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Course/Section: CPE232 - CPE31S4	**Date Submitted:** 11-06-23
Instructor: Dr. Jonathan V. Taylar	**Semester and SY:** 1st Sem: '23 - '24

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.

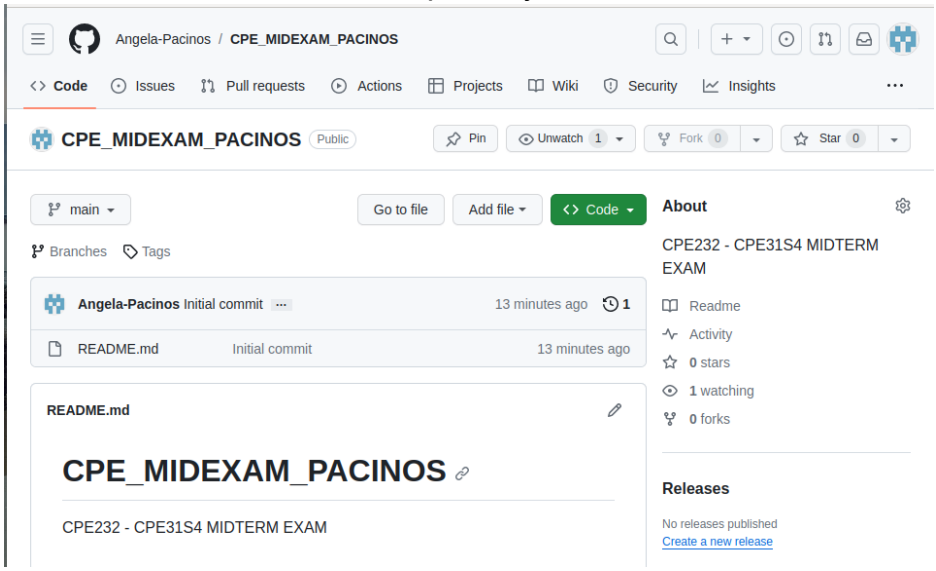
5. Finally, paste also the link of your GitHub repository in the documentation.

3. Output (screenshots and explanations)

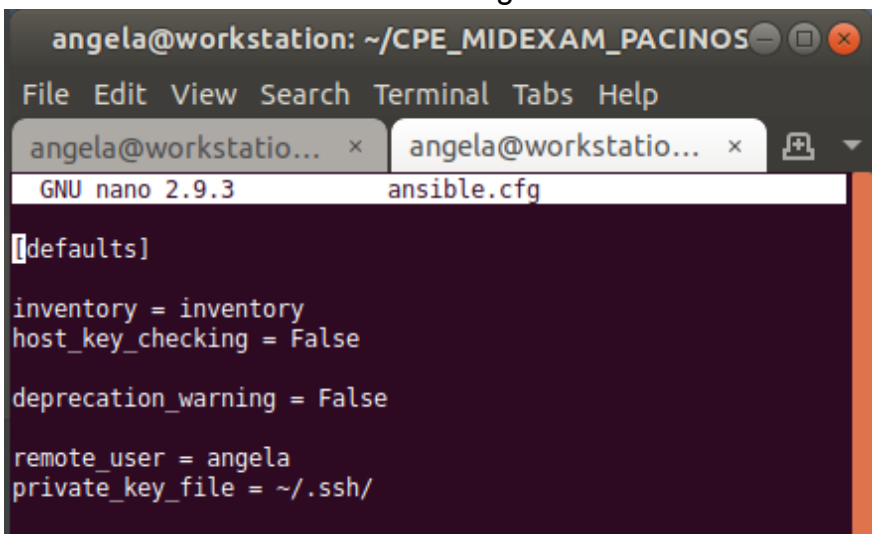
INPUT

Clone the repository and create the needed files for the roles and playbook.

