Name: Escobilla, Davonn P.	**Date Performed: 30/10/2022**
Course/Section: CPE31S24	**Date Submitted: 30/10/2022**
Instructor: Dr. Jonathan Taylar	**Semester and SY: 1st Sem, 2022-2023**

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)

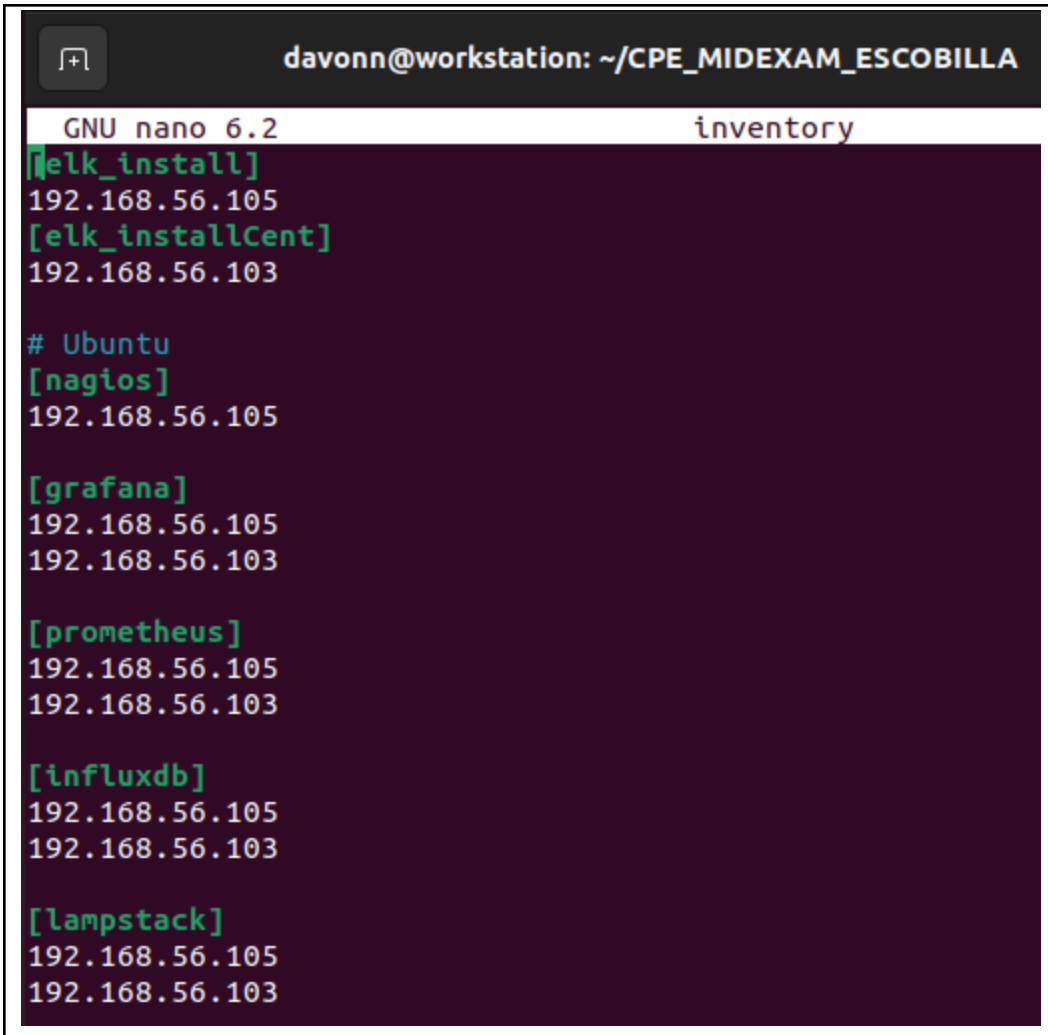
First, create repository for midexam.

Next step is to clone the repository into the managed node.

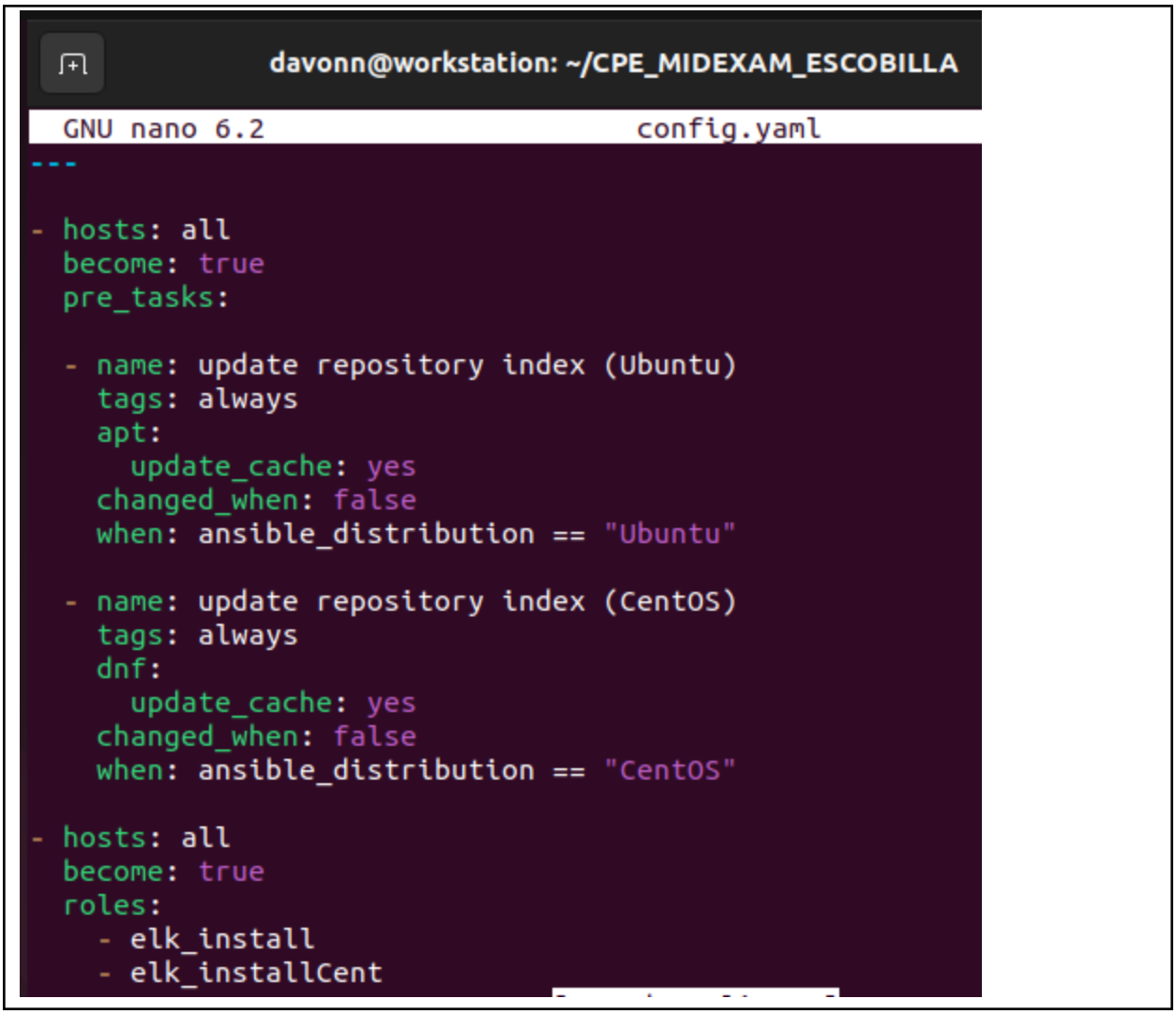
```
davonn@workstation:~$ git clone git@github.com:DavonnEscobilla/CPE_MIDEXAM_ESCO
BILLA.git
Cloning into 'CPE_MIDEXAM_ESCOBILLA'...
warning: You appear to have cloned an empty repository.
davonn@workstation:~$ ls
CPE232_Davonn           Downloads                Music      Templates
CPE232_Escobilla        Escobilla_Act10          nano.save  Videos
CPE_MIDEXAM_ESCOBILLA   Escobilla_Act8Nagios     Pictures
Desktop                 Escobilla_Act9Prometheus Public
Documents               main.yml                 snap
```

Now create the ansible.cfg and the inventory.

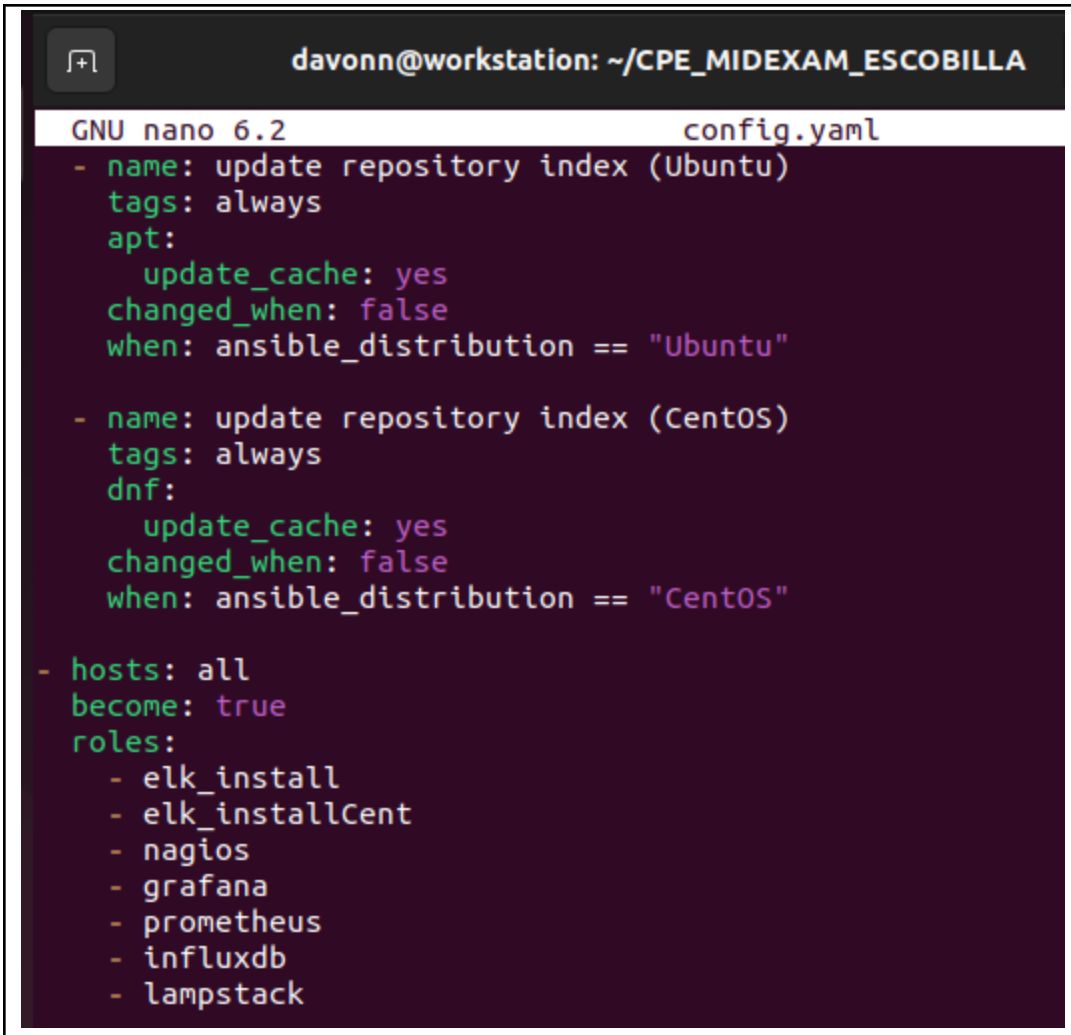
```
davonn@workstation: ~/CPE_MIDEXAM_ESCOBILLA
  GNU nano 6.2                          ansible.cfg *
[defaults]

inventory = inventory
private_key_file = ~/.ssh/
```



Create the playbook to implement installation on each control nodes with config.yaml.

