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Course/Section: CPE31S5	**Date Submitted:** 11/15/2023
Instructor: Engr. Roman Richard	**Semester and SY:** 1st Sem – 2023-2024

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

1. Objectives

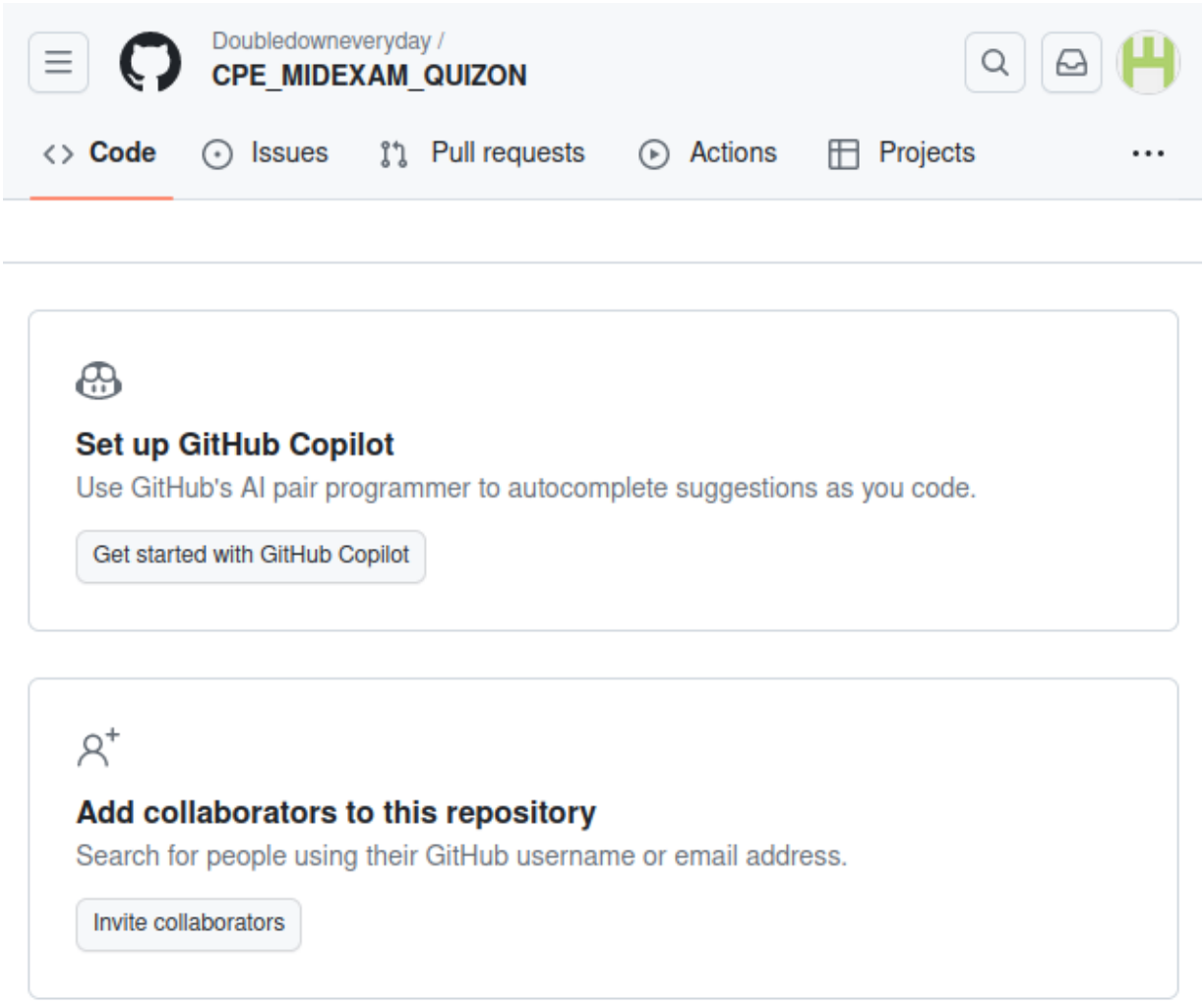
Create and design a workflow that installs, configure and manage enterprise availability, performance and log monitoring tools using Ansible as an Infrastructure as Code (IaC) tool.

