# Topics in Computing Lab Assignment 3 : Openstack

## Objective:

OpenStack is a cloud operating system that controls large pools of compute, storage, and networking resources throughout a datacenter, all managed and provisioned through APIs with common authentication mechanisms.

#### Controller node:

This is the node in which all openstack services run. The Controller node supplies API, scheduling, and other shared services for the cloud.

Services installed:

- mysql
- rabbitmq
- keystone
- cinder
- glance
- neutron
- nova

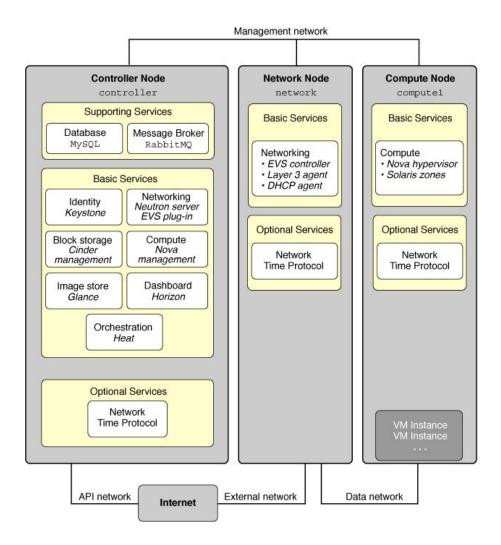
#### Network node:

The Network node provides virtual networking and networking services to Nova instances using the Neutron Layer 3 and DHCP network services.

#### Compute node:

The Compute node is where the VM instances (Nova compute instances) are installed. Services installed:

- nova-compute
- ntp



# Implementation:

# 1. Installation of Openstack:

Used Devstack to deploy a complete Openstack environment by following the guide provided on:

https://computingforgeeks.com/openstack-deployment-on-ubuntu-with-devstack/

3 systems were required for the assignment - system for controller node, compute node and network node. However the system requirements for the installation led us to try to install in 6 systems but only succeed in installing on 2 systems.

#### Steps followed:

- 1. Update the Ubuntu system
- 2. Add user Stack
- 3. Download Devstack and configure local.conf
- 4. Start Openstack Deployment with devstack by using the command ./stack.sh DevStack installed:
  - Keystone Identity Service
  - Glance Image Service
  - Nova Compute Service
  - Placement Placement API
  - Cinder Block Storage Service
  - Neutron Network Service
  - Horizon Openstack Dashboard

#### Errors occuring during the installation (using ./stack.sh)

1. Permission denied to access and use pip

```
File Edit View Search Terminal Help

self.require_hashes

File "/usr/local/lib/python2.7/dist-packages/virtualenv_support/pip-19.1.1-py2
.py3-none-any.whl/pip/_internal/operations/prepare.py", line 282, in prepare_lin
ked_requirement
    req.populate_link(finder, upgrade_allowed, require_hashes)
File "/usr/local/lib/python2.7/dist-packages/virtualenv_support/pip-19.1.1-py2
.py3-none-any.whl/pip/_internal/req/req_install.py", line 201, in populate_link
    self.link = self. wheel_cache.get(self.link, self.name)
File "/usr/local/lib/python2.7/dist-packages/virtualenv_support/pip-19.1.1-py2
.py3-none-any.whl/pip/_internal/cache.py", line 216, in get
    retval = self._wheel_cache.get(link, package_name)
File "/usr/local/lib/python2.7/dist-packages/virtualenv_support/pip-19.1.1-py2
.py3-none-any.whl/pip/_internal/cache.py", line 157, in get
    for wheel_name in self._get_candidates(link, package_name):
File "/usr/local/lib/python2.7/dist-packages/virtualenv_support/pip-19.1.1-py2
.py3-none-any.whl/pip/_internal/cache.py", line 91, in _get_candidates
    return os.listdir(root)
OSError: [Errno 13] Permission denied: '/opt/stack/.cache/pip/wheels/a7/a2/8a/56
Saf7edf191010843485c006f4ec47983709ebdd37ce4b73cb'
Cleaning up...
Removed build tracker '/tmp/pip-req-tracker-v8iyyw'
....Installing setuptools, pip, wheel...done.
Traceback (most recent call last):
```

