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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**:

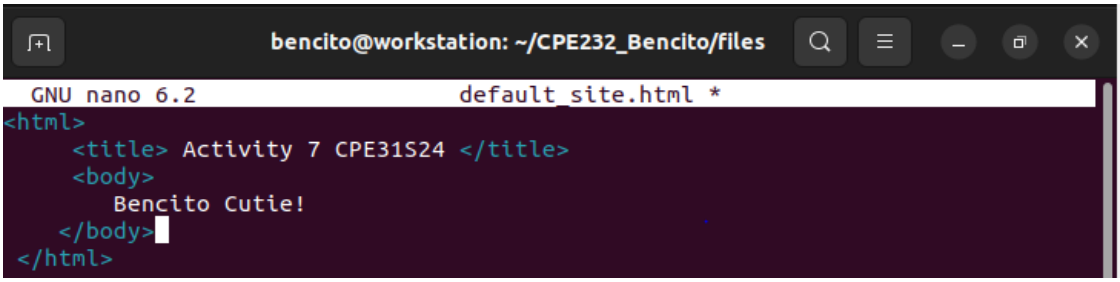
In this activity, we look at the concept of copying a file to a server. We are going to create a file into our git repository and use Ansible to grab that file and put it into a particular place so that we could do things like customize a default website, or maybe install a default configuration file.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

```
bencito@workstation:~/CPE232_Bencito$ mkdir files
bencito@workstation:~/CPE232_Bencito$ ls
ansible.cfg  files  install_apache.yml  inventory  README.md  site.yml
bencito@workstation:~/CPE232_Bencito$
```

```
bencito@workstation:~/CPE232_Bencito$ cd files
bencito@workstation:~/CPE232_Bencito/files$ nano default_site.html
```



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

```
bencito@workstation:~/CPE232_Bencito$ nano site.yml
bencito@workstation:~/CPE232_Bencito$
```

```
- name: copy html file for site
  tags: apache,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.

```
bencito@workstation:~/CPE232_Bencito$ ansible-playbook --ask-become-pass site.y
ml
BECOME password:

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

TASK [Gathering Facts] *********************************************************
*
ok: [192.168.56.105]
ok: [192.168.56.101]

TASK [install updates (CentOS)] ************************************************
*
skipping: [192.168.56.101]
ok: [192.168.56.105]

TASK [install updates (Ubuntu)] ************************************************
*
skipping: [192.168.56.105]
ok: [192.168.56.101]

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

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

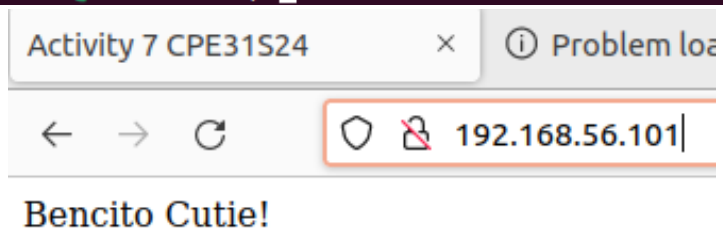
```
ok: [192.168.56.105]

TASK [install httpd package (CentOS)] ************************************
*
skipping: [192.168.56.101]
changed: [192.168.56.105]

TASK [install apache2 package (Ubuntu)] **********************************
*
skipping: [192.168.56.105]
ok: [192.168.56.101]

TASK [copy html file for site] *******************************************
*
ok: [192.168.56.101]
changed: [192.168.56.105]

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

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

TASK [install mariadb server package (CentOS)] ***************************
*
changed: [192.168.56.105]

TASK [install mariadb server] ********************************************
*
skipping: [192.168.56.105]

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

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

TASK [install samba package] *********************************************
*
ok: [192.168.56.101]

PLAY RECAP ***************************************************************
*
192.168.56.101             : ok=7    changed=0    unreachable=0    failed=0
skipped=2    rescued=0    ignored=0
192.168.56.105             : ok=7    changed=3    unreachable=0    failed=0
skipped=3    rescued=0    ignored=0

bencito@workstation:~/CPE232_Bencito$
```

The changes were successfully adding the given code and it will install the need on my Remote OS.

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.

