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Course/Section: CPE31S5	Date Submitted: 11/15/2023
Instructor: Engr. Roman Richard	Semester and SY: 2nd sem SY 2023-2024

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 separate 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. Create a repository in your GitHub account and label it CPE_MIDEXAM_SURNAME.

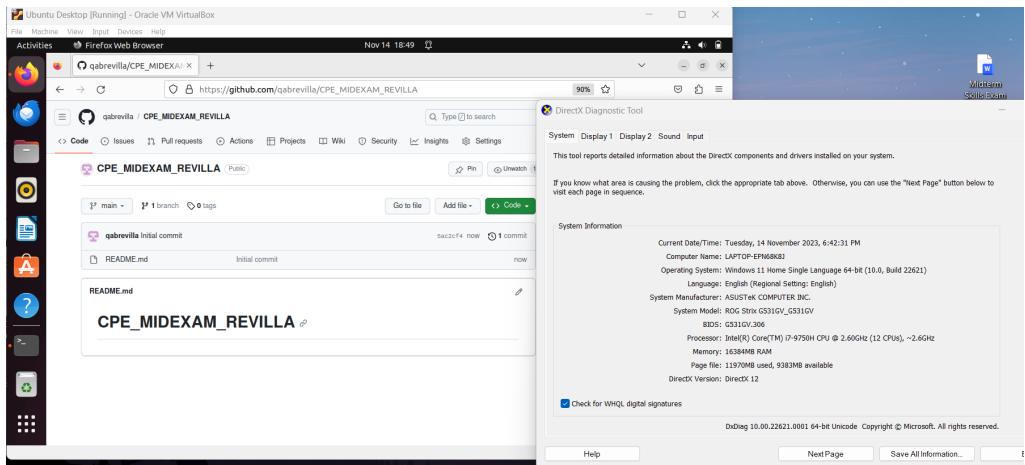


Figure 1.1 create Github

Create a repository in your GitHub account and label it CPE_MIDEXAM_REVILLA.

2. Clone the repository and do the following:

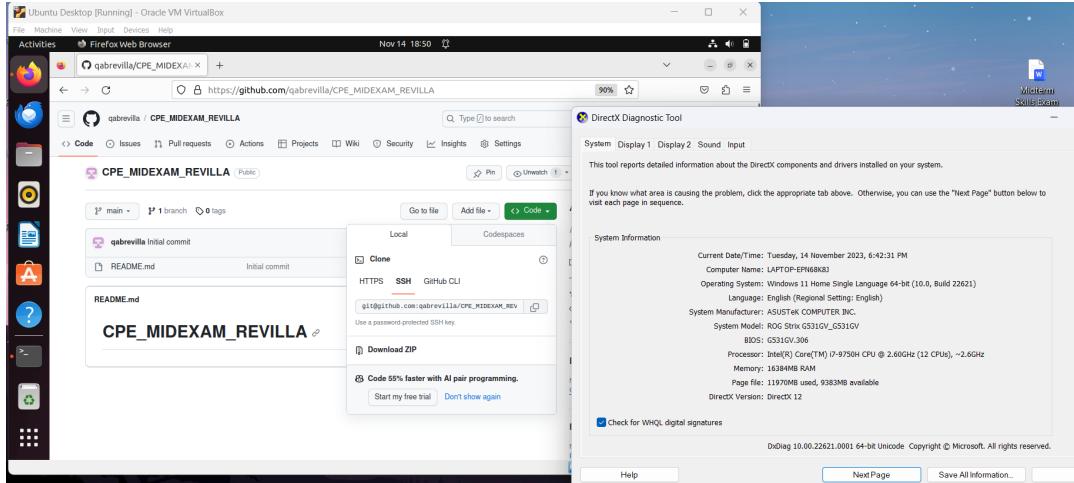


Figure 2.1 copy ssh

In the created repository, copy the ssh link because it will be needed on cloning.

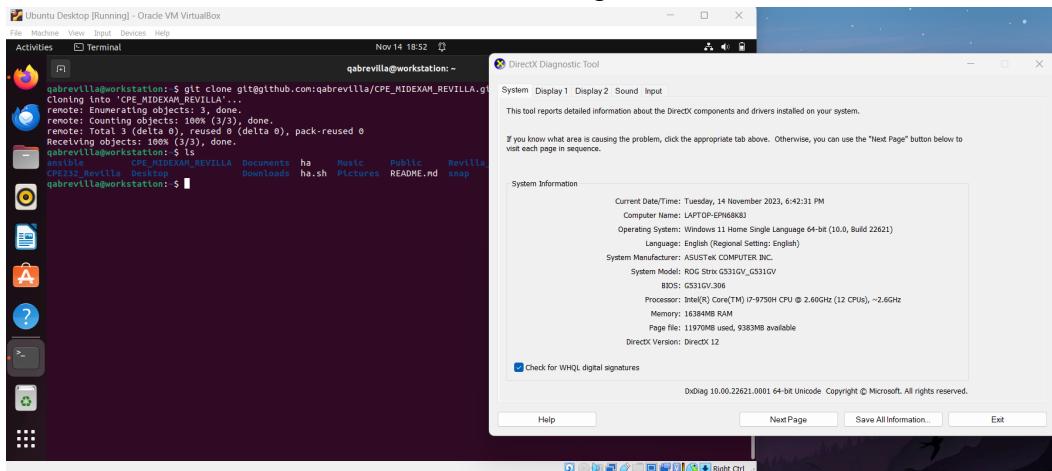
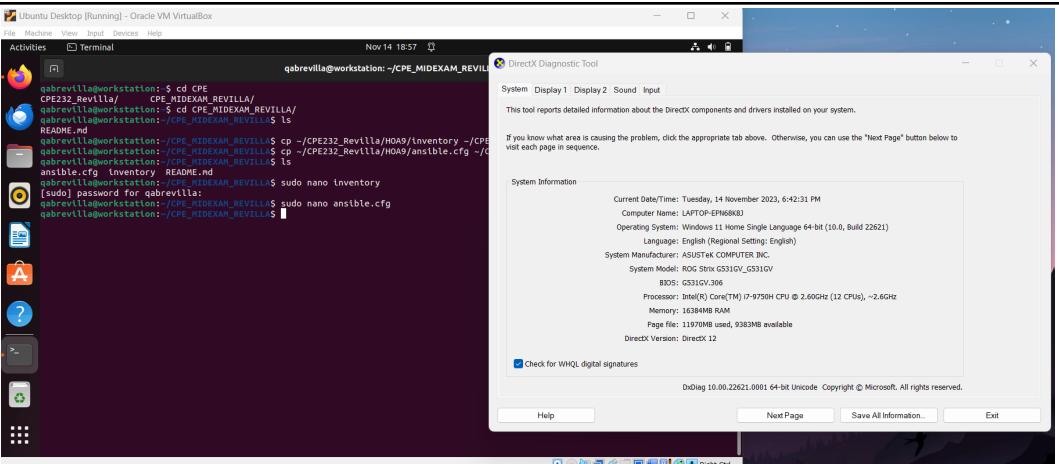


Figure 2.2 git clone

The command for cloning is `git clone [ssh link]`, this will create a directory in ubuntu that you can access and linked to github.



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.

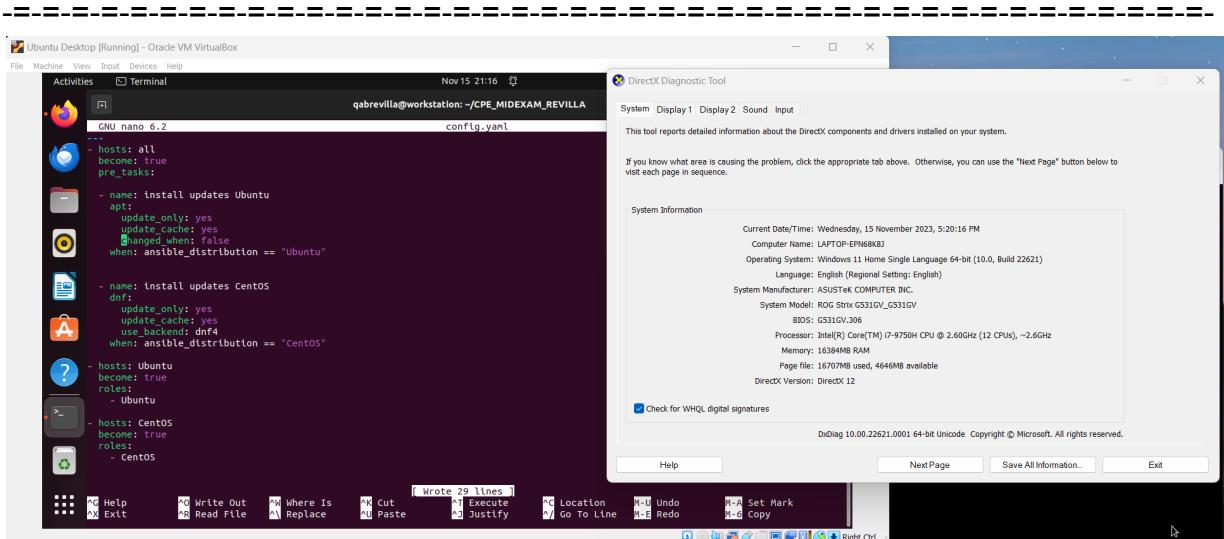


Figure 3.1 config.yaml

This is the main playbook that has the flow of the commands that will be run. It will determine the sequence of execution of codes.

