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<b>Course/Section:</b> CPE 232 - CPE31S4	<b>Date Submitted:</b> 10-10-2023
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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 0: Preparation

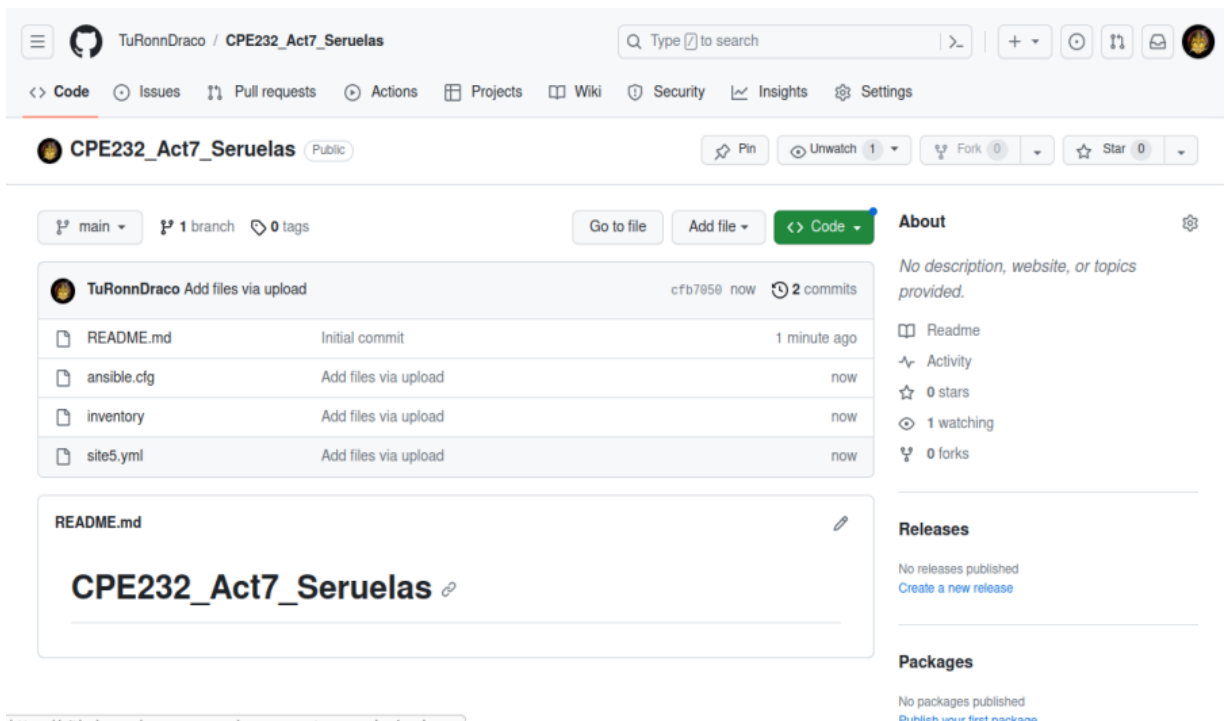
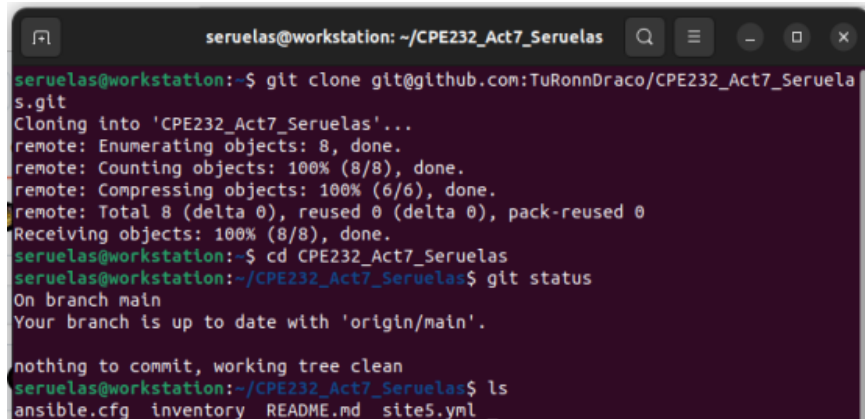


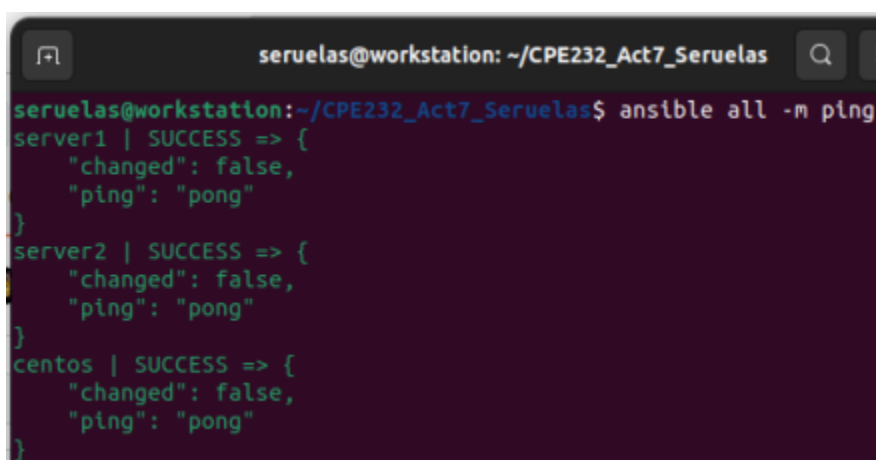
Figure 0.1 - Creation of the new repository, alongside with files from previous activity.



```
seruelas@workstation: ~/CPE232_Act7_Seruelas
seruelas@workstation:~$ git clone git@github.com:TuRonnDraco/CPE232_Act7_Seruela
s.git
Cloning into 'CPE232_Act7_Seruelas'...
remote: Enumerating objects: 8, done.
remote: Counting objects: 100% (8/8), done.
remote: Compressing objects: 100% (6/6), done.
remote: Total 8 (delta 0), reused 0 (delta 0), pack-reused 0
Receiving objects: 100% (8/8), done.
seruelas@workstation:~$ cd CPE232_Act7_Seruelas
seruelas@workstation:~/CPE232_Act7_Seruelas$ git status
On branch main
Your branch is up to date with 'origin/main'.

nothing to commit, working tree clean
seruelas@workstation:~/CPE232_Act7_Seruelas$ ls
ansible.cfg  inventory  README.md  site5.yml
```

Figure 0.2 - Cloning of new repository to the workstation.

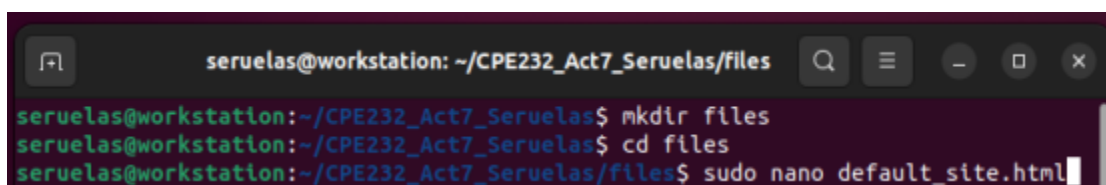


```
seruelas@workstation: ~/CPE232_Act7_Seruelas
seruelas@workstation:~/CPE232_Act7_Seruelas$ ansible all -m ping
server1 | SUCCESS => {
  "changed": false,
  "ping": "pong"
}
server2 | SUCCESS => {
  "changed": false,
  "ping": "pong"
}
centos | SUCCESS => {
  "changed": false,
  "ping": "pong"
}
```

Figure 0.3 - Pinging all machines to verify online status.

