Name: Philip Sebastian Afan	**Date Performed:** December 13, 2024
Course/Section: CPE 212-CPE31S21	**Date: Submitted:** December 13, 2024
Instructor: Sir Robin Valenzuela	**Semester and SY:** 2024-2025

Hands-on Final Exam

Tools Needed:

1. VM with Ubuntu, CentOS and Ansible installed

2. Web browser

Procedure:

1. Create a repository and label it as "Final_Exam_Surname"

2. Clone your new repository in your VM

3. Create an Ansible playbook that does the following with an input of a config.yaml file and structure inventory file.

3.1 Install and configure one enterprise service that can be installed in Debian and Centos servers

3.2 Install and configure one monitoring tool that can be installed in Debian and Centos servers (if it is a stack there should be option of different host)

4.4 Change Motd as "Ansible Managed by <username>"

4. Push and commit your files in GitHub

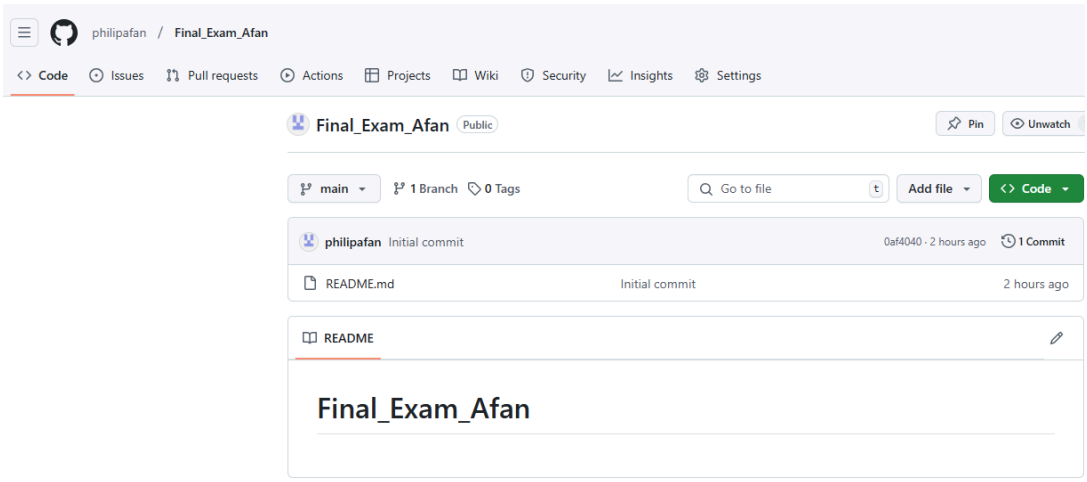
5. Make sure to show evidence of input (codes) process (codes successfully running) and output (evidence of installation)

5. For your final exam to be counted, please paste your repository link as an answer in this exam.

Note: Extra points if you will implement the said services via containerization.

Output:

Create Github Repository




```
vboxuser@afanserver3:~$ git clone git@github.com:philipafan/Final_Exam_Afan.git
fatal: destination path 'Final_Exam_Afan' already exists and is not an empty dir
ectory.
vboxuser@afanserver3:~$ cd
vboxuser@afanserver3:~$ cd Final_Exam_Afan
vboxuser@afanserver3:~/Final_Exam_Afan$
```

Configure ansible.cfg file

vboxuser@afanserver3: ~/Final_Exam_Afan

```
  GNU nano 6.2                ansible-playbook/ansible.cfg
[defaults]

inventory = inventory
host_key_checking = false

depracation_warnings = false

remote_user = vboxuser
private_key_file = ~/.ssh/
```

Configure Inventory file

vboxuser@afanserver3: ~/Final_Exam_Afan

```
  GNU nano 6.2                      ansible-playbook/inventory.yml
[all]
192.168.56.101
192.168.56.103

[Ubuntu]
192.168.56.103

[CentOs]
192.168.56.101
```

Create config.yaml

vboxuser@afanserver3: ~/Final_Exam...

