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Course/Section: CPE31S2	Date Submitted: 04/12/2024
Instructor: Engr. Robin Valenzuela	Semester and SY: 1st sem - 2024
Hands-on Final Exam	
Mark Angelo Aquino GitHub - https://github.com/CPE232-MarkAngelo/Final_Exam_Aquino.git	
Tools Needed:	
1. VM with Ubuntu, CentOS and Ansible installed 2. Web browser	
Procedure:	
<ol style="list-style-type: none"> 1. <i>Create a repository and label it as "Final_Exam_Surname"</i> 2. <i>Clone your new repository in your VM</i> 3. <i>Create an Ansible playbook that does the following with an input of a config.yaml file and structure inventory file.</i> <ol style="list-style-type: none"> 3.1 <i>Install and configure one enterprise service that can be installed in Debian and Centos servers</i> 3.2 <i>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)</i> 4.4 <i>Change Motd as "Ansible Managed by <username>"</i> 4. <i>Push and commit your files in GitHub</i> 5. <i>Make sure to show evidence of input (codes) process (codes successfully running) and output (evidence of installation)</i> 5. <i>For your final exam to be counted, please paste your repository link as an answer in this exam.</i> <p><u><i>Note: Extra points if you will implement the said services via containerization.</i></u></p>	


Procedure Tasks: Screenshots

Create a new repository

A repository contains all project files, including the revision history. Already have a project repository [Import a repository](#).

Required fields are marked with an asterisk (*).

Owner *

 CPE232-MarkAngelo

Repository name *

Final_Exam_Aquino

✓ Final_Exam_Aquino is available.

Great repository names are short and memorable. Need inspiration? How about [studious-journey](#)

Description (optional)

☒  **Public**

Anyone on the internet can see this repository. You choose who can commit.

☐  **Private**

You choose who can see and commit to this repository.

Initialize this repository with:

☒ **Add a README file**

This is where you can write a long description for your project. [Learn more about READMEs](#).

Add .gitignore

.gitignore template: None

Figure 1: Creating new repository named Final_Exam_Aquino

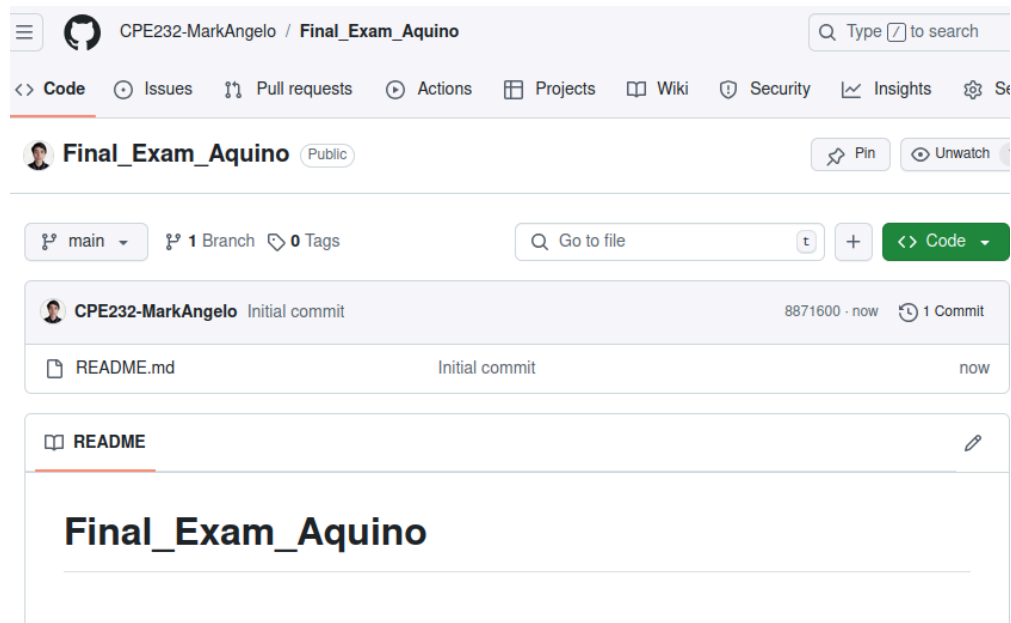
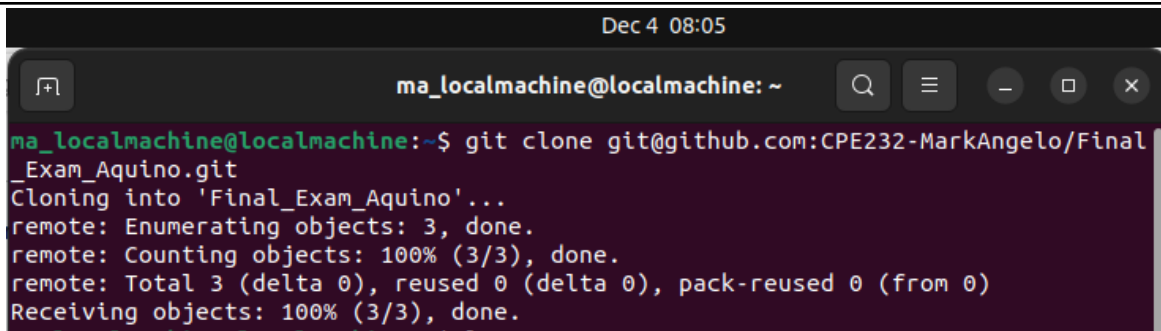
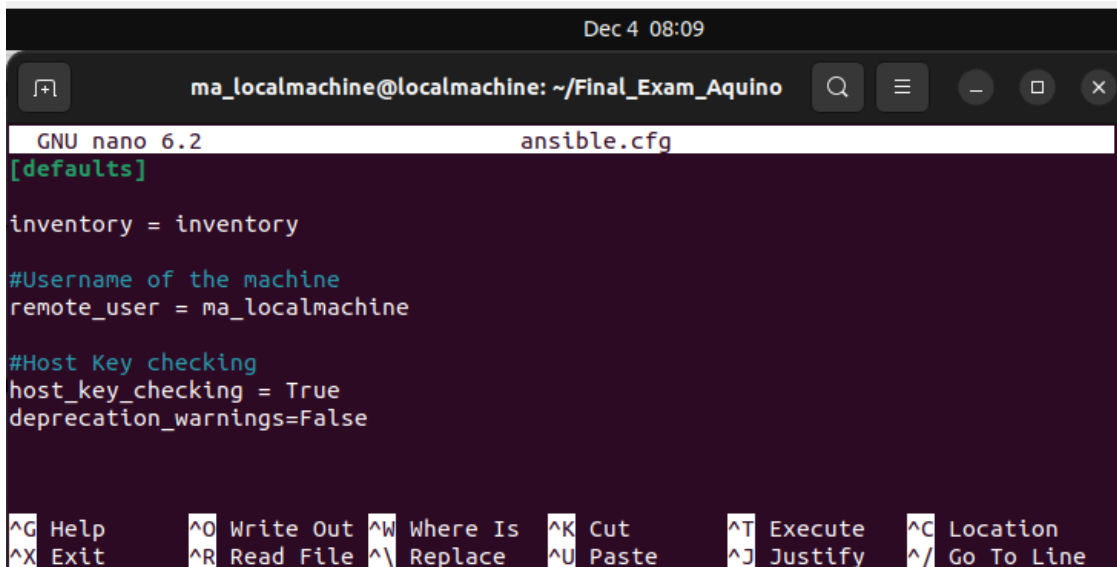


Figure 2: Final_Exam_Aquino repository was created.



```
Dec 4 08:05
ma_localmachine@localmachine: ~
ma_localmachine@localmachine:~$ git clone git@github.com:CPE232-MarkAngelo/Final_Exam_Aquino.git
Cloning into 'Final_Exam_Aquino'...
remote: Enumerating objects: 3, done.
remote: Counting objects: 100% (3/3), done.
remote: Total 3 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
Receiving objects: 100% (3/3), done.
```

Figure 3: Final_Exam_Aquino repository was clone using the command “git clone”



```
Dec 4 08:09
ma_localmachine@localmachine: ~/Final_Exam_Aquino
GNU nano 6.2 ansible.cfg
[defaults]

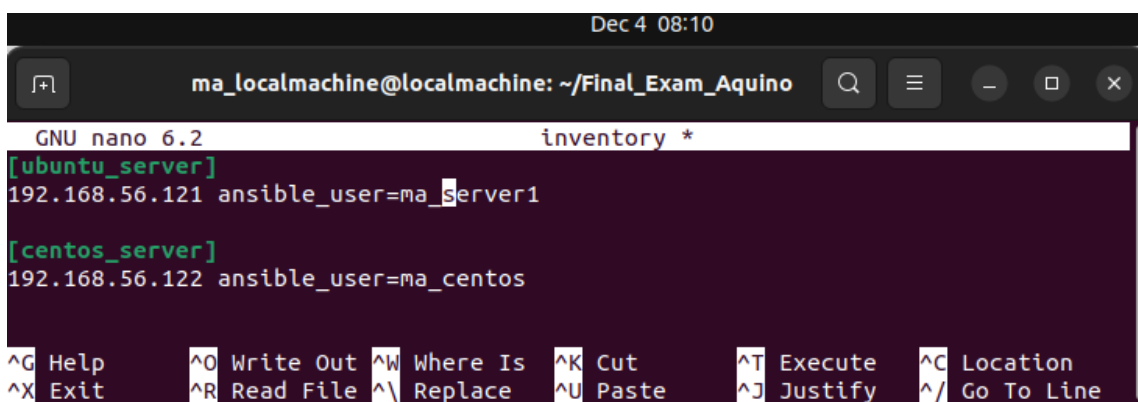
inventory = inventory

#Username of the machine
remote_user = ma_localmachine

#Host Key checking
host_key_checking = True
deprecation_warnings=False

^G Help      ^O Write Out ^W Where Is  ^K Cut       ^T Execute   ^C Location
^X Exit      ^R Read File ^\ Replace   ^U Paste     ^J Justify   ^_ Go To Line
```

Figure 4: Creating a ansible.cfg.

