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Activity 6: Targeting Specific Nodes and Managing Services

1. **Objectives:**

1.1 Individualize hosts

1.2 Apply tags in selecting plays to run

1.3 Managing Services from remote servers using playbooks

2. **Discussion**:

In this activity, we try to individualize hosts. For example, we don't want apache on all our servers, or maybe only one of our servers is a web server, or maybe we have different servers like database or file servers running different things on different categories of servers and that is what we are going to take a look at in this activity.

We also try to manage services that do not automatically run using the automations in playbook. For example, when we install web servers or httpd for CentOS, we notice that the service did not start automatically.

Requirement:

In this activity, you will need to create another Ubuntu VM and name it Server 3. Likewise, you need to activate the second adapter to a host-only adapter after the installations. Take note of the IP address of the Server 3. Make sure to use the command *ssh-copy-id* to copy the public key to Server 3. Verify if you can successfully SSH to Server 3.

Task 1: Targeting Specific Nodes

1. Create a new playbook and named it site.yml. Follow the commands as shown in the image below. Make sure to save the file and exit.

```
---

- hosts: all
  become: true
  tasks:

  - name: install apache and php for Ubuntu servers
    apt:
      name:
        - apache2
        - libapache2-mod-php
      state: latest
      update_cache: yes
    when: ansible_distribution == "Ubuntu"

  - name: install apache and php for CentOS servers
    dnf:
      name:
        - httpd
        - php
      state: latest
    when: ansible_distribution == "CentOS"
```

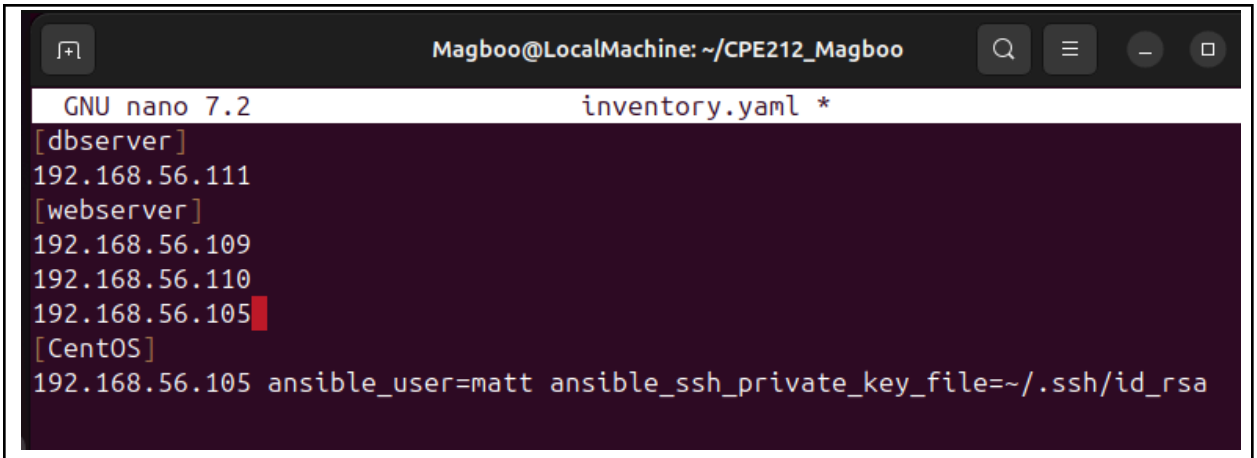
Magboo@LocalMachine: ~/CPE212_Magboo

GNU nano 7.2 site.yml

```
---

- hosts: all
  become: true
  tasks:

  - name: install apache and php for Ubuntu servers
    apt:
      name:
        - apache2
        - libapache2-mod-php
      state: latest
      update_cache: yes
    when: ansible_distribution == "Ubuntu"

  - name: install apache and php for CentOS servers
    dnf:
      name:
        - httpd
        - php
      state: latest
    when: ansible_distribution == "CentOS"
```

2. Edit the inventory file. Remove the variables we put in our last activity and group according to the image shown below:

```
[web_servers]
192.168.56.120
192.168.56.121

[db_servers]
192.168.56.122


[file_servers]
192.168.56.123
```

