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Course/Section: CPE31S4	**Date Submitted:** 10/23/2023
Instructor: Dr. Jonathan V. Taylar	**Semester and SY:** 1st sem 2023-2024

Activity 9: Install, Configure, and Manage Performance Monitoring tools

1. Objectives

Create and design a workflow that installs, configure and manage enterprise performance tools using Ansible as an Infrastructure as Code (IaC) tool.

2. Discussion

Performance monitoring is a type of monitoring tool that identifies current resource consumption of the workload, in this page we will discuss multiple performance monitoring tool.

Prometheus

Prometheus fundamentally stores all data as timeseries: streams of timestamped values belonging to the same metric and the same set of labeled dimensions. Besides stored time series, Prometheus may generate temporary derived time series as the result of queries. Source: Prometheus - Monitoring system & time series database

Cacti

Cacti is a complete network graphing solution designed to harness the power of RRDTool's data storage and graphing functionality. Cacti provides a fast poller, advanced graph templating, multiple data acquisition methods, and user management features out of the box. All of this is wrapped in an intuitive, easy to use interface that makes sense for LAN-sized installations up to complex networks with thousands of devices. Source: Cacti® - The Complete RRDTool-based Graphing Solution

3. Tasks

1. Create a playbook that installs Prometheus in both Ubuntu and CentOS. Apply the concept of creating roles.
2. Describe how you did step 1. (Provide screenshots and explanations in your report. Make your report detailed such that it will look like a manual.)
3. Show an output of the installed Prometheus for both Ubuntu and CentOS.
4. Make sure to create a new repository in GitHub for this activity.

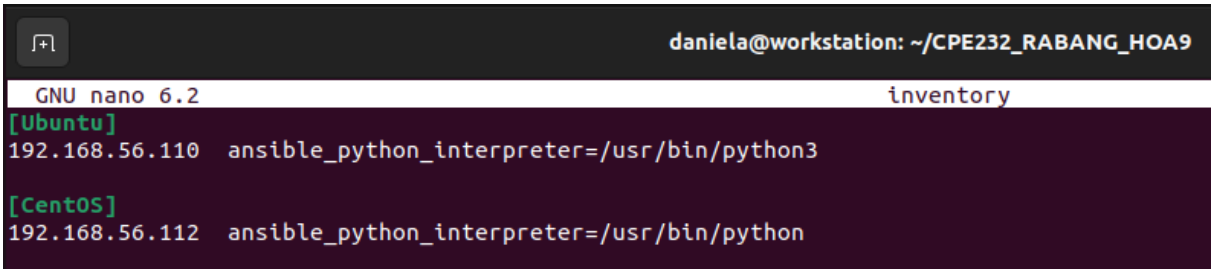
4. Output (screenshots and explanations)

Git clone the repository that you had made through your workstation.

```
daniela@workstation:~$ git clone https://github.com/danielarabang/CPE232_RABANG_HOA9.git
Cloning into 'CPE232_RABANG_HOA9'...
remote: Enumerating objects: 3, done.
remote: Counting objects: 100% (3/3), done.
remote: Total 3 (delta 0), reused 0 (delta 0), pack-reused 0
Unpacking objects: 100% (3/3), done.
daniela@workstation:~$ cd CPE232_RABANG_HOA9
daniela@workstation:~/CPE232_RABANG_HOA9$
```

- I had cloned my repository into my workstation so that I would be able to access it through my workstation.

Create an inventory file.



- I had created an inventory file that I had modified with the ip address of my Ubuntu server and the CentOS server.

Create an ansible.cfg file.

- I had created a ansible.cfg file.