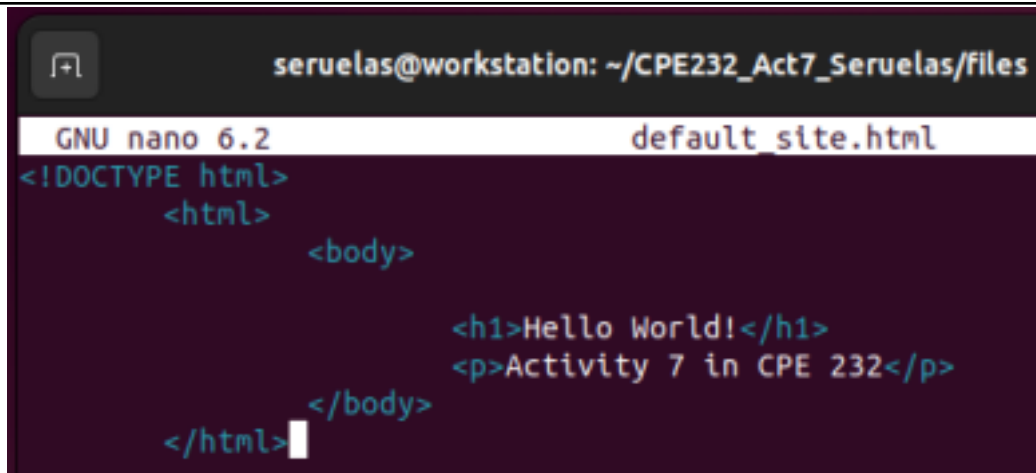
### Task 1: Create a file and copy it to remote servers

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.



```
seruelas@workstation: ~/CPE232_Act7_Seruelas/files
seruelas@workstation:~/CPE232_Act7_Seruelas$ mkdir files
seruelas@workstation:~/CPE232_Act7_Seruelas$ cd files
seruelas@workstation:~/CPE232_Act7_Seruelas/files$ sudo nano default_site.html
```

Figure 1.1.1 - Creation of the **files** directory and the **default\_site.html**.

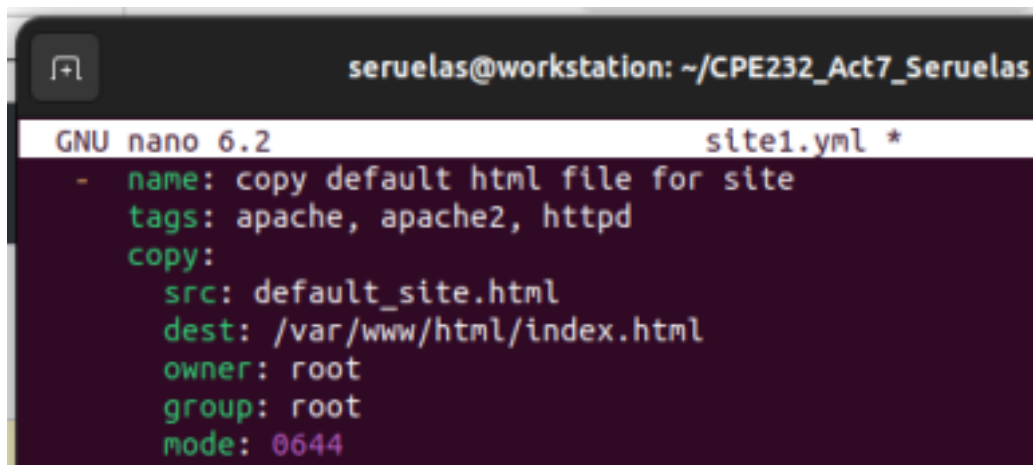


```
seruelas@workstation: ~/CPE232_Act7_Seruelas/files
GNU nano 6.2 default_site.html
<!DOCTYPE html>
  <html>
    <body>
      <h1>Hello World!</h1>
      <p>Activity 7 in CPE 232</p>
    </body>
  </html>
```

Figure 1.1.2 - Basic syntax inside of 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:

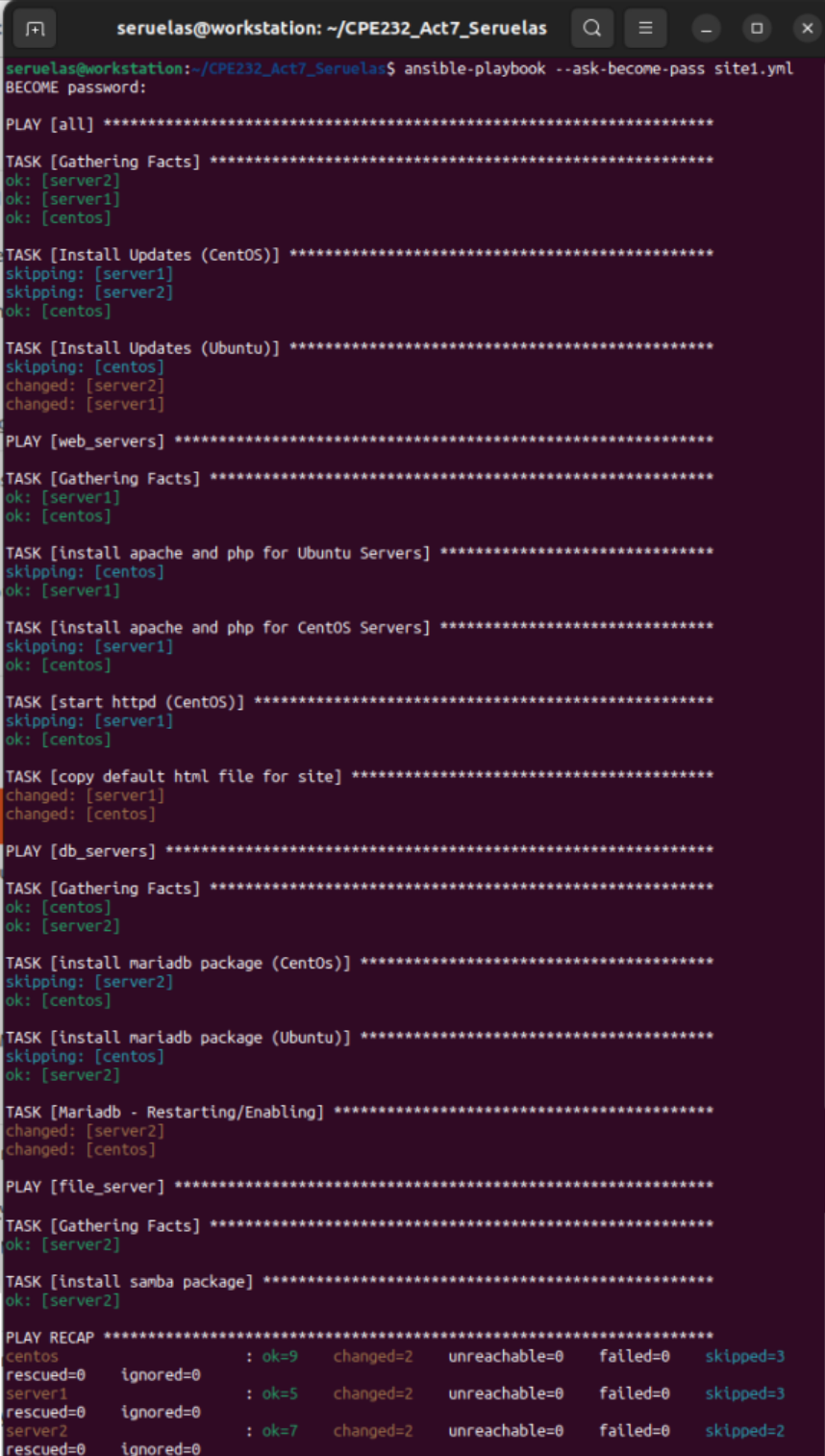
```
name: copy default html file for site
tags: apache, apache2, httpd
copy:
  src: default_site.html
  dest: /var/www/html/index.html
  owner: root
  group: root
  mode: 0644
```



```
seruelas@workstation: ~/CPE232_Act7_Seruelas
GNU nano 6.2 site1.yml *
- 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
```