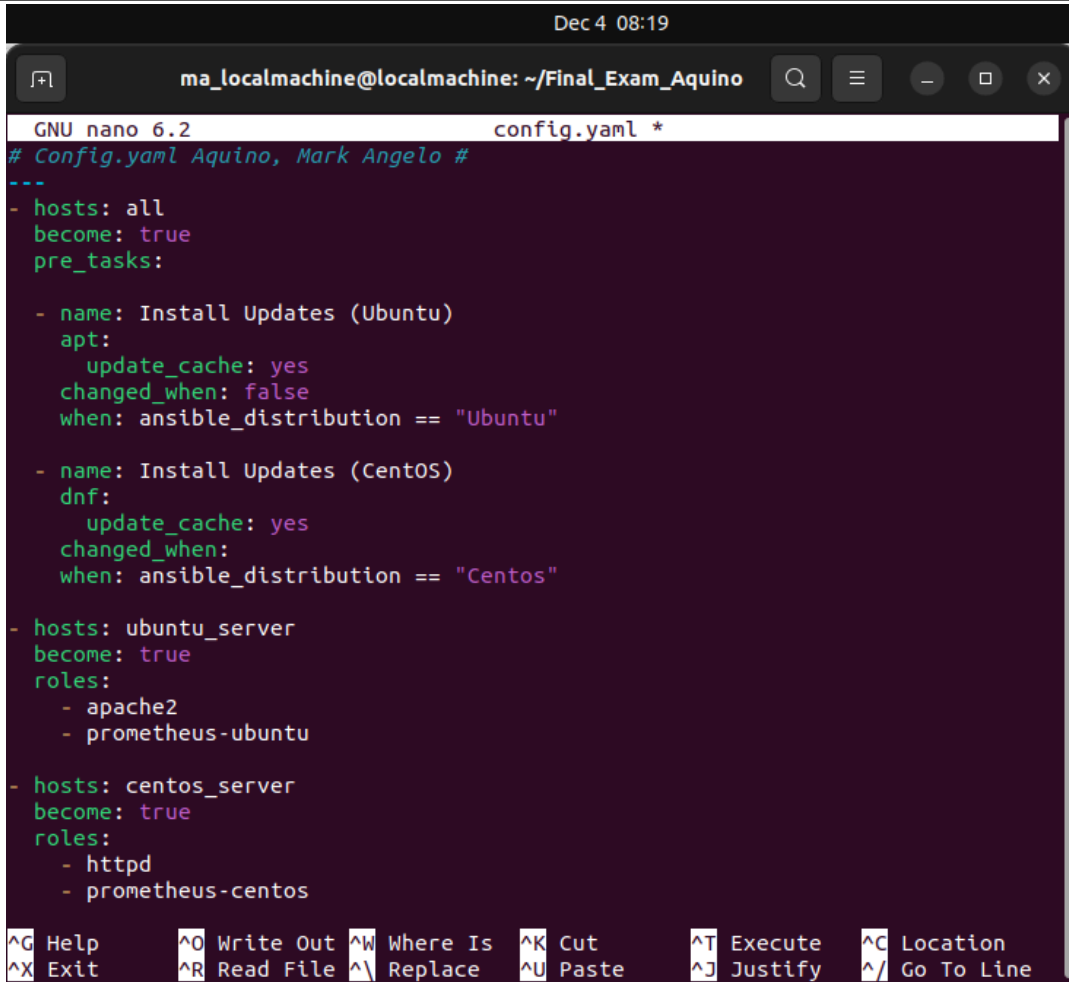


```
Dec 4 08:10
ma_localmachine@localmachine: ~/Final_Exam_Aquino
GNU nano 6.2 inventory *
[ubuntu_server]
192.168.56.121 ansible_user=ma_server1

[centos_server]
192.168.56.122 ansible_user=ma_centos

^G Help      ^O Write Out ^W Where Is  ^K Cut       ^T Execute   ^C Location
^X Exit      ^R Read File ^\ Replace   ^U Paste     ^J Justify   ^_ Go To Line
```

Figure 5: Creating inventory file where Ubuntu server and CentOS server IP address is located.



```
Dec 4 08:19
ma_localmachine@localmachine: ~/Final_Exam_Aquino
GNU nano 6.2 config.yaml *
# Config.yaml Aquino, Mark Angelo #
---
- hosts: all
  become: true
  pre_tasks:

  - name: Install Updates (Ubuntu)
    apt:
      update_cache: yes
      changed_when: false
      when: ansible_distribution == "Ubuntu"

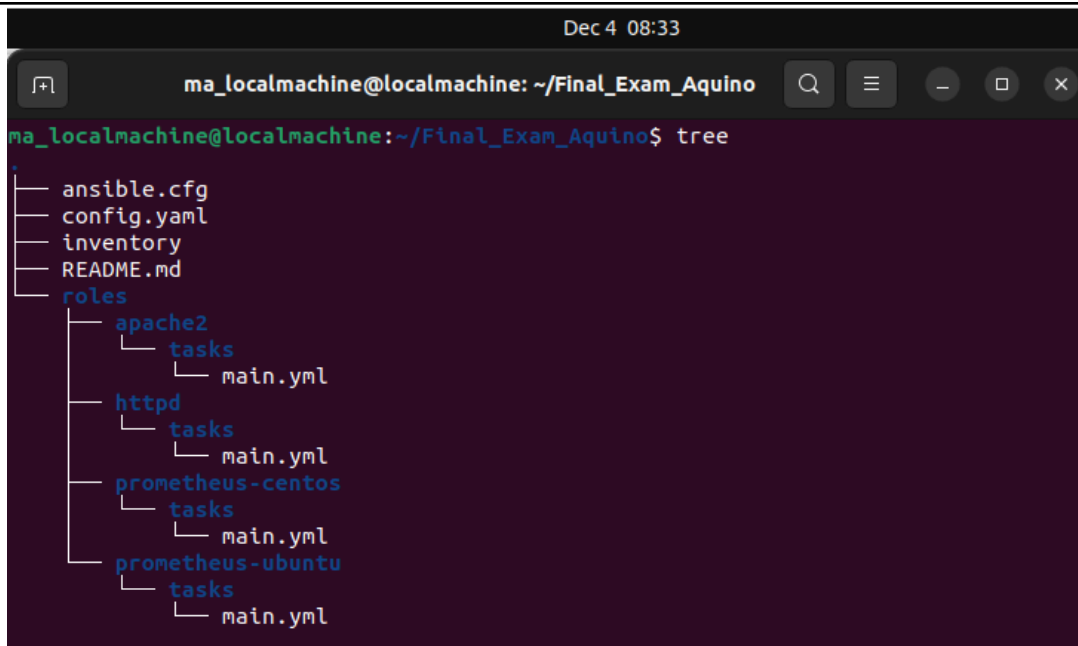
  - name: Install Updates (CentOS)
    dnf:
      update_cache: yes
      changed_when:
      when: ansible_distribution == "Centos"

- hosts: ubuntu_server
  become: true
  roles:
    - apache2
    - prometheus-ubuntu

- hosts: centos_server
  become: true
  roles:
    - httpd
    - prometheus-centos

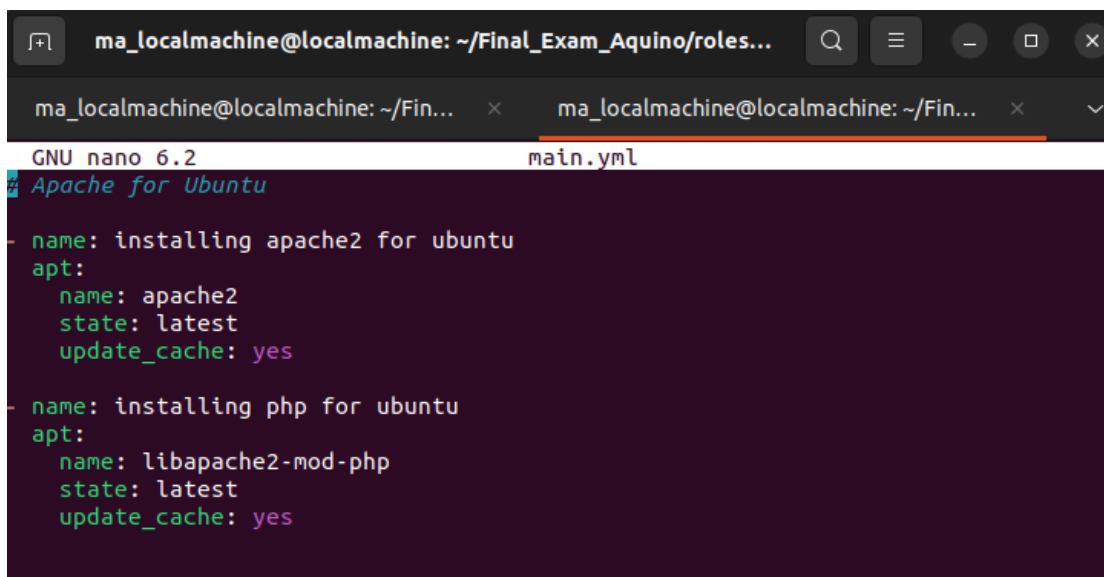
^G Help      ^O Write Out ^W Where Is  ^K Cut       ^T Execute  ^C Location
^X Exit      ^R Read File ^\ Replace   ^U Paste     ^J Justify  ^_ Go To Line
```

Figure 6: Creating a **config.yaml** for calling installations of tasks in Ubuntu and CentOS.



