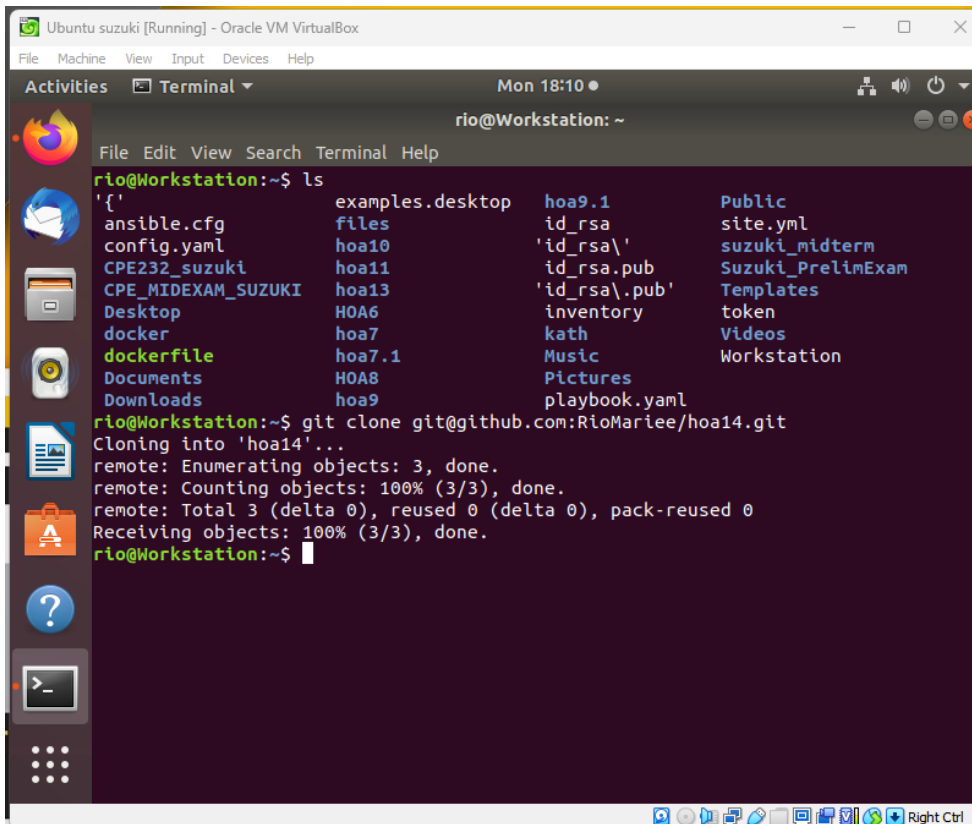
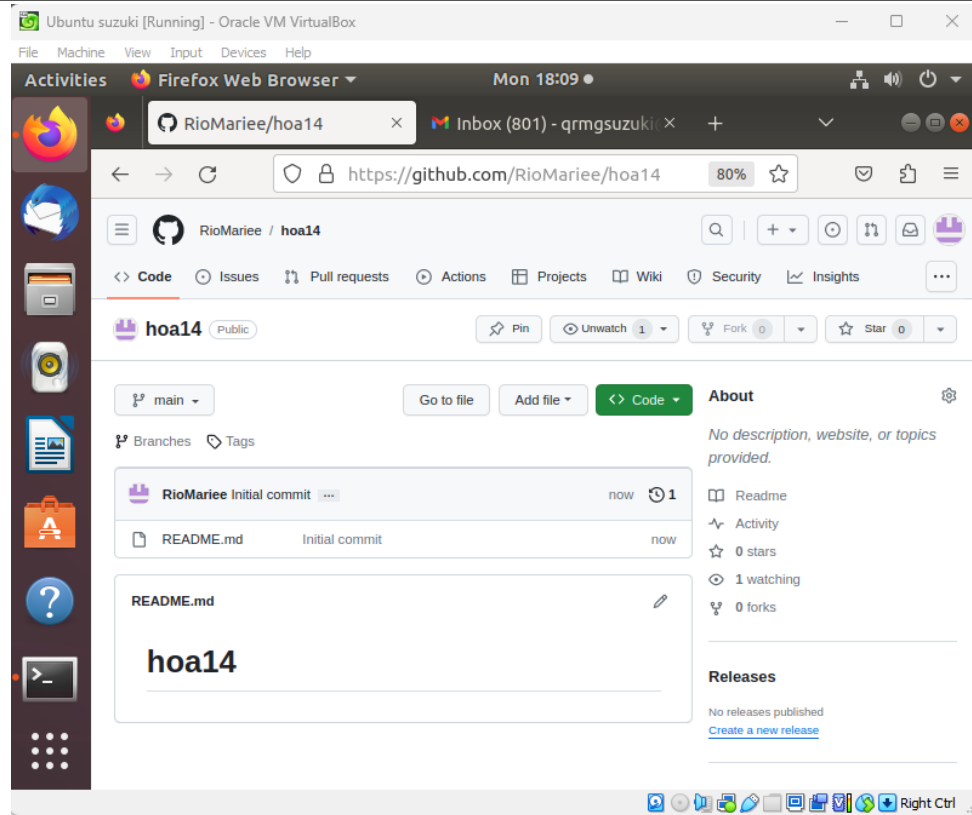
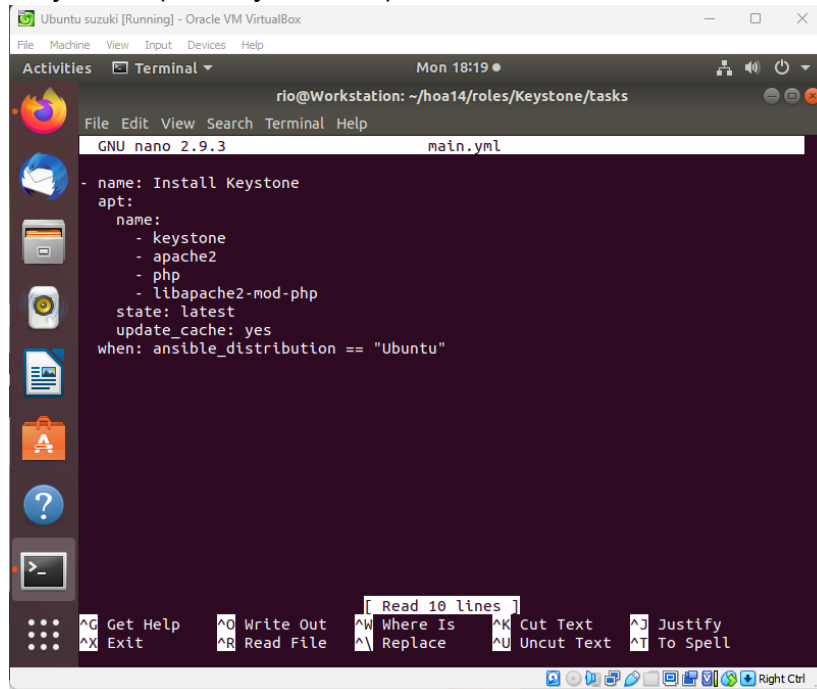