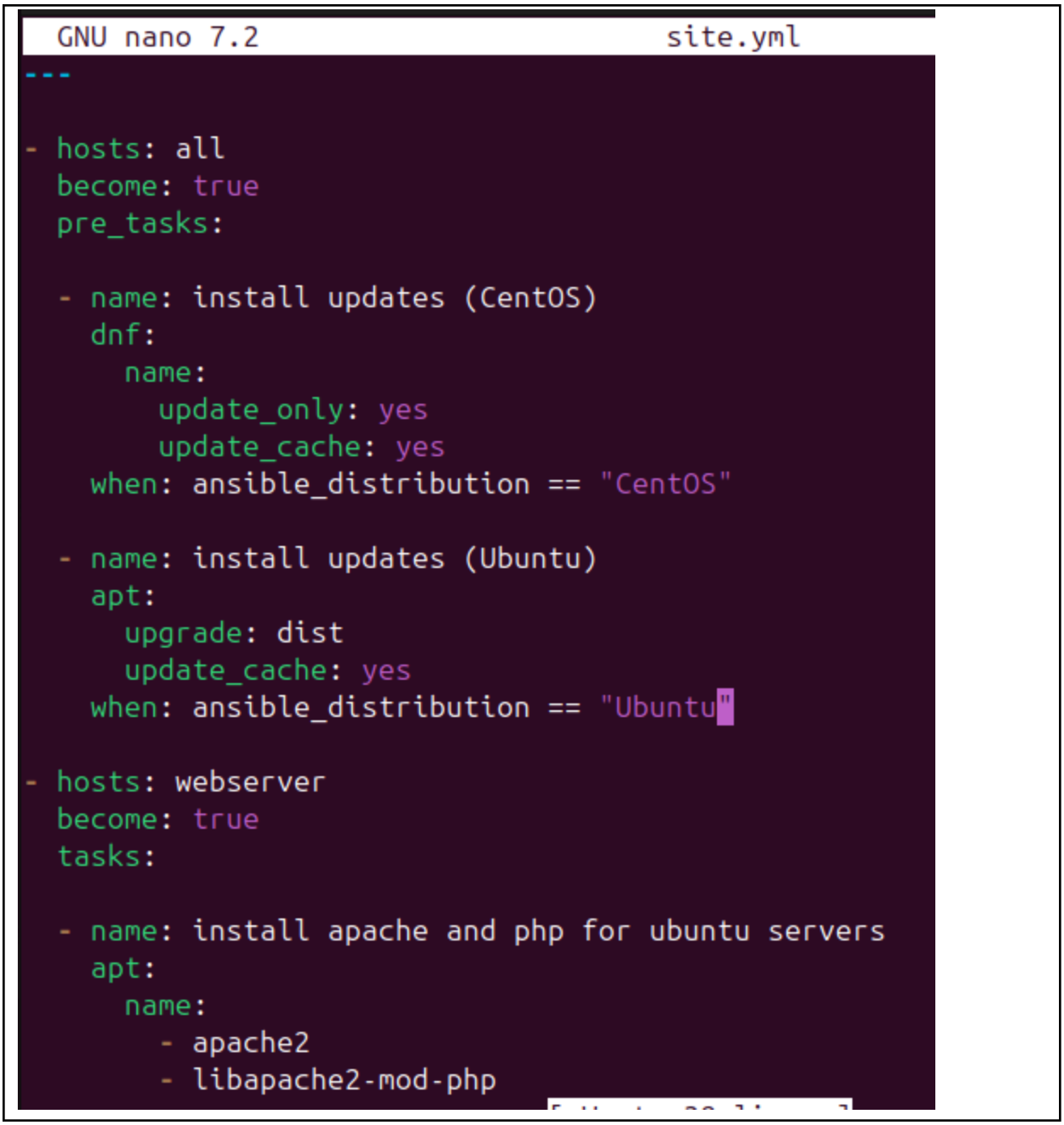


Make sure to save the file and exit.

Right now, we have created groups in our inventory file and put each server in its own group. In other cases, you can have a server be a member of multiple groups, for example you have a test server that is also a web server.

3. Edit the *site.yml* by following the image below:

```
---

- hosts: all
  become: true
  pre_tasks:

  - name: install updates (CentOS)
    dnf:
      update_only: yes
      update_cache: yes
    when: ansible_distribution == "CentOS"

  - name: install updates (Ubuntu)
    apt:
      upgrade: dist
      update_cache: yes
    when: ansible_distribution == "Ubuntu"


- hosts: web_servers
  become: true
  tasks:

  - name: install apache and php for Ubuntu servers
    apt:
      name:
        - apache2
        - libapache2-mod-php
      state: latest
    when: ansible_distribution == "Ubuntu"

  - name: install apache and php for CentOS servers
    dnf:
      name:
        - httpd
        - php
      state: latest
    when: ansible_distribution == "CentOS"
```


GNU nano 7.2 site.yml

- hosts: all
become: true
pre_tasks:
- name: install updates (CentOS)
dnf:
name:
update_only: yes
update_cache: yes
when: ansible_distribution == "CentOS"
- name: install updates (Ubuntu)
apt:
upgrade: dist
update_cache: yes
when: ansible_distribution == "Ubuntu"
- hosts: webserver
become: true
tasks:
- name: install apache and php for ubuntu servers
apt:
name:
- apache2
- libapache2-mod-php

```
    state: latest
  when: ansible_distribution == "Ubuntu"

- name: install apache and php for CentOS servers
  dnf:
    name:
      - httpd
      - php
    state: latest
  when: ansible_distribution == "CentOS"
```

Make sure to save the file and exit.

The *pre-tasks* command tells the ansible to run it before any other thing. In the *pre-tasks*, CentOS will install updates while Ubuntu will upgrade its distribution package. This will run before running the second play, which is targeted at *web_servers*. In the second play, apache and php will be installed on both Ubuntu servers and CentOS servers.

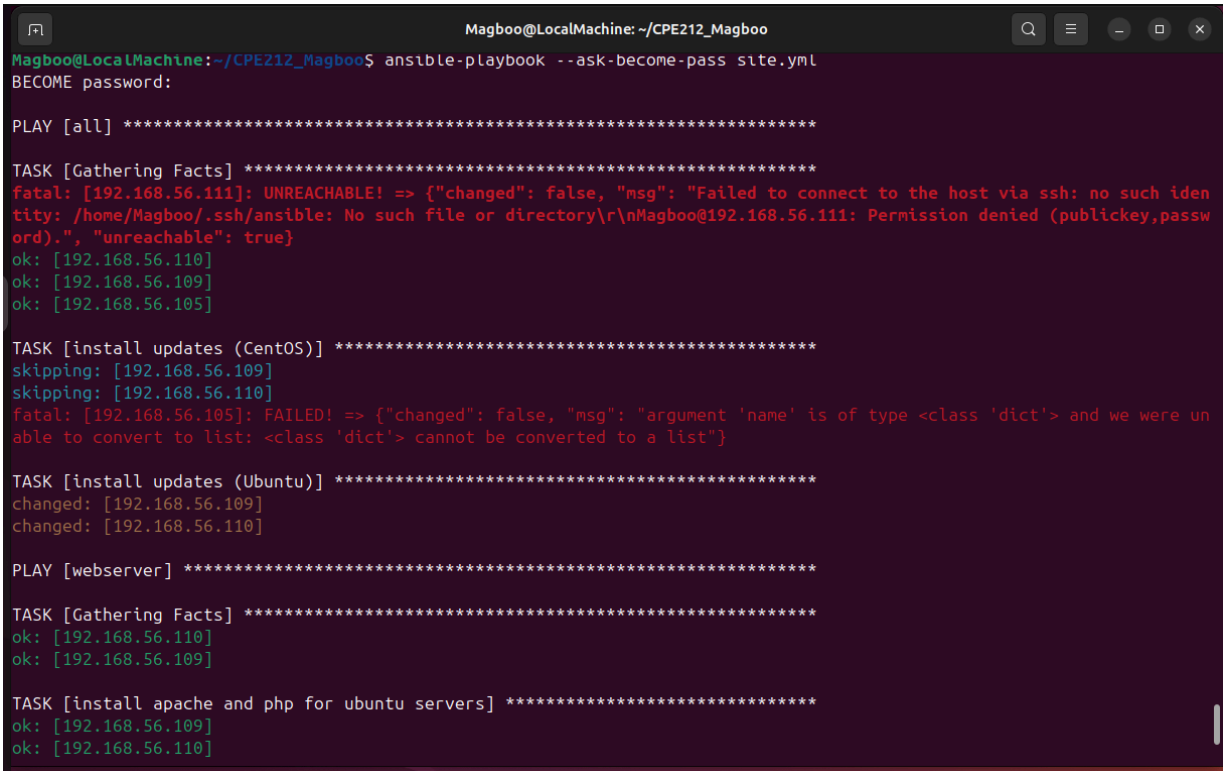
Run the *site.yml* file and describe the result.