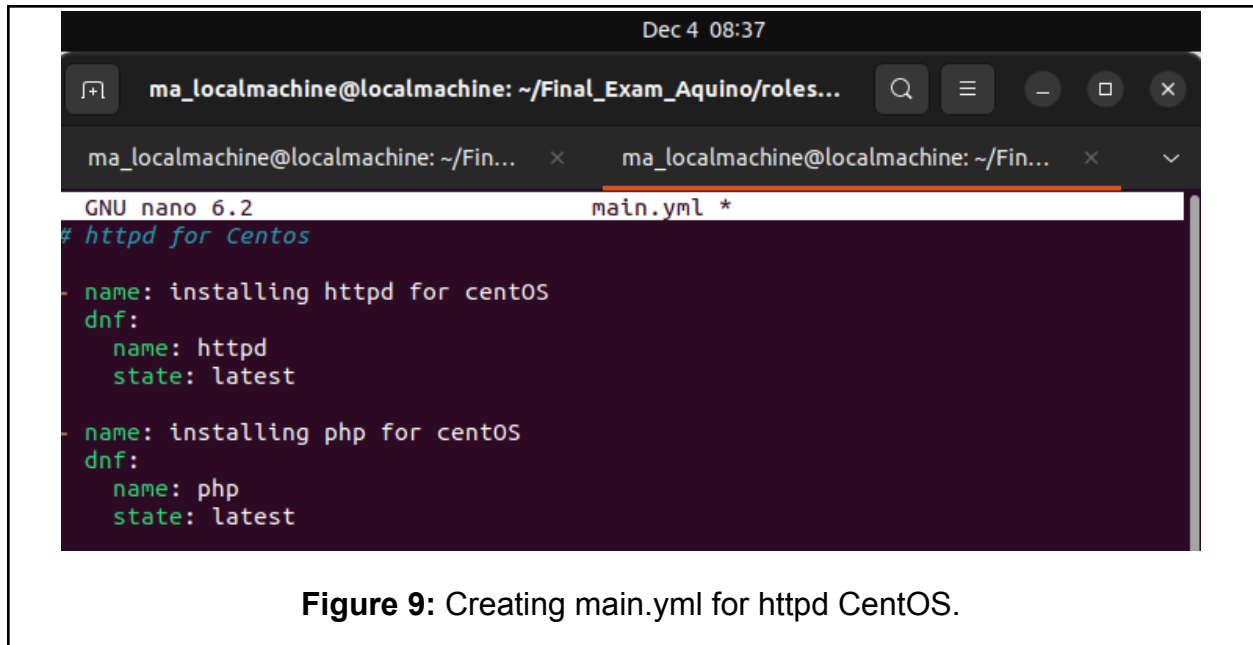
```
Dec 4 08:33
ma_localmachine@localmachine: ~/Final_Exam_Aquino
ma_localmachine@localmachine:~/Final_Exam_Aquino$ tree
.
├── ansible.cfg
├── config.yaml
├── inventory
├── README.md
├── roles
│   ├── apache2
│   │   └── tasks
│   │       └── main.yml
│   ├── httpd
│   │   └── tasks
│   │       └── main.yml
│   ├── prometheus-centos
│   │   └── tasks
│   │       └── main.yml
│   └── prometheus-ubuntu
│       └── tasks
│           └── main.yml
```

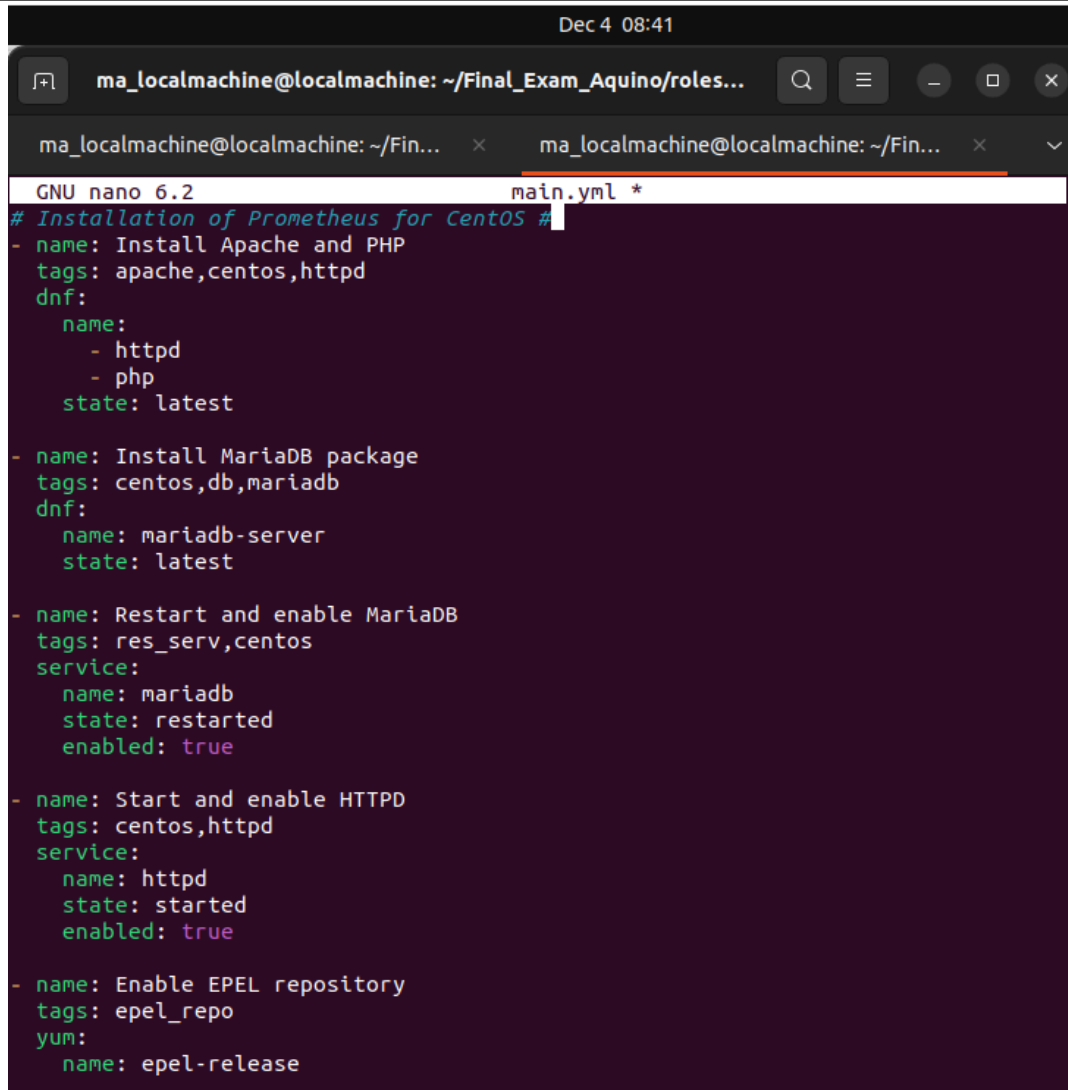
Figure 7: Commanding “tree” to show all directory paths.



```
ma_localmachine@localmachine: ~/Final_Exam_Aquino/roles...
ma_localmachine@localmachine: ~/Fin... x ma_localmachine@localmachine: ~/Fin... x
GNU nano 6.2 main.yml
Apache for Ubuntu
- name: installing apache2 for ubuntu
  apt:
    name: apache2
    state: latest
    update_cache: yes
- name: installing php for ubuntu
  apt:
    name: libapache2-mod-php
    state: latest
    update_cache: yes
```