#### Solution:

As root run:

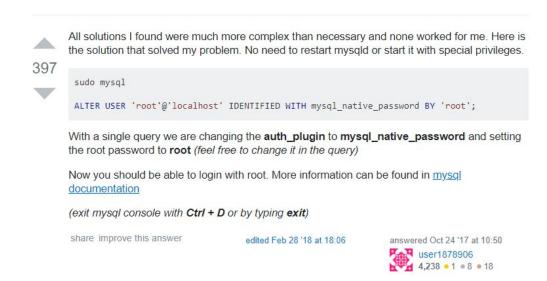
**Chown stack:** /opt/stack to give permission of the whole directory where pip is temporarily stored to the user stack

```
stack@mnit-OptiPlex-5040: ~/devstack
File Edit View Search Terminal Help
                                                     exit trap
                                                     local r=1
++./stack.sh:exit_trap:534
+./stack.sh:exit_trap:534
+./stack.sh:exit_trap:537
+./stack.sh:exit_trap:543
                                                      jobs -p
                                                      jobs=
                                                     [[ -n '' ]]
'[' -f '' ']'
                                                     kill_spinner
'[' '!' -z '' ']'
                                                     [[ 1 -ne 0 ]]
echo 'Error on exit'
Error on exit
                                                     type -p generate-subunit
                                                      generate-subunit 1567149979 29 fail
+./stack.sh:exit_trap:556
+./stack.sh:exit_trap:559
                                                      [[ -z /opt/stack/logs ]]
                                                      /opt/stack/devstack/tools/worlddump.p
y -d /opt/stack/logs
World dumping... see /opt/stack/logs/worlddump-2019-08-30-072648.txt for details
                                                     exit 1
stack@mnit-OptiPlex-5040:~/devstack$ sudo chown stack: /opt/stack/.cache
stack@mnit-OptiPlex-5040:~/devstack$
```

#### 2. Access denied to Mysql server

```
stack@mnit-OptiPlex-5040: ~/devstack
                                                                                             File Edit View Search Terminal Help
                                                     is_opensuse
                                                     [[ -z Ubuntu ]]
                                                     [[ Ubuntu =~ (openSUSE) ]]
+functions-common:is_suse:463 is_suse_linux_enterprise 
+functions-common:is_suse_linux_enterprise:482 [[ -z Ubuntu ]] 
+functions-common:is_suse_linux_enterprise:486 [[ Ubuntu =~ (^SUSE) ]] 
+lib/databases/mysql:configure_database_mysql:93 sudo mysqladmin -u root passwo
rd StrongAdminSecret
mysqladmin: connect to server at '127.0.0.1' failed
error: 'Access denied for user 'root'@'localhost''
entified by '\''StrongAdminSecret'\'';'
mysql: [Warning] Using a password on the command line interface can be insecure.
ERROR 1698 (28000): Access denied for user 'root'@'localhost'
                                                      jobs -p
                                                      jobs=
                                                     '[' -f /tmp/tmp.t6CvEKquq8 ']'
                                                     rm /tmp/tmp.t6CvEKquq8
                                                     kill spinner
```

#### Grant privileges manually to Root



3. Keystone service not starting / Cinder service not starting / Neutron service not starting /devstack service not starting

```
osboxes@ubuntu: ~/Desktop/devstack
                                                                           File Edit View Search Terminal Help
                                              timeout 60 bash -x
                                               curl -g -k --noproxy '*' -s -o
/dev/null -w '%{http_code}' http://192.168.2.2/identity/v3/
                                             rval=124
+functions:wait_for_service:437
+functions-common:time_stop:2336
                                              time_stop wait_for_service
                                              local name
                                             local end time
+functions-common:time_stop:2338
                                             local elapsed_time
                                               local total
                                             local start time
                                            name=wait_for_service
                                              start_time=1567148150591
                                              [[ -z 1567148150591 ]]
++functions-common:time_stop:2348
                                              date +%s%3N
                                              end_time=1567148210847
                                              elapsed_time=60256
                                              total=0
                                              _TIME_START[$name]=
_TIME_TOTAL[$name]=60256
+functions:wait_for_service:438
+lib/keystone:start_keystone:538
                                              return 124
die 538 'keystone did not start
                                              local exitcode=0
                                              set +o xtrace
[Call Trace]
./stack.sh:1144:start_keystone
home/osboxes/Desktop/devstack/lib/keystone:538:die
[ERROR] /home/osboxes/Desktop/devstack/lib/keystone:538 keystone did not s
tart
World dumping... see /opt/stack/logs/worlddump-2019-08-30-065652.txt for d
etails
osboxes@ubuntu:~/Desktop/devstack$
```