Ubuntu Desktop [Running] - Oracle VM VirtualBox

Activities Terminal Nov 15 21:02 qabrevilla@workstation: ~/CPE_MIDEXAM_REVILLA/roles/CentOS/tasks

```
GNU nano 6.2 main.yml *
```

```
... - name: Install prerequisites
  dnf:
    name:
      - java-1.8.0-openjdk
      - epel-release
      - wget
      - which
    state: latest
    use_backend: dnf4

- name: Add Elasticsearch RPM repository
  shell: rpm --import https://artifacts.elastic.co/GPG-KEY-elasticsearch

- name: Add Elasticsearch YUM repository
  copy:
    content:
      - elasticsearch-7.x
        elasticsearch repository for 7.x packages
        baseurl=https://artifacts.elastic.co/packages/7.x/yum
        gpgkey=https://artifacts.elastic.co/GPG-KEY-elasticsearch
        enabled=1
        refresh=1
        type=nd
        dest=/etc/yum.repos.d/elasticsearch.repo
    become: yes

- name: Install Elasticsearch
  dnf:
    name: elasticsearch
```

Help Write Out Where Is Cut Execute Location

DirectX Diagnostic Tool

System Display 1 Display 2 Sound Input

This tool reports detailed information about the DirectX components and drivers installed on your system.

If you know what area is causing the problem, click the appropriate tab above. Otherwise, you can use the "Next Page" button below to visit each page in sequence.

System Information

Current Date/Time: Wednesday, 15 November 2023, 5:20:16 PM
Computer Name: LAPTOP-EPN6K8J8
Operating System: Windows 11 Home Single Language 64-bit (10.0, Build 22621)
Language: English (Regional Setting: English)
System Manufacturer: ASUSTeK COMPUTER INC.
System Model: ROG Strix GS310V_GS310V
BIOS: GS310V.306
Processor: Intel(R) Core(TM) i7-9750H CPU @ 2.60GHz (12 CPUs), ~2.6GHz
Memory: 16384MB RAM
Page file: 16707MB used, 4646MB available
DirectX Version: DirectX 12

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Ubuntu Desktop [Running] - Oracle VM VirtualBox

Activities Terminal Nov 15 21:02 qabrevilla@workstation: ~/CPE_MIDEXAM_REVILLA/roles/CentOS/tasks

```
GNU nano 6.2 main.yml *
```

```
... - name: elasticsearch
  use_backend: dnf4
  state: latest

- name: Install kibana
  dnf:
    name: kibana
    use_backend: dnf4
    state: latest

- name: Install Logstash for CentOS
  dnf:
    name: logstash
    use_backend: dnf4
    state: latest

#PHP + HTTP + MARADB INSTALLATION
- name: install php and httpd for CentOS
  dnf:
    name:
      - php
      - httpd
    state: latest
  use_backend: dnf4
  update_cache: yes

- name: install mariadb for CentOS
  dnf:
    name: mariadb-server
    state: latest
  use_backend: dnf4
```

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Ubuntu Desktop [Running] - Oracle VM VirtualBox

Activities Terminal Nov 15 21:02 qabrevilla@workstation: ~/CPE_MIDEXAM_REVILLA/roles/CentOS

```
GNU nano 6.2 main.yml *
```

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

#PROMETHEUS INSTALLATION
- name: Prometheus PATH directory
  files:
    path: ~/prometheus
    state: directory

- name: Creating directory for Prometheus files
  files:
    path:
      - /etc/prometheus
      - /var/lib/prometheus
    mode: 0777
    state: directory

- name: Prometheus config file duplicate
  copy:
    src: prometheus.service
    dest: /etc/systemd/system
    mode: 777
    owner: root
    group: root

- name: Install Prometheus for CentOS
  unarchive:
    url: https://github.com/prometheus/prometheus/releases/download/v2.8.1/prometheus-2.8.1.linux-amd64.tar.gz
    path: /etc/prometheus
```

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The figure consists of three vertically stacked screenshots of a Windows desktop environment. Each screenshot shows a terminal window on the left and a DirectX Diagnostic Tool window on the right.

Screenshot 1 (Top):

- Terminal:** Shows an Ansible playbook named `main.yml` for the `CentOS` role. It includes tasks for installing Prometheus, configuring SELinux, and installing Grafana.
- DirectX Diagnostic Tool:** Reports system information for a Windows 11 Home Single Language 64-bit system. It lists the processor as Intel(R) Core(TM) i7-9750H CPU @ 2.60GHz (12 CPUs), ~2.6GHz, 16384MB RAM, and 16707MB used, 4646MB available. DirectX Version: DirectX 12.

Screenshot 2 (Middle):

- Terminal:** Shows an Ansible playbook named `main.yml` for the `CentOS` role. It includes tasks for modifying SELinux configurations, rebooting the system, installing Grafana, and copying the Influxdb repository file.
- DirectX Diagnostic Tool:** Reports system information for a Windows 11 Home Single Language 64-bit system. It lists the processor as Intel(R) Core(TM) i7-9750H CPU @ 2.60GHz (12 CPUs), ~2.6GHz, 16384MB RAM, and 16707MB used, 4646MB available. DirectX Version: DirectX 12.

Screenshot 3 (Bottom):

- Terminal:** Shows an Ansible playbook named `main.yml` for the `CentOS` role. It includes tasks for installing Grafana, starting and enabling the Grafana service, and copying the Influxdb repository file.
- DirectX Diagnostic Tool:** Reports system information for a Windows 11 Home Single Language 64-bit system. It lists the processor as Intel(R) Core(TM) i7-9750H CPU @ 2.60GHz (12 CPUs), ~2.6GHz, 16384MB RAM, and 16707MB used, 4646MB available. DirectX Version: DirectX 12.

Figure 3.2 roles/Centos/tasks/main.yml

This is the tasks for Centos, It has the codes for installing tools needed specifically for centos

Ubuntu Desktop [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

Activities Terminal Nov 15 21:19

qabrevilla@workstation: ~/CPE_MIDEXAM_REVILLA/roles/Ubuntu

```
GNU nano 6.2 main.yml
```

```
# INSTALL_NAGIOS
- name: install nagios for Ubuntu
  apt:
    name:
      - nagios4-core
      - nagios-plugins
    state: latest

# INSTALL_ELASTACK
- name: Install necessary prerequisites
  apt:
    name:
      - default-jre
      - apt-transport-https
      - curl
      - software-properties-common
    state: latest
  become: yes

- name: Add Elasticsearch GPG key
  apt_key:
    url: https://artifacts.elastic.co/GPG-KEY-elasticsearch
  become: yes

- name: Add Elasticsearch APT repository
  apt_repository:
    repo: "deb https://artifacts.elastic.co/packages/7.x/apt stable main"
  state: present
  become: yes
```

Help Exit Write Out Read File Where Is Replace Cut Paste Execute Justify Location Go To Line Undo Redo Set Mark Copy Right Ctrl

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Ubuntu Desktop [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

Activities Terminal Nov 15 21:19

qabrevilla@workstation: ~/CPE_MIDEXAM_REVILLA/roles/Ubuntu

```
GNU nano 6.2 main.yml
```

```
- name: Install Elasticsearch
  apt:
    name: elasticsearch
    state: latest

- name: Install Kibana
  apt:
    name: kibana
    state: latest

- name: Install Logstash
  apt:
    name: logstash
    state: latest

# INSTALL_LAMPSTACK
- name: install apache2 and php packages for Ubuntu
  apt:
    name:
      - apache2
      - libapache2-mod-php
    state: latest

- name: install mariadb package Ubuntu
  apt:
    name: mariadb-server
    state: latest

- name: "Mariadb- Restarting/Enabling"
  service:
```

Help Exit Write Out Read File Where Is Replace Cut Paste Execute Justify Location Go To Line Undo Redo Set Mark Copy Right Ctrl

DirectX Diagnostic Tool

System Display 1 Display 2 Sound Input

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Ubuntu Desktop [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

Activities Terminal Nov 15 21:19

qabrevilla@workstation: ~/CPE_MIDEXAM_REVILLA/roles/Ubuntu

```
GNU nano 6.2 main.yml
```

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

# install PROMETHEUS
- name: Install Prometheus for Ubuntu
  apt:
    name: prometheus
    state: latest

- name: Prometheus Start service
  service:
    name: prometheus
    state: restarted
    enabled: true

# install GRAFANA
- name: Install dependencies
  apt:
    name:
      - software-properties-common
      - apt-transport-https
      - ca-certificates
      - curl
    tags: [prerequisites]

- name: Add Grafana APT repository key
  apt_key:
```

Help Exit Write Out Read File Where Is Replace Cut Paste Execute Justify Location Go To Line Undo Redo Set Mark Copy Right Ctrl

