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Course/Section: CPE31S5	Date Submitted: 11/15/23
Instructor: Engr. Roman Richard	Semester and SY: 2023

Midterm Skills Exam: Install, Configure, and Manage Log Monitoring tools

1. Objectives

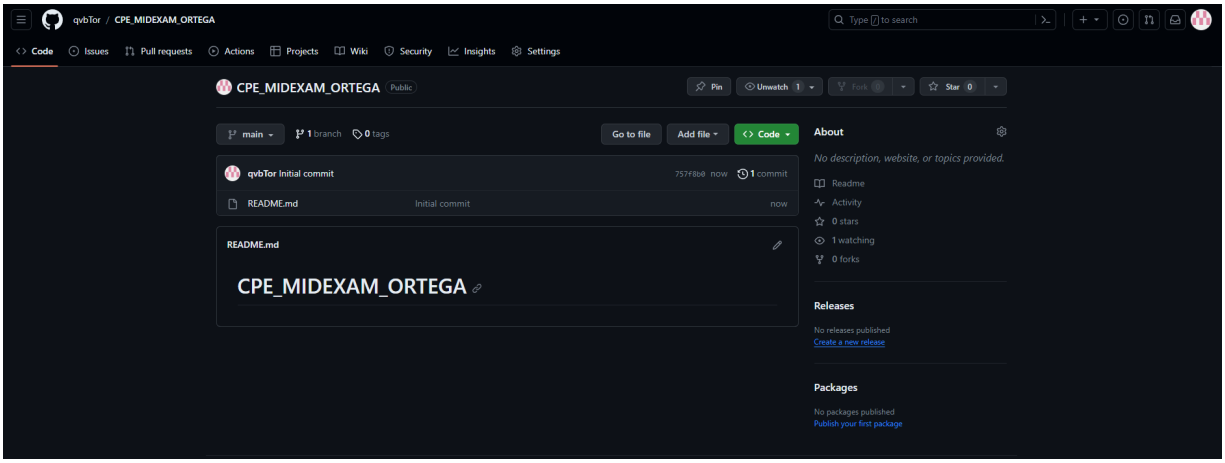
Create and design a workflow that installs, configure and manage enterprise availability, performance and log monitoring tools using Ansible as an Infrastructure as Code (IaC) tool.

2. Instructions

1. Create a repository in your GitHub account and label it CPE_MIDEXAM_SURNAME.
2. Clone the repository and do the following:
   2.1. Create an Ansible playbook that does the following with an input of a config.yaml file and arranged Inventory file:
   2.2. Install and configure Elastic Stack in separate hosts (Elastic Search, Kibana, Logstash) • Install Nagios in one host
   2.3. Install Grafana,Prometheus and Influxdb in seperate hosts (Influxdb,Grafana,Prometheus)
   2.4. Install Lamp Stack in separate hosts (Httpd + Php,Mariadb)
3. Document all your tasks using this document. Provide proofs of all the ansible playbooks codes and successful installations.
4. Document the push and commit from the local repository to GitHub.
5. Finally, paste also the link of your GitHub repository in the documentation.

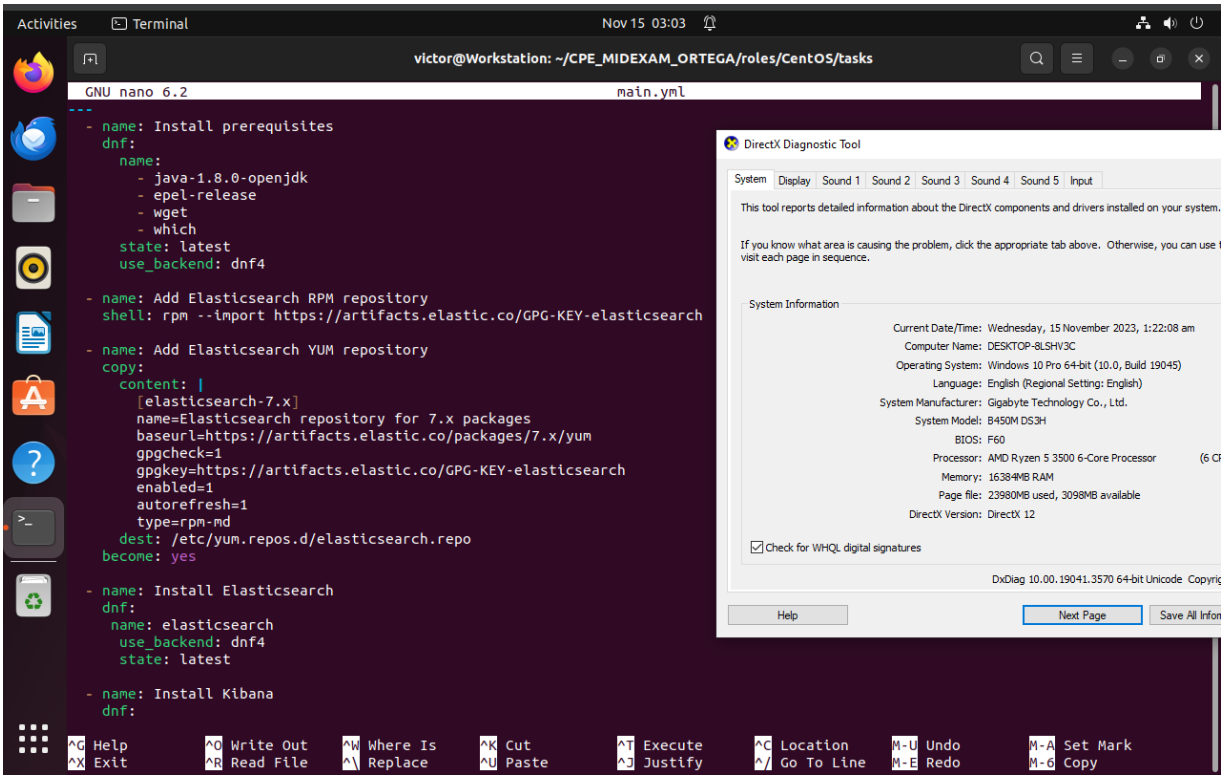
3. Output (screenshots and explanations)