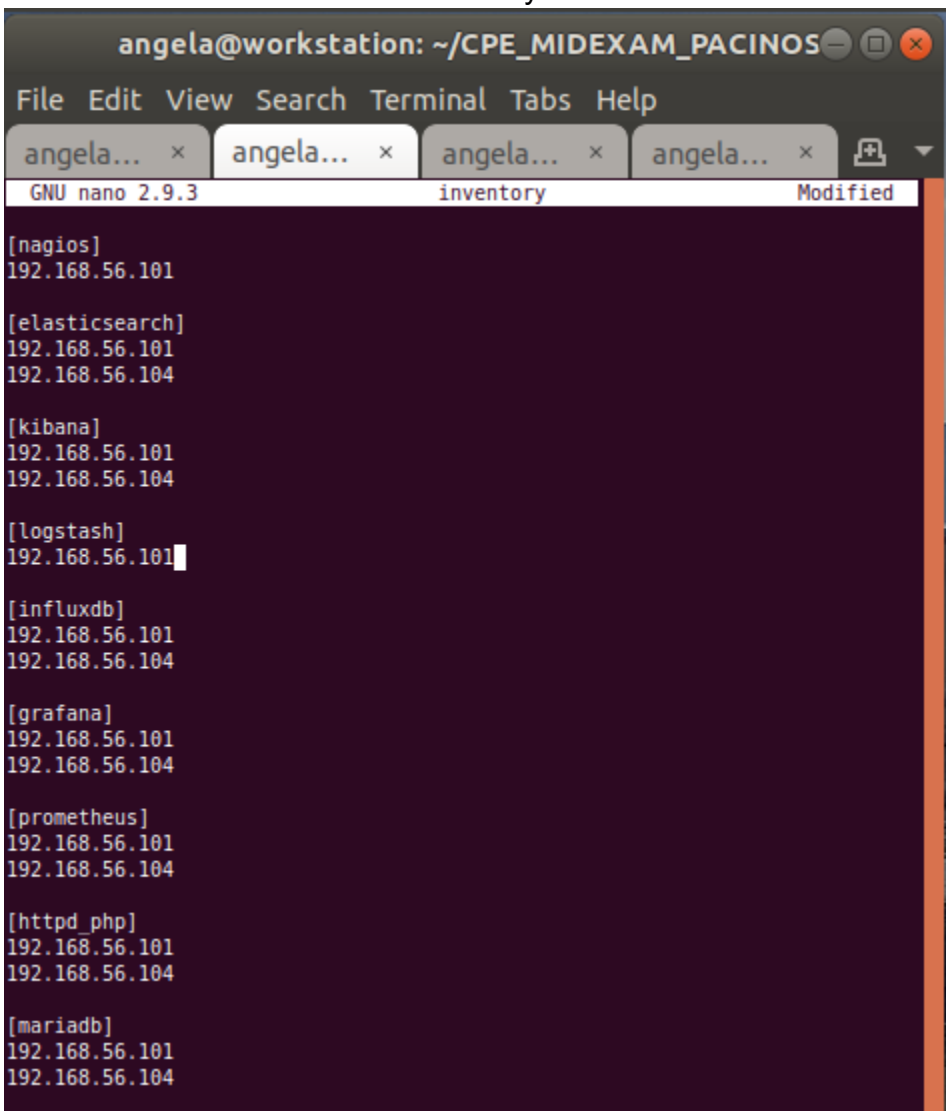
repository



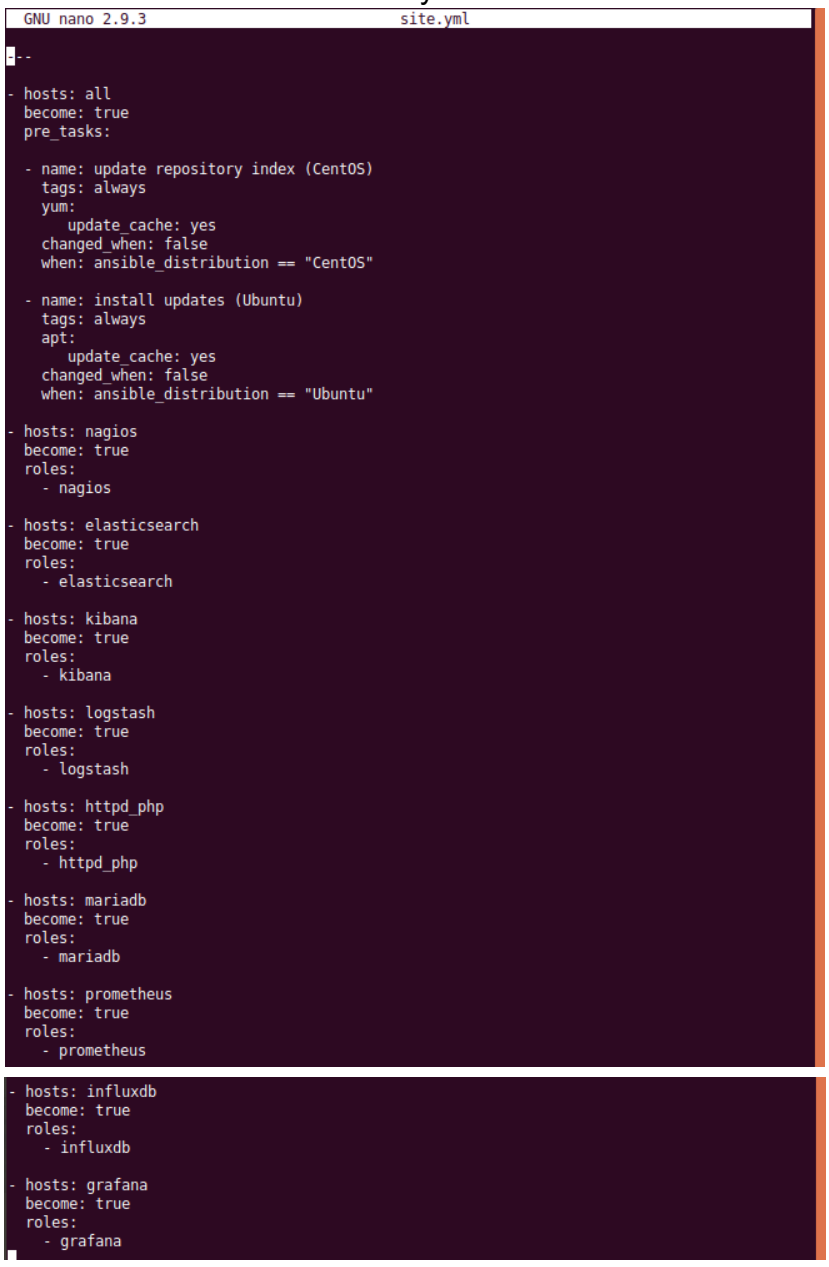
ansible.cfg



inventory


angela@workstation: ~/CPE_MIDEXAM_PACINOS
File Edit View Search Terminal Tabs Help
angela...
angela...
angela...
angela...
GNU nano 2.9.3 inventory Modified
[nagios]
192.168.56.101
[elasticsearch]
192.168.56.101
192.168.56.104
[kibana]
192.168.56.101
192.168.56.104
[logstash]
192.168.56.101
[influxdb]
192.168.56.101
192.168.56.104
[grafana]
192.168.56.101
192.168.56.104
[prometheus]
192.168.56.101
192.168.56.104
[httpd_php]
192.168.56.101
192.168.56.104
[mariadb]
192.168.56.101
192.168.56.104

site.yml



```
 GNU nano 2.9.3                          site.yml

---

- 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: nagios
  become: true
  roles:
    - nagios

- hosts: elasticsearch
  become: true
  roles:
    - elasticsearch

- hosts: kibana
  become: true
  roles:
    - kibana

- hosts: logstash
  become: true
  roles:
    - logstash

- hosts: httpd_php
  become: true
  roles:
    - httpd_php

- hosts: mariadb
  become: true
  roles:
    - mariadb

- hosts: prometheus
  become: true
  roles:
    - prometheus
```

```
- hosts: influxdb
  become: true
  roles:
    - influxdb

- hosts: grafana
  become: true
  roles:
    - grafana
```

Under the same directory, create a new directory and name it ’roles’. Enter the roles directory and create new directories: and name it similar to the groups that we created in inventory. In each directory, create a new directory and name it tasks.

```
angela@workstation:~/CPE_MIDEXAM_PACINOS$ tree
.
├── ansible.cfg
├── inventory
├── README.md
├── roles
│   ├── elasticsearch
│   │   └── tasks
│   │       └── main.yml
│   ├── grafana
│   │   └── tasks
│   │       └── main.yml
│   ├── httpd_php
│   │   └── tasks
│   │       └── main.yml
│   ├── influxdb
│   │   └── tasks
│   │       └── main.yml
│   ├── kibana
│   │   └── tasks
│   │       └── main.yml
│   ├── logstash
│   │   └── tasks
│   │       └── main.yml
│   ├── mariadb
│   │   └── tasks
│   │       └── main.yml
│   ├── nagios
│   │   └── tasks
│   │       └── main.yml
│   └── prometheus
│       └── tasks
│           └── main.yml
└── site.yml

19 directories, 13 files
```