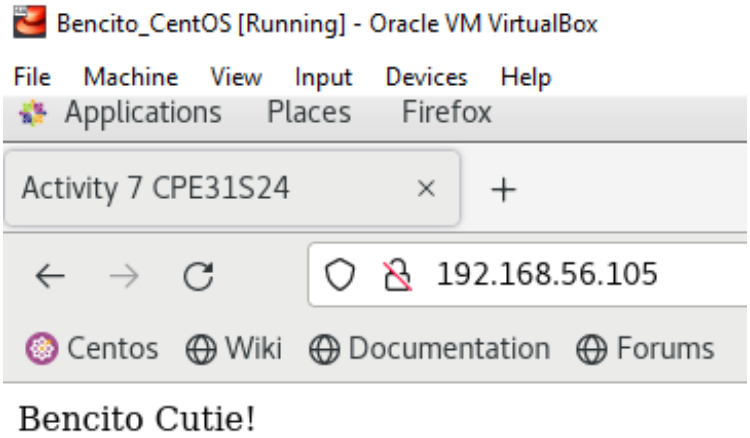
   Server 1

```
bencito@Server1:~$ cat /var/www/html/index.html
<html>
     <title> Activity 7 CPE31S24 </title>
     <body>
        Bencito Cutie!
    </body>
 </html>
bencito@Server1:~$
```



CentOS

```
[bencito@localhost ~]$ cat /var/www/html/index.html
<html>
     <title> Activity 7 CPE31S24 </title>
     <body>
        Bencito Cutie!
    </body>
 </html>
[bencito@localhost ~]$
```



It was successfully shown on my two remote servers. There is no error and we can see the message that we edit and add on our playbook.

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

```
bencito@workstation:~/CPE232_Bencito$ git add inventory
bencito@workstation:~/CPE232_Bencito$ git add site.yml
bencito@workstation:~/CPE232_Bencito$ git add files/
bencito@workstation:~/CPE232_Bencito$ git commit -m "Activity 7"
[main 8a34525] Activity 7
 3 files changed, 90 insertions(+), 86 deletions(-)
 create mode 100644 files/default_site.html
 rewrite site.yml (99%)
bencito@workstation:~/CPE232_Bencito$ git push origin main
Enumerating objects: 9, done.
Counting objects: 100% (9/9), done.
Compressing objects: 100% (5/5), done.
Writing objects: 100% (6/6), 1.01 KiB | 345.00 KiB/s, done.
Total 6 (delta 0), reused 0 (delta 0), pack-reused 0
To github.com:Bencitoo/CPE232_Bencito.git
   de0e86b..8a34525  main -> main
bencito@workstation:~/CPE232_Bencito$
```

The changes were successfully push on my repository.

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

```
- 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>
      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.\

```
  GNU nano 6.2                                  inventory
[web_servers]
192.168.56.101
192.168.56.105

[workstation_servers]
192,168.56.101

[db_servers]
192.168.56.105

[file_servers]
192.168.56.101
```

3. Run the playbook. Describe the output.

```
bencito@workstation:~/CPE232_Bencito$ ansible-playbook --ask-become-pass site.y
ml
BECOME password:

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

TASK [Gathering Facts] *********************************************************
*
ok: [192.168.56.105]
ok: [192.168.56.101]

TASK [install updates (CentOS)] ************************************************
*
skipping: [192.168.56.101]
ok: [192.168.56.105]

TASK [install updates (Ubuntu)] ************************************************
*
skipping: [192.168.56.105]
ok: [192.168.56.101]

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

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

```
TASK [install unzip] ***********************************************************
*
ok: [192.168.56.101]

TASK [install terraform] *******************************************************
*
changed: [192.168.56.101]

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

TASK [Gathering Facts] *********************************************************
*
ok: [192.168.56.101]
ok: [192.168.56.105]

TASK [install httpd package (CentOS)] ******************************************
*
skipping: [192.168.56.101]
ok: [192.168.56.105]

TASK [install apache2 package (Ubuntu)] ****************************************
*
skipping: [192.168.56.105]
ok: [192.168.56.101]

TASK [copy html file for site] *************************************************
*
ok: [192.168.56.101]
```

```
ok: [192.168.56.105]

TASK [install mariadb server package (CentOS)] *********************************
*
ok: [192.168.56.105]

TASK [install mariadb server] **************************************************
*
skipping: [192.168.56.105]

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

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

TASK [install samba package] ***************************************************
*
ok: [192.168.56.101]

PLAY RECAP *********************************************************************
*
192.168.56.101             : ok=10   changed=1    unreachable=0    failed=0
skipped=2    rescued=0    ignored=0
192.168.56.105             : ok=7    changed=0    unreachable=0    failed=0
skipped=3    rescued=0    ignored=0

bencito@workstation:~/CPE232_Bencito$
```

There is a change on my server 1 because I use that as my workstation to install the terraform.