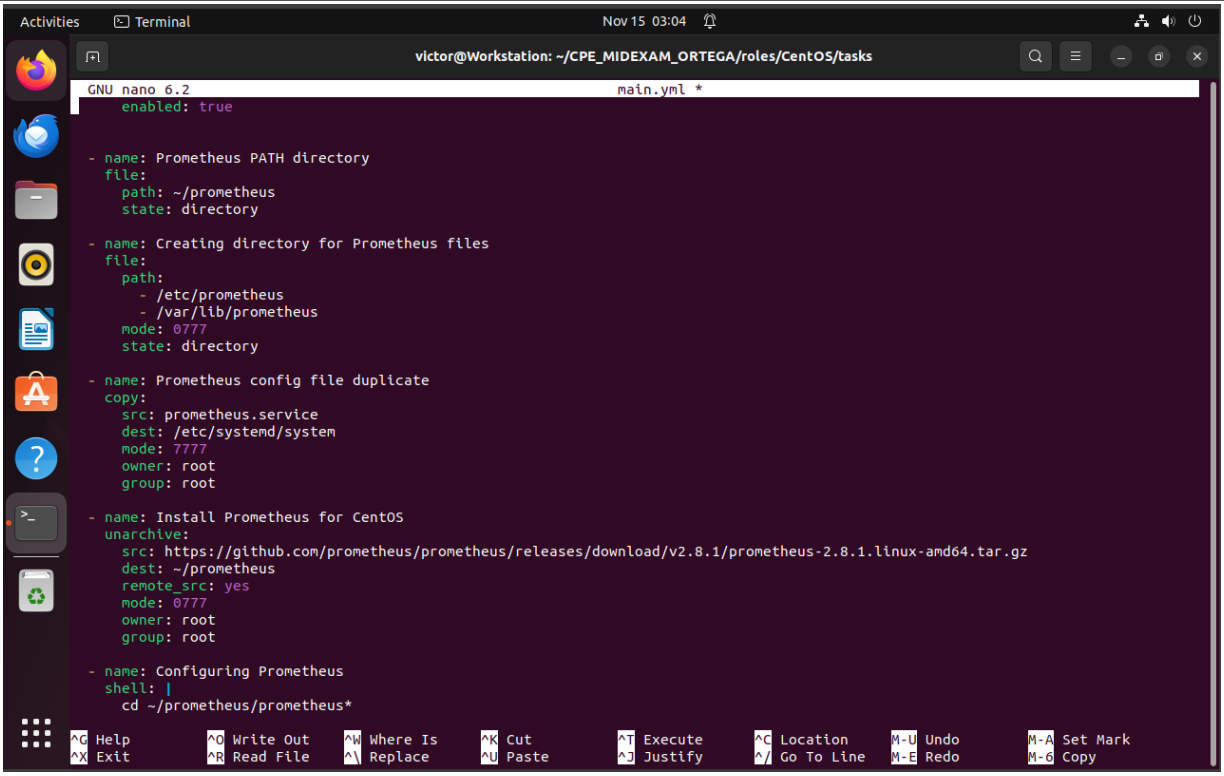
1. Creating repository in GitHub



2. Creating Main files for CentOS notebook.

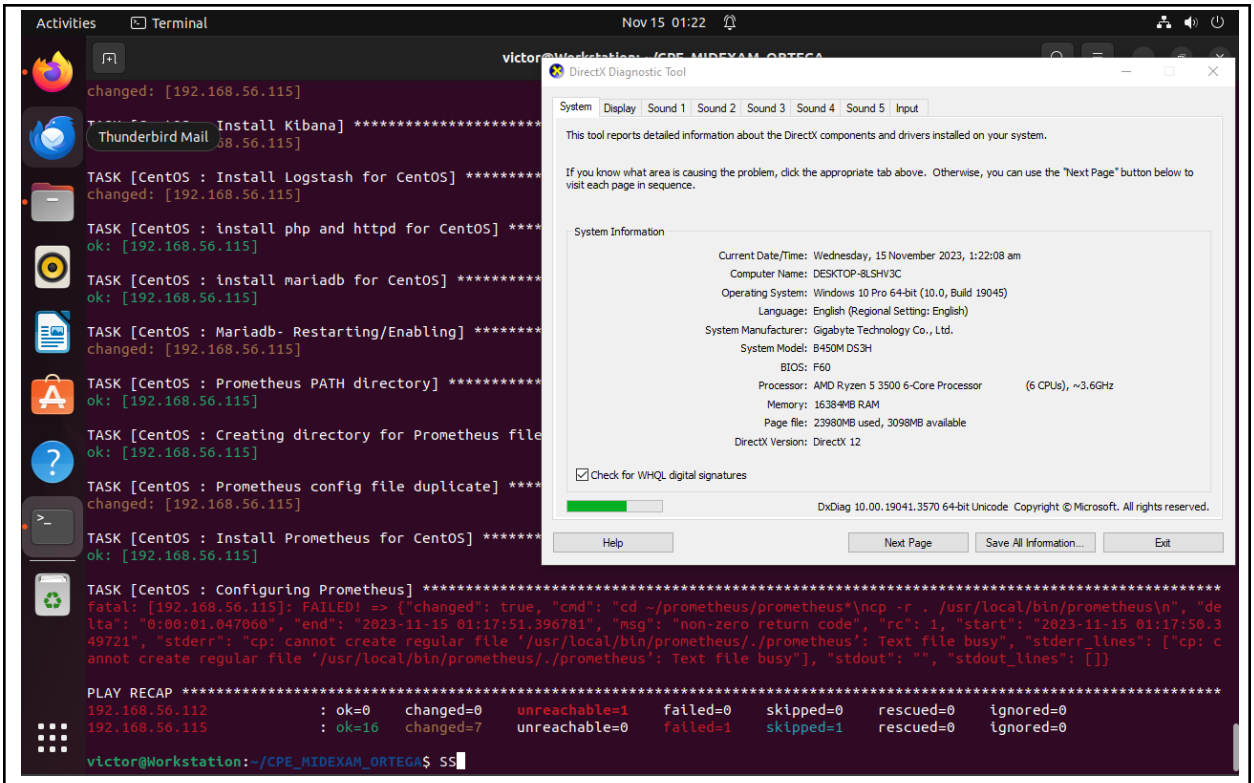
```
victor@Workstation:~/CPE_MIDEXAM_ORTEGA$ tree
.
├── ansible.cfg
├── config.yaml
├── files
│   ├── influxdb.repo
│   └── prometheus.service
├── inventory
├── README.md
└── roles
    └── CentOS
        └── tasks
            ├── grafana.repo.j2
            └── main.yml

4 directories, 8 files
```



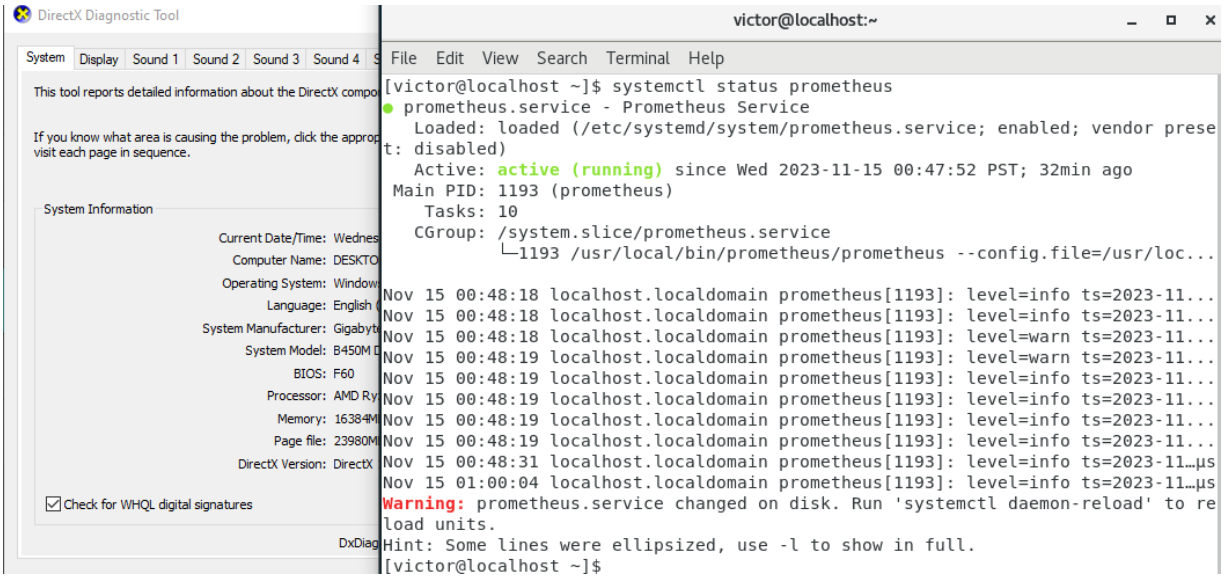

Activities
Terminal
Nov 15 03:04
victor@Workstation: ~/CPE_MIDEXAM_ORTEGA/roles/CentOS/tasks
GNU nano 6.2 main.yml *
enabled: true
- name: Prometheus PATH directory
file:
path: ~/prometheus
state: directory
- name: Creating directory for Prometheus files
file:
path:
- /etc/prometheus
- /var/lib/prometheus
mode: 0777
state: directory
- name: Prometheus config file duplicate
copy:
src: prometheus.service
dest: /etc/systemd/system
mode: 7777
owner: root
group: root
- name: Install Prometheus for CentOS
unarchive:
src: https://github.com/prometheus/prometheus/releases/download/v2.8.1/prometheus-2.8.1.linux-amd64.tar.gz
dest: ~/prometheus
remote_src: yes
mode: 0777
owner: root
group: root
- name: Configuring Prometheus
shell: |
cd ~/prometheus/prometheus*
^G Help ^O Write Out ^W Where Is ^K Cut ^T Execute ^C Location M-U Undo M-A Set Mark
^X Exit ^R Read File ^\ Replace ^U Paste ^J Justify ^/ Go To Line M-E Redo M-6 Copy

