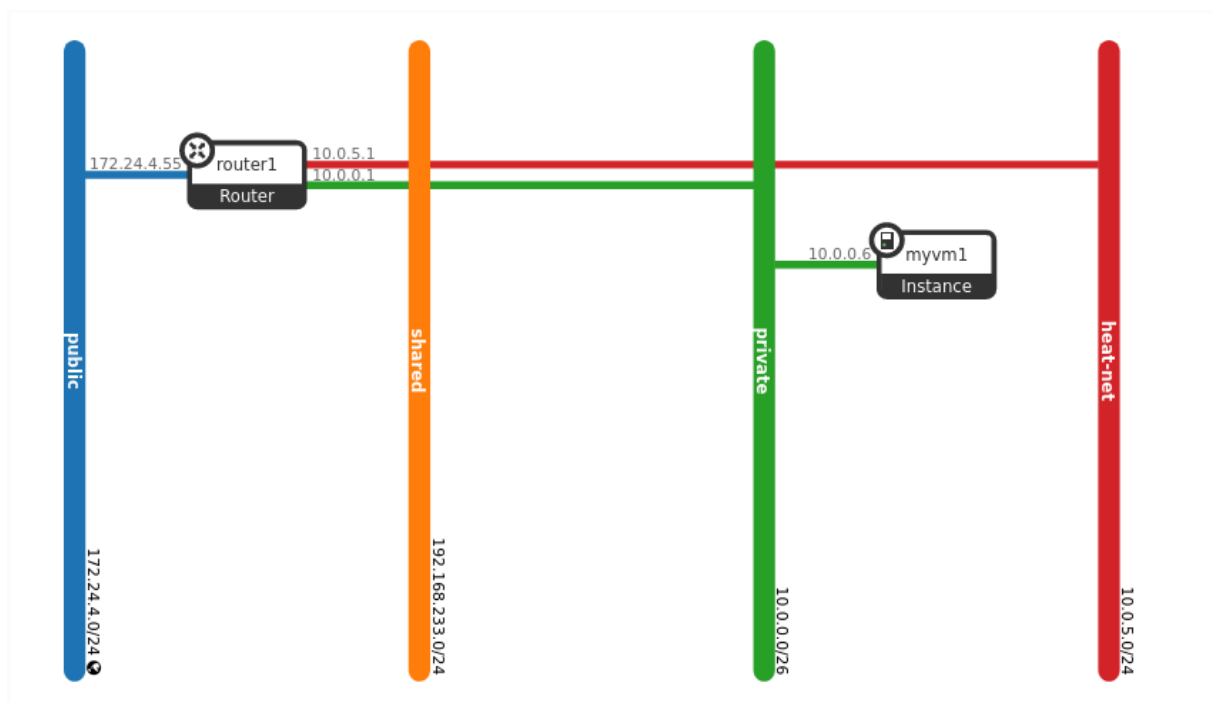


# OpenstackPrivate Cloud Admin management

## Openstack network Service (Neutron)

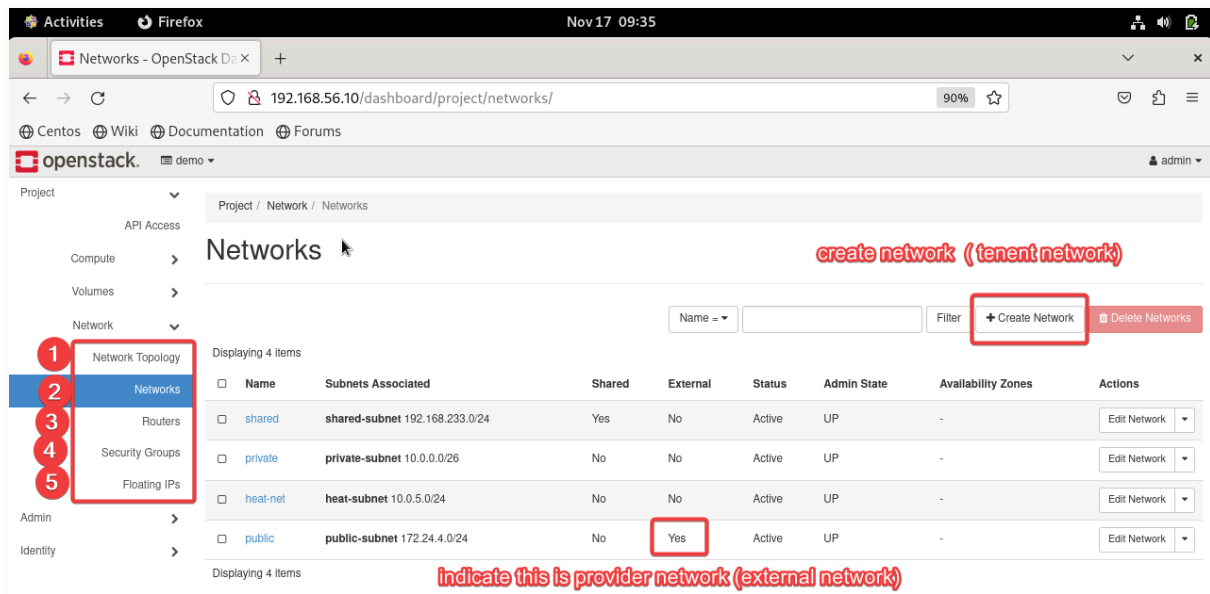
Neutron is an OpenStack project to provide “Network connectivity as a Service (NaaS)”. The OpenStack Networking service (neutron) provides an API that allows users to build rich networking topologies, set up and define network connectivity, configure advanced network policies and addressing in the cloud.



Public - or provider network this network provide external network access to openstack. Router has one gateway connect to provider network. Router use ip and subnet to manage access to machine.

When create VM process. If we want to give external access, we can **allocate** IP address from external ip pool and **associate** to vm

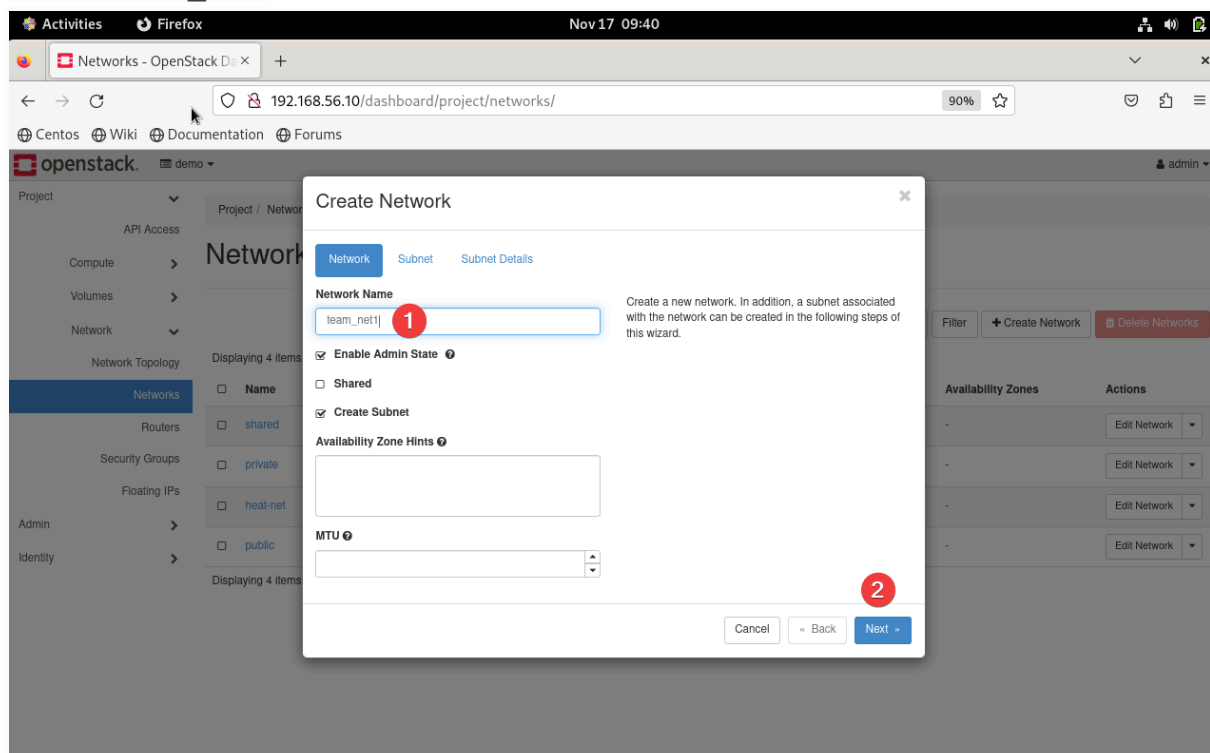
If we look into menu on the left side. Openstack have 5 main options