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

```
bencito@Server1:~$ terraform --version
Terraform v0.12.28

Your version of Terraform is out of date! The latest version
is 1.3.2. You can update by downloading from https://www.ter
raform.io/downloads.html
```

It was successfully installed on my workstation and that is my Server 1

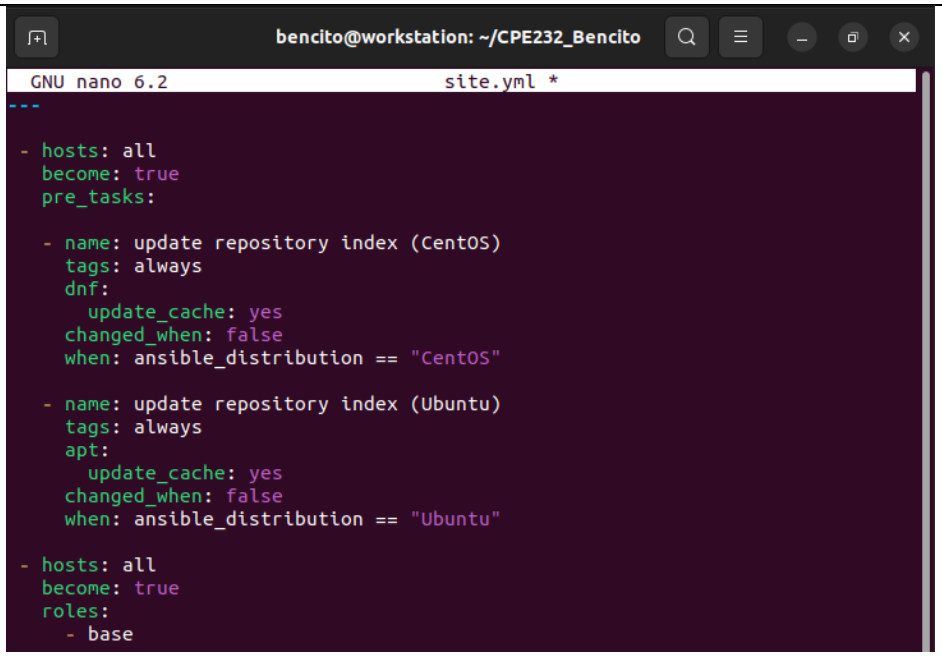
Task 3: Create roles

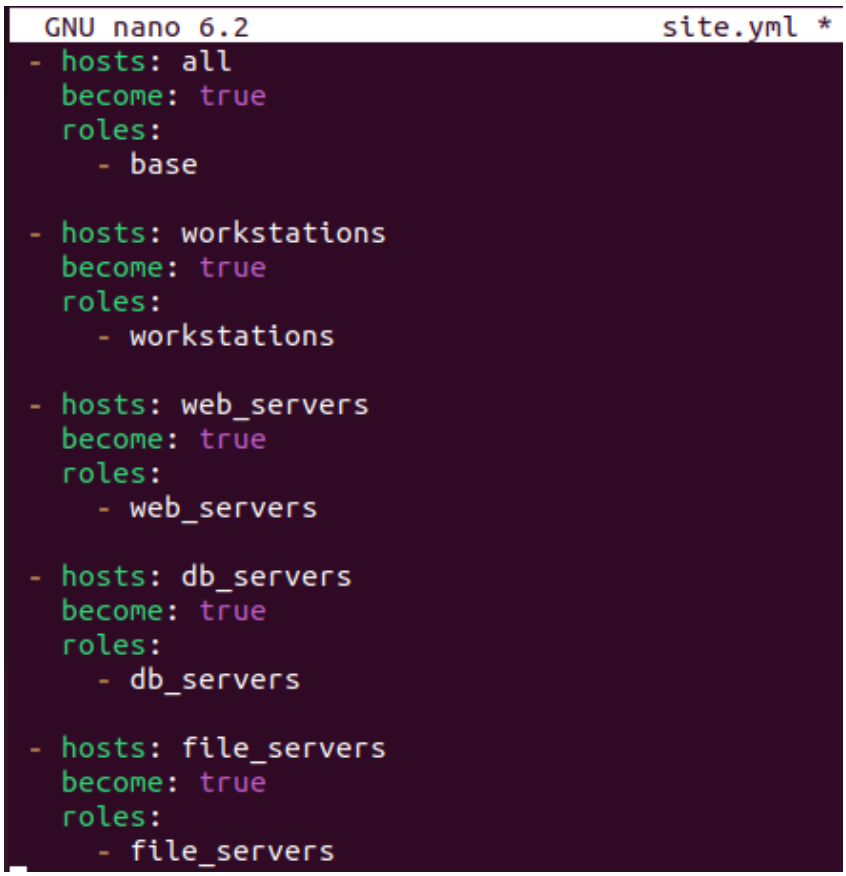
1. Edit the site.yml. Configure roles as follows: (make sure to create a copy of the old site.yml file because you will be copying the specific plays for all groups)

```
---
- 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.