Figure 1.2.1 - Copying new task unto site.yml. (Created new version of site.yml)

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



```
seruelas@workstation: ~/CPE232_Act7_Seruelas
seruelas@workstation:~/CPE232_Act7_Seruelas$ ansible-playbook --ask-become-pass site.yml
BECOME password:

PLAY [all] *****

TASK [Gathering Facts] *****
ok: [server2]
ok: [server1]
ok: [centos]

TASK [Install Updates (CentOS)] *****
skipping: [server1]
skipping: [server2]
ok: [centos]

TASK [Install Updates (Ubuntu)] *****
skipping: [centos]
changed: [server2]
changed: [server1]

PLAY [web_servers] *****

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

TASK [install apache and php for Ubuntu Servers] *****
skipping: [centos]
ok: [server1]

TASK [install apache and php for CentOS Servers] *****
skipping: [server1]
ok: [centos]

TASK [start httpd (CentOS)] *****
skipping: [server1]
ok: [centos]

TASK [copy default html file for site] *****
changed: [server1]
changed: [centos]

PLAY [db_servers] *****

TASK [Gathering Facts] *****
ok: [centos]
ok: [server2]

TASK [install mariadb package (CentOs)] *****
skipping: [server2]
ok: [centos]

TASK [install mariadb package (Ubuntu)] *****
skipping: [centos]
ok: [server2]

TASK [Mariadb - Restarting/Enabling] *****
changed: [server2]
changed: [centos]

PLAY [file_server] *****

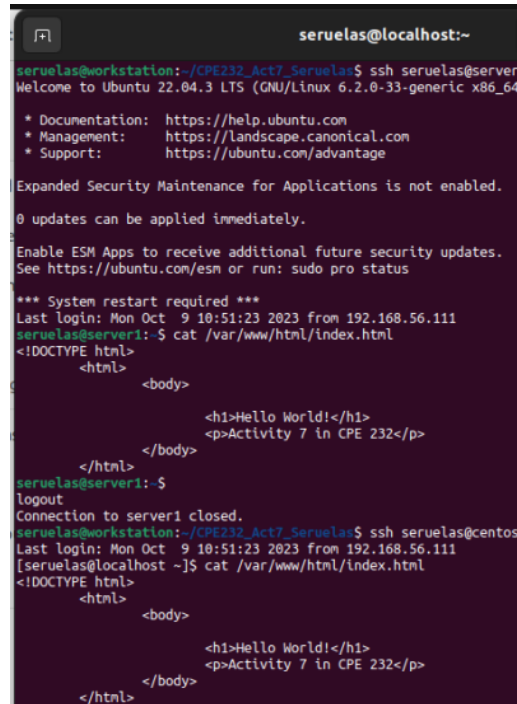
TASK [Gathering Facts] *****
ok: [server2]

TASK [install samba package] *****
ok: [server2]

PLAY RECAP *****
centos                : ok=9    changed=2    unreachable=0    failed=0    skipped=3
rescued=0    ignored=0
server1              : ok=5    changed=2    unreachable=0    failed=0    skipped=3
rescued=0    ignored=0
server2              : ok=7    changed=2    unreachable=0    failed=0    skipped=2
rescued=0    ignored=0
```

Figure 1.3.1 - Running the playbook added a new task which was executed in the remote group, *web\_servers*.

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.



```
seruelas@localhost:~  
seruelas@workstation: ~/CPE232_Act7_Seruelas$ ssh seruelas@server1  
Welcome to Ubuntu 22.04.3 LTS (GNU/Linux 6.2.0-33-generic x86_64)  
  
 * Documentation:  https://help.ubuntu.com  
 * Management:    https://landscape.canonical.com  
 * Support:        https://ubuntu.com/advantage  
  
Expanded Security Maintenance for Applications is not enabled.  
  
0 updates can be applied immediately.  
  
Enable ESM Apps to receive additional future security updates.  
See https://ubuntu.com/esm or run: sudo pro status  
  
*** System restart required ***  
Last login: Mon Oct 9 10:51:23 2023 from 192.168.56.111  
seruelas@server1:~$ cat /var/www/html/index.html  
<!DOCTYPE html>  
  <html>  
  <body>  
    <h1>Hello World!</h1>  
    <p>Activity 7 in CPE 232</p>  
  </body>  
</html>  
seruelas@server1:~$  
logout  
Connection to server1 closed.  
seruelas@workstation: ~/CPE232_Act7_Seruelas$ ssh seruelas@centos  
Last login: Mon Oct 9 10:51:23 2023 from 192.168.56.111  
[seruelas@localhost ~]$ cat /var/www/html/index.html  
<!DOCTYPE html>  
  <html>  
  <body>  
    <h1>Hello World!</h1>  
    <p>Activity 7 in CPE 232</p>  
  </body>  
</html>
```

Figure 1.4.1 - Verification of successful copying of default\_site.html unto the remote web\_servers.

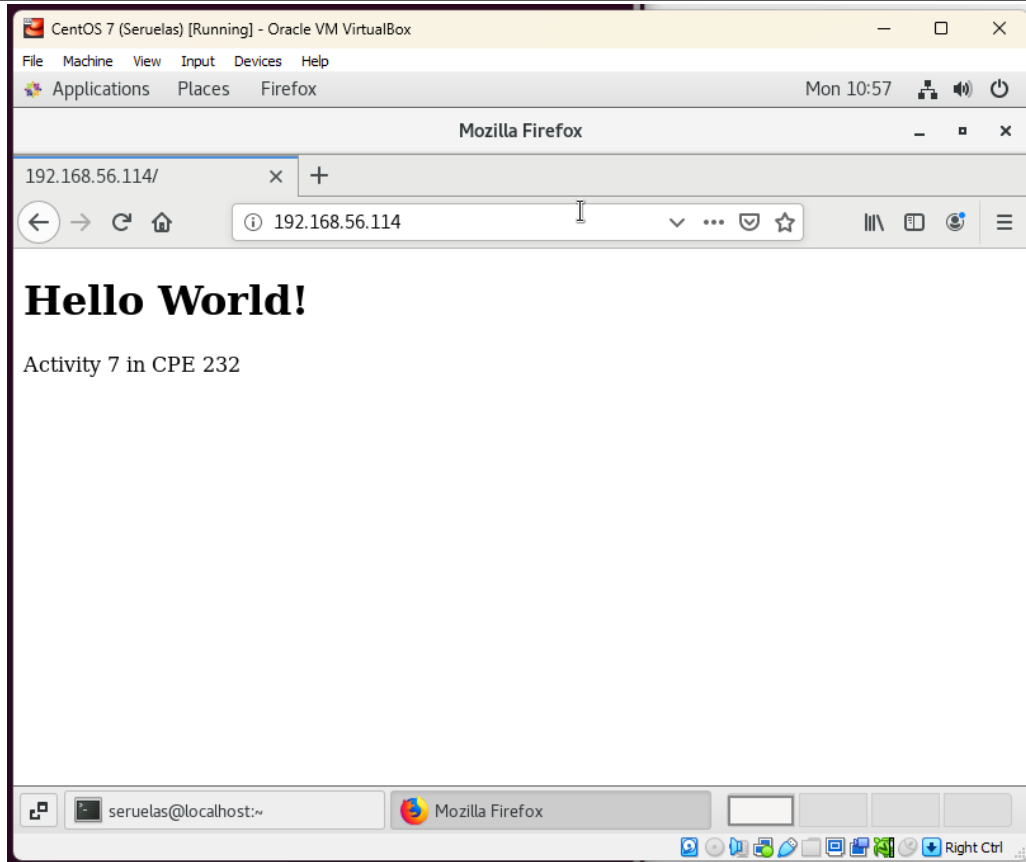


Figure 1.4.2 - Verification of successful transfer of default\_site.html in CentOS.