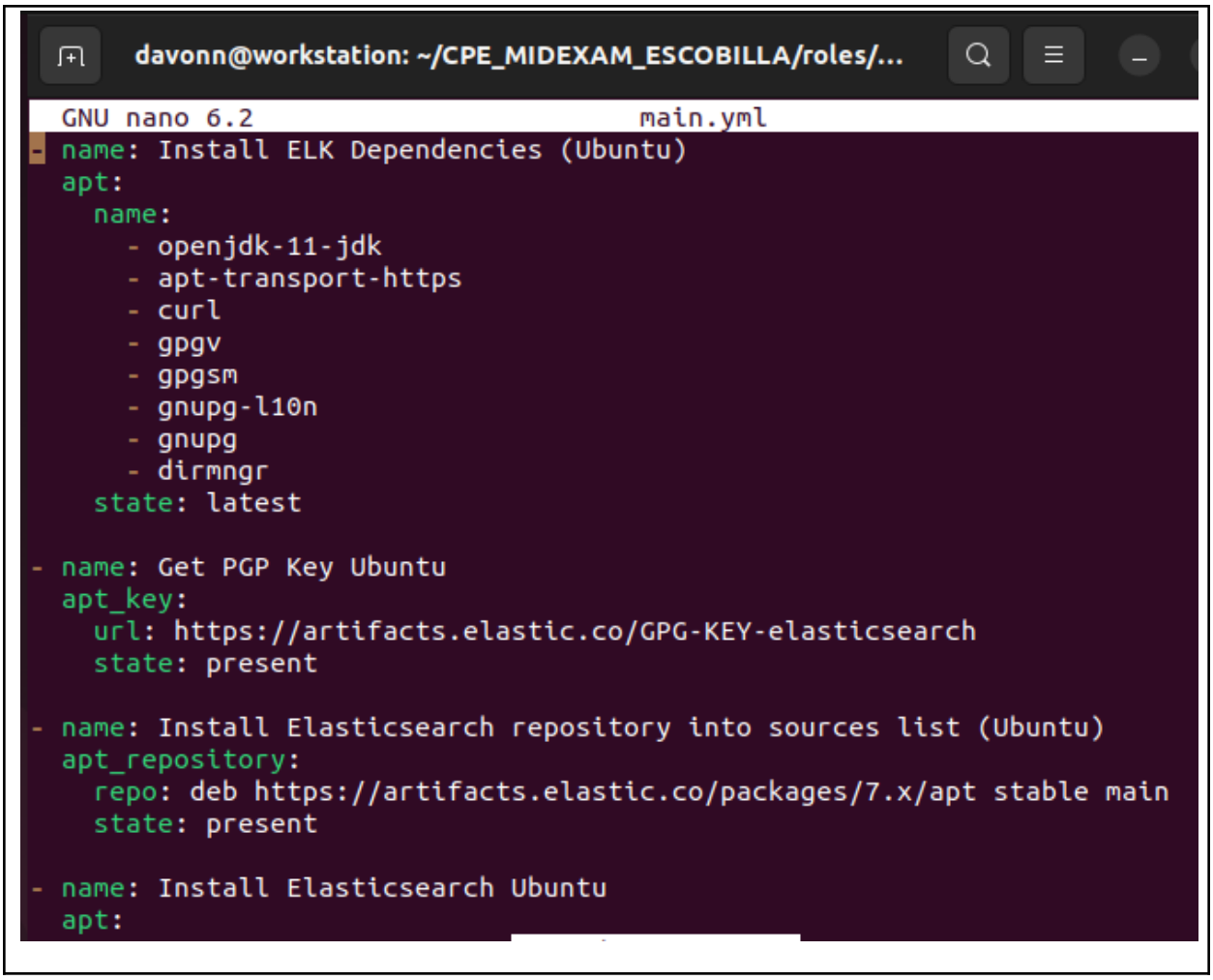

davonn@workstation: ~/CPE_MIDEXAM_ESCOBILLA
GNU nano 6.2 config.yaml

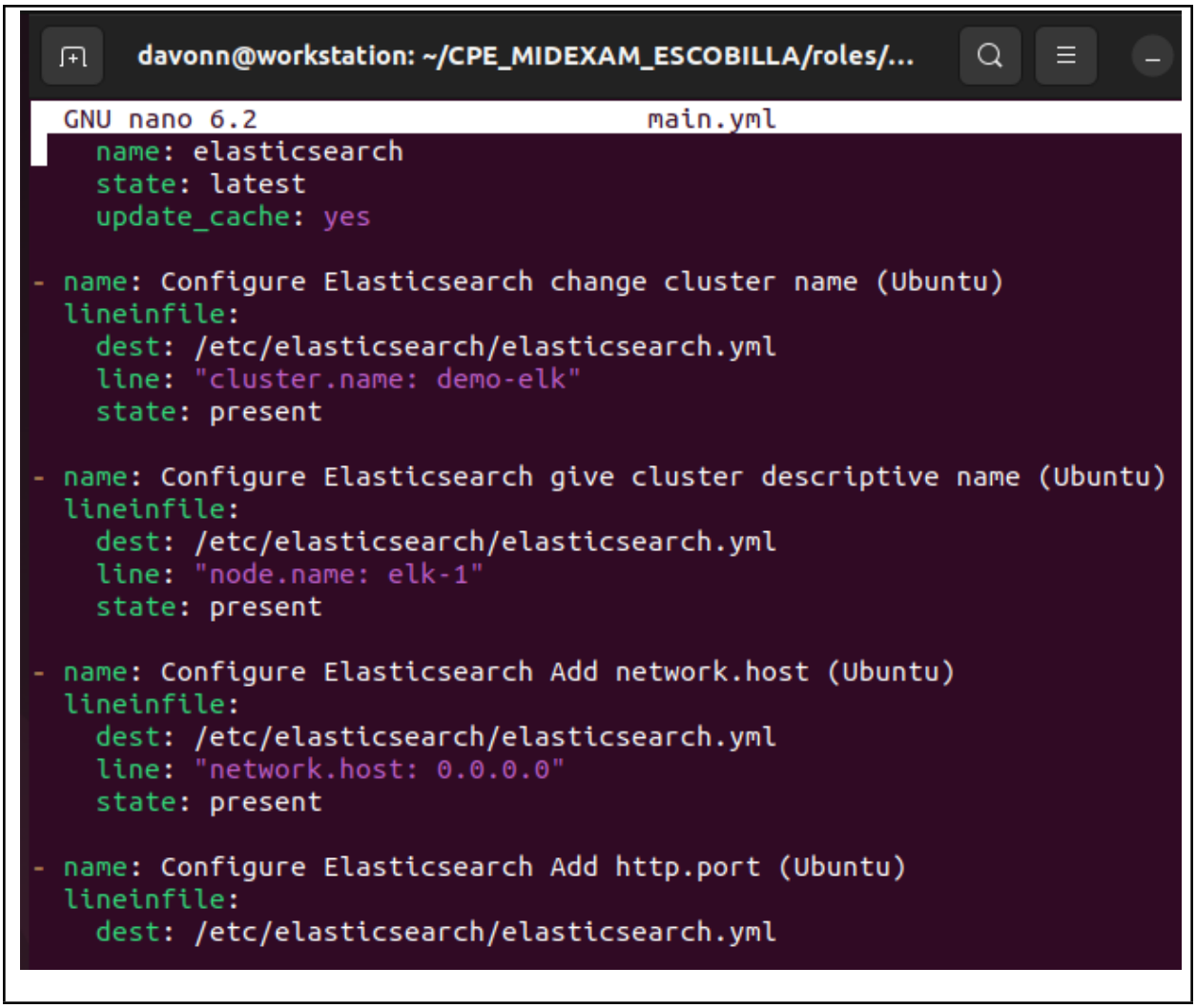
- hosts: all
become: true
pre_tasks:
- name: update repository index (Ubuntu)
tags: always
apt:
update_cache: yes
changed_when: false
when: ansible_distribution == "Ubuntu"
- name: update repository index (CentOS)
tags: always
dnf:
update_cache: yes
changed_when: false
when: ansible_distribution == "CentOS"
- hosts: all
become: true
roles:
- elk_install
- elk_installCent

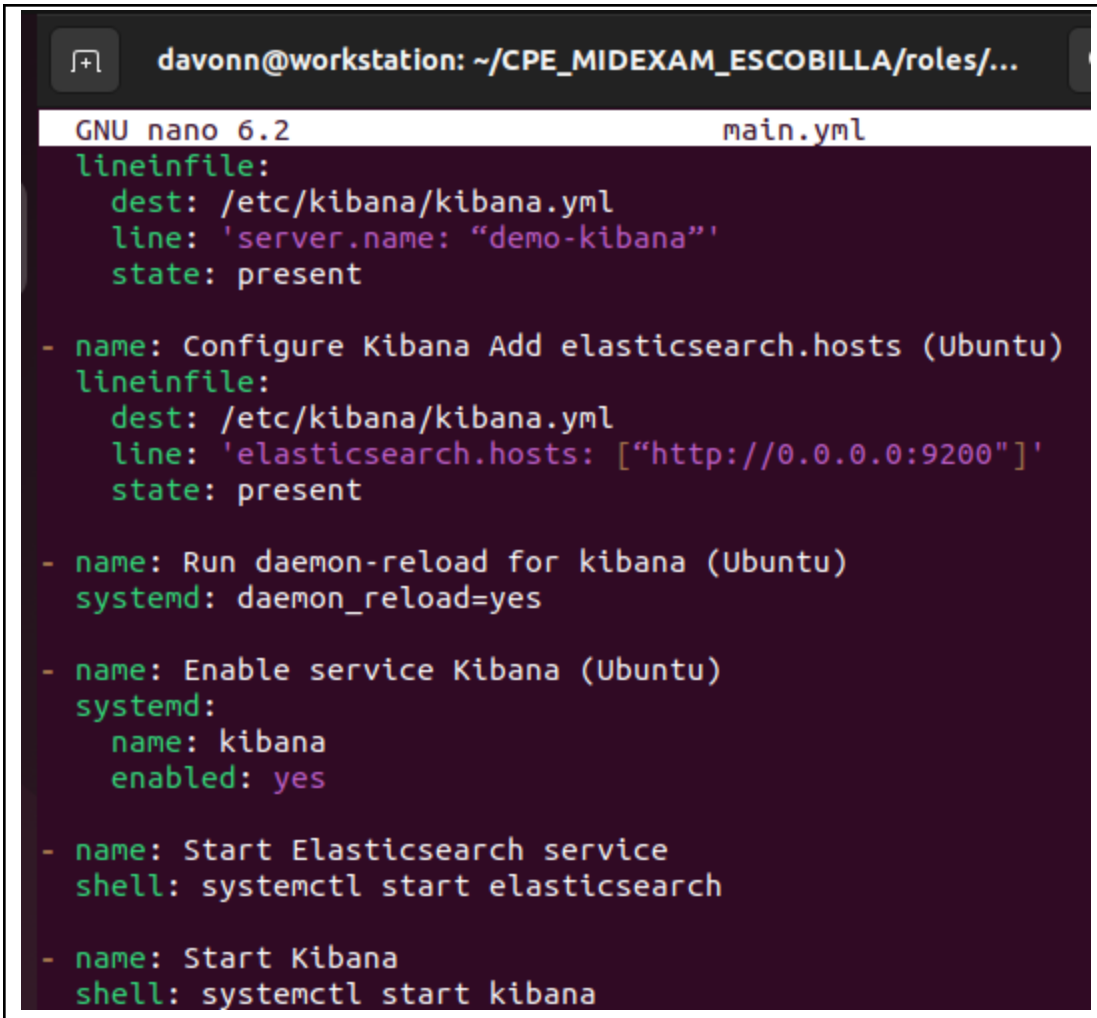


Create a directory for roles as well as the task and configure main.yml on each.