## Create tenant network from GUI

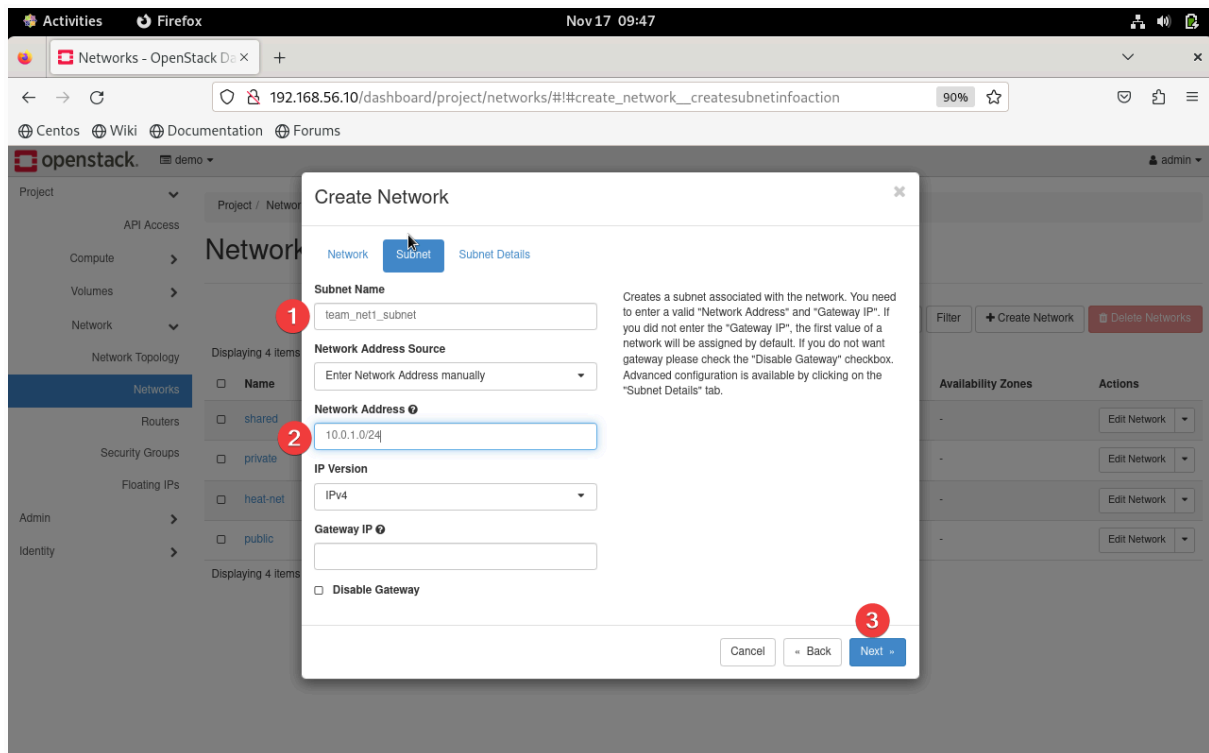
Go to Project > Network > Networks menu and click add network.