| | |
|---|---|
| Name: Rio Marie G. Suzuki | Date Performed: 12/04/2023 |
| Course/Section: CPE232 31-S6 | Date Submitted: 12/04/2023 |
| Instructor: Dr. Jonathan Taylar | Semester and SY: 1st sem 2023-2024 |
| Activity 14: OpenStack Installation (Keystone, Glance, Nova) | |
| 1. Objectives | |
| Create a workflow to install OpenStack using Ansible as your Infrastructure as Code (IaC). | |
| 2. Intended Learning Outcomes | |
| <ol style="list-style-type: none"> 1. Analyze the advantages and disadvantages of cloud services 2. Evaluate different Cloud deployment and service models 3. Create a workflow to install and configure OpenStack base services using Ansible as documentation and execution. | |
| 3. Resources | |
| <p>Oracle VirtualBox (Hypervisor)</p> <p>1x Ubuntu VM or Centos VM</p> | |
| 4. Tasks | |
| <ol style="list-style-type: none"> 1. Create a new repository for this activity. | |



2. Create a playbook that converts the steps in the following items in <https://docs.openstack.org/install-guide/>

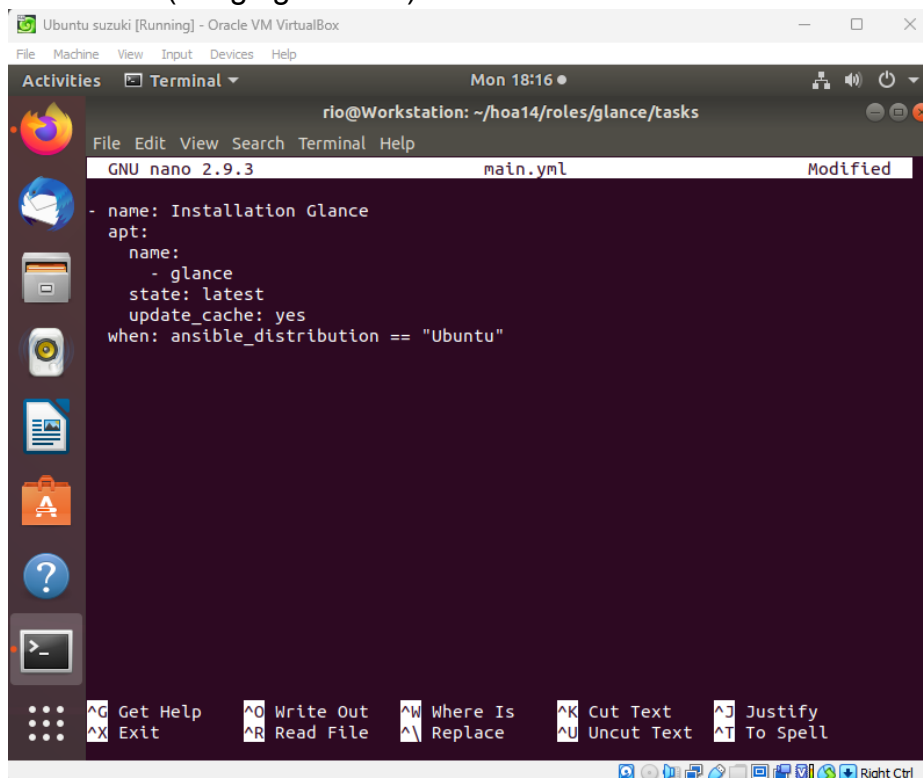
a. Keystone (Identity Service)