DirectX Diagnostic Tool

System Display 1 Display 2 Sound Input

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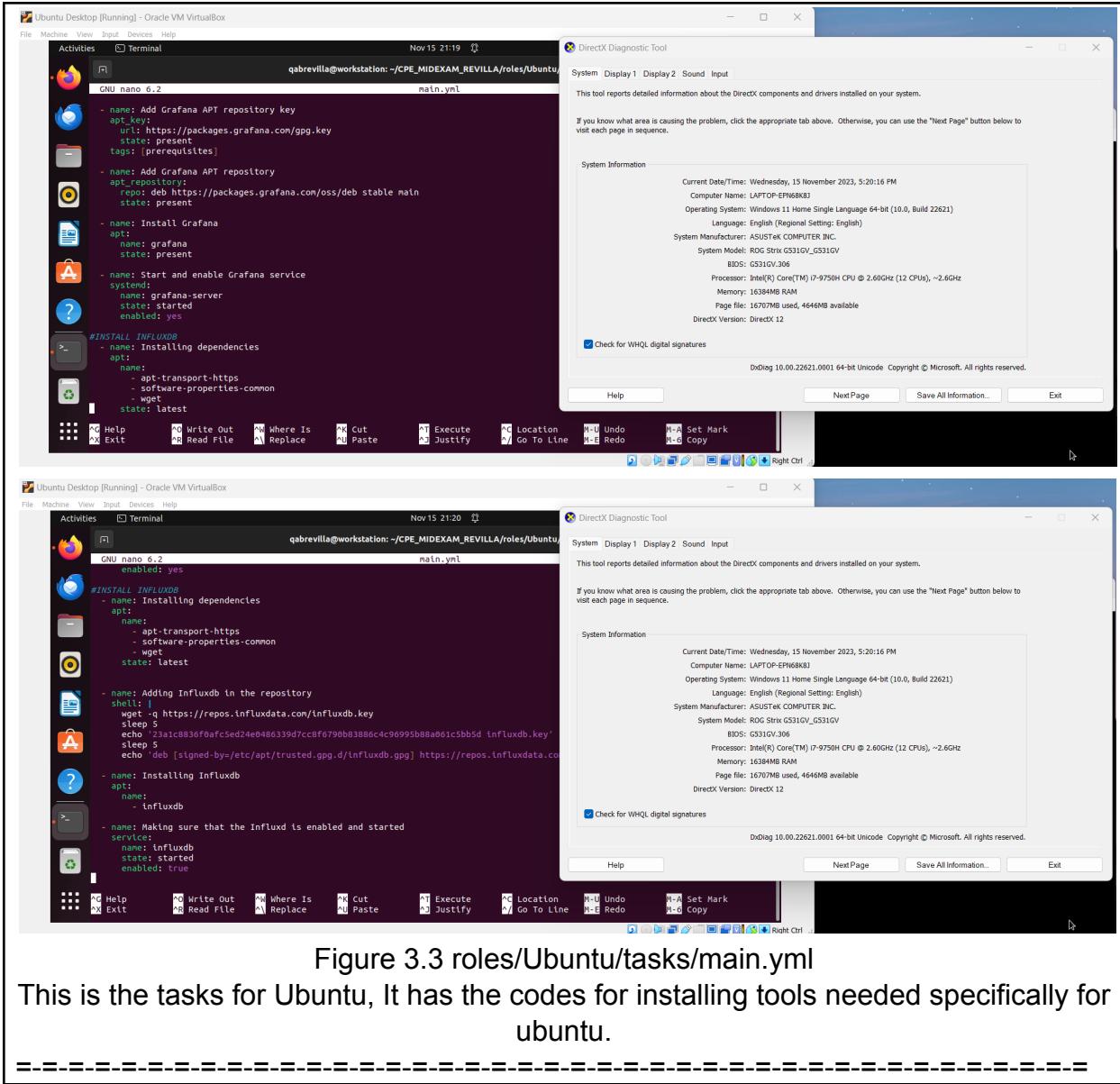


Figure 3.3 roles/Ubuntu/tasks/main.yml

This is the tasks for Ubuntu, It has the codes for installing tools needed specifically for ubuntu.

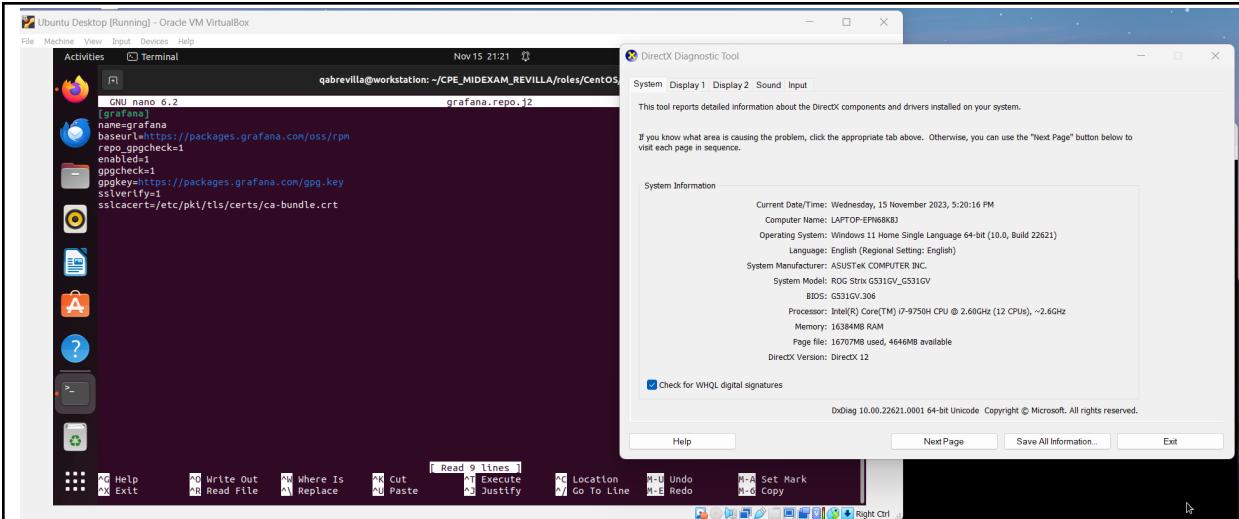


Figure 3.4 roles/CentOS/tasks/grafana.repo.j2

This code is needed for the installation of grafana. It is a prerequisite for the grafana installation for the Ubuntu distribution.

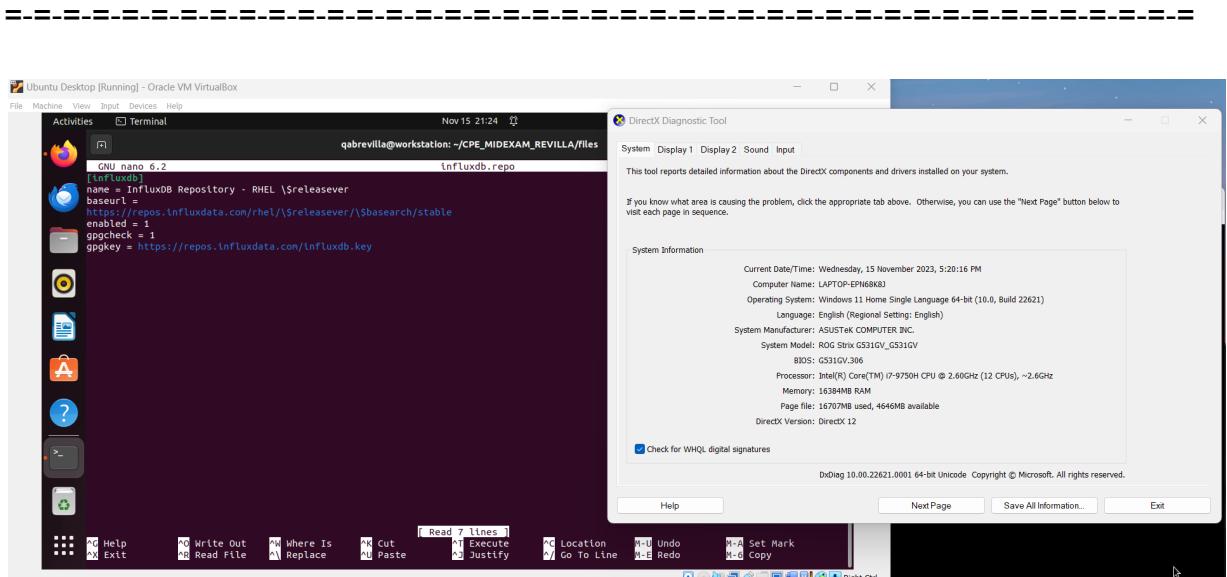


Figure 3.5 files/influxdb.repo

It contains the prerequisite of influxdb that will be needed in installing influx on the main playbook. It requires to set up the appropriate package repository to ensure the installation, update, and management of InfluxDB using the package manager.