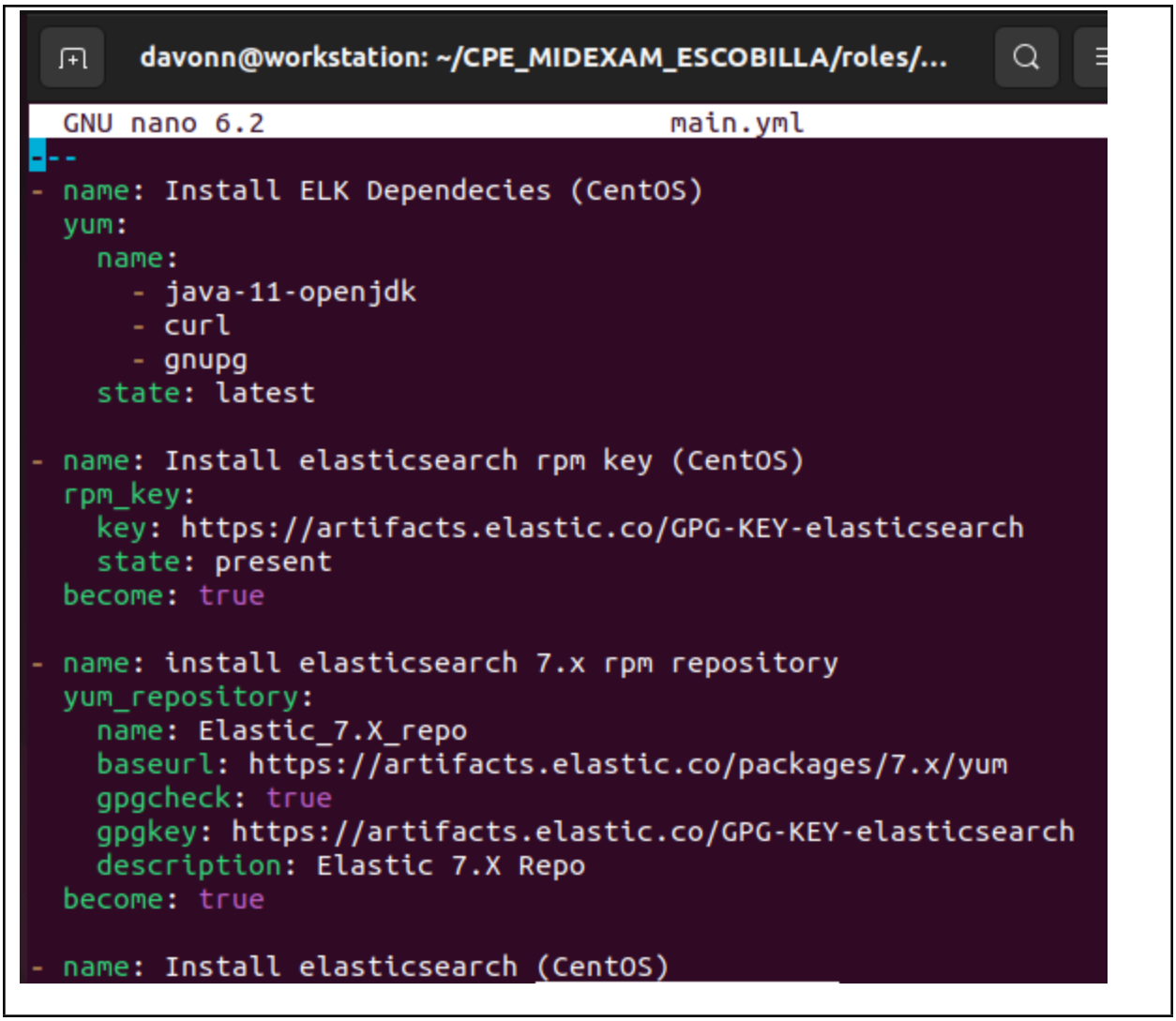
First configure the elk installation main.yml


davonn@workstation: ~/CPE_MIDEXAM_ESCOBILLA/roles/...
GNU nano 6.2 main.yml
- name: Install ELK Dependencies (Ubuntu)
apt:
name:
- openjdk-11-jdk
- apt-transport-https
- curl
- gpgv
- gpgsm
- gnupg-l10n
- gnupg
- dirmngr
state: latest
- name: Get PGP Key Ubuntu
apt_key:
url: https://artifacts.elastic.co/GPG-KEY-elasticsearch
state: present
- name: Install Elasticsearch repository into sources list (Ubuntu)
apt_repository:
repo: deb https://artifacts.elastic.co/packages/7.x/apt stable main
state: present
- name: Install Elasticsearch Ubuntu
apt:

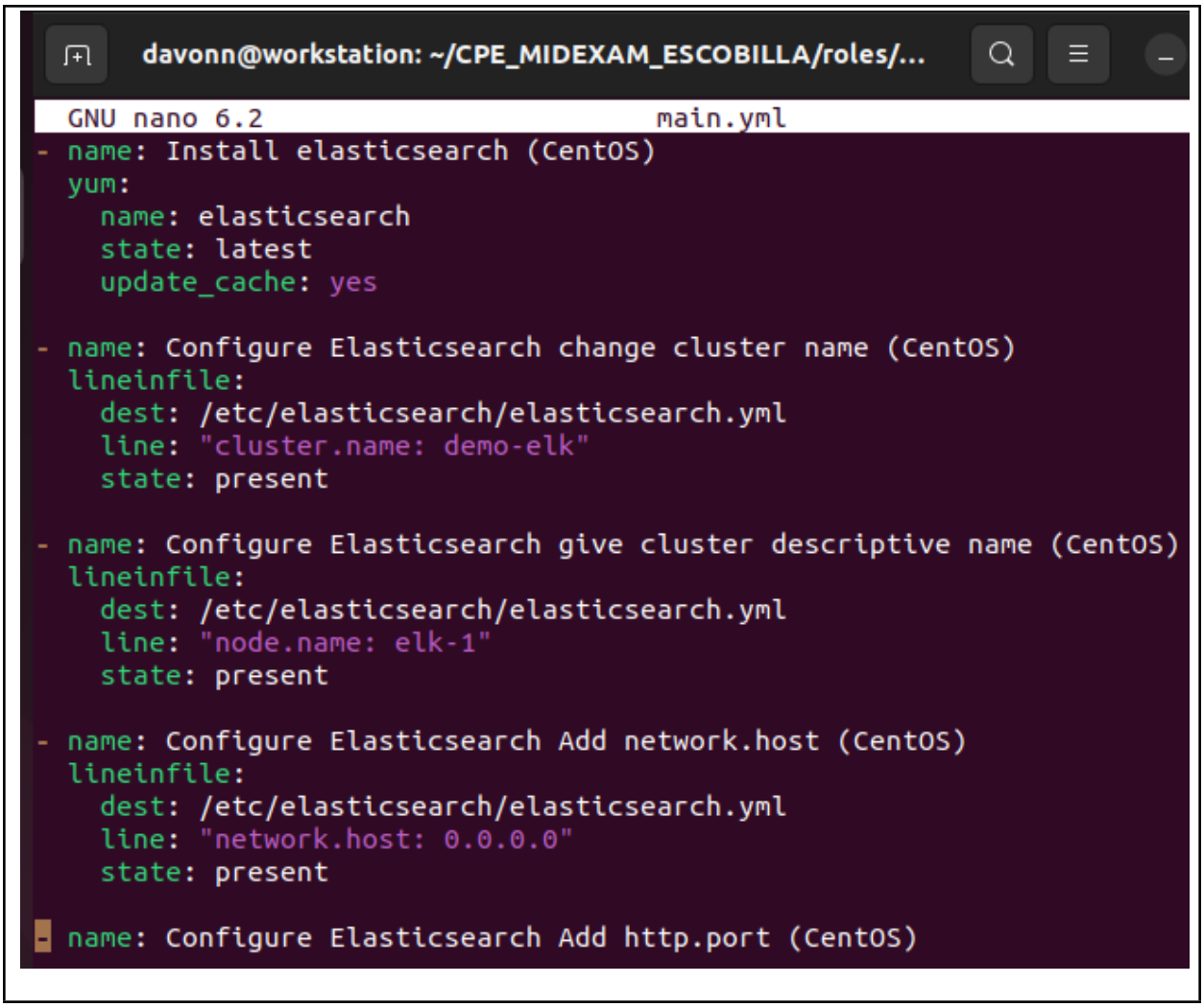

davonn@workstation: ~/CPE_MIDEXAM_ESCOBILLA/roles/...
GNU nano 6.2 main.yml
name: elasticsearch
state: latest
update_cache: yes
- name: Configure Elasticsearch change cluster name (Ubuntu)
lineinfile:
dest: /etc/elasticsearch/elasticsearch.yml
line: "cluster.name: demo-elk"
state: present
- name: Configure Elasticsearch give cluster descriptive name (Ubuntu)
lineinfile:
dest: /etc/elasticsearch/elasticsearch.yml
line: "node.name: elk-1"
state: present
- name: Configure Elasticsearch Add network.host (Ubuntu)
lineinfile:
dest: /etc/elasticsearch/elasticsearch.yml
line: "network.host: 0.0.0.0"
state: present
- name: Configure Elasticsearch Add http.port (Ubuntu)
lineinfile:
dest: /etc/elasticsearch/elasticsearch.yml

