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Course/Section: CPE 232 - CPE31S6	Date Submitted: Oct 2, 2023
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Activity 7: Managing Files and Creating Roles in Ansible

1. Objectives:

1.1 Manage files in remote servers

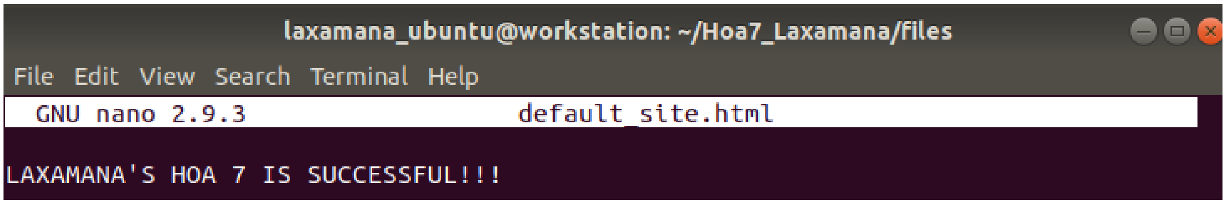
1.2 Implement roles in ansible

2. Discussion:

In this activity, we look at the concept of copying a file to a server. We are going to create a file into our git repository and use Ansible to grab that file and put it into a particular place so that we could do things like customize a default website, or maybe install a default configuration file. We will also implement roles to consolidate plays.

Task 1: Create a file and copy it to remote servers

1. Using the previous directory we created, create a directory, and named it "*files*." Create a file inside that directory and name it "*default_site.html*." Edit the file and put basic HTML syntax. Any content will do, as long as it will display text later. Save the file and exit.


laxamana_ubuntu@workstation: ~/Hoa7_Laxamana/files
File Edit View Search Terminal Help

```
  GNU nano 2.9.3                    default_site.html

LAXAMANA'S HOA 7 IS SUCCESSFUL!!!
```

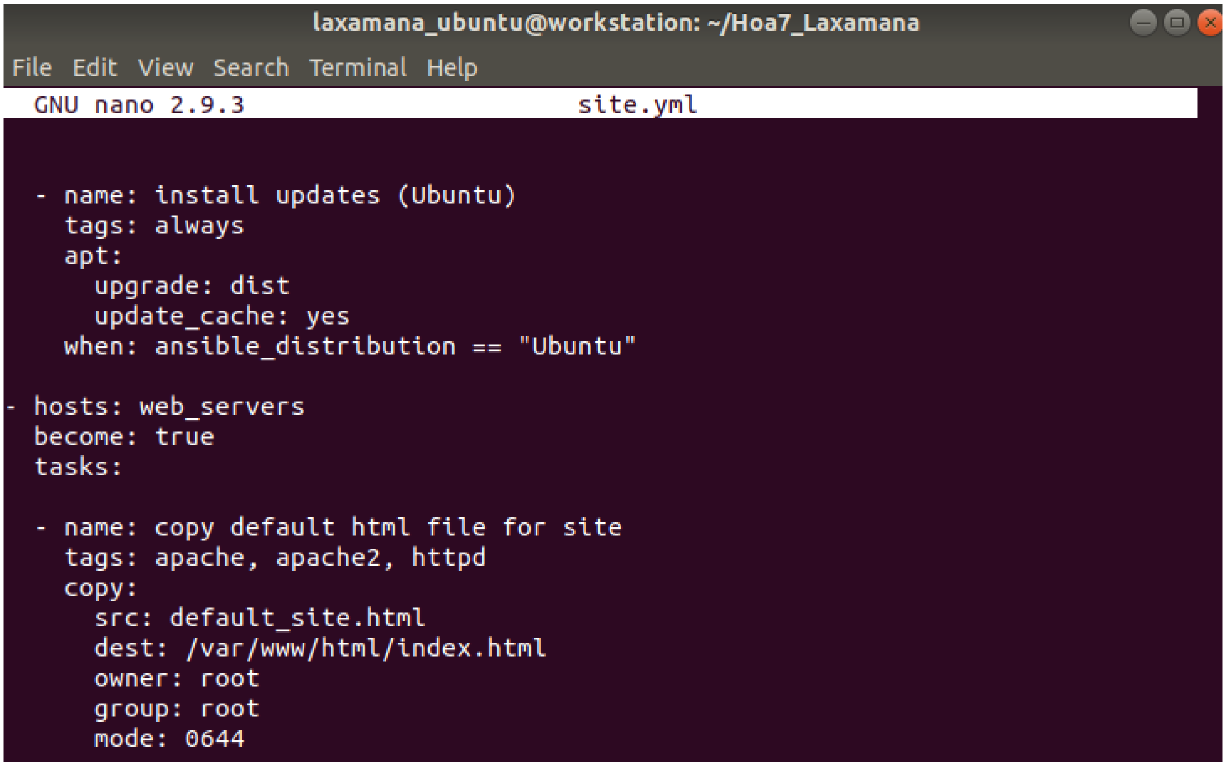
2. Edit the *site.yml* file and just below the *web_servers* play, create a new file to copy the default html file for site:

```
- name: copy default html file for site

  tags: apache, apache2, httpd
  copy:
    src: default_site.html
    dest: /var/www/html/index.html
```

owner: root

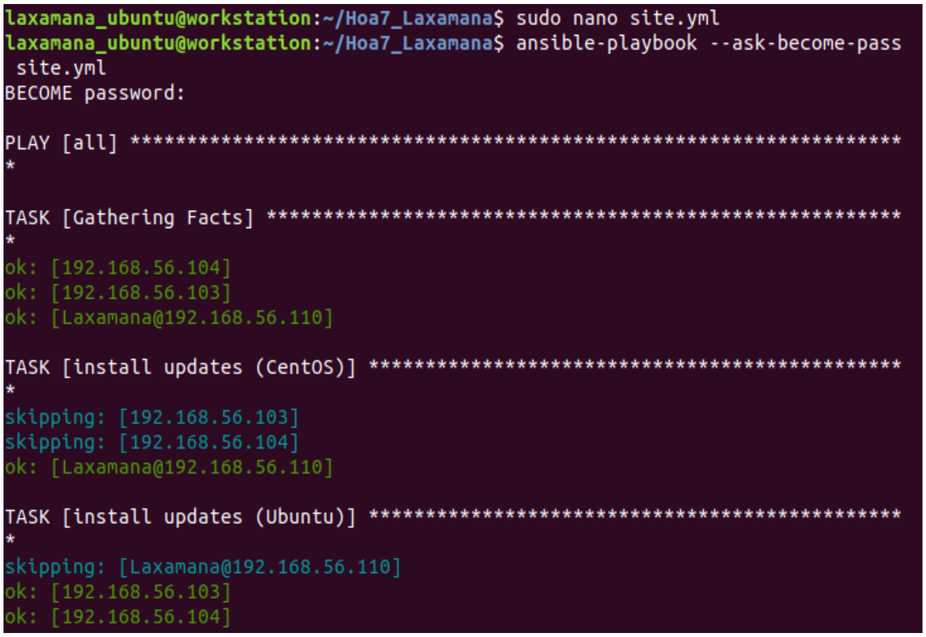
group: root

mode: 0644

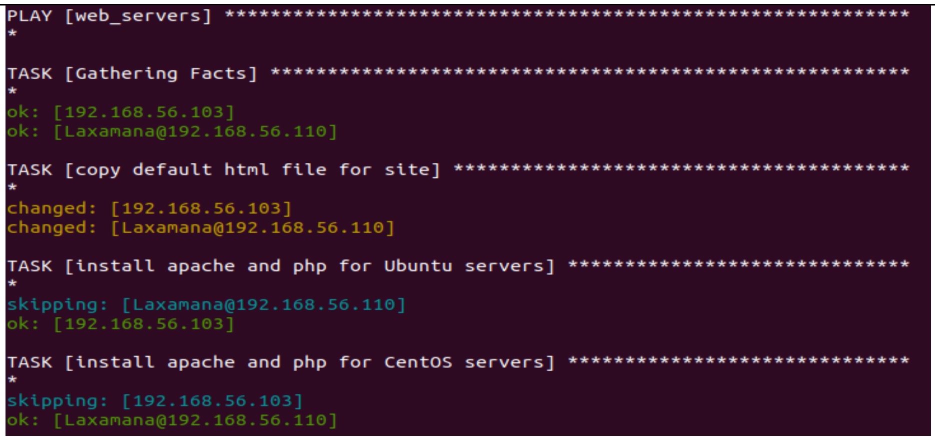

laxamana_ubuntu@workstation: ~/Hoa7_Laxamana
File Edit View Search Terminal Help

```
  GNU nano 2.9.3                        site.yml


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

- hosts: web_servers
  become: true
  tasks:

  - name: copy default html file for site
    tags: apache, apache2, httpd
    copy:
      src: default_site.html
      dest: /var/www/html/index.html
      owner: root
      group: root
      mode: 0644
```

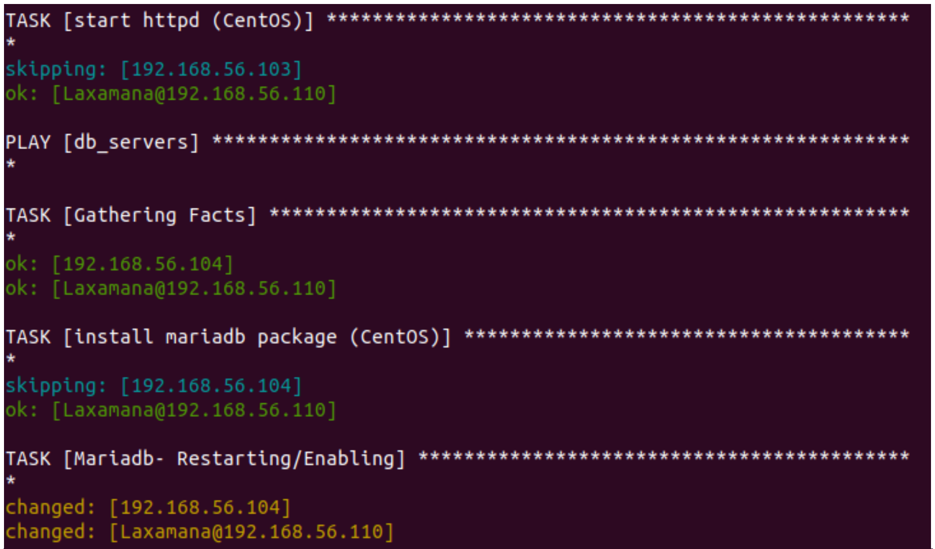
3. Run the playbook *site.yml*. Describe the changes.