2. Instructions

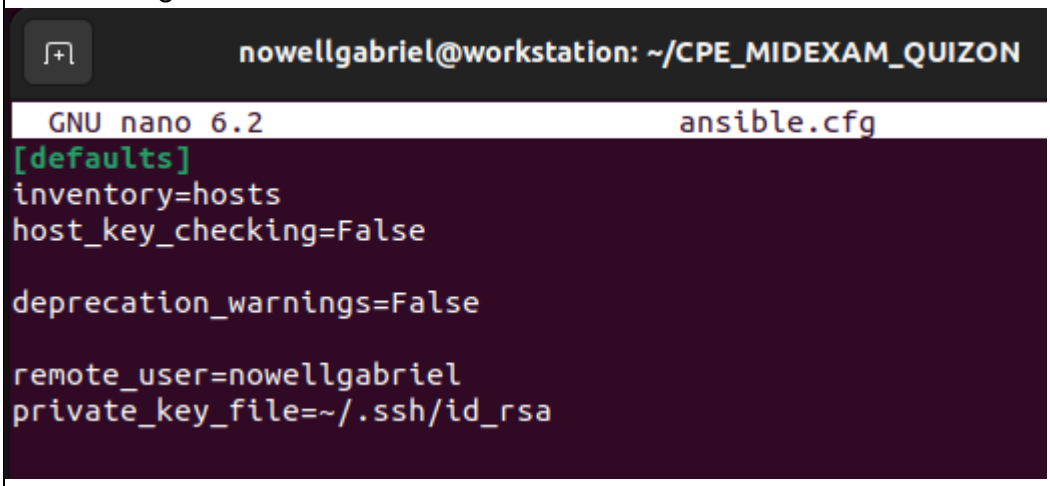
1. Create a repository in your GitHub account and label it CPE_MIDEXAM_SURNAME.
2. Clone the repository and do the following:
   - 2.1. Create an Ansible playbook that does the following with an input of a config.yaml file and arranged Inventory file:
   - 2.2. Install and configure Elastic Stack in separate hosts (Elastic Search, Kibana, Logstash) • Install Nagios in one host
   - 2.3. Install Grafana,Prometheus and Influxdb in 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)

Github:



Ansible.cfg:



Hosts:

nowellgabriel@workstation: ~/CPE_MIDEXAM_QUIZON

```
 GNU nano 6.2                                  hosts
[Ubuntu]
192.168.56.110

[CentOS]
192.168.56.108
```

Config.yml:

nowellgabriel@workstation: ~/CPE_MIDEXAM_QUIZON

```
 GNU nano 6.2                              config.yml *
---
- hosts: all
  become: true
  pre_tasks:

  - name: install updates Ubuntu
    apt:
      update_cache: yes
    changed_when: false
    when: ansible_distribution == "Ubuntu"


  - name: install updates CentOS
    dnf:
      update_only: yes
      update_cache: yes
      use_backend: dnf4
    when: ansible_distribution == "CentOS"

- hosts: Ubuntu
  become: true
  roles:
    - Ubuntu

- hosts: CentOS
  become: true
  roles:
    - CentOS
```

Inlfuxdb.repo:

nowellgabriel@workstation: ~/CPE_MIDEXAM_QUIZON/files

```
  GNU nano 6.2                                influxdb.repo
[influxdb]
name = InfluxDB Repository - RHEL \$releasever
baseurl =
https://repos.influxdata.com/rhel/\$releasever/\$basearch/stable
enabled = 1
gpgcheck = 1
gpgkey = https://repos.influxdata.com/influxdb.key
```

Prometheus.service:

nowellgabriel@workstation: ~/CPE_MIDEXAM_QUIZON/files

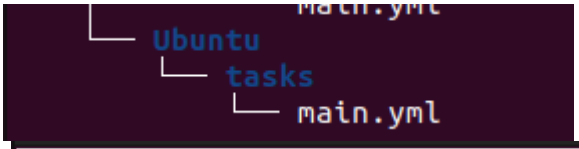
```
  GNU nano 6.2                          prometheus.service
[Unit]
Description=ServicePrometheus
After=network.target

[Service]
Type=simple
ExecStart=/usr/local/bin/prometheus/prometheus --config.file=/usr/local/bin/pro>

[Install]
WantedBy=multi-user.target
```

Grafana.repo.j2:

nowellgabriel@workstation: ~/CPE_MIDEXAM_QUIZON/role...

```
  GNU nano 6.2                                grafana.repo.j2
[grafana]
name=grafana
baseurl=https://packages.grafana.com/oss/rpm
repo_gpgcheck=1
enabled=1
gpgcheck=1
gpgkey=https://packages.grafana.com/gpg.key
sslverify=1
sslcacert=/etc/pki/tls/certs/ca-bundle.crt
```