```
bencito@workstation:~/CPE232_Bencito$ cp site.yml site_before_roles.yml
bencito@workstation:~/CPE232_Bencito$ nano site_before_roles.yml
bencito@workstation:~/CPE232_Bencito$ nano site_before_roles.yml
bencito@workstation:~/CPE232_Bencito$ nano site.yml
```





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.

```
bencito@workstation:~/CPE232_Bencito$ mkdir roles
bencito@workstation:~/CPE232_Bencito$ cd roles
bencito@workstation:~/CPE232_Bencito/roles$ mkdir base
bencito@workstation:~/CPE232_Bencito/roles$ mkdir web_servers
bencito@workstation:~/CPE232_Bencito/roles$ mkdir file_servers
bencito@workstation:~/CPE232_Bencito/roles$ mkdir db_servers
bencito@workstation:~/CPE232_Bencito/roles$ mkdir workstations
bencito@workstation:~/CPE232_Bencito/roles$ ls
base  db_servers  file_servers  web_servers  workstations
bencito@workstation:~/CPE232_Bencito/roles$
```

```
bencito@workstation:~/CPE232_Bencito/roles$ cd base
bencito@workstation:~/CPE232_Bencito/roles/base$ mkdir tasks
bencito@workstation:~/CPE232_Bencito/roles/base$ ls
tasks
```

```
bencito@workstation:~/CPE232_Bencito/roles/web_servers$ mkdir tasks
bencito@workstation:~/CPE232_Bencito/roles/web_servers$ ls
tasks
```

```
bencito@workstation:~/CPE232_Bencito/roles/file_servers$ mkdir tasks
bencito@workstation:~/CPE232_Bencito/roles/file_servers$ ls
tasks
```

```
bencito@workstation:~/CPE232_Bencito/roles/db_servers$ mkdir tasks
bencito@workstation:~/CPE232_Bencito/roles/db_servers$ ls
tasks
```

```
bencito@workstation:~/CPE232_Bencito/roles/workstations$ mkdir tasks
bencito@workstation:~/CPE232_Bencito/roles/workstations$ ls
tasks
```

```
bencito@workstation:~/CPE232_Bencito/roles$ tree
.
├── base
│   └── tasks
├── db_servers
│   └── tasks
├── file_servers
│   └── tasks
├── web_servers
│   └── tasks
└── workstations
    └── tasks
```

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.

```
bencito@workstation:~$ cd CPE232_Bencito/roles
bencito@workstation:~/CPE232_Bencito/roles$ tree
.
├── base
│   └── tasks
│       └── main.yml
├── db_servers
│   └── tasks
│       └── main.yml
├── file_servers
│   └── tasks
│       └── main.yml
├── web_servers
│   └── tasks
│       └── main.yml
└── workstations
    └── tasks
        └── main.yml

10 directories, 5 files
```

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

```
bencito@workstation:~/CPE232_Bencito$ ansible-playbook --ask-become-pass site.y
ml
BECOME password:

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

TASK [Gathering Facts] *********************************************************
*
ok: [192.168.56.101]
ok: [192.168.56.105]

TASK [update repository index (CentOS)] ****************************************
*
skipping: [192.168.56.101]
ok: [192.168.56.105]

TASK [update repository index (Ubuntu)] ****************************************
*
skipping: [192.168.56.105]
ok: [192.168.56.101]

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

TASK [Gathering Facts] *********************************************************
*
```

```
ok: [192.168.56.105]
ok: [192.168.56.101]

TASK [base : adding of ssh bencito] ****************************************
*
changed: [192.168.56.105]
ok: [192.168.56.101]

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

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

TASK [workstations : install unzip] ****************************************
*
ok: [192.168.56.101]

TASK [workstations : install terraform] ************************************
*
ok: [192.168.56.101]

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

TASK [Gathering Facts] *****************************************************
*
ok: [192.168.56.105]
ok: [192.168.56.101]

TASK [web_servers : install httpd package (CentOS)] ************************
*
skipping: [192.168.56.101]
ok: [192.168.56.105]

TASK [web_servers : Create a base user] ************************************
*
ok: [192.168.56.101]
ok: [192.168.56.105]

TASK [web_servers : start httdp (CentOS)] **********************************
*
skipping: [192.168.56.101]
ok: [192.168.56.105]

TASK [web_servers : install apache2 package (Ubuntu)] **********************
*
skipping: [192.168.56.105]
ok: [192.168.56.101]