4. Let's try to edit again the *site.yml* file. This time, we are going to add plays targeting the other servers. This time we target the *db_servers* by adding it on the current *site.yml*. Below is an example: (Note add this at the end of the playbooks from task 1.3.

```
- hosts: db_servers
  become: true
  tasks:

  - name: install mariadb package (CentOS)
    yum:
      name: mariadb-server
      state: latest
    when: ansible_distribution == "CentOS"

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

  - name: install mariadb packege (Ubuntu)
    apt:
      name: mariadb-server
      state: latest
    when: ansible_distribution == "Ubuntu"
```

Make sure to save the file and exit.

Run the *site.yml* file and describe the result.



```
TASK [install apache and php for CentOS servers] ******************************
skipping: [192.168.56.109]
skipping: [192.168.56.110]

PLAY RECAP ********************************************************************
192.168.56.105             : ok=1    changed=0    unreachable=0    failed=1    skipped=0    rescued=0    ignored=0
192.168.56.109             : ok=4    changed=1    unreachable=0    failed=0    skipped=2    rescued=0    ignored=0
192.168.56.110             : ok=4    changed=1    unreachable=0    failed=0    skipped=2    rescued=0    ignored=0
192.168.56.111             : ok=0    changed=0    unreachable=1    failed=0    skipped=0    rescued=0    ignored=0

Magboo@LocalMachine:~/CPE212_Magboo$ sudo nano site.yml
```

it automatically skipped when the described OS is not what is needed when CentOS package is mentioned it will skip the ubuntu ip and vice versa.

5. Go to the remote server (Ubuntu) terminal that belongs to the db_servers group and check the status for mariadb installation using the command: *systemctl status mariadb.* Do this on the CentOS server also.

```
Magboo@Server1: ~
● mariadb.service - MariaDB 10.11.13 database server
     Loaded: loaded (/usr/lib/systemd/system/mariadb.service; enabled; preset: >
     Active: active (running) since Fri 2025-09-12 08:33:48 UTC; 1h 26min ago
       Docs: man:mariadbd(8)
             https://mariadb.com/kb/en/library/systemd/
   Main PID: 1431 (mariadbd)
     Status: "Taking your SQL requests now..."
      Tasks: 11 (limit: 30380)
     Memory: 109.1M (peak: 113.1M)
        CPU: 1.828s
     CGroup: /system.slice/mariadb.service
             └─1431 /usr/sbin/mariadbd

Sep 12 08:33:47 Server1 mariadbd[1431]: 2025-09-12  8:33:47 0 [Note] Plugin 'FE>
Sep 12 08:33:48 Server1 mariadbd[1431]: 2025-09-12  8:33:48 0 [Warning] You nee>
Sep 12 08:33:48 Server1 mariadbd[1431]: 2025-09-12  8:33:48 0 [Note] InnoDB: Bu>
Sep 12 08:33:48 Server1 mariadbd[1431]: 2025-09-12  8:33:48 0 [Note] Server soc>
Sep 12 08:33:48 Server1 mariadbd[1431]: 2025-09-12  8:33:48 0 [Note] /usr/sbin/>
Sep 12 08:33:48 Server1 mariadbd[1431]: Version: '10.11.13-MariaDB-0ubuntu0.24.>
Sep 12 08:33:48 Server1 systemd[1]: Started mariadb.service - MariaDB 10.11.13 >
Sep 12 08:33:48 Server1 /etc/mysql/debian-start[1590]: Upgrading MariaDB tables>
Sep 12 08:33:48 Server1 /etc/mysql/debian-start[1634]: Checking for insecure ro>
Sep 12 08:33:48 Server1 /etc/mysql/debian-start[1638]: Triggering myisam-recove>
lines 1-23
```

Describe the output.

mariadb is already enabled and running

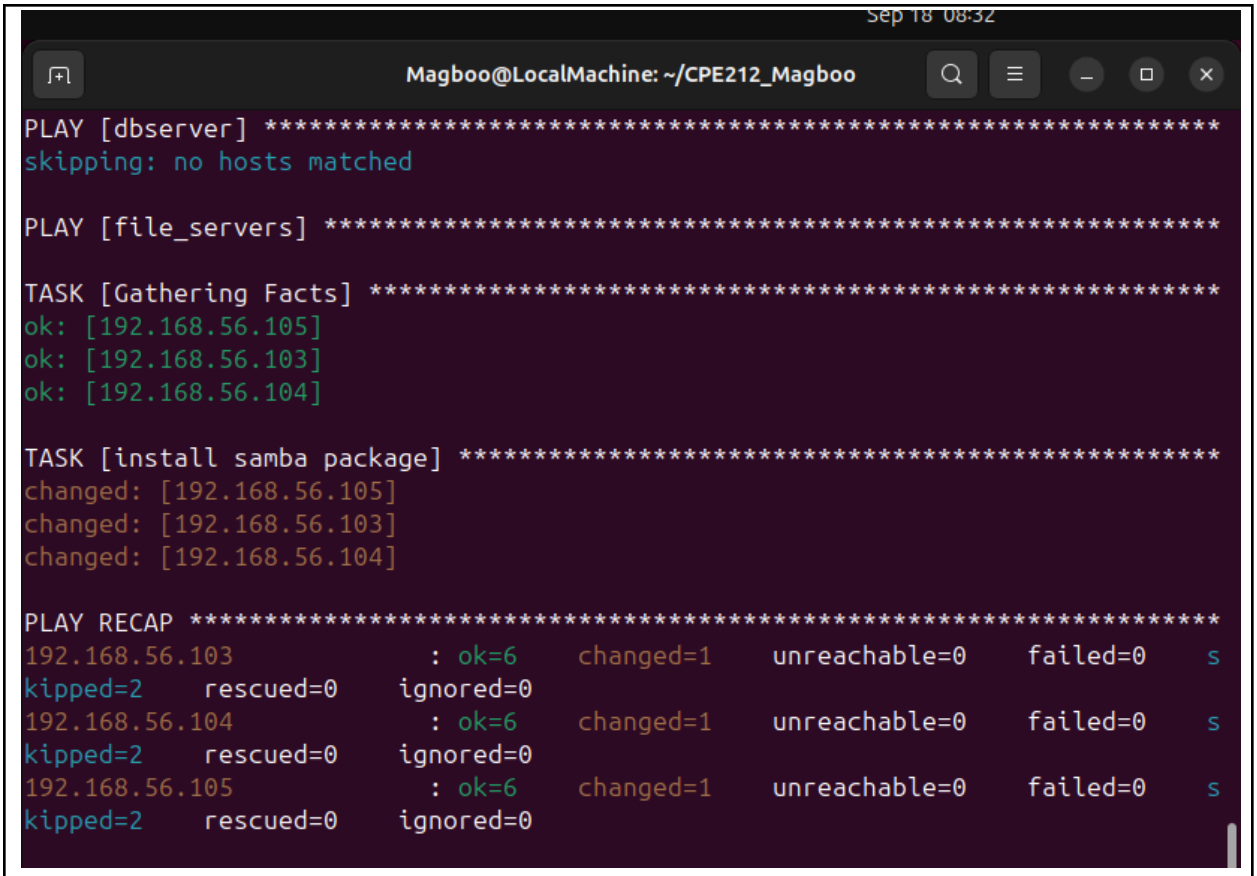
6. Edit the *site.yml* again. This time we will append the code to configure installation on the *file_servers* group. We can add the following on our file.

```
- hosts: file_servers
  become: true
  tasks:

  - name: install samba package
    package:
      name: samba
      state: latest
```

```
- hosts: file_serves
  become: true
  tasks:

  - name: install samba package
    package:
      name: samba
      state: latest
```