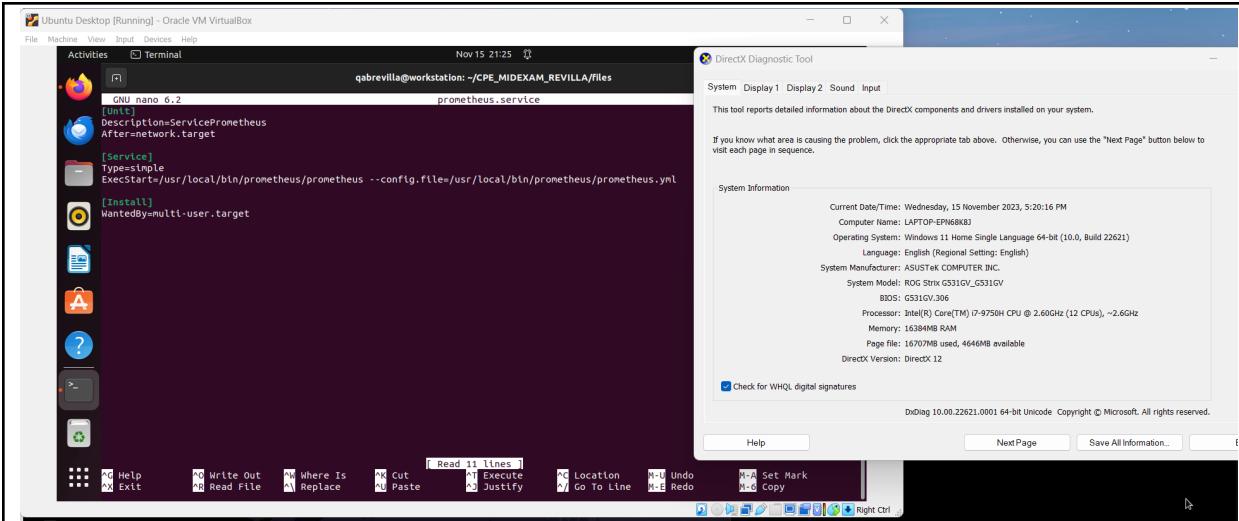
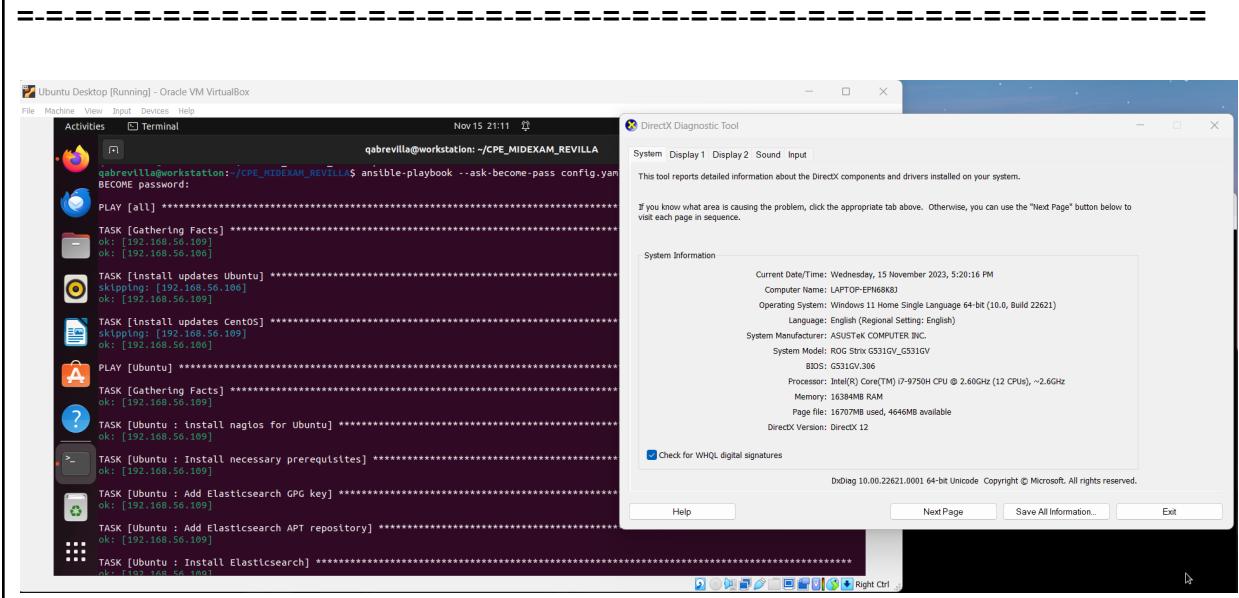
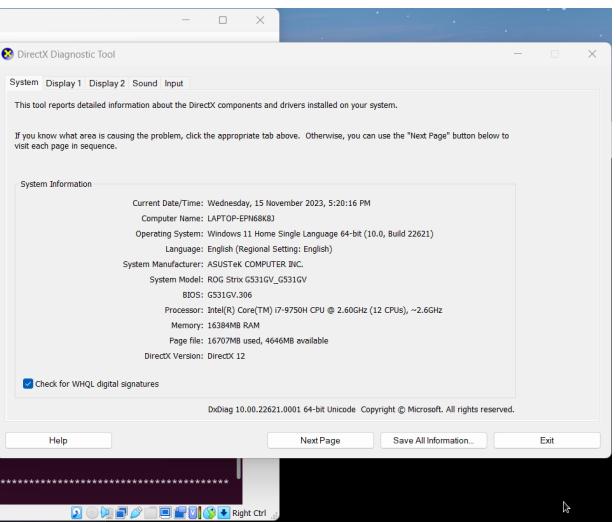
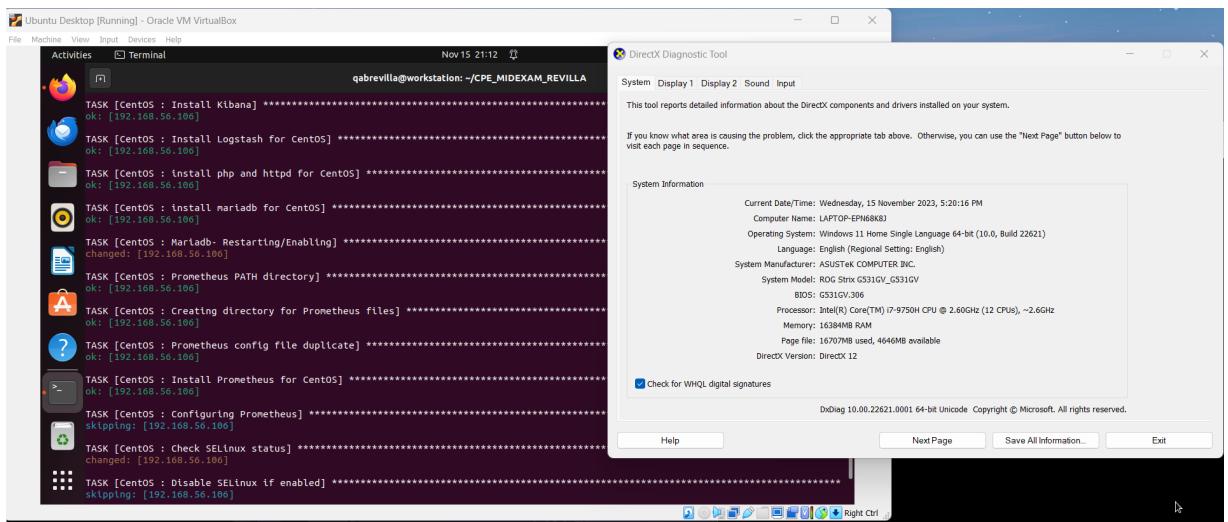
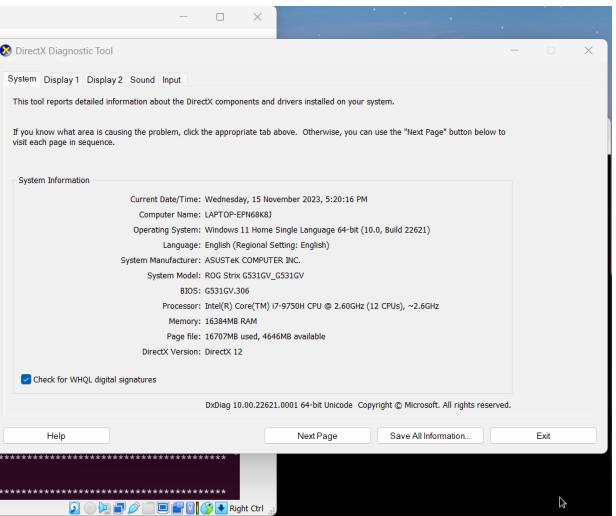
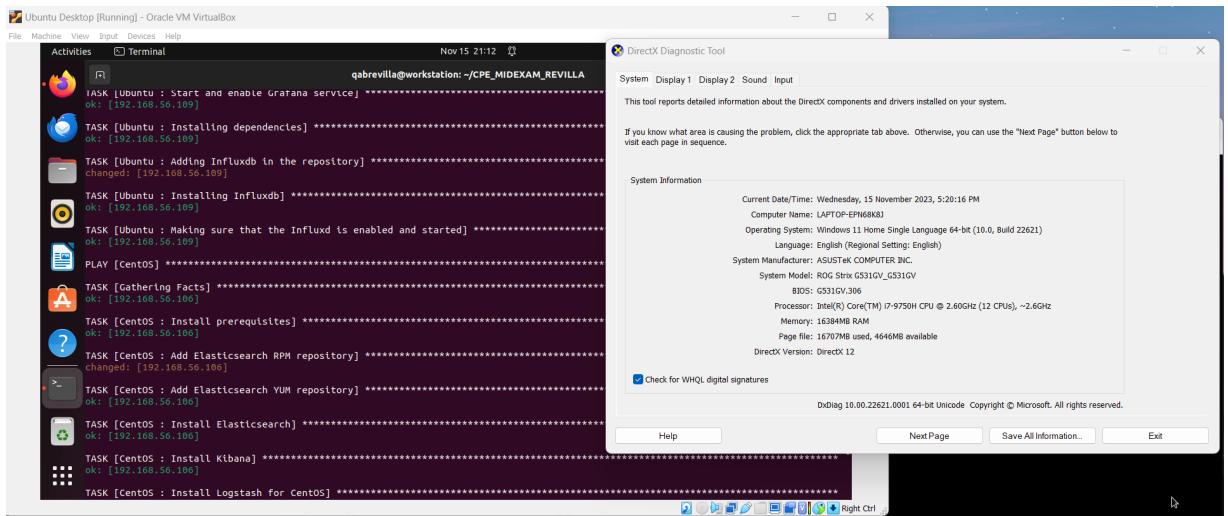
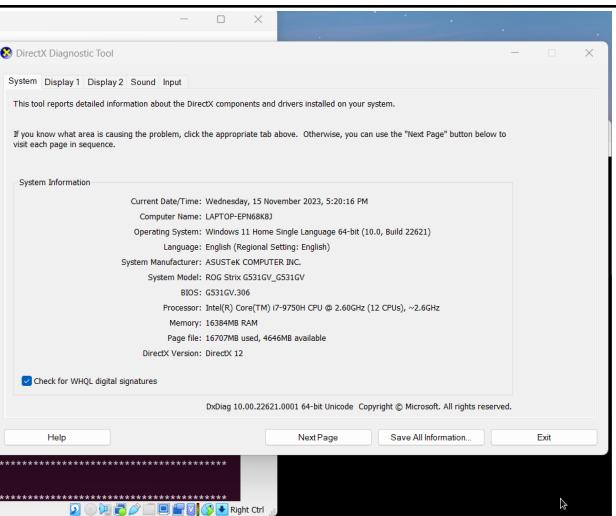
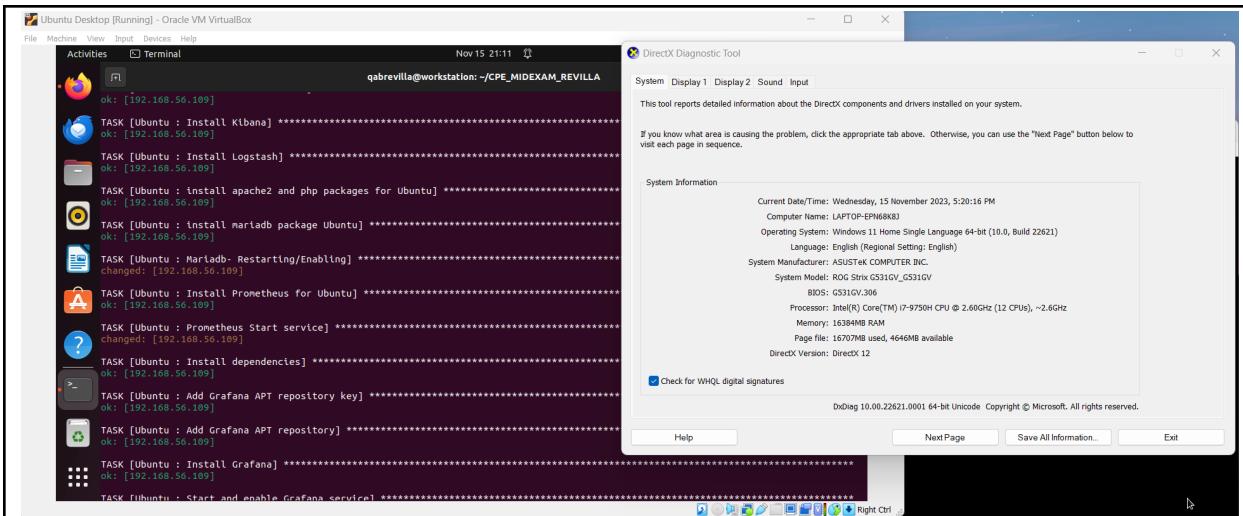