TASK [web_servers : copy html file for site] *******************************
*
ok: [192.168.56.101]
ok: [192.168.56.105]
```

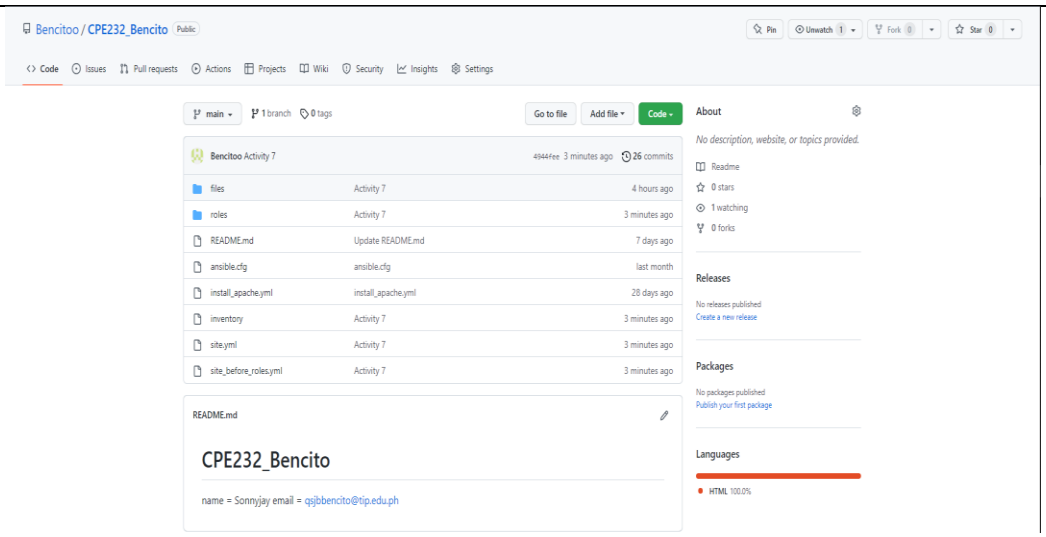
```
TASK [web_servers : copy html file for site] ********************************
*
ok: [192.168.56.101]
ok: [192.168.56.105]

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

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

TASK [db_servers : install mariadb server package (CentOS)] *****************
*
ok: [192.168.56.105]

TASK [db_servers : install mariadb server] ***********************************
*
skipping: [192.168.56.105]

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

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

TASK [file_servers : install samba package] **********************************
*
```

```
TASK [file_servers : install samba package] **********************************
*
ok: [192.168.56.101]

PLAY RECAP ******************************************************************
*
192.168.56.101             : ok=13   changed=0    unreachable=0    failed=0
skipped=3    rescued=0    ignored=0
192.168.56.105             : ok=11   changed=1    unreachable=0    failed=0
skipped=3    rescued=0    ignored=0

bencito@workstation:~/CPE232_Bencito$
```

<u>There is one changes because, I add into my base directory the SSH of my servers.</u>

Commit and Git push into repository:

```
bencito@workstation:~/CPE232_Bencito$ git add inventory
bencito@workstation:~/CPE232_Bencito$ git add site.yml
bencito@workstation:~/CPE232_Bencito$ git add roles/
bencito@workstation:~/CPE232_Bencito$ git add site_before_roles.yml
bencito@workstation:~/CPE232_Bencito$ git commit -m "Activity 7"
[main 4944fee] Activity 7
 8 files changed, 153 insertions(+), 80 deletions(-)
 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
 rewrite site.yml (77%)
 copy site.yml => site_before_roles.yml (70%)
bencito@workstation:~/CPE232_Bencito$ git push
Enumerating objects: 24, done.
Counting objects: 100% (24/24), done.
Compressing objects: 100% (11/11), done.
Writing objects: 100% (21/21), 2.94 KiB | 167.00 KiB/s, done.
Total 21 (delta 3), reused 0 (delta 0), pack-reused 0
remote: Resolving deltas: 100% (3/3), done.
To github.com:Bencitoo/CPE232_Bencito.git
   8a34525..4944fee  main -> main
bencito@workstation:~/CPE232_Bencito$
```



Reflections:

Answer the following:

1. What is the importance of creating roles?
   The important of creating roles is to make it organize and when you run the playbook it will connect to each other without issue, you just need to double check it by typing the command tree if all of the files are created successfully.
2. What is the importance of managing files?
   The managing file is important to make it organized and make it easier to find. It will easy to write and edit the files in your control server.

I affirm that I shall not give or receive any unauthorized help on this assignment and that all work shall be my own.