The screenshot shows a terminal window titled "Ubuntu suzuki [Running] - Oracle VM VirtualBox". The terminal is running the GNU nano 2.9.3 editor, editing a file named "main.yml". The content of the file is an Ansible task named "Install Keystone". The task uses the "apt" module to install the "keystone", "apache2", "php", and "libapache2-mod-php" packages. It sets the state to "latest", updates the cache, and specifies that it should only run on Ubuntu distributions.

```
rio@Workstation: ~/hoa14/roles/Keystone/tasks
GNU nano 2.9.3 main.yml
- name: Install Keystone
  apt:
    name:
      - keystone
      - apache2
      - php
      - libapache2-mod-php
    state: latest
    update_cache: yes
    when: ansible_distribution == "Ubuntu"
```

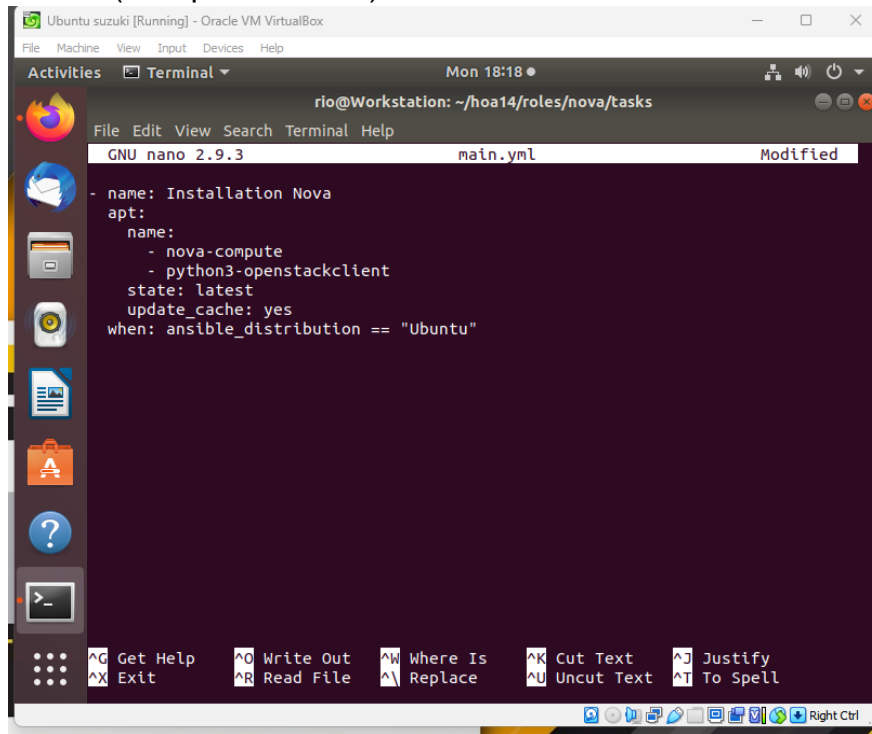
b. Glance (Imaging Service)



The screenshot shows a terminal window titled "Ubuntu suzuki [Running] - Oracle VM VirtualBox". The terminal is running the GNU nano 2.9.3 editor, editing a file named "main.yml". The content of the file is an Ansible task named "Installation Glance". The task uses the "apt" module to install the "glance" package. It sets the state to "latest", updates the cache, and specifies that it should only run on Ubuntu distributions.

```
rio@Workstation: ~/hoa14/roles/glance/tasks
GNU nano 2.9.3 main.yml Modified
- name: Installation Glance
  apt:
    name:
      - glance
    state: latest
    update_cache: yes
    when: ansible_distribution == "Ubuntu"
```

c. Nova (Compute Service)