For Nagios

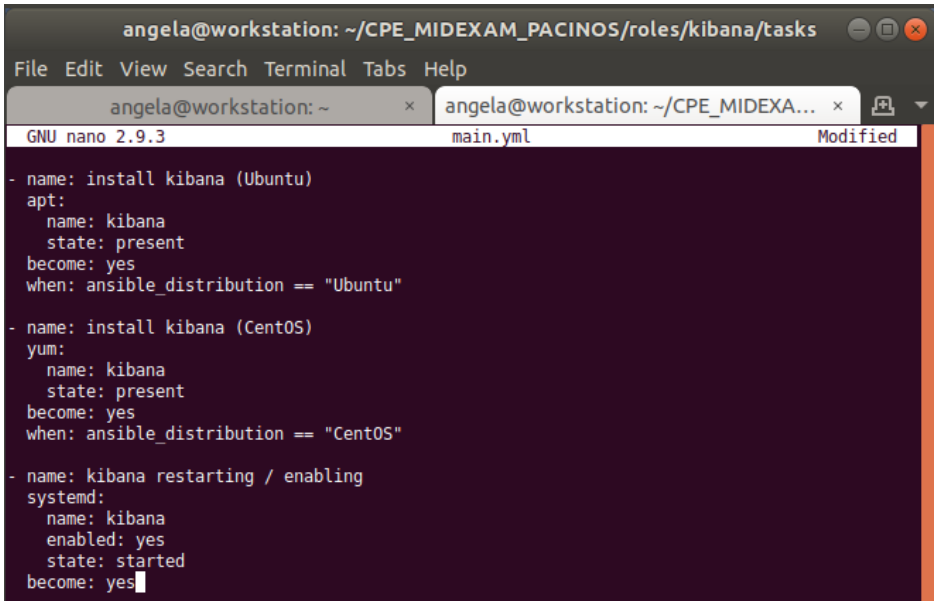
```
 GNU nano 2.9.3                          main.yml

- name: installation of nagios dependencies and libraries (Ubuntu)
  tags: dependencies, libraries
  apt:
    name:
      - autoconf
      - libc6
      - gcc
      - make
      - wget
      - unzip
      - apache2
      - php
      - libapache2-mod-php
      - libgd-dev
      - openssl
      - libssl-dev
      - bc
      - gawk
      - dc
      - build-essential
      - snmp
      - libnet-snmp-perl
      - gettext
      - python3
      - python3-pip
    state: latest
  when: ansible_distribution == "Ubuntu"

- name: installation of nagios dependencies and libraries (CentOS)
  tags:
    - dependencies
    - libraries
  yum:
    name:
      - gcc
      - glibc
      - glibc-common
      - perl
      - httpd
      - php
      - wget
      - gd
      - gd-devel
      - openssl-devel
      - gcc
      - glibc
      - glibc-common
      - make
      - gettext
      - automake
      - autoconf
      - wget
      - openssl-devel
      - net-snmp
      - net-snmp-utils
      - python
```

```
      - python
      - python2-pip
      - python3-pip
    state: latest
  when: ansible_distribution == "CentOS"

- name: install passlib package
  pip:
    name: passlib

- name: assign nagios path directory
  file:
    path: ~/nagios
    state: directory

- name: download nagios
  unarchive:
    src: https://github.com/NagiosEnterprises/nagioscore/archive/nagios-4.4.6.tar.gz
    dest: ~/nagios
    remote_src: yes
    mode: 0777
    owner: root
    group: root

- name: add users to nagios
  community.general.htpasswd:
    path: /usr/local/nagios/etc/htpasswd.users
    name: angela
    password: pacinos_tip

- name: start and enable nagios
  service:
    name: nagios
    state: started
    enabled: yes

- name: start and enable apache
  service:
    name: apache2
    state: restarted
    enabled: true
  when: ansible_distribution == "Ubuntu"

- name: start and enable httpd
  service:
    name: httpd
    state: restarted
    enabled: true
  when: ansible_distribution == "CentOS"
```

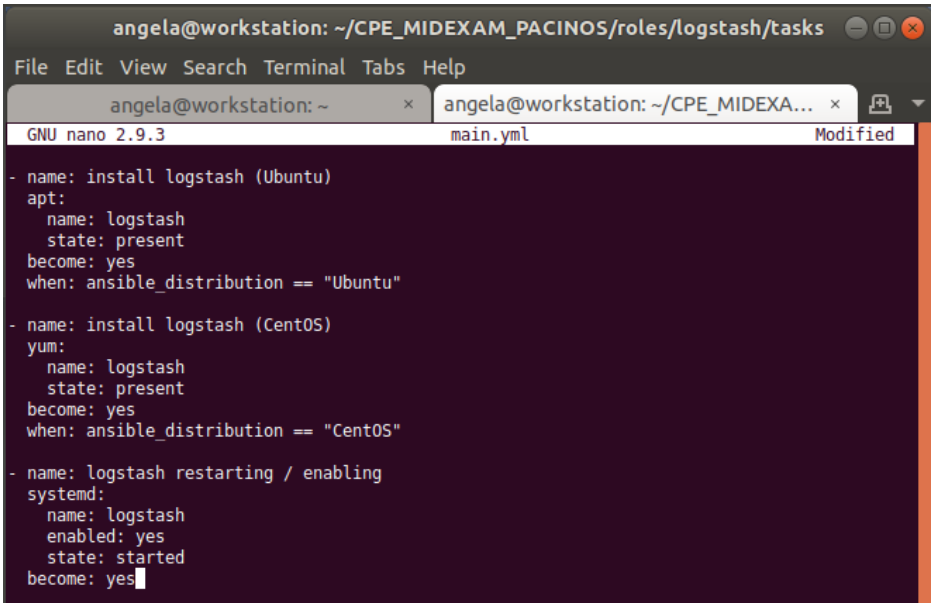
For Elastic search

```
angela@workstation: ~/CPE_MIDEXAM_PACINOS/roles/elasticsearch/tasks
File  Edit  View  Search  Terminal  Tabs  Help
angela@workstation: ~                    angela@workstation: ~/CPE_MIDEXA...
 GNU nano 2.9.3                      main.yml                        Modified


- name: install the prerequisites
  yum:
    name:
      - java-1.8.0-openjdk
      - epel-release
      - wget
      - which
    state: present
  when: ansible_distribution == "CentOS"

- name: add elastic search rpm repository
  shell: rpm --import https://artifacts.elastic.co/GPG-KEY-elasticsearch
  when: ansible_distribution == "CentOS"

- name: add elastic search 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
  when: ansible_distribution == "CentOS"

- name: install elastic search (CentOS)
  yum:
    name: elasticsearch
    state: present
  when: ansible_distribution == "CentOS"

- name: elastic search restarting / enabling
  service:
    name: elasticsearch
    state: restarted
    enabled: true
```

