Multi Node OpenStack Installation on CentOS via Packstack

Here, I used three virtual machines hosted on VirtualBox namely, ravi-controller, ravi-computing and ravi-network respectively. We can see the architectural details of each virtual machine below.

Controller Node:

Hostname: ravi-controller
IP address : 172.30.44.224
OS: CentOS 7

Compute Node:

Hostname: ravi-computing
IP address : 172.30.44.226
OS: CentOS 7

Network Node:

Hostname: ravi-network
IP address : 172.30.44.229
OS: CentOS 7

Steps for Installation:

Important note: It is highly recommended to verify after every command whether it ran successfully or not by using the command.
echo $?
If it displays 0, the last command we used is success. If it displays a non-zero value, it means that there is an error in the command.

Before starting the steps, don't forget to take the snapshot of all nodes.

Step1: Update the three nodes using the "yum" command.

yum -y update
reboot

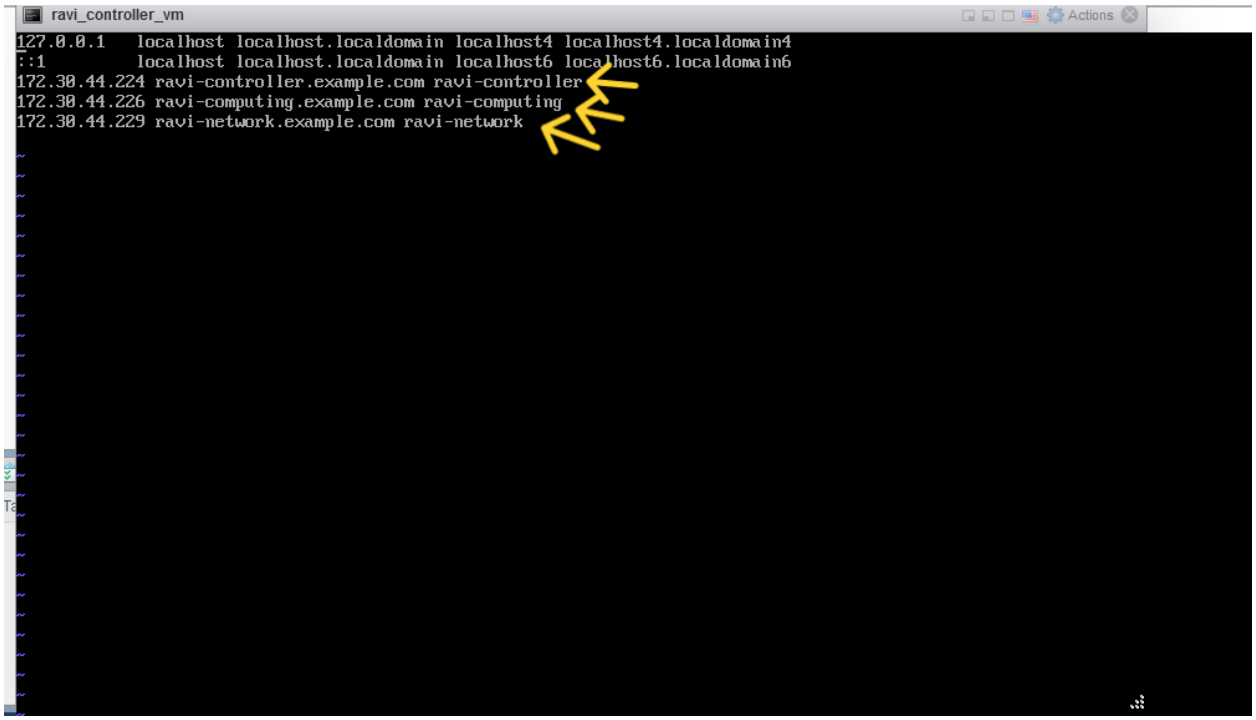
Step2: Update Hostname:

The hostname can be set during the creation of the node only. If it is not done, then set a new hostname on all three VMs using the following command.

hostnamectl set-hostname 'new-hostname'

Step3: Update the file /etc/hosts :

Open the file using "vi" editor. Go to insert mode and update the hostnames of three nodes as shown in the below image and save the file.
vi /etc/hosts



Step 4: Disable SELinux on all three nodes:

Use the following command:

setenforce 0

We can disable SELinux permanently by the following steps:
-
vi /etc/sysconfig/selinux (open the file and go to insert mode)

Modify the value : SELINUX='disabled'
Save the file and exit.