Figure 8: Creating main.yml for Apache Ubuntu.





```
Dec 4 08:41
ma_localmachine@localmachine: ~/Final_Exam_Aquino/roles...
ma_localmachine@localmachine: ~/Fin... x ma_localmachine@localmachine: ~/Fin... x v
GNU nano 6.2 main.yml *
# Installation of Prometheus for CentOS #
- name: Install Apache and PHP
  tags: apache,centos,httpd
  dnf:
    name:
      - httpd
      - php
    state: latest

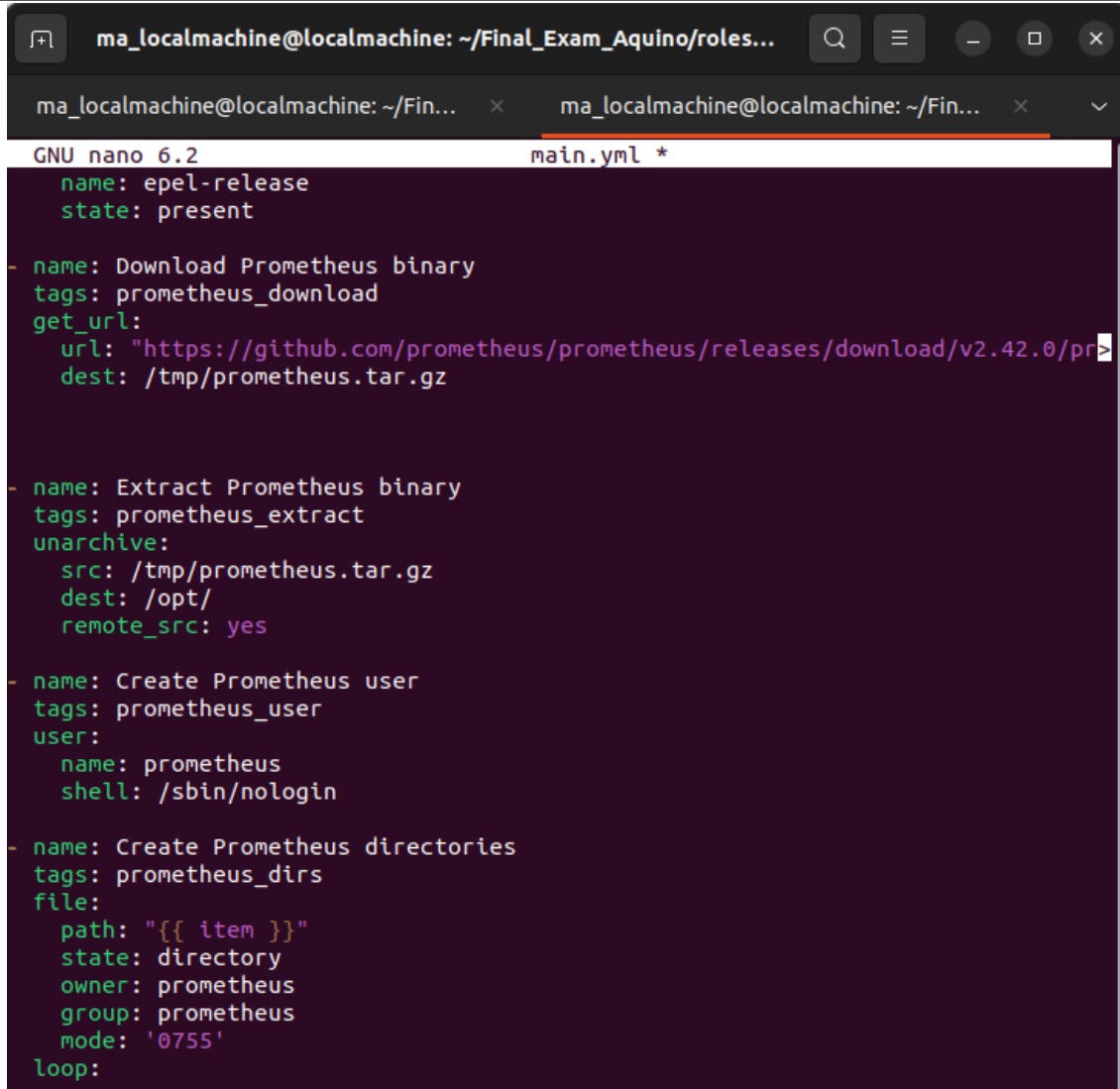
- name: Install MariaDB package
  tags: centos,db,mariadb
  dnf:
    name: mariadb-server
    state: latest

- name: Restart and enable MariaDB
  tags: res_serv,centos
  service:
    name: mariadb
    state: restarted
    enabled: true

- name: Start and enable HTTPD
  tags: centos,httpd
  service:
    name: httpd
    state: started
    enabled: true

- name: Enable EPEL repository
  tags: epel_repo
  yum:
    name: epel-release
```

Figure 10: Creating main.yml for installation of Prometheus and required tasks for CentOS.



The image shows a terminal window with a dark background. At the top, the window title is 'ma_localmachine@localmachine: ~/Final_Exam_Aquino/roles...'. Below the title bar, there are two tabs: 'ma_localmachine@localmachine: ~/Fin...' and 'ma_localmachine@localmachine: ~/Fin...'. The main content area shows the GNU nano 6.2 editor editing a file named 'main.yml'. The file contains a list of tasks for installing Prometheus on CentOS. The tasks are: 1. 'name: epel-release' with 'state: present'. 2. 'name: Download Prometheus binary' with 'tags: prometheus_download', 'get_url' (url: 'https://github.com/prometheus/prometheus/releases/download/v2.42.0/pr', dest: '/tmp/prometheus.tar.gz'). 3. 'name: Extract Prometheus binary' with 'tags: prometheus_extract', 'unarchive' (src: '/tmp/prometheus.tar.gz', dest: '/opt/', remote_src: 'yes'). 4. 'name: Create Prometheus user' with 'tags: prometheus_user', 'user' (name: 'prometheus', shell: '/sbin/nologin'). 5. 'name: Create Prometheus directories' with 'tags: prometheus_dirs', 'file' (path: '{{ item }}', state: 'directory', owner: 'prometheus', group: 'prometheus', mode: '0755'), and a 'loop' block.

```
GNU nano 6.2 main.yml *
name: epel-release
state: present

- name: Download Prometheus binary
tags: prometheus_download
get_url:
url: "https://github.com/prometheus/prometheus/releases/download/v2.42.0/pr
dest: /tmp/prometheus.tar.gz

- name: Extract Prometheus binary
tags: prometheus_extract
unarchive:
src: /tmp/prometheus.tar.gz
dest: /opt/
remote_src: yes

- name: Create Prometheus user
tags: prometheus_user
user:
name: prometheus
shell: /sbin/nologin

- name: Create Prometheus directories
tags: prometheus_dirs
file:
path: "{{ item }}"
state: directory
owner: prometheus
group: prometheus
mode: '0755'
loop:
```

Figure 11: Creating main.yml for installation of Prometheus and required tasks for CentOS. (Part 2)


```
ma_localmachine@localmachine: ~/Final_Exam_Aquino/roles...
ma_localmachine@localmachine: ~/Fin... x ma_localmachine@localmachine: ~/Fin... x v
GNU nano 6.2 main.yml *
loop:
  - /etc/prometheus
  - /var/lib/prometheus

name: Create Prometheus systemd service
tags: prometheus_service
copy:
  dest: /etc/systemd/system/prometheus.service
  content: |
    [Unit]
    Description=Prometheus
    Wants=network-online.target
    After=network-online.target

    [Service]
    User=prometheus
    Group=prometheus
    ExecStart=/opt/prometheus-2.42.0.linux-amd64/prometheus \
      --config.file=/etc/prometheus/prometheus.yml \
      --storage.tsdb.path=/var/lib/prometheus \
      --web.listen-address=0.0.0.0:9090

    [Install]
    WantedBy=multi-user.target

name: Reload systemd daemon
tags: prometheus_systemd_reload
systemd:
  daemon_reload: yes

name: Start and enable Prometheus
tags: prometheus_start
service:
```

Figure 12: Creating main.yml for installation of Prometheus and required tasks for CentOS. (Part 3)

```
- name: Start and enable Prometheus
tags: prometheus_start
service:
  name: prometheus
  state: started
  enabled: true

- name: Open firewall port 9090 for Prometheus
tags: open_firewall
firewalld:
  port: 9090/tcp
  permanent: true
  state: enabled

- name: Restart firewalld to apply changes
tags: rest_fireeld
systemd:
  name: firewalld
  state: restarted
  enabled: true
```










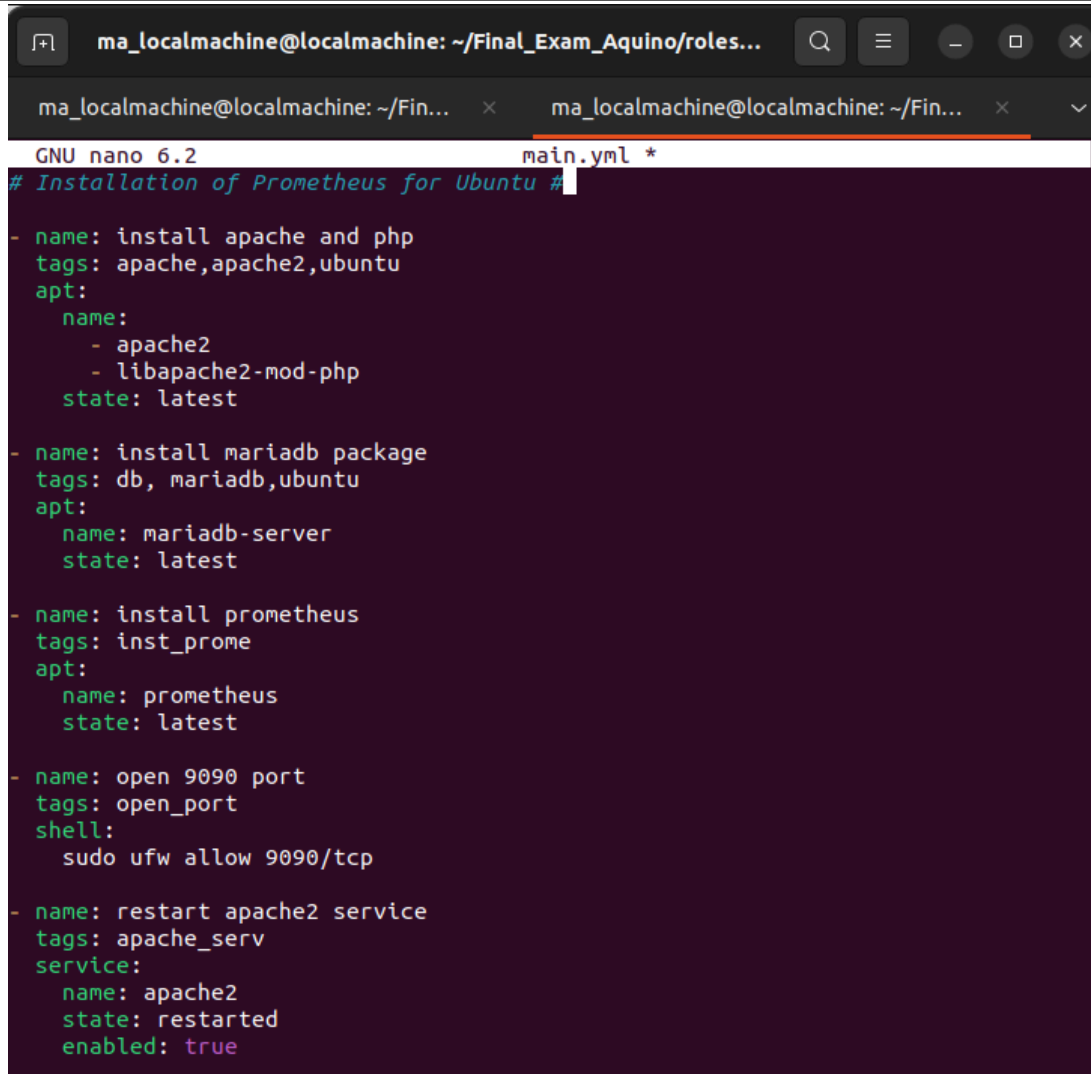
 Help	 Write Out	 Where Is	 Cut	 Execute	 Location
 Exit	 Read File	 Replace	 Paste	 Justify	 Go To Line