Name: team\_net1



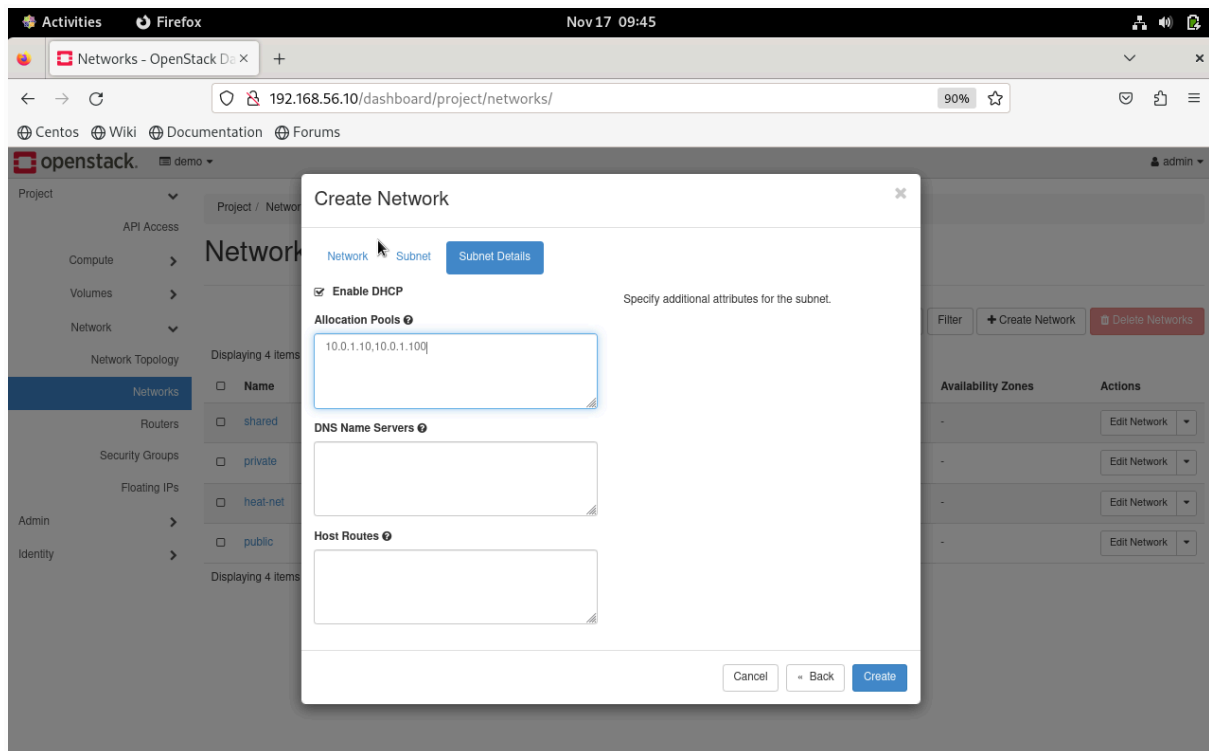
Subnet Name: team\_net1\_subnet

Network Address: 10.0.1.0/24

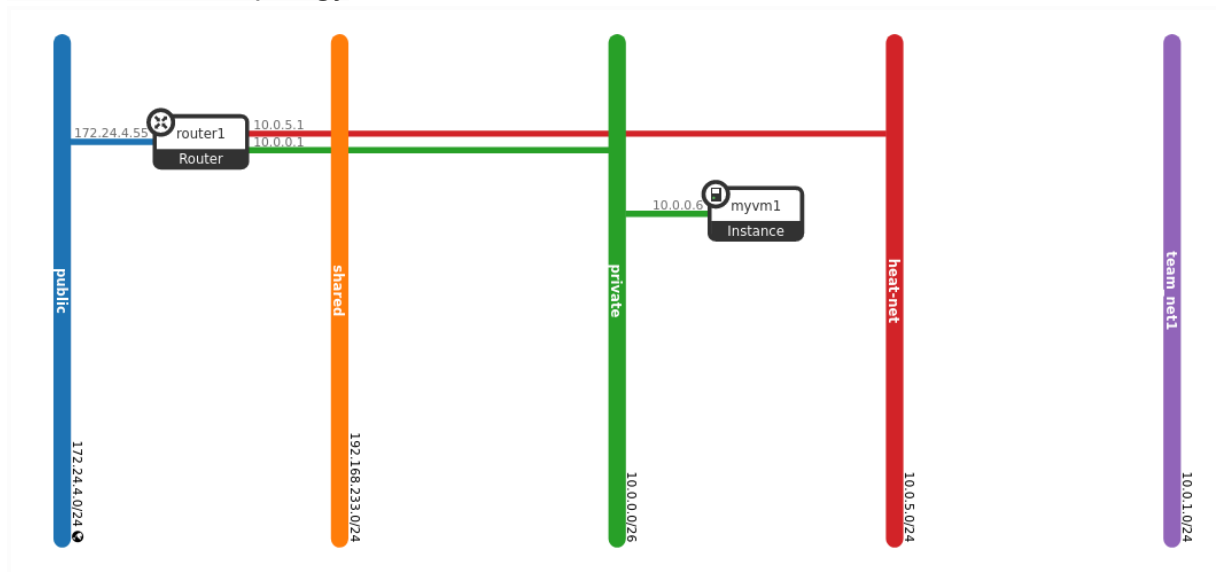


Enable dhcp

Allocation Pools: 10.0.1.10,10.0.1.100 ( ip range with comma subperation)

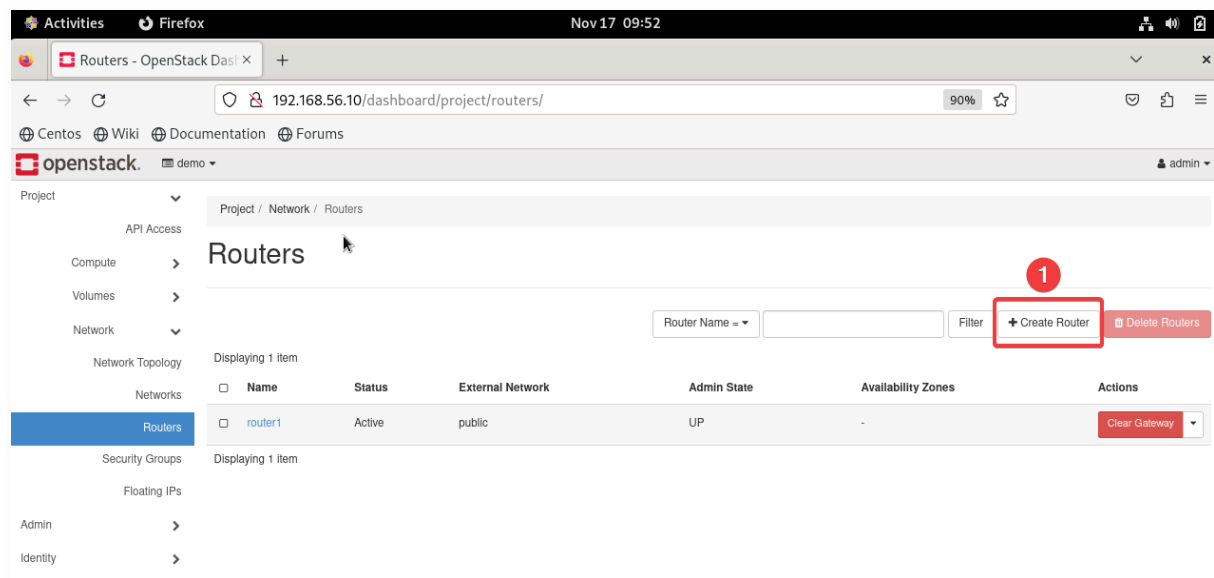


## Check network topology

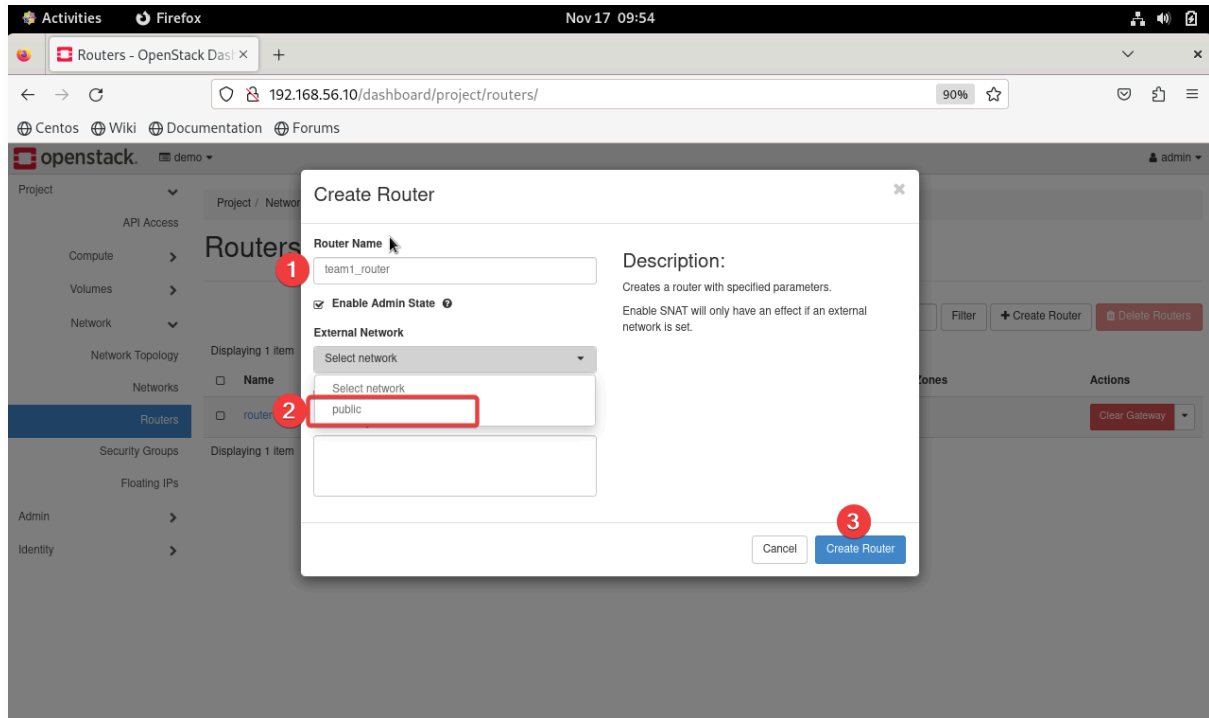


## Create Router connect tenant network

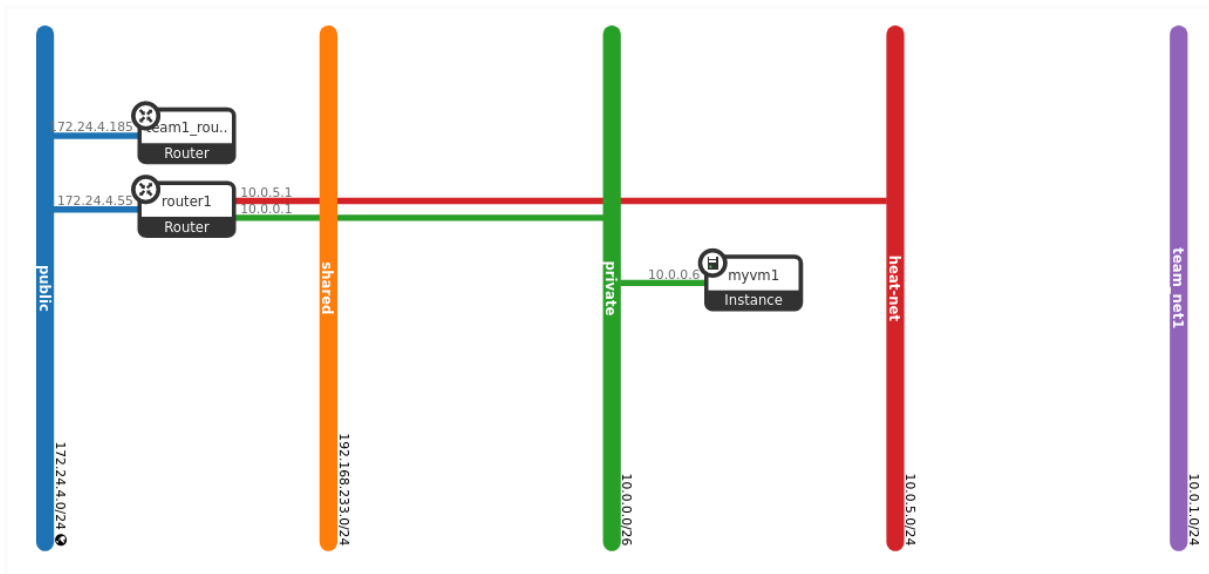
Next Create Router connect **private network** and **team\_net1** network. And make router have external access to public network. Go to menu **Project > network > Routers** and create create router