To disable Network manager on all three virtual machines, follow the below commands.
systemctl stop NetworkManager
systemctl disable NetworkManager
reboot

Step 5: Set passwordless authentication from controller node to compute & Network Node:

- Go to the Controller VM.
- Open the console.
- Enter the commands:
  # ssh-keygen
  # ssh-copy-id -i /root/.ssh/id_rsa.pub root@172.30.44.226
  (To connect compute VM, enter the IP address of the same)

  # ssh-copy-id -i /root/.ssh/id_rsa.pub root@172.30.44.229
  (To connect compute VM, enter the IP address of the same)

- To verify the connection: Try to connect with the other two VMs using SSH command and hostname in the controller VM.

  # ssh ravi-computing # ssh ravi-network

hostname # hostname

Alternate Method to create passwordless authentication using ssh:

- Go to the controller node and enter the below command.

  # ssh-keygen -t rsa

- Press the “enter” button for the next three lines.

```
[root@ravi-vm ~]# ssh-keygen -t rsa
Generating public/private rsa key pair.
Enter file in which to save the key (/root/.ssh/id_rsa):
Created directory '/root/.ssh'.
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /root/.ssh/id_rsa.
Your public key has been saved in /root/.ssh/id_rsa.pub.
The key fingerprint is:
SHA256:aMJ52BlB4dJ+kbt/cIwiAaeq73mKtmdqi2+6FA2W8Pk root@ravi-vm
The key's randomart image is:
+---[RSA 2048]----+
|.    .+.         |
|.....o.. .       |
| +o .++ o        |
|. oo.*.+ o       |
| . oE B.S  o     |
|  o  +....o o    |
| o     ... o     |
|++.+.    .  .    |
|B@%o      ..     |
+----[SHA256]-----+
[root@ravi-vm ~]#
```

- Now enter the below command:

  # ssh-copy-id root@172.30.44.226 (Ip address of compute VM)

- To verify:

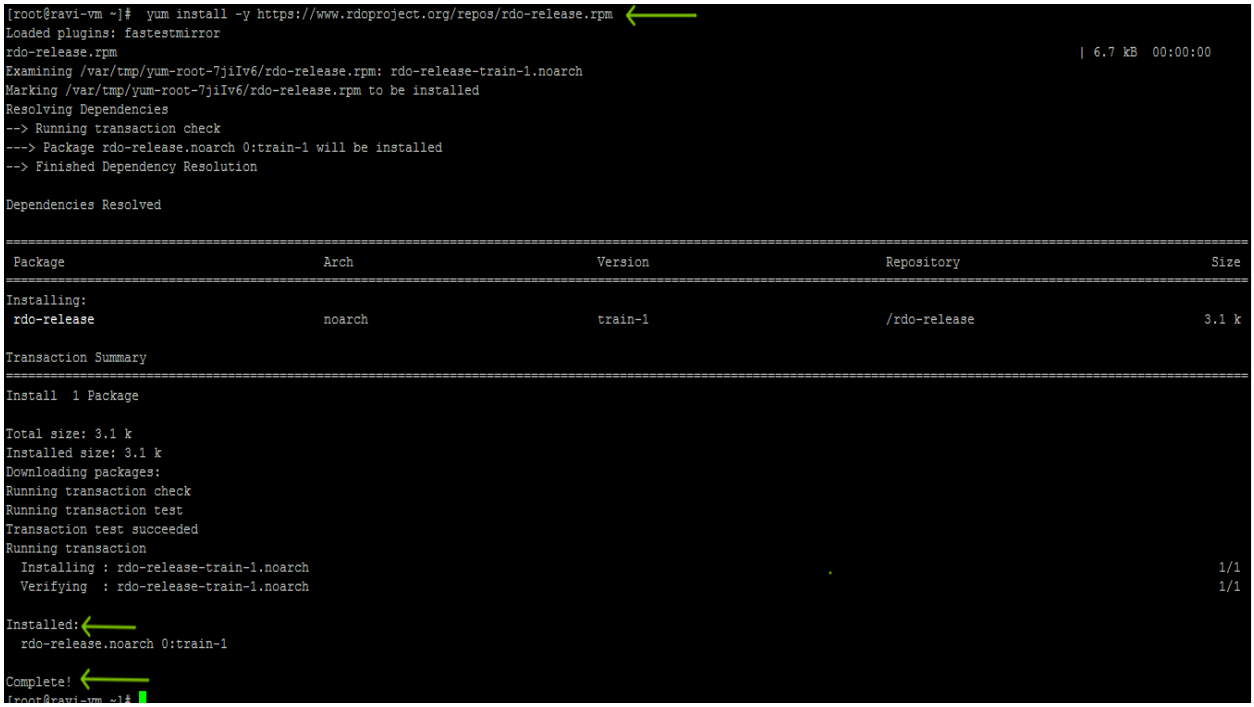
  # ssh root@172.30.44.226

- Do the same steps for network VM also.

Step 6: Enable RDO repository and install packstack utility:

A] Before running packstack (AIO mode for testing) following steps have been done:
On the controller VM:

yum install -y https://www.rdoproject.org/repos/rdo-release.rpm



B] To list the available openstack release:

#yum list | grep -i centos-release-openstack

Output:

[root@ravi-vm ~]# yum list | grep -i centos-release-openstack

centos-release-openstack-queens.noarch 1-2.el7.centos extras

centos-release-openstack-rocky.noarch 1-1.el7.centos extras

centos-release-openstack-stein.noarch 1-1.el7.centos extras

centos-release-openstack-train.noarch 1-1.el7.centos extras

C] Please make sure you will install the queen's version by using the following command from the above list:

#yum -y install centos-release-openstack-queens

D] Now install Packstack by using the below command:

yum install -y openstack-packstack

Step 7: To get swift account installed pre install packages, it does no harm to packstack during runtime:

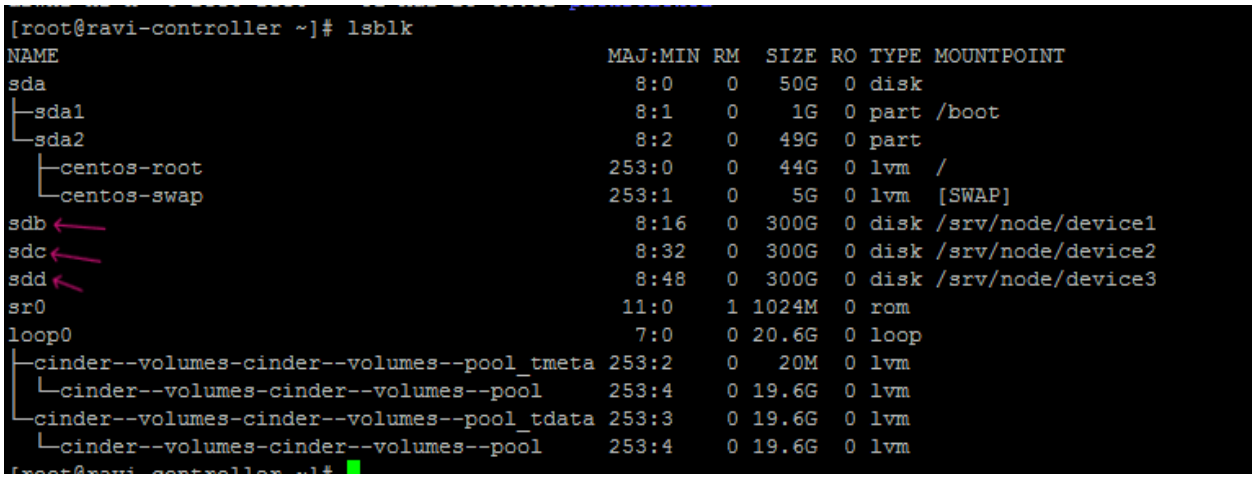
yum install -y openstack-swift-object openstack-swift-container \