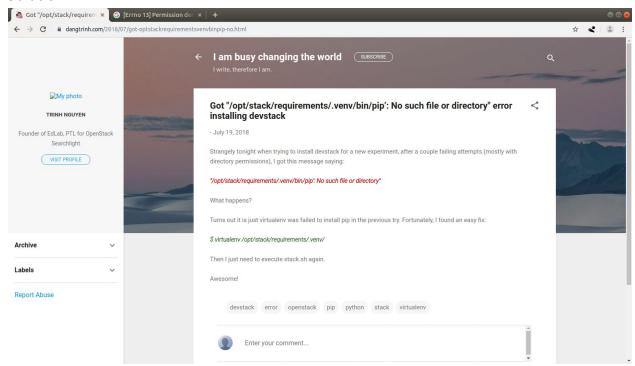
Run commands:

./unstack.sh

./clean.sh

./stack.sh

# 4. /opt/stack/requirements/.venv/bin/pip does not exist Solution:



#### Run:

- Virtualenv /opt/stack/requirements/.venv
- Chown stack: /opt/stack

#### 5. Database connection error

```
stack@jahnavi-Inspiron-5559: ~/devstack
                                                                                File Edit View Search Terminal Help
                                      urc:133 uacabase_conneccion_urc_ grance
/opt/stack/devstack/lib/database: line 133: database_connection_url_: command no
t found
+lib/glance:configure_glance:112
                                              dburl=
+lib/glance:configure_glance:1
                                              exit_trap
local r=127
                                               jobs -p
                                              jobs=
                                              [[ -n '' ]]
'[' -f '' <u>'</u>]'
                                              kill_spinner
'[' '!' -z '' ']'
                                              [[ 127 -ne 0 ]]
                                              echo 'Error on exit'
Error on exit
                                              type -p generate-subunit
                                              generate-subunit 1567226612 158 fail
                                              [[ -z /opt/stack/logs ]]
                                              /opt/stack/devstack/tools/worlddump.p
y -d /opt/stack/logs
World dumping... see /opt/stack/logs/worlddump-2019-08-31-044611.txt for details
                                              exit 127
stack@jahnavi-Inspiron-5559:~/devstack$
stack@jahnavi-Inspiron-5559:~/devstack$ nano local.conf
```