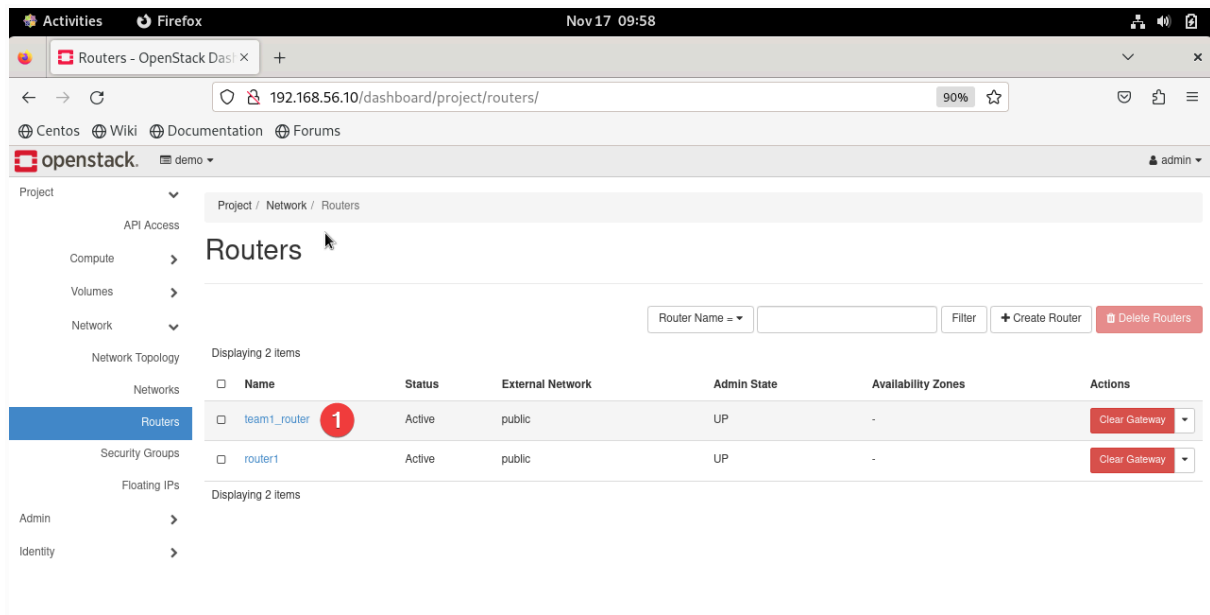
Name team1\_router  
External network public



Check network topology



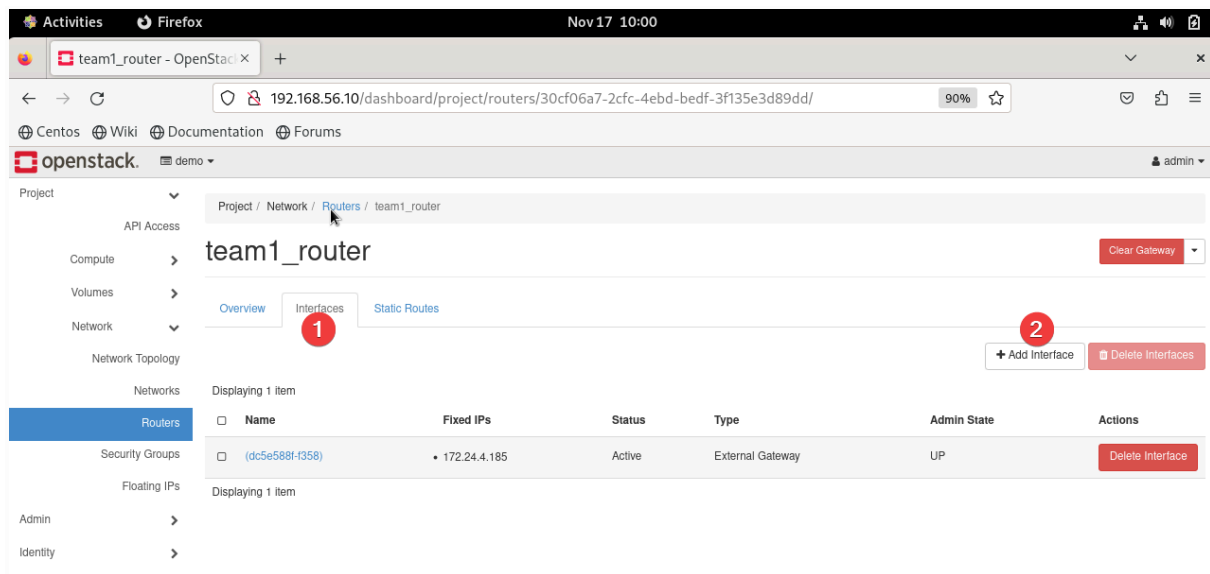
Click router name to add more network



The screenshot shows the OpenStack dashboard in a Firefox browser window. The address bar displays the URL `192.168.56.10/dashboard/project/routers/`. The left sidebar contains a navigation menu with categories like Project, API Access, Compute, Volumes, Network, and Admin. The 'Network' category is expanded, and the 'Routers' link is selected. The main content area is titled 'Routers' and shows a table with two routers. A red circle with the number 1 highlights the 'team1\_router' link in the 'Name' column.

Name	Status	External Network	Admin State	Availability Zones	Actions
<a href="#">team1_router</a>	Active	public	UP	-	<a href="#">Clear Gateway</a>
<a href="#">router1</a>	Active	public	UP	-	<a href="#">Clear Gateway</a>

