

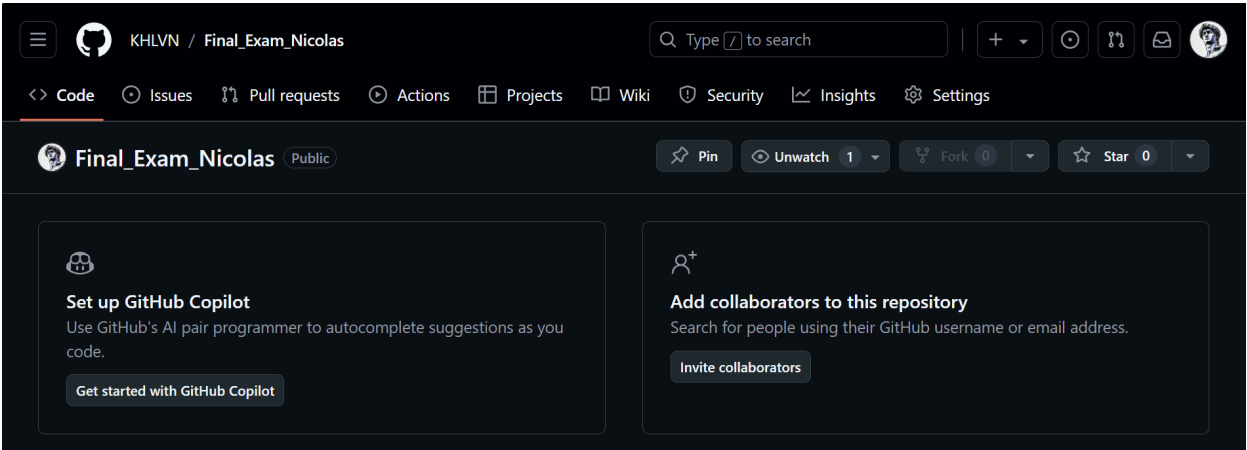
CPE 212 Final Examination (Skills)	
Khelvin P. Nicolas	4/12/2024
CPE 212 - CPE31S2	Engr. Robin Valenzuela

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

```
punopaughey@workstation:~$ git clone git@github.com:KHLVN/Final_Exam_Nicolas.git
Cloning into 'Final_Exam_Nicolas'...
Warning: Permanently added the ECDSA host key for IP address '4.237.22.38' to the list of known hosts.
warning: You appear to have cloned an empty repository.
punopaughey@workstation:~$ ls
CPE212_Activity11  CPE212_Activity8  Downloads  Pictures  Videos
CPE212_Activity5   CPE212_Activity9  Final_Exam_Nicolas  Public
CPE212_Activity6   Desktop           Music      Task1
CPE212_Activity7   Documents         Nicolas_PrelimExam  Templates
punopaughey@workstation:~$ cd *Nicolas
punopaughey@workstation:~/Final_Exam_Nicolas$
```

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

```

punopaughey@workstation:~/Final_Exam_Nicolas$ cat ansible.cfg
[defaults]
inventory = inventory
remote_user = punopaughey
host_key_checking = true
deprecation_warnings = false

punopaughey@workstation:~/Final_Exam_Nicolas$ cat inventory
[ubuntu]
server1

[centos]
centos ansible_user=khlvn
punopaughey@workstation:~/Final_Exam_Nicolas$

```

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

(Lamp Stack) refer to the screenshots below

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)

(Nagios) refer to the screenshots below

### setup.yml

```

---
- hosts: all
  become: true
  vars:
    username: "punopaughey (NICOLAS)"
  pre_tasks:
    - name: update repository index (CentOS)
      dnf:
        update_cache: yes
        changed_when: false
        when: ansible_distribution == "CentOS"

    - name: update repository index (Ubuntu)
      apt:
        update_cache: yes
        changed_when: false
        when: ansible_distribution == "Ubuntu"

    - name: Set Custom MOTD
      lineinfile:
        path: /etc/motd
        line: "Ansible Managed by {{ username }}"

- hosts: nodes

```

```
become: true
roles:
  - nodes

- hosts: db
  become: true
  roles:
    - db

- hosts: web
  become: true
  roles:
    - web
```