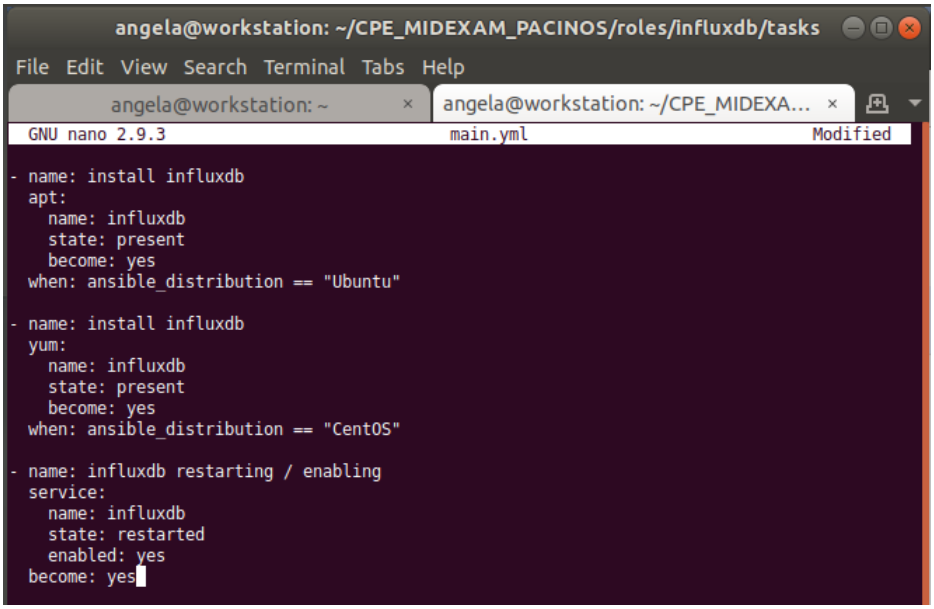
For Kibana



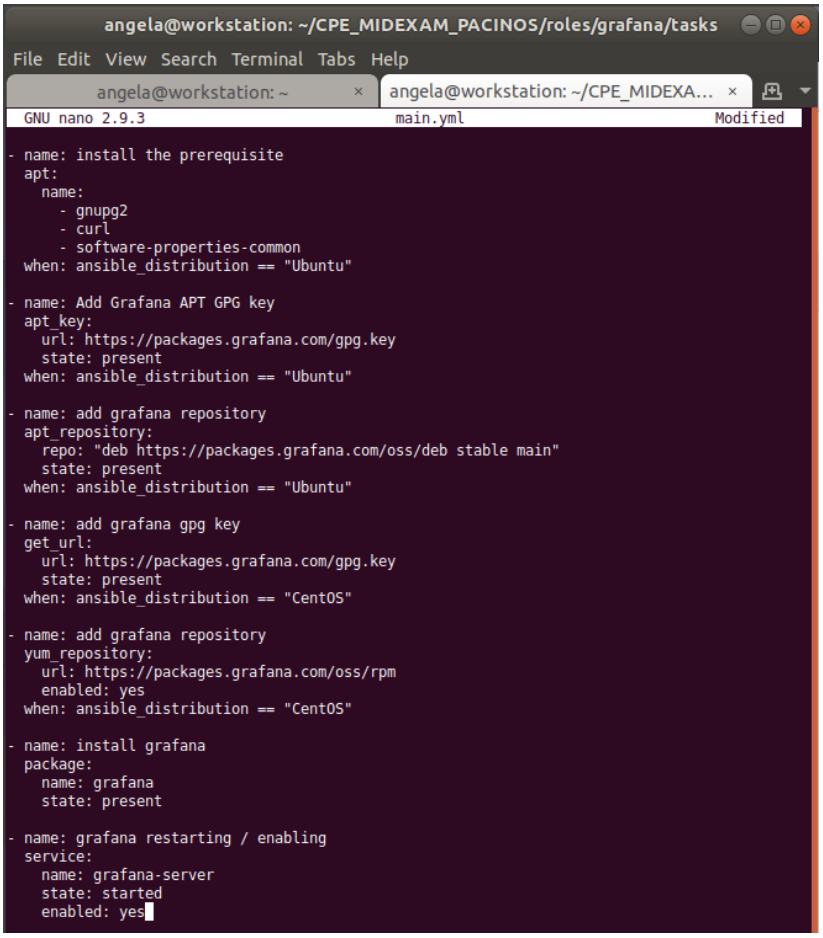
For Logstash



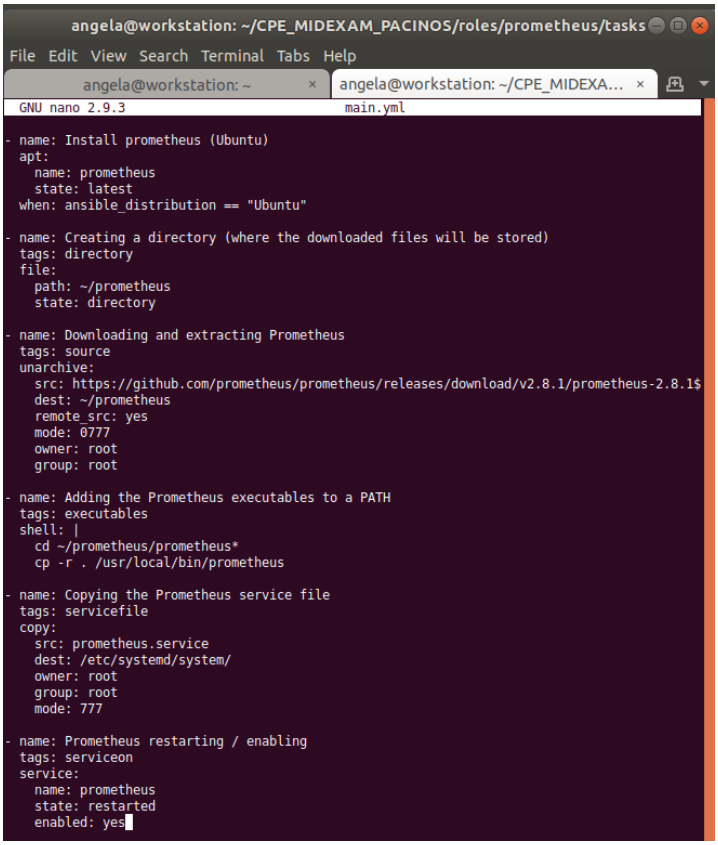
For InfluxDB



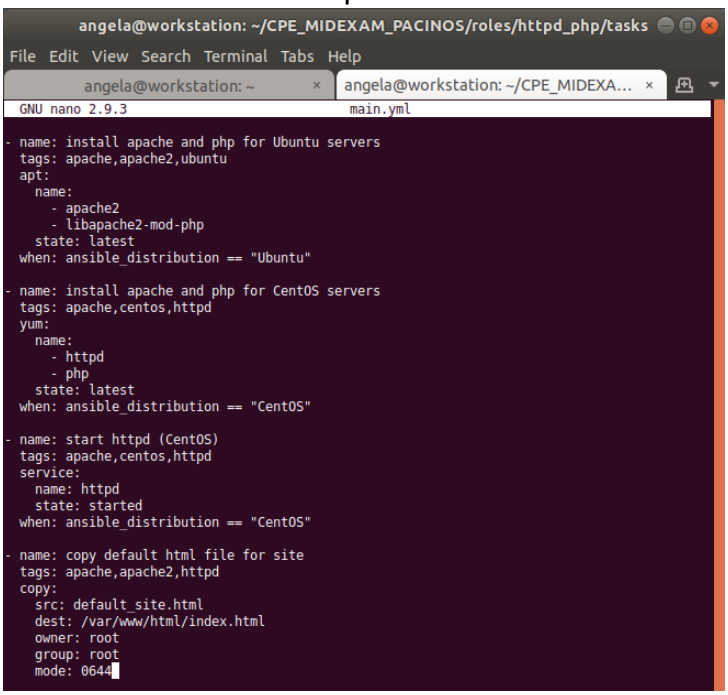
For Grafana



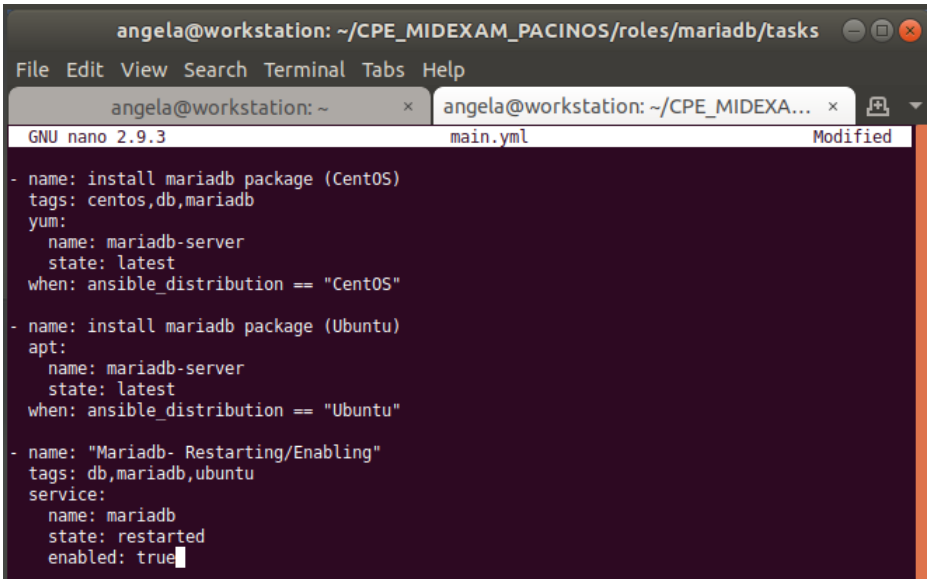
For Prometheus



For Httpd + PHP



For Mariadb

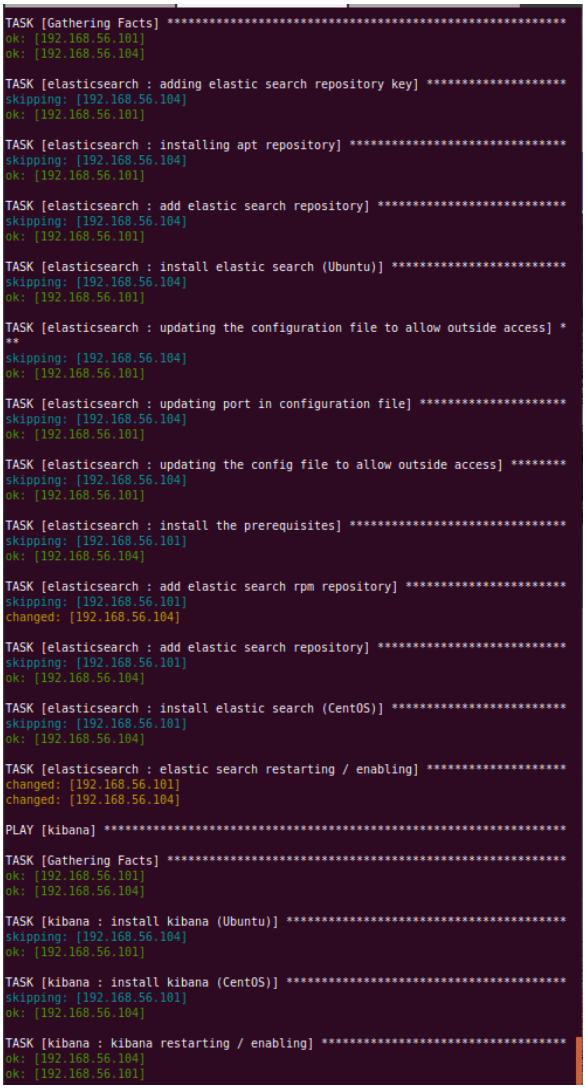


Make sure that the repository is sync in the Github

```
angela@workstation:~/CPE_MIDEXAM_PACINOS$ git add *
angela@workstation:~/CPE_MIDEXAM_PACINOS$ git commit -m "MIDTERM EXAM"
[main 34e17de] MIDTERM EXAM
 14 files changed, 496 insertions(+)
 create mode 100644 ansible.cfg
 create mode 100644 inventory
 create mode 100644 roles/elasticsearch/tasks/main.yml
 create mode 100644 roles/grafana/tasks/main.yml
 create mode 100644 roles/httpd_php/tasks/main.yml
 create mode 100644 roles/influxdb/tasks/main.yml
 create mode 100644 roles/kibana/tasks/main.yml