3. Running the notebook for CentOS

```
victor@Workstation:~/CPE_MIDEXAM_ORTEGA$ ansible-playbook --ask-become-pass config.yaml
BECOME password:

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

TASK [Gathering Facts] *********************************************************************************************************
fatal: [192.168.56.112]: UNREACHABLE! => {"changed": false, "msg": "Failed to connect to the host via ssh: ssh: connect to host 192.
168.56.112 port 22: No route to host", "unreachable": true}
ok: [192.168.56.115]

TASK [install updates Ubuntu] **************************************************************************************************
skipping: [192.168.56.115]

TASK [install updates CentOS] **************************************************************************************************
ok: [192.168.56.115]

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

TASK [Gathering Facts] *********************************************************************************************************
ok: [192.168.56.115]

TASK [CentOS : Install prerequisites] ******************************************************************************************
changed: [192.168.56.115]

TASK [CentOS : Add Elasticsearch RPM repository] *******************************************************************************
changed: [192.168.56.115]

TASK [CentOS : Add Elasticsearch YUM repository] *******************************************************************************
ok: [192.168.56.115]

TASK [CentOS : Install Elasticsearch] ******************************************************************************************
changed: [192.168.56.115]

TASK [CentOS : Install Kibana] *************************************************************************************************
changed: [192.168.56.115]

TASK [CentOS : Install Logstash for CentOS] ************************************************************************************
changed: [192.168.56.115]
```



There is an error encountered during configuring Prometheus, this could lead to an existing file of prometheus due to last activity. The important thing is, Prometheus is installed in CentOS.



Then installing Grafana and Influxdb.

```
TASK [CentOS : Check SELinux status] ********************************************************************************************
changed: [192.168.56.115]

TASK [CentOS : Disable SELinux if enabled] **************************************************************************************
skipping: [192.168.56.115]

TASK [CentOS : Modify SELinux configurations] ***********************************************************************************
skipping: [192.168.56.115]

TASK [CentOS : Reboot system if SELinux was disabled] ***************************************************************************
skipping: [192.168.56.115]

TASK [CentOS : Create Grafana YUM repository file] ******************************************************************************
changed: [192.168.56.115]

TASK [CentOS : Install Grafana] *************************************************************************************************
changed: [192.168.56.115]

TASK [CentOS : Start and enable Grafana service] ********************************************************************************
changed: [192.168.56.115]
```

```
TASK [install updates Ubuntu] ***************************************************************************************************
skipping: [192.168.56.115]

TASK [install updates CentOS] ***************************************************************************************************
ok: [192.168.56.115]

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

TASK [Gathering Facts] **********************************************************************************************************
ok: [192.168.56.115]

TASK [CentOS : Copying the Influxdb repository file] ****************************************************************************
changed: [192.168.56.115]

TASK [CentOS : Adding the executables to the PATH] ******************************************************************************
changed: [192.168.56.115]
```

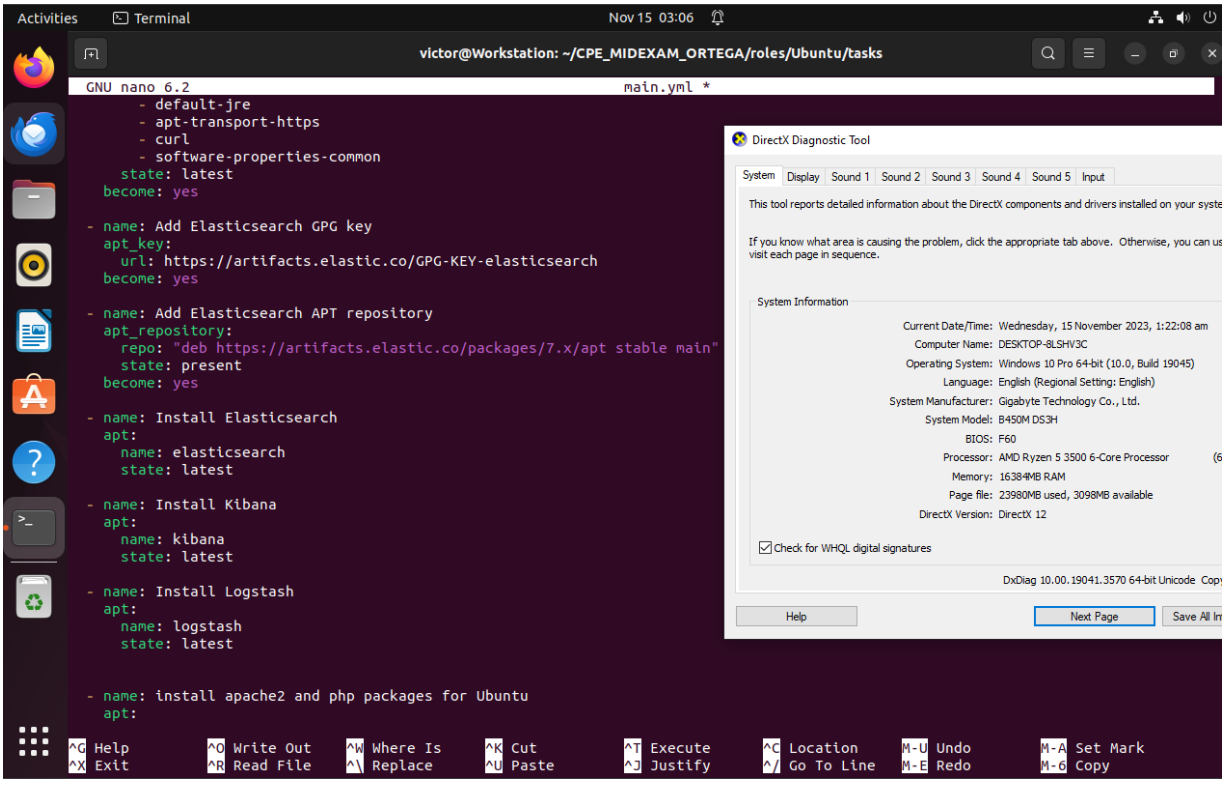
```
PLAY RECAP **********************************************************************************************************************
192.168.56.112             : ok=0    changed=0    unreachable=1    failed=0    skipped=0    rescued=0    ignored=0
192.168.56.115             : ok=7    changed=4    unreachable=0    failed=0    skipped=4    rescued=0    ignored=0
```