**nodes/tasks/main.yml**

**web/tasks/main.yml**

**db/tasks/main.yml**

```
---
# Enterprise Tool (LampStack)

# Ubuntu

- name: Install LampStack (Ubuntu)
  apt:
    name:
      - apache2
      - mysql-server
      - libapache2-mod-php
      - php-mysql
    state: present
    when: ansible_distribution == "Ubuntu"

# CentOS

- name: Install LampStack (CentOS)
  yum:
    name:
      - httpd
      - mariadb-server
      - php-mysql
    state: present
    when: ansible_distribution == "CentOS"

# Monitoring Tool (Nagios)
```

## # Ubuntu

### - name: install Nagios Prerequisites (Ubuntu)

package:

name:

- libc6-dev
- libpng-dev
- libfreetype6-dev
- gcc
- libgd-dev

state: latest

when: ansible\_distribution == "Ubuntu"

### - name: Install Nagios Core (Ubuntu)

apt:

name: nagios3

state: latest

when: ansible\_distribution == "Ubuntu"

## # CentOS

### - name: install Nagios Prerequisites (CentOS)

package:

name:

- epel-release
- libpng-devel
- gd-devel
- gcc
- freetype-devel
- glibc

state: latest

when: ansible\_distribution == "CentOS"

### - name: Install Nagios Core (CentOS)

package:

name: nagios

state: latest

when: ansible\_distribution == "CentOS"

## Running Ansible Playbook

### ALL

```
punopaughey@workstation:~/Final_Exam_Nicolas$ ansible-playbook --ask-become-pass setup.yml
BECOME password:

PLAY [all] *****

TASK [Gathering Facts] *****
ok: [server1]
ok: [centos]

TASK [update repository index (CentOS)] *****
skipping: [server1]
ok: [centos]

TASK [update repository index (Ubuntu)] *****
skipping: [centos]
ok: [server1]

TASK [Set Custom MOTD] *****
changed: [server1]
ok: [centos]
```

### NODES

```
PLAY [nodes] *****

TASK [Gathering Facts] *****
ok: [server1]
ok: [centos]

TASK [nodes : Install LampStack (Ubuntu)] *****
skipping: [centos]
ok: [server1]

TASK [nodes : Install LampStack (CentOS)] *****
skipping: [server1]
ok: [centos]

TASK [nodes : install Nagios Prerequisites (Ubuntu)] *****
skipping: [centos]
ok: [server1]

TASK [nodes : Install Nagios Core (Ubuntu)] *****
skipping: [centos]
ok: [server1]

TASK [nodes : install Nagios Prerequisites (CentOS)] *****
skipping: [server1]
ok: [centos]

TASK [nodes : Install Nagios Core (CentOS)] *****
skipping: [server1]
ok: [centos]
```

### DB

```

PLAY [db] *****

TASK [Gathering Facts] *****
ok: [server1]

TASK [db : Install LampStack (Ubuntu)] *****
ok: [server1]

TASK [db : Install LampStack (CentOS)] *****
skipping: [server1]

TASK [db : install Nagios Prerequisites (Ubuntu)] *****
ok: [server1]

TASK [db : Install Nagios Core (Ubuntu)] *****
ok: [server1]

TASK [db : install Nagios Prerequisites (CentOS)] *****
skipping: [server1]

TASK [db : Install Nagios Core (CentOS)] *****
skipping: [server1]

```

## WEB

```

PLAY [web] *****

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

TASK [web : Install LampStack (Ubuntu)] *****
skipping: [centos]

TASK [web : Install LampStack (CentOS)] *****
ok: [centos]

TASK [web : install Nagios Prerequisites (Ubuntu)] *****
skipping: [centos]

TASK [web : Install Nagios Core (Ubuntu)] *****
skipping: [centos]

TASK [web : install Nagios Prerequisites (CentOS)] *****
ok: [centos]

TASK [web : Install Nagios Core (CentOS)] *****
ok: [centos]

```

## PLAY RECAP

```

PLAY RECAP *****
centos                : ok=11   changed=0    unreachable=0    failed=0    skipped=7
  rescued=0           ignored=0
server1               : ok=11   changed=1    unreachable=0    failed=0    skipped=7
  rescued=0           ignored=0