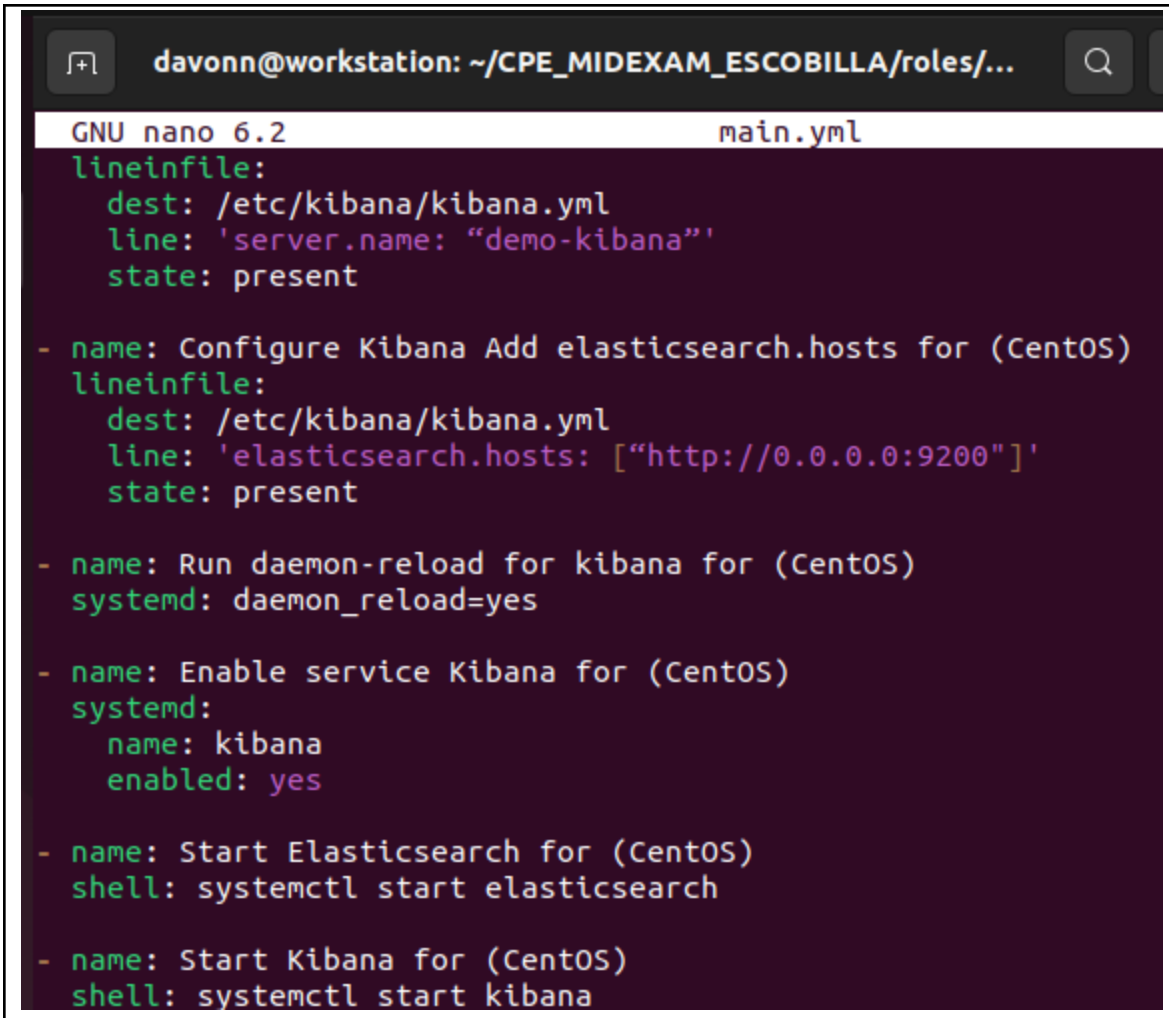


Next is configure the main.yml elk installation on CentOS.

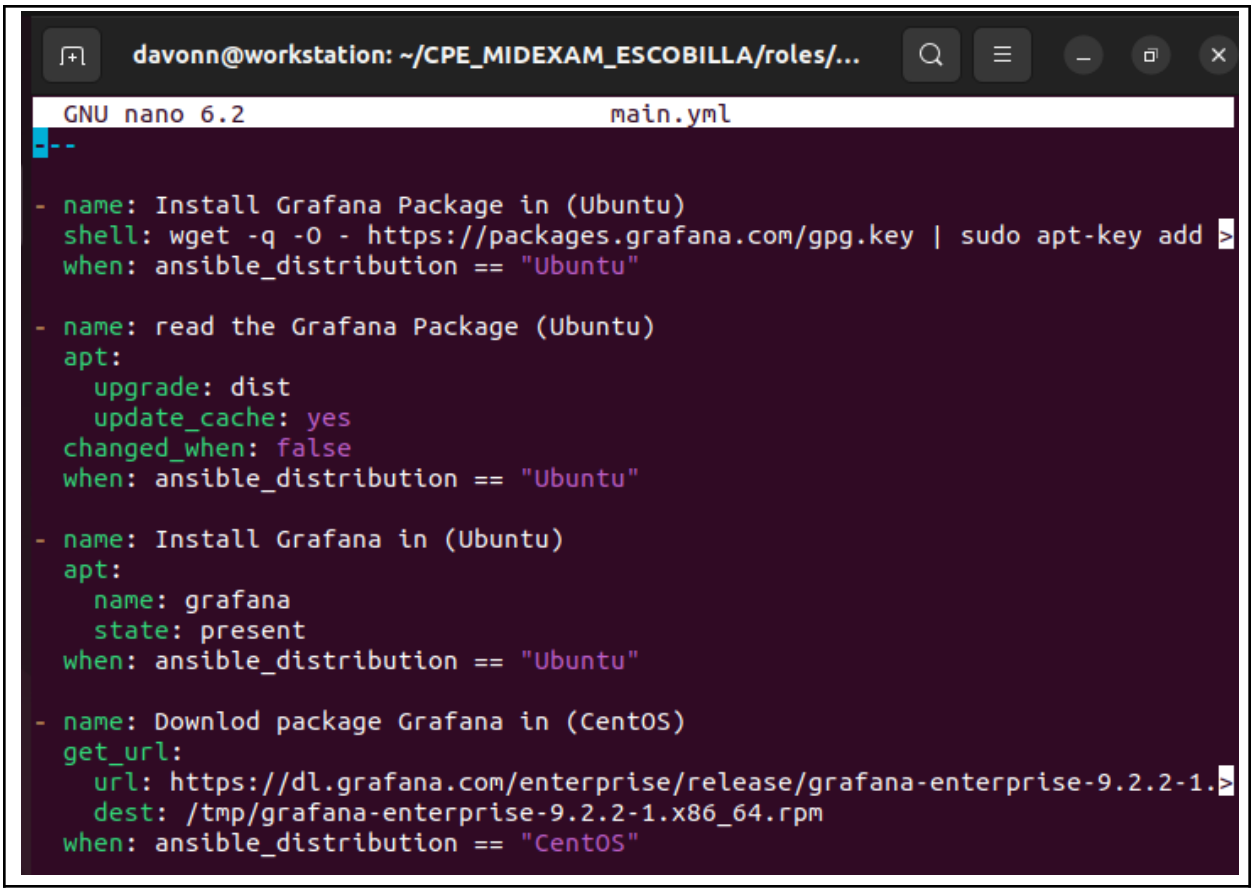

davonn@workstation: ~/CPE_MIDEXAM_ESCOBILLA/roles/...
GNU nano 6.2 main.yml

- name: Install ELK Dependecies (CentOS)
yum:
name:
- java-11-openjdk
- curl
- gnupg
state: latest
- name: Install elasticsearch rpm key (CentOS)
rpm_key:
key: https://artifacts.elastic.co/GPG-KEY-elasticsearch
state: present
become: true
- name: install elasticsearch 7.x rpm repository
yum_repository:
name: Elastic_7.X_repo
baseurl: https://artifacts.elastic.co/packages/7.x/yum
gpgcheck: true
gpgkey: https://artifacts.elastic.co/GPG-KEY-elasticsearch
description: Elastic 7.X Repo
become: true
- name: Install elasticsearch (CentOS)

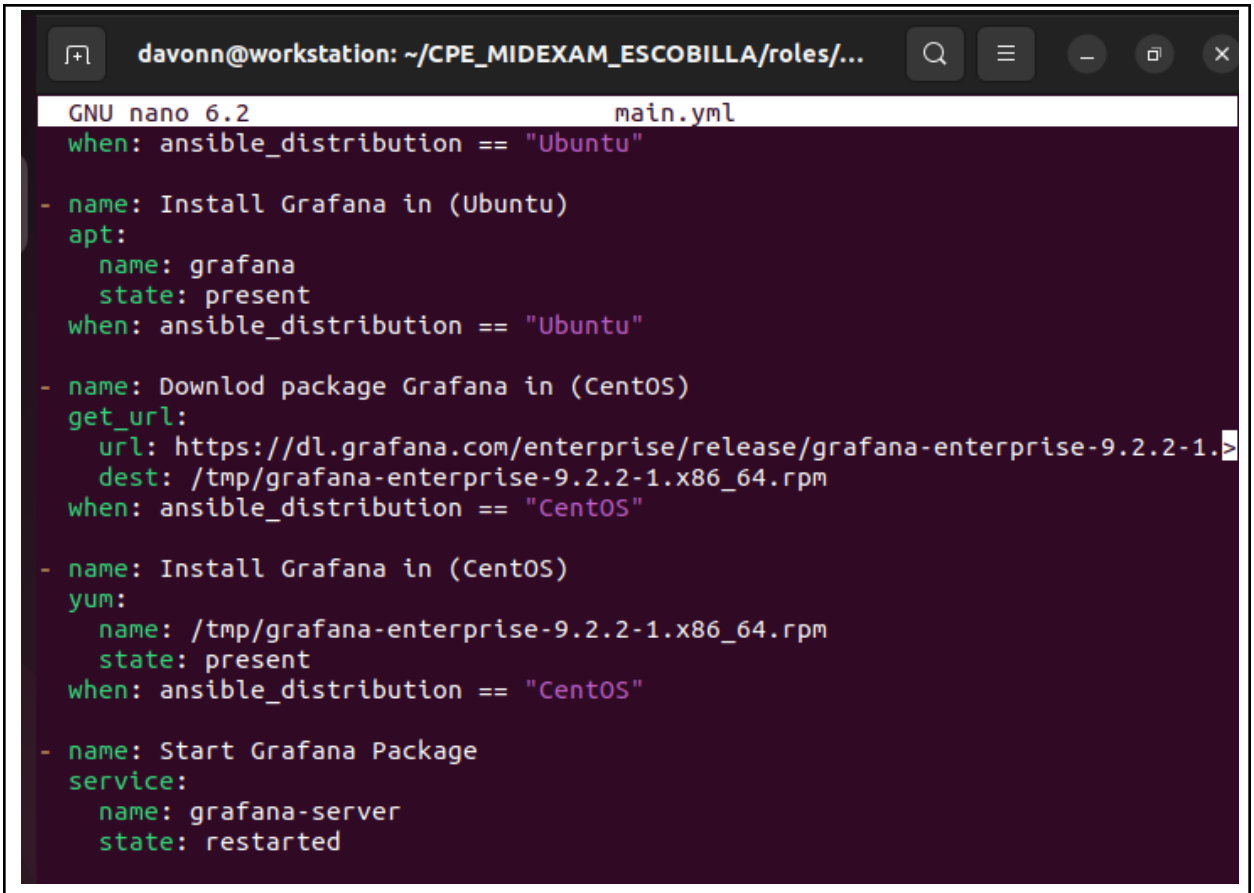

davonn@workstation: ~/CPE_MIDEXAM_ESCOBILLA/roles/...
GNU nano 6.2 main.yml
- name: Install elasticsearch (CentOS)
yum:
name: elasticsearch
state: latest
update_cache: yes
- name: Configure Elasticsearch change cluster name (CentOS)
lineinfile:
dest: /etc/elasticsearch/elasticsearch.yml
line: "cluster.name: demo-elk"
state: present
- name: Configure Elasticsearch give cluster descriptive name (CentOS)
lineinfile:
dest: /etc/elasticsearch/elasticsearch.yml
line: "node.name: elk-1"
state: present
- name: Configure Elasticsearch Add network.host (CentOS)
lineinfile:
dest: /etc/elasticsearch/elasticsearch.yml
line: "network.host: 0.0.0.0"
state: present
- name: Configure Elasticsearch Add http.port (CentOS)