Figure 3.6 files/prometheus.service

prometheus.service is the prerequisite file that is typically created to define how the Prometheus service should be managed by systemd. This includes specifying the executable binary, command-line options, user and group information, environment variables, and other relevant configurations.





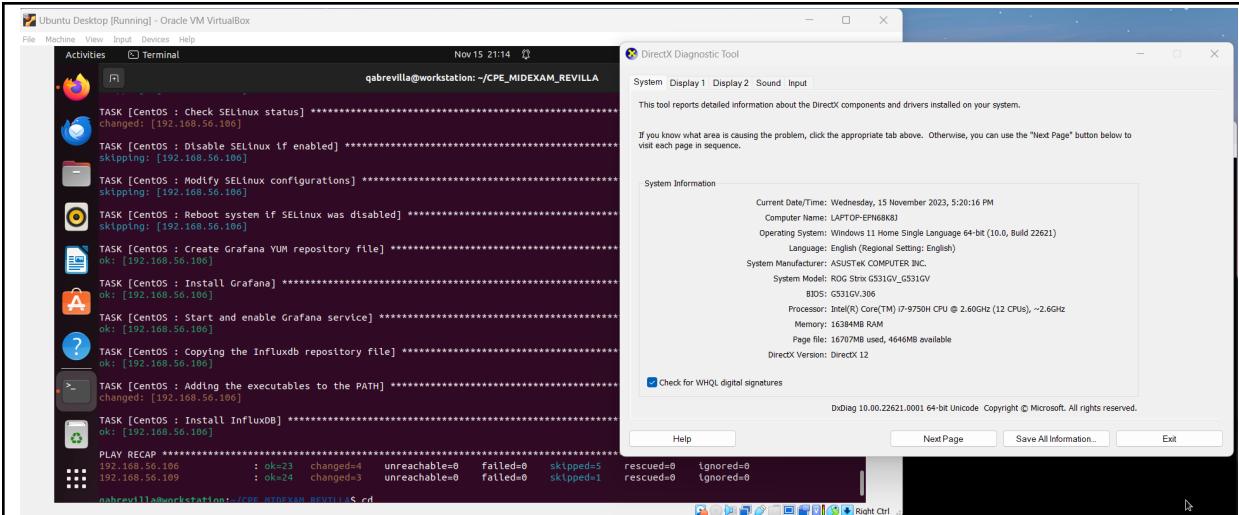
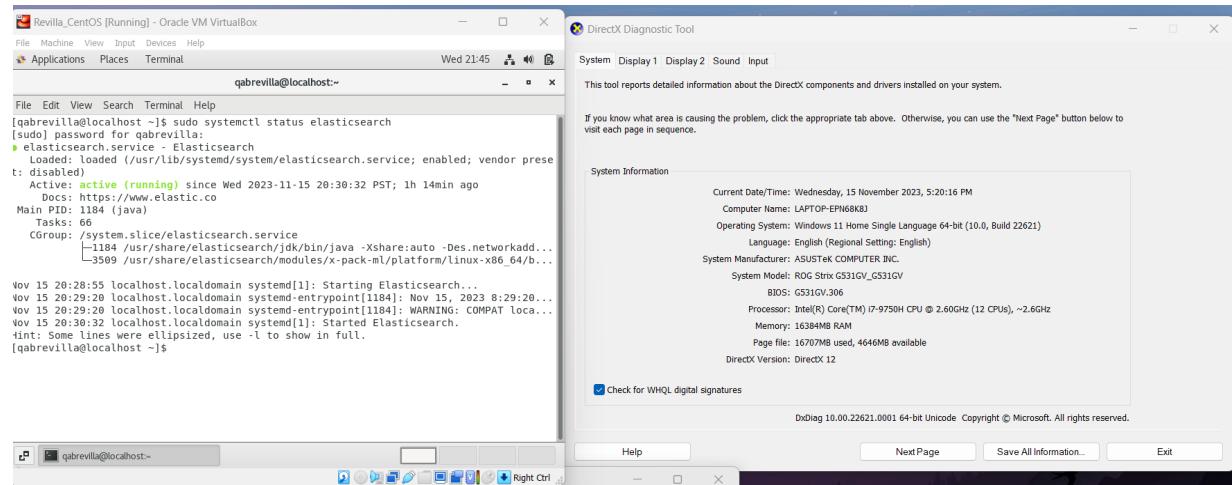


Figure 3.7 running playbook

After running the playbook, It was able to install configure and manage enterprise availability, performance and log monitoring tools. It show a lot of ok on status because of many attempts in running.

Proof



Using the command `sudo systemctl status elasticsearch`, It will show a proof that elastic search is successfully installed.

```

Revilla_CentOS [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Applications Places Terminal
qabrevilla@localhost:~ % sudo systemctl status kibana
● Kibana.service - Kibana
   Loaded: loaded (/etc/systemd/system/kibana.service; enabled; vendor preset: disabled)
     Active: active (running) since Wed 2023-11-15 20:28:55 PST; 1h 16min ago
       Docs: https://www.elastic.co
     Main PID: 1186 (node)
       Tasks: 11
      CGroup: /system.slice/kibana.service
              └─1186 /usr/share/kibana/bin/../node/bin/node /usr/share/kibana/bin/.../sr...
Nov 15 20:28:55 localhost.localdomain systemd[1]: Started Kibana.
Nov 15 20:29:20 localhost.localdomain systemd[1]:warning: COMPAT local socket: /var/run/kibana/kibana.sock:5359: Some lines were ellipsized, use -l to show in full.
[qabrevilla@localhost ~]$ 

```

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Using the command `sudo systemctl status kibana`, It will show a proof that kibana is successfully installed.

```

Revilla_CentOS [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Applications Places Terminal
qabrevilla@localhost:~ % sudo systemctl status logstash
● logstash.service - logstash
   Loaded: loaded (/etc/systemd/system/logstash.service; enabled; vendor preset: disabled)
     Active: active (running) since Wed 2023-11-15 21:45:49 PST; 31s ago
       Docs: https://www.elastic.co
     Main PID: 23059 (java)
       Tasks: 1
      CGroup: /system.slice/logstash.service
              └─23059 /usr/share/logstash/jdk/bin/java -Xms1g -Xmx1g -XX:+UseConcMarkSw...
Nov 15 21:45:49 localhost.localdomain systemd[1]: Started logstash.
Nov 15 21:45:49 localhost.localdomain logstash[23059]: Using bundled JDK: /usr/share...
Nov 15 21:45:49 localhost.localdomain logstash[23059]: OpenJDK 64-Bit Server VM war...
Hint: Some lines were ellipsized, use -l to show in full.
[qabrevilla@localhost ~]$ 