 create mode 100644 roles/logstash/tasks/main.yml
 create mode 100644 roles/mariadb/tasks/main.yml
 create mode 100644 roles/nagios/tasks/main.yml
 create mode 100644 roles/prometheus/tasks/main.yml
 create mode 100644 roles/prometheus/tasks/prometheus.service
 create mode 100644 roles/prometheus/tasks/prometheus.services
 create mode 100644 site.yml
angela@workstation:~/CPE_MIDEXAM_PACINOS$ git push origin main
Username for 'https://github.com': Angela-Pacinos
Password for 'https://Angela-Pacinos@github.com':
Counting objects: 35, done.
Delta compression using up to 3 threads.
Compressing objects: 100% (18/18), done.
Writing objects: 100% (35/35), 5.32 KiB | 1.06 MiB/s, done.
Total 35 (delta 0), reused 0 (delta 0)
To https://github.com/Angela-Pacinos/CPE_MIDEXAM_PACINOS.git
   b4e39db..34e17de  main -> main
```

PROCESS

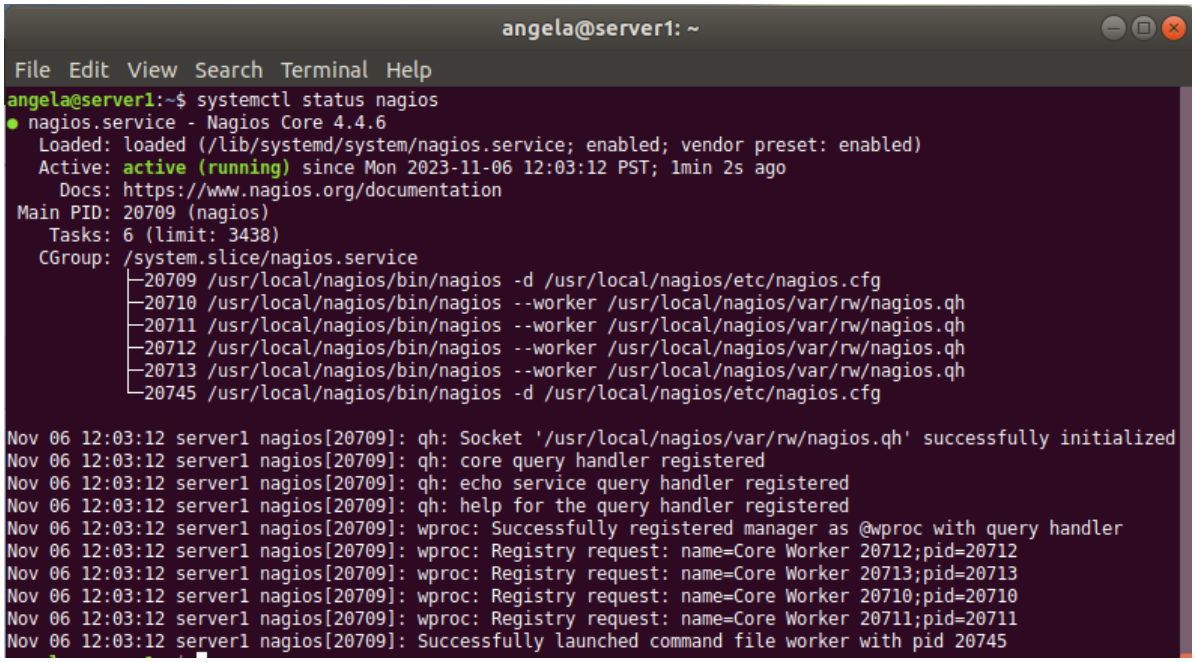
run the site.yml playbook and show the result.