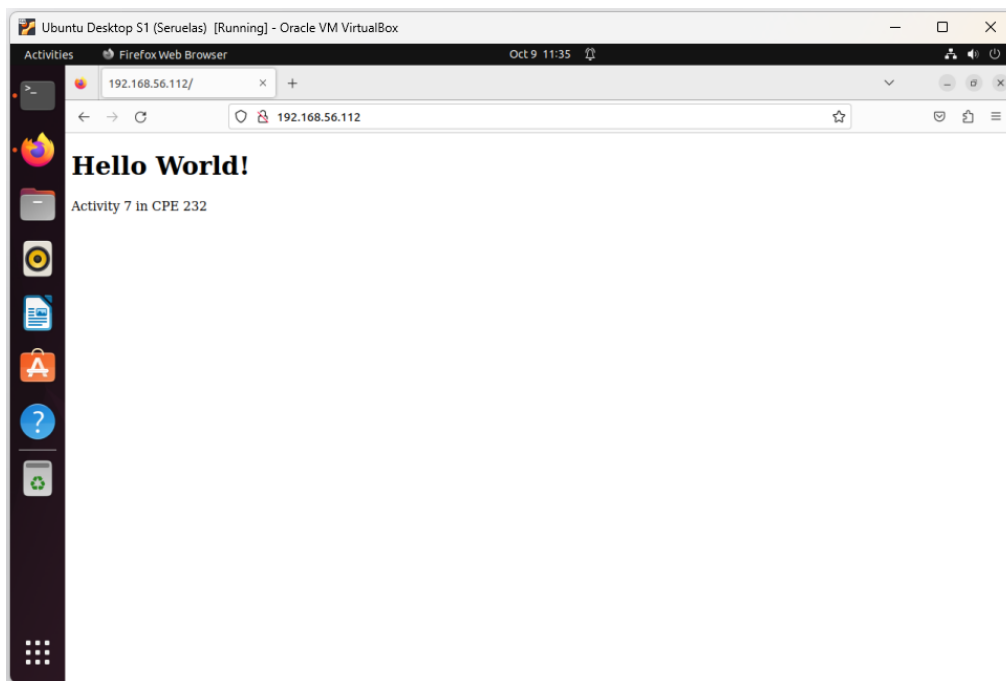


Figure 1.4.3 - Verification of successful transfer of default\_site.html in Ubuntu Server1.

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

```
seruelas@workstation: ~/CPE232_Act7_Seruelas
seruelas@workstation:~/CPE232_Act7_Seruelas$ git add *
seruelas@workstation:~/CPE232_Act7_Seruelas$ git commit -m "09-10-2023 at 10:58am"
[main d3c8790] 09-10-2023 at 10:58am
3 files changed, 187 insertions(+)
create mode 100644 files/default_site.html
create mode 100644 site.yml
create mode 100644 site1.yml
seruelas@workstation:~/CPE232_Act7_Seruelas$ git push origin
Enumerating objects: 6, done.
Counting objects: 100% (6/6), done.
Delta compression using up to 2 threads
Compressing objects: 100% (4/4), done.
Writing objects: 100% (5/5), 983 bytes | 983.00 KiB/s, done.
Total 5 (delta 1), reused 0 (delta 0), pack-reused 0
remote: Resolving deltas: 100% (1/1), completed with 1 local object.
To github.com:TuRonnDraco/CPE232_Act7_Seruelas.git
 cfb7050..d3c8790  main -> main
```

Figure 1.5.1 - Syncing local repository to GitHub repository.

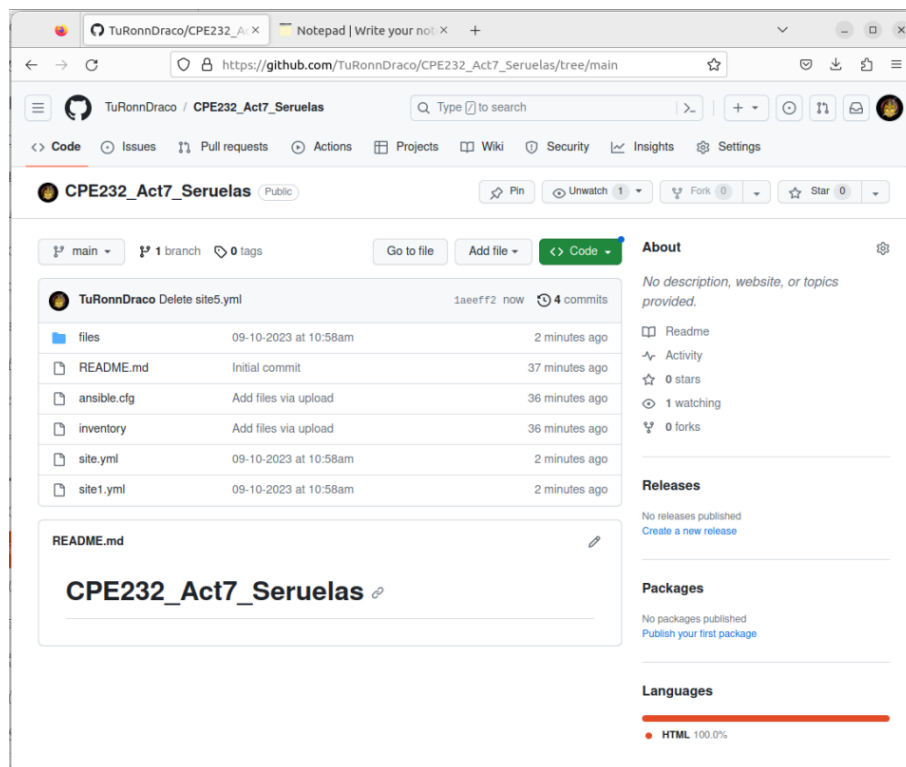


Figure 1.5.2 - Verification of sync in the GitHub repository. A change that can be seen is that there is a new section in GitHub where it displays the languages that is presently used in the repository.