Make sure to save the file and exit.

Run the *site.yml* file and describe the result.



The testing of the *file_servers* is beyond the scope of this activity, and as well as our topics and objectives. However, in this activity we were able to show that we can target hosts or servers using grouping in ansible playbooks.

Task 2: Using Tags in running playbooks

In this task, our goal is to add metadata to our plays so that we can only run the plays that we want to run, and not all the plays in our playbook.

1. Edit the *site.yml* file. Add tags to the playbook. After the name, we can place the tags: *name_of_tag*. This is an arbitrary command, which means you can use any name for a tag.

```
---

- hosts: all
  become: true
  pre_tasks:

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

  - name: install updates (Ubuntu)
    tags: always
    apt:
      upgrade: dist
      update_cache: yes
    when: ansible_distribution == "Ubuntu"
```

```
 GNU nano 7.2
---

- hosts: all
  become: true
  pre_tasks:

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

  - name: install updates (Ubuntu)
    tags: always
    apt:
      upgrade: dist
      update_cache: yes
    when: ansible_distribution == "Ubuntu"
```

```
- hosts: web_servers
  become: true
  tasks:

  - name: install apache and php for Ubuntu servers
    tags: apache,apache2,ubuntu
    apt:
      name:
        - apache2
        - libapache2-mod-php
      state: latest
    when: ansible_distribution == "Ubuntu"

  - name: install apache and php for CentOS servers
    tags: apache,centos,httpd
    dnf:
      name:
        - httpd
        - php
      state: latest
    when: ansible_distribution == "CentOS"
```

```
- hosts: webserver
  become: true
  tasks:

  - name: install apache and php for ubuntu servers
    tags: apache,apache2,ubuntu
    apt:
      name:
        - apache2
        - libapache2-mod-php
      state: latest
    when: ansible_distribution == "Ubuntu"

  - name: install apache and php for CentOS servers
    tags: apache,centos,httpd
    dnf:
      name:
        - httpd
        - php
      state: latest
    when: ansible_distribution == "CentOS"
```

```
- hosts: db_servers
  become: true
  tasks:

  - name: install mariadb package (CentOS)
    tags: centos, db,mariadb
    dnf:
      name: mariadb-server
      state: latest
    when: ansible_distribution == "CentOS"

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

  - name: install mariadb packege (Ubuntu)
    tags: db, mariadb,ubuntu
    apt:
      name: mariadb-server
      state: latest
    when: ansible_distribution == "Ubuntu"

- hosts: file_servers
  become: true
  tasks:

  - name: install samba package
    tags: samba
    package:
      name: samba
      state: latest
```

```
- hosts: dbserver
  become: true
  tasks:

  - name: install mariadb package (CentOS)
    tags: centos, db,mariadb
    dnf:
      name: mariadb-server
      state: latest
    when: ansible_distribution == "CentOS"

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

  - name: insta;; mariadb package (Ubuntu)
    tags: db, mariadb,ubuntu
    apt:
      name: mariadb-server
      state: latest
    when: ansible_distribution == "Ubuntu"
```

```
- hosts: file_servers
  become: true
  tasks:

  - name: install samba package
    tags: samba
    package:
      name: samba
      state: latest
```

Make sure to save the file and exit.
Run the *site.yml* file and describe the result.

```
TASK [Mariadb- Restarting/Enabling] ****************************************
fatal: [192.168.56.104]: FAILED! => {"changed": false, "msg": "Could not find th
e requested service mariadb: host"}
fatal: [192.168.56.103]: FAILED! => {"changed": false, "msg": "Could not find th
e requested service mariadb: host"}
changed: [192.168.56.105]

TASK [install mariadb package (Ubuntu)] ************************************
skipping: [192.168.56.105]

PLAY [file_servers] ********************************************************

TASK [Gathering Facts] *****************************************************
ok: [192.168.56.105]

TASK [install samba package] ***********************************************
ok: [192.168.56.105]

PLAY RECAP *****************************************************************
192.168.56.103             : ok=5    changed=0    unreachable=0    failed=1    s
kipped=3    rescued=0    ignored=0
192.168.56.104             : ok=5    changed=0    unreachable=0    failed=1    s
kipped=3    rescued=0    ignored=0
192.168.56.105             : ok=9    changed=2    unreachable=0    failed=0    s
kipped=3    rescued=0    ignored=0
```

the tasked failed on mariadb restart because on ubuntu there is different command than centos