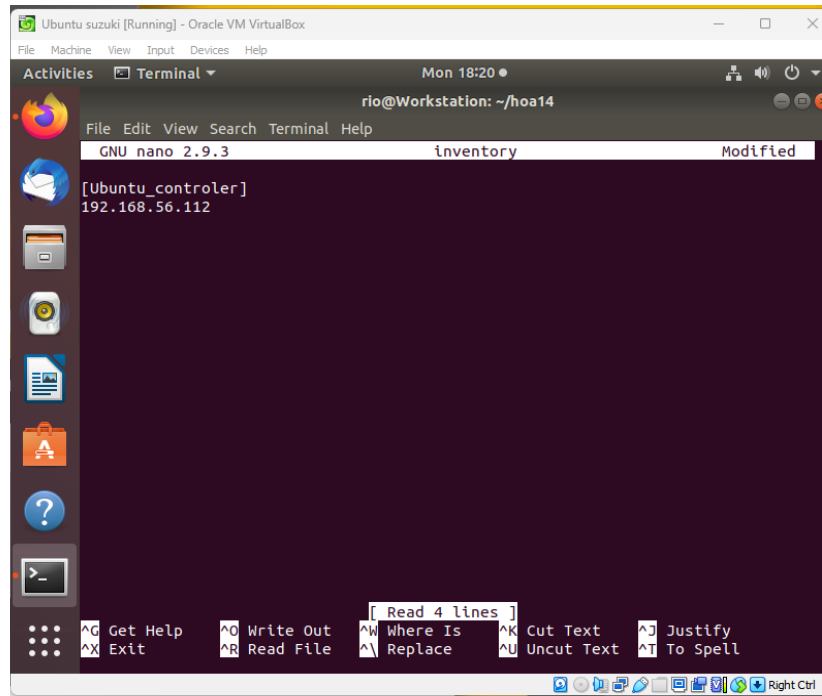


The screenshot shows a terminal window titled "Ubuntu suzuki [Running] - Oracle VM VirtualBox". The terminal is running the GNU nano 2.9.3 editor, editing a file named "main.yml". The content of the file is as follows:

```
- name: Installation Nova
  apt:
    name:
      - nova-compute
      - python3-openstackclient
    state: latest
    update_cache: yes
  when: ansible_distribution == "Ubuntu"
```

The terminal window also shows a sidebar with various application icons and a bottom status bar with system information and keyboard shortcuts.

d. Create different plays in installing per server type (controller, compute etc.) and identify it as a group in the Inventory file.



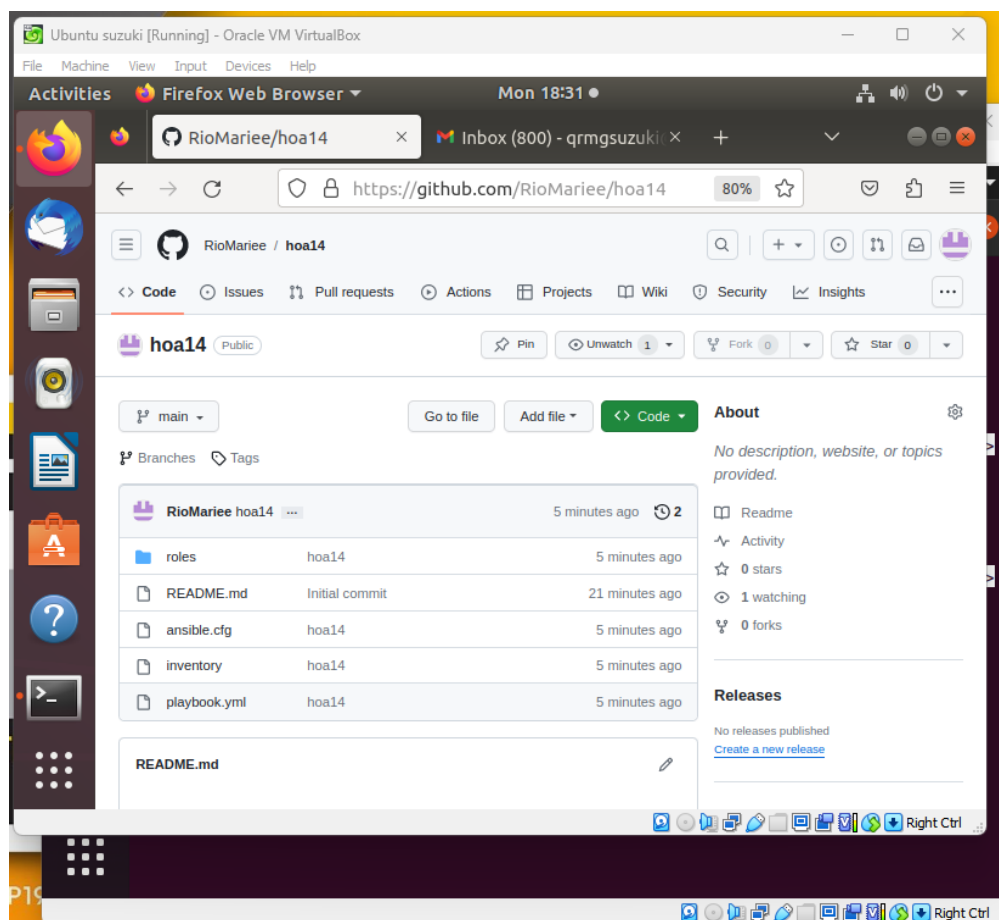
The screenshot shows a terminal window titled "Ubuntu suzuki [Running] - Oracle VM VirtualBox". The terminal is running the GNU nano 2.9.3 editor, editing a file named "inventory". The content of the file is as follows:

```
[Ubuntu_controller]
192.168.56.112
```