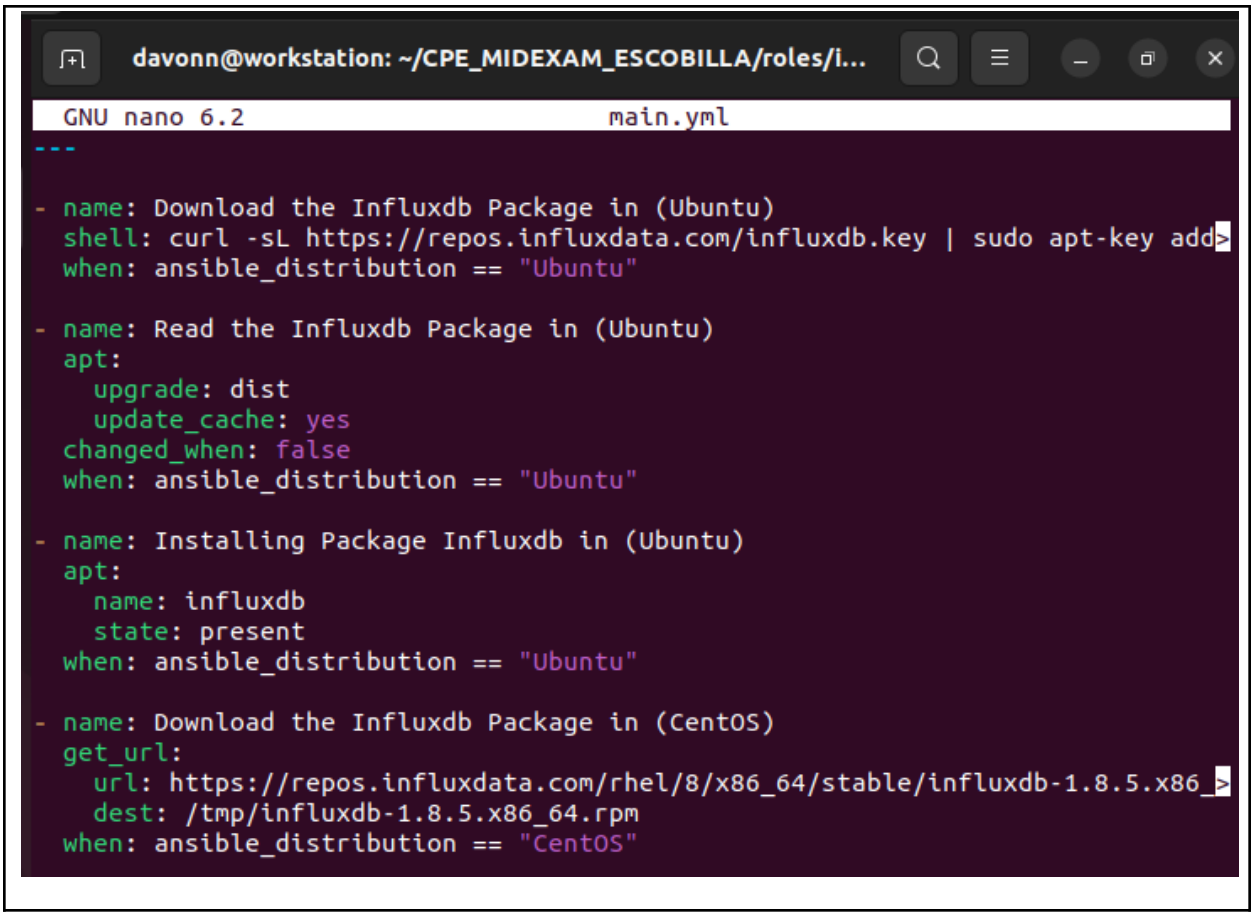
Next step, configure the main.yml for grafana.


davonn@workstation: ~/CPE_MIDEXAM_ESCOBILLA/roles/...
GNU nano 6.2 main.yml

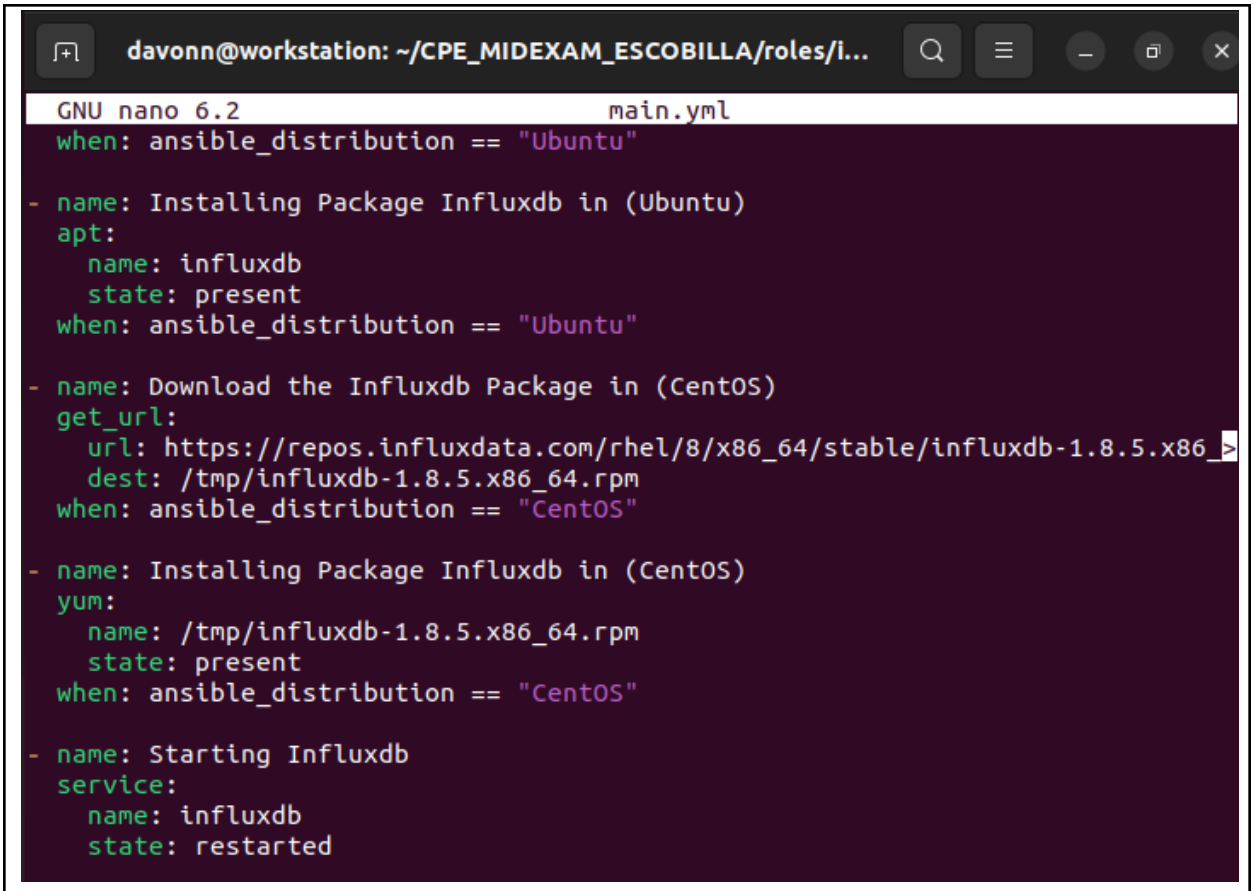
- name: Install Grafana Package in (Ubuntu)
shell: wget -q -O - https://packages.grafana.com/gpg.key | sudo apt-key add >
when: ansible_distribution == "Ubuntu"
- name: read the Grafana Package (Ubuntu)
apt:
upgrade: dist
update_cache: yes
changed_when: false
when: ansible_distribution == "Ubuntu"
- name: Install Grafana in (Ubuntu)
apt:
name: grafana
state: present
when: ansible_distribution == "Ubuntu"
- name: Downlod package Grafana in (CentOS)
get_url:
url: https://dl.grafana.com/enterprise/release/grafana-enterprise-9.2.2-1.>
dest: /tmp/grafana-enterprise-9.2.2-1.x86_64.rpm
when: ansible_distribution == "CentOS"



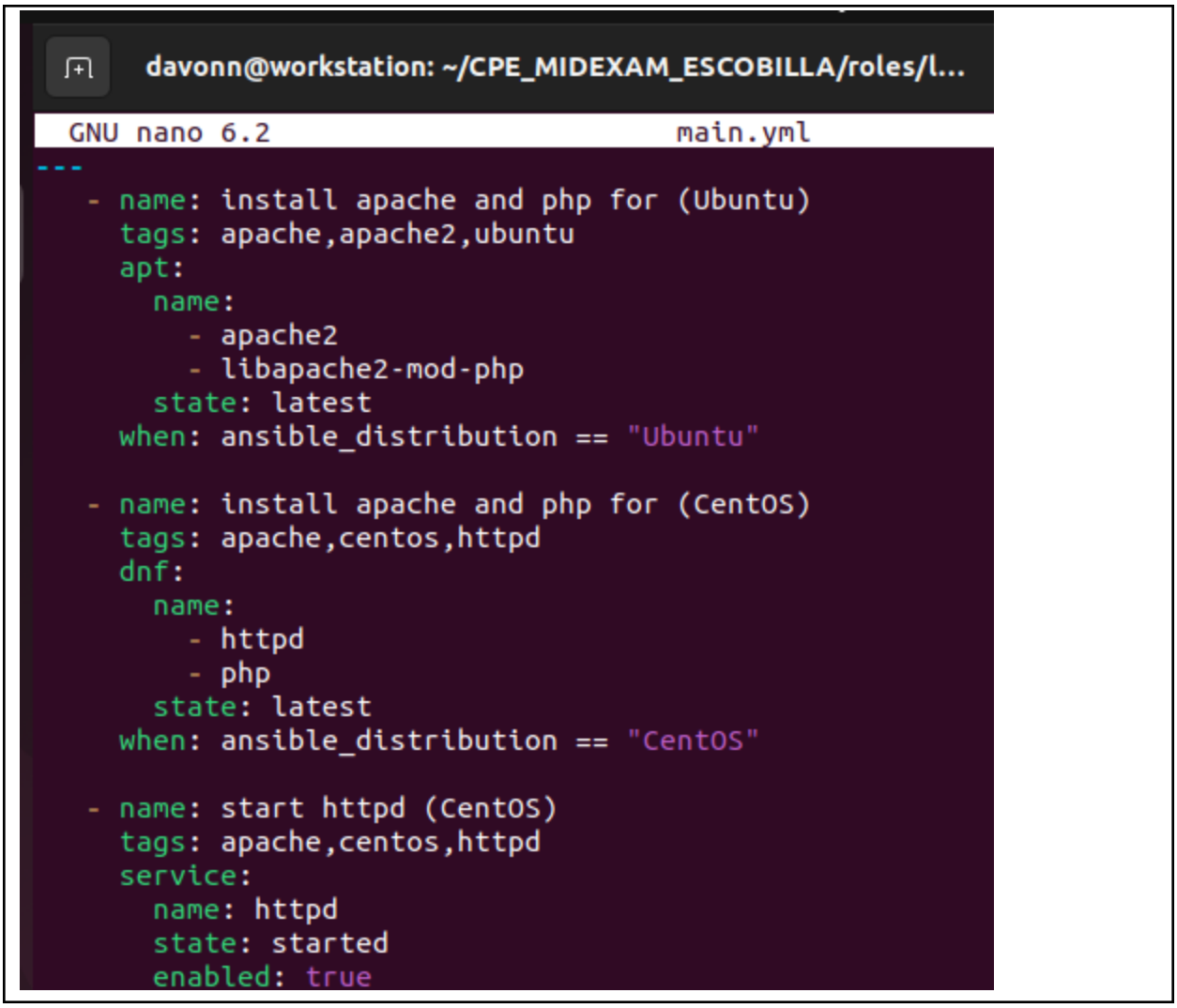
Next, configure main.yml of influxdb.