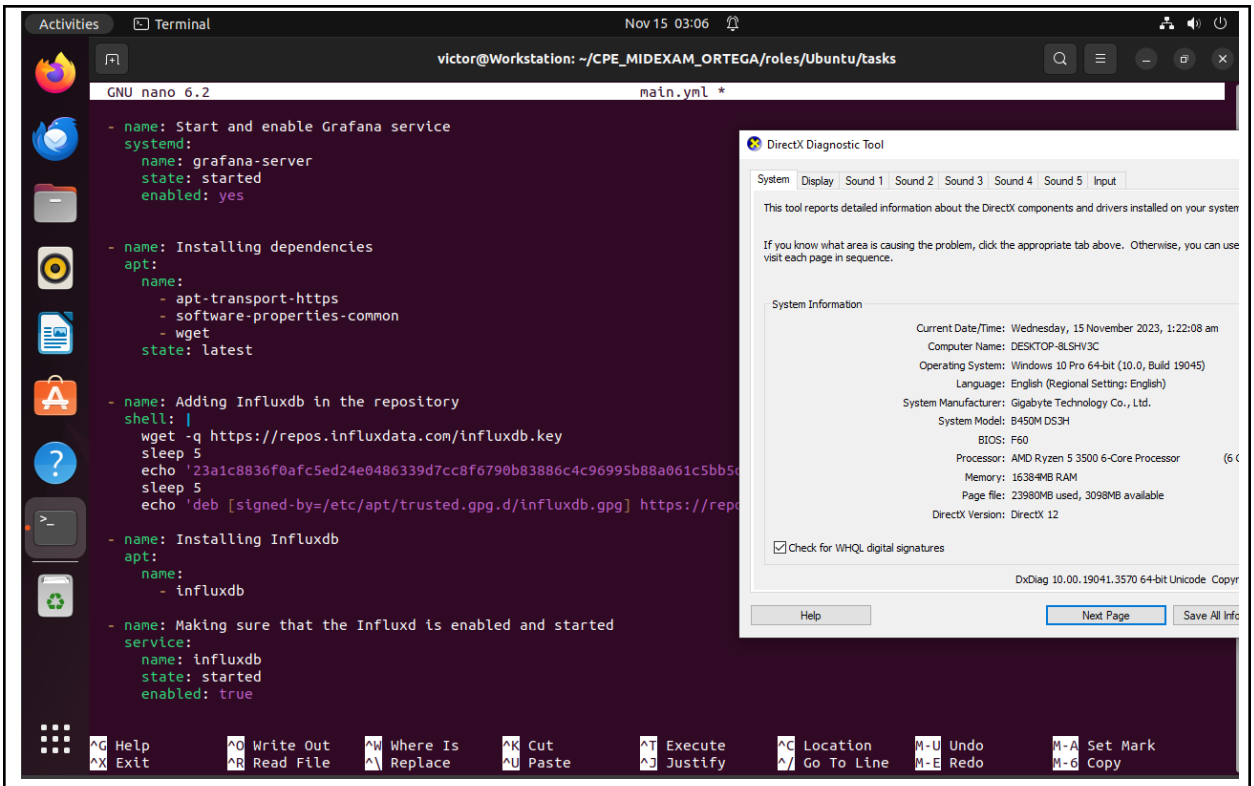
```
● grafana-server.service - Grafana instance
   Loaded: loaded (/usr/lib/systemd/system/grafana-server.service; enabled; vendor preset: disabled
   Active: active (running) since Wed 2023-11-15 01:36:07 PST; 26min ago
     Docs: http://docs.grafana.org
 Main PID: 4675 (grafana)
    Tasks: 18
   CGroup: /system.slice/grafana-server.service
           └─4675 /usr/share/grafana/bin/grafana server --config=/etc/grafana...
```

```
● telegraf.service - The plugin-driven server agent for reporting metrics into InfluxDB
   Loaded: loaded (/lib/systemd/system/telegraf.service; enabled; vendor preset: enabled)
   Active: active (running) since Wed 2023-11-15 01:36:07 PST; 26min ago
     Docs: https://github.com/influxdata/telegraf
 Main PID: 2925 (telegraf)
    Tasks: 8 (limit: 4915)
   Memory: 25.4M
   CGroup: /system.slice/telegraf.service
           └─2925 /usr/bin/telegraf -config /etc/telegraf/telegraf.conf -config-directory
```