openstack-swift-account openstack-swift-proxy openstack-utils \

rsync xfsprogs

{Note: "\" symbol indicates the new line}

Step 8: Find out the available disks present in your VM by using the command "lsblk" as shown below:



Run the commands as shown below for each disk separately.

mkfs.xfs /dev/sdb

mkdir -p /srv/node/sdb

echo "/dev/sdb /srv/node/sdb xfs defaults 1 2" >> /etc/fstab

mkfs.xfs /dev/sdc

mkdir -p /srv/node/sdc

echo "/dev/sdc /srv/node/sdc xfs defaults 1 2" >> /etc/fstab

mkfs.xfs /dev/sdd

mkdir -p /srv/node/sdd

echo "/dev/sdd /srv/node/sdd xfs defaults 1 2" >> /etc/fstab

Now run the next three commands on the controller node:

mount -a

chown -R swift:swift /srv/node

restorecon -R /srv/node

Note: *If you get any error in running any of these commands as shown below.*

[root@ravi-controller ~]# chown -R swift:swift /srv/node

chown: invalid user: 'swift:swift'

Then, add the user swift and try again.

useradd swift

Step 9: Generate answer.txt file and customize it:

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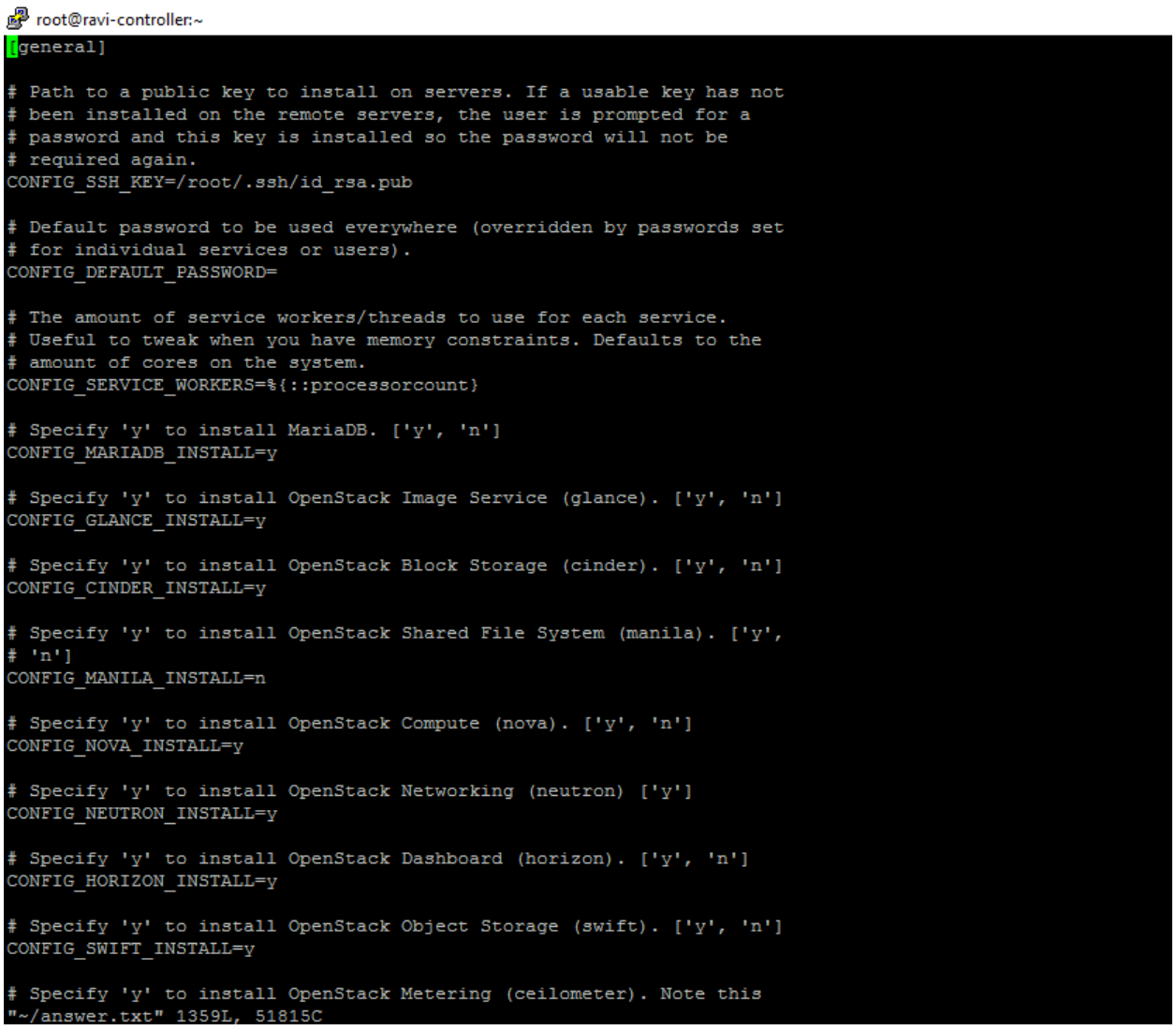
To generate the answer.txt file, use the following command:

[root@controller~]# packstack --gen-answer-file=/root/answer.txt

Now open the file using vi editor, # vi /root/answer.txt. The first few lines of the file can be seen in the below picture.



Apart from this, edit the following services in the answer.txt file with appropriate values as shown below.

- CONFIG_SWIFT_INSTALL=y
- CONFIG_SWIFT_KS_PW=7de571599d894b86
- CONFIG_SWIFT_STORAGES=/dev/sdb6,/dev/sda6
- CONFIG_SWIFT_STORAGE_ZONES=2
- CONFIG_SWIFT_STORAGE_REPLICAS=2
- CONFIG_SWIFT_STORAGE_FSTYPE=xfs
- CONFIG_SWIFT_HASH=eb150786b84346dd
- CONFIG_SWIFT_STORAGE_SIZE=50G

- CONFIG_CONTROLLER_HOST=192.168.1.30
- CONFIG_COMPUTE_HOSTS=192.168.1.31
- CONFIG_NETWORK_HOSTS=192.168.1.32
- CONFIG_PROVISION_DEMO=n
- CONFIG_CEILOMETER_INSTALL=n
- CONFIG_HORIZON_SSL=y
- CONFIG_NTP_SERVERS=<Specify NTP Server IP >
- CONFIG_KEYSTONE_ADMIN_PW=<Specify New_Password>

Note : In case if you don't have an NTP server then you can leave the NTP parameter as it is, but it is highly recommended that we should use NTP server for time syncing.

Edited services in the answer.txt file in ravi-controller VM are shown in the below menu as a sample:

Server on which to install OpenStack services specific to the # controller role (for example, API servers or dashboard). CONFIG_CONTROLLER_HOST=172.30.44.224
List the servers on which to install the Compute service. CONFIG_COMPUTE_HOSTS=172.30.44.226
List of servers on which to install the network service such as # Compute networking (nova network) or OpenStack Networking (neutron). CONFIG_NETWORK_HOSTS=172.30.44.229 # Specify 'y' to install OpenStack Object Storage (swift). ['y', 'n'] CONFIG_SWIFT_INSTALL=y
Comma-separated list of devices to use as storage device for Object # Storage. Each entry must take the format /path/to/dev (for example, # specifying /dev/vdb installs /dev/vdb as the Object Storage storage # device; Packstack does not create the filesystem, you must do this # first). If left empty, Packstack creates a loopback device for test # setup.