```

DirectX Diagnostic Tool

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Using the command `sudo systemctl status logstash`, It will show a proof that logstash is successfully installed.

```

Revilla_CentOS [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Applications Places Terminal
qabrevilla@localhost:~ % sudo systemctl status nagios
● nagios.service - Nagios Core 4.4.9
   Loaded: loaded (/usr/lib/systemd/system/nagios.service; disabled; vendor preset: disabled)
     Active: active (running) since Wed 2023-11-15 21:49:56 PST; 4s ago
       Docs: https://www.nagios.org/documentation
     Process: 23351 ExecStart=/usr/sbin/nagios -d /etc/nagios/nagios.cfg (code=exited, sta...
     Process: 23350 ExecStartPre=/usr/sbin/nagios -v /etc/nagios/nagios.cfg (code=exited, sta...
     Process: 23350 ExecStartPre=/usr/sbin/nagios -v /etc/nagios/nagios.cfg (code=exited, sta...
Main PID: 23353 (nagios)
   Tasks: 8
  CGroup: /system.slice/nagios.service
          └─23353 /usr/sbin/nagios -d /etc/nagios/nagios.cfg
          ├─23358 /usr/sbin/nagios -worker /var/spool/nagios/cmd/nagios.qh
          ├─23359 /usr/sbin/nagios -worker /var/spool/nagios/cmd/nagios.qh
          ├─23360 /usr/sbin/nagios -worker /var/spool/nagios/cmd/nagios.qh
          ├─23361 /usr/sbin/nagios -worker /var/spool/nagios/cmd/nagios.qh
          ├─23373 /usr/sbin/nagios -d /etc/nagios/nagios.cfg
          ├─23374 /usr/lib64/nagios/plugins/check_ping -w 127.0.0.1 -w 3000.0.80% -...
          └─23375 /usr/bin/ping -n -U -w 30 -c 5 127.0.0.1

Nov 15 21:49:56 localhost.localdomain nagios[23353]: qh: Socket '/var/spool/nagios/...d
Nov 15 21:49:56 localhost.localdomain nagios[23353]: qh: core query handler registered
Nov 15 21:49:56 localhost.localdomain nagios[23353]: qh: echo service query handler...d
Nov 15 21:49:56 localhost.localdomain nagios[23353]: qh: help for the query handler...d

```

DirectX Diagnostic Tool

This tool reports detailed information about the DirectX components and drivers installed on your system.

If you know what area is causing the problem, click the appropriate tab above. Otherwise, you can use the "Next Page" button below to visit each page in sequence.

System Information

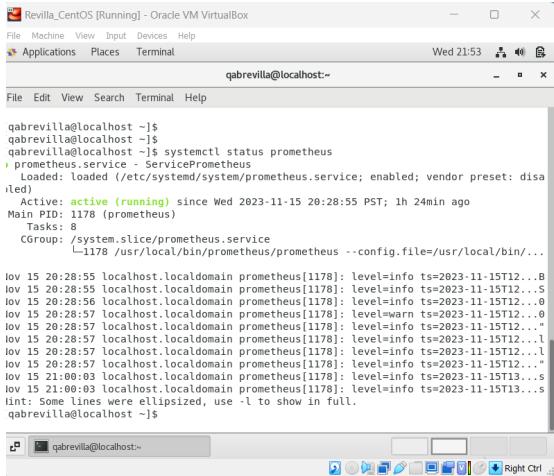
Current Date/Time: Wednesday, 15 November 2023, 5:20:16 PM
Computer Name: LAPTOP-EPN68K8J
Operating System: Windows 11 Home Single Language 64-bit (10.0, Build 22621)
Language: English (Regional Setting: English)
System Manufacturer: ASUSTeK COMPUTER INC.
System Model: ROG Strix G531GV_G531GV
BIOS: G531GV.306
Processor: Intel(R) Core(TM) i7-9750H CPU @ 2.60GHz (12 CPUs), ~2.6GHz
Memory: 16384MB RAM
Page file: 16707MB used, 4646MB available
DirectX Version: DirectX 12

Check for WHQL digital signatures

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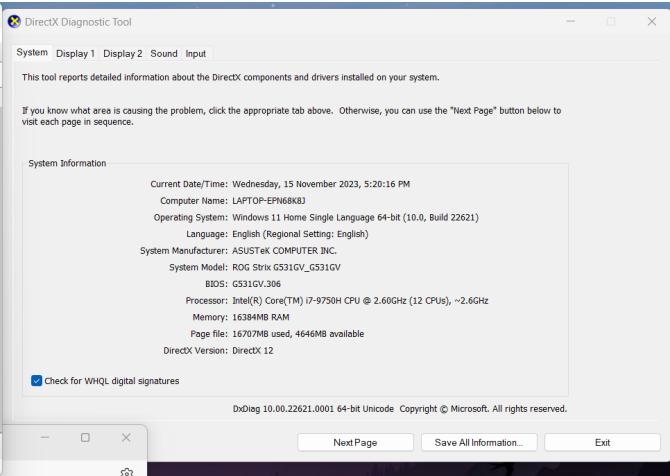
Help Next Page Save All Information... Exit

Using the command sudo systemctl status nagios, It will show a proof that nagios is successfully installed.



```
Revilla_CentOS [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Applications Places Terminal Wed 21:53
qabrevilla@localhost:~%
```

```
qabrevilla@localhost ~]$ sudo systemctl status prometheus
● Prometheus.service - ServicePrometheus
   Loaded: loaded (/etc/systemd/system/prometheus.service; enabled; vendor preset: disabled)
     Active: active (running) since Wed 2023-11-15 20:28:55 PST; 1h 24min ago
Main PID: 1178 (prometheus)
   Tasks: 8
      CGroup: /system.slice/prometheus.service
              └─1178 /usr/local/bin/prometheus --config.file=/usr/local/bin/...
lo 15 20:28:55 localhost.localdomain prometheus[1178]: level=info ts=2023-11-15T12...8
lo 15 20:28:55 localhost.localdomain prometheus[1178]: level=info ts=2023-11-15T12...5
lo 15 20:28:56 localhost.localdomain prometheus[1178]: level=info ts=2023-11-15T12...0
lo 15 20:28:57 localhost.localdomain prometheus[1178]: level=warn ts=2023-11-15T12...0
lo 15 20:28:57 localhost.localdomain prometheus[1178]: level=info ts=2023-11-15T12...8
lo 15 20:28:57 localhost.localdomain prometheus[1178]: level=info ts=2023-11-15T12...1
lo 15 20:28:57 localhost.localdomain prometheus[1178]: level=info ts=2023-11-15T12...1
lo 15 21:00:03 localhost.localdomain prometheus[1178]: level=info ts=2023-11-15T13...5
lo 15 21:00:03 localhost.localdomain prometheus[1178]: level=info ts=2023-11-15T13...5
Hint: Some lines were ellipsized, use -l to show in full.
qabrevilla@localhost ~]$
```



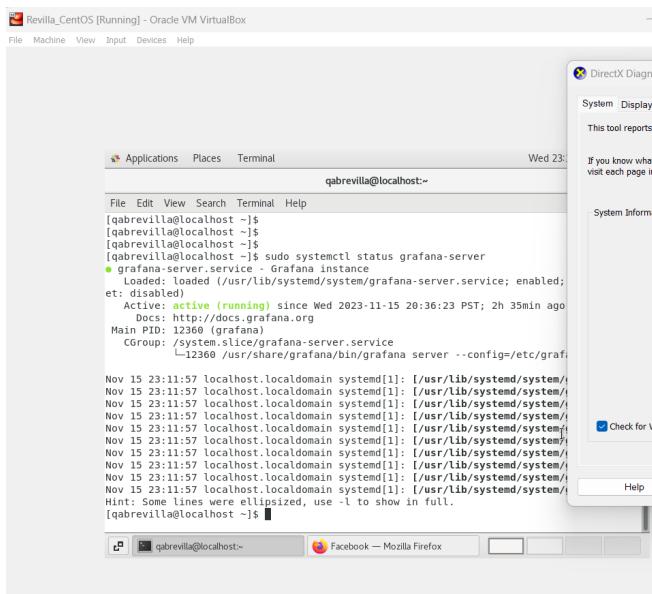
System Information

- Current Date/Time: Wednesday, 15 November 2023, 5:20:16 PM
- Computer Name: LAPTOP-EPN68K8J
- Operating System: Windows 11 Home Single Language 64-bit (10.0, Build 22621)
- Language: English (Regional Setting: English)
- System Manufacturer: ASUSTeK COMPUTER INC.
- System Model: ROG Strix G531GV_G531GV
- BIOS: G531GV_306
- Processor: Intel(R) Core(TM) i7-9750H CPU @ 2.60GHz (12 CPUs), ~2.6GHz
- Memory: 16384MB RAM
- Page file: 16707MB used, 4646MB available
- DIRECTX Version: DirectX 12

Check for WHQL digital signatures

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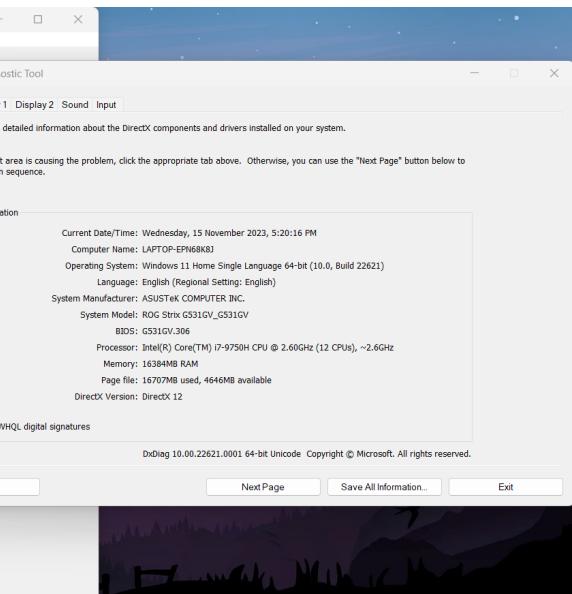
Using the command sudo systemctl status prometheus, It will show a proof that prometheus is successfully installed.



```
Revilla_CentOS [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Applications Places Terminal Wed 23:11
qabrevilla@localhost:~%
```

```
qabrevilla@localhost ~]$ sudo systemctl status grafana-server
● grafana-server.service - Grafana instance
   Loaded: loaded (/usr/lib/systemd/system/grafana-server.service; enabled; et: disabled)
     Active: active (running) since Wed 2023-11-15 20:36:23 PST; 2h 35min ago
       Docs: http://docs.grafana.org
 Main PID: 12360 (grafana)
    CGroup: /system.slice/grafana-server.service
            └─12360 /usr/share/grafana/bin/grafana server --config=/etc/grafan...
```

```
Nov 15 23:11:57 localhost.localdomain systemd[1]: [/usr/lib/systemd/system/...
Hint: Some lines were ellipsized, use -l to show in full.
[qabrevilla@localhost ~]$
```