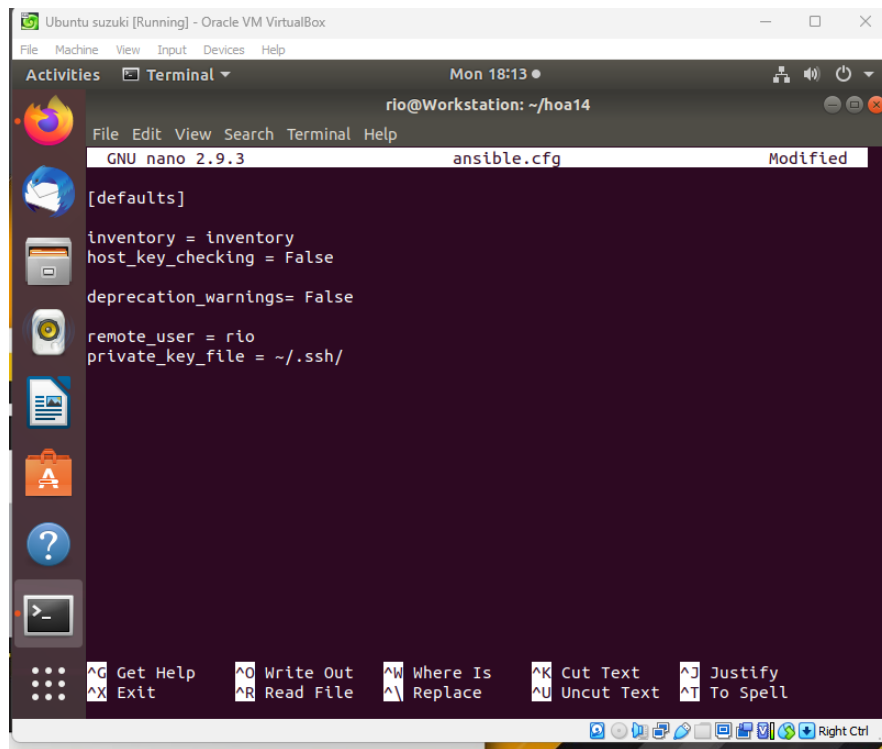
The terminal window also shows a sidebar with various application icons and a bottom status bar with system information and keyboard shortcuts.

e. Add, commit and push it to your GitHub repo.

```
rio@Workstation:~/hoa14$ git add .
rio@Workstation:~/hoa14$ git commit -m "hoa14"
[main f7870d8] hoa14
 6 files changed, 58 insertions(+)
 create mode 100644 ansible.cfg
 create mode 100644 inventory
 create mode 100644 playbook.yml
 create mode 100644 roles/Keystone/tasks/main.yml
 create mode 100644 roles/glance/tasks/main.yml
 create mode 100644 roles/nova/tasks/main.yml
rio@Workstation:~/hoa14$ git push
Counting objects: 15, done.
Delta compression using up to 2 threads.
Compressing objects: 100% (8/8), done.
Writing objects: 100% (15/15), 1.42 KiB | 1.42 MiB/s, done.
Total 15 (delta 0), reused 0 (delta 0)
To github.com:RioMarieee/hoa14.git
 a844beb..f7870d8  main -> main
rio@Workstation:~/hoa14$
```



ansible.cfg:

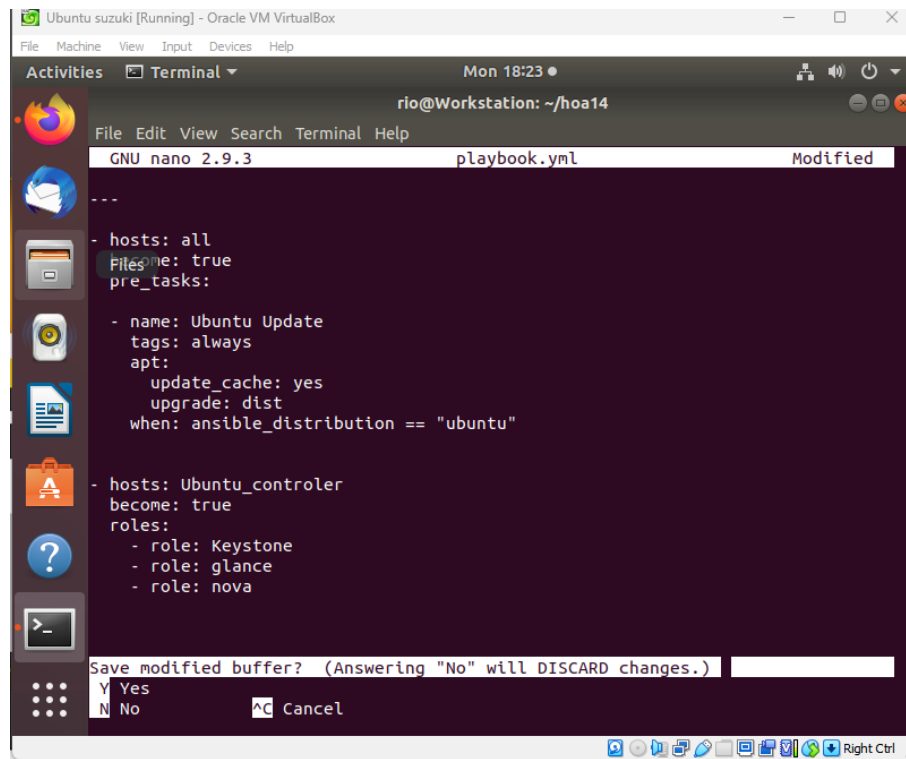


The screenshot shows a terminal window titled "Ubuntu suzuki [Running] - Oracle VM VirtualBox". The terminal is running the nano text editor, editing the file "ansible.cfg". The file content is as follows:

```
[defaults]
inventory = inventory
host_key_checking = False
deprecation_warnings= False
remote_user = rio
private_key_file = ~/.ssh/
```

The terminal window also shows a sidebar with application icons and a bottom status bar with keyboard shortcuts like "Get Help", "Write Out", "Where Is", "Cut Text", "Justify", "Exit", "Read File", "Replace", "Uncut Text", and "To Spell".

Playbook_controller:



The screenshot shows a terminal window titled "Ubuntu suzuki [Running] - Oracle VM VirtualBox". The terminal is running the nano text editor, editing the file "playbook.yml". The file content is as follows:

```
---
- hosts: all
  become: true
  pre_tasks:

- name: Ubuntu Update
  tags: always
  apt:
    update_cache: yes
    upgrade: dist
    when: ansible_distribution == "ubuntu"

- hosts: Ubuntu_controller
  become: true
  roles:
    - role: Keystone
    - role: glance
    - role: nova
```

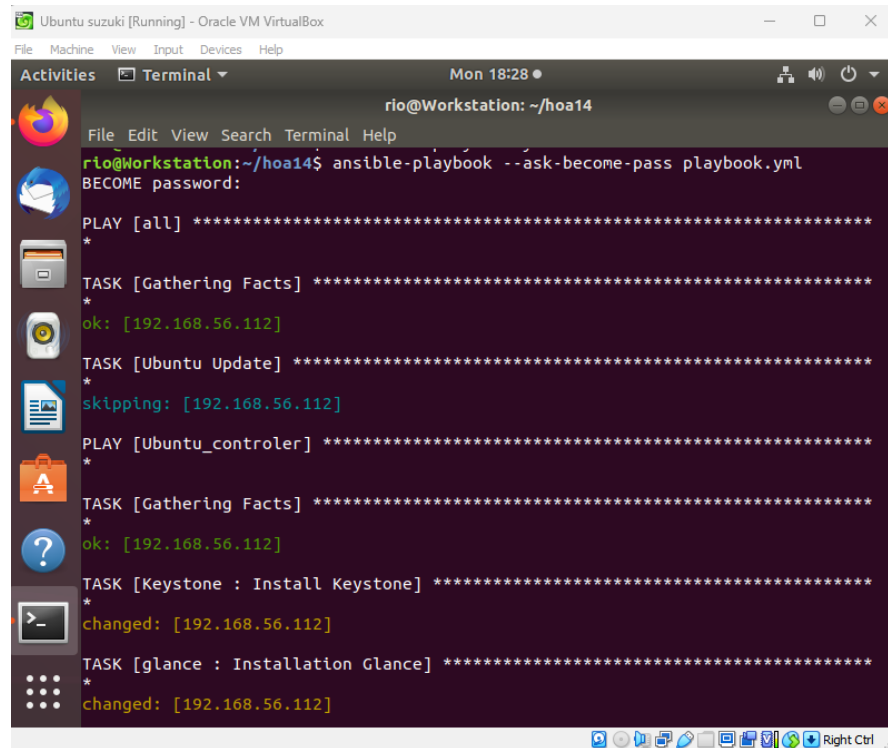
The terminal window also shows a sidebar with application icons and a bottom status bar with keyboard shortcuts. At the bottom of the terminal, a prompt asks "Save modified buffer? (Answering 'No' will DISCARD changes.)" with options "Y Yes", "N No", and "AC Cancel".