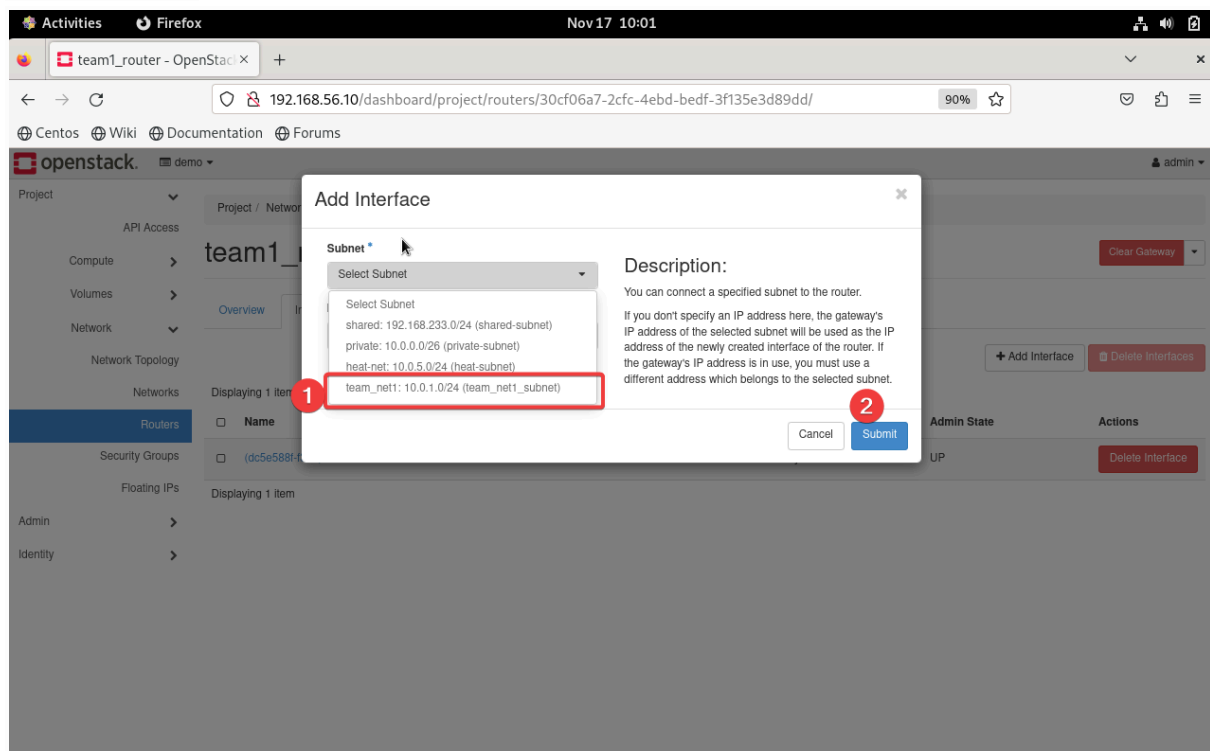
After click router name, you will see interface tab. This is how we connect to other network by add interface to router



The screenshot shows the OpenStack dashboard in a Firefox browser window. The address bar displays the URL `192.168.56.10/dashboard/project/routers/30cf06a7-2cfc-4ebd-bedf-3f135e3d89dd/`. The left sidebar is the same as the previous screenshot. The main content area is titled 'team1\_router' and shows three tabs: 'Overview', 'Interfaces', and 'Static Routes'. The 'Interfaces' tab is selected, and a red circle with the number 1 highlights it. Below the tabs, there is a table with one interface. A red circle with the number 2 highlights the '+ Add Interface' button.

Name	Fixed IPs	Status	Type	Admin State	Actions
<a href="#">(dc5e588f-1358)</a>	• 172.24.4.185	Active	External Gateway	UP	<a href="#">Delete Interface</a>

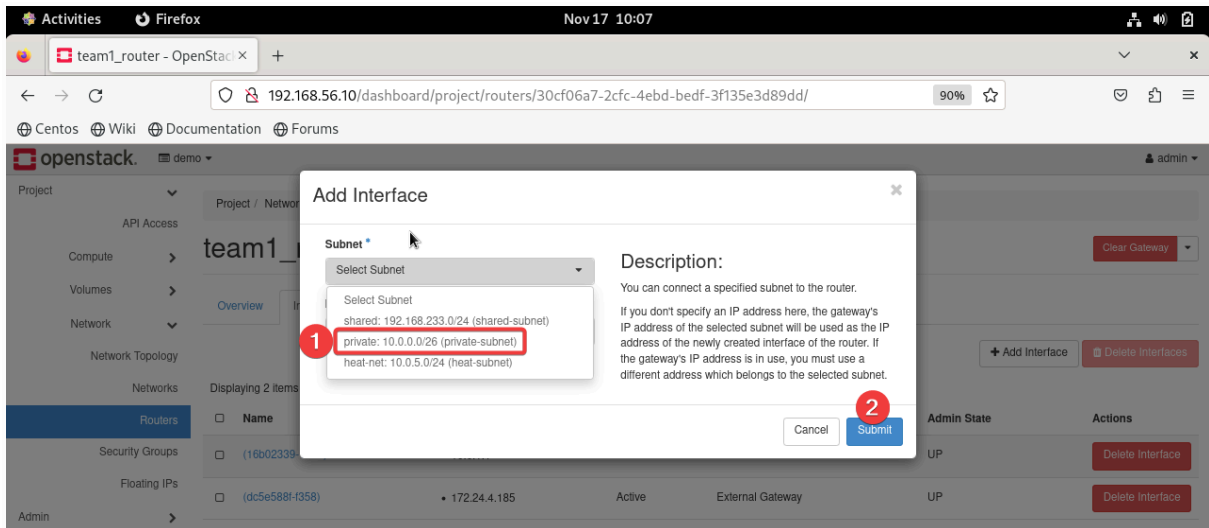
## Select subnet



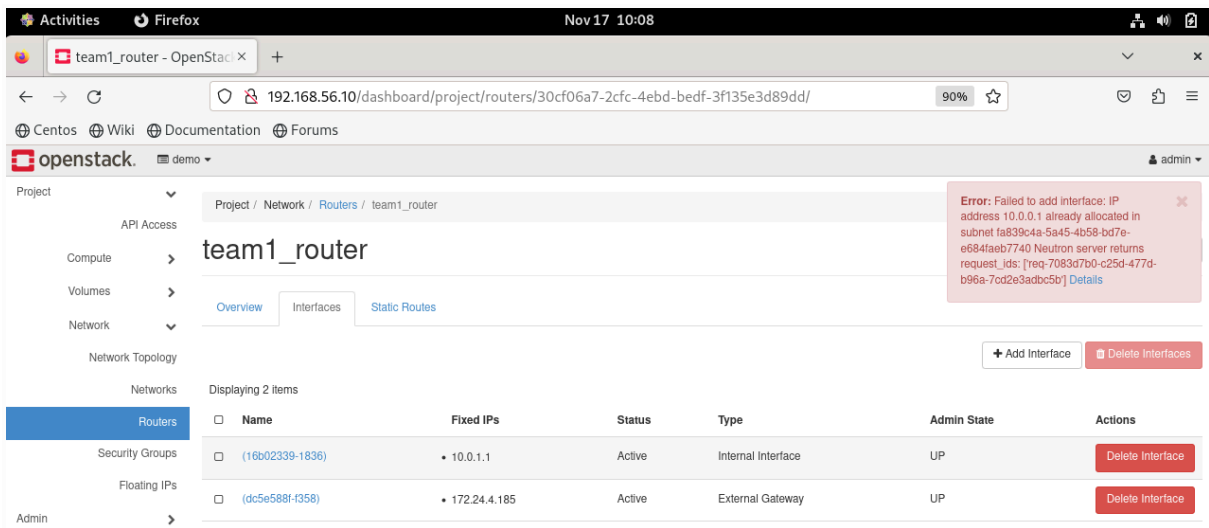
Router display additional interface to 10.0.1.1 ( router always take first ip address of subnet and also responsible for gateway of network



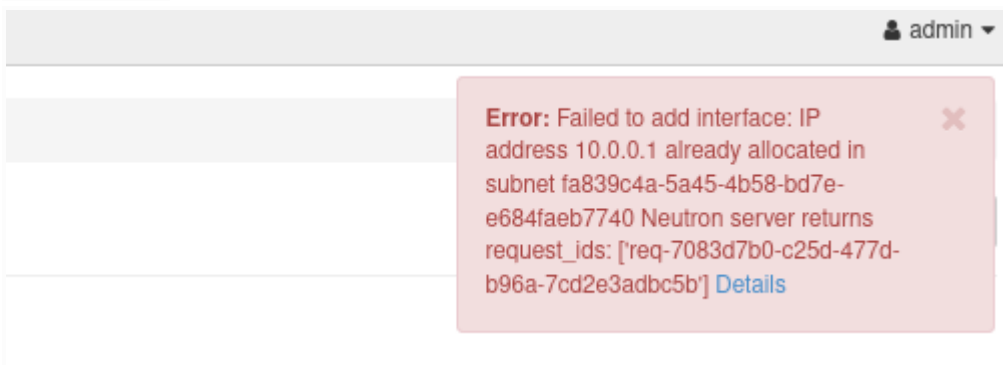
Last part is add private network to router. Reproduce this process but this time we will add private network