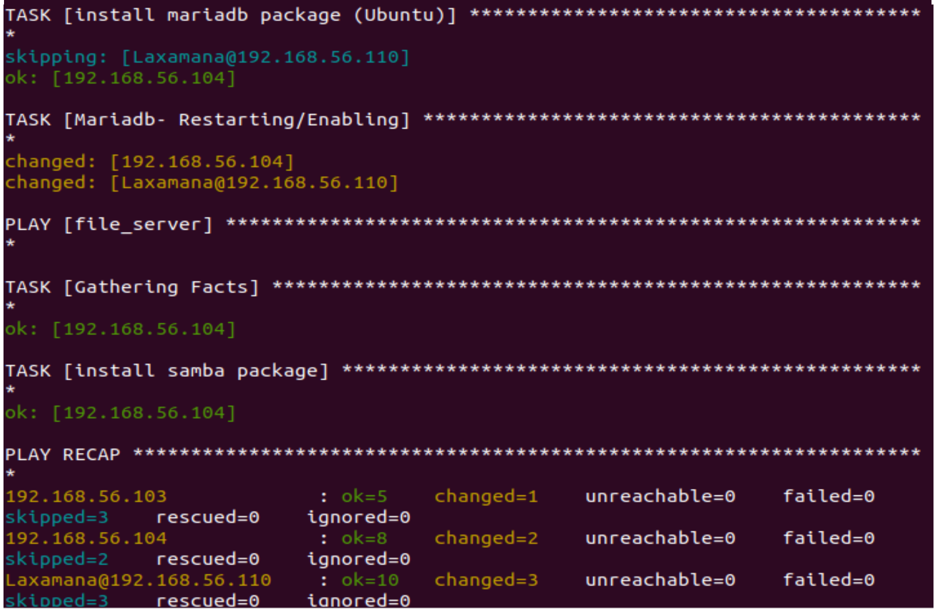
```
laxamana_ubuntu@workstation:~/Hoa7_Laxamana$ sudo nano site.yml
laxamana_ubuntu@workstation:~/Hoa7_Laxamana$ ansible-playbook --ask-become-pass
 site.yml
BECOME password:

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

TASK [Gathering Facts] ****************************************************
*
ok: [192.168.56.104]
ok: [192.168.56.103]
ok: [Laxamana@192.168.56.110]

TASK [install updates (CentOS)] *******************************************
*
skipping: [192.168.56.103]
skipping: [192.168.56.104]
ok: [Laxamana@192.168.56.110]

TASK [install updates (Ubuntu)] *******************************************
*
skipping: [Laxamana@192.168.56.110]
ok: [192.168.56.103]
ok: [192.168.56.104]
```



```
PLAY [web_servers] ***************************************************************
*

TASK [Gathering Facts] ***********************************************************
*
ok: [192.168.56.103]
ok: [Laxamana@192.168.56.110]

TASK [copy default html file for site] *******************************************
*
changed: [192.168.56.103]
changed: [Laxamana@192.168.56.110]

TASK [install apache and php for Ubuntu servers] *********************************
*
skipping: [Laxamana@192.168.56.110]
ok: [192.168.56.103]

TASK [install apache and php for CentOS servers] *********************************
*
skipping: [192.168.56.103]
ok: [Laxamana@192.168.56.110]
```



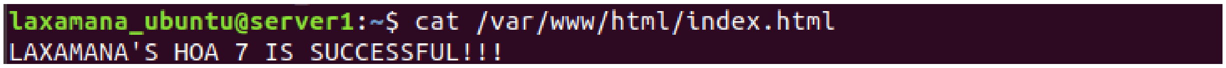
```
TASK [start httpd (CentOS)] ******************************************************
*
skipping: [192.168.56.103]
ok: [Laxamana@192.168.56.110]

PLAY [db_servers] ****************************************************************
*

TASK [Gathering Facts] ***********************************************************
*
ok: [192.168.56.104]
ok: [Laxamana@192.168.56.110]

TASK [install mariadb package (CentOS)] ******************************************
*
skipping: [192.168.56.104]
ok: [Laxamana@192.168.56.110]

TASK [Mariadb- Restarting/Enabling] **********************************************
*
changed: [192.168.56.104]
changed: [Laxamana@192.168.56.110]
```



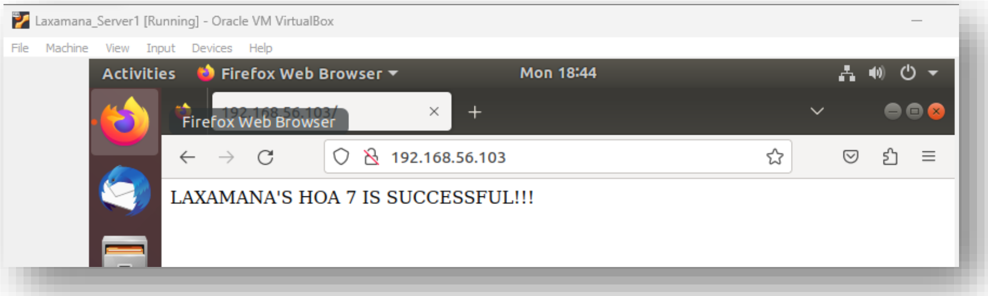
```
TASK [install mariadb package (Ubuntu)] ******************************************
*
skipping: [Laxamana@192.168.56.110]
ok: [192.168.56.104]

TASK [Mariadb- Restarting/Enabling] **********************************************
*
changed: [192.168.56.104]
changed: [Laxamana@192.168.56.110]

PLAY [file_server] ***************************************************************
*

TASK [Gathering Facts] ***********************************************************
*
ok: [192.168.56.104]

TASK [install samba package] *****************************************************
*
ok: [192.168.56.104]

PLAY RECAP ***********************************************************************
*
192.168.56.103             : ok=5    changed=1    unreachable=0    failed=0
skipped=3    rescued=0    ignored=0
192.168.56.104             : ok=8    changed=2    unreachable=0    failed=0
skipped=2    rescued=0    ignored=0
Laxamana@192.168.56.110    : ok=10   changed=3    unreachable=0    failed=0
skipped=3    rescued=0    ignored=0
```

After running the playbook, we can observe the changes in the process. The task copy default html file for site have been added and the tasks for enabling and restarting mariadb have been changed.

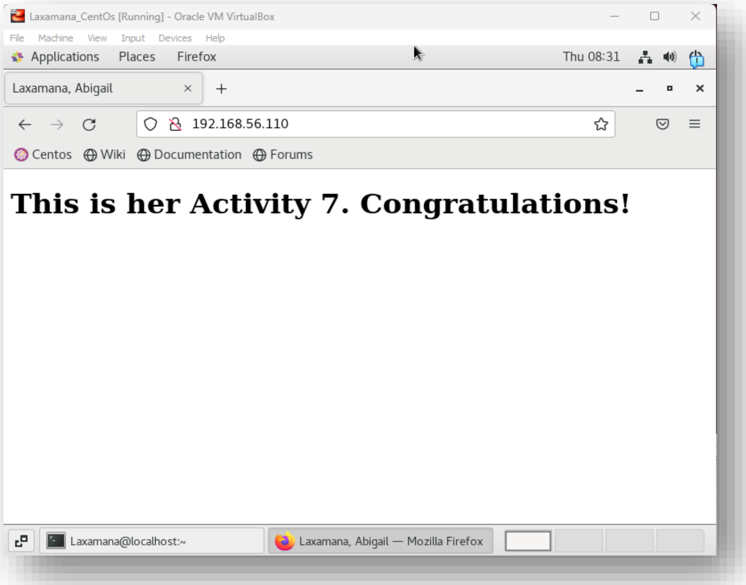
4. Go to the remote servers (*web_servers*) listed in your inventory. Use cat command to check if the index.html is the same as the local repository file (*default_site.html*). Do both for Ubuntu and CentOS servers. On the CentOS server, go to the browser and type its IP address. Describe the output.



```
laxamana_ubuntu@server1:~$ cat /var/www/html/index.html
LAXAMANA'S HOA 7 IS SUCCESSFUL!!!
```



LAXAMANA'S HOA 7 IS SUCCESSFUL!!!