davonn@workstation: ~/CPE_MIDEXAM_ESCOBILLA/roles/i...
GNU nano 6.2 main.yml

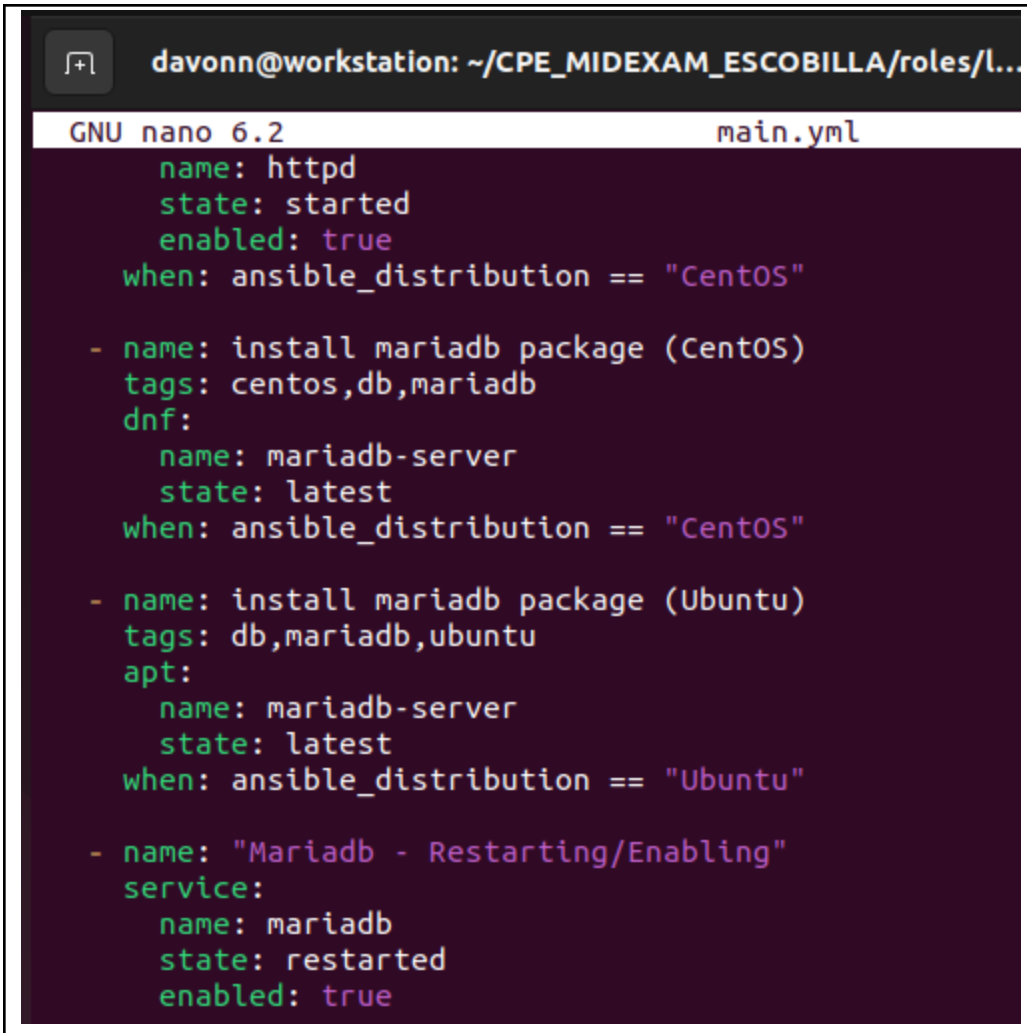
- name: Download the Influxdb Package in (Ubuntu)
shell: curl -sL https://repos.influxdata.com/influxdb.key | sudo apt-key add>
when: ansible_distribution == "Ubuntu"
- name: Read the Influxdb Package in (Ubuntu)
apt:
upgrade: dist
update_cache: yes
changed_when: false
when: ansible_distribution == "Ubuntu"
- name: Installing Package Influxdb in (Ubuntu)
apt:
name: influxdb
state: present
when: ansible_distribution == "Ubuntu"
- name: Download the Influxdb Package in (CentOS)
get_url:
url: https://repos.influxdata.com/rhel/8/x86_64/stable/influxdb-1.8.5.x86_>
dest: /tmp/influxdb-1.8.5.x86_64.rpm
when: ansible_distribution == "CentOS"



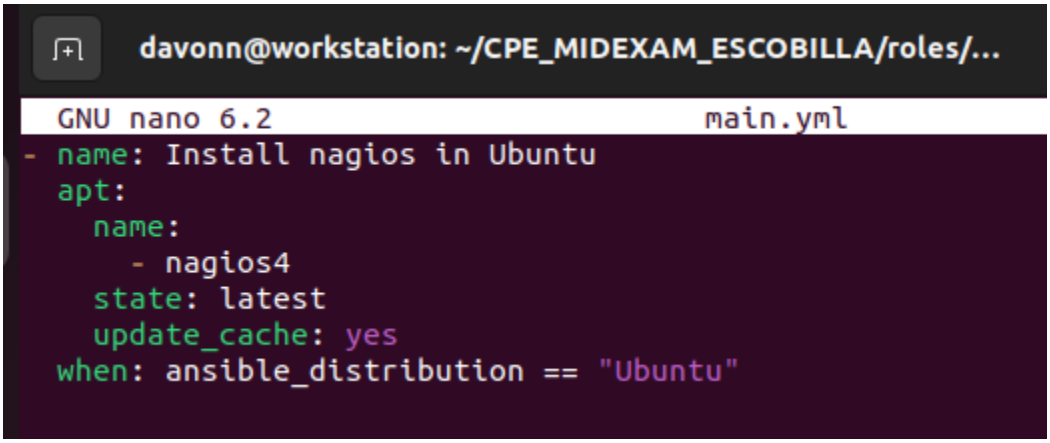
Next, configure the main.yml of lampstack.


davonn@workstation: ~/CPE_MIDEXAM_ESCOBILLA/roles/l...
GNU nano 6.2 main.yml

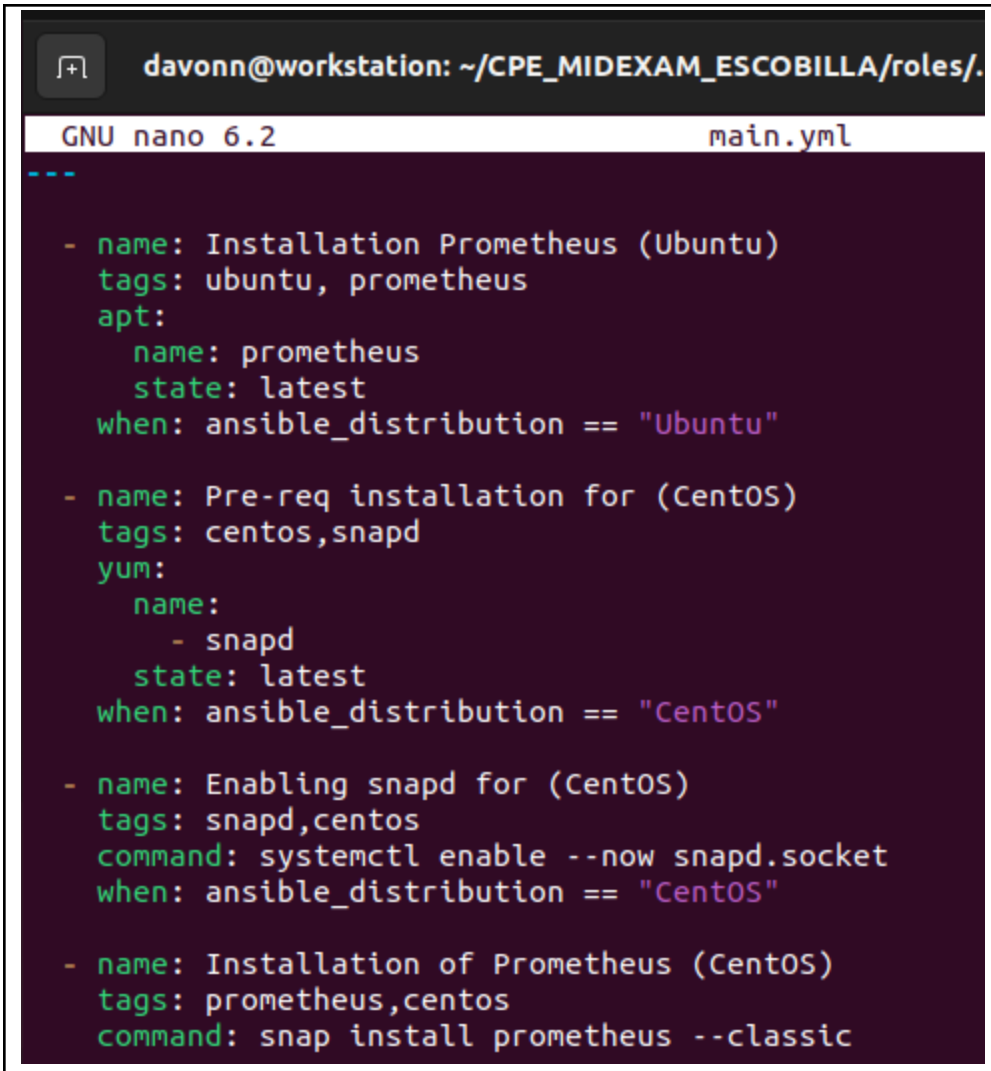
- name: install apache and php for (Ubuntu)
tags: apache,apache2,ubuntu
apt:
name:
- apache2
- libapache2-mod-php
state: latest
when: ansible_distribution == "Ubuntu"
- name: install apache and php for (CentOS)
tags: apache,centos,httpd
dnf:
name:
- httpd
- php
state: latest
when: ansible_distribution == "CentOS"
- name: start httpd (CentOS)
tags: apache,centos,httpd
service:
name: httpd
state: started
enabled: true