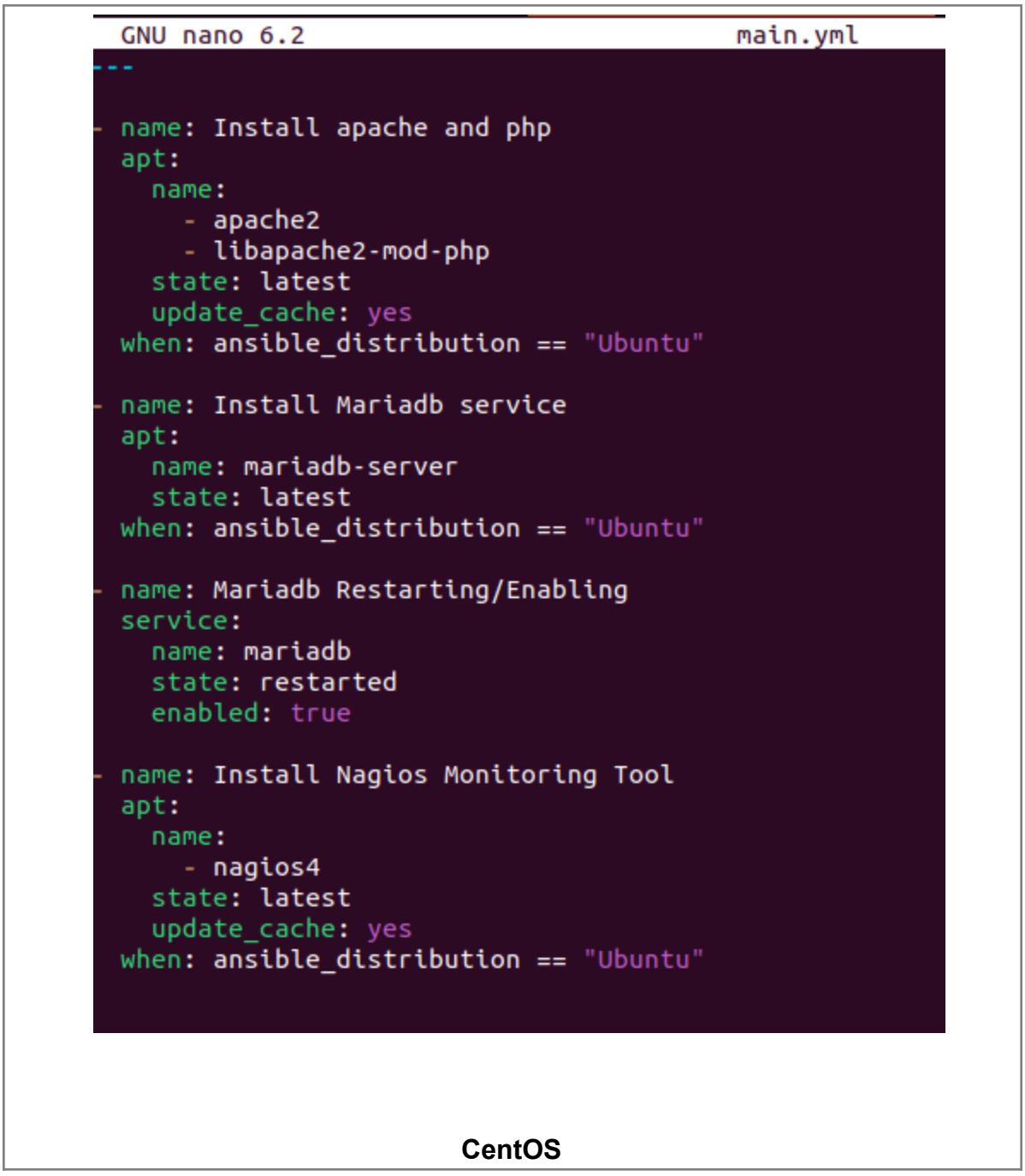
GNU nano 6.2 ansible-playbook/config.yaml *

```
---

- hosts: all
  become: true
  pre_tasks:

  - name: install updates (Ubuntu)
    tags: always
    apt:
      update_cache: yes
    changed_when: False
    when: ansible_distribution == "Ubuntu"

  - name: install updates (CentOS)
    tags: always
    dnf:
      update_cache: yes
    changed_when: False
    when: ansible_distribution == "CentOS"

  - name: Create a banner motd
    copy:
      content: "Ansible Manage by Afan\n"
      dest: /etc/motd

- hosts: Ubuntu
  become: true
  roles:
    - Ubuntu

- hosts: CentOs
  become: true
  roles:
    - CentOs
```