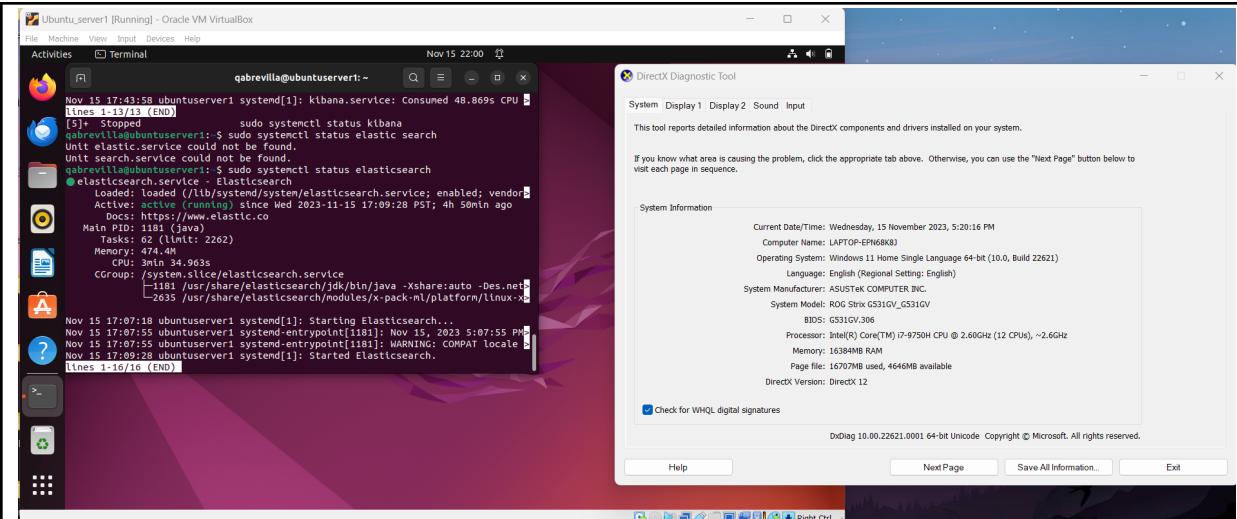
System Information

- Current Date/Time: Wednesday, 15 November 2023, 5:20:16 PM
- Computer Name: LAPTOP-EPN68K8J
- Operating System: Windows 11 Home Single Language 64-bit (10.0, Build 22621)
- Language: English (Regional Setting: English)
- System Manufacturer: ASUSTeK COMPUTER INC.
- System Model: ROG Strix G531GV_G531GV
- BIOS: G531GV_306
- Processor: Intel(R) Core(TM) i7-9750H CPU @ 2.60GHz (12 CPUs), ~2.6GHz
- Memory: 16384MB RAM
- Page file: 16707MB used, 4646MB available
- DIRECTX Version: DirectX 12

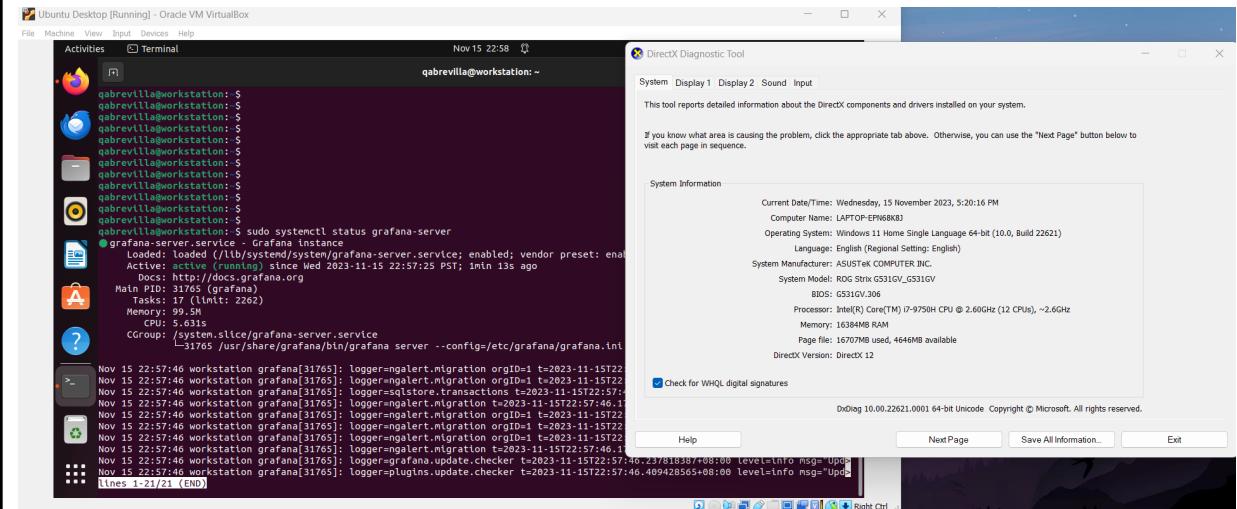
Check for WHQL digital signatures

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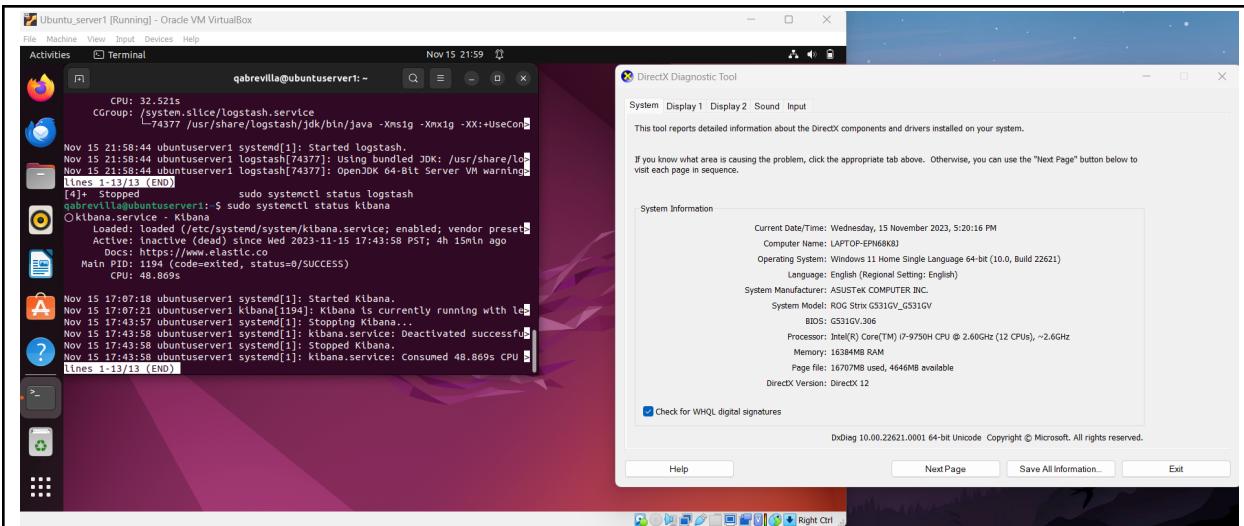
Using the command sudo systemctl status grafana, It will show a proof that grafana is successfully installed.



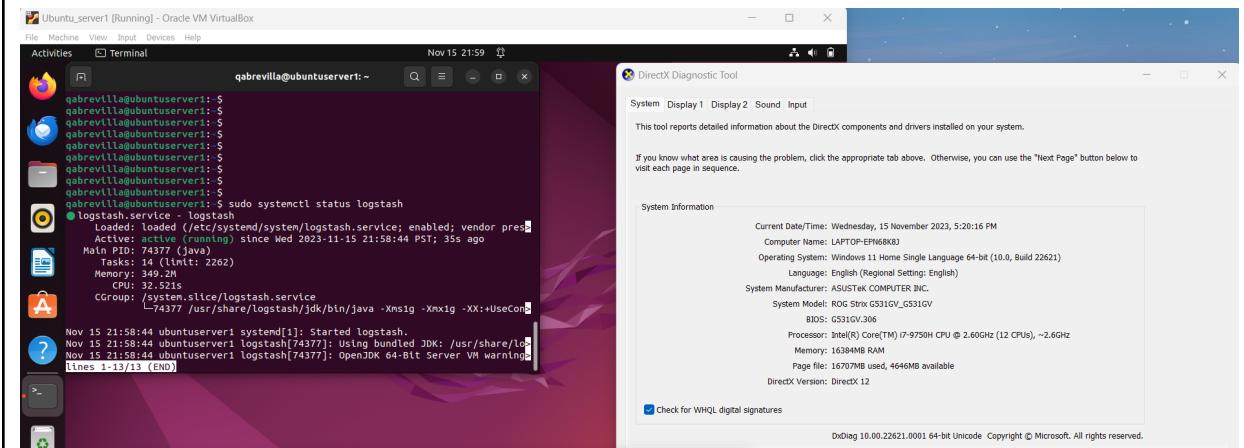
Using the command `sudo systemctl status elasticsearch`, It will show a proof that elastic search is successfully installed.