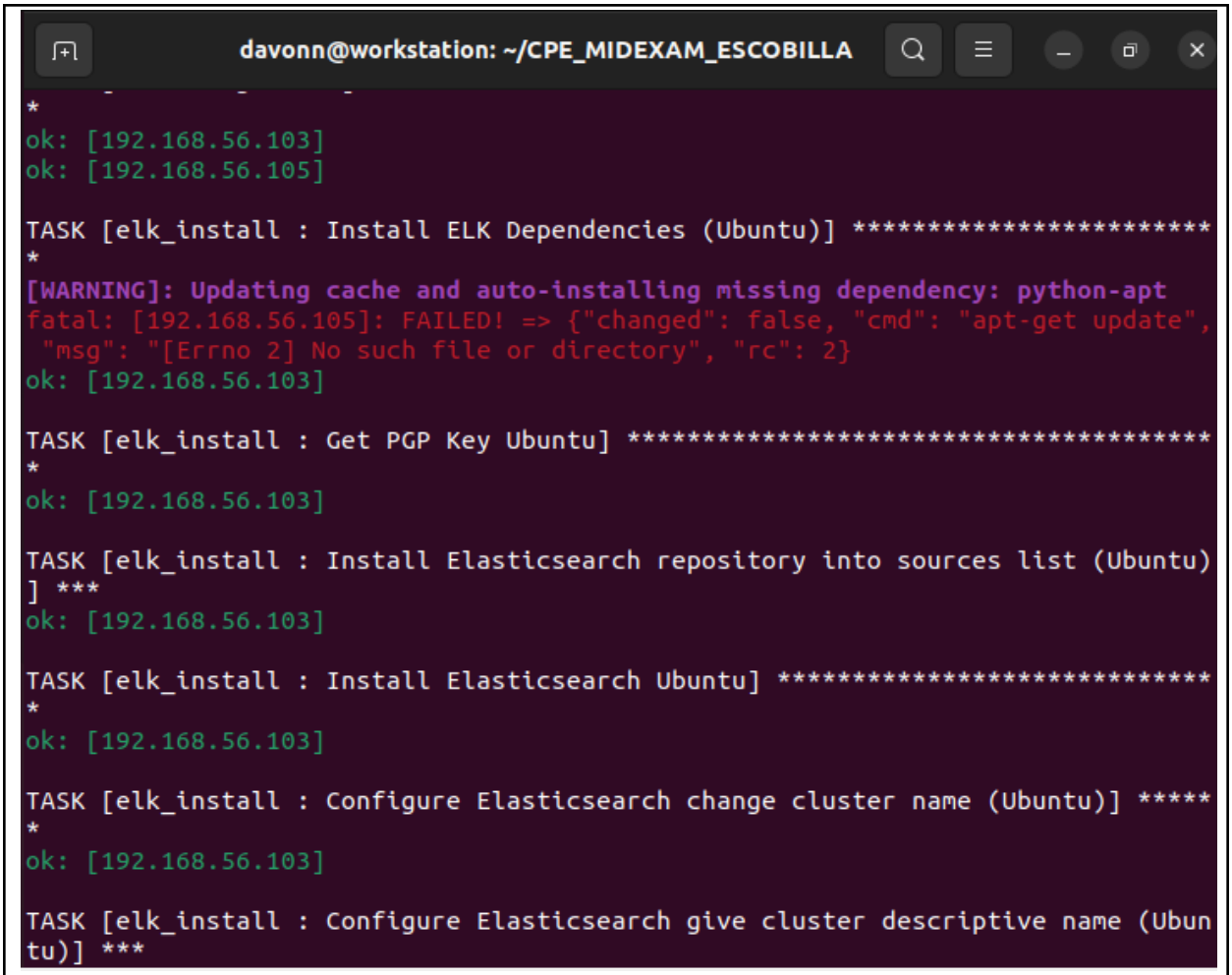
Next, configure the main.yml for nagios.



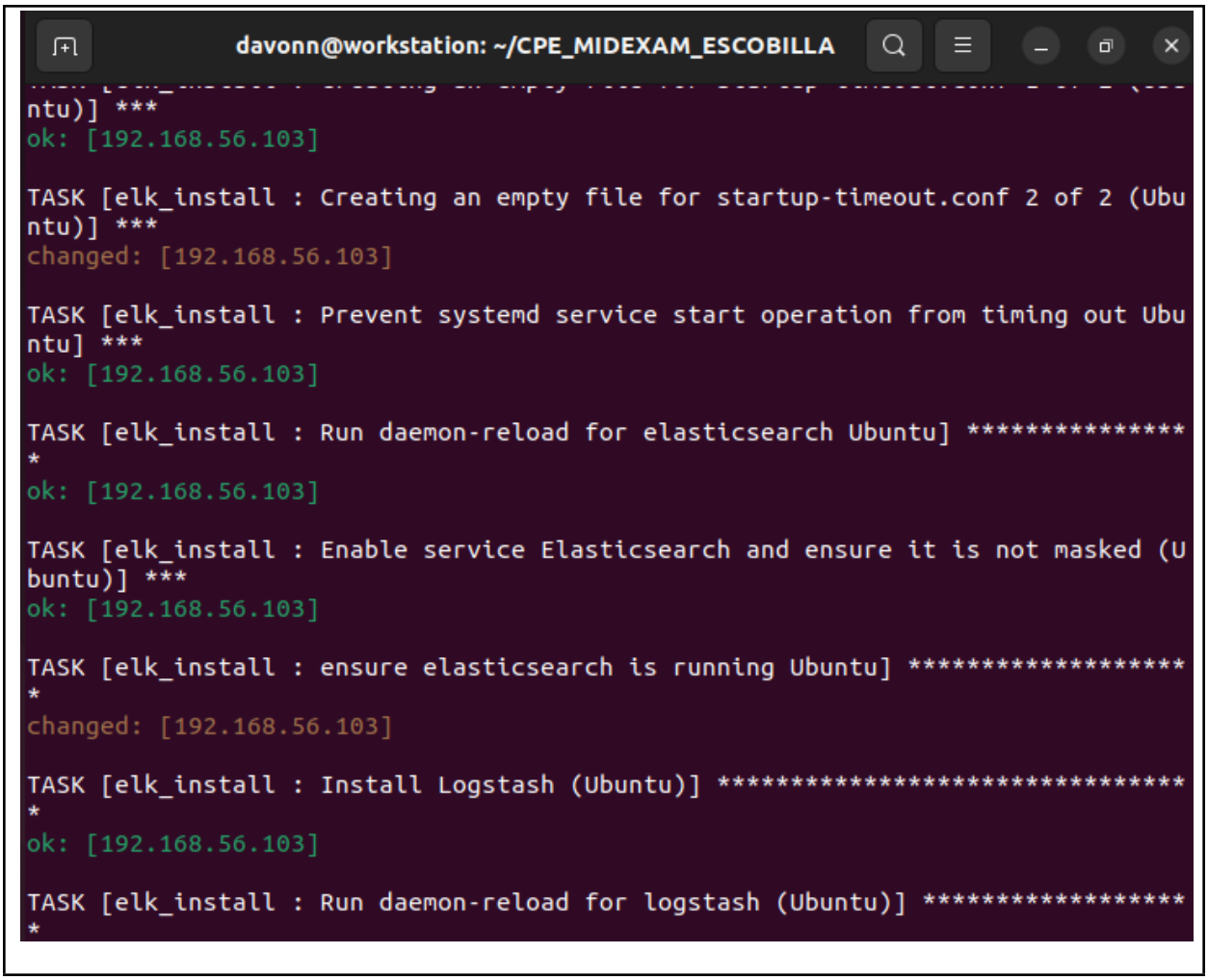
Lastly, configure the main.yml for prometheus.