Figure 13: Creating main.yml for installation of Prometheus and required tasks for CentOS. (Last part)



```
ma_localmachine@localmachine: ~/Final_Exam_Aquino/roles...
ma_localmachine@localmachine: ~/Fin... x ma_localmachine@localmachine: ~/Fin... x
GNU nano 6.2 main.yml *
# Installation of Prometheus for Ubuntu #

- name: install apache and php
  tags: apache,apache2,ubuntu
  apt:
    name:
      - apache2
      - libapache2-mod-php
    state: latest

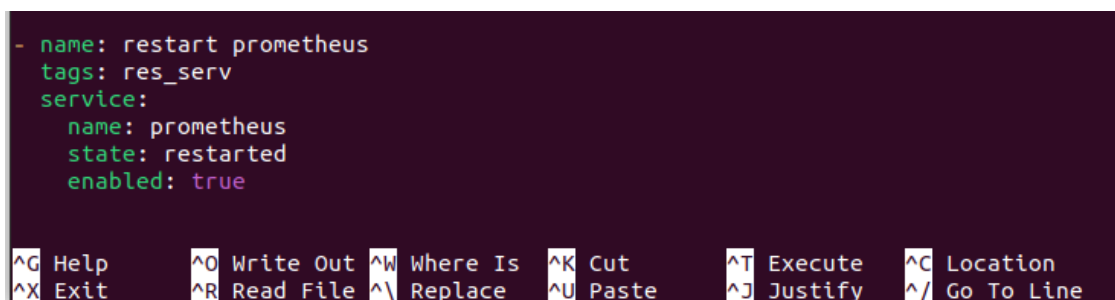
- name: install mariadb package
  tags: db, mariadb,ubuntu
  apt:
    name: mariadb-server
    state: latest

- name: install prometheus
  tags: inst_prome
  apt:
    name: prometheus
    state: latest

- name: open 9090 port
  tags: open_port
  shell:
    sudo ufw allow 9090/tcp

- name: restart apache2 service
  tags: apache_serv
  service:
    name: apache2
    state: restarted
    enabled: true
```

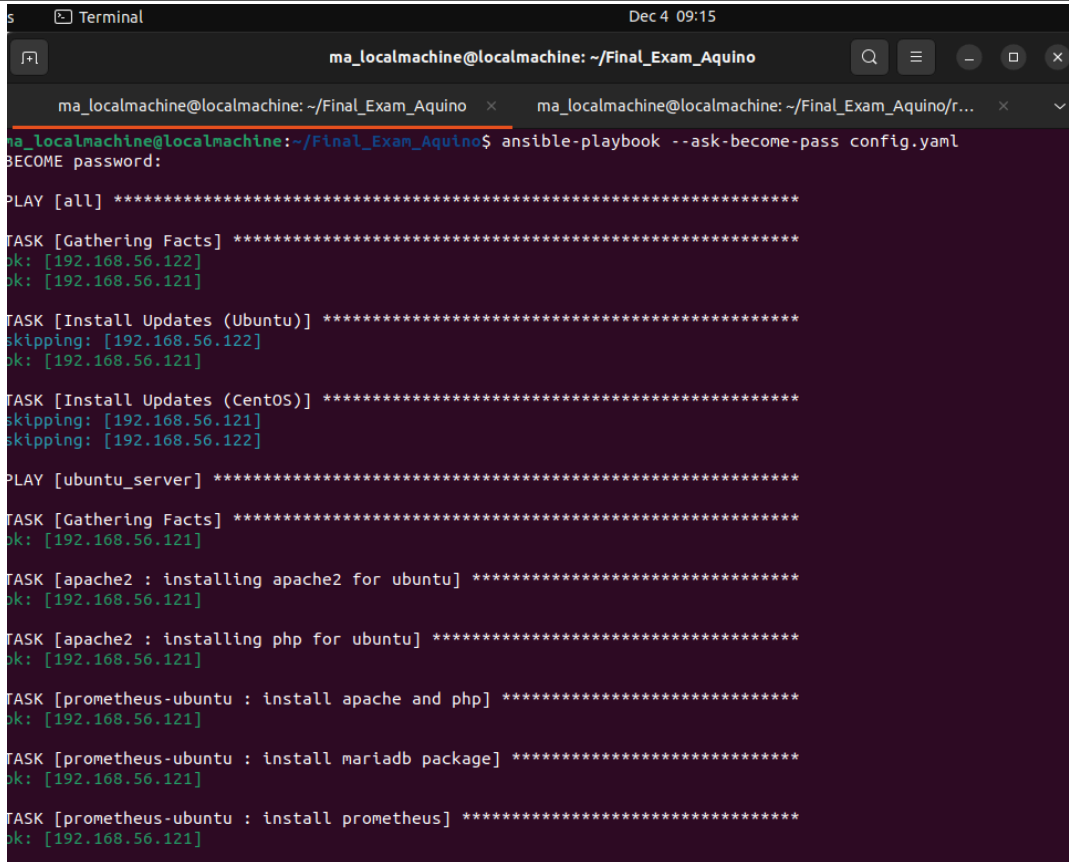
Figure 14: Creating main.yml for installation of Prometheus and required tasks for Ubuntu.



```
- name: restart prometheus
  tags: res_serv
  service:
    name: prometheus
    state: restarted
    enabled: true
```

^G Help ^O Write Out ^W Where Is ^K Cut ^T Execute ^C Location
^X Exit ^R Read File ^\ Replace ^U Paste ^J Justify ^_ Go To Line

Figure 15: Creating main.yml for installation of Prometheus and required tasks for Ubuntu. (Last part)

A terminal window titled "Terminal" with a timestamp "Dec 4 09:15". The window shows a user "ma_localmachine@localmachine" in the directory "~/Final_Exam_Aquino". The user has executed the command "ansible-playbook --ask-become-pass config.yaml". The output shows the playbook running on "all" hosts. It starts with a "Gathering Facts" task, followed by "Install Updates (Ubuntu)" and "Install Updates (CentOS)" tasks, both of which are skipped. Then, it runs a "PLAY [ubuntu_server]" block. This block contains several tasks: "Gathering Facts", "apache2 : installing apache2 for ubuntu", "apache2 : installing php for ubuntu", "prometheus-ubuntu : install apache and php", "prometheus-ubuntu : install mariadb package", and "prometheus-ubuntu : install prometheus". Each task is shown with its status and the IP address "192.168.56.121".

```
ma_localmachine@localmachine: ~/Final_Exam_Aquino
ma_localmachine@localmachine: ~/Final_Exam_Aquino$ ansible-playbook --ask-become-pass config.yaml
BECOME password:

PLAY [all] *****

TASK [Gathering Facts] *****
ok: [192.168.56.122]
ok: [192.168.56.121]

TASK [Install Updates (Ubuntu)] *****
skipping: [192.168.56.122]
ok: [192.168.56.121]

TASK [Install Updates (CentOS)] *****
skipping: [192.168.56.121]
skipping: [192.168.56.122]

PLAY [ubuntu_server] *****

TASK [Gathering Facts] *****
ok: [192.168.56.121]

TASK [apache2 : installing apache2 for ubuntu] *****
ok: [192.168.56.121]

TASK [apache2 : installing php for ubuntu] *****
ok: [192.168.56.121]

TASK [prometheus-ubuntu : install apache and php] *****
ok: [192.168.56.121]

TASK [prometheus-ubuntu : install mariadb package] *****
ok: [192.168.56.121]

TASK [prometheus-ubuntu : install prometheus] *****
ok: [192.168.56.121]
```

Figure 16 : Commanding “ansible-playbook –ask-become-pass config.yaml” to begin installation.

```
es Terminal Dec 4 09:16
ma_localmachine@localmachine: ~/Final_Exam_Aquino
ma_localmachine@localmachine: ~/Final_Exam_Aquino x ma_localmachine@localmachine: ~/Final_Exam_Aquino/r... x v
ok: [192.168.56.121]
TASK [prometheus-ubuntu : install prometheus] *****
ok: [192.168.56.121]
TASK [prometheus-ubuntu : open 9090 port] *****
[WARNING]: Consider using 'become', 'become_method', and 'become_user' rather
than running sudo
changed: [192.168.56.121]
TASK [prometheus-ubuntu : restart apache2 service] *****
changed: [192.168.56.121]
TASK [prometheus-ubuntu : restart prometheus] *****
changed: [192.168.56.121]
PLAY [centos_server] *****
TASK [Gathering Facts] *****
ok: [192.168.56.122]
TASK [httpd : installing httpd for centOS] *****
ok: [192.168.56.122]
TASK [httpd : installing php for centOS] *****
ok: [192.168.56.122]
TASK [prometheus-centos : Install Apache and PHP] *****
ok: [192.168.56.122]
TASK [prometheus-centos : Install MariaDB package] *****
ok: [192.168.56.122]
TASK [prometheus-centos : Restart and enable MariaDB] *****
changed: [192.168.56.122]
TASK [prometheus-centos : Start and enable HTTPD] *****
```