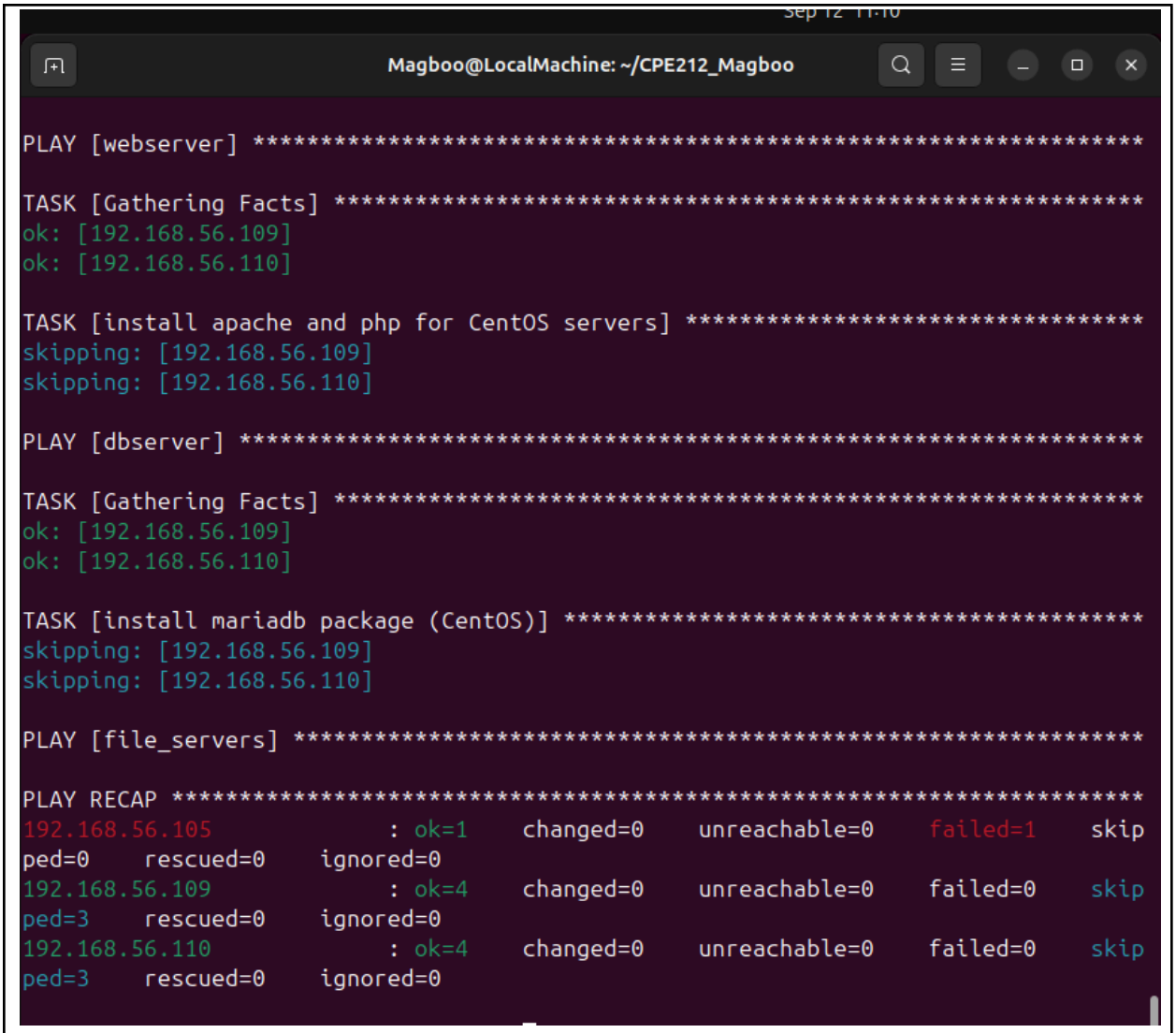
2. On the local machine, try to issue the following commands and describe each result:

   2.1 *ansible-playbook --list-tags site.yml*

```
Magboo@LocalMachine:~/CPE212_Magboo$ ansible-playbook --list-tags site.yml

playbook: site.yml

  play #1 (all): all    TAGS: []
      TASK TAGS: [always]

  play #2 (webserver): webserver        TAGS: []
      TASK TAGS: [apache, apache2, centos, httpd, ubuntu]

  play #3 (dbserver): dbserver  TAGS: []
      TASK TAGS: [centos, db, mariadb, ubuntu]

  play #4 (file_servers): file_servers  TAGS: []
      TASK TAGS: [samba]
```