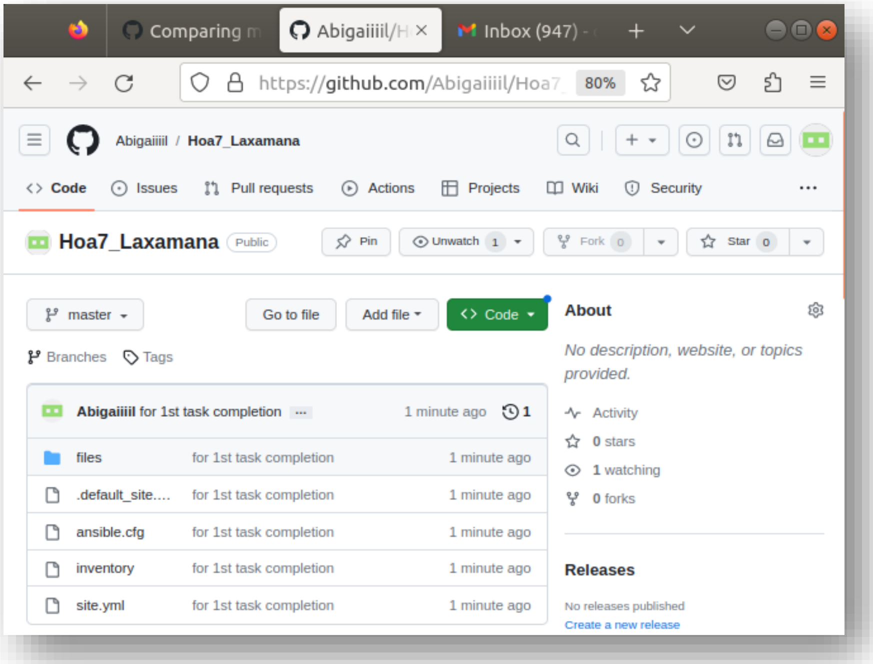


Laxamana_CentOs [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Applications Places Firefox
Thu 08:31
Laxamana, Abigail
192.168.56.110
Centos Wiki Documentation Forums
Laxamana@localhost:~
Laxamana, Abigail — Mozilla Firefox

This is her Activity 7. Congratulations!

When I inputted the ip address of server 1 to the web browser of server 1, the content of the default_site.html popped up. It is also what happened to CentOS server

5. Sync your local repository with GitHub and describe the changes.



No description, website, or topics provided.

No releases published

Abigaiiil for 1st task completion ... 1 minute ago 1

files	for 1st task completion	1 minute ago
.default_site....	for 1st task completion	1 minute ago
ansible.cfg	for 1st task completion	1 minute ago
inventory	for 1st task completion	1 minute ago
site.yml	for 1st task completion	1 minute ago

The files I created have been uploaded to the Github repository. The files directory have been a folder type to Github, it is where the metagroups are located.

Task 2: Download a file and extract it to a remote server

1. Edit the site.yml. Just before the web_servers play, create a new play:

```
-   hosts: workstations
    become: true
    tasks:


    - name: install unzip
      package:
        name: unzip


    - name: install terraform
      unarchive:
```

src:

https://releases.hashicorp.com/terraform/0.12.28/terraform_0.12.28_linux_amd64.zip