But this time got error

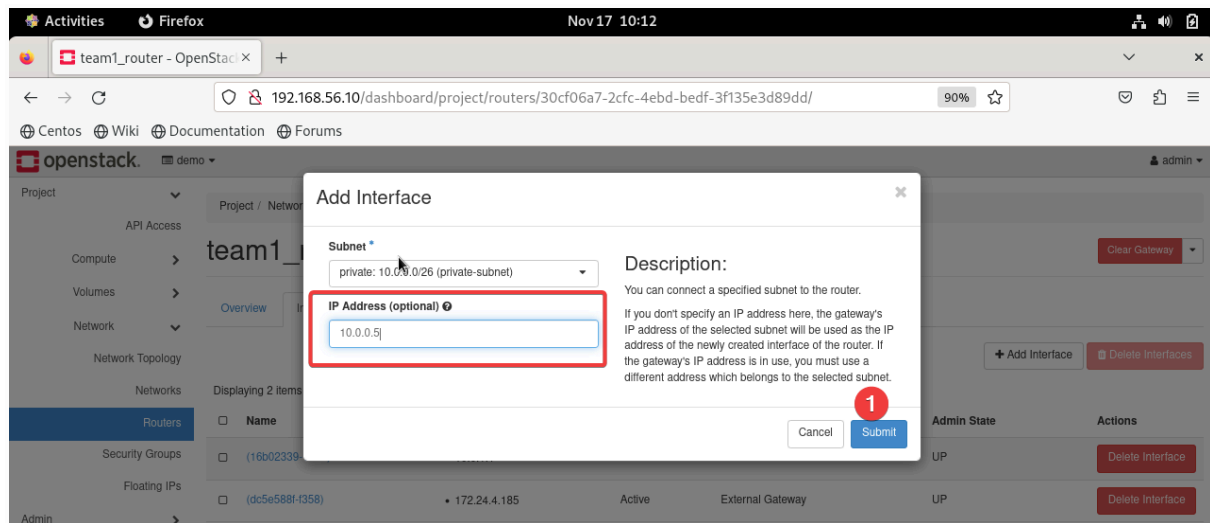


Check error





Let fix it by set ip of gateway



The final result in network topology



## Workshop

1. Create teamvm1 on team\_net1 use Fedora cloud image (don't forget to add security group)
2. Associate Floating ip to teamvm1
3. Ssh into teamvm1

## First Screen 1 show success result

Project / Compute / Instances

### Instances

Instance ID =  Filter [Launch Instance](#) [Delete Instances](#) More Actions ▾

Displaying 2 Items

<input type="checkbox"/>	Instance Name	Image Name	IP Address	Flavor	Key Pair	Status	Availability Zone	Task	Power State	Age	Actions
<input type="checkbox"/>	teamvm1	Fedora-Cloud-Base-37-1.7.x86_64	10.0.1.69, 172.24.4.209	m1.small	mykeypair_1	Active	nova	None	Running	7 minutes	<a href="#">Create Snapshot</a>
<input type="checkbox"/>	myvm1	ubuntu2310	10.0.0.6, 172.24.4.234	m1.small	mykeypair_1	Active	nova	None	Running	10 hours, 34 minutes	<a href="#">Create Snapshot</a>

Displaying 2 Items

## Screen 2

Check console log every time when you associate floating ip. To make sure you vm acknowledge

Project / Compute / Instances

### Instance Console Log

Log Length  Go [View Full Log](#)

```
[0:32m OK [0m] Started [0:1:39mgetty@tty1.service[0m - Getty on tty1.
[0:32m OK [0m] Started [0:1:39mserial-getty@tty500.service[0m - Serial Getty on tty50.
[0:32m OK [0m] Reached target [0:1:39mgetty.target[0m - Login Prompts.
[0:32m OK [0m] Started [0:1:39msshd.service[0m - OpenSSH server daemon.
[0:32m OK [0m] Reached target [0:1:39mmulti-user.target[0m - Multi-User System.
Starting [0:1:39msystemd-update-utmp[0m - Record Runlevel Change in UTMP...
[0:32m OK [0m] Finished [0:1:39msystemd-update-utmp[0m - Record Runlevel Change in UTMP.

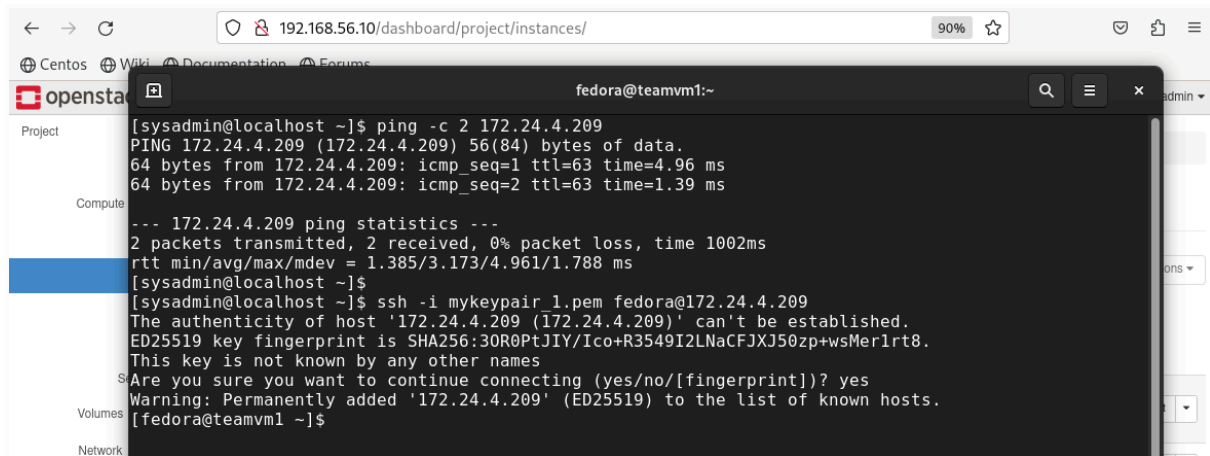
Fedora Linux 37 (Cloud Edition)
Kernel 6.0.7-301.fc37.x86_64 on an x86_64 (tty50)

eth0: 10.0.1.69 fe80::a45c:be84:2435:6f19
teamvm1 login: [ 245.603706] cloud-init[823]: Cloud-init v. 22.2 running 'modules:config' at Fri, 17 Nov 2023 03:39:37 +0000. Up 244.29 seconds.
[ 256.276377] cloud-init[830]: Cloud-init v. 22.2 running 'modules:final' at Fri, 17 Nov 2023 03:39:48 +0000. Up 255.32 seconds.
ci-info: +++++Authorized keys from /home/fedora/.ssh/authorized_keys for user fedora+++++
ci-info: +-----+
ci-info: | Keytype |                               Fingerprint (sha256)                               | Options |      Comment      |
ci-info: +-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
ci-info: | ssh-rsa | e2:9a:67:3e:ed:ba:65:a6:fc:bc:72:d4:d1:3a:9d:95:75:d7:16:0d:b2:fb:6f:38:13:68:2a:6d:75:3c:f3 | - | Generated-by-Nova |
ci-info: +-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+

<14>Nov 17 03:39:52 cloud-init: #####
<14>Nov 17 03:39:52 cloud-init: -----BEGIN SSH HOST KEY FINGERPRINTS-----
<14>Nov 17 03:39:52 cloud-init: 1024 SHA256:PG90/7Fg/CW00NyT1RyGV0ZykgwblRzSag3+MqhoiK4 root@teamvm1.novalocal (DSA)
<14>Nov 17 03:39:52 cloud-init: 256 SHA256:hQatCcoWpEwdkJevM/LMfnTprKx1HD2urnj0rR184 root@teamvm1.novalocal (ECDSA)
<14>Nov 17 03:39:52 cloud-init: 256 SHA256:30R0PtJII/Ico+R3549I2LNaCFJXJ50zp+wsMer1rt8 root@teamvm1.novalocal (ED25519)
<14>Nov 17 03:39:52 cloud-init: 3072 SHA256:0uwmihiq+IAA/NFDjSot2njSFFCIq/+qs4G+Q7cNaM root@teamvm1.novalocal (RSA)
<14>Nov 17 03:39:52 cloud-init: -----END SSH HOST KEY FINGERPRINTS-----
<14>Nov 17 03:39:52 cloud-init: #####
-----BEGIN SSH HOST KEY KEYS-----
ecdsha-sha2-nistp256 AAAAE2VjZHNhLXNoYTU1bmlkbGlhbmQiOjE0NTY1AAABBB8EryJ57771r1g970D8p5wmu0B94xee0E1XaDE557iNtbNA89SvDTWH57898+cIFjathZuL7AXG
ssh-ed25519 AAAAC3NzaC1lZDI1NTE5AAAAIOyudQtU8T0bMnyqv7PRDWeDhJ1/eWmLSDV+nYt8GuU/ root@teamvm1.novalocal
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAQgKj4D+nMzJ6ox1F+3XpIXHwudB0N4/norkXUSzzmXl28dzEwX77BzYzVbFz+qrISHCI9FM4JC2rdUoRg5JaFStBzJAGdQyMtfsRCUj9A6j+6
-----END SSH HOST KEY KEYS-----
[ 259.711479] cloud-init[830]: Cloud-init v. 22.2 finished at Fri, 17 Nov 2023 03:39:53 +0000. DataSource DataSourceOpenStackLocal [net,ver=2].
```