## 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](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

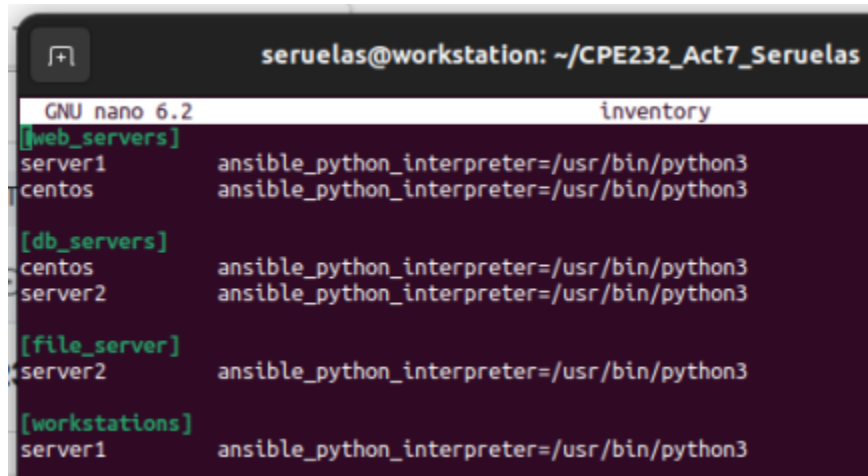


```
seruelas@workstation: ~/CPE232_Act7_Seruelas
GNU nano 6.2 site2.yml *
- hosts: workstations
  become: true
  tasks:
    - name: install unzip
      package:
        name: unzip
    - name: install terraform
      unarchive:
        src: https://releases.hashicorp.com/terraform/0.12.28/terraform_0.12.28_linux_amd64.zip
        dest: /usr/local/bin
        remote_src: yes
        mode: 0755
        owner: root
        group: root
```

Figure 2.1.1 - Adding additional tasks for remote group workstations in site.yml (New version of site.yml)



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



```
seruelas@workstation: ~/CPE232_Act7_Seruelas
GNU nano 6.2 inventory
[web_servers]
server1    ansible_python_interpreter=/usr/bin/python3
centos     ansible_python_interpreter=/usr/bin/python3

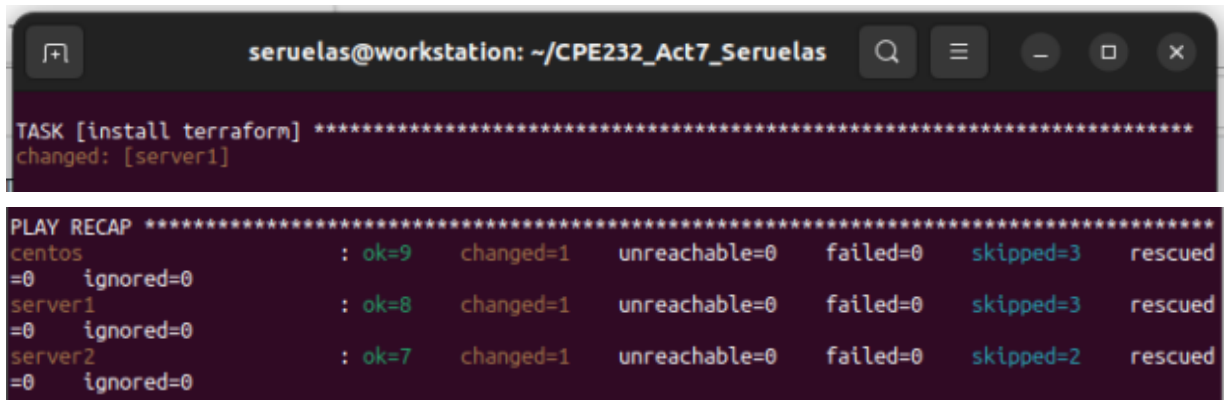
[db_servers]
centos     ansible_python_interpreter=/usr/bin/python3
server2    ansible_python_interpreter=/usr/bin/python3

[file_server]
server2    ansible_python_interpreter=/usr/bin/python3

[workstations]
server1    ansible_python_interpreter=/usr/bin/python3
```

Figure 2.2.1 - Adding a new remote group in inventory, the workstations. (Choosing Ubuntu Server1 as the remote user)

3. Run the playbook. Describe the output.

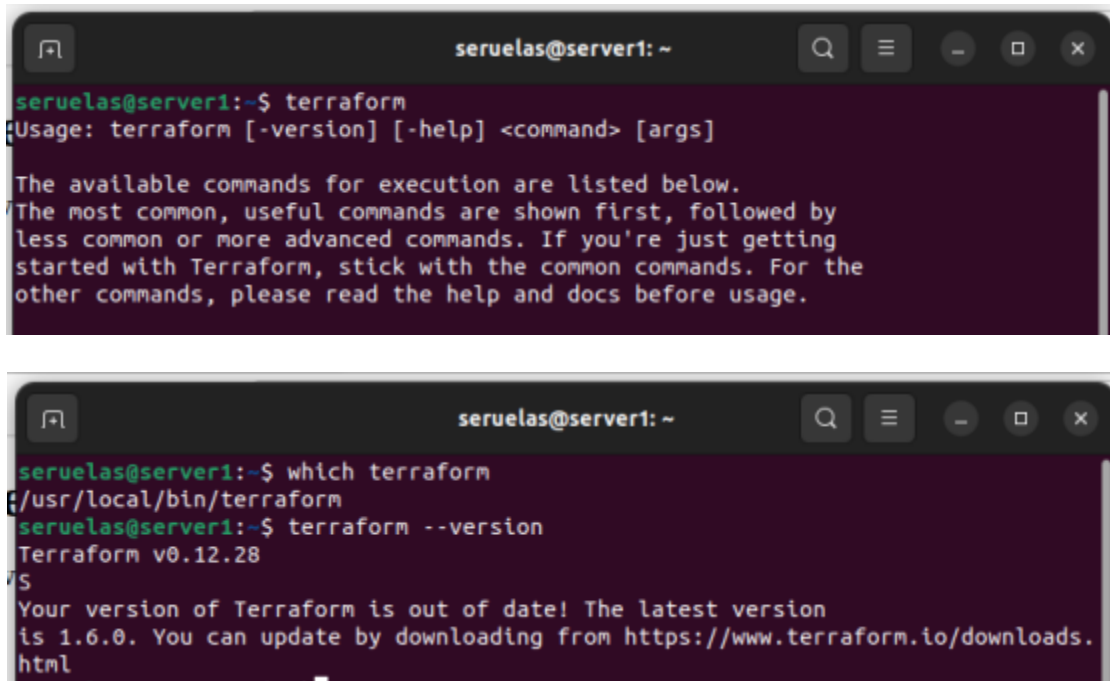


```
seruelas@workstation: ~/CPE232_Act7_Seruelas
TASK [install terraform] *****
changed: [server1]

PLAY RECAP *****
centos      : ok=9    changed=1    unreachable=0    failed=0    skipped=3    rescued=0    ignored=0
server1     : ok=8    changed=1    unreachable=0    failed=0    skipped=3    rescued=0    ignored=0
server2     : ok=7    changed=1    unreachable=0    failed=0    skipped=2    rescued=0    ignored=0
```

Figure 2.3.1-2.3.2 - Installation of the terraform was successful.