Tree:

```
rio@Workstation:~/hoa14$ tree
.
├── ansible.cfg
├── inventory
├── playbook.yml
├── README.md
└── roles
    ├── glance
    │   └── tasks
    │       └── main.yml
    ├── Keystone
    │   └── tasks
    │       └── main.yml
    └── nova
        └── tasks
            └── main.yml

7 directories, 7 files
rio@Workstation:~/hoa14$
```

Process:



The screenshot shows a terminal window titled "Ubuntu suzuki [Running] - Oracle VM VirtualBox". The terminal output shows the execution of an Ansible playbook named "ansible-playbook --ask-become-pass playbook.yml". The process starts with a "PLAY [all]" block, followed by a "TASK [Gathering Facts]" which reports "ok: [192.168.56.112]". This is followed by a "TASK [Ubuntu Update]" which reports "skipping: [192.168.56.112]". The next block is "PLAY [Ubuntu_controller]", followed by a "TASK [Gathering Facts]" which reports "ok: [192.168.56.112]". This is followed by a "TASK [Keystone : Install Keystone]" which reports "changed: [192.168.56.112]". The final task shown is "TASK [glance : Installation Glance]" which reports "changed: [192.168.56.112]". The terminal window has a menu bar with "File", "Edit", "View", "Search", "Terminal", and "Help". The status bar at the bottom shows "Mon 18:28" and "Right Ctrl".

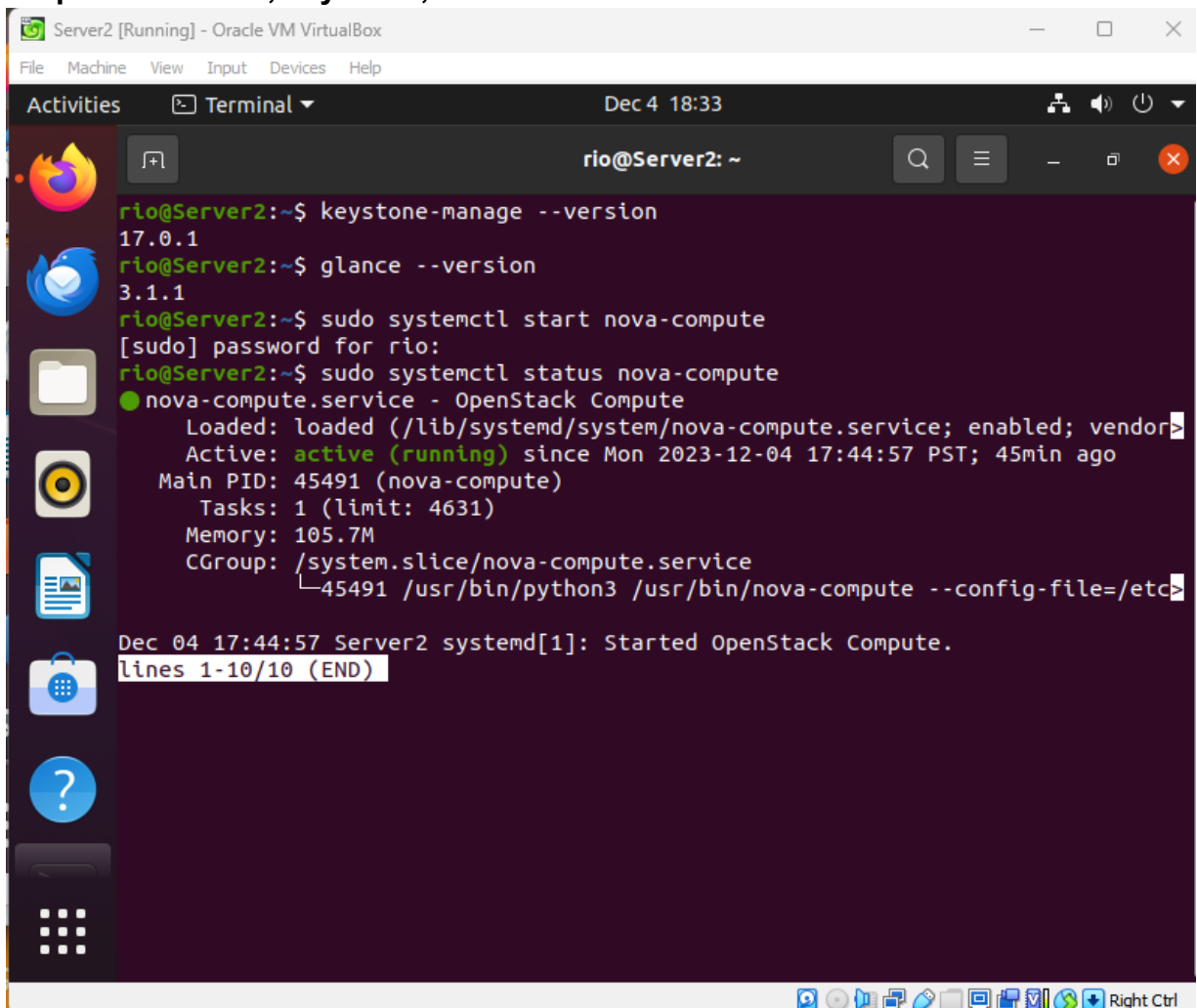
```
rio@Workstation: ~/hoa14
File Edit View Search Terminal Help
Mon 18:28
rio@Workstation: ~/hoa14
rio@Workstation:~/hoa14$ ansible-playbook --ask-become-pass playbook.yml
BECOME password:
PLAY [all] *****
*
TASK [Gathering Facts] *****
*
ok: [192.168.56.112]
TASK [Ubuntu Update] *****
*
skipping: [192.168.56.112]
PLAY [Ubuntu_controller] *****
*
TASK [Gathering Facts] *****
*
ok: [192.168.56.112]
TASK [Keystone : Install Keystone] *****
*
changed: [192.168.56.112]
TASK [glance : Installation Glance] *****
*
changed: [192.168.56.112]
```

```
Ubuntu suzuki [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Activities Terminal Mon 18:28
rio@Workstation: ~/hoa14
File Edit View Search Terminal Help
skipping: [192.168.56.112]
PLAY [Ubuntu_controller] *****
*
TASK [Gathering Facts] *****
*
ok: [192.168.56.112]
TASK [Keystone : Install Keystone] *****
*
changed: [192.168.56.112]
TASK [glance : Installation Glance] *****
*
changed: [192.168.56.112]
TASK [nova : Installation Nova] *****
*
ok: [192.168.56.112]
PLAY RECAP *****
*
192.168.56.112 : ok=5 changed=2 unreachable=0 failed=0
skipped=1 rescued=0 ignored=0
rio@Workstation:~/hoa14$ git add .
rio@Workstation:~/hoa14$ git commit -m "hoa14"
[main f7870d8] hoa14
```