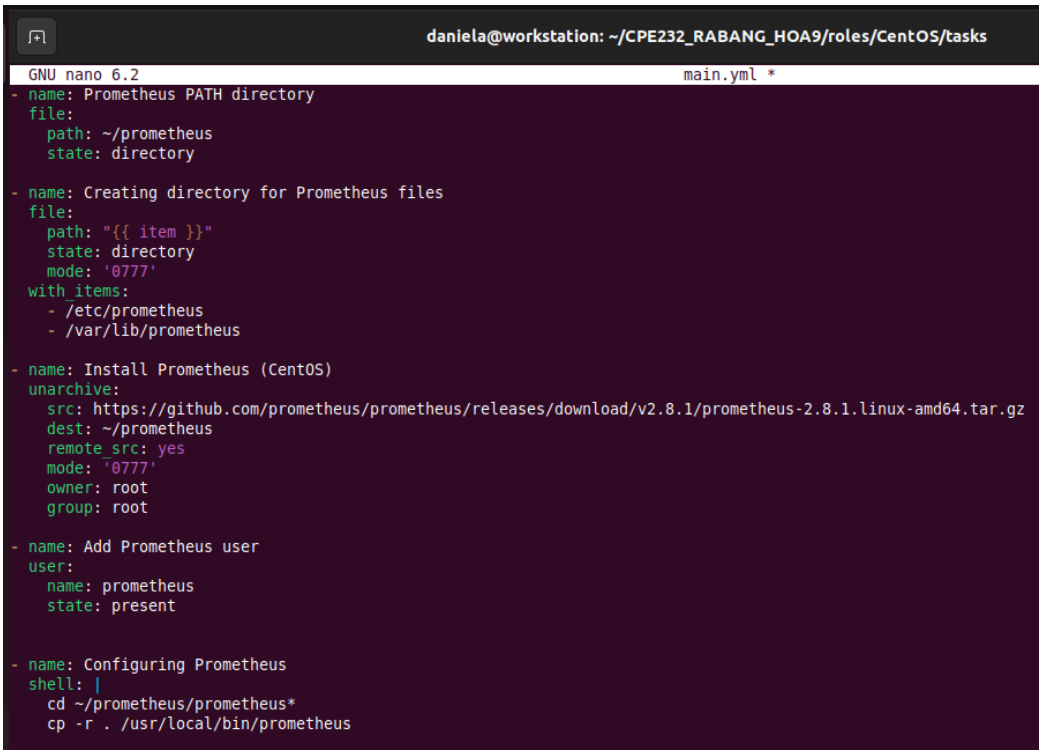
Create a directory for roles.

```
daniela@workstation:~/CPE232_RABANG_HOA9$ mkdir roles
```

```
daniela@workstation:~/CPE232_RABANG_HOA9$ cd roles
daniela@workstation:~/CPE232_RABANG_HOA9/roles$ mkdir Ubuntu
daniela@workstation:~/CPE232_RABANG_HOA9/roles$ mkdir CentOS
```

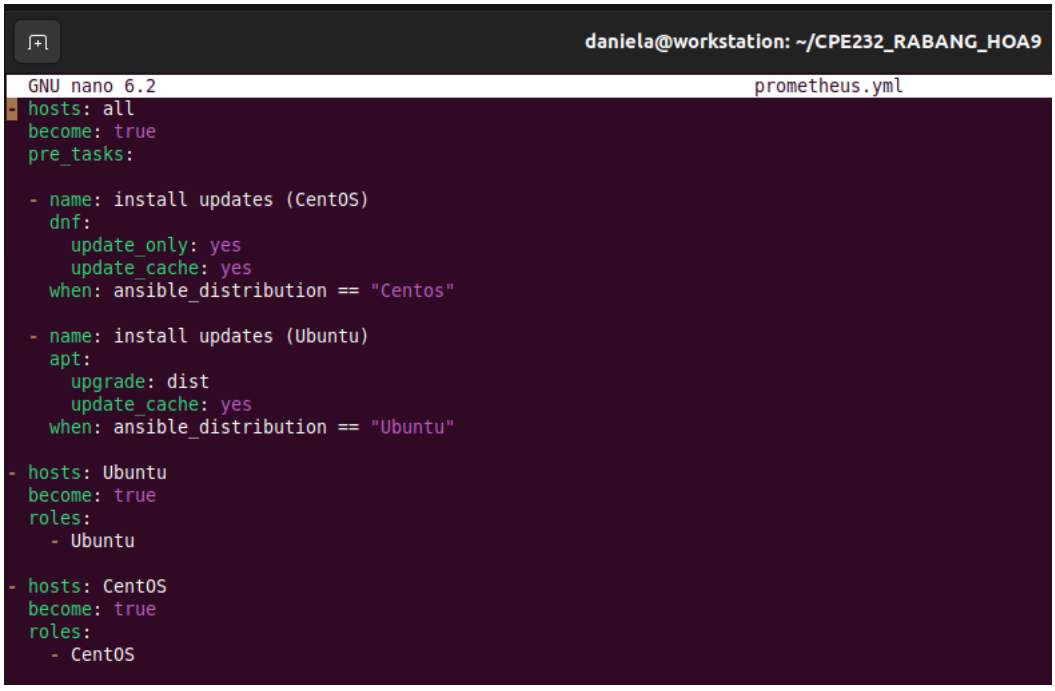
- I had created a directory for roles, and in that directory I created another directory which is the two roles, Ubuntu and CentOS.