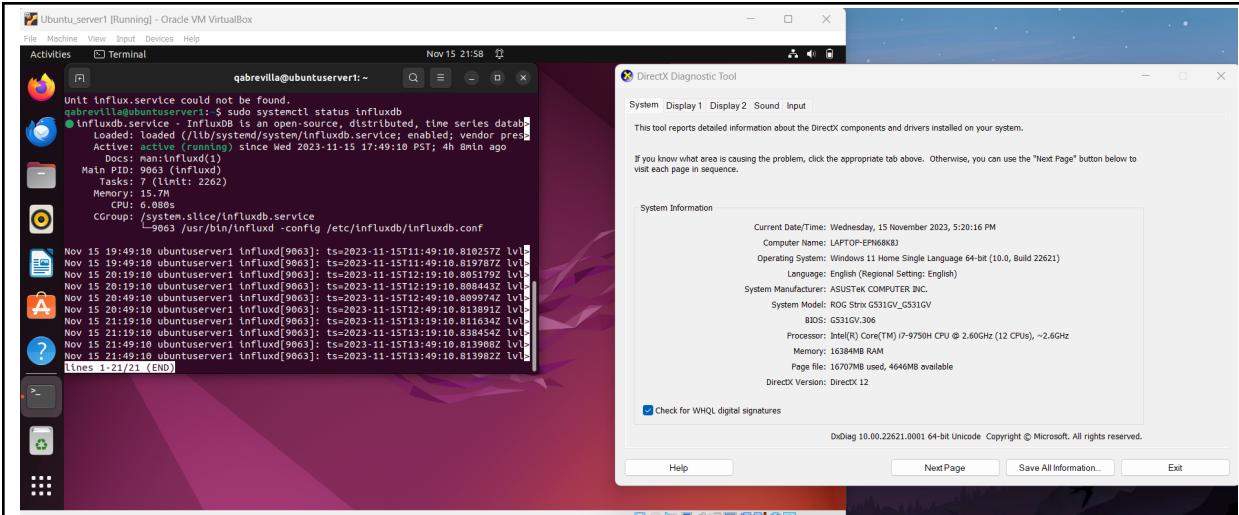
Using the command `sudo systemctl status grafana`, It will show a proof that grafana is successfully installed.



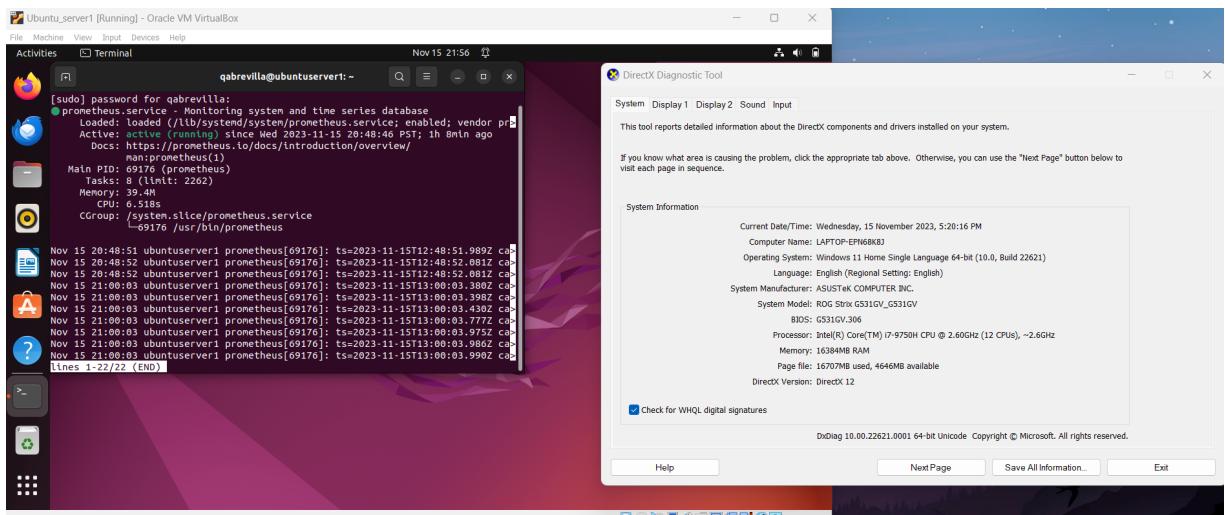
Using the command `sudo systemctl status kibana`, It will show a proof that kibana is successfully installed.



Using the command `sudo systemctl status logstash`, It will show a proof that logstash is successfully installed.



Using the command `sudo systemctl status influxdb`, It will show a proof that influxdb is successfully installed.



Using the command `sudo systemctl status prometheus`, It will show a proof that prometheus is successfully installed.

4. Document the push and commit from the local repository to GitHub.

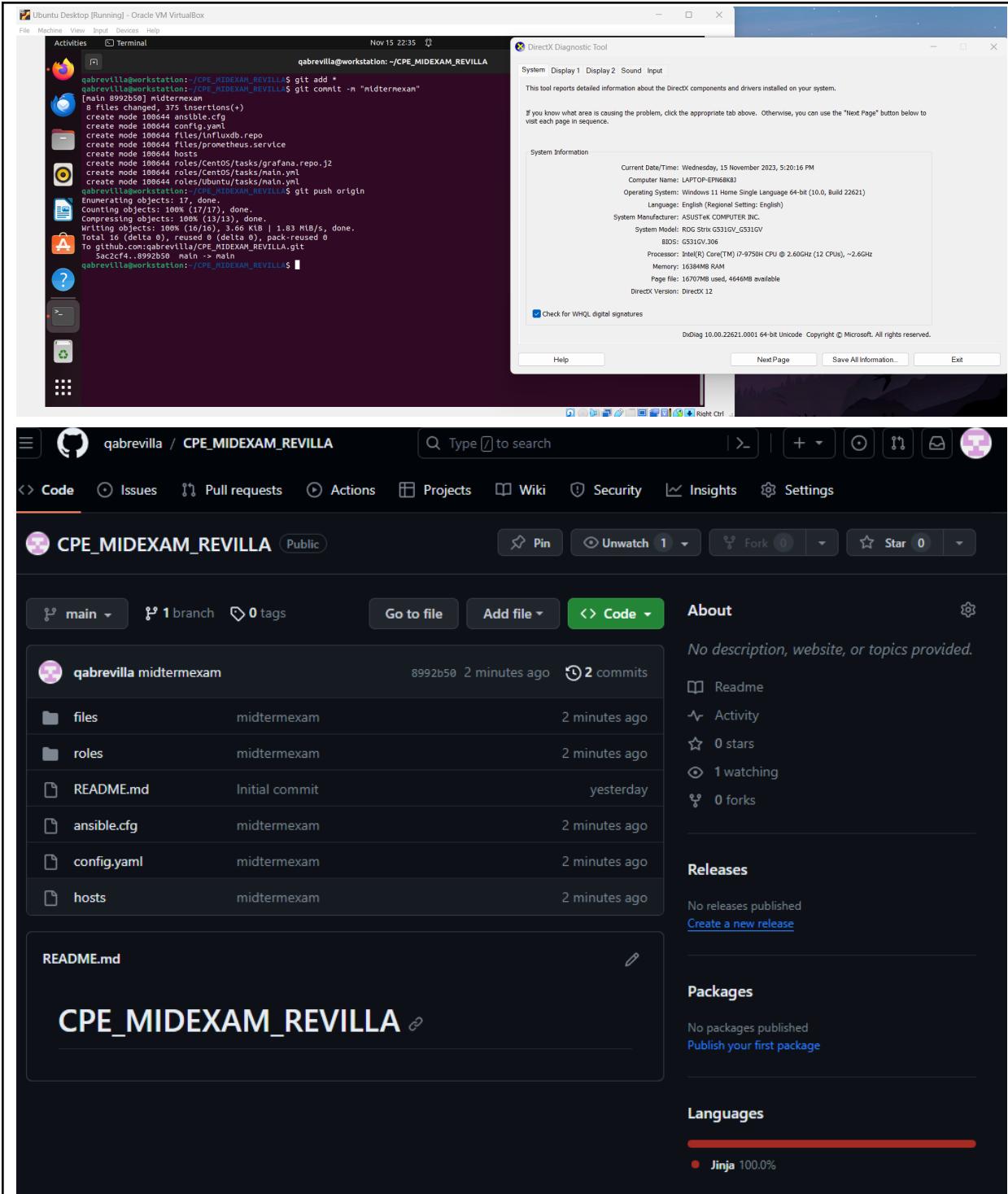


Figure 4.1 Git push

Using the commands in the screenshot it was able to push it to my repository successfully.

- Finally, paste also the link of your GitHub repository in the documentation.

GitHub link:

https://github.com/qabrevilla/CPE_MIDEXAM_REVILLA

Conclusions: (link your conclusion from the objective)

For this Midterm Skill Examination, we are tasked to install, configure and manage enterprise availability, performance and log monitoring tools in remote servers. The list of programs included Elasticsearch, Kibana, Logstash, Grafana, InfluxDB, and Prometheus, each posing its own set of intricacies and prerequisites. The tools that we downloaded require a lot of pre-requisites to be able to install in different distributions. We are able to apply our learnings in the lessons in the midterm period to be able to configure the programs. I faced a lot of challenges in configuring the program because I am not familiar with these tools. Also the vm virtual box requires a lot of CPU that causes lag when downloading it simultaneously. But overall I enjoyed this activity because I was able to create a playbook and applying roles and tasks to be able to install multiple programs. This experience will help a lot in the future in doing more playbooks.