^G Help ^O Write Out ^W Where Is ^K Cut ^T Execute

^X Exit ^R Read File ^\ Replace ^U Paste ^J Justify

Create main.yml that contains the tasks for each roles Ubuntu


GNU nano 6.2 main.yml

- name: Install apache and php
apt:
name:
- apache2
- libapache2-mod-php
state: latest
update_cache: yes
when: ansible_distribution == "Ubuntu"
- name: Install Mariadb service
apt:
name: mariadb-server
state: latest
when: ansible_distribution == "Ubuntu"
- name: Mariadb Restarting/Enabling
service:
name: mariadb
state: restarted
enabled: true
- name: Install Nagios Monitoring Tool
apt:
name:
- nagios4
state: latest
update_cache: yes
when: ansible_distribution == "Ubuntu"

CentOS

```
  GNU nano 6.2                                main.yml
---

- name: Install httpd and php for CentOS
  dnf:
    name:
      - httpd
      - php
    state: latest
  when: ansible_distribution == "CentOS"

- name: httpd Restarting/Enabling
  service:
    name: httpd
    state: restarted
    enabled: true

- name: Install Mariadb service
  dnf:
    name: mariadb-server
    state: latest
  when: ansible_distribution == "CentOS"

- name: madiadb Restarting/Enabling
  service:
    name: mariadb
    state: restarted
    enabled: true

- name: Install Nagios Monitoring tool
  command: wget https://assets.nagios.com/downloads/nagioscore/releases/nagios-4.4.10.>
  when: ansible_distribution == "CentOS"
```

Run ansible playbook :

```
PLAY [all] *********************************************************************

TASK [Gathering Facts] *********************************************************
ok: [192.168.56.103]
[DEPRECATION WARNING]: Distribution centos 9 on host 192.168.56.101 should use
/usr/libexec/platform-python, but is using /usr/bin/python for backward compatibility
with prior Ansible releases. A future Ansible release will default to using the
discovered platform python for this host. See
https://docs.ansible.com/ansible/2.10/reference_appendices/interpreter_discovery.html
for more information. This feature will be removed in version 2.12. Deprecation
warnings can be disabled by setting deprecation_warnings=False in ansible.cfg.
ok: [192.168.56.101]

TASK [install updates (Ubuntu)] ************************************************
skipping: [192.168.56.101]
ok: [192.168.56.103]

TASK [install updates (CentOS)] ************************************************
skipping: [192.168.56.103]
ok: [192.168.56.101]

TASK [Create a banner motd] ****************************************************
ok: [192.168.56.103]
ok: [192.168.56.101]
```

```
PLAY [Ubuntu] ******************************************************************

TASK [Gathering Facts] *********************************************************
ok: [192.168.56.103]

TASK [Ubuntu : Install apache and php] *****************************************
ok: [192.168.56.103]

TASK [Ubuntu : Install Mariadb service] ****************************************
changed: [192.168.56.103]

TASK [Ubuntu : Mariadb Restarting/Enabling] ************************************
changed: [192.168.56.103]

TASK [Ubuntu : Install Nagios Monitoring Tool] *********************************
ok: [192.168.56.103]
```

```
PLAY [CentOs] ******************************************************************

TASK [Gathering Facts] *********************************************************
ok: [192.168.56.101]

TASK [CentOs : Install httpd and php for CentOS] *******************************
changed: [192.168.56.101]

TASK [CentOs : httpd Restarting/Enabling] **************************************
changed: [192.168.56.101]

TASK [CentOs : Install Mariadb service] ****************************************
changed: [192.168.56.101]

TASK [CentOs : madiadb Restarting/Enabling] ************************************
changed: [192.168.56.101]

TASK [CentOs : Install Nagios Monitoring tool] *********************************
[WARNING]: Consider using the get_url or uri module rather than running 'wget'.  If
you need to use command because get_url or uri is insufficient you can add 'warn:
false' to this command task or set 'command_warnings=False' in ansible.cfg to get rid
of this message.
changed: [192.168.56.101]

PLAY RECAP *********************************************************************
192.168.56.101             : ok=9    changed=5    unreachable=0    failed=0    skipped=1    rescued=0    ignored=0
192.168.56.103             : ok=8    changed=2    unreachable=0    failed=0    skipped=1    rescued=0    ignored=0
```