In every roles directory create a main.yml



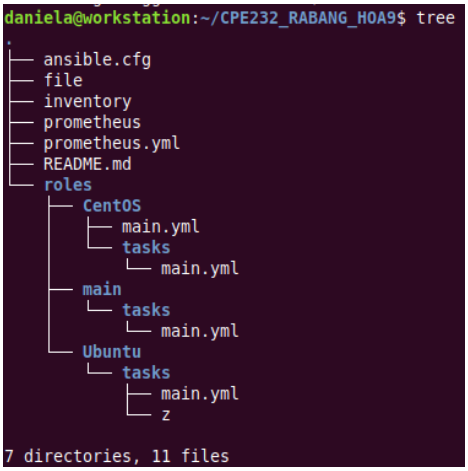
- I created a main.yml file for the tasks in every role directory. This playbook is used to install prometheus in both Ubuntu and CentOS.

Create a playbook in the main.



- I had created a playbook in the main where I can play it to make the tasks run for the following roles that are assigned.

The tree of my repository:



- In this part I show all the directories and files that I had created inside this repository. There are files that are not needed and I accidentally made them.

Then run the playbook.

```
daniela@workstation:~/CPE232_RABANG_HOA9$ ansible-playbook --ask-become-pass prometheus.yml
[DEPRECATION WARNING]: Ansible will require Python 3.8 or newer on the controller starting with Ansible 2.12. Current version: 3.6.9 (default, Mar 10 2023, 16:46:00)
[GCC 8.4.0]. This feature will be removed from ansible-core in version 2.12. Deprecation warnings can be disabled by setting deprecation_warnings=False in ansible.cfg.
BECOME password:

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

TASK [Gathering Facts] *********************************************************************************************************************************************
ok: [192.168.56.110]
ok: [192.168.56.112]

TASK [install updates (CentOS)] ************************************************************************************************************************************
ok: [192.168.56.110]
skipping: [192.168.56.112]

TASK [install updates (Ubuntu)] ************************************************************************************************************************************
skipping: [192.168.56.112]
ok: [192.168.56.110]

PLAY [Ubuntu] ******************************************************************************************************************************************************

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

TASK [Ubuntu : Install Prometheus (Ubuntu)] ************************************************************************************************************************
ok: [192.168.56.110]

TASK [Ubuntu : Prometheus Start/Enable Check service] **************************************************************************************************************
ok: [192.168.56.110]

TASK [Ubuntu : Apache Start/Enable Check] **************************************************************************************************************************
changed: [192.168.56.110]

PLAY [CentOS] ******************************************************************************************************************************************************

TASK [Gathering Facts] *********************************************************************************************************************************************
ok: [192.168.56.112]

TASK [CentOS : Prometheus PATH directory] **************************************************************************************************************************
ok: [192.168.56.112]

TASK [CentOS : Creating directory for Prometheus files] ************************************************************************************************************
ok: [192.168.56.112] => (item=/etc/prometheus)
ok: [192.168.56.112] => (item=/var/lib/prometheus)

TASK [CentOS : Install Prometheus (CentOS)] ************************************************************************************************************************
ok: [192.168.56.112]

TASK [CentOS : Add Prometheus user] ********************************************************************************************************************************
ok: [192.168.56.112]

TASK [CentOS : Configuring Prometheus] *****************************************************************************************************************************
changed: [192.168.56.112]

PLAY RECAP *********************************************************************************************************************************************************
192.168.56.110             : ok=6    changed=1    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
192.168.56.112             : ok=7    changed=1    unreachable=0    failed=0    skipped=2    rescued=0    ignored=0
```

- I had run the playbook and the installation of prometheus in both servers had been successful.