```

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

CentOS	<pre>punopaughey@workstation:~/Final_Exam_Nicolas\$ ssh khlvn@centos Last login: Tue Dec  3 20:40:17 2024 from 192.168.56.15 Ansible Managed by punopaughey (NICOLAS) [khlvn@centos ~]\$</pre>
Ubuntu	<pre>punopaughey@workstation:~/Final_Exam_Nicolas\$ ssh punopaughey@server1 Welcome to Ubuntu 18.04.6 LTS (GNU/Linux 5.4.0-150-generic x86_64)   * Documentation:  https://help.ubuntu.com  * Management:    https://landscape.canonical.com  * Support:       https://ubuntu.com/pro  Expanded Security Maintenance for Infrastructure is not enabled.  0 updates can be applied immediately.  257 additional security updates can be applied with ESM Infra. Learn more about enabling ESM Infra service for Ubuntu 18.04 at https://ubuntu.com/18-04  New release '20.04.6 LTS' available. Run 'do-release-upgrade' to upgrade to it.  Your Hardware Enablement Stack (HWE) is supported until April 2023. Ansible Managed by punopaughey (NICOLAS) Last login: Wed Dec  4 09:49:30 2024 from 192.168.56.15</pre>

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

## Verifying services

server1

### apache2

```
punopaughey@server1:~$ systemctl status apache2
● apache2.service - The Apache HTTP Server
   Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor preset: enabled)
   Drop-In: /lib/systemd/system/apache2.service.d
            └─apache2-systemd.conf
   Active: active (running) since Wed 2024-11-20 08:20:29 +08; 2 weeks 0 days ago
     Main PID: 1236 (apache2)
        Tasks: 6 (limit: 4656)
      CGroup: /system.slice/apache2.service
              └─ 1236 /usr/sbin/apache2 -k start
                 19097 /usr/sbin/apache2 -k start
                 19098 /usr/sbin/apache2 -k start
                 19099 /usr/sbin/apache2 -k start
                 19100 /usr/sbin/apache2 -k start
                 19101 /usr/sbin/apache2 -k start

Warning: Journal has been rotated since unit was started. Log output is incomplete or unaligned.
lines 1-16/16 (END)
```

### mysql

```
punopaughey@server1:~/Final_Exam_Nicolas$ sudo systemctl status mysql
● mysql.service - MySQL Community Server
   Loaded: loaded (/lib/systemd/system/mysql.service; enabled; vendor preset: enabled)
   Active: active (running) since Wed 2024-12-04 09:57:22 +08; 58s ago
     Main PID: 8088 (mysqld)
        Tasks: 27 (limit: 4629)
      CGroup: /system.slice/mysql.service
              └─ 8088 /usr/sbin/mysqld --daemonize --pid-file=/run/mysqld/mysqld.pid

Dec 04 09:57:22 workstation systemd[1]: Starting MySQL Community Server..
Dec 04 09:57:22 workstation systemd[1]: Started MySQL Community Server.
```

### Php

```
punopaughey@server1:~$ which php
/usr/bin/php
punopaughey@server1:~$
```



## Nagios

```
punopaughey@server1:~$ systemctl status nagios3
● nagios3.service - LSB: nagios host/service/network monitoring and management system
   Loaded: loaded (/etc/init.d/nagios3; generated)
   Active: active (running) since Wed 2024-11-20 08:20:30 +08; 2 weeks 0 days ago
     Docs: man:systemd-sysv-generator(8)
    Tasks: 1 (limit: 4656)
   CGroup: /system.slice/nagios3.service
           └─1317 /usr/sbin/nagios3 -d /etc/nagios3/nagios.cfg

Warning: Journal has been rotated since unit was started. Log output is incomplete or unavailable
lines 1-9/9 (END)
```

## Centos

### httpd

```
[khlvn@centos ~]$ sudo systemctl status httpd
[sudo] password for khlvn:
● httpd.service - The Apache HTTP Server
   Loaded: loaded (/usr/lib/systemd/system/httpd.service; enabled; vendor preset: disabled)
   Active: active (running) since Tue 2024-12-03 18:51:42 EST; 2h 11min ago
     Docs: man:httpd(8)
           man:apachectl(8)
  Main PID: 1332 (httpd)
    Status: "Total requests: 0; Current requests/sec: 0; Current traffic:  0 B/sec"
     Tasks: 6
    CGroup: /system.slice/httpd.service
            └─1332 /usr/sbin/httpd -DFOREGROUND
              6953 /usr/sbin/httpd -DFOREGROUND
              6954 /usr/sbin/httpd -DFOREGROUND
              6955 /usr/sbin/httpd -DFOREGROUND
              6956 /usr/sbin/httpd -DFOREGROUND
              6957 /usr/sbin/httpd -DFOREGROUND

Dec 03 18:51:33 centos systemd[1]: Starting The Apache HTTP Server...
Dec 03 18:51:39 centos httpd[1332]: AH00558: httpd: Could not reliably determine the...age
Dec 03 18:51:42 centos systemd[1]: Started The Apache HTTP Server.
Dec 03 19:10:07 centos systemd[1]: Reloading The Apache HTTP Server.
Dec 03 19:10:11 centos httpd[6796]: AH00558: httpd: Could not reliably determine the...age
Dec 03 19:10:11 centos systemd[1]: Reloaded The Apache HTTP Server.
Hint: Some lines were ellipsized, use -l to show in full.
[khlvn@centos ~]$
```