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



The image contains two terminal window screenshots. The top screenshot shows the command 'terraform' being executed, which displays the usage instructions and a list of available commands. The bottom screenshot shows the commands 'which terraform' and 'terraform --version' being executed, which return the installation path and the current version number, respectively.

```
seruelas@server1: ~  
seruelas@server1:~$ terraform  
Usage: terraform [-version] [-help] <command> [args]  
  
The available commands for execution are listed below.  
The most common, useful commands are shown first, followed by  
less common or more advanced commands. If you're just getting  
started with Terraform, stick with the common commands. For the  
other commands, please read the help and docs before usage.  
  
seruelas@server1:~$ which terraform  
/usr/local/bin/terraform  
seruelas@server1:~$ terraform --version  
Terraform v0.12.28  
Your version of Terraform is out of date! The latest version  
is 1.6.0. You can update by downloading from https://www.terraform.io/downloads.  
html
```

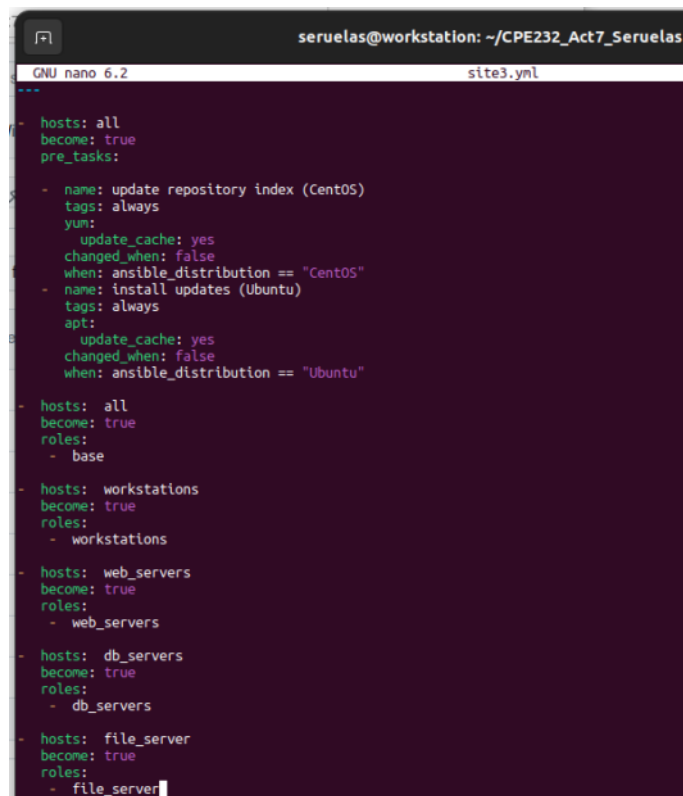
Figure 2.4.1-2.4.2 - Verification of successful installation of terraform in Ubuntu Server1.

### 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
      yum:
        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.

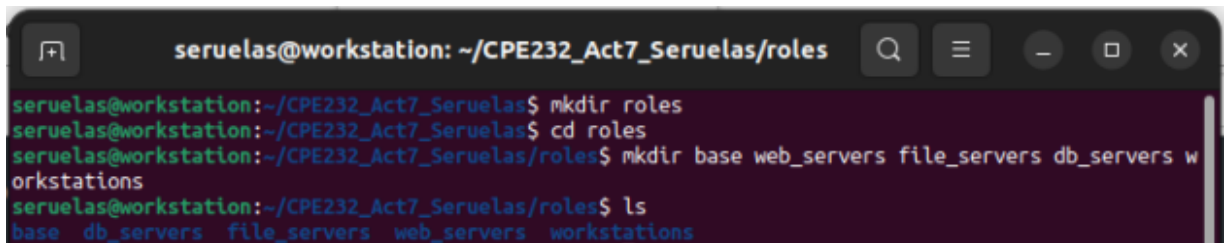


The screenshot shows a terminal window with the title bar 'seruelas@workstation: ~/CPE232\_Act7\_Seruelas'. The window is running the GNU nano 6.2 text editor, editing a file named 'site3.yml'. The content of the file is a YAML configuration for Ansible, defining pre-tasks for all hosts and roles for different host groups. The code is as follows:

```
---
- hosts: all
  become: true
  pre_tasks:
    - name: update repository index (CentOS)
      tags: always
      yum:
        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_server
  become: true
  roles:
    - file_server
```

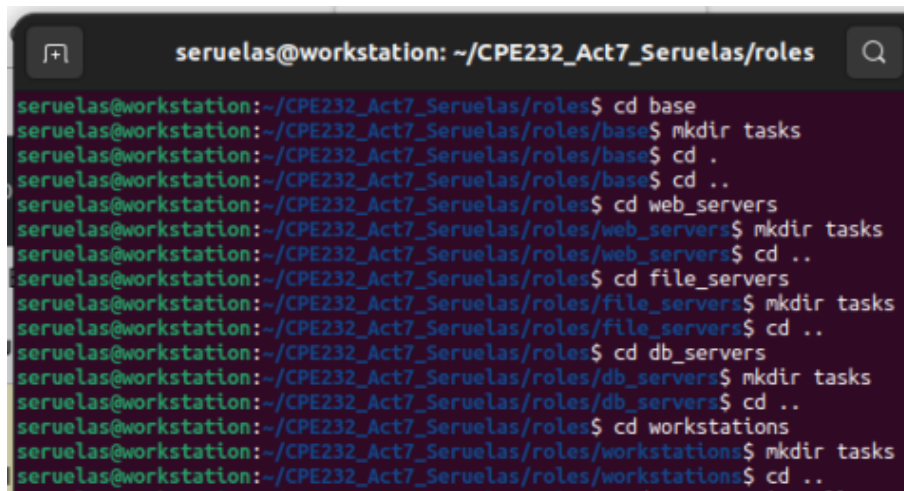
Figure 3.1.1 - Creation of new site.yml (New version of site.yml)

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.



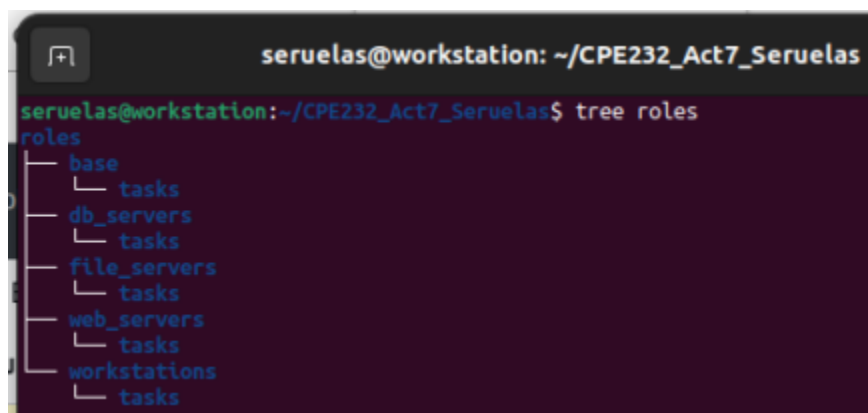
```
seruelas@workstation: ~/CPE232_Act7_Seruelas/roles
seruelas@workstation:~/CPE232_Act7_Seruelas$ mkdir roles
seruelas@workstation:~/CPE232_Act7_Seruelas$ cd roles
seruelas@workstation:~/CPE232_Act7_Seruelas/roles$ mkdir base web_servers file_servers db_servers w
orkstations
seruelas@workstation:~/CPE232_Act7_Seruelas/roles$ ls
base db_servers file_servers web_servers workstations
```