dest: /usr/local/bin

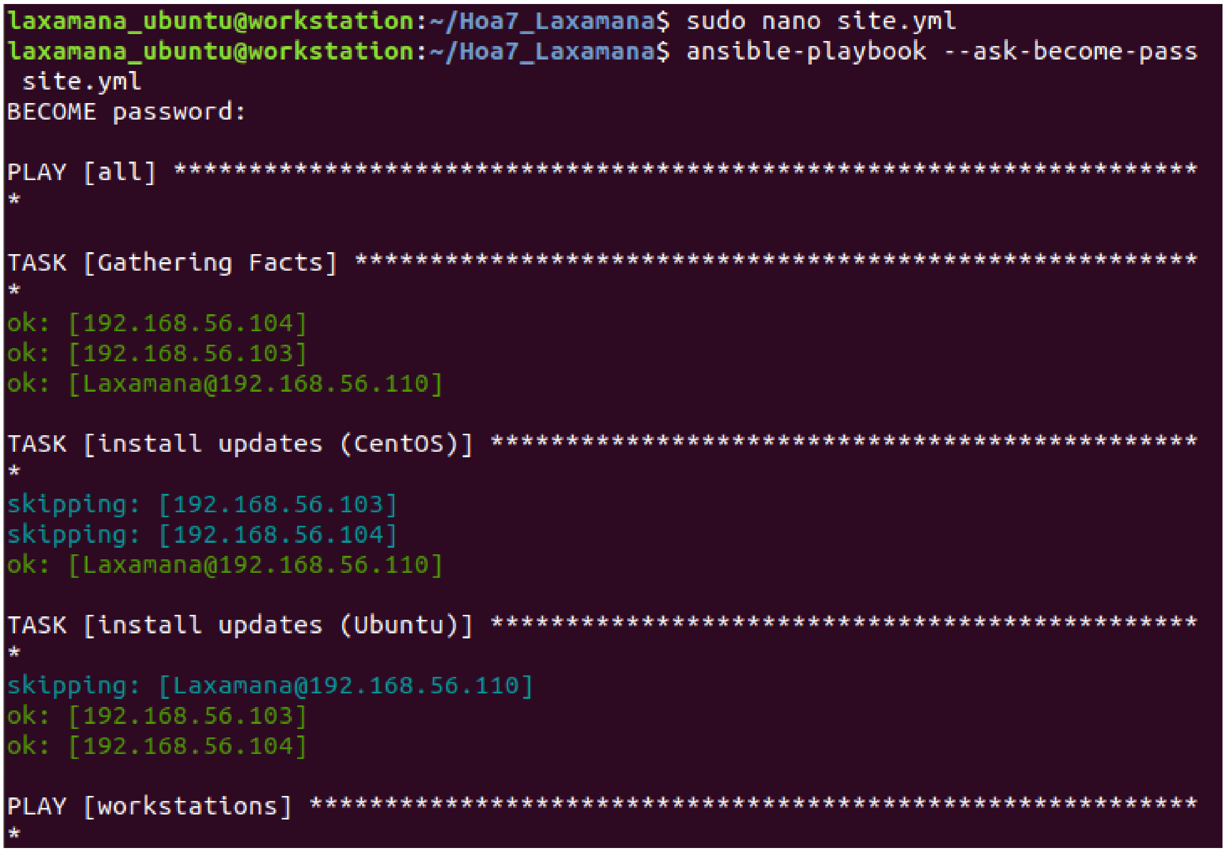
remote_src: yes

mode: 0755

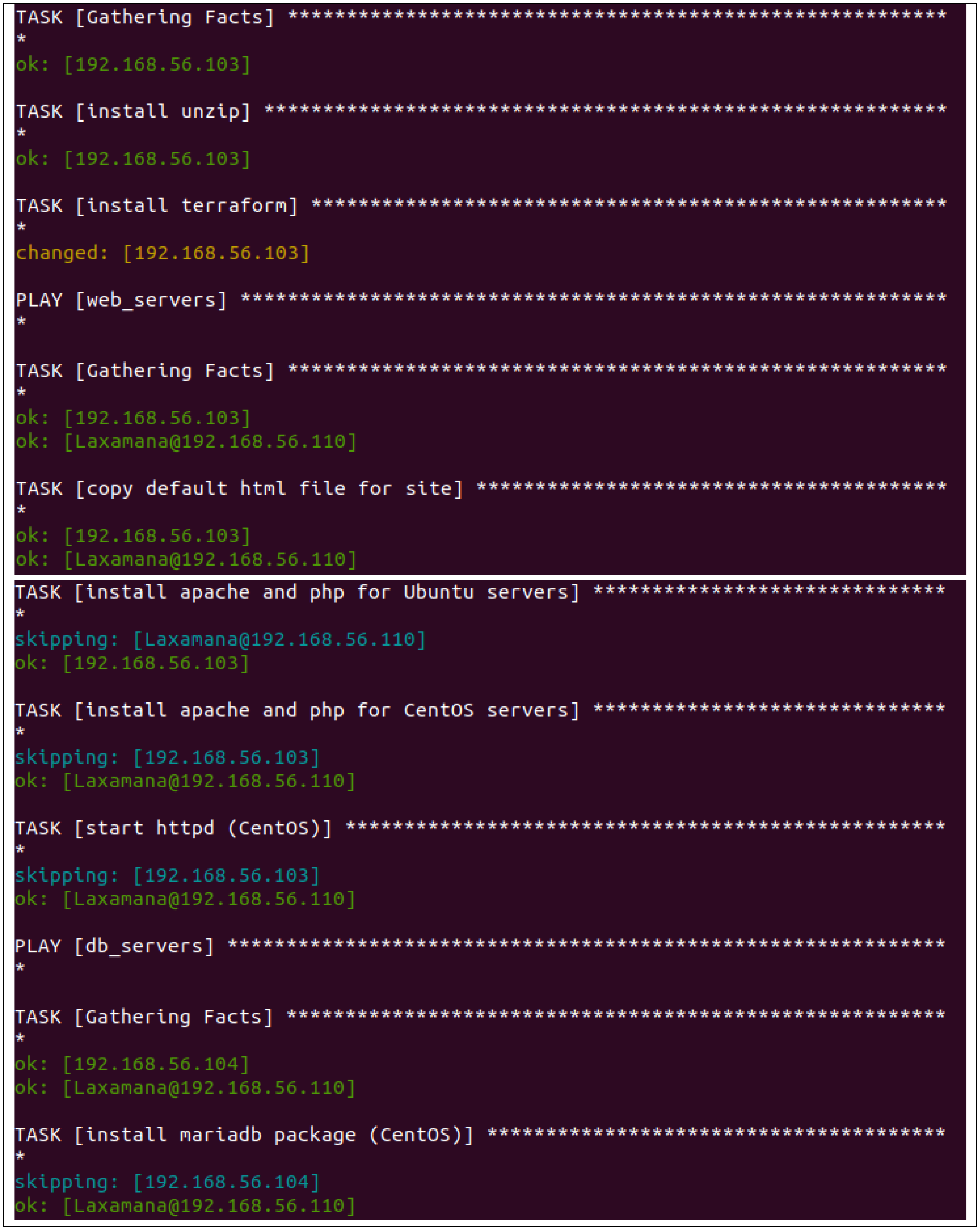
owner: root

group: root

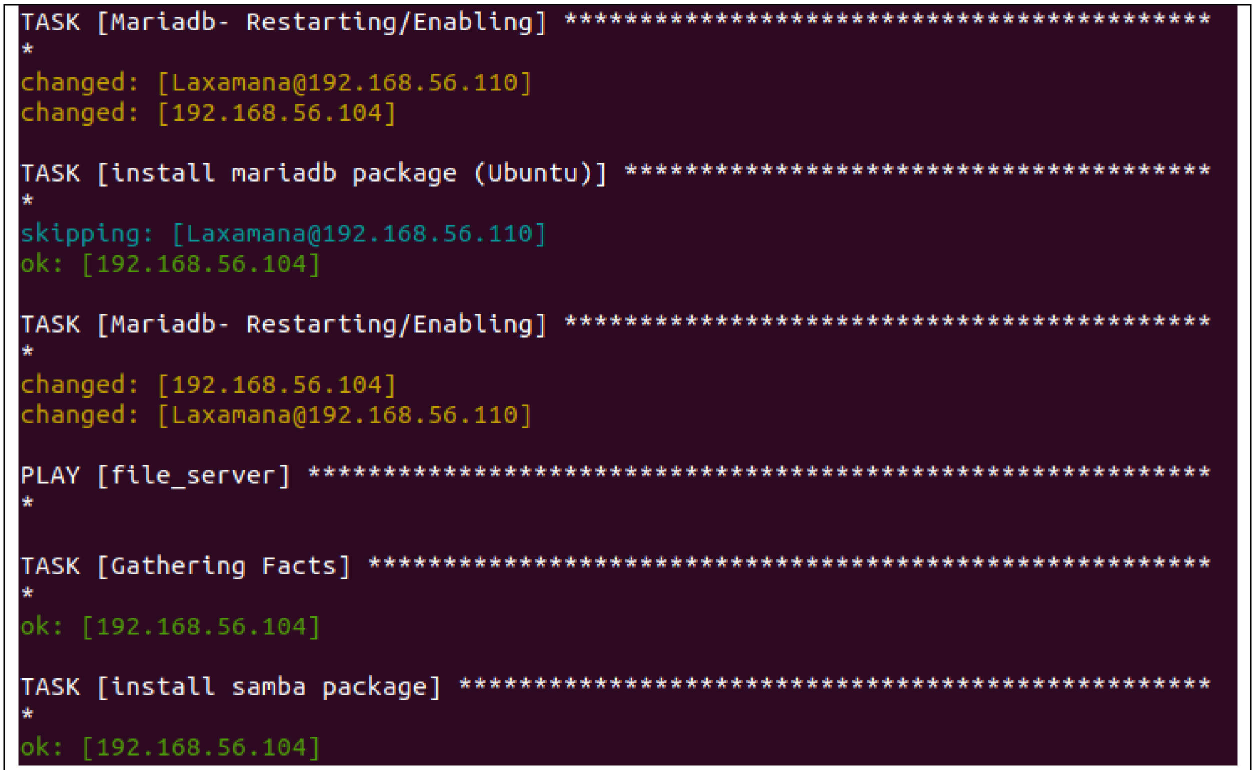
2. Edit the inventory file and add workstations group. Add any Ubuntu remote server. Make sure to remember the IP address.
3. Run the playbook. Describe the output.



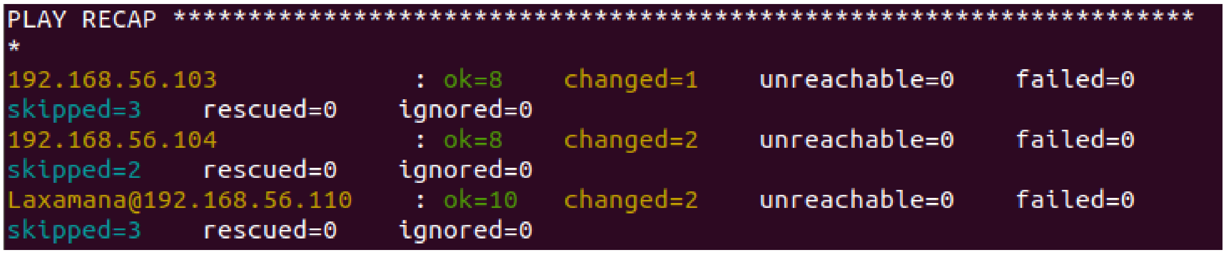
```
laxamana_ubuntu@workstation:~/Hoa7_Laxamana$ sudo nano site.yml
laxamana_ubuntu@workstation:~/Hoa7_Laxamana$ ansible-playbook --ask-become-pass
 site.yml
BECOME password:

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

TASK [Gathering Facts] *********************************************************
*
ok: [192.168.56.104]
ok: [192.168.56.103]
ok: [Laxamana@192.168.56.110]

TASK [install updates (CentOS)] ************************************************
*
skipping: [192.168.56.103]
skipping: [192.168.56.104]
ok: [Laxamana@192.168.56.110]

TASK [install updates (Ubuntu)] ************************************************
*
skipping: [Laxamana@192.168.56.110]
ok: [192.168.56.103]
ok: [192.168.56.104]

PLAY [workstations] ************************************************************
*
```



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

TASK [install unzip] **********************************************************
*
ok: [192.168.56.103]

TASK [install terraform] ******************************************************
*
changed: [192.168.56.103]

PLAY [web_servers] ************************************************************
*

TASK [Gathering Facts] ********************************************************
*
ok: [192.168.56.103]
ok: [Laxamana@192.168.56.110]

TASK [copy default html file for site] ****************************************
*
ok: [192.168.56.103]
ok: [Laxamana@192.168.56.110]
TASK [install apache and php for Ubuntu servers] ******************************
*
skipping: [Laxamana@192.168.56.110]
ok: [192.168.56.103]

TASK [install apache and php for CentOS servers] ******************************
*
skipping: [192.168.56.103]
ok: [Laxamana@192.168.56.110]

TASK [start httpd (CentOS)] ***************************************************
*
skipping: [192.168.56.103]
ok: [Laxamana@192.168.56.110]

PLAY [db_servers] *************************************************************
*

TASK [Gathering Facts] ********************************************************
*
ok: [192.168.56.104]
ok: [Laxamana@192.168.56.110]

TASK [install mariadb package (CentOS)] ***************************************
*
skipping: [192.168.56.104]
ok: [Laxamana@192.168.56.110]
```



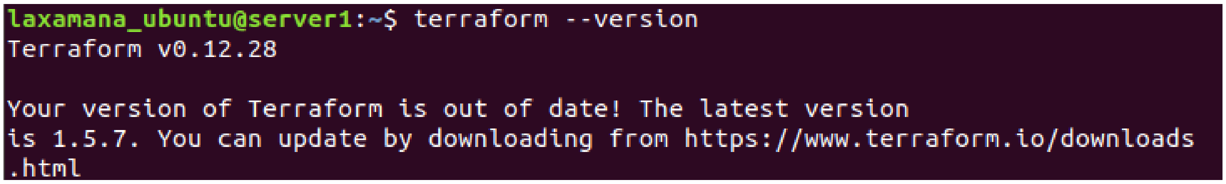
```
TASK [Mariadb- Restarting/Enabling] *******************************************
*
changed: [Laxamana@192.168.56.110]
changed: [192.168.56.104]

TASK [install mariadb package (Ubuntu)] ***************************************
*
skipping: [Laxamana@192.168.56.110]
ok: [192.168.56.104]

TASK [Mariadb- Restarting/Enabling] *******************************************
*
changed: [192.168.56.104]
changed: [Laxamana@192.168.56.110]

PLAY [file_server] ************************************************************
*

TASK [Gathering Facts] ********************************************************
*
ok: [192.168.56.104]

TASK [install samba package] **************************************************
*
ok: [192.168.56.104]
```