CONFIG_SWIFT_STORAGES=/dev/sdb,/dev/sdc,/dev/sdd
Number of Object Storage storage zones; this number MUST be no # larger than the number of configured storage devices. CONFIG_SWIFT_STORAGE_ZONES=3
Number of Object Storage storage replicas; this number MUST be no # larger than the number of configured storage zones. CONFIG_SWIFT_STORAGE_REPLICAS=3
Size of the Object Storage loopback file storage device. CONFIG_SWIFT_STORAGE_SIZE=800G
File system type for storage nodes. ['xfs', 'ext4'] CONFIG_SWIFT_STORAGE_FSTYPE=xfs
Specify 'y' to install OpenStack Metering (ceilometer). Note this # will also automatically install gnocchi service and configures it as # the metrics backend. ['y', 'n'] CONFIG_CEILOMETER_INSTALL=n
Specify 'y' to set up Horizon communication over https. ['y', 'n'] CONFIG_HORIZON_SSL=y

Step:7 Start Installation using packstack command:

Now we are good to start the openstack installation using packstack command. Run the below command from Controller node.

```
[root@controller ~]# time packstack --answer-file=/root/answer.txt
```

Note: To know the time consumed to complete the installation process by putting “time” before the command.

Once the installation is completed successfully we will get below in the console:

Applying 172.30.44.226_compute.pp

172.30.44.226_compute.pp: [DONE]

Applying Puppet manifests [DONE]

Finalizing [DONE]

**** Installation completed successfully ******

Additional information:

* Parameter CONFIG_NEUTRON_L2_AGENT: You have chosen OVN Neutron backend. Note that this backend does not support the VPNaaS or FWaaS services. Geneve will be used as the encapsulation method for tenant networks

* File /root/keystonerc_admin has been created on OpenStack client host 172.30.44.224. To use the command line tools you need to source the file.

* NOTE : A certificate was generated to be used for ssl, You should change the ssl certificate configured in /etc/httpd/conf.d/ssl.conf on 172.30.44.224 to use a CA signed cert.

* To access the OpenStack Dashboard browse to https://172.30.44.224/dashboard .

Please, find your login credentials stored in the keystonerc_admin in your home directory.

* The installation log file is available at: /var/tmp/packstack/20230329-033846-WqBtVj/openstack-setup.log

* The generated manifests are available at: /var/tmp/packstack/20230329-033846-WqBtVj/manifests

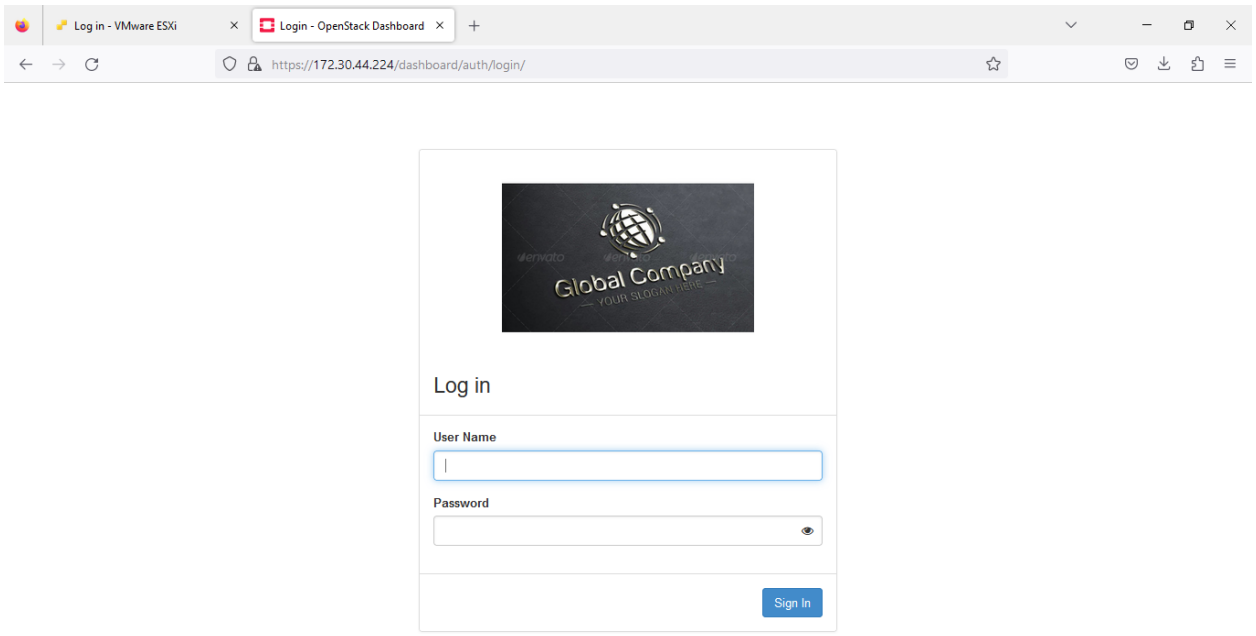
real 20m35.520s

```
user    0m10.310s

sys     0m7.140s
```