Proof For Installation
Ubuntu

Apache

```
vboxuser@afanserver3: ~/Final_Exam_Afan
vboxuser@afanserver3:~/Final_Exam_Afan$ systemctl status apache2
● apache2.service - The Apache HTTP Server
     Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor preset:>
     Active: active (running) since Fri 2024-12-13 11:13:15 +08; 15s ago
       Docs: https://httpd.apache.org/docs/2.4/
   Main PID: 103061 (apache2)
      Tasks: 55 (limit: 9439)
     Memory: 5.5M
        CPU: 46ms
     CGroup: /system.slice/apache2.service
             ├─103061 /usr/sbin/apache2 -k start
             ├─103062 /usr/sbin/apache2 -k start
             └─103063 /usr/sbin/apache2 -k start
lines 1-12/12 (END)
```

PHP

```
vboxuser@afanserver3: ~/Final_Exam_Afan
vboxuser@afanserver3:~/Final_Exam_Afan$ php --version
PHP 8.1.2-1ubuntu2.20 (cli) (built: Dec  3 2024 20:14:35) (NTS)
Copyright (c) The PHP Group
Zend Engine v4.1.2, Copyright (c) Zend Technologies
    with Zend OPcache v8.1.2-1ubuntu2.20, Copyright (c), by Zend Technologies
vboxuser@afanserver3:~/Final_Exam_Afan$
```