## Screen3 Ssh in to vm

Default name of fedora is fedora

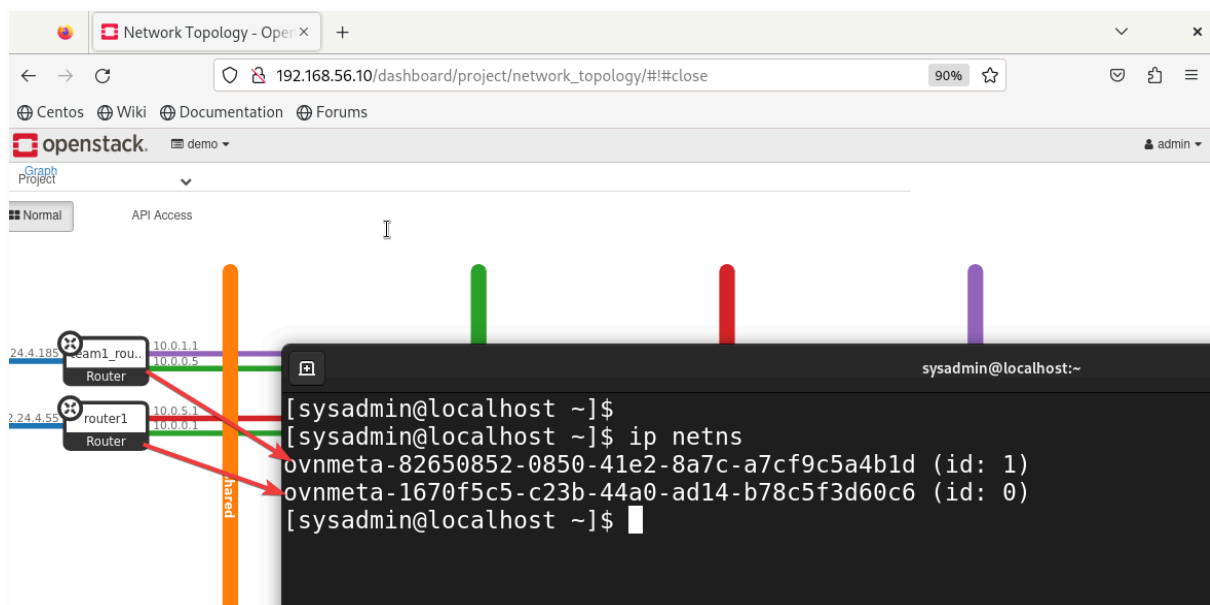


The screenshot shows the OpenStack dashboard at 192.168.56.10. A terminal window titled 'fedora@teamvm1:~' is open, displaying the following commands and output:

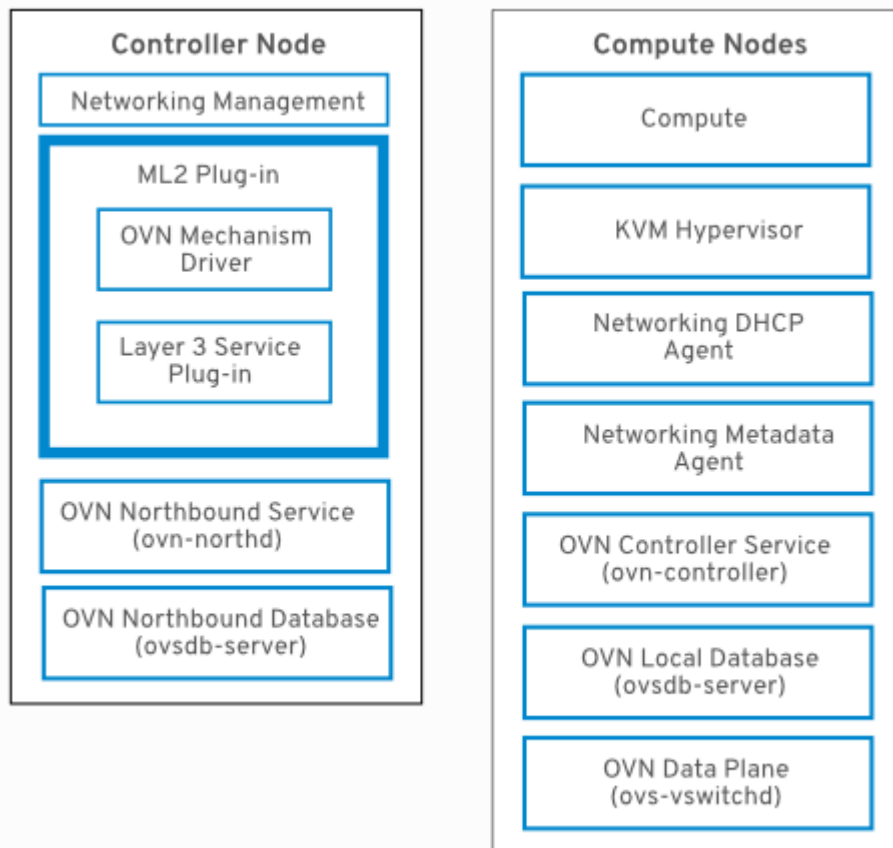
```
[sysadmin@localhost ~]$ ping -c 2 172.24.4.209
PING 172.24.4.209 (172.24.4.209) 56(84) bytes of data.
64 bytes from 172.24.4.209: icmp_seq=1 ttl=63 time=4.96 ms
64 bytes from 172.24.4.209: icmp_seq=2 ttl=63 time=1.39 ms

--- 172.24.4.209 ping statistics ---
2 packets transmitted, 2 received, 0% packet loss, time 1002ms
rtt min/avg/max/mdev = 1.385/3.173/4.961/1.788 ms
[sysadmin@localhost ~]$
[sysadmin@localhost ~]$ ssh -i mykeypair 1.pem fedora@172.24.4.209
The authenticity of host '172.24.4.209 (172.24.4.209)' can't be established.
ED25519 key fingerprint is SHA256:30R0PtJIY/Ico+R3549I2LNaCFJXJ50zp+wsMer1rt8.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '172.24.4.209' (ED25519) to the list of known hosts.
[sysadmin@localhost ~]$
```

## Underhood neutron network Archintecure (Extra topic)



Openstack use network namespace and Open Virtual Network (OVN) to manage network layer. What is Open Virtual Network is Open vSwitch-based software-defined networking (SDN) solution for supplying network service to instances.