Step 11: Access Open stack Dashboard:

Now Open the dashboard by using the url https://172.30.44.224/dashboard in the browser.



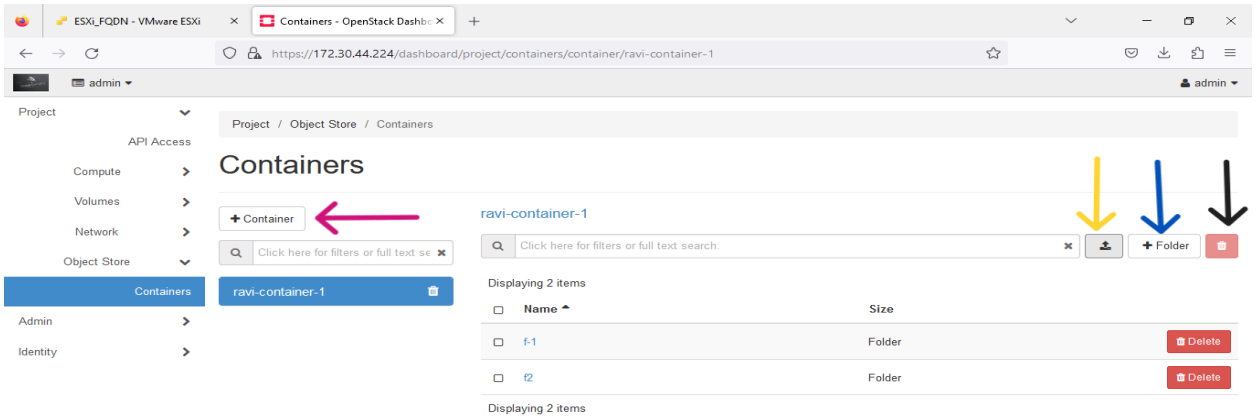
To know the username and password:

```
#[root@ravi-controller ~]# cat keystonerc_admin
unset OS_SERVICE_TOKEN
    export OS_USERNAME=admin
    export OS_PASSWORD='52f190ad7b4f4f59'
    export OS_REGION_NAME=RegionOne
    export OS_AUTH_URL=http://172.30.44.224:5000/v3
    export PS1='[\u@\h \W(keystone_admin)]\$ '
```

After signing to the above page, we can see the front [age as shown below:

Select “Object store” and click on containers in the above page.
Here, We can do the following actions:

- Create a new container (Pink Arrow mark)
- Upload a file from the device (Yellow arrow)
- Create a new folder in the container. (Blue arrow)
- Delete a folder



Resources:

https://www.linuxtechi.com/multiple-node-openstack-liberty-installation-on-centos-7-x/

https://dbaxps.blogspot.com/2016/02/setup-swift-as-glance-backend-on-rdo.html