Figure 3.2.1 - Creation of the roles directory, inside of it being the directories regarding each remote group.



```
seruelas@workstation: ~/CPE232_Act7_Seruelas/roles
seruelas@workstation:~/CPE232_Act7_Seruelas/roles$ cd base
seruelas@workstation:~/CPE232_Act7_Seruelas/roles/base$ mkdir tasks
seruelas@workstation:~/CPE232_Act7_Seruelas/roles/base$ cd .
seruelas@workstation:~/CPE232_Act7_Seruelas/roles/base$ cd ..
seruelas@workstation:~/CPE232_Act7_Seruelas/roles$ cd web_servers
seruelas@workstation:~/CPE232_Act7_Seruelas/roles/web_servers$ mkdir tasks
seruelas@workstation:~/CPE232_Act7_Seruelas/roles/web_servers$ cd ..
seruelas@workstation:~/CPE232_Act7_Seruelas/roles$ cd file_servers
seruelas@workstation:~/CPE232_Act7_Seruelas/roles/file_servers$ mkdir tasks
seruelas@workstation:~/CPE232_Act7_Seruelas/roles/file_servers$ cd ..
seruelas@workstation:~/CPE232_Act7_Seruelas/roles$ cd db_servers
seruelas@workstation:~/CPE232_Act7_Seruelas/roles/db_servers$ mkdir tasks
seruelas@workstation:~/CPE232_Act7_Seruelas/roles/db_servers$ cd ..
seruelas@workstation:~/CPE232_Act7_Seruelas/roles$ cd workstations
seruelas@workstation:~/CPE232_Act7_Seruelas/roles/workstations$ mkdir tasks
seruelas@workstation:~/CPE232_Act7_Seruelas/roles/workstations$ cd ..
```

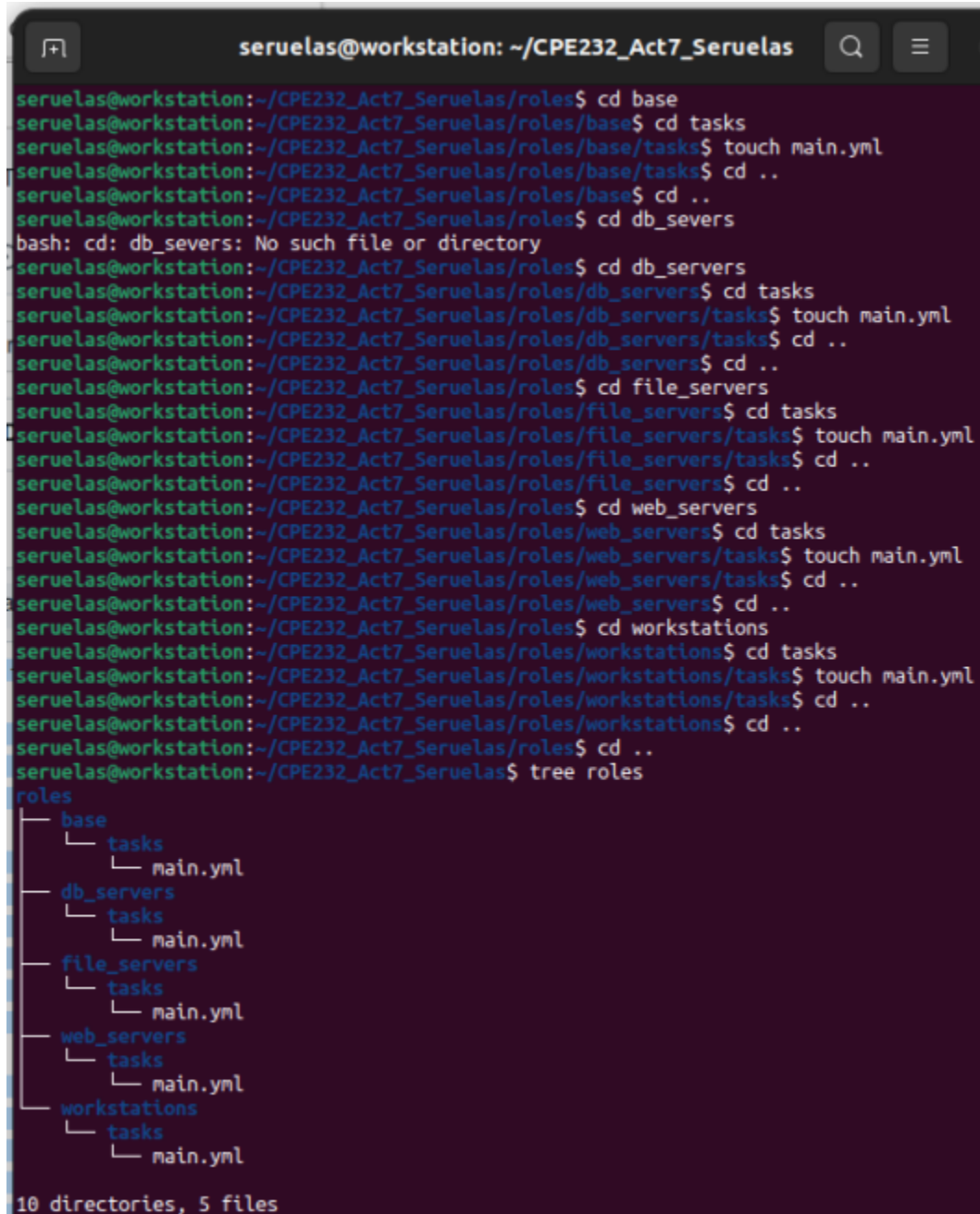
Figure 3.2.2 - Creation of tasks directory in each role directory.



```
seruelas@workstation: ~/CPE232_Act7_Seruelas
seruelas@workstation:~/CPE232_Act7_Seruelas$ tree roles
roles
├── base
│   └── tasks
├── db_servers
│   └── tasks
├── file_servers
│   └── tasks
├── web_servers
│   └── tasks
└── workstations
    └── tasks
```

Figure 3.2.3 - Verification of new created directories.

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.



```
seruelas@workstation: ~/CPE232_Act7_Seruelas
seruelas@workstation:~/CPE232_Act7_Seruelas/roles$ cd base
seruelas@workstation:~/CPE232_Act7_Seruelas/roles/base$ cd tasks
seruelas@workstation:~/CPE232_Act7_Seruelas/roles/base/tasks$ touch main.yml
seruelas@workstation:~/CPE232_Act7_Seruelas/roles/base/tasks$ cd ..
seruelas@workstation:~/CPE232_Act7_Seruelas/roles/base$ cd ..
seruelas@workstation:~/CPE232_Act7_Seruelas/roles$ cd db_servers
bash: cd: db_servers: No such file or directory
seruelas@workstation:~/CPE232_Act7_Seruelas/roles$ cd db_servers
seruelas@workstation:~/CPE232_Act7_Seruelas/roles/db_servers$ cd tasks
seruelas@workstation:~/CPE232_Act7_Seruelas/roles/db_servers/tasks$ touch main.yml
seruelas@workstation:~/CPE232_Act7_Seruelas/roles/db_servers/tasks$ cd ..
seruelas@workstation:~/CPE232_Act7_Seruelas/roles/db_servers$ cd ..
seruelas@workstation:~/CPE232_Act7_Seruelas/roles$ cd file_servers
seruelas@workstation:~/CPE232_Act7_Seruelas/roles/file_servers$ cd tasks
seruelas@workstation:~/CPE232_Act7_Seruelas/roles/file_servers/tasks$ touch main.yml
seruelas@workstation:~/CPE232_Act7_Seruelas/roles/file_servers/tasks$ cd ..
seruelas@workstation:~/CPE232_Act7_Seruelas/roles/file_servers$ cd ..
seruelas@workstation:~/CPE232_Act7_Seruelas/roles$ cd web_servers
seruelas@workstation:~/CPE232_Act7_Seruelas/roles/web_servers$ cd tasks
seruelas@workstation:~/CPE232_Act7_Seruelas/roles/web_servers/tasks$ touch main.yml
seruelas@workstation:~/CPE232_Act7_Seruelas/roles/web_servers/tasks$ cd ..
seruelas@workstation:~/CPE232_Act7_Seruelas/roles/web_servers$ cd ..
seruelas@workstation:~/CPE232_Act7_Seruelas/roles$ cd workstations
seruelas@workstation:~/CPE232_Act7_Seruelas/roles/workstations$ cd tasks
seruelas@workstation:~/CPE232_Act7_Seruelas/roles/workstations/tasks$ touch main.yml
seruelas@workstation:~/CPE232_Act7_Seruelas/roles/workstations/tasks$ cd ..
seruelas@workstation:~/CPE232_Act7_Seruelas/roles/workstations$ cd ..
seruelas@workstation:~/CPE232_Act7_Seruelas/roles$ cd ..
seruelas@workstation:~/CPE232_Act7_Seruelas$ tree roles
roles
├── 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
```

Figure 3.3.1 - Creation of main.yml in each tasks directory of each role directory.

```
seruelas@workstation: ~/CPE232_Act7_Seruelas/roles/db_servers/tasks
GNU nano 6.2 main.yml

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

- 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
```

Figure 3.3.2 - main.yml content for role db\_servers.

```
seruelas@workstation: ~/CPE232_Act7_Seruelas/roles/file_server/tasks
GNU nano 6.2 main.yml

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

Figure 3.3.3 - main.yml content for role file\_server.