Verify if the Prometheus package is installed in both Ubuntu and CentOS server.

```
daniela@server1:~$ sudo systemctl status prometheus
[sudo] password for daniela:
● prometheus.service - Monitoring system and time series database
   Loaded: loaded (/lib/systemd/system/prometheus.service; enabled; vendor preset: enabled)
   Active: active (running) since Mon 2023-10-23 13:09:36 PST; 6min ago
     Docs: https://prometheus.io/docs/introduction/overview/
 Main PID: 12925 (prometheus)
    Tasks: 8 (limit: 2318)
   CGroup: /system.slice/prometheus.service
           └─12925 /usr/bin/prometheus

Oct 23 13:09:36 server1 prometheus[12925]: level=info ts=2023-10-23T05:09:36.395893914Z caller=main.go:218 msg="Starting Prometheus"
Oct 23 13:09:36 server1 prometheus[12925]: level=info ts=2023-10-23T05:09:36.396283231Z caller=main.go:219 build_context="(go=go1.9.2
Oct 23 13:09:36 server1 prometheus[12925]: level=info ts=2023-10-23T05:09:36.396383571Z caller=main.go:220 host_details="(Linux 5.4.0
Oct 23 13:09:36 server1 prometheus[12925]: level=info ts=2023-10-23T05:09:36.396417989Z caller=main.go:221 fd_limits="(soft=1024, har
Oct 23 13:09:36 server1 prometheus[12925]: level=info ts=2023-10-23T05:09:36.401054612Z caller=main.go:492 msg="Starting TSDB ..."
Oct 23 13:09:36 server1 prometheus[12925]: level=info ts=2023-10-23T05:09:36.401675057Z caller=web.go:359 component=web msg="Start li
Oct 23 13:09:36 server1 prometheus[12925]: level=info ts=2023-10-23T05:09:36.440429359Z caller=main.go:502 msg="TSDB started"
Oct 23 13:09:36 server1 prometheus[12925]: level=info ts=2023-10-23T05:09:36.440550583Z caller=main.go:578 msg="Loading configuration
Oct 23 13:09:36 server1 prometheus[12925]: level=info ts=2023-10-23T05:09:36.440820969Z caller=main.go:479 msg="Server is ready to re
Oct 23 13:09:36 server1 prometheus[12925]: level=info ts=2023-10-23T05:09:36.440945348Z caller=manager.go:59 component="scrape manage
lines 1-19/19 (END)
```

```
[daniela@localhost ~]$ sudo systemctl status prometheus
[sudo] password for daniela:
● prometheus.service - Monitoring system and time series database
   Loaded: loaded (/lib/systemd/system/prometheus.service; enabled; vendor preset: enabled)
   Active: active (running) since Mon 2023-10-23 13:09:36 PST; 6min ago
     Docs: https://prometheus.io/docs/introduction/overview/
 Main PID: 12925 (prometheus)
    Tasks: 8 (limit: 2318)
   CGroup: /system.slice/prometheus.service
           └─12925 /usr/bin/prometheus

Oct 23 13:09:36 localhost.localdomain systemd[1]: Started The Prometheus monitoring...
Oct 23 13:09:36 localhost.localdomain prometheus[29381]: ts=2023-10-23T05:09:36.396283231Z ca
Oct 23 13:09:36 localhost.localdomain prometheus[29381]: ts=2023-10-23T05:09:36.396383571Z ca
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Oct 23 13:09:36 localhost.localdomain prometheus[29381]: ts=2023-10-23T05:09:36.440550583Z ca
Oct 23 13:09:36 localhost.localdomain prometheus[29381]: ts=2023-10-23T05:09:36.440820969Z ca
Oct 23 13:09:36 localhost.localdomain prometheus[29381]: ts=2023-10-23T05:09:36.440945348Z ca
```
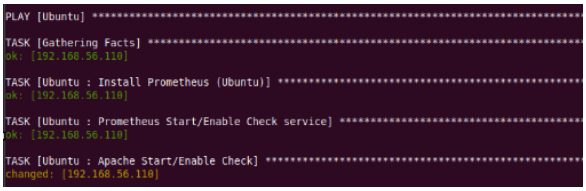

- I had verified that the prometheus package had been installed on the two servers.