Github link: <https://github.com/RioMarieee/hoa14.git>

5. Output (screenshots and explanations)

Output for Glance, keystone, and nova verification:



```
Server2 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Activities Terminal Dec 4 18:33
rio@Server2: ~
rio@Server2:~$ keystone-manage --version
17.0.1
rio@Server2:~$ glance --version
3.1.1
rio@Server2:~$ sudo systemctl start nova-compute
[sudo] password for rio:
rio@Server2:~$ sudo systemctl status nova-compute
● nova-compute.service - OpenStack Compute
   Loaded: loaded (/lib/systemd/system/nova-compute.service; enabled; vendor preset: enabled)
   Active: active (running) since Mon 2023-12-04 17:44:57 PST; 45min ago
     Main PID: 45491 (nova-compute)
        Tasks: 1 (limit: 4631)
       Memory: 105.7M
      CGroup: /system.slice/nova-compute.service
              └─45491 /usr/bin/python3 /usr/bin/nova-compute --config-file=/etc/nova/nova.conf

Dec 04 17:44:57 Server2 systemd[1]: Started OpenStack Compute.
lines 1-10/10 (END)
```

Reflections:

Answer the following:

1. Describe Keystone, Glance and Nova services

- In OpenStack, Keystone assumes the important role of an identity service, functioning as the keeper for secure access and authorization. Managing user identities and permissions, Keystone ensures a robust authentication framework, allowing users to engage seamlessly with other OpenStack services. Glance steps into the spotlight as the image service, overseeing the registration, discovery, and retrieval of virtual machine images. This centralized repository ensures standardized images, laying the groundwork for efficient instance creation within the OpenStack environment. Meanwhile, Nova takes the reins as the compute service, steering the orchestration of compute resources. From the creation to termination of virtual machines, Nova enables dynamic scaling and flexible resource allocation, catering to the computational

demands of cloud users. In concert, Keystone, Glance, and Nova form a foundational trio, embodying the core elements of identity management, image storage, and compute resource orchestration in the intricate tapestry of OpenStack's cloud infrastructure.

Conclusions:

To conclude, using Ansible as our Infrastructure as Code (IaC) has been very eye-opening. It wasn't just about OpenStack deployment intricacies; it was also about IaC for making infrastructure processes easy. Ansible made it easy to install OpenStack and use it efficiently, making things easier to repeat. Bringing IaC into the mix isn't just about simplifying the deployment hustle – it's laying down a solid groundwork for keeping our infrastructure strong and consistent. As I do this activity, the knowledge we gained from using OpenStack installation with Ansible is a nod to the idea that diving into IaC is the real deal in today's infrastructure.