~# sudo tail /var/log/cloud-init.log
sudo: unable to resolve host instance1: Temporary failure in name resolution
2023-11-30 17:32:30,843 - util.py[DEBUG]: Writing to /var/lib/cloud/instance/boot-finished - wb: [644] 70 bytes
2023-11-30 17:32:30,852 - handlers.py[DEBUG]: finish: modules-final/config-final_message: SUCCESS: config-final_message ran successfully
2023-11-30 17:32:30,853 - main.py[DEBUG]: Ran 11 modules with 0 failures
2023-11-30 17:32:30,860 - atomic_helper.py[DEBUG]: Atomically writing to file /var/lib/cloud/data/status.json (via temporary file /var/lib/cloud/data/tmpuufil6z_) - w: [644] 590 bytes/chars
2023-11-30 17:32:30,867 - atomic_helper.py[DEBUG]: Atomically writing to file /var/lib/cloud/data/result.json (via temporary file /var/lib/cloud/data/tmpwmysadmy) - w: [644] 87 bytes/chars
2023-11-30 17:32:30,870 - util.py[DEBUG]: Creating symbolic link from '/run/cloud-init/result.json' => '../var/lib/cloud/data/result.json'
2023-11-30 17:32:30,872 - util.py[DEBUG]: Reading from /proc/uptime (quiet=False)
2023-11-30 17:32:30,875 - util.py[DEBUG]: Read 12 bytes from /proc/uptime
2023-11-30 17:32:30,877 - util.py[DEBUG]: cloud-init mode 'modules' took 3.172 seconds (3.17)
2023-11-30 17:32:30,878 - handlers.py[DEBUG]: finish: modules-final: SUCCESS: running modules for final
root@instance1:~# _

```

31. Ensure that the `/root/hello.txt` file exists and has the correct content.

```
root@instance:~# cat /root/hello.txt
```

```

Connected to QEMU (Instance-0000000b)
root@instance1:~# cat /root/hello.txt
Hello, world!
root@instance1:~# _

```

32. Log out of the *Horizon Dashboard* and close the web browser.
33. Focus back on the terminal and delete **instance1**.

```
ubuntu@workstation:~$ openstack server delete instance1
```

```

ubuntu@workstation:~$ openstack server delete instance1
ubuntu@workstation:~$

```

34. Another instance will be created and customized using the *OpenStack Unified CLI*. First, create a **user-data** script that will be attached to the instance at creation. Create a script called `~/set_hostname` that matches the content shown below. Press **CTRL+X**, then **Y** to accept the file changes. Press **Enter** to confirm and exit back to the terminal.

```
ubuntu@workstation: nano ~/set_hostname
```

```

GNU nano 2.9.3 /home/ubuntu/set_hostname Modified
#!/bin/bash
hostnamectl set-hostname nexus

```

35. Launch an instance using the **user-data** option with the previously created script to perform the customization. Use the **ubuntu** image, the **m1.small** flavor, the **shared** network, the **dev-secgroup** security group, and the **dev-keypair** key pair.

```
ubuntu@workstation: openstack server create \
> --image ubuntu \
> --flavor m1.small \
> --nic net-id=shared \
> --security-group dev-secgroup \
> --key-name dev-keypair \
> --user-data ~/set_hostname \
> --wait instance2
```

```
ubuntu@workstation:~$ openstack server create \
> --image ubuntu \
> --flavor m1.small \
> --nic net-id=shared \
> --security-group dev-secgroup \
> --key-name dev-keypair \
> --user-data ~/set_hostname \
> --wait instance2
```

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-0000000c
OS-EXT-STS:power_state	Running
OS-EXT-STS:task_state	None
OS-EXT-STS:vm_state	active
OS-SRV-USG:launched_at	2023-11-30T18:31:03.000000
OS-SRV-USG:terminated_at	None
accessIPv4	
accessIPv6	
addresses	shared=192.168.233.47
adminPass	5G5xNceVrXus
config_drive	
created	2023-11-30T18:31:00Z
flavor	m1.small (2)
hostId	151e314f6e3cfc8b4db0b1f6035cc4b68cb1e6c9aa97163a575f9f6c
id	d178095d-49e4-4e05-9729-0e320cfe5309
image	ubuntu (10d986bd-8501-47be-b9d9-d72eab219920)
key_name	dev-keypair
name	instance2
progress	0
project_id	c524eaead1f74d4f9141f71b280e0237
properties	
security_groups	name='dev-secgroup'
status	ACTIVE
updated	2023-11-30T18:31:04Z
user_id	b4bdeae0865449e1905f5c5e639007753
volumes_attached	

```
ubuntu@workstation:~$
```

36. Verify that the status of the **instance2** instance is **ACTIVE**.

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

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

ID	Name	Status	Networks	Image	Flavor
d178095d-49e4-4e05-9729-0e320cfe5309	instance2	ACTIVE	shared=192.168.233.47	ubuntu	m1.small

```
ubuntu@workstation:~$
```

37. Generate another floating IP address to assign to this instance. Take note of the IP address generated, which is listed in the *name* row in the output from the below command.

```
ubuntu@workstation:~$ openstack floating ip create external
```

```
ubuntu@workstation:~$ openstack floating ip create external
+-----+-----+
| Field | Value |
+-----+-----+
| created_at | 2023-11-29T22:29:11Z |
| description | |
| fixed_ip_address | None |
| floating_ip_address | 172.25.250.63 |
| floating_network_id | 9413be91-6d77-4bd3-a206-d4b0d51e107a |
| id | 61840770-30bb-4bed-83c2-9cb95c7a831f |
| name | 172.25.250.63 |
| port_id | None |
| project_id | c524eaead1f74d4f9141f71b280e0237 |
| qos_policy_id | None |
| revision_number | 0 |
| router_id | None |
| status | DOWN |
| subnet_id | None |
| updated_at | 2023-11-29T22:29:11Z |
+-----+-----+
ubuntu@workstation:~$
```

38. Assign the floating IP generated from the last step to **instance2**.

```
ubuntu@workstation:~$ openstack server add floating ip \
instance2 172.25.250.63
```

```
ubuntu@workstation:~$ openstack server add floating ip \
> instance2 172.25.250.63
ubuntu@workstation:~$
```

Note

The actual value of your floating IP address may be different.

2 Verify Customized Instances

In this task, you will verify that cloud-init has correctly customized the two instances created in the previous section.

1. If a terminal window is not already open, open one and source the admin credentials from the `~/keystonerc-admin` file.
2. Determine the floating IP address associated with **instance1**. Remember that the floating IP address is in the **172.25.250.0/24** subnet.

```
ubuntu@workstation: openstack server show instance1 \  
> | grep address
```

Note

The floating IP addresses in your output may differ from these examples.

3. Now, use this command again to determine the floating IP address associated with **instance2**.

```
ubuntu@workstation: openstack server show instance2 \  
> | grep address
```