```
PLAY RECAP ********************************************************************
*
192.168.56.103             : ok=8    changed=1    unreachable=0    failed=0
skipped=3    rescued=0    ignored=0
192.168.56.104             : ok=8    changed=2    unreachable=0    failed=0
skipped=2    rescued=0    ignored=0
Laxamana@192.168.56.110    : ok=10   changed=2    unreachable=0    failed=0
skipped=3    rescued=0    ignored=0
```

In this part, a task has been added to the process of the playbook and it installed terraform as it is what that task is all about.

4. On the Ubuntu remote workstation, type terraform to verify installation of terraform. Describe the output.

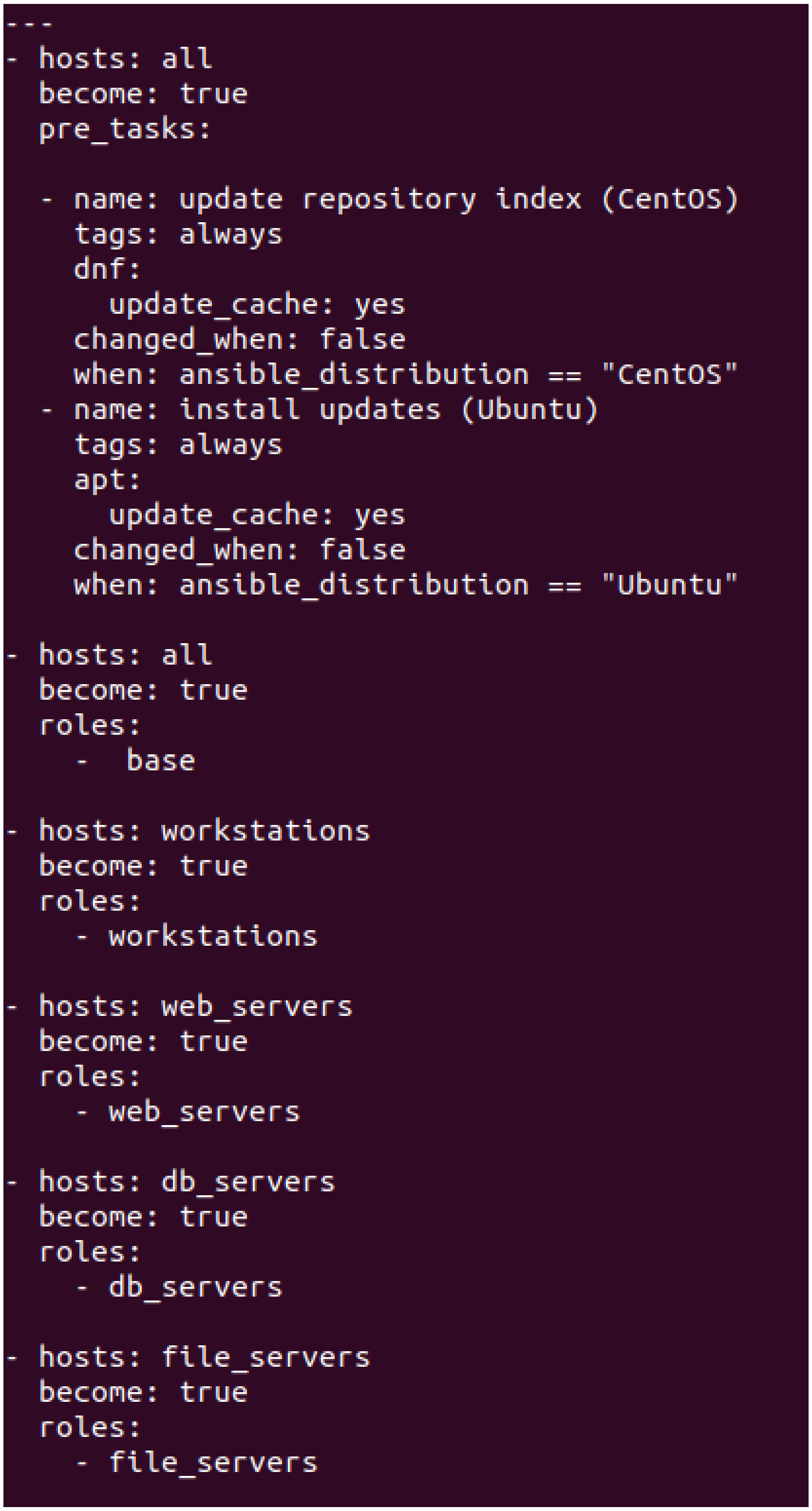


```
laxamana_ubuntu@server1:~$ terraform --version
Terraform v0.12.28

Your version of Terraform is out of date! The latest version
is 1.5.7. You can update by downloading from https://www.terraform.io/downloads
.html
```

To check is terraform have been installed, I used the command **terraform –version**. Since it had given an output of what version my terraform is, it means that the installation was successful.

Task 3: Create roles

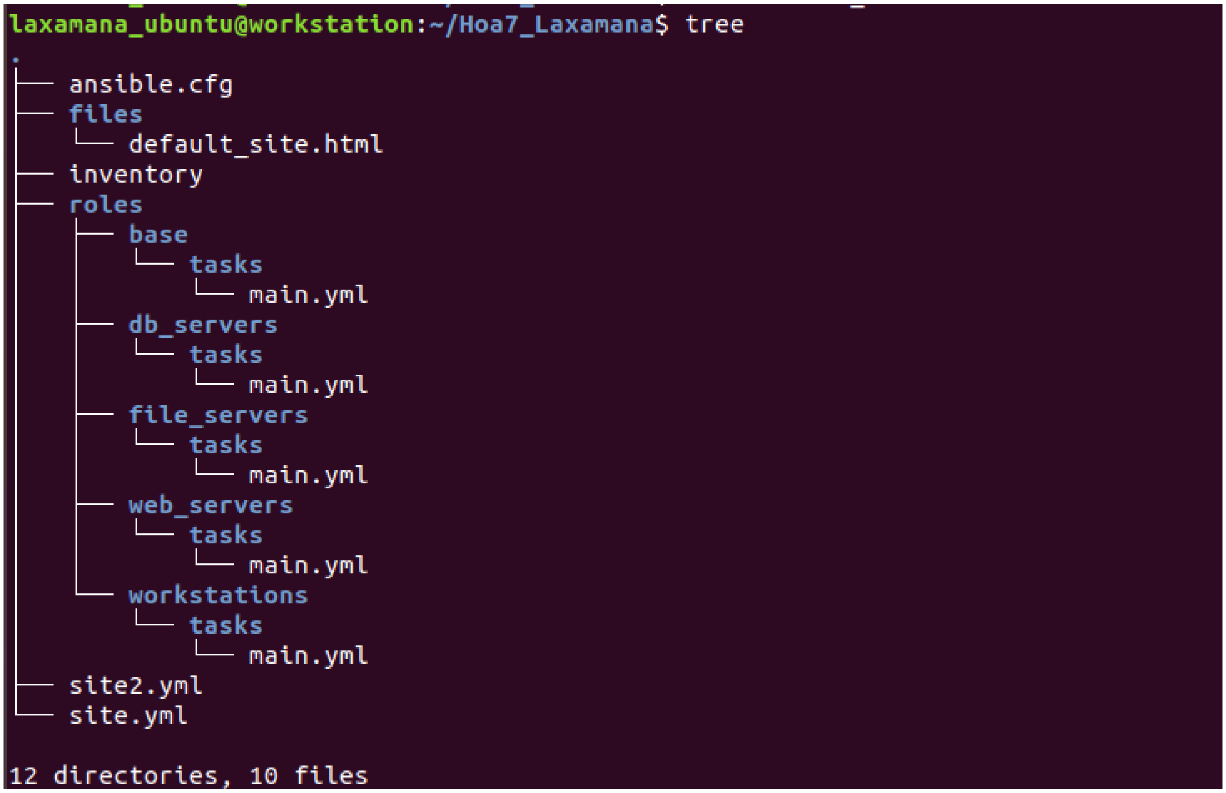
1. Edit the site.yml. Configure roles as follows: (make sure to create a copy of the old site.yml file because you will be copying the specific plays for all groups)



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

  - name: update repository index (CentOS)
    tags: always
    dnf:
      update_cache: yes
    changed_when: false
    when: ansible_distribution == "CentOS"
  - name: install updates (Ubuntu)
    tags: always
    apt:
      update_cache: yes
    changed_when: false
    when: ansible_distribution == "Ubuntu"

- hosts: all
  become: true
  roles:
    -  base

- hosts: workstations
  become: true
  roles:
    - workstations

- hosts: web_servers
  become: true
  roles:
    - web_servers

- hosts: db_servers
  become: true
  roles:
    - db_servers

- hosts: file_servers
  become: true
  roles:
    - file_servers
```

Save the file and exit.

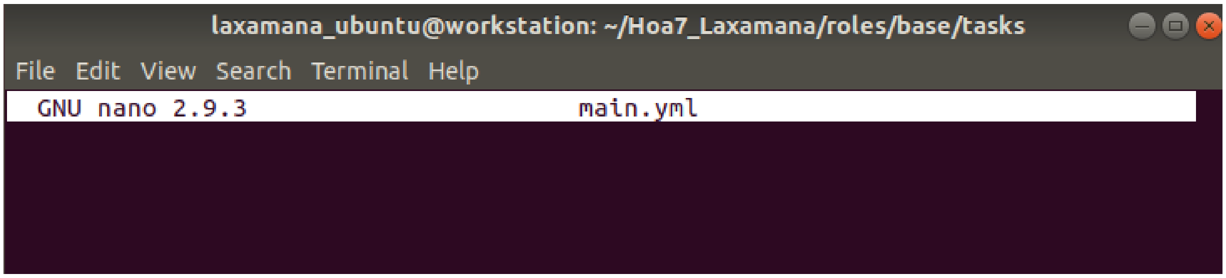
2. Under the same directory, create a new directory and name it roles. Enter the roles directory and create new directories: base, web_servers, file_servers, db_servers and workstations. For each directory, create a directory and name it tasks.



```
laxamana_ubuntu@workstation:~/Hoa7_Laxamana$ tree
.
├── ansible.cfg
├── files
│   └── default_site.html
├── inventory
├── roles
│   ├── base
│   │   └── tasks
│   │       └── main.yml
│   ├── db_servers
│   │   └── tasks
│   │       └── main.yml
│   ├── file_servers
│   │   └── tasks
│   │       └── main.yml
│   ├── web_servers
│   │   └── tasks
│   │       └── main.yml
│   └── workstations
│       └── tasks
│           └── main.yml
├── site2.yml
└── site.yml

12 directories, 10 files
```

3. Go to tasks for all directory and create a file. Name it main.yml. In each of the tasks for all directories, copy and paste the code from the old site.yml file. Show all contents of main.yml files for all tasks.