IPO of Ubuntu

Input	Process
	

Output

```
daniela@server1:~$ sudo systemctl status prometheus
[sudo] password for daniela:
● prometheus.service - Monitoring system and time series database
   Loaded: loaded (/lib/systemd/system/prometheus.service; enabled; vendor preset: enabled)
   Active: active (running) since Mon 2023-10-23 13:09:36 PST; 6min ago
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Oct 23 13:09:36 server1 prometheus[12925]: level=info ts=2023-10-23T05:09:36.396417989Z caller=main.go:221 fd_limits="(soft=1024, har
Oct 23 13:09:36 server1 prometheus[12925]: level=info ts=2023-10-23T05:09:36.401054612Z caller=main.go:492 msg="Starting TSDB ..."
Oct 23 13:09:36 server1 prometheus[12925]: level=info ts=2023-10-23T05:09:36.401675057Z caller=web.go:359 component=web msg="Start li
Oct 23 13:09:36 server1 prometheus[12925]: level=info ts=2023-10-23T05:09:36.440429359Z caller=main.go:502 msg="TSDB started"
Oct 23 13:09:36 server1 prometheus[12925]: level=info ts=2023-10-23T05:09:36.440550583Z caller=main.go:578 msg="Loading configuration
Oct 23 13:09:36 server1 prometheus[12925]: level=info ts=2023-10-23T05:09:36.440820969Z caller=main.go:479 msg="Server is ready to re
Oct 23 13:09:36 server1 prometheus[12925]: level=info ts=2023-10-23T05:09:36.440945348Z caller=manager.go:59 component="scrape manage
lines 1-19/19 (END)
```
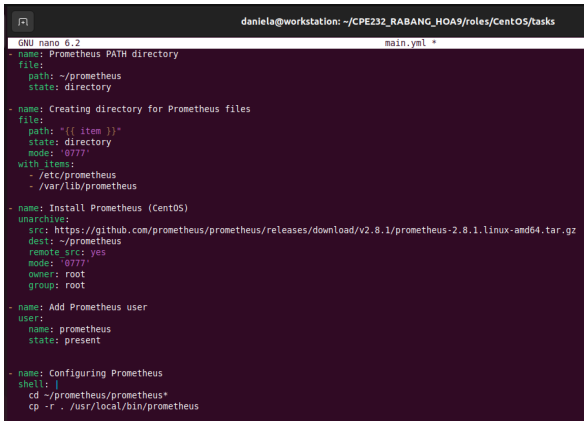
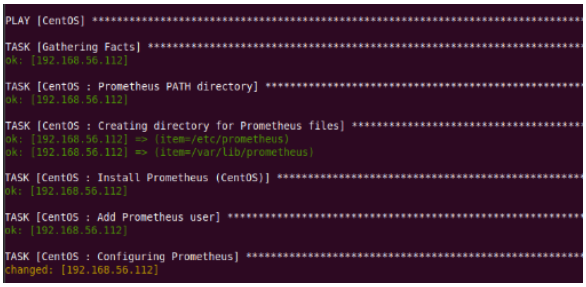
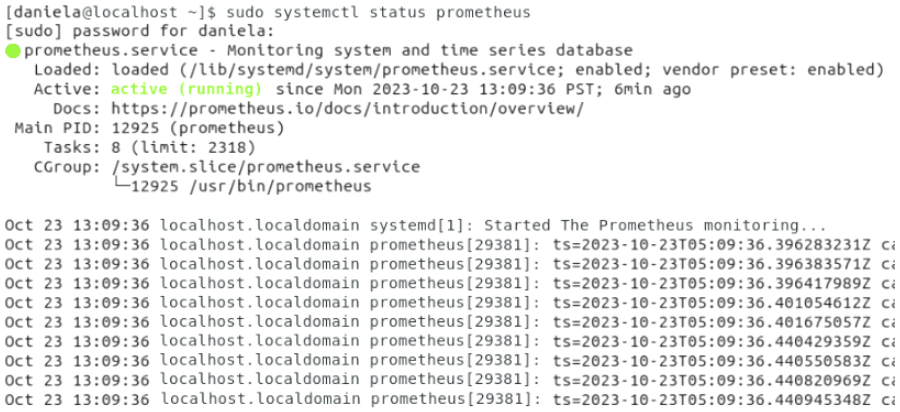

- In this section it shows the input codes that are used to install the prometheus package in the Ubuntu server same as the process when you run the playbook and the output where it shows the evidence that the prometheus is installed.