## mariadb

```
[khlvn@centos ~]$ sudo systemctl status mariadb
● mariadb.service - MariaDB database server
   Loaded: loaded (/usr/lib/systemd/system/mariadb.service; enabled; vendor preset: disabled)
   Active: active (running) since Tue 2024-12-03 18:51:47 EST; 2h 11min ago
   Main PID: 1485 (mysqld_safe)
     Tasks: 20
    CGroup: /system.slice/mariadb.service
            └─1485 /bin/sh /usr/bin/mysqld_safe --basedir=/usr
              └─1686 /usr/libexec/mysqld --basedir=/usr --datadir=/var/lib/mysql --plugin-...

Dec 03 18:51:32 centos systemd[1]: Starting MariaDB database server...
Dec 03 18:51:34 centos mariadb-prepare-db-dir[1303]: Database MariaDB is probably init....
Dec 03 18:51:34 centos mariadb-prepare-db-dir[1303]: If this is not the case, make sur....
Dec 03 18:51:34 centos mysqld_safe[1485]: 241203 18:51:34 mysqld_safe Logging to '/va...'.
Dec 03 18:51:35 centos mysqld_safe[1485]: 241203 18:51:35 mysqld_safe Starting mysqld...ql
Dec 03 18:51:47 centos systemd[1]: Started MariaDB database server.
Hint: Some lines were ellipsized, use -l to show in full.
[khlvn@centos ~]$
```

## php

```
[khlvn@centos ~]$ which php
/usr/bin/php
[khlvn@centos ~]$
```

## Nagios

```
[khlvn@centos ~]$ sudo systemctl status nagios
● nagios.service - Nagios Core 4.4.14
   Loaded: loaded (/usr/lib/systemd/system/nagios.service; enabled; vendor preset: disabled)
   Active: active (running) since Tue 2024-12-03 18:51:33 EST; 2h 12min ago
     Docs: https://www.nagios.org/documentation
   Main PID: 1406 (nagios)
     Tasks: 8
    CGroup: /system.slice/nagios.service
            └─1406 /usr/sbin/nagios -d /etc/nagios/nagios.cfg
              └─1424 /usr/sbin/nagios --worker /var/spool/nagios/cmd/nagios.qh
                └─1425 /usr/sbin/nagios --worker /var/spool/nagios/cmd/nagios.qh
                  └─1426 /usr/sbin/nagios --worker /var/spool/nagios/cmd/nagios.qh
                    └─1427 /usr/sbin/nagios --worker /var/spool/nagios/cmd/nagios.qh
                      └─1428 /usr/sbin/nagios --worker /var/spool/nagios/cmd/nagios.qh
                        └─1429 /usr/sbin/nagios --worker /var/spool/nagios/cmd/nagios.qh
                          └─1707 /usr/sbin/nagios -d /etc/nagios/nagios.cfg
```

6. Push and commit your files in GitHub

```
punopaughey@workstation:~/Final_Exam_Nicolas$ git add *
punopaughey@workstation:~/Final_Exam_Nicolas$ git status
On branch master

No commits yet

Changes to be committed:
  (use "git rm --cached <file>..." to unstage)

        new file:   ansible.cfg
        new file:   inventory
        new file:   roles/db/tasks/main.yml
        new file:   roles/nodes/tasks/main.yml
        new file:   roles/web/tasks/main.yml
        new file:   setup.yml

punopaughey@workstation:~/Final_Exam_Nicolas$ git commit -m "Final Exam"
[master (root-commit) ba248d4] Final Exam
 6 files changed, 254 insertions(+)
 create mode 100644 ansible.cfg
 create mode 100644 inventory
 create mode 100644 roles/db/tasks/main.yml
 create mode 100644 roles/nodes/tasks/main.yml
 create mode 100644 roles/web/tasks/main.yml
 create mode 100644 setup.yml
punopaughey@workstation:~/Final_Exam_Nicolas$ git push
Counting objects: 9, done.
Delta compression using up to 4 threads.
Compressing objects: 100% (7/7), done.
Writing objects: 100% (9/9), 1.24 KiB | 1.24 MiB/s, done.
Total 9 (delta 0), reused 0 (delta 0)
To github.com:KHLVN/Final_Exam_Nicolas.git
 * [new branch]      master -> master
```