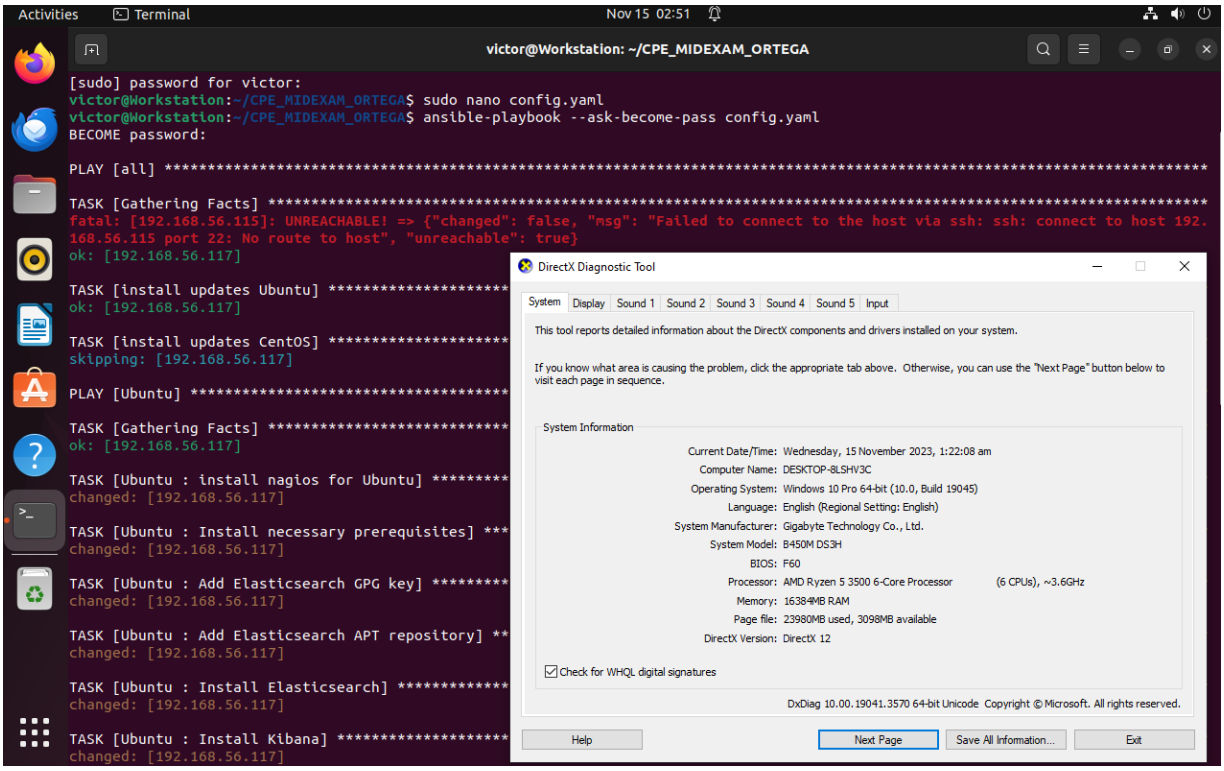
4. Creating .yml for Ubuntu

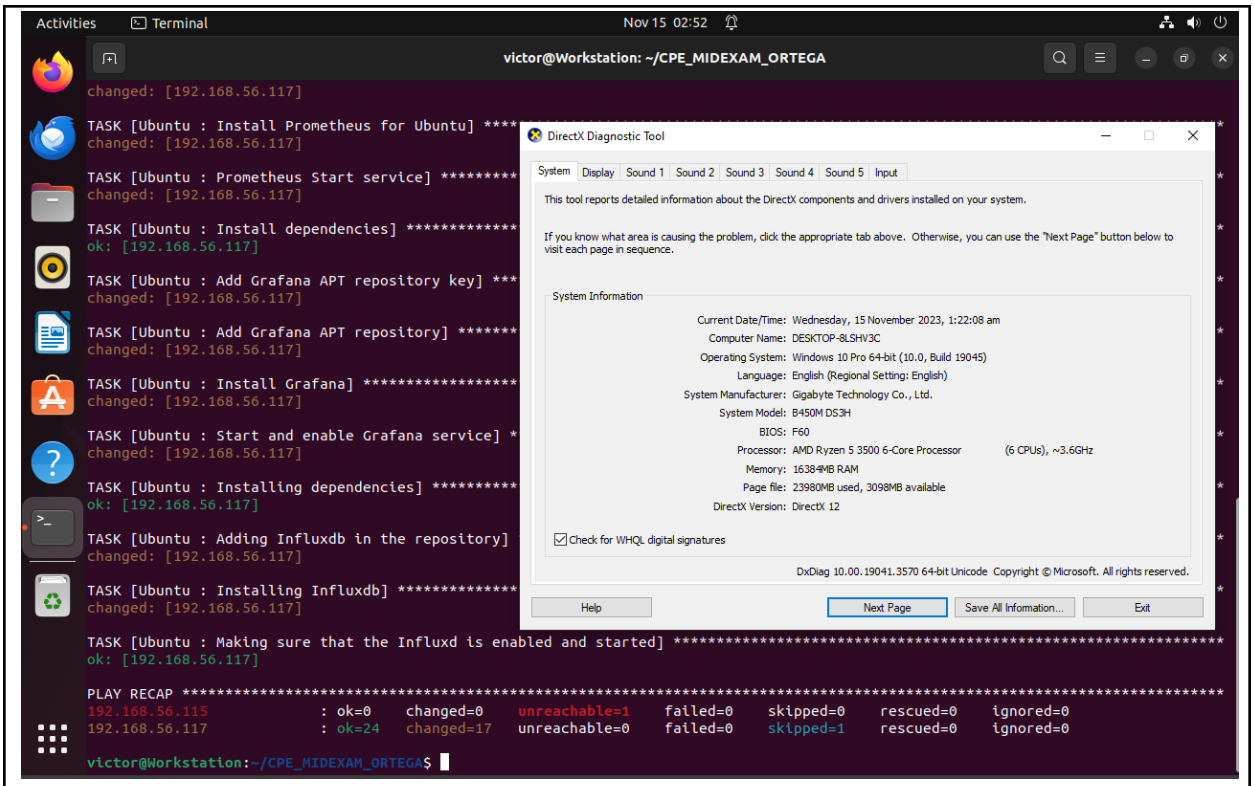
```
victor@Workstation:~/CPE_MIDEXAM_ORTEGA$ tree
.
├── ansible.cfg
├── config.yaml
├── files
│   ├── influxdb.repo
│   └── prometheus.service
├── inventory
├── README.md
└── roles
    ├── CentOS
    │   └── tasks
    │       ├── grafana.repo.j2
    │       └── main.yml
    └── Ubuntu
        └── tasks
            └── main.yml
```