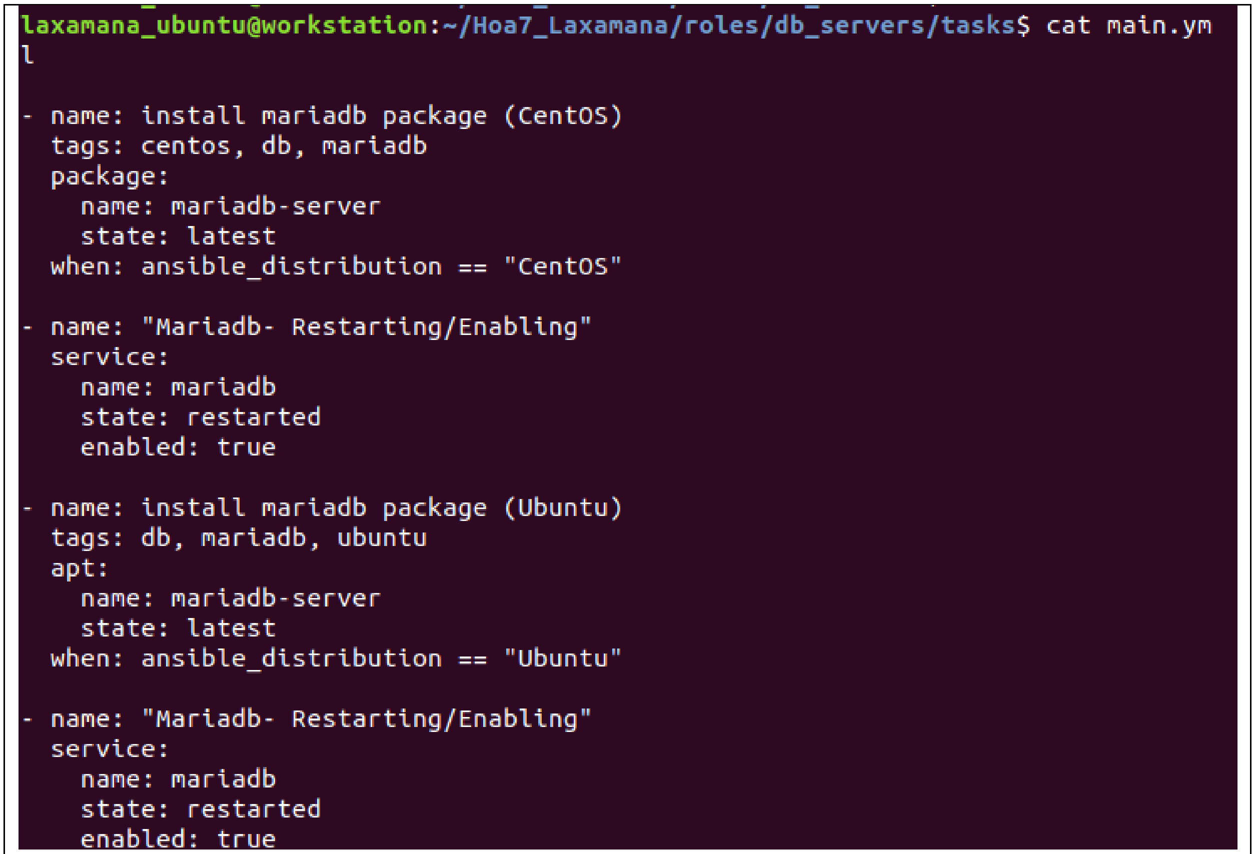
base/tasks/main.yml



laxamana_ubuntu@workstation: ~/Hoa7_Laxamana/roles/base/tasks
File Edit View Search Terminal Help

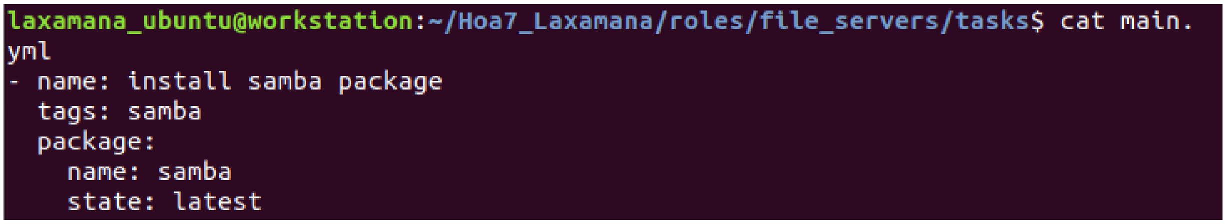
```
  GNU nano 2.9.3                    main.yml
```

db_servers/tasks. main.yml



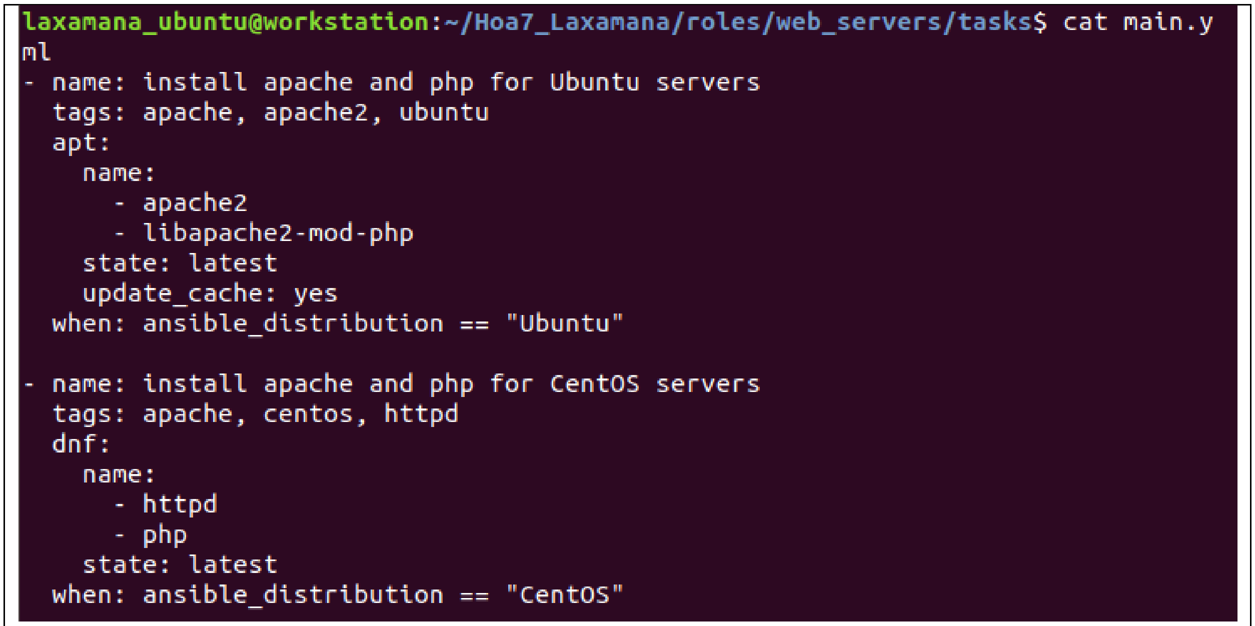
```
laxamana_ubuntu@workstation:~/Hoa7_Laxamana/roles/db_servers/tasks$ cat main.ym
l

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

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

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

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

file_servers/tasks/main.yml

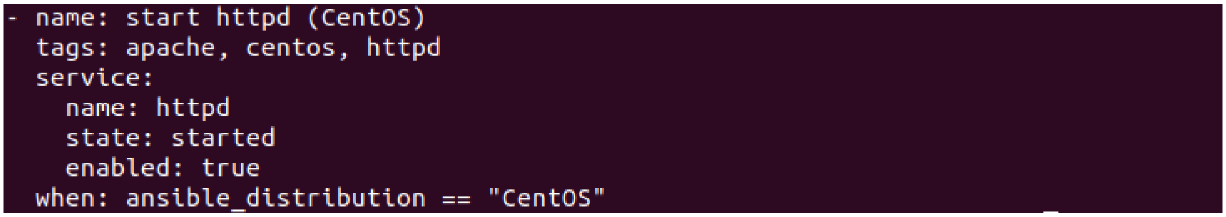