```

seruelas@workstation: ~/CPE232_Act7_Seruelas/roles/web_servers/tasks
GNU nano 6.2 main.yml
- 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
  yum:
    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"

- 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

```

Figure 3.3.4 - main.yml content for role web\_servers.

```

seruelas@workstation: ~/CPE232_Act7_Seruelas/roles/workstations/tasks
GNU nano 6.2 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_linux_amd64.zip
    dest: /usr/local/bin
    remote_src: yes
    mode: 0755
    owner: root
    group: root

```

Figure 3.3.4 - main.yml content for role workstations.

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

```
seruelas@workstation: ~/CPE232_Act7_Seruelas
seruelas@workstation:~/CPE232_Act7_Seruelas$ ansible-playbook --ask-become-pass site3.yml
BECOME password:

PLAY [all] *****

TASK [Gathering Facts] *****
ok: [server2]
ok: [server1]
ok: [centos]

TASK [update repository index (CentOS)] *****
skipping: [server1]
skipping: [server2]
ok: [centos]

TASK [install updates (Ubuntu)] *****
skipping: [centos]
ok: [server2]
ok: [server1]

PLAY [all] *****

TASK [Gathering Facts] *****
ok: [server2]
ok: [server1]
ok: [centos]

PLAY [workstations] *****

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

TASK [workstations : install unzip] *****
ok: [server1]

TASK [workstations : install terraform] *****
ok: [server1]

PLAY [web_servers] *****

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

TASK [web_servers : install apache and php for Ubuntu Servers] *****
skipping: [centos]
ok: [server1]

TASK [web_servers : install apache and php for CentOS Servers] *****
skipping: [server1]
ok: [centos]

TASK [web_servers : start httpd (CentOS)] *****
skipping: [server1]
ok: [centos]

TASK [web_servers : copy default html file for site] *****
ok: [server1]
ok: [centos]

PLAY [db_servers] *****

TASK [Gathering Facts] *****
ok: [server2]
ok: [centos]

TASK [db_servers : install mariadb package (CentOS)] *****
skipping: [server2]
ok: [centos]

TASK [db_servers : install mariadb package (Ubuntu)] *****
skipping: [centos]
ok: [server2]

TASK [db_servers : Mariadb - Restarting/Enabling] *****
changed: [server2]
changed: [centos]

PLAY [file_server] *****

TASK [Gathering Facts] *****
ok: [server2]

TASK [file_server : install samba package] *****
ok: [server2]

PLAY RECAP *****
centos                : ok=10   changed=1   unreachable=0   failed=0   skipped=3   rescued=0   ignored=0
server1               : ok=9    changed=0   unreachable=0   failed=0   skipped=3   rescued=0   ignored=0
server2               : ok=8    changed=1   unreachable=0   failed=0   skipped=2   rescued=0   ignored=0
```

Figure 3.4.1 - Playbook ran shows that each tasks done were done by a specific role.



5. Push and save everything to GitHub.

```
seruelas@workstation: ~/CPE232_Act7_Seruelas
seruelas@workstation:~/CPE232_Act7_Seruelas$ git add *
seruelas@workstation:~/CPE232_Act7_Seruelas$ git commit -m "Finished at 09-10-2023 at 01:11pm"
[main 4f59d0f] Finished at 09-10-2023 at 01:11pm
6 files changed, 81 insertions(+), 2 deletions(-)
create mode 100644 roles/file_server/tasks/main.yml
delete mode 100644 roles/file_servers/tasks/main.yml
seruelas@workstation:~/CPE232_Act7_Seruelas$ git push origin
Enumerating objects: 26, done.
Counting objects: 100% (22/22), done.
Delta compression using up to 2 threads
Compressing objects: 100% (8/8), done.
Writing objects: 100% (16/16), 1.62 KiB | 1.62 MiB/s, done.
Total 16 (delta 2), reused 0 (delta 0), pack-reused 0
remote: Resolving deltas: 100% (2/2), completed with 2 local objects.
To github.com:TuRonnDraco/CPE232_Act7_Seruelas.git
ffe6bb9..4f59d0f  main -> main
```

Figure 3.5.1 - Pushing local repository to GitHub.

The screenshot displays the GitHub repository page for **CPE232\_Act7\_Seruelas** by user **TuRonnDraco**. The repository is public and has 8 commits. The file list includes:

File	Commit	Time	Age
files	09-10-2023 at 10:58am	2 hours ago	
roles	Finished at 09-10-2023 at 01:11pm	1 minute ago	
README.md	Initial commit	2 hours ago	
ansible.cfg	Add files via upload	2 hours ago	
inventory	09-10-2023 at 11:46pm	1 hour ago	
site.yml	09-10-2023 at 10:58am	2 hours ago	
site1.yml	09-10-2023 at 10:58am	2 hours ago	
site2.yml	09-10-2023 at 11:46pm	1 hour ago	
site3.yml	Finished at 09-10-2023 at 01:11pm	1 minute ago	

The README.md file is visible, showing the repository name **CPE232\_Act7\_Seruelas**. The right sidebar contains repository statistics: 0 stars, 1 watching, 0 forks, and 0 releases.

Figure 3.5.2 - Verification of latest commit into GitHub repository.

[https://github.com/TuRonnDraco/CPE232\\_Act7\\_Seruelas](https://github.com/TuRonnDraco/CPE232_Act7_Seruelas)

**Reflections:**

Answer the following:

1. What is the importance of creating roles?

- The importance of creating roles in a database is that it allows us to separate and to specify which tasks are to be executed by each role or web group that is given to. The main purpose of roles is to allow the administrators to separate and to organize the tasks of each remote hosts that is grouped by inventory and remote groups, allowing the main.yml to have more memory that executes the tasks of the remote groups separately from the main.yml

2. What is the importance of managing files?

- The importance of managing files in a database is that it allows the administrator to have more memory and space and organization in their files, allowing more setups and fixated steps for their database, to avoid any conflicts in the files.

**Conclusion:**

In this activity, we were able to educate ourselves in the importance of managing files and creating roles in ansible. We were able to learn that managing files in our own database or repository allows us to have a more cleaner interface that allows us to create and to specify more setups in our own interface. Creating roles is a huge fundamental in ansible as it also allows us to specify and to preserve more memory in executing our playbooks, allowing us to have better performance and more efficient process in managing enterprise servers. To conclude this activity, we were able to manage our repository by organizing the roles and files needed to execute our playbook.

***“I affirm that I have not received or given any unauthorized help on this activity and that all work is my own.”***