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

**GITHUB LINK:** [https://github.com/KHLVN/Final\\_Exam\\_Nicolas](https://github.com/KHLVN/Final_Exam_Nicolas)

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

```

punopaughey@workstation:~/Final_Exam_Nicolas$ cat Dockerfile
FROM php:8.1-apache

RUN apt-get update && apt-get install -y default-mysql-client

RUN a2enmod rewrite

COPY ./src /var/www/html/

WORKDIR /var/www/html

RUN chown -R www-data:www-data /var/www/html

EXPOSE 80

CMD ["apache2-foreground"]

```

### Dockerfile

```

punopaughey@workstation:~/Final_Exam_Nicolas$ docker images
REPOSITORY    TAG       IMAGE ID       CREATED        SIZE
<none>        <none>    017fe98b65bc   11 seconds ago 604MB
php           8.1-apache 173bd614b4e4   12 days ago   500MB
punopaughey@workstation:~/Final_Exam_Nicolas$

```

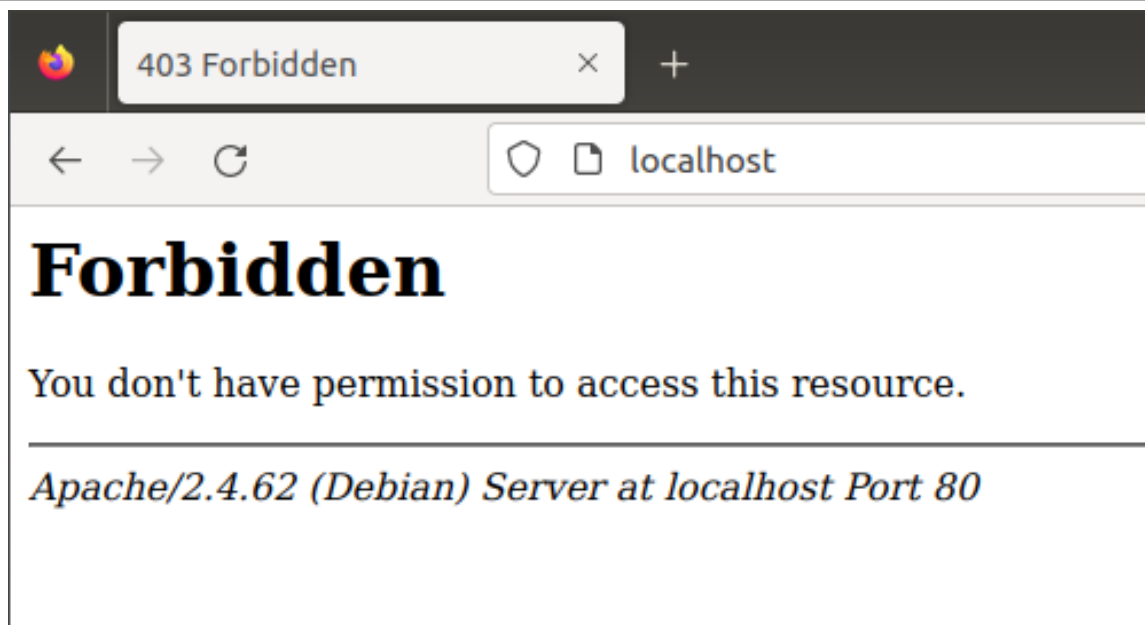
### Building Docker Image

```

punopaughey@workstation:~/Final_Exam_Nicolas$ sudo docker ps
CONTAINER ID   IMAGE          COMMAND                  CREATED        STATUS        PORTS
b112cb2823f1   my-web-lamp    "docker-php-entrypoi..." 5 seconds ago  Up 4 seconds  0.0.0
.0:80->80/tcp, :::80->80/tcp  web-lamp
punopaughey@workstation:~/Final_Exam_Nicolas$

```

### Running Container



[Website](#)