```
laxamana_ubuntu@workstation:~/Hoa7_Laxamana/roles/file_servers/tasks$ cat main.
yml
- name: install samba package
  tags: samba
  package:
    name: samba
    state: latest
```

web_servers/tasks/main.yml

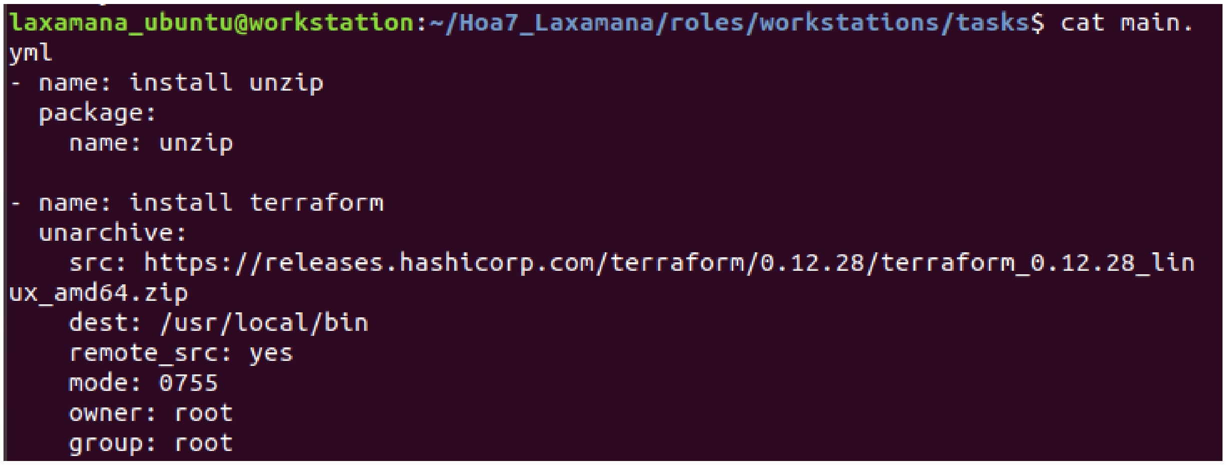


```
laxamana_ubuntu@workstation:~/Hoa7_Laxamana/roles/web_servers/tasks$ cat main.y
ml
- name: install apache and php for Ubuntu servers
  tags: apache, apache2, ubuntu
  apt:
    name:
      - apache2
      - libapache2-mod-php
    state: latest
    update_cache: yes
  when: ansible_distribution == "Ubuntu"

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



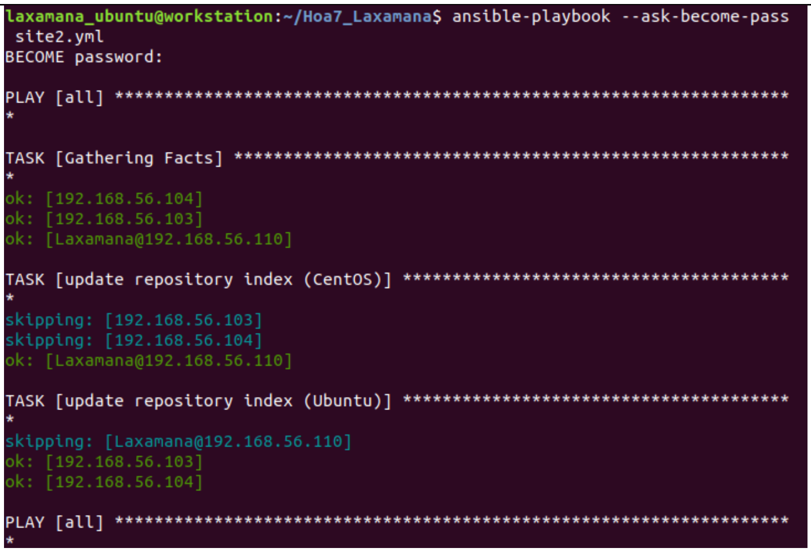
```
- name: start httpd (CentOS)
  tags: apache, centos, httpd
  service:
    name: httpd
    state: started
    enabled: true
  when: ansible_distribution == "CentOS"
```

workstations/tasks

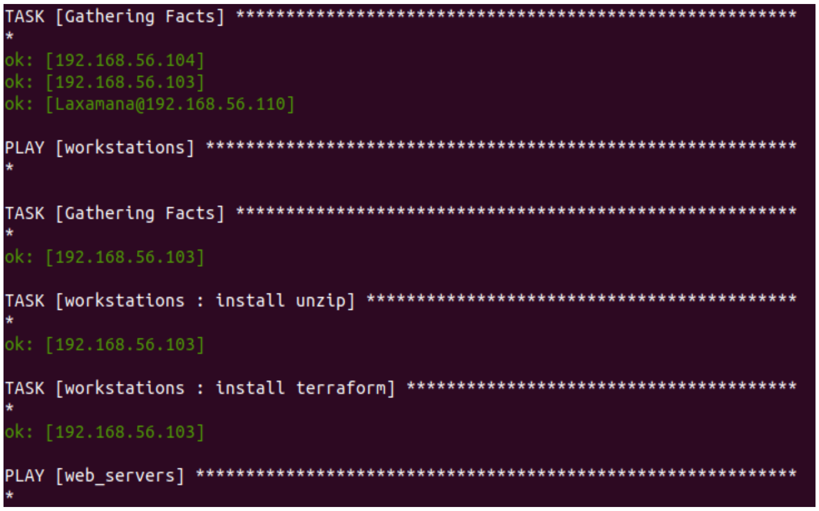


```
laxamana_ubuntu@workstation:~/Hoa7_Laxamana/roles/workstations/tasks$ cat main.
yml
- name: install unzip
  package:
    name: unzip

- name: install terraform
  unarchive:
    src: https://releases.hashicorp.com/terraform/0.12.28/terraform_0.12.28_lin
ux_amd64.zip
    dest: /usr/local/bin
    remote_src: yes
    mode: 0755
    owner: root
    group: root
```

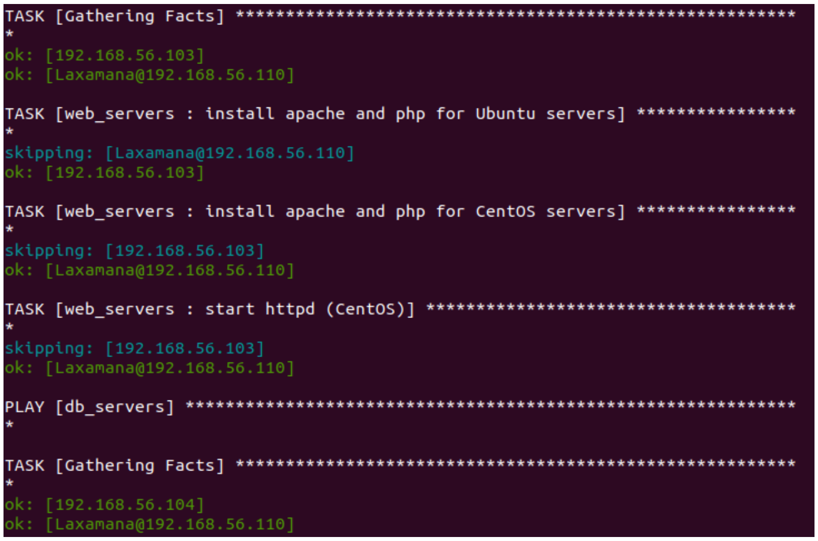
4. Run the site.yml playbook and describe the output.



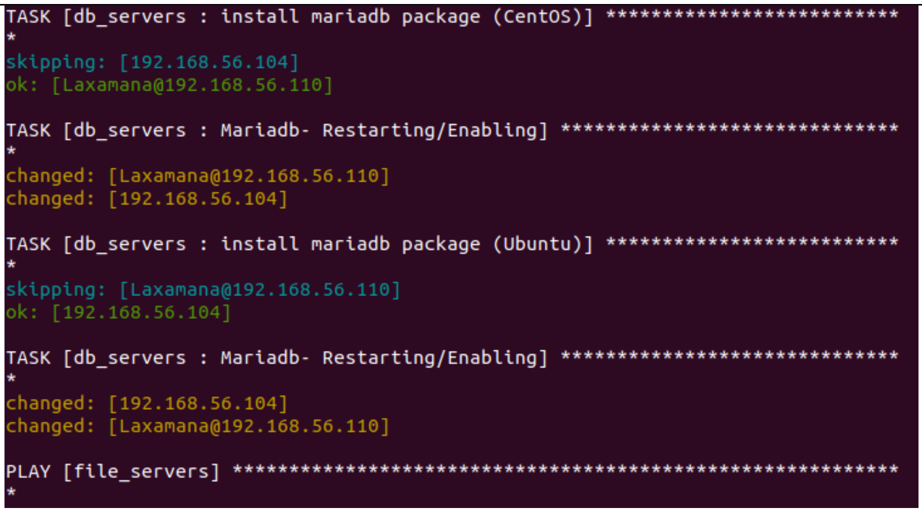
```
laxamana_ubuntu@workstation:~/Hoa7_Laxamana$ ansible-playbook --ask-become-pass
 site2.yml
BECOME password:

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

TASK [Gathering Facts] *********************************************************
*
ok: [192.168.56.104]
ok: [192.168.56.103]
ok: [Laxamana@192.168.56.110]

TASK [update repository index (CentOS)] ****************************************
*
skipping: [192.168.56.103]
skipping: [192.168.56.104]
ok: [Laxamana@192.168.56.110]

TASK [update repository index (Ubuntu)] ****************************************
*
skipping: [Laxamana@192.168.56.110]
ok: [192.168.56.103]
ok: [192.168.56.104]

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



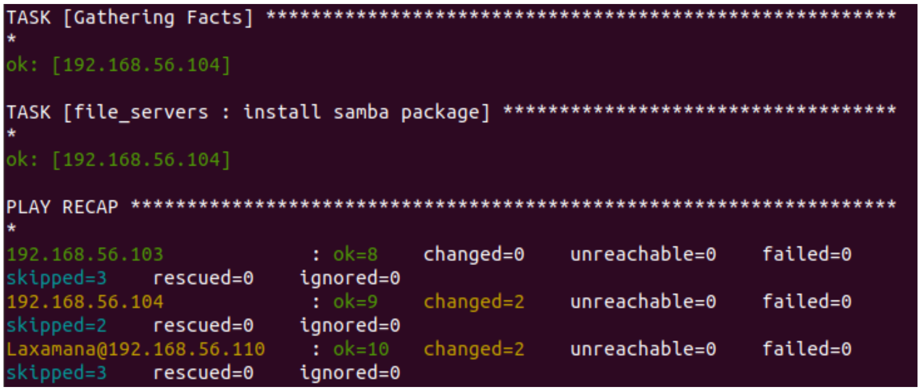
```
TASK [Gathering Facts] *********************************************************
*
ok: [192.168.56.104]
ok: [192.168.56.103]
ok: [Laxamana@192.168.56.110]