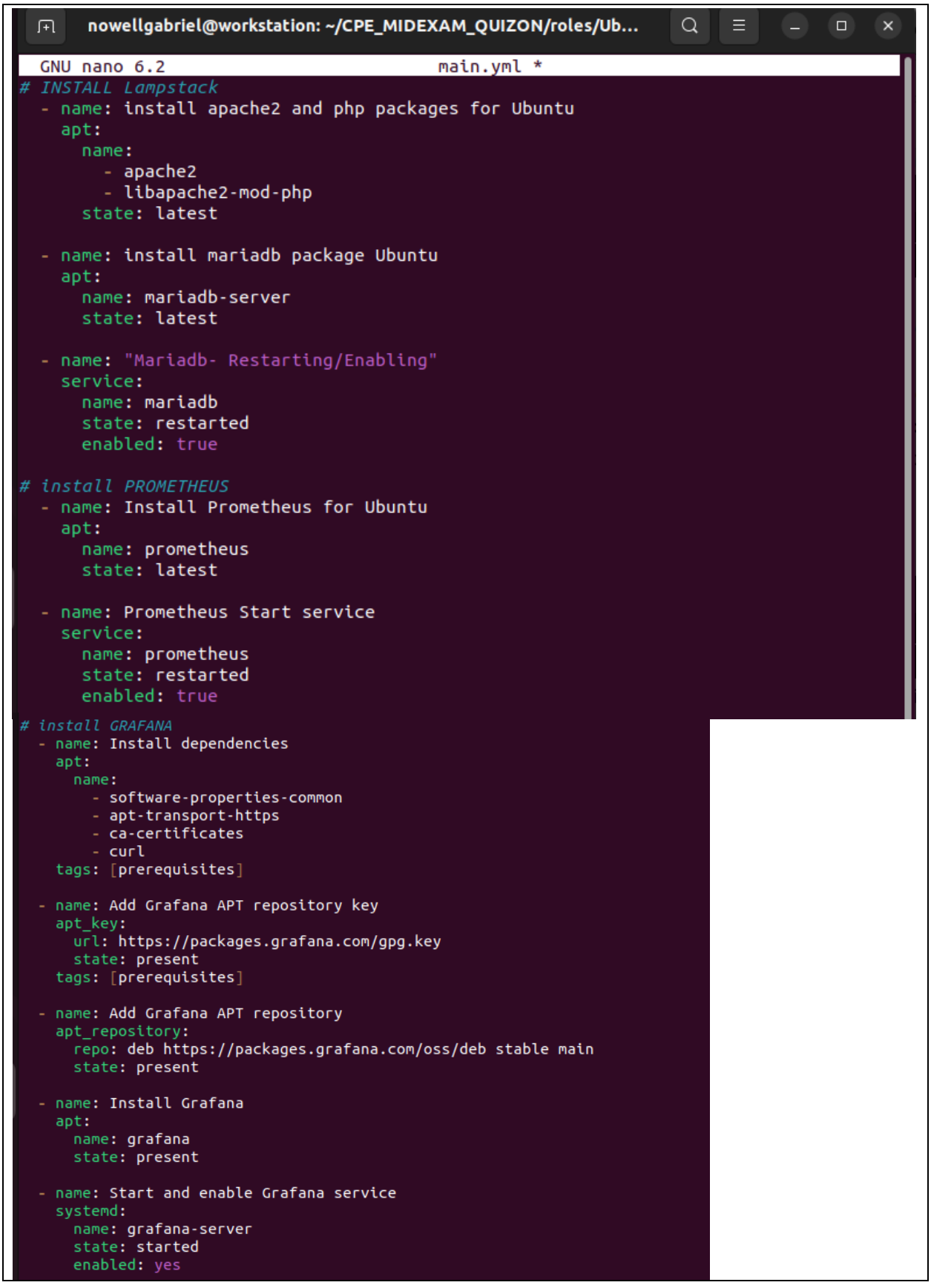
Ubuntu:




```
  GNU nano 6.2                          main.yml
---
# INSTALL NAGIOS
  - name: install nagios for Ubuntu
    apt:
      name:
        - nagios4-core
        - nagios-plugins
      state: latest
```

nowellgabriel@workstation: ~/CPE_MIDEXAM_QUIZON/roles/Ub...