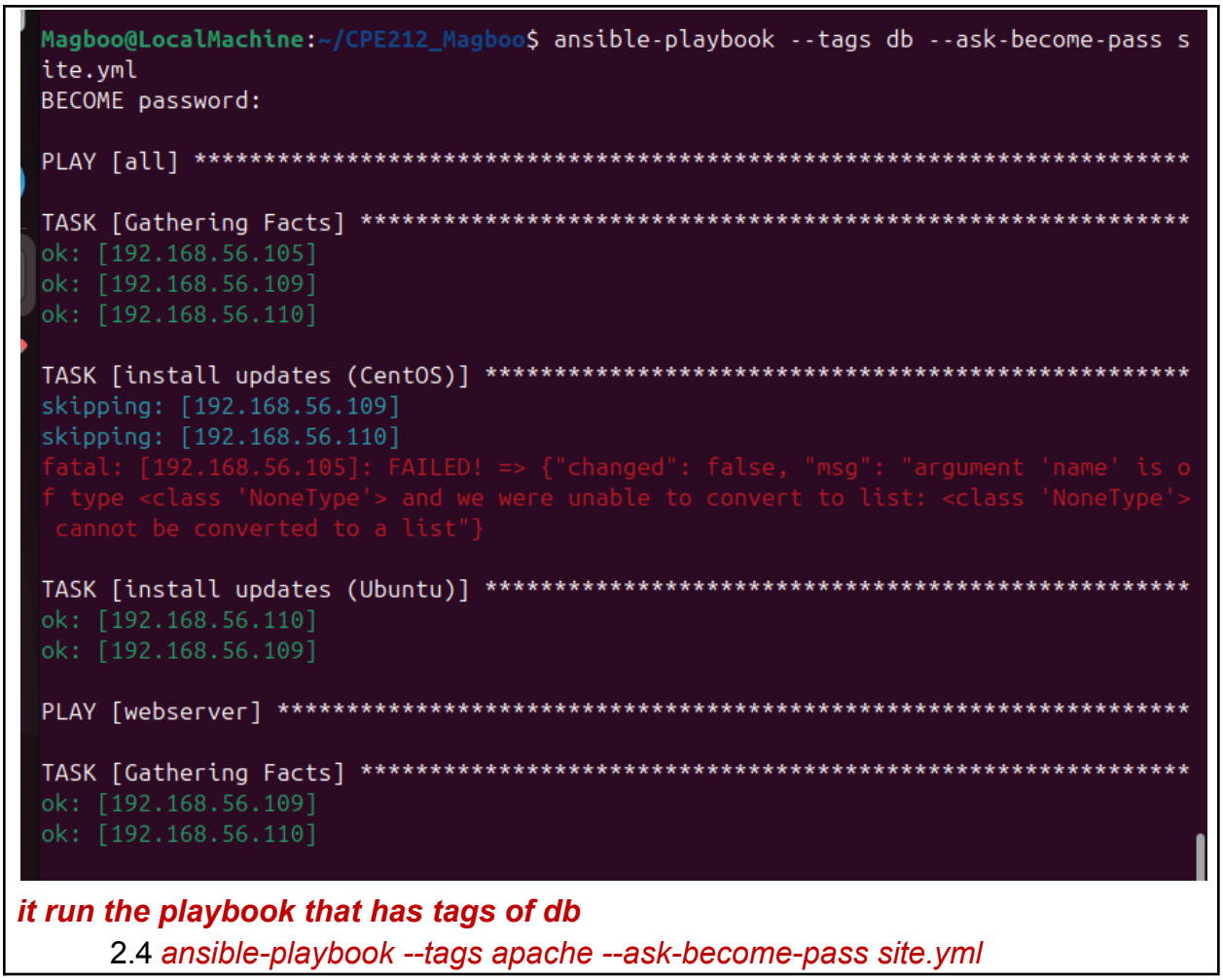
it showed the task tags

   2.2 *ansible-playbook --tags centos --ask-become-pass site.yml*



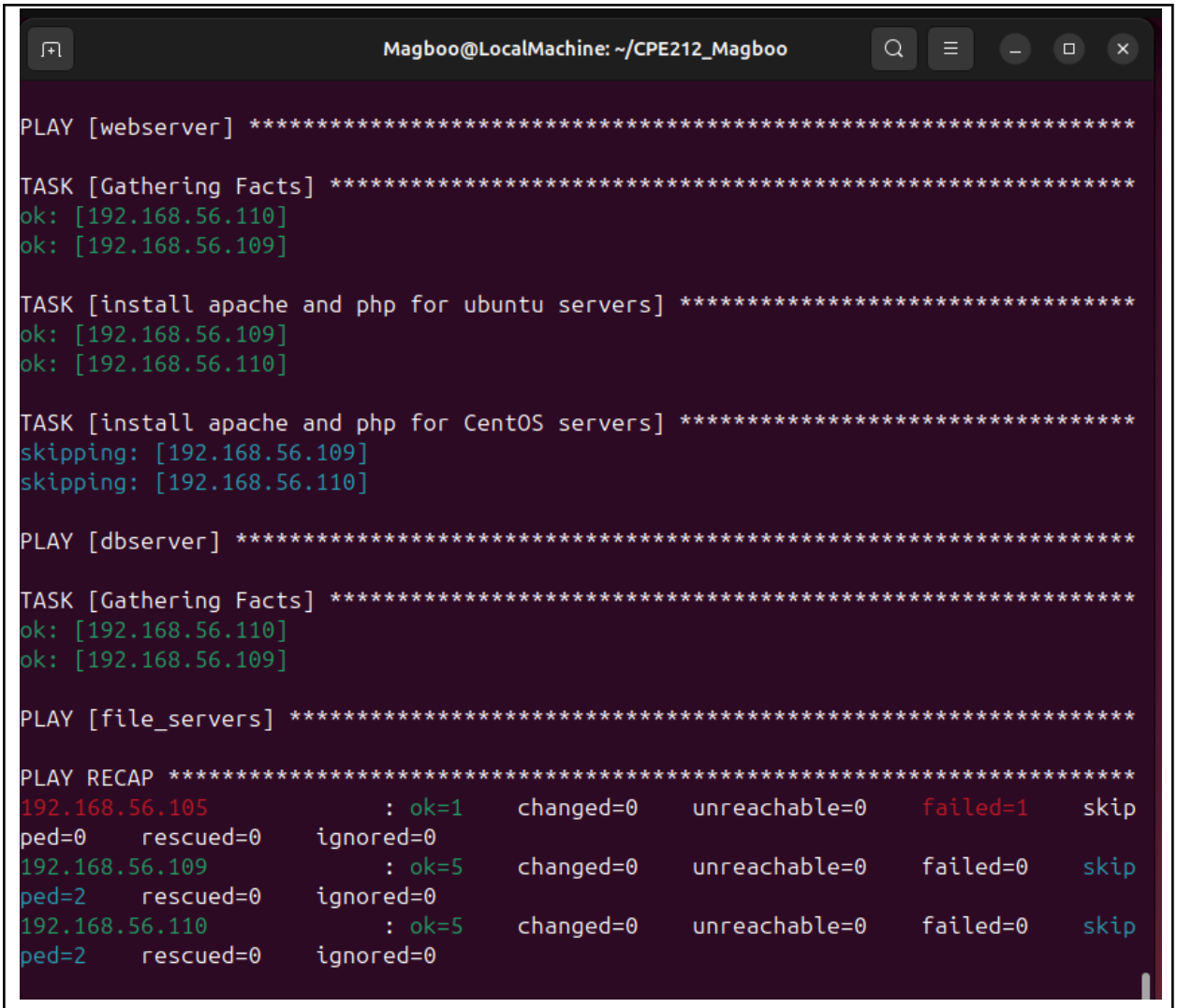
it run everything but i still get the same error as last time

2.3 *ansible-playbook --tags db --ask-become-pass site.yml*



it run the playbook that has tags of db

2.4 *ansible-playbook --tags apache --ask-become-pass site.yml*



it runs the playbook that has a tag of apache

2.5 *ansible-playbook --tags “apache,db” --ask-become-pass site.yml*

```
Magboo@LocalMachine:~/CPE212_Magboo$ ansible-playbook --tags "apache,db" --ask-beco
me-pass site.yml
BECOME password:

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

TASK [Gathering Facts] *********************************************************
ok: [192.168.56.105]
ok: [192.168.56.109]
ok: [192.168.56.110]

TASK [install updates (CentOS)] ************************************************
skipping: [192.168.56.109]
skipping: [192.168.56.110]
fatal: [192.168.56.105]: FAILED! => {"changed": false, "msg": "argument 'name' is o
f type <class 'NoneType'> and we were unable to convert to list: <class 'NoneType'>
 cannot be converted to a list"}

TASK [install updates (Ubuntu)] ************************************************
ok: [192.168.56.109]
ok: [192.168.56.110]

PLAY [webserver] ***************************************************************

TASK [Gathering Facts] *********************************************************
ok: [192.168.56.110]
ok: [192.168.56.109]

TASK [install apache and php for ubuntu servers] *******************************
```

it run that has both the tags of apache and db

Task 3: Managing Services

1. Edit the file site.yml and add a play that will automatically start the httpd on CentOS server.

```
- name: install apache and php for CentOS servers
  tags: apache,centos,httpd
  dnf:
    name:
      - httpd
      - php
    state: latest
  when: ansible_distribution == "CentOS"

- name: start httpd (CentOS)
  tags: apache, centos,httpd
  service:
    name: httpd
    state: started
  when: ansible_distribution == "CentOS"
```