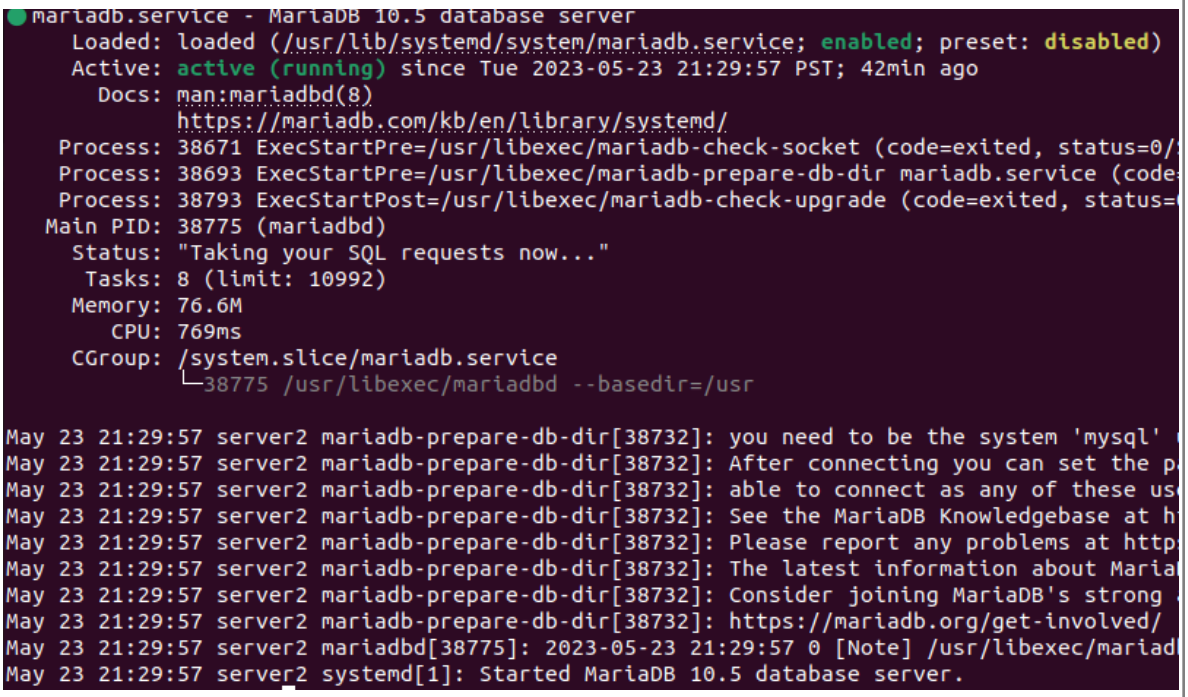
MARIADB

```
● mariadb.service - MariaDB 10.6.12 database server
     Loaded: loaded (/lib/systemd/system/mariadb.service; enabled; vendor preset: enabled)
     Active: active (running) since Tue 2023-05-23 21:22:51 +08; 44min ago
       Docs: man:mariadbd(8)
             https://mariadb.com/kb/en/library/systemd/
    Process: 21344 ExecStartPre=/usr/bin/install -m 755 -o mysql -g root -d /var/run/mysqld
    Process: 21345 ExecStartPre=/bin/sh -c systemctl unset-environment _WSREP_START_POSITIO
    Process: 21347 ExecStartPre=/bin/sh -c [ ! -e /usr/bin/galera_recovery ] && VAR= ||   V
    Process: 21388 ExecStartPost=/bin/sh -c systemctl unset-environment _WSREP_START_POSITI
    Process: 21390 ExecStartPost=/etc/mysql/debian-start (code=exited, status=0/SUCCESS)
   Main PID: 21376 (mariadbd)
     Status: "Taking your SQL requests now..."
      Tasks: 8 (limit: 2271)
     Memory: 63.5M
        CPU: 849ms
     CGroup: /system.slice/mariadb.service
             └─21376 /usr/sbin/mariadbd
lines 1-17/17 (END)
```

CENTOS
Httpd

```
● httpd.service - The Apache HTTP Server
     Loaded: loaded (/usr/lib/systemd/system/httpd.service; enabled; preset: disabled)
    Drop-In: /usr/lib/systemd/system/httpd.service.d
             └─php-fpm.conf
     Active: active (running) since Tue 2023-05-23 21:24:31 PST; 46min ago
       Docs: man:httpd.service(8)
   Main PID: 8226 (httpd)
     Status: "Total requests: 0; Idle/Busy workers 100/0;Requests/sec: 0; Bytes served/sec:   0 B/sec"
      Tasks: 213 (limit: 10992)
     Memory: 24.0M
        CPU: 1.454s
     CGroup: /system.slice/httpd.service
             ├─8226 /usr/sbin/httpd -DFOREGROUND
             ├─8345 /usr/sbin/httpd -DFOREGROUND
             ├─8346 /usr/sbin/httpd -DFOREGROUND
             ├─8347 /usr/sbin/httpd -DFOREGROUND
             └─8348 /usr/sbin/httpd -DFOREGROUND

May 23 21:24:31 server2 systemd[1]: Starting The Apache HTTP Server...
May 23 21:24:31 server2 httpd[8226]: AH00558: httpd: Could not reliably determine the server's fully qu
May 23 21:24:31 server2 httpd[8226]: Server configured, listening on: port 80
May 23 21:24:31 server2 systemd[1]: Started The Apache HTTP Server.
lines 1-22/22 (END)
```