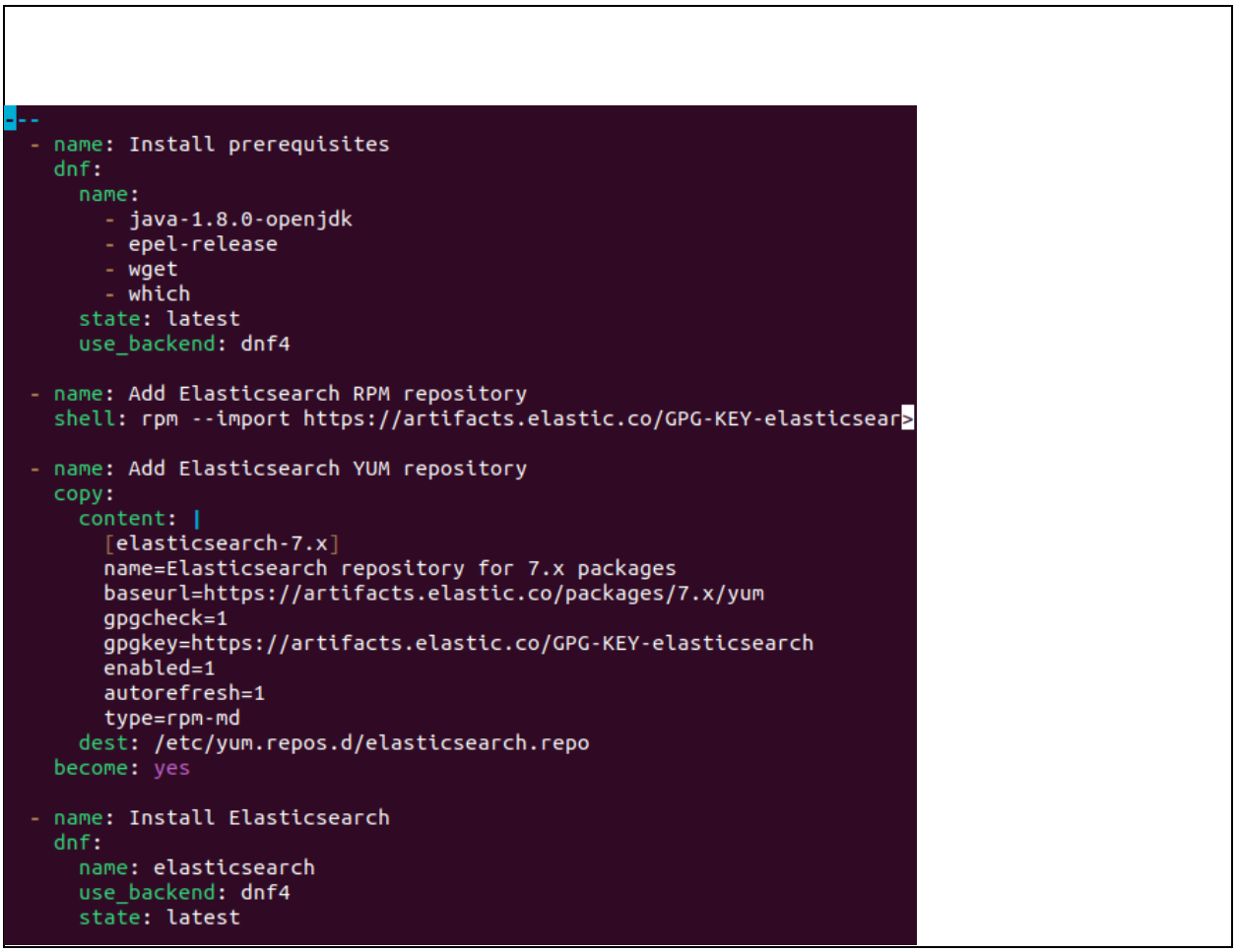
```
  GNU nano 6.2                          main.yml *
# INSTALL ELSTACK
  - name: Install necessary prerequisites
    apt:
      name:
        - default-jre
        - apt-transport-https
        - curl
        - software-properties-common
      state: latest
    become: yes

  - 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

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

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

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


nowellgabriel@workstation: ~/CPE_MIDEXAM_QUIZON/roles/Ub...
GNU nano 6.2 main.yml *
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:
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:
url: https://packages.grafana.com/gpg.key
state: present
tags: [prerequisites]
- name: Add Grafana APT repository
apt_repository:
repo: deb https://packages.grafana.com/oss/deb stable main
state: present
- name: Install Grafana
apt:
name: grafana
state: present
- name: Start and enable Grafana service
systemd:
name: grafana-server
state: started
enabled: yes

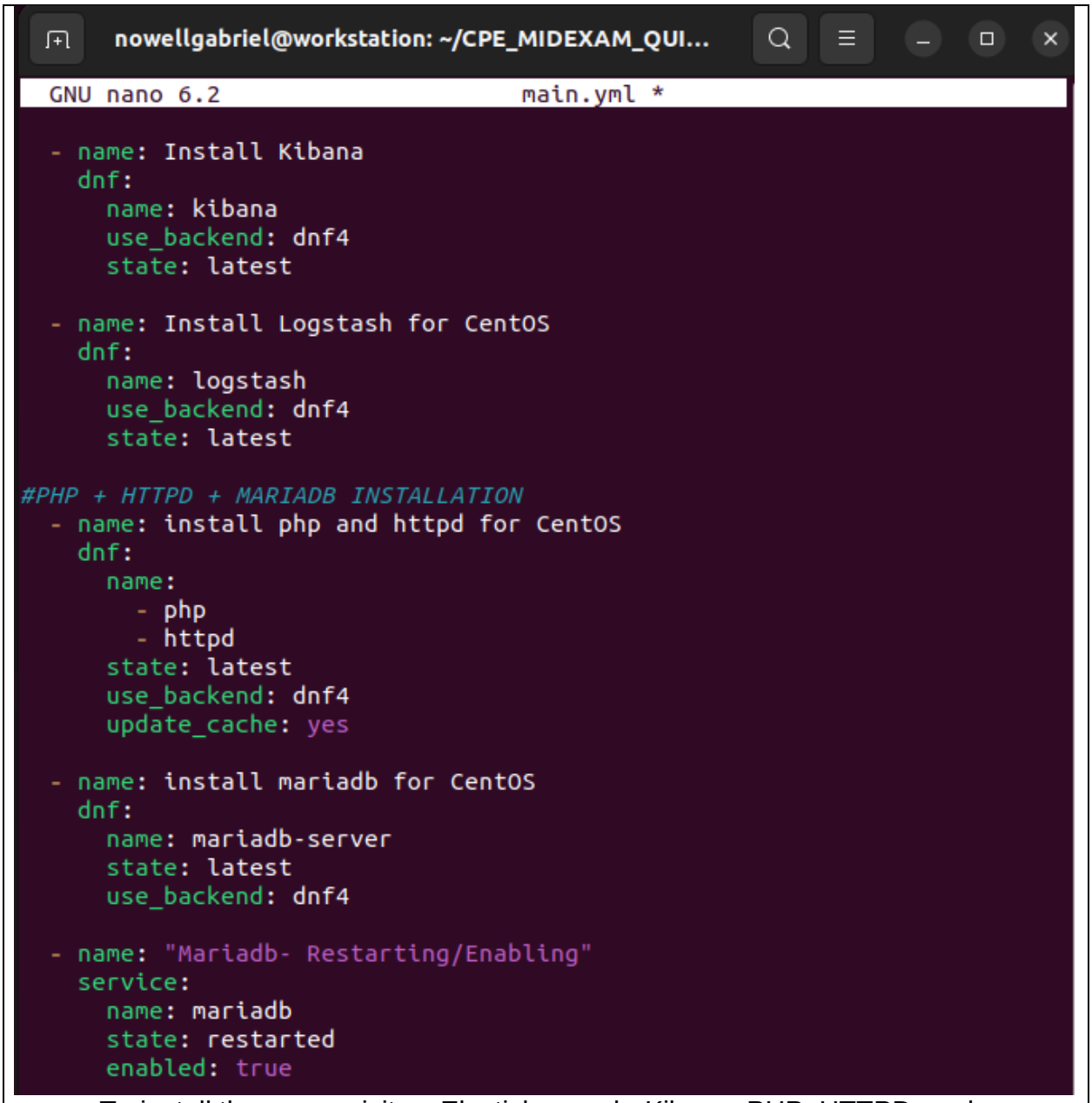
```
#INSTALL INFLUXDB
  - name: Installing dependencies
    apt:
      name:
        - apt-transport-https
        - software-properties-common
        - wget
      state: latest


