ASSIGNMENTS

20INMCA565 - CLOUD COMPUTING

Mathew Peter
Roll No: 42
INTMCA S9

OpenStack

OpenStack is an open-source cloud computing platform that provides a set of software tools for building and managing public and private clouds. It allows you to deploy and manage large networks of virtual machines, storage, and networking resources, similar to what commercial cloud providers like Amazon Web Services (AWS), Google Cloud Platform (GCP), and Microsoft Azure offer.

Use Cases for OpenStack

- **Enterprise Private Cloud:** Organizations can use OpenStack to build private clouds for internal use, ensuring control over data and applications.
- **Public Cloud Providers:** Some companies use OpenStack to offer public cloud services to customers, similar to AWS or GCP.
- **Hybrid Cloud**: OpenStack can be integrated with other cloud platforms to create a hybrid environment, combining the benefits of both private and public clouds.
- **DevOps and CI/CD:** OpenStack provides the infrastructure needed for continuous integration and continuous deployment pipelines in software development.

OpenStack Installation

OpenStack can be deployed in various configurations depending on your needs (single-node, multi-node, etc.). Below is a general guide for installing OpenStack using the OpenStack-Ansible method on a single-node environment, which is commonly used for testing and development purposes.

Step 1: Prepare the System

Update the system packages:

```
sudo apt update && sudo apt upgrade -y   # For Ubuntu
sudo dnf update -y                       # For CentOS
```

Install essential packages:

```
sudo apt install git curl vim -y
sudo dnf install git curl vim -y
```

Set Hostname:

```
sudo hostnamectl set-hostname openstack-controller
```

Disable Swap (required by OpenStack):

```
sudo swapoff -a
sudo sed -i '/ swap / s/^/#/' /etc/fstab
```

Reboot the server:

```
sudo reboot
```

Step 2: Install OpenStack-Ansible

Clone the OpenStack-Ansible repository:

```
git clone https://opendev.org/openstack/openstack-ansible /opt/openstack-ansible
```

Navigate to the directory and check out the desired branch:

```
cd /opt/openstack-ansible
git checkout stable/zed  # replace 'zed' with the desired release
```

Run the bootstrap script:

```
sudo scripts/bootstrap-ansible.sh
```

Prepare the configuration files:

```
sudo cp -R /opt/openstack-ansible/etc/openstack_deploy /etc/
cd /etc/openstack_deploy
sudo cp openstack_user_config.yml.example openstack_user_config.yml
sudo cp user_variables.yml.example user_variables.yml
```

Edit openstack_user_config.yml to configure your network interface:

```
openstack_user_config:
  compute_hosts:
    compute1:
      ip: <your_controller_ip>
  control_plane:
    ip: <your_controller_ip>
```

Run the OpenStack-Ansible playbooks:

```
cd /opt/openstack-ansible/playbooks
sudo openstack-ansible setup-hosts.yml
sudo openstack-ansible setup-infrastructure.yml
sudo openstack-ansible setup-openstack.yml
```

Step 3: Accessing the OpenStack Dashboard

Once the installation completes:

Access the Horizon Dashboard by navigating to the IP address of your controller in a web browser:

```
http://<your_controller_ip>/horizon
```

Login using the default credentials:

Username: admin

Password: Retrieve from /etc/openstack_deploy/admin_password (or set during installation)

Step 4: Post-Installation Tasks

Create and manage projects, users, and resources through the dashboard or OpenStack CLI.

Verify Services:

```
openstack service list
openstack compute service list
```

Manage OpenStack using the CLI:

Install the OpenStack client:

```
sudo apt install python3-openstackclient
```

Authenticate:

```
source  /etc/openstack_deploy/admin-openrc.sh
```

Use OpenStack commands to manage resources.

Troubleshooting

Logs: Check logs in /var/log/ for any issues during installation.

Services: Ensure all OpenStack services are running. Use systemctl status to check individual services.