5. Running the playbook for Ubuntu.





Grafana:

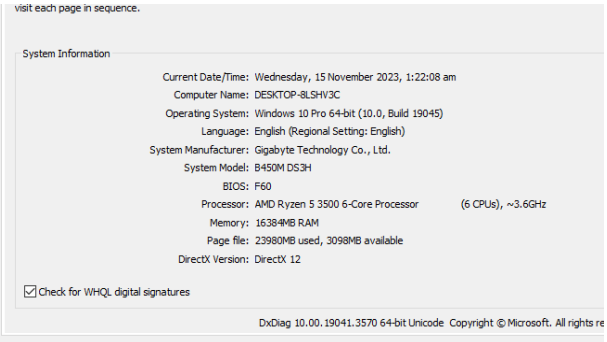
```
victor@Workstation:~$ systemctl status grafa-server
Unit grafa-server.service could not be found.
victor@Workstation:~$ systemctl status grafana-server
● grafana-server.service - Grafana instance
     Loaded: loaded (/lib/systemd/system/grafana-server.service; enabled; vendor preset: enabled)
     Active: active (running) since Wed 2023-11-15 02:47:11 +08; 7min ago
       Docs: http://docs.grafana.org
   Main PID: 12693 (grafana)
      Tasks: 13 (limit: 7344)
     Memory: 75.8M
        CPU: 4.776s
     CGroup: /system.slice/grafana-server.service
             └─12693 /usr/share/grafana/bin/grafana server --config=/etc/grafana/grafana.ini --pidfile=/run/grafana/grafana-server.>

Nov 15 02:47:21 Workstation grafana[12693]: logger=ngalert.migration orgID=1 t=2023-11-15T02:47:21.816721903+08:00 level=info msg=">
Nov 15 02:47:21 Workstation grafana[12693]: logger=ngalert.migration orgID=1 t=2023-11-15T02:47:21.817171613+08:00 level=warn msg=">
Nov 15 02:47:21 Workstation grafana[12693]: logger=ngalert.migration t=2023-11-15T02:47:21.826672466+08:00 level=info msg="Complete>
Nov 15 02:47:21 Workstation grafana[12693]: logger=grafana.update.checker t=2023-11-15T02:47:21.830600252+08:00 level=info msg="Upd>
Nov 15 02:47:21 Workstation grafana[12693]: logger=ngalert.state.manager t=2023-11-15T02:47:21.859830632+08:00 level=info msg="Stat>
Nov 15 02:47:21 Workstation grafana[12693]: logger=ngalert.scheduler t=2023-11-15T02:47:21.859927002+08:00 level=info msg="Starting>
Nov 15 02:47:21 Workstation grafana[12693]: logger=ticker t=2023-11-15T02:47:21.859989439+08:00 level=info msg=starting first_tick=>
Nov 15 02:47:21 Workstation grafana[12693]: logger=ngalert.multiorg.alertmanager t=2023-11-15T02:47:21.860126024+08:00 level=info m>
Nov 15 02:47:22 Workstation grafana[12693]: logger=plugins.update.checker t=2023-11-15T02:47:22.010251359+08:00 level=info msg="Upd>
Nov 15 02:48:42 Workstation grafana[12693]: logger=infra.usagestats t=2023-11-15T02:48:42.747931542+08:00 level=info msg="Usage sta>
```