  - name: Adding Influxdb in the repository
    shell: |
      wget -q https://repos.influxdata.com/influxdb.key
      sleep 5
      echo '23a1c8836f0afc5ed24e0486339d7cc8f6790b83886c4c96995b88a061c5bb5d influx>
      sleep 5
      echo 'deb [signed-by=/etc/apt/trusted.gpg.d/influxdb.gpg] https://repos.influ>

  - name: Installing Influxdb
    apt:
      name:
        - influxdb

  - name: Making sure that the Influxd is enabled and started
    service:
      name: influxdb
      state: started
      enabled: true
```

```
nowellgabriel@workstation:~/CPE_MIDEXAM_QUIZON$ tree
.
├── ansible.cfg
├── config.yml
├── files
│   ├── influxdb.repo
│   └── prometheus.service
├── hosts
└── roles
    ├── CentOS
    │   └── tasks
    │       ├── grafana.repo.j2
    │       └── main.yml
    └── Ubuntu
        └── tasks
            └── main.yml
```

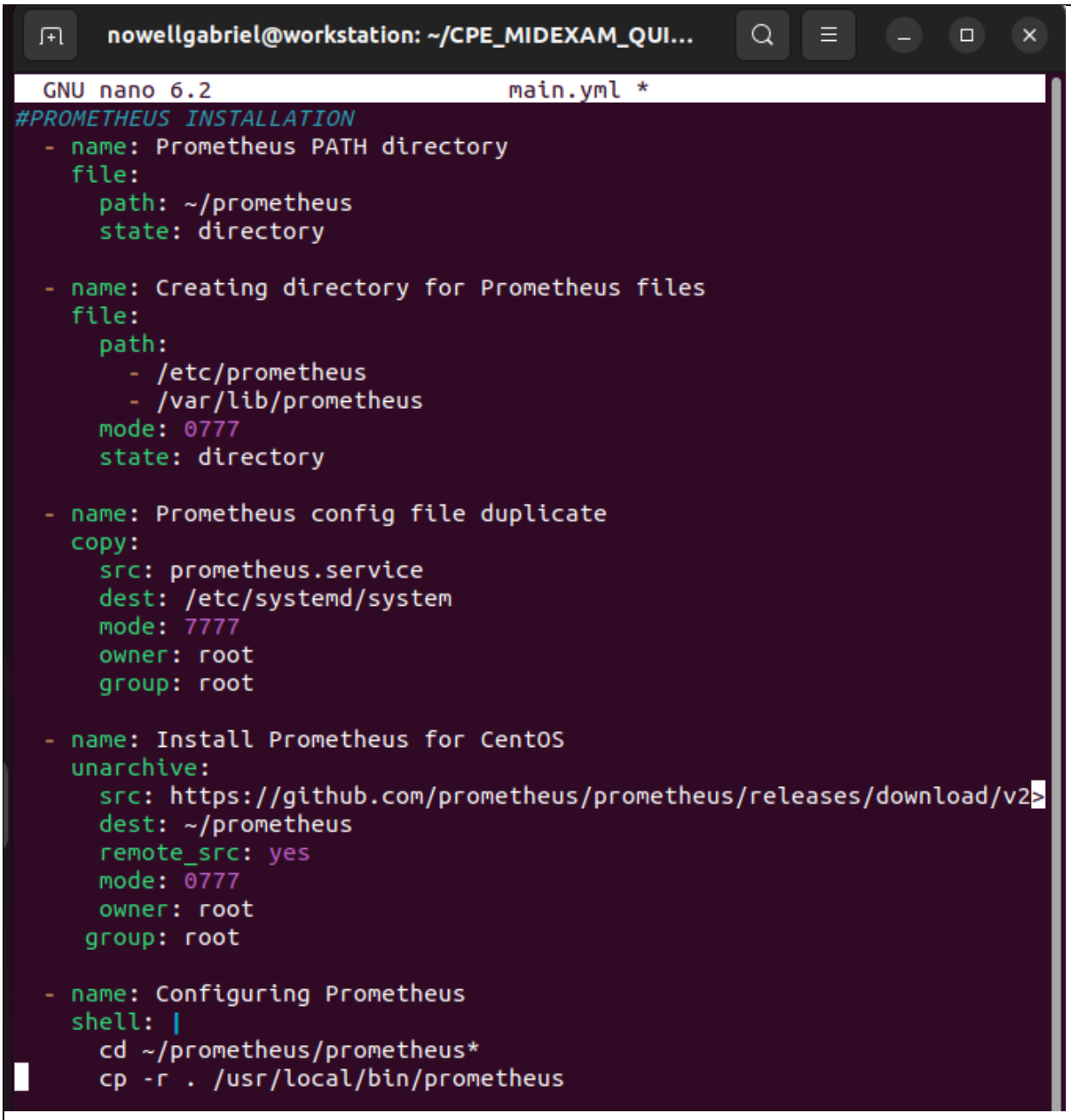
- Created the required files and directories



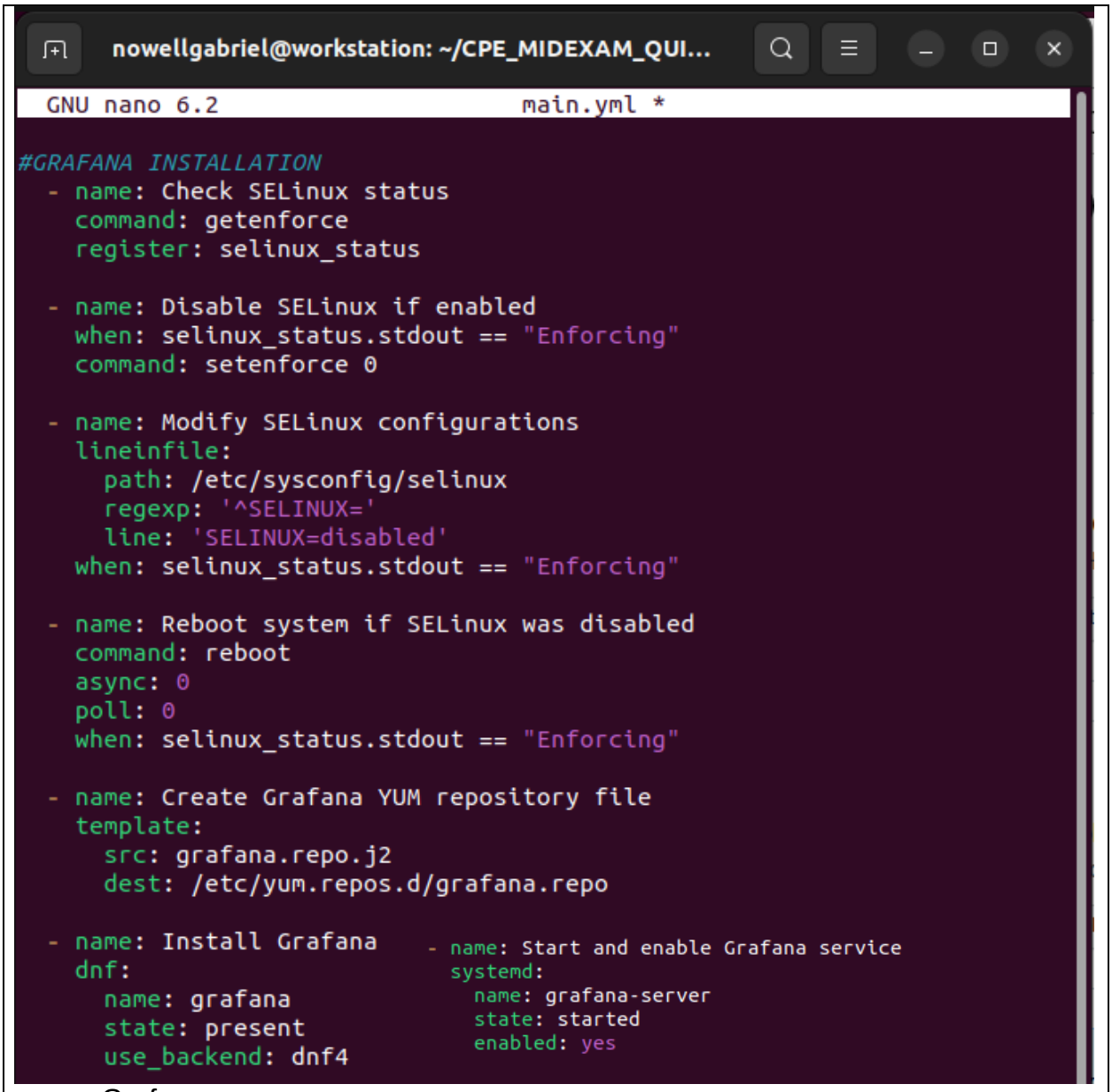
- name: Install prerequisites
dnf:
name:
- java-1.8.0-openjdk
- epel-release
- wget
- which
state: latest
use_backend: dnf4
- name: Add Elasticsearch RPM repository
shell: rpm --import https://artifacts.elastic.co/GPG-KEY-elasticsear
- name: Add Elasticsearch YUM repository
copy:
content: |
[elasticsearch-7.x]
name=Elasticsearch repository for 7.x packages
baseurl=https://artifacts.elastic.co/packages/7.x/yum
gpgcheck=1
gpgkey=https://artifacts.elastic.co/GPG-KEY-elasticsearch
enabled=1
autorefresh=1
type=rpm-md
dest: /etc/yum.repos.d/elasticsearch.repo
become: yes
- name: Install Elasticsearch
dnf:
name: elasticsearch
use_backend: dnf4
state: latest



- To install the prerequisites, Elastickserarch, Kibana, PHP, HTTPD, and MARIADB.


nowellgabriel@workstation: ~/CPE_MIDEXAM_QUI...
GNU nano 6.2 main.yml *
#PROMETHEUS INSTALLATION
- 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
dest: ~/prometheus
remote_src: yes
mode: 0777
owner: root
group: root
- name: Configuring Prometheus
shell: |
cd ~/prometheus/prometheus*
cp -r . /usr/local/bin/prometheus

- Prometheus


nowellgabriel@workstation: ~/CPE_MIDEXAM_QUI...
GNU nano 6.2 main.yml *
#GRAFANA INSTALLATION
- name: Check SELinux status
command: getenforce
register: selinux_status
- name: Disable SELinux if enabled
when: selinux_status.stdout == "Enforcing"
command: setenforce 0
- name: Modify SELinux configurations
lineinfile:
path: /etc/sysconfig/selinux
regexp: '^SELINUX='
line: 'SELINUX=disabled'
when: selinux_status.stdout == "Enforcing"
- name: Reboot system if SELinux was disabled
command: reboot
async: 0
poll: 0
when: selinux_status.stdout == "Enforcing"
- name: Create Grafana YUM repository file
template:
src: grafana.repo.j2
dest: /etc/yum.repos.d/grafana.repo
- name: Install Grafana
dnf:
name: grafana
state: present
use_backend: dnf4
- name: Start and enable Grafana service
systemd:
name: grafana-server
state: started
enabled: yes

- Grafana

```
#INFLUXDB INSTALLATION
- name: Copying the Influxdb repository file
  unarchive:
    src: https://dl.influxdata.com/influxdb/releases/influxdb2-2.4.0-lin>
    dest: /tmp/
    remote_src: yes
    mode: 0777
    owner: root
    group: root

- name: Adding the executables to the PATH
  shell:
    cd /tmp/influxdb2*
    sudo cp influxdb2-2.4.0-linux-amd64/influxd /usr/local/bin/

- name: Install InfluxDB
  dnf:
    name: influxdb
    state: present
    use_backend: dnf4
```

- Influxdb

```
nowellgabriel@workstation:~/CPE_MIDEXAM_QUIZON$ sudo systemctl status elasticsea
rch
● elasticsearch.service - Elasticsearch
     Loaded: loaded (/lib/systemd/system/elasticsearch.service; enabled; vendor>
     Active: active (running) since Wed 2023-11-15 23:18:58 +08; 18s ago
       Docs: https://www.elastic.co
   Main PID: 17593 (java)
      Tasks: 78 (limit: 4599)
     Memory: 1.7G
        CPU: 36.051s
     CGroup: /system.slice/elasticsearch.service
             ├─17593 /usr/share/elasticsearch/jdk/bin/java -Xshare:auto -Des.ne>
             └─17804 /usr/share/elasticsearch/modules/x-pack-ml/platform/linux->

Nov 15 23:18:33 workstation systemd[1]: Starting Elasticsearch...
Nov 15 23:18:44 workstation systemd-entrypoint[17593]: Nov 15, 2023 11:18:44 PM>
Nov 15 23:18:44 workstation systemd-entrypoint[17593]: WARNING: COMPAT locale p>
Nov 15 23:18:58 workstation systemd[1]: Started Elasticsearch.
nowellgabriel@workstation:~/CPE_MIDEXAM_QUIZON$ sudo systemctl status kibana
● kibana.service - Kibana
     Loaded: loaded (/etc/systemd/system/kibana.service; enabled; vendor preset>
     Active: active (running) since Wed 2023-11-15 23:21:45 +08; 34s ago
       Docs: https://www.elastic.co
   Main PID: 18160 (node)
      Tasks: 11 (limit: 4599)
     Memory: 504.5M
        CPU: 13.656s
     CGroup: /system.slice/kibana.service
             └─18160 /usr/share/kibana/bin/../node/bin/node /usr/share/kibana/b>

Nov 15 23:21:45 workstation systemd[1]: Started Kibana.
Nov 15 23:21:45 workstation kibana[18160]: Kibana is currently running with leg>
lines 1-13/13 (END)
```

```
nowellgabriel@workstation:~/CPE_MIDEXAM_QUIZON$ sudo systemctl status influxdb
● influxdb.service - InfluxDB is an open-source, distributed, time series datab>
     Loaded: loaded (/lib/systemd/system/influxdb.service; enabled; vendor pres>
     Active: active (running) since Wed 2023-11-15 23:06:26 +08; 25min ago
       Docs: man:influxd(1)
   Main PID: 16114 (influxd)
      Tasks: 10 (limit: 4599)
     Memory: 11.6M
        CPU: 748ms
     CGroup: /system.slice/influxdb.service
             └─16114 /usr/bin/influxd -config /etc/influxdb/influxdb.conf

Nov 15 23:06:26 workstation influxd[16114]: ts=2023-11-15T15:06:26.759000Z lvl=>
```

```
nowellgabriel@workstation:~/CPE_MIDEXAM_QUIZON$ sudo systemctl enable prometheus
Synchronizing state of prometheus.service with SysV service script with /lib/sys
temd/systemd-sysv-install.
Executing: /lib/systemd/systemd-sysv-install enable prometheus
nowellgabriel@workstation:~/CPE_MIDEXAM_QUIZON$ sudo systemctl status prometheus
● prometheus.service - Monitoring system and time series database
     Loaded: loaded (/lib/systemd/system/prometheus.service; enabled; vendor pr>
     Active: active (running) since Wed 2023-11-15 23:23:52 +08; 1min 21s ago
       Docs: https://prometheus.io/docs/introduction/overview/
             man:prometheus(1)
   Main PID: 19401 (prometheus)
      Tasks: 9 (limit: 4599)
     Memory: 25.4M
        CPU: 178ms
     CGroup: /system.slice/prometheus.service
             └─19401 /usr/bin/prometheus
```

```
nowellgabriel@workstation:~/CPE_MIDEXAM_QUIZON$ sudo systemctl status grafana-se
rver
● grafana-server.service - Grafana instance
     Loaded: loaded (/lib/systemd/system/grafana-server.service; enabled; vendo>
     Active: active (running) since Wed 2023-11-15 23:30:00 +08; 45s ago
       Docs: http://docs.grafana.org
   Main PID: 21173 (grafana)
      Tasks: 15 (limit: 4599)
     Memory: 125.9M
        CPU: 3.528s
     CGroup: /system.slice/grafana-server.service
             └─21173 /usr/share/grafana/bin/grafana server --config=/etc/grafan>

Nov 15 23:30:05 workstation grafana[21173]: logger=ngalert.migration orgID=1 t=>
```

```
nowellgabriel@workstation:~/CPE_MIDEXAM_QUIZON$ git add *
nowellgabriel@workstation:~/CPE_MIDEXAM_QUIZON$ git commit -m "MIDEXAM_QUIZON"
[main (root-commit) 1028304] MIDEXAM_QUIZON
 8 files changed, 367 insertions(+)
 create mode 100644 ansible.cfg
 create mode 100644 config.yml
 create mode 100644 files/influxdb.repo
 create mode 100644 files/prometheus.service
 create mode 100644 hosts
 create mode 100644 roles/CentOS/tasks/grafana.repo.j2
 create mode 100644 roles/CentOS/tasks/main.yml
 create mode 100644 roles/Ubuntu/tasks/main.yml
nowellgabriel@workstation:~/CPE_MIDEXAM_QUIZON$ git push origin
Enumerating objects: 16, done.
Counting objects: 100% (16/16), done.
Delta compression using up to 4 threads
Compressing objects: 100% (12/12), done.
Writing objects: 100% (16/16), 3.61 KiB | 3.61 MiB/s, done.
Total 16 (delta 0), reused 0 (delta 0), pack-reused 0
To github.com:Doubledowneveryday/CPE_MIDEXAM_QUIZON.git
 * [new branch]      main -> main
nowellgabriel@workstation:~/CPE_MIDEXAM_QUIZON$ sudo systemctl status nagios
● nagios.service - Nagios Core 4.4.6
     Loaded: loaded (/lib/systemd/system/nagios.service; disabled; vendor preset: e>
     Active: active (running) since Wed 2023-11-15 23:54:12 +08; 33s ago
       Docs: https://www.nagios.org/documentation
    Process: 27051 ExecStartPre=/usr/local/nagios/bin/nagios -v /usr/local/nagios/e>
    Process: 27052 ExecStart=/usr/local/nagios/bin/nagios -d /usr/local/nagios/etc/>
   Main PID: 27053 (nagios)
      Tasks: 8 (limit: 4599)
     Memory: 2.6M
        CPU: 18ms
     CGroup: /system.slice/nagios.service
             ├─27053 /usr/local/nagios/bin/nagios -d /usr/local/nagios/etc/nagios.c>
             ├─27054 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw>
             ├─27055 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw>
             ├─27056 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw>
             ├─27057 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw>
             ├─27058 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw>
             ├─27059 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw>
             └─27060 /usr/local/nagios/bin/nagios -d /usr/local/nagios/etc/nagios.c>

Nov 15 23:54:12 workstation nagios[27053]: qh: help for the query handler registered
```

GitHub link:

https://github.com/Doubledowneveryday/CPE_MIDEXAM_QUIZON

Conclusions: (link your conclusion from the objective)

In conclusion, implementing an Ansible-based Infrastructure as Code (IaC) workflow to deploy and manage enterprise management tools ensures flexible, consistent, and automated design work over marked by centralized control and reproducibility, this approach increases operational efficiency, facilitates scalability, and enables rapid adaptation to evolving monitoring needs with, institutions active monitoring , achieve rapid issue identification and efficient administration, and through so enables IT infrastructure resilience and efficiency These strategic applications of IaC principles are in line with modern IT practices, improving speed and reliability in the dynamic business environment operations