Figure 17 : Commanding “ansible-playbook –ask-become-pass config.yaml” to begin installation. (progress installation part 2)

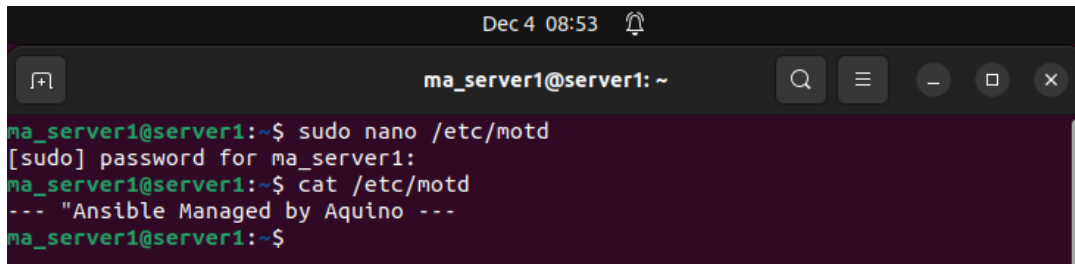
```
es Terminal Dec 4 09:16
ma_localmachine@localmachine: ~/Final_Exam_Aquino
ma_localmachine@localmachine: ~/Final_Exam_Aquino x ma_localmachine@localmachine: ~/Final_Exam_Aquino/r... x v
TASK [prometheus-centos : Start and enable HTTPD] *****
ok: [192.168.56.122]
TASK [prometheus-centos : Enable EPEL repository] *****
ok: [192.168.56.122]
TASK [prometheus-centos : Download Prometheus binary] *****
changed: [192.168.56.122]
TASK [prometheus-centos : Extract Prometheus binary] *****
changed: [192.168.56.122]
TASK [prometheus-centos : Create Prometheus user] *****
changed: [192.168.56.122]
TASK [prometheus-centos : Create Prometheus directories] *****
changed: [192.168.56.122] => (item=/etc/prometheus)
changed: [192.168.56.122] => (item=/var/lib/prometheus)
TASK [prometheus-centos : Create Prometheus systemd service] *****
changed: [192.168.56.122]
TASK [prometheus-centos : Reload systemd daemon] *****
ok: [192.168.56.122]
TASK [prometheus-centos : Start and enable Prometheus] *****
ok: [192.168.56.122]
TASK [prometheus-centos : Open firewall port 9090 for Prometheus] *****
changed: [192.168.56.122]
TASK [prometheus-centos : Restart firewalld to apply changes] *****
changed: [192.168.56.122]
PLAY RECAP *****
192.168.56.121 : ok=11 changed=3 unreachable=0 failed=0 skipped=1 rescued=0 ig
nored=0
192.168.56.122 : ok=11 changed=3 unreachable=0 failed=0 skipped=1 rescued=0 ig
nored=0
```

Figure 18 : Commanding “ansible-playbook –ask-become-pass config.yaml” to begin installation. (progress installation part 2)

```
es Terminal Dec 4 09:17
ma_localmachine@localmachine: ~/Final_Exam_Aquino
ma_localmachine@localmachine: ~/Final_Exam_Aquino x ma_localmachine@localmachine: ~/Final_Exam_Aquino/r... x v
TASK [prometheus-centos : Restart firewalld to apply changes] *****
changed: [192.168.56.122]
PLAY RECAP *****
192.168.56.121 : ok=11 changed=3 unreachable=0 failed=0 skipped=1 rescued=0 ig
nored=0
192.168.56.122 : ok=18 changed=8 unreachable=0 failed=0 skipped=2 rescued=0 ig
nored=0
ma_localmachine@localmachine: ~/Final_Exam_Aquino$
```

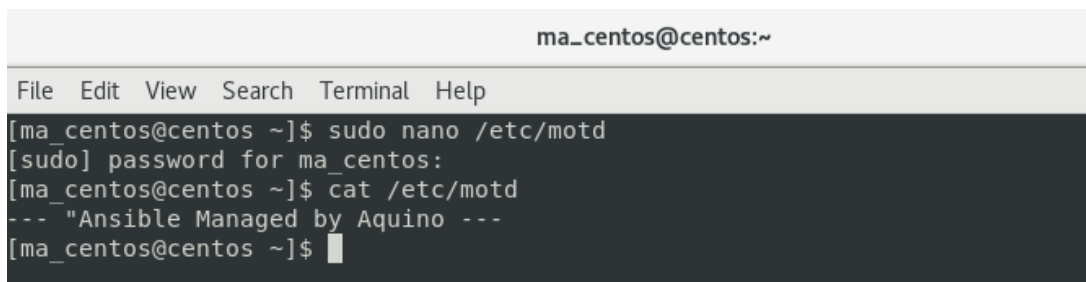
Figure 19 : Commanding “ansible-playbook –ask-become-pass config.yaml” to begin installation. (progress installation last part)

- The playbook successfully installed the required task for Ubuntu and CentOS. No errors was encountered that leads to 11 ok for Ubuntu and 18 ok for CentOS.

A terminal window titled 'ma_server1@server1: ~' with a dark background. The user 'ma_server1' is at the prompt. They run 'sudo nano /etc/motd', enter a password, and then run 'cat /etc/motd'. The output shows the message '--- "Ansible Managed by Aquino ---' on a green background.

```
ma_server1@server1:~$ sudo nano /etc/motd
[sudo] password for ma_server1:
ma_server1@server1:~$ cat /etc/motd
--- "Ansible Managed by Aquino ---
ma_server1@server1:~$
```

Figure 20 : Creating a Motd message “ Ansible Manage by Aquino” on Ubuntu server.

A terminal window titled 'ma_centos@centos:~' with a light background. The user 'ma_centos' is at the prompt. They run 'sudo nano /etc/motd', enter a password, and then run 'cat /etc/motd'. The output shows the message '--- "Ansible Managed by Aquino ---' on a dark background.

```
ma_centos@centos:~$ sudo nano /etc/motd
[sudo] password for ma_centos:
ma_centos@centos:~$ cat /etc/motd
--- "Ansible Managed by Aquino ---
ma_centos@centos:~$
```

Figure 21 : Creating a Motd message “ Ansible Manage by Aquino” on CentOS server.

```
Dec 4 09:01
ma_server1@server1: ~
ma_server1@server1:~$ sudo nano /etc/motd
[sudo] password for ma_server1:
ma_server1@server1:~$ cat /etc/motd
--- "Ansible Managed by Aquino ---"
ma_server1@server1:~$ sudo systemctl status mariadb
● mariadb.service - MariaDB 10.6.18 database server
   Loaded: loaded (/lib/systemd/system/mariadb.service; enabled; vendor prese
   Active: active (running) since Wed 2024-12-04 08:13:36 +08; 47min ago
     Docs: man:mariadb(8)
           https://mariadb.com/kb/en/library/systemd/
   Main PID: 1071 (mariadb)
    Status: "Taking your SQL requests now..."
     Tasks: 8 (limit: 14986)
    Memory: 1.8M
       CPU: 949ms
    CGroup: /system.slice/mariadb.service
            └─1071 /usr/sbin/mariadb

Dec 04 08:13:35 server1 mariadb[1071]: Version: '10.6.18-MariaDB-0ubuntu0.22.0
Dec 04 08:13:36 server1 systemd[1]: Started MariaDB 10.6.18 database server.
Dec 04 08:13:36 server1 /etc/mysql/debian-start[1900]: Upgrading MySQL tables i
Dec 04 08:13:43 server1 /etc/mysql/debian-start[1903]: Looking for 'mariadb' as
Dec 04 08:13:43 server1 /etc/mysql/debian-start[1903]: Looking for 'mariadb-che
Dec 04 08:13:43 server1 /etc/mysql/debian-start[1903]: This installation of Mar
Dec 04 08:13:43 server1 /etc/mysql/debian-start[1903]: There is no need to run
Dec 04 08:13:43 server1 /etc/mysql/debian-start[1903]: You can use --force if y
Dec 04 08:13:43 server1 /etc/mysql/debian-start[2010]: Checking for insecure ro
lines 1-22...skipping...
● mariadb.service - MariaDB 10.6.18 database server
   Loaded: loaded (/lib/systemd/system/mariadb.service; enabled; vendor prese
   Active: active (running) since Wed 2024-12-04 08:13:36 +08; 47min ago
     Docs: man:mariadb(8)
           https://mariadb.com/kb/en/library/systemd/
   Main PID: 1071 (mariadb)
    Status: "Taking your SQL requests now..."
     Tasks: 8 (limit: 14986)
    Memory: 1.8M
       CPU: 949ms
    CGroup: /system.slice/mariadb.service
```

Figure 22 : Mariadb on Ubuntu Server 1.

- The Mariadb was actively running and successfully installed in ma_server1 Ubuntu.


```
Dec 4 09:04
ma_server1@server1: ~
lines 1-23/23 (END)
ma_server1@server1:~$ cat /etc/motd
--- "Ansible Managed by Aquino ---"
ma_server1@server1:~$ sudo systemctl status prometheus
● prometheus.service - Monitoring system and time series database
   Loaded: loaded (/lib/systemd/system/prometheus.service; enabled; vendor pre>
   Active: active (running) since Wed 2024-12-04 08:12:56 +08; 50min ago
     Docs: https://prometheus.io/docs/introduction/overview/
    Main PID: 640 (prometheus)
      Tasks: 9 (limit: 2270)
     Memory: 37.6M
        CPU: 6.649s
    CGroup: /system.slice/prometheus.service
            └─640 /usr/bin/prometheus

Dec 04 08:13:50 server1 prometheus[640]: ts=2024-12-04T00:13:50.438Z caller=head>
Dec 04 08:13:52 server1 prometheus[640]: ts=2024-12-04T00:13:52.904Z caller=comp>
Dec 04 08:13:52 server1 prometheus[640]: ts=2024-12-04T00:13:52.909Z caller=head>
Dec 04 08:13:58 server1 prometheus[640]: ts=2024-12-04T00:13:58.379Z caller=comp>
Dec 04 08:13:58 server1 prometheus[640]: ts=2024-12-04T00:13:58.383Z caller=head>
Dec 04 08:13:58 server1 prometheus[640]: ts=2024-12-04T00:13:58.384Z caller=chec>
Dec 04 08:13:59 server1 prometheus[640]: ts=2024-12-04T00:13:59.070Z caller=db.g>
Dec 04 08:14:06 server1 prometheus[640]: ts=2024-12-04T00:14:06.563Z caller=comp>
Dec 04 08:14:06 server1 prometheus[640]: ts=2024-12-04T00:14:06.960Z caller=db.g>
Dec 04 08:14:07 server1 prometheus[640]: ts=2024-12-04T00:14:07.121Z caller=db.g>
lines 1-22/22 (END)
```

Figure 23 : Prometheus on Ubuntu Server 1.

- The Prometheus was actively running and successfully installed in ma_server1 Ubuntu.



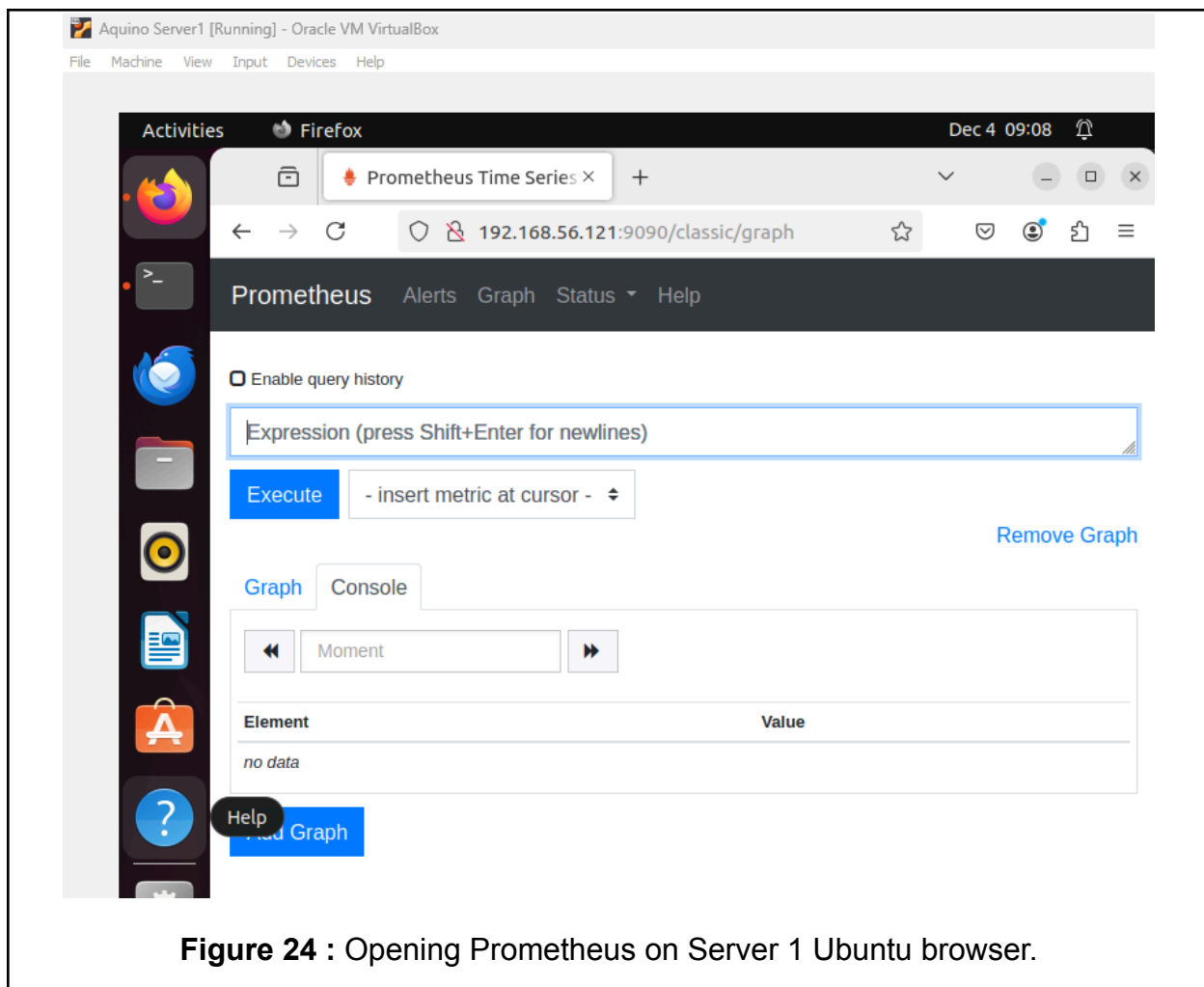


Figure 24 : Opening Prometheus on Server 1 Ubuntu browser.

The screenshot shows a terminal window titled "ma_centos@centos:~" within an Oracle VM VirtualBox environment. The terminal output shows the following commands and results:

```
[ma_centos@centos ~]$ cat /etc/motd
--- "Ansible Managed by Aquino ---"
[ma_centos@centos ~]$ sudo systemctl prometheus
[sudo] password for ma_centos:
[ma_centos@centos ~]$ sudo systemctl status prometheus
[sudo] password for ma_centos:
● prometheus.service - Prometheus
   Loaded: loaded (/etc/systemd/system/prometheus.service; enabled; vendor preset: disabled)
   Active: active (running) since Tue 2024-12-03 19:14:23 EST; 1h 8min ago
 Main PID: 1167 (prometheus)
    Tasks: 8
   CGroup: /system.slice/prometheus.service
           └─1167 /usr/local/bin/prometheus --config.file=/etc/prometheus/prometheus...

Dec 03 19:15:00 centos prometheus[1167]: ts=2024-12-04T00:15:00.251Z caller=head.g...ms
Dec 03 19:15:00 centos prometheus[1167]: ts=2024-12-04T00:15:00.251Z caller=checkp...00
Dec 03 19:15:00 centos prometheus[1167]: ts=2024-12-04T00:15:00.585Z caller=head.g...ms
Dec 03 19:15:02 centos prometheus[1167]: ts=2024-12-04T00:15:02.475Z caller=compac...3s
Dec 03 19:15:02 centos prometheus[1167]: ts=2024-12-04T00:15:02.586Z caller=db.go:...R1
Dec 03 19:15:02 centos prometheus[1167]: ts=2024-12-04T00:15:02.666Z caller=db.go:...85
Dec 03 19:15:03 centos prometheus[1167]: ts=2024-12-04T00:15:03.958Z caller=compac...4s
Dec 03 19:15:04 centos prometheus[1167]: ts=2024-12-04T00:15:04.042Z caller=db.go:...EF
Dec 03 19:15:04 centos prometheus[1167]: ts=2024-12-04T00:15:04.364Z caller=db.go:...KC
Dec 03 20:15:25 centos systemd[1]: Current command vanished from the unit file, e...ed.
Hint: Some lines were ellipsized, use -l to show in full.
```

Figure 25 : Prometheus on CentOS.

- The Prometheus was actively running and successfully installed in ma_centos CentOS.

The screenshot shows a terminal window titled "ma_centos@centos:~" within an Oracle VM VirtualBox environment. The terminal output shows the user running 'cat /etc/motd' and then 'sudo systemctl status httpd'. The output indicates that the httpd.service is active and running. Below the status information, a list of processes is shown, all running /usr/sbin/httpd in the foreground. At the bottom, system logs show the service starting successfully.

```
Hint: Some lines were ellipsized, use -l to show in full.
[ma_centos@centos ~]$ cat /etc/motd
--- "Ansible Managed by Aquino ---"
[ma_centos@centos ~]$ sudo systemctl status httpd
Unit http.service could not be found.
[ma_centos@centos ~]$ sudo systemctl status httpd
● 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 19:14:29 EST; 1h 9min ago
     Docs: man:httpd(8)
           man:apachectl(8)
  Main PID: 1173 (httpd)
    Status: "Total requests: 14; Current requests/sec: 0; Current traffic:  0 B/sec"
     Tasks: 6
    CGroup: /system.slice/httpd.service
            └─1173 /usr/sbin/httpd -DFOREGROUND
              └─1960 /usr/sbin/httpd -DFOREGROUND
                └─1961 /usr/sbin/httpd -DFOREGROUND
                  └─1962 /usr/sbin/httpd -DFOREGROUND
                    └─1963 /usr/sbin/httpd -DFOREGROUND
                      └─1964 /usr/sbin/httpd -DFOREGROUND

Dec 03 19:14:23 centos systemd[1]: Starting The Apache HTTP Server...
Dec 03 19:14:28 centos httpd[1173]: AH00558: httpd: Could not reliably determine ...age
Dec 03 19:14:29 centos systemd[1]: Started The Apache HTTP Server.
```

Figure 26 : Httpd on CentOS.

- The Httpd was actively running and successfully installed in ma_centos CentOS.

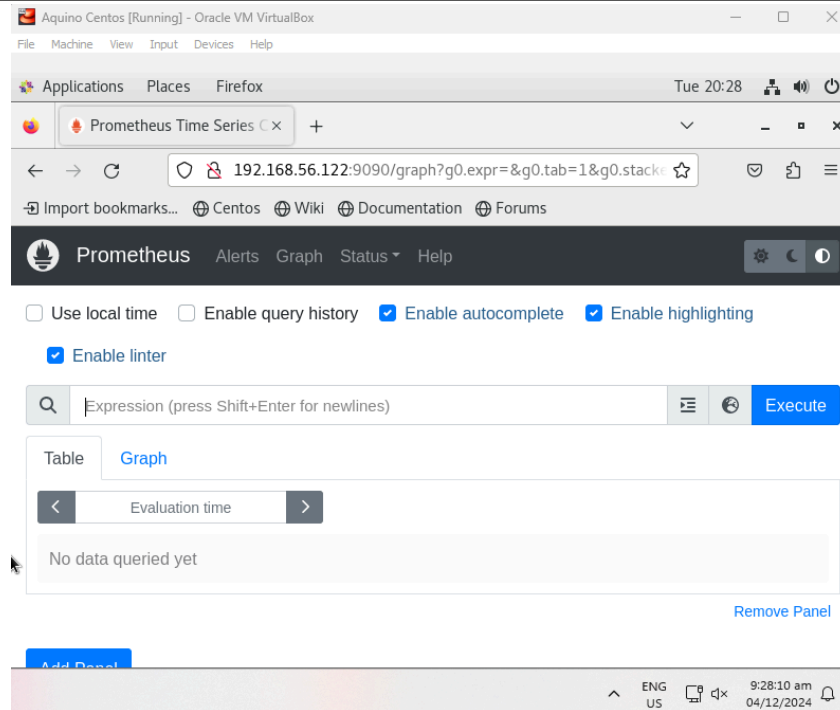


Figure 27 : Opening Prometheus on CentOS browser.

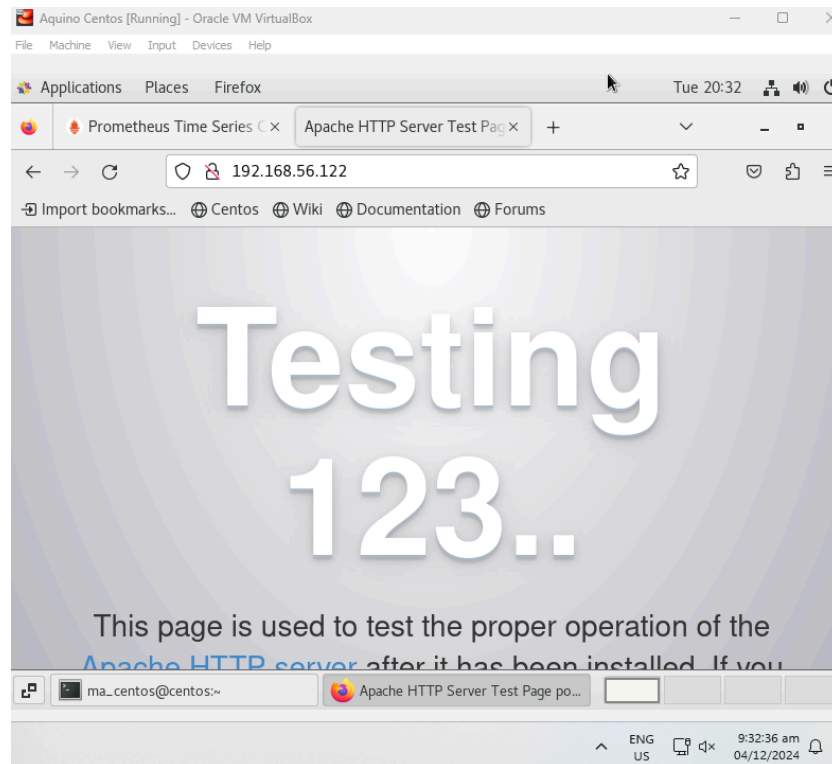


Figure 28 : Testing Httpd on CentOS browser.

```
Aquino LocalMachine [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Activities Dec 4 09:36
ma_localmachine@localmachine: ~/Final_Exam_Aquino
ma_localmachine@localmachine: ~/Final_Exam_Aquino
ma_localmachine@localmachine:~/Final_Exam_Aquino$ ls
ansible.cfg  config.yaml  inventory  README.md  roles
ma_localmachine@localmachine:~/Final_Exam_Aquino$ git add ansible.cfg
ma_localmachine@localmachine:~/Final_Exam_Aquino$ git add config.yaml
Thunderbird Mail 'l' is not a git command. See 'git --help'.
ma_localmachine@localmachine:~/Final_Exam_Aquino$ git add inventory
ma_localmachine@localmachine:~/Final_Exam_Aquino$ git add roles
ma_localmachine@localmachine:~/Final_Exam_Aquino$ git commit -m "Final_Exam_Aquino"
[main 7ae2fa2] Final_Exam_Aquino
7 files changed, 225 insertions(+)
create mode 100644 ansible.cfg
create mode 100644 config.yaml
create mode 100644 inventory
create mode 100644 roles/apache2/tasks/main.yml
create mode 100644 roles/httpd/tasks/main.yml
create mode 100644 roles/prometheus-centos/tasks/main.yml
create mode 100644 roles/prometheus-ubuntu/tasks/main.yml
ma_localmachine@localmachine:~/Final_Exam_Aquino$ git push origin main
Enumerating objects: 19, done.
Counting objects: 100% (19/19), done.
Delta compression using up to 2 threads
Compressing objects: 100% (10/10), done.
Writing objects: 100% (18/18), 2.61 KiB | 2.61 MiB/s, done.
Total 18 (delta 0), reused 0 (delta 0), pack-reused 0
To github.com:CPE232-MarkAngelo/Final_Exam_Aquino.git
8871600..7ae2fa2  main -> main
ma_localmachine@localmachine:~/Final_Exam_Aquino$
```

Figure 29 : Adding, committing, and pushing all directories and files on CPE232-MarkAngelo GitHub account.

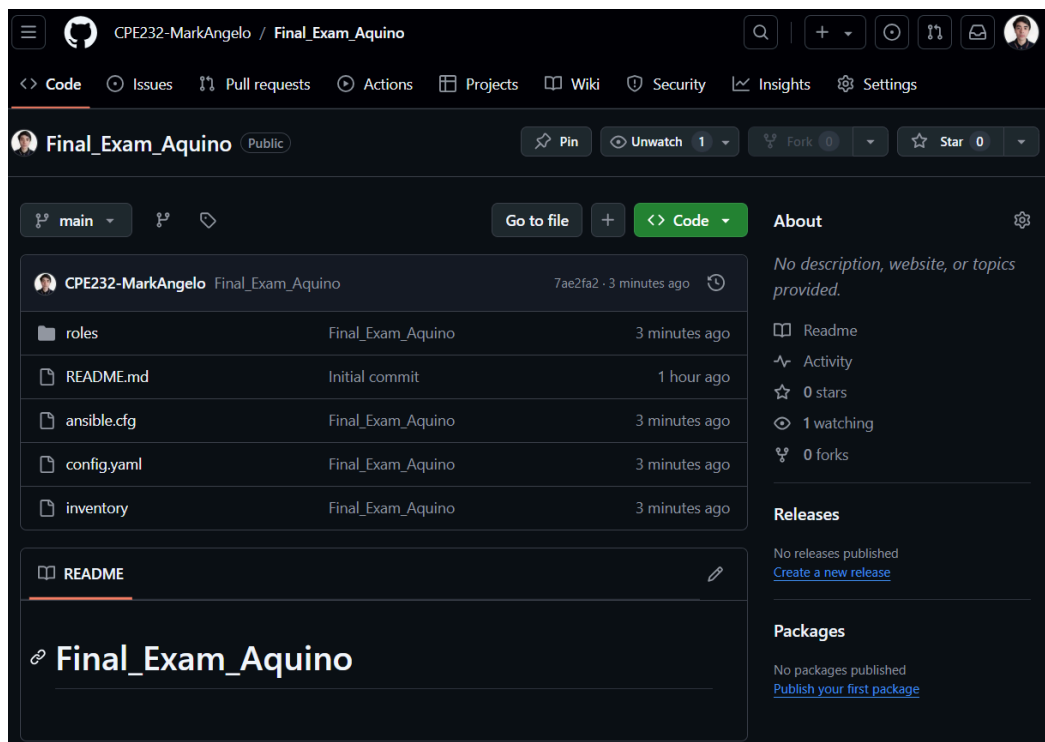


Figure 30 : Final_Exam_Aquino repository was updated.

Conclusion:**Reflections:**

In this Final Exam, I have used MariaDB and Prometheus installation for Ubuntu server which is my ma_server1. For ma_centos of my CentOS server, Httpd and Prometheus were installed. I conclude that I have successfully accomplished the given tasks that were given to us. I have used roles for installation so it will be more manageable to configure and to easily approach whenever some errors happen. In this Final Exam, I have applied all my knowledge that I have remembered during the previous lessons that we have discussed. Implementing an ansible playbook is important to apply especially when installing different applications in many servers. This helps to be more flexible in managing softwares and debugging possible problems that occur. Finally, I have successfully push my updated repository on my GitHub account **CPE232-MarkAngelo**