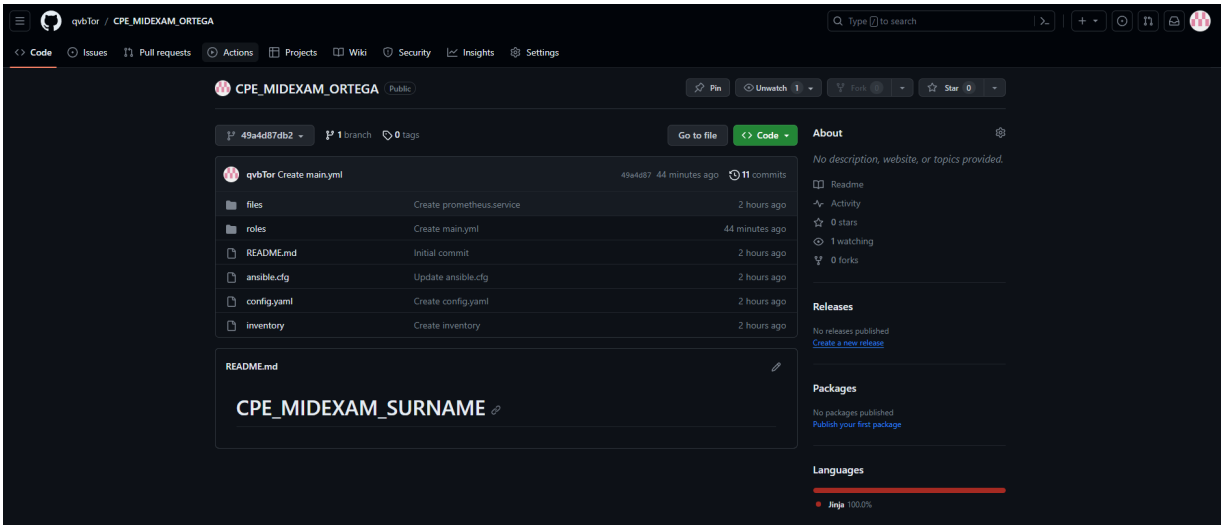
Influxdb:

```
victor@Workstation:~$ systemctl status influxdb
● influxdb.service - InfluxDB is an open-source, distributed, time series database
     Loaded: loaded (/lib/systemd/system/influxdb.service; enabled; vendor preset: enabled)
     Active: active (running) since Wed 2023-11-15 02:47:37 +08; 9min ago
       Docs: man:influxd(1)
   Main PID: 12968 (influxd)
      Tasks: 8 (limit: 7344)
     Memory: 7.5M
        CPU: 263ms
     CGroup: /system.slice/influxdb.service
             └─12968 /usr/bin/influxd -config /etc/influxdb/influxdb.conf

Nov 15 02:47:37 Workstation influxd[12968]: ts=2023-11-14T18:47:37.561890Z lvl=info msg="Registered diagnostics client" log_id=0lVn>
Nov 15 02:47:37 Workstation influxd[12968]: ts=2023-11-14T18:47:37.561901Z lvl=info msg="Starting precreation service" log_id=0lVnP>
Nov 15 02:47:37 Workstation influxd[12968]: ts=2023-11-14T18:47:37.561911Z lvl=info msg="Starting snapshot service" log_id=0lVnPsJW>
Nov 15 02:47:37 Workstation influxd[12968]: ts=2023-11-14T18:47:37.561915Z lvl=info msg="Starting continuous query service" log_id=>
Nov 15 02:47:37 Workstation influxd[12968]: ts=2023-11-14T18:47:37.561920Z lvl=info msg="Starting HTTP service" log_id=0lVnPsJW000 >
Nov 15 02:47:37 Workstation influxd[12968]: ts=2023-11-14T18:47:37.561924Z lvl=info msg="opened HTTP access log" log_id=0lVnPsJW000>
Nov 15 02:47:37 Workstation influxd[12968]: ts=2023-11-14T18:47:37.561994Z lvl=info msg="Listening on HTTP" log_id=0lVnPsJW000 serv>
Nov 15 02:47:37 Workstation influxd[12968]: ts=2023-11-14T18:47:37.562004Z lvl=info msg="Starting retention policy enforcement serv>
Nov 15 02:47:37 Workstation influxd[12968]: ts=2023-11-14T18:47:37.562368Z lvl=info msg="Storing statistics" log_id=0lVnPsJW000 ser>
Nov 15 02:47:37 Workstation influxd[12968]: ts=2023-11-14T18:47:37.562591Z lvl=info msg="Listening for signals" log_id=0lVnPsJW000

[2]+  Stopped                 systemctl status influxdb
```

6. Updating GitHub repository.

```
victor@Workstation:~/CPE_MIDEXAM_ORTEGA$ git add *
victor@Workstation:~/CPE_MIDEXAM_ORTEGA$ git commit -m "Updates"
[main 8c39d4e] Updates
 2 files changed, 5 insertions(+), 5 deletions(-)
victor@Workstation:~/CPE_MIDEXAM_ORTEGA$ git push origin
Enumerating objects: 7, done.
Counting objects: 100% (7/7), done.
Delta compression using up to 2 threads
Compressing objects: 100% (3/3), done.
Writing objects: 100% (4/4), 398 bytes | 398.00 KiB/s, done.
Total 4 (delta 2), reused 0 (delta 0), pack-reused 0
remote: Resolving deltas: 100% (2/2), completed with 2 local objects.
To github.com:qvbTor/CPE_MIDEXAM_ORTEGA.git
   49a4d87..8c39d4e  main -> main
victor@Workstation:~/CPE_MIDEXAM_ORTEGA$
```





Overall, I encountered multiple crashes on my desktop when running three virtual machines at the same time. I avoided conflicts by running only the CentOS and

Ubuntu machines at a time. To install InfluxDB, visit the downloads page, choose Ubuntu and CentOS, and follow the instructions. For Grafana, download it, follow the installation guide, then add InfluxDB as a data source in Grafana to create visualizations. Lastly, the Prometheus, MariaDB, Apache, PHP and HTTPD I used the previous command and follow the algorithm and applied it in the current playbook.

GitHub link:

https://github.com/qvbTor/CPE_MIDEXAM_ORTEGA.git

Conclusions: (link your conclusion from the objective)

Therefore, by implementing InfluxDB and Grafana, users can establish a powerful data monitoring and visualization system. InfluxDB, a specialized time-series database, excels at handling large volumes of time-stamped data, making it well-suited for IoT, monitoring, and analytics applications. Grafana, on the other hand, complements InfluxDB by providing a user-friendly platform for creating interactive dashboards. This combination enables users to efficiently store, retrieve, and visualize data trends, facilitating informed decision-making across a wide range of domains, from IT infrastructure monitoring to industrial sensor networks.