Test ip netns command

\$ sudo ip netns exec <network-namespace> <command>

In example below run <command> in side name space is **ip a**

```

sysadmin@localhost:~$
sysadmin@localhost:~$ ip netns
vnmeta-82650852-0850-41e2-8a7c-a7cf9c5a4b1d (id: 1)
vnmeta-1670f5c5-c23b-44a0-ad14-b78c5f3d60c6 (id: 0)
sysadmin@localhost:~$ sudo ip netns exec vnmeta-1670f5c5-c23b-44a0-ad14-b78c5f3d60c6 ip a
sudo] password for sysadmin:
: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
  link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
  inet 127.0.0.1/8 scope host lo
    valid lft forever preferred_lft forever
  inet6 ::1/128 scope host
    valid lft forever preferred_lft forever
: tap1670f5c5-c1@if16: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue state UP group default qlen 1000
  link/ether fa:16:3e:ba:6e:97 brd ff:ff:ff:ff:ff:ff link-netnsid 0
  inet 169.254.169.254/32 brd 169.254.169.254 scope global tap1670f5c5-c1
    valid lft forever preferred_lft forever
  inet 10.0.0.2/26 brd 10.0.0.63 scope global tap1670f5c5-c1
    valid lft forever preferred_lft forever
sysadmin@localhost:~$
sysadmin@localhost:~$ sudo ip netns exec vnmeta-82650852-0850-41e2-8a7c-a7cf9c5a4b1d ip a
: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
  link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
  inet 127.0.0.1/8 scope host lo
    valid lft forever preferred_lft forever
  inet6 ::1/128 scope host
    valid lft forever preferred_lft forever
: tap82650852-01@if24: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue state UP group default qlen 1000
  link/ether fa:16:3e:17:88:c3 brd ff:ff:ff:ff:ff:ff link-netnsid 0
  inet 10.0.1.10/24 brd 10.0.1.255 scope global tap82650852-01
    valid lft forever preferred_lft forever
  inet 169.254.169.254/32 brd 169.254.169.254 scope global tap82650852-01
    valid lft forever preferred_lft forever
sysadmin@localhost:~$

```

## Deep explore inside the output

```
ip netns exec                                sysadmin@localhost
[sysadmin@localhost ~]$ sudo ip netns exec ovnmeta 82650852-0850-41e2-8a7c-a7cf9c5a4b1d ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid lft forever preferred_lft forever
2: tap82650852-01@if24: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue state UP group default
    link/ether fa:16:3e:17:88:c3 brd ff:ff:ff:ff:ff:ff link-netnsid 0
    inet 10.0.1.10/24 brd 10.0.1.255 scope global tap82650852-01
        valid lft forever preferred_lft forever
    inet 169.254.169.254/32 brd 169.254.169.254 scope global tap82650852-01
        valid lft forever preferred_lft forever
[sysadmin@localhost ~]$
```

## Test access to vm from underhood cloud in frastruture

Network namespace is underhood cloud (internal environment). Next step we test connectivity through ovn (my teamvm1 is 10.0.1.69 may be not same to yours)

Instances - OpenStack Dashboard

192.168.56.10/dashboard/project/instances/

Centos Wiki Documentation Forums

openstack demo admin

Project / Compute / Instances

Instances

Instance ID = Filter Launch Instance Delete Instances More Actions

Displaying 2 items

Instance Name	Image Name	IP Address	Flavor	Key Pair	Status	Availability Zone	Task	Power State	Age	Actions
teamvm1	Fedor a-Cloud-Bas e-37-1.7.x86_64	10.0.1.69	m1.small	mykeypair_1	Active	nova	None	Running	43 minutes	Create Snapshot
myvm1	ubuntu2310	10.0.0.6	m1.small	mykeypair_1	Active	nova	None	Running	11 hours, 10 minutes	Create Snapshot

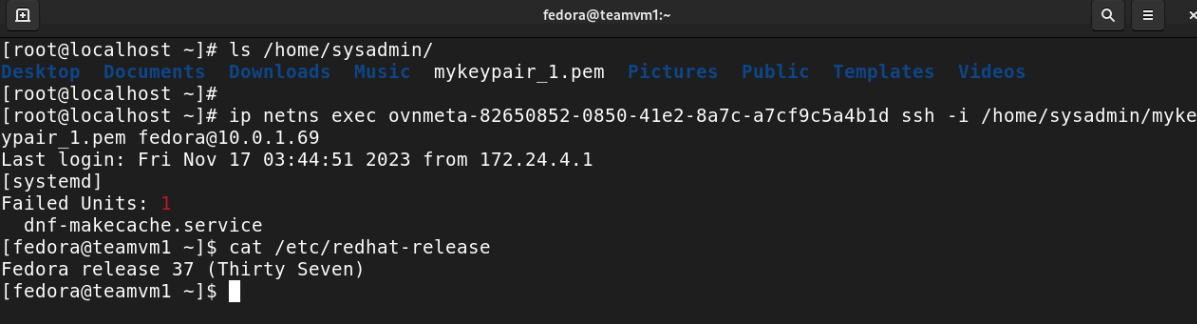
Displaying 2 items

Can you test this?

```
Activities Terminal Nov 17 11:28
root@localhost:~
[sysadmin@localhost ~]$
[sysadmin@localhost ~]$ sudo su -
[root@localhost ~]# ip netns
ovnmeta-82650852-0850-41e2-8a7c-a7cf9c5a4b1d (id: 1)
ovnmeta-1670f5c5-c23b-44a0-ad14-b78c5f3d60c6 (id: 0)
[root@localhost ~]#
[root@localhost ~]# ip netns exec ovnmeta-82650852-0850-41e2-8a7c-a7cf9c5a4b1d ping -c 4 10.0.1.69
PING 10.0.1.69 (10.0.1.69) 56(84) bytes of data:
64 bytes from 10.0.1.69: icmp_seq=1 ttl=64 time=1.16 ms
64 bytes from 10.0.1.69: icmp_seq=2 ttl=64 time=1.17 ms
64 bytes from 10.0.1.69: icmp_seq=3 ttl=64 time=1.27 ms
64 bytes from 10.0.1.69: icmp_seq=4 ttl=64 time=1.18 ms

--- 10.0.1.69 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3007ms
rtt min/avg/max/mdev = 1.155/1.191/1.267/0.044 ms
[root@localhost ~]#
```

Test ssh connectivity with internal IP (not floating).

A terminal window titled 'fedora@teamvm1:~' with search and menu icons in the title bar. The terminal shows a root user at localhost performing several commands. First, 'ls /home/sysadmin/' lists files including 'mykeypair\_1.pem'. Then, 'ip netns exec ovmmeta-82650852-0850-41e2-8a7c-a7cf9c5a4b1d ssh -i /home/sysadmin/mykeypair\_1.pem fedora@10.0.1.69' is executed, resulting in a successful login for the 'fedora' user. The user then runs 'cat /etc/redhat-release', which outputs 'Fedora release 37 (Thirty Seven)'.

```
[root@localhost ~]# ls /home/sysadmin/
Desktop Documents Downloads Music mykeypair_1.pem Pictures Public Templates Videos
[root@localhost ~]#
[root@localhost ~]# ip netns exec ovmmeta-82650852-0850-41e2-8a7c-a7cf9c5a4b1d ssh -i /home/sysadmin/mykeypair_1.pem fedora@10.0.1.69
Last login: Fri Nov 17 03:44:51 2023 from 172.24.4.1
[systemd]
Failed Units: 1
  dnf-makecache.service
[fedora@teamvm1 ~]$ cat /etc/redhat-release
Fedora release 37 (Thirty Seven)
[fedora@teamvm1 ~]$
```