PLAY [workstations] ************************************************************
*

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

TASK [workstations : install unzip] ********************************************
*
ok: [192.168.56.103]

TASK [workstations : install terraform] ****************************************
*
ok: [192.168.56.103]

PLAY [web_servers] *************************************************************
*
```



```
TASK [Gathering Facts] *********************************************************
*
ok: [192.168.56.103]
ok: [Laxamana@192.168.56.110]

TASK [web_servers : install apache and php for Ubuntu servers] *****************
*
skipping: [Laxamana@192.168.56.110]
ok: [192.168.56.103]

TASK [web_servers : install apache and php for CentOS servers] *****************
*
skipping: [192.168.56.103]
ok: [Laxamana@192.168.56.110]

TASK [web_servers : start httpd (CentOS)] **************************************
*
skipping: [192.168.56.103]
ok: [Laxamana@192.168.56.110]

PLAY [db_servers] **************************************************************
*

TASK [Gathering Facts] *********************************************************
*
ok: [192.168.56.104]
ok: [Laxamana@192.168.56.110]
```



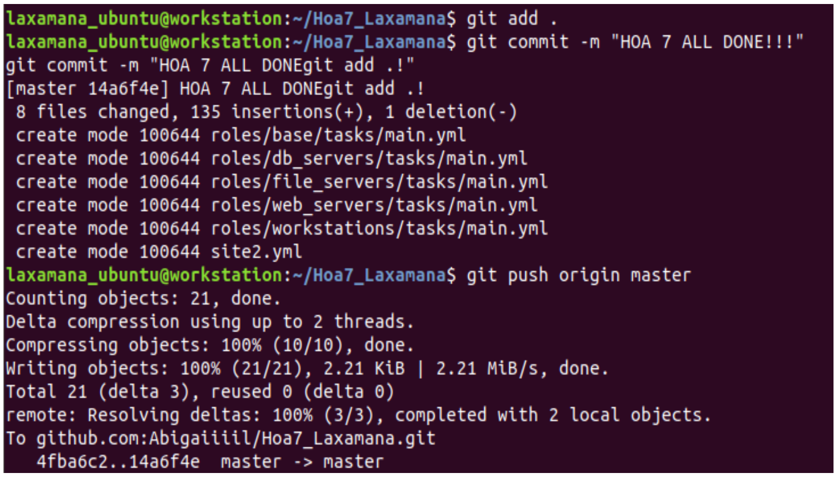
```
TASK [db_servers : install mariadb package (CentOS)] **************************
*
skipping: [192.168.56.104]
ok: [Laxamana@192.168.56.110]

TASK [db_servers : Mariadb- Restarting/Enabling] ******************************
*
changed: [Laxamana@192.168.56.110]
changed: [192.168.56.104]

TASK [db_servers : install mariadb package (Ubuntu)] **************************
*
skipping: [Laxamana@192.168.56.110]
ok: [192.168.56.104]

TASK [db_servers : Mariadb- Restarting/Enabling] ******************************
*
changed: [192.168.56.104]
changed: [Laxamana@192.168.56.110]

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



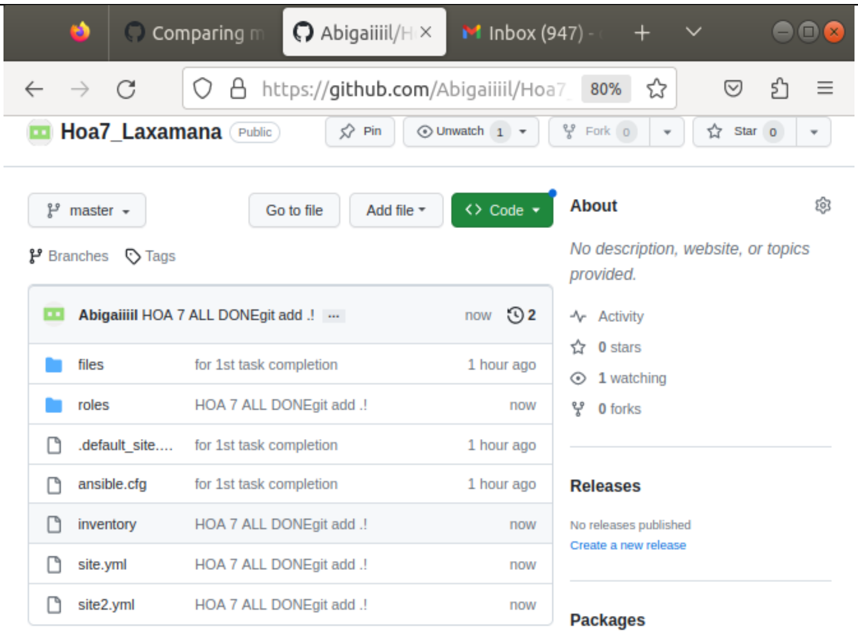
```
TASK [Gathering Facts] ********************************************************
*
ok: [192.168.56.104]

TASK [file_servers : install samba package] ***********************************
*
ok: [192.168.56.104]

PLAY RECAP ********************************************************************
*
192.168.56.103             : ok=8    changed=0    unreachable=0    failed=0
skipped=3    rescued=0    ignored=0
192.168.56.104             : ok=9    changed=2    unreachable=0    failed=0
skipped=2    rescued=0    ignored=0
Laxamana@192.168.56.110    : ok=10   changed=2    unreachable=0    failed=0
skipped=3    rescued=0    ignored=0
```

After running the playbook, the task processed accordingly based on the tree. The metagroup have been played first individually and then the tasks accomplished after gathering facts.

GITHUB commit and push



```
laxamana_ubuntu@workstation:~/Hoa7_Laxamana$ git add .
laxamana_ubuntu@workstation:~/Hoa7_Laxamana$ git commit -m "HOA 7 ALL DONE!!!"
git commit -m "HOA 7 ALL DONEgit add .!"
[master 14a6f4e] HOA 7 ALL DONEgit add .!
 8 files changed, 135 insertions(+), 1 deletion(-)
 create mode 100644 roles/base/tasks/main.yml
 create mode 100644 roles/db_servers/tasks/main.yml
 create mode 100644 roles/file_servers/tasks/main.yml
 create mode 100644 roles/web_servers/tasks/main.yml
 create mode 100644 roles/workstations/tasks/main.yml
 create mode 100644 site2.yml
laxamana_ubuntu@workstation:~/Hoa7_Laxamana$ git push origin master
Counting objects: 21, done.
Delta compression using up to 2 threads.
Compressing objects: 100% (10/10), done.
Writing objects: 100% (21/21), 2.21 KiB | 2.21 MiB/s, done.
Total 21 (delta 3), reused 0 (delta 0)
remote: Resolving deltas: 100% (3/3), completed with 2 local objects.
To github.com:Abigaiiiil/Hoa7_Laxamana.git
   4fba6c2..14a6f4e  master -> master
```



No description, website, or topics provided.

No releases published
Create a new release

Abigaiiiil HOA 7 ALL DONEgit add .! ... now 2

files	for 1st task completion	1 hour ago
roles	HOA 7 ALL DONEgit add .!	now
.default_site....	for 1st task completion	1 hour ago
ansible.cfg	for 1st task completion	1 hour ago
inventory	HOA 7 ALL DONEgit add .!	now
site.yml	HOA 7 ALL DONEgit add .!	now
site2.yml	HOA 7 ALL DONEgit add .!	now

repository link: https://github.com/Abigaiiiil/Hoa7_Laxamana.git

Reflections:

Answer the following:

1. What is the importance of creating roles?

Creating roles makes running of specific tasks to a playbook easier because there is no need of running all unnecessary tasks to accomplished what you need. Creating roles makes management and maintenance of a playbook easier as we can focus only in a specific task/s. For testing and debugging, roles can be a big help and we can run specific role and bugs can be found with ease.

2. What is the importance of managing files?

By managing files, administrators can make sure that systems are appropriately setup, software is deployed effectively, and data is protected. Ansible streamlines normal operations, minimizing human error, and gaining important time by automating file-related procedures.

Conclusion

I therefore conclude that making use of roles, tags, and file management can make system administration simpler. Through this activity, I have learned that we can simplify a long playbook script by segmenting tasks and putting it into a specific folder. It might be time consuming to transfer data at first but it surely will save you some time in the long run. Running the playbook either with long script or with segmented tasks, does not make a difference. The tasks will be process as how you told it to, you just organized and compartmentalized them in a folder.