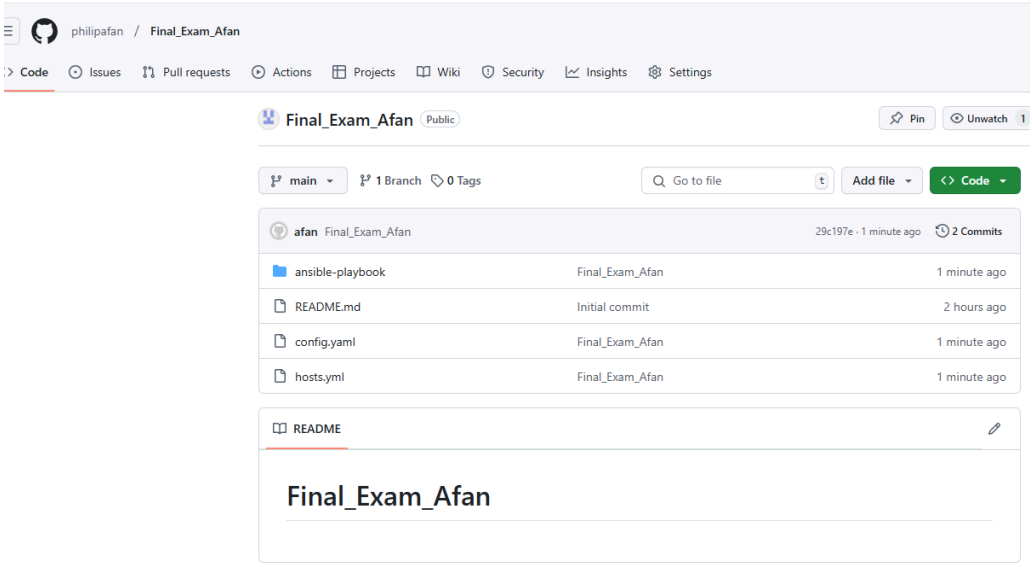
MARIADB



Git status, add, commit, push

```
vboxuser@afanserver3: ~/Final_Exam_Afan
vboxuser@afanserver3:~/Final_Exam_Afan$ git add .
vboxuser@afanserver3:~/Final_Exam_Afan$ git commit -m "Final_Exam_Afan"
[main 29c197e] Final_Exam_Afan
 Committer: afan <vboxuser@afanserver3.myguest.virtualbox.org>
Your name and email address were configured automatically based
on your username and hostname. Please check that they are accurate.
You can suppress this message by setting them explicitly:

    git config --global user.name "Your Name"
    git config --global user.email you@example.com

After doing this, you may fix the identity used for this commit with:

    git commit --amend --reset-author

 9 files changed, 136 insertions(+)
 create mode 100644 ansible-playbook/ansible.cfg
 create mode 100644 ansible-playbook/config.yaml
 create mode 100644 ansible-playbook/inventory.yml
 create mode 100644 ansible-playbook/inventory/hosts.yml
 create mode 100644 ansible-playbook/main.yml
 create mode 100644 ansible-playbook/playbook.yml
 create mode 100644 ansible-playbook/templates/motd.j2
 create mode 100644 config.yaml
 create mode 100644 hosts.yml
vboxuser@afanserver3:~/Final_Exam_Afan$ git push
Enumerating objects: 15, done.
Counting objects: 100% (15/15), done.
Delta compression using up to 6 threads
Compressing objects: 100% (10/10), done.
Writing objects: 100% (14/14), 1.94 KiB | 1.94 MiB/s, done.
Total 14 (delta 0), reused 0 (delta 0), pack-reused 0
```

Git Repository



https://github.com/philipafan/Final_Exam_Afan.git
CONCLUSION:
Taking the enterprise server management course has been a truly valuable experience for me. I have gained a better understanding of how servers are managed, from the basics to more advanced concepts. The course provided clear explanations and hands-on practice, allowing me to apply what I learned in real-world scenarios. This helped me build a stronger foundation of server management knowledge and develop skills that will be directly useful in a professional environment. I am confident that the skills I've learned in this course will make me better prepared for future career opportunities in the IT field. It's been an excellent investment in my growth, not just in terms of knowledge, but also in practical, real-world experience. I appreciate the insights I've gained and am excited to use this knowledge in my professional journey.