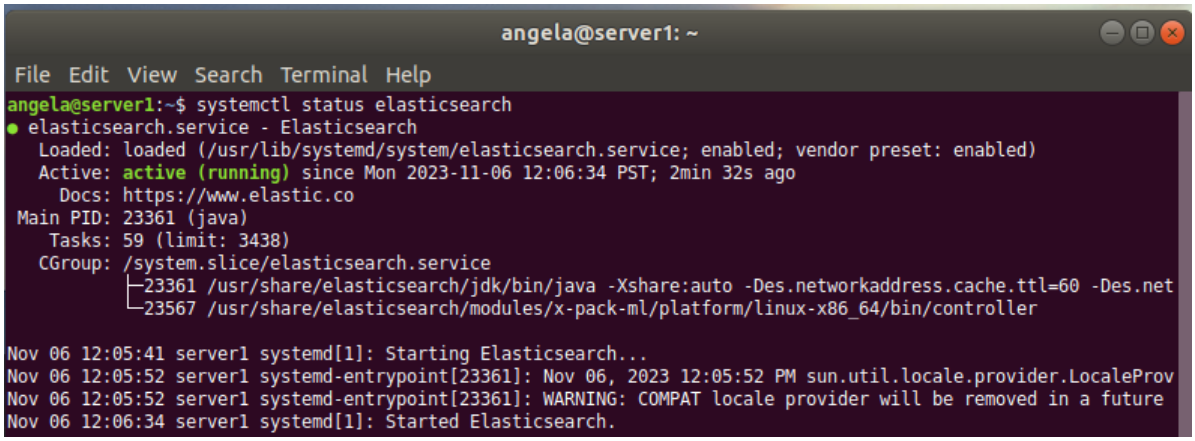
OUTPUT

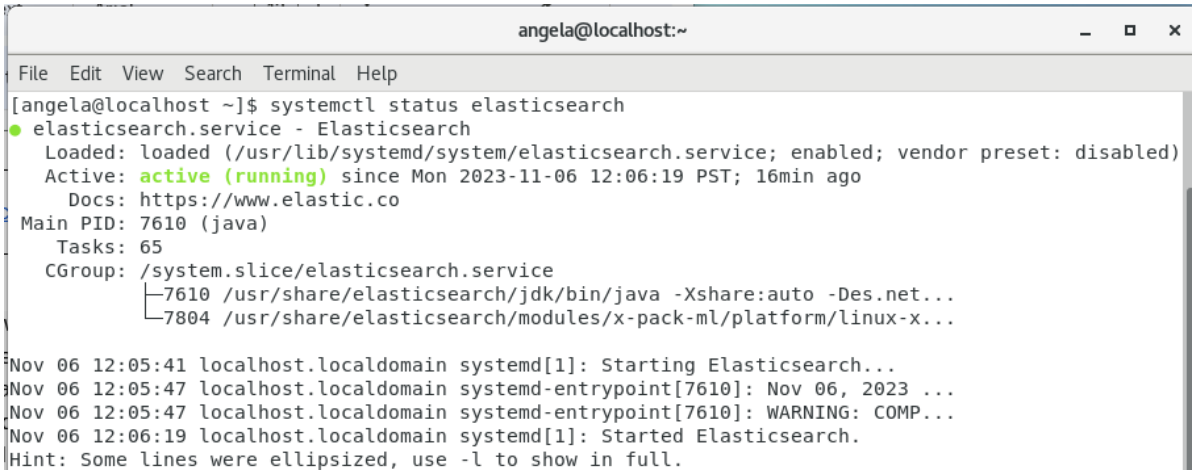
Check the control nodes if the packages are successfully installed. Show the output.