IPO of CentOS

Input	Process
	

Output



```
[daniela@localhost ~]$ sudo systemctl status prometheus
[sudo] password for daniela:
● prometheus.service - Monitoring system and time series database
     Loaded: loaded (/lib/systemd/system/prometheus.service; enabled; vendor preset: enabled)
     Active: active (running) since Mon 2023-10-23 13:09:36 PST; 6min ago
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Oct 23 13:09:36 localhost.localdomain prometheus[29381]: ts=2023-10-23T05:09:36.396417989Z ca
Oct 23 13:09:36 localhost.localdomain prometheus[29381]: ts=2023-10-23T05:09:36.401054612Z ca
Oct 23 13:09:36 localhost.localdomain prometheus[29381]: ts=2023-10-23T05:09:36.401675057Z ca
Oct 23 13:09:36 localhost.localdomain prometheus[29381]: ts=2023-10-23T05:09:36.440429359Z ca
Oct 23 13:09:36 localhost.localdomain prometheus[29381]: ts=2023-10-23T05:09:36.440550583Z ca
Oct 23 13:09:36 localhost.localdomain prometheus[29381]: ts=2023-10-23T05:09:36.440820969Z ca
Oct 23 13:09:36 localhost.localdomain prometheus[29381]: ts=2023-10-23T05:09:36.440945348Z ca
```
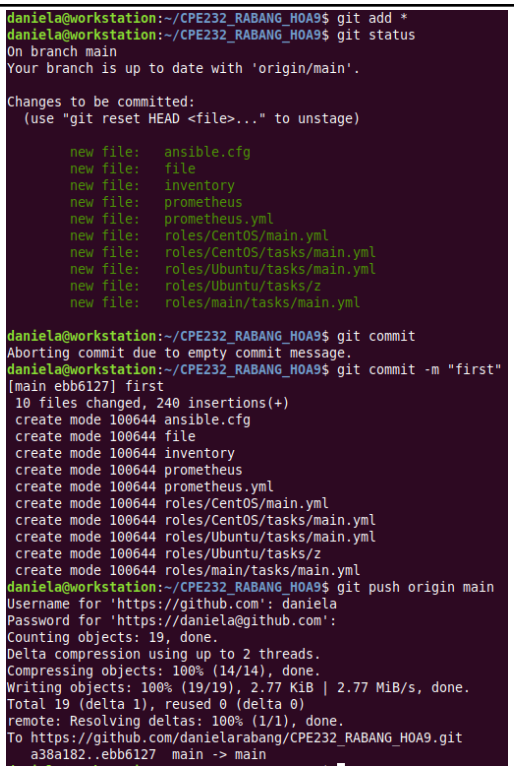

- In this section it shows the input codes that are used to install the prometheus package in the CentOS server, same as the process when you run the playbook and the output where it shows the evidence that the prometheus is installed.

Then push all the progress or finish output into the repository.



Reflections:

Answer the following:

1. **What are the benefits of having a performance monitoring tool?**
   - The benefits of a performance monitoring tool can be seen in creating it more operationally efficient and the improved overall performance so it can be efficient for the users.

Conclusions:

In this hands-on activity that focuses on the installation, configuration, and managing performance monitoring tools. In the procedure part of this activity it shows a brief discussion about this topic. Then I am tasked to create a playbook where it uses roles to install the prometheus for both servers which is the Ubuntu and CentOS server. Before I started creating a playbook, I created a repository in my github account for this hands-on activity, then I cloned the repository into my workstation so I can manage the codes, and files that we are going to create. After cloning the repository and changing the directory to CPE232_RABANG_HOA9 I created a file inventory, ansible.cfg, prometheus.yml, and a directory for the roles that I will assign. These are the two roles which are the Ubuntu and the CentOS inside this directory. I also created a dir task where I created the main.yml or the playbook where the codes for installing prometheus are imputed. In the prometheus.yml in the main I had input all the assignments of the roles. Then when I was already okay for the codes, I had run the playbook prometheus.yml and in the firsts try I encountered errors and I had fixed it already until the installation for both servers are finished.