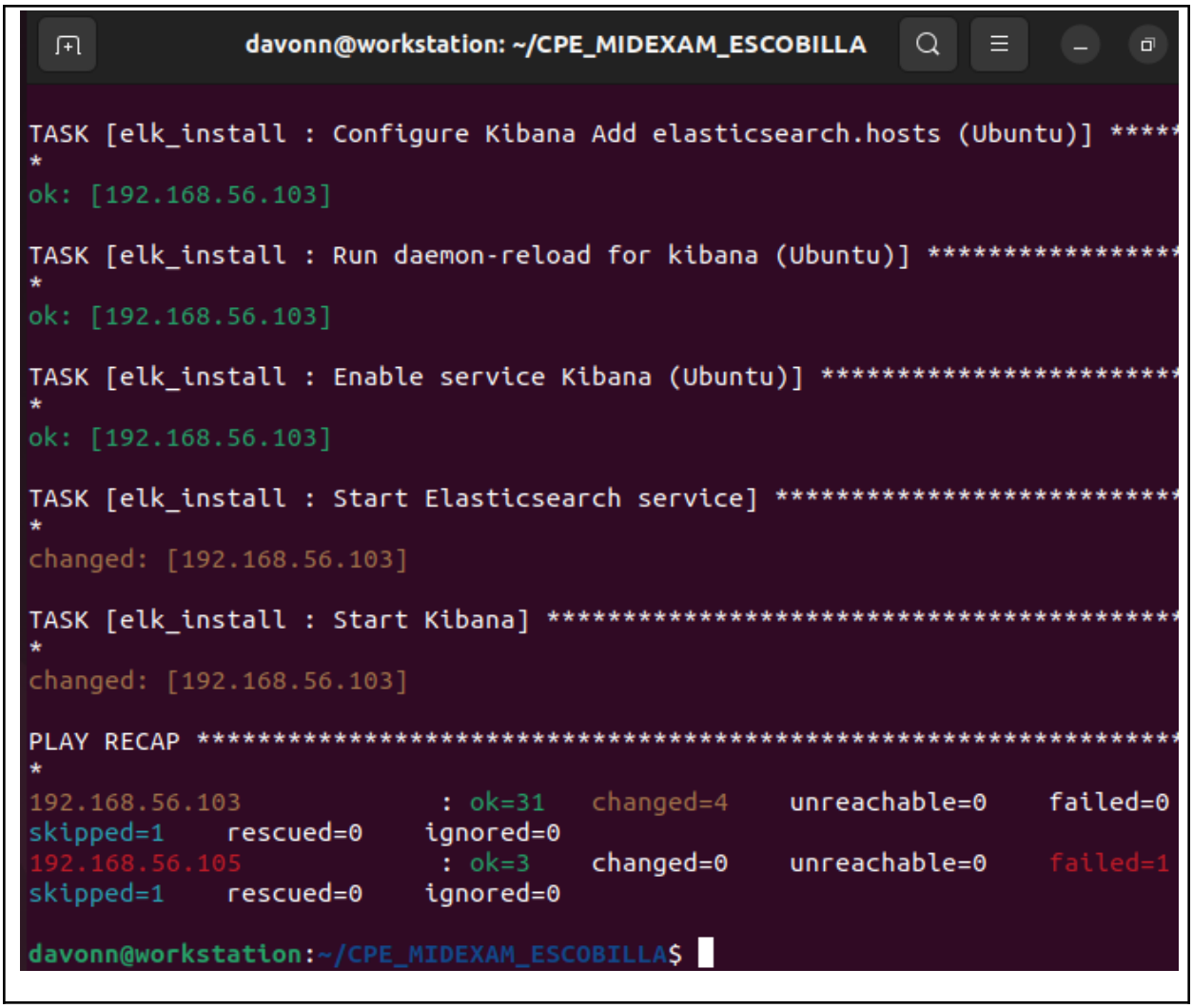


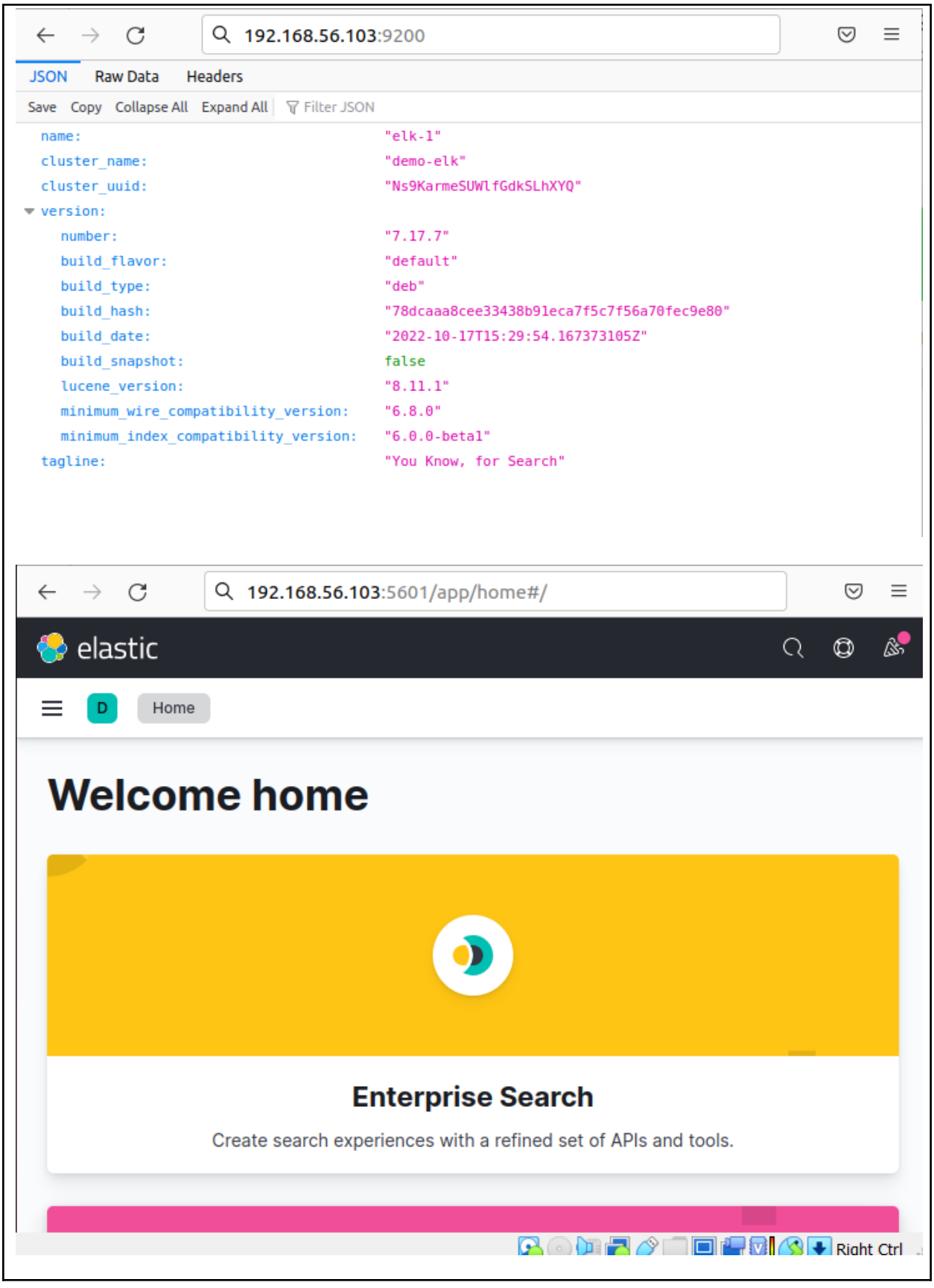
Now run the playbook in order to execute the tasks.



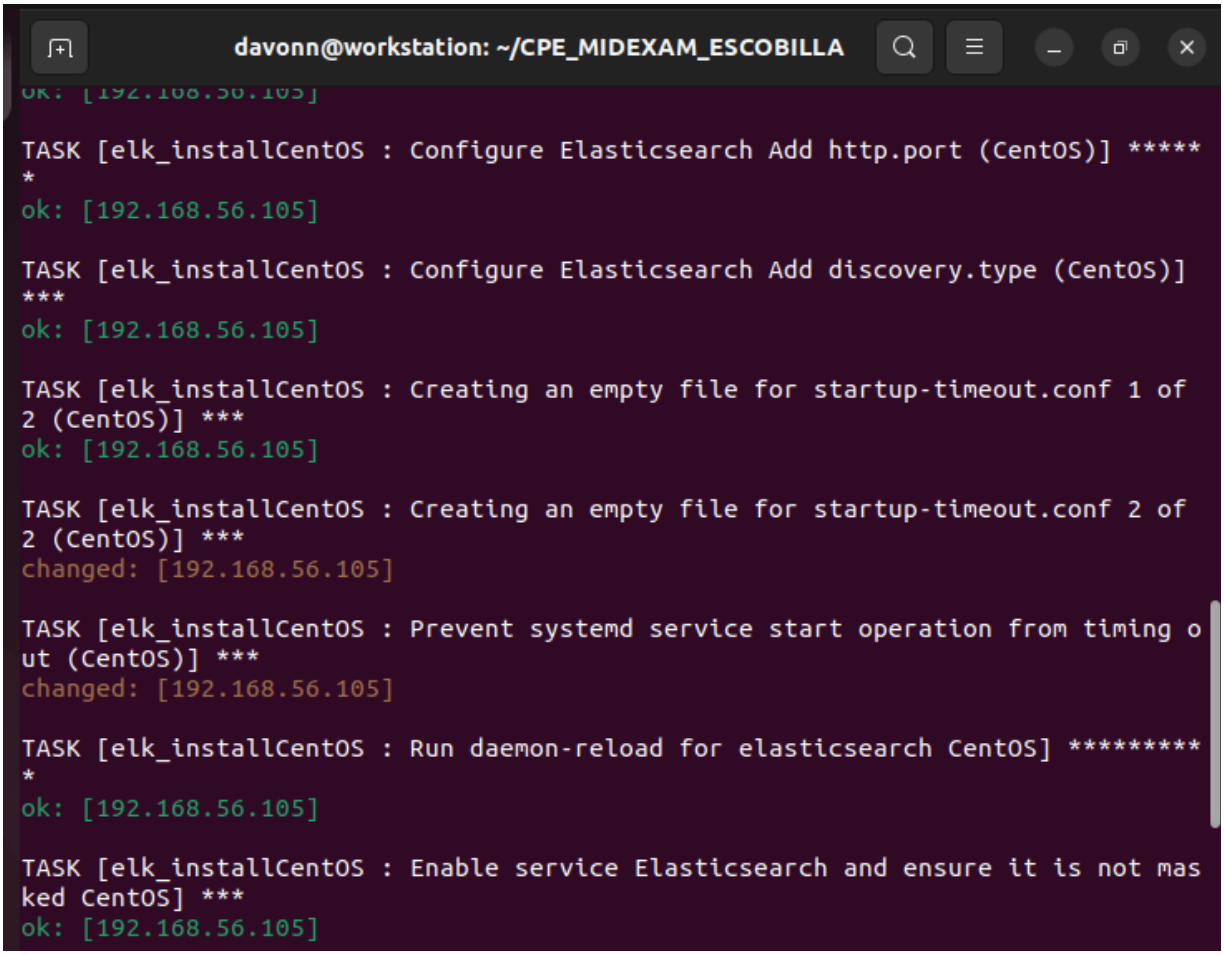
This error appeared since it is already installed on CentOS and is currently off. Also, I separated the installments for elk for Ubuntu and centOS in a more organized manner.

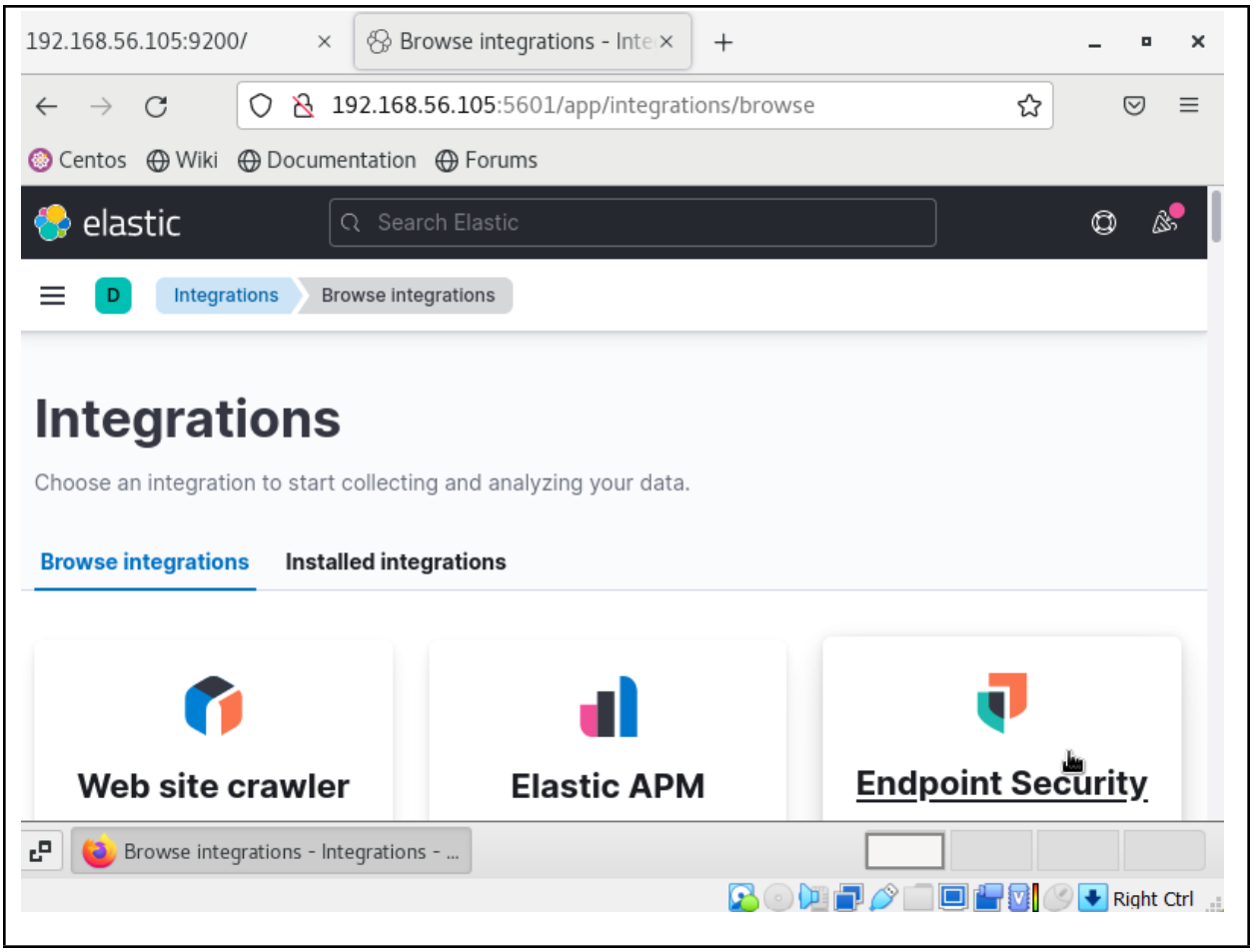

davonn@workstation: ~/CPE_MIDEXAM_ESCOBILLA
ntu)] ***
ok: [192.168.56.103]
TASK [elk_install : Creating an empty file for startup-timeout.conf 2 of 2 (Ubu
ntu)] ***
changed: [192