Nagios

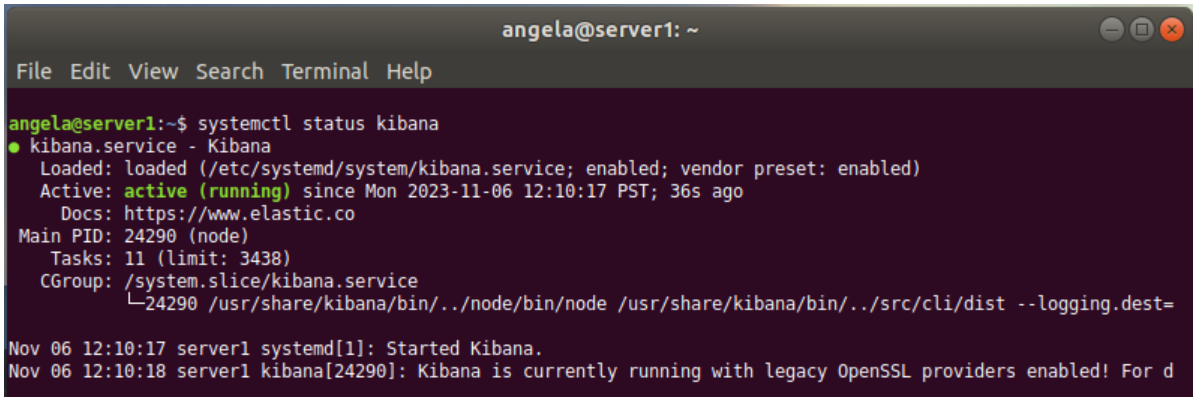


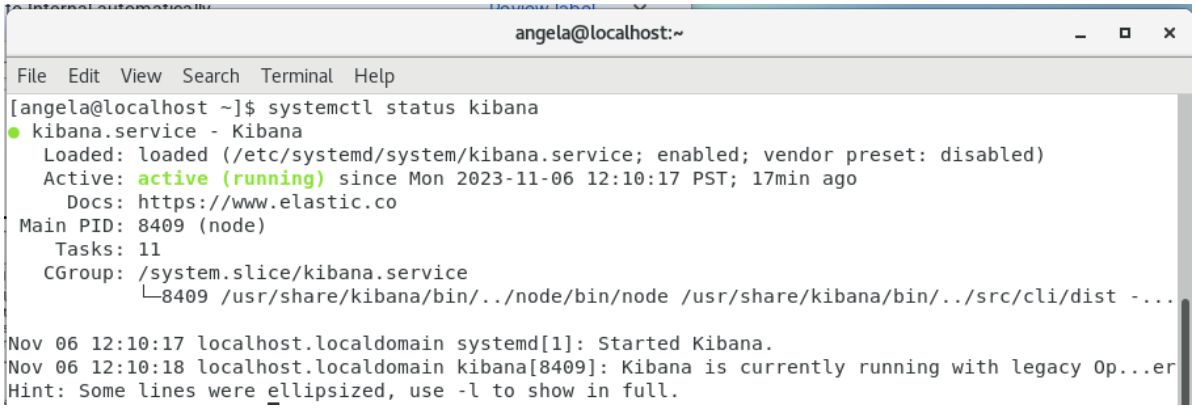
Elasticsearch



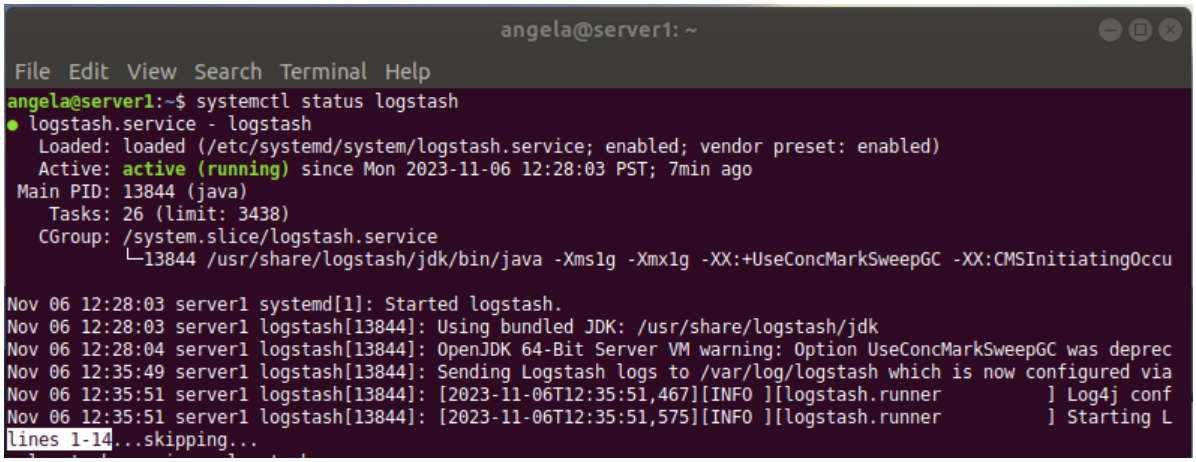


Kibana





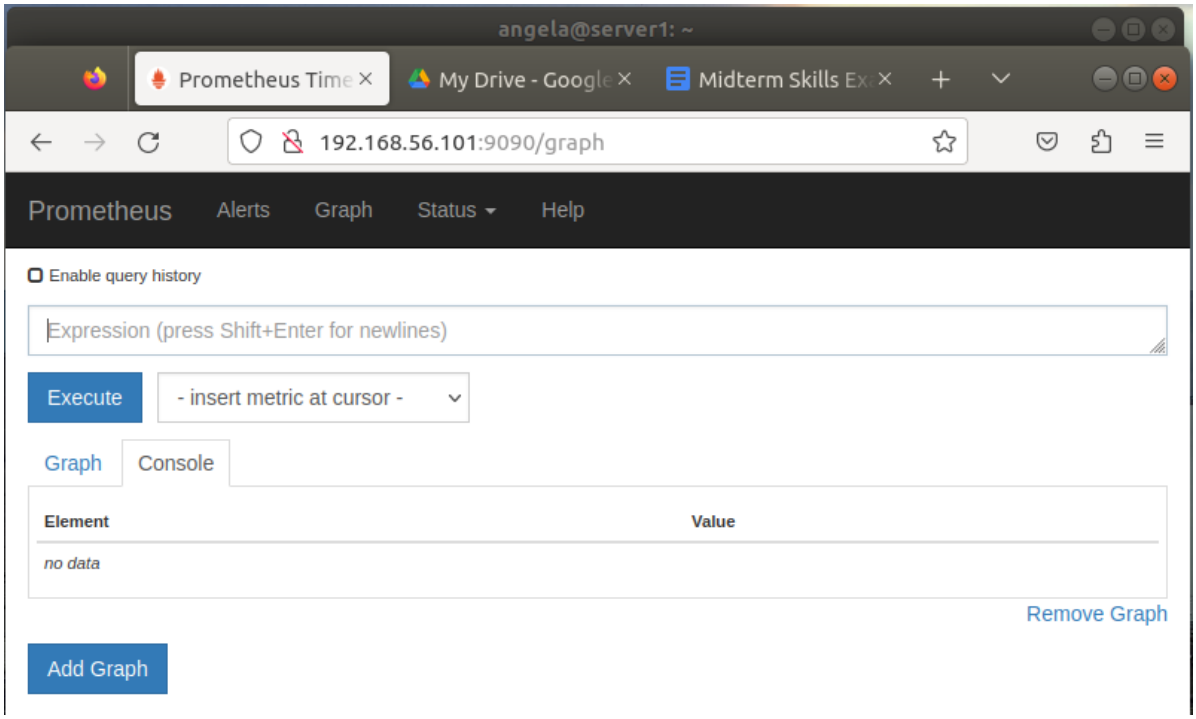
Logstash

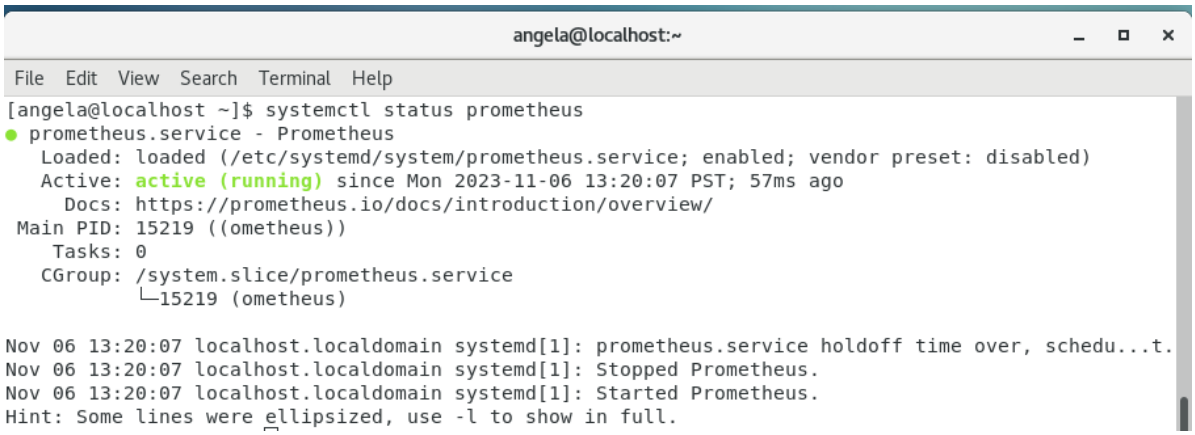


InfluxDB

Grafana

Prometheus





Httpd + PHP

MariaDB

GitHub link: https://github.com/Angela-Pacinos/CPE_MIDEXAM_PACINOS.git

Conclusions:

For this Midterm exam we were tasked to install similar packages as we have already tried to do them, and some new packages, into our Ubuntu and Centos. Since there are familiar packages, what I did to not waste time is I copied the codes from what I previously did and modified it a little bit. For the new packages that I need to install, I searched on how to install them but only a little information was given. What I did is build the structure of the installation based on the information that there is. As for the roles I separated each package into each role just like what we did in HOA7. I had a lot of problems with the main.yml codes because the indentation for the codes should be correct if it wont even start running the playbook. I consumed so much of the time going back and forth to those files just to correct the indentations. It was kind of nerve wracking since there is only limited time, there are a lot to install, plus the internet speed to run the playbook was so slow.