#### Solution:

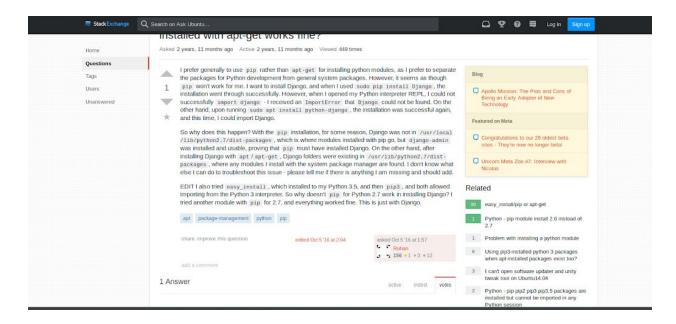
Not found

#### 6. Django module not found

```
mnit@mnit-OptiPlex-5040: ~/devstack
                                                                                          File Edit View Search Terminal Help
++functions-common:_safe_permission_operation:2059 grep xtrace
+functions-common:_safe_permission_operation:2059 xtrace='set -o xtrace'
izon/horizon.egg-info
+inc/python:_setup_package_with_constraints_edit:481                          use_library_from_git /opt/stac
k/horizon
                                                 local name=/opt/stack/horizon
+inc/python:use_library_from_git:330
+inc/python:use_library_from_git:331
+inc/python:use_library_from_git:331
+inc/python:use_library_from_git:332
                                                 local enabled=1
                                                 [[ '' = \A\L\L ]]
[[ ,, =~ ,/opt/stack/horizon, ]]
                                                 return 1
+lib/horizon:configure_horizon:81
                                                 cd /opt/stack/horizon
+lib/horizon:configure_horizon:81
                                                 /home/mnit/anaconda3/bin/python manage.py
 compilemessages
Traceback (most recent call last):
  File "manage.py", line 18, in <module>
from django.core.management import execute_from_command_line
ModuleNotFoundError: No module named 'django'
                                                exit_trap
```

#### Not found

Tried re-installing pip, re-installing django using pip and re-installing django using apt-get



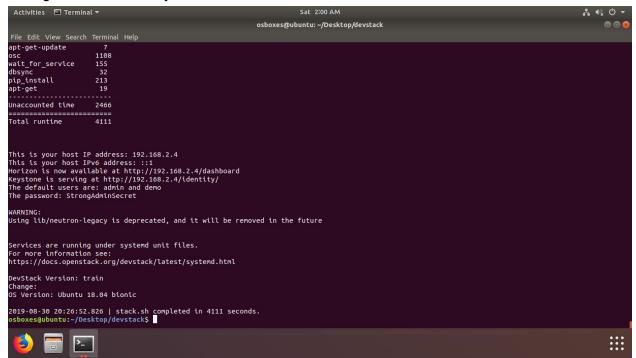
#### 7. Can't connect to Mysql server using socket /var/run/mysqld/mysqld.sock

```
jahnavi@jahnavi-Inspiron-5559: ~
                                                                            File Edit View Search Terminal Help
times in /etc/apt/sources.list:52 and /etc/apt/sources.list.d/vscode.list:3
W: Target DEP-11-icons (main/dep11/icons-64x64.tar) is configured multiple times
in /etc/apt/sources.list:52 and /etc/apt/sources.list.d/vscode.list:3
W: Target CNF (main/cnf/Commands-amd64) is configured multiple times in /etc/apt
/sources.list:52 and /etc/apt/sources.list.d/vscode.list:3
W: Target CNF (main/cnf/Commands-all) is configured multiple times in /etc/apt/s
ources.list:52 and /etc/apt/sources.list.d/vscode.list:3
(base) jahnavi@jahnavi-Inspiron-5559:~$ sudo apt install mysql-server
Reading package lists... Done
Building dependency tree
Reading state information... Done
<code>mysql-server</code> is already the newest version (5.7.27-0ubuntu0.18.04.1).
The following packages were automatically installed and are no longer required:
 libllvm7 libllvm7:i386
Use 'sudo apt autoremove' to remove them.
O upgraded, O newly installed, O to remove and 1 not upgraded.
(base) jahnavi@jahnavi-Inspiron-5559:~$ sudo mysql secure installation
Securing the MySQL server deployment.
Enter password for user root:
Error: Can't connect to local MySQL server through socket '/var/run/mysqld/mysql
d.sock' (2)
(base) jahnavi@jahnavi-Inspiron-5559:~$
```

Logical solution is to re-install mysql. But despite multiple attempts, this failed.

#### **Installation Completed**

Managed to install in 2 systems:



# 2. Setting up Controller node

The guide followed can be found at:

https://docs.openstack.org/newton/install-guide-rdo/nova-controller-install.html

#### Steps followed:

- 1. Source the admin credentials to gain access to admin-only CLI commands:
  - . admin-openrc
- 2. Create the Compute service credentials:
  - Create the nova user:
    - \$ openstack user create --domain default --password-prompt nova
  - Add the admin role to the nova user:
    - \$ openstack role add --project service --user nova admin
  - Create the nova service entity:

# \$ openstack service create --name nova \ --description "OpenStack Compute" compute

3. Create the Compute API service endpoints:

\$ openstack endpoint create --region RegionOne \compute public

#### http://controller:8774/v2.1

- 4. Edit the /etc/nova/nova.conf file
- 5. Populate the Compute databases

## 3. Setting up Compute node

The guide followed can be found at:

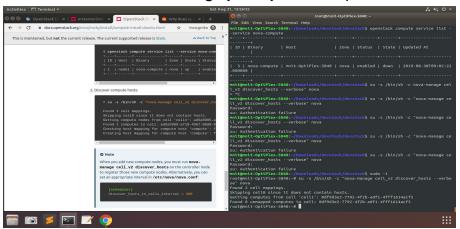
https://docs.openstack.org/newton/install-guide-ubuntu/nova-compute-install.html

#### Steps followed:

- 1. Edit the /etc/nova/nova.conf file
  - o In the [DEFAULT] section, configure RabbitMQ message queue access
  - In the [DEFAULT] and [keystone\_authtoken] sections, configure Identity service access
  - In the [DEFAULT] section, configure the my\_ip option
  - In the [DEFAULT] section, enable support for the Networking service
  - o In the [vnc] section, enable and configure remote console access
  - o In the [glance] section, configure the location of the Image service API
  - In the [oslo concurrency] section, configure the lock path
  - Due to a packaging bug, remove the log-dir option from the [DEFAULT] section
- 2. Determine whether your compute node supports hardware acceleration for virtual machines
- 3. Restart the Compute service

### **Errors during setup of Controller / Compute node**

1. Nova su error in setting up compute node (Authentication failure)



#### Solution:



su asks for the root password. Since Ubuntu doesn't set a root password by default, you can't use it to become root.



Instead, to become root, use sudo -i with your personal password.



share improve this answer



edited Jun 21 '16 at 12:01



answered Apr 10 '11 at 7:51

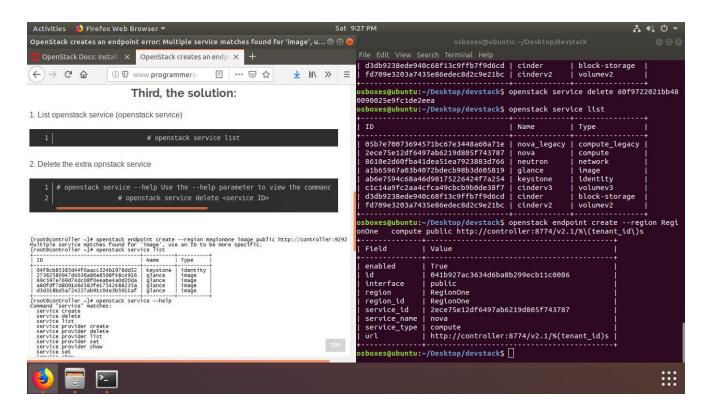


- 2 I admit I tend to use sudo bash but your incantation makes me want to use su sudo or maybe su su sudo . Jerry Asher Apr 10 '11 at 9:42 /
- 5 sudo su is not the recommended way use sudo -i instead. guntbert Mar 2 '14 at 21:30

Try <u>youtube.com/watch?v=axDObUgsuZQ</u> instead, it will help you to solve the authentication failure error on su root – vijay Jun 16 at 5:21

add a comment

2. Unable to create Endpoint : Multiple service matches found (Compute node)



3. Creation of domain (Controller node)

```
osboxes@ubuntu: ~/Desktop/devstack

File Edit View Search Terminal Help
osboxes@ubuntu: ~\S cd Desktop/devstack\/
osboxes@ubuntu: ~\Desktop/devstack\$\$ openstack user create --domain
default --password-prompt nova
Missing value auth-url required for auth plugin password
osboxes@ubuntu: ~\Desktop/devstack\$\$ nano admin-openrc
osboxes@ubuntu: ~\Desktop/devstack\$\$ nano admin-openrc.sh
osboxes@ubuntu: ~\Desktop/devstack\$\$ openstack user create --domain
default --password-prompt nova
Missing value auth-url required for auth plugin password
osboxes@ubuntu: ~\Desktop/devstack\$
```