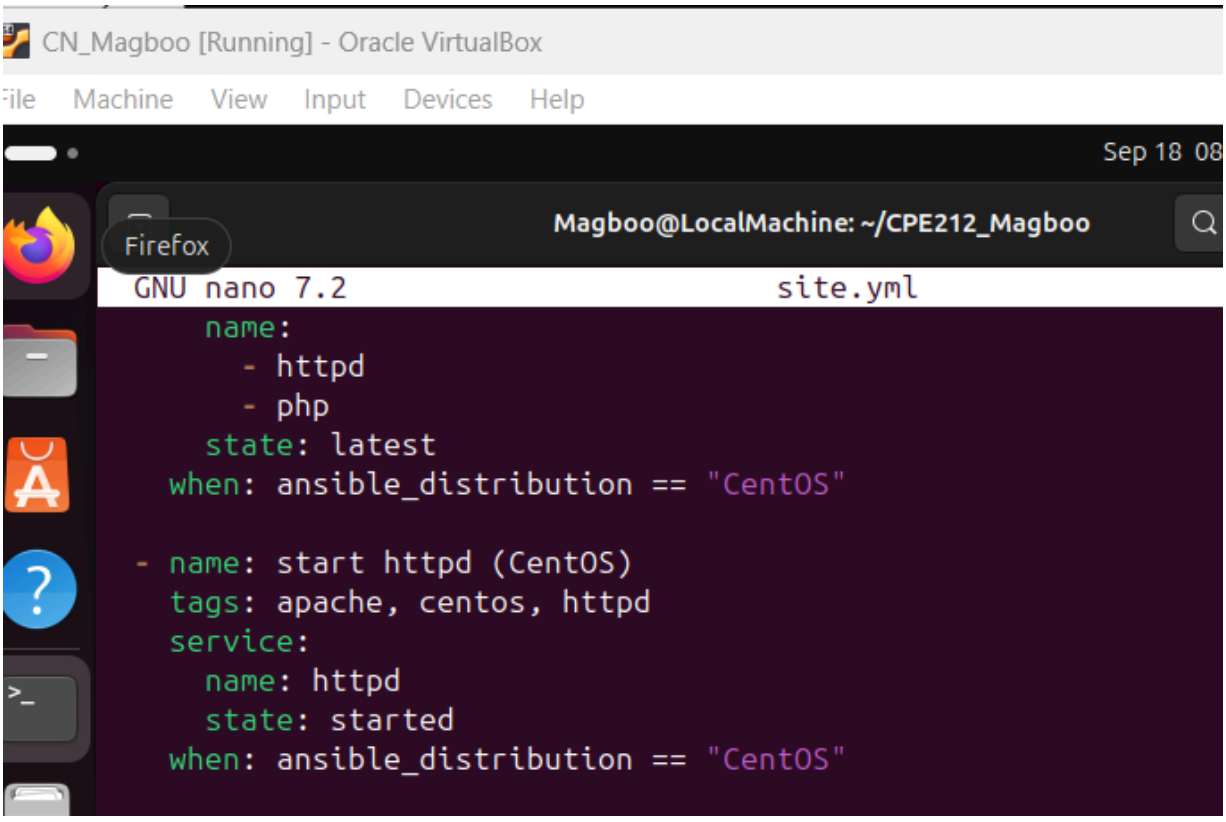


Figure 3.1.1
Make sure to save the file and exit.

You would also notice from our previous activity that we already created a module that runs a service.

```
- hosts: db_servers
  become: true
  tasks:

  - name: install mariadb package (CentOS)
    tags: centos, db,mariadb
    dnf:
      name: mariadb-server
      state: latest
    when: ansible_distribution == "CentOS"

  - name: "Mariadb- Restarting/Enabling"
    service:
      name: mariadb
      state: restarted
      enabled: true
```

```
 - name: "Mariadb- Restarting/Enabling"
   service:
     name: mariadb
     state: restarted
     enabled: true
```

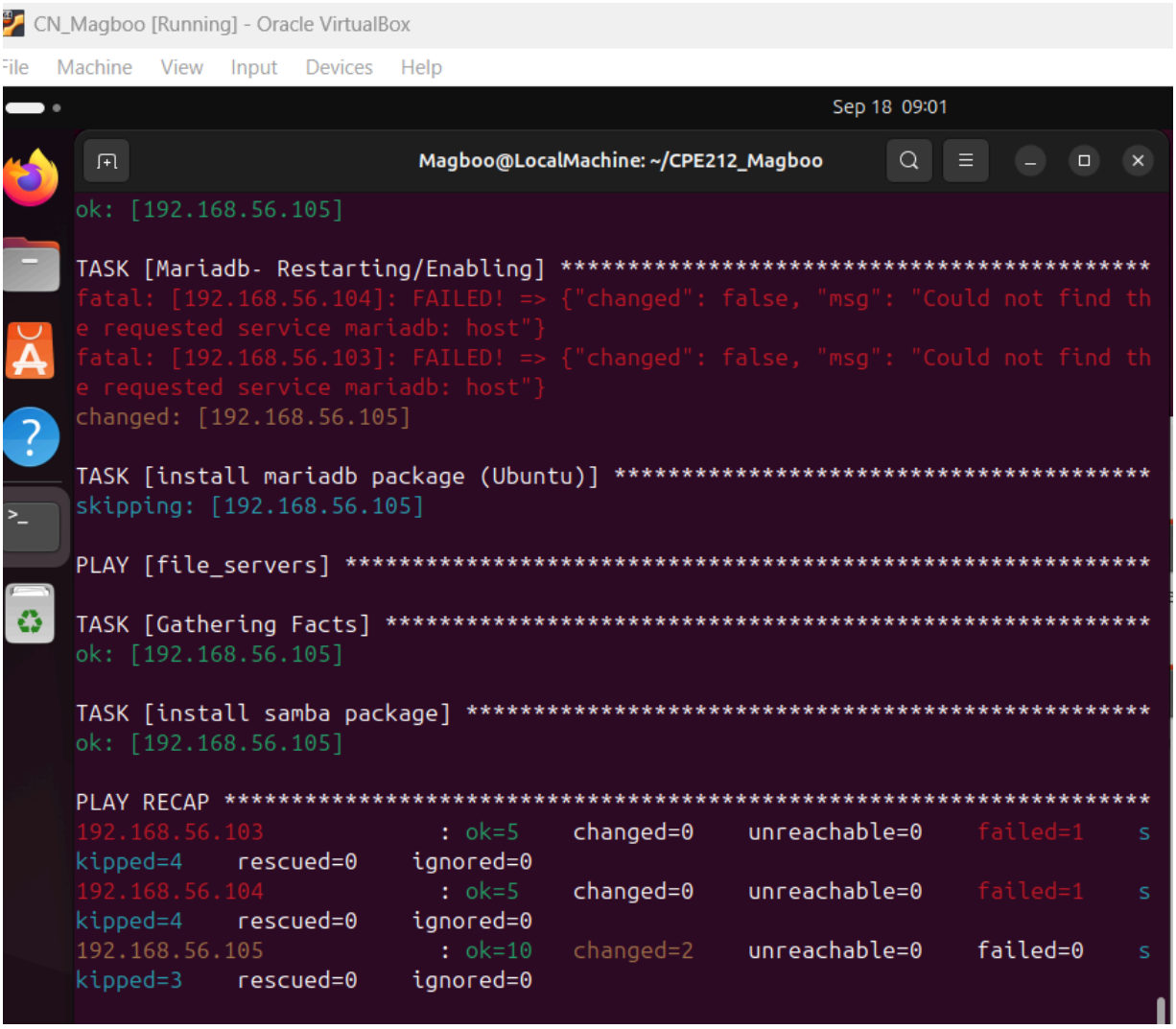
Figure 3.1.2

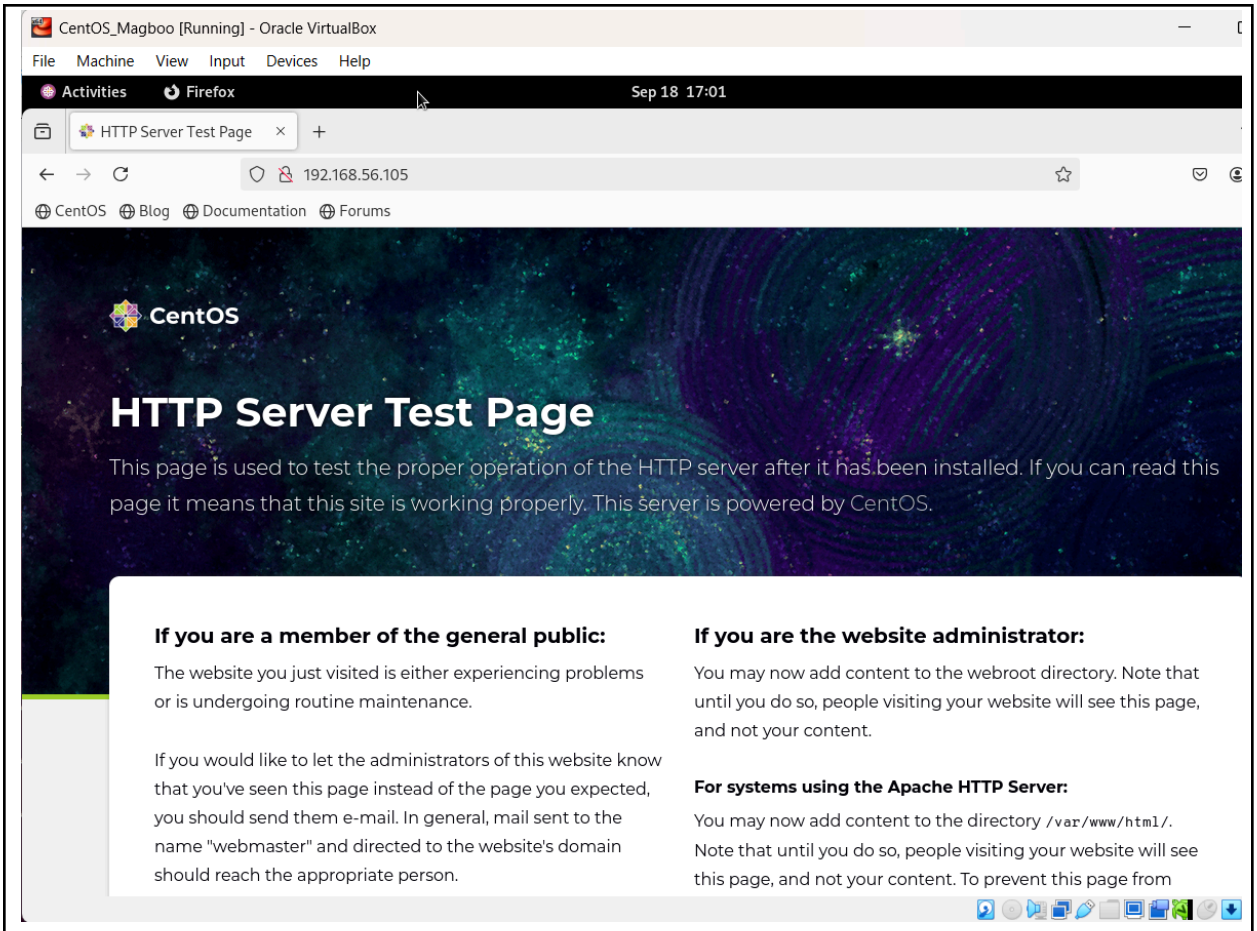
This is because in CentOS, installed packages' services are not run automatically. Thus, we need to create the module to run it automatically.

2. To test it, before you run the saved playbook, go to the CentOS server and stop the currently running httpd using the command *sudo systemctl stop httpd*. When prompted, enter the sudo password. After that, open the browser and enter the CentOS server's IP address. You should not be getting a display because we stopped the httpd service already.

```
magboo@vbox:~
[magboo@vbox ~]$ sudo systemctl stop httpd
[sudo] password for magboo:
[magboo@vbox ~]$
```

3. Go to the local machine and this time, run the *site.yml* file. Then after running the file, go again to the CentOS server and enter its IP address on the browser. Describe the result.





though the command for the mariadb in centos and ubuntu are different since we called correctly for the mariadb in centos it still run ok though it failed to run for the ubuntu

To automatically enable the service every time we run the playbook, use the command *enabled: true* similar to Figure 7.1.2 and save the playbook.

Reflections:

Answer the following:

1. What is the importance of putting our remote servers into groups?
   so that you would know which should be installed in which server meaning you can pin point which computer that needs the update or install or which group they are

2. What is the importance of tags in playbooks?

It is important because it can be the control in which part of the playbook should be used instead of running everything in the playbook. You can pinpoint exactly what you

need and don’t need to wait for it to run everything to know that the program runs properly.

3. Why do think some services need to be managed automatically in playbooks?

   some services are too important to the systems thats why it needs to be automated like the firewall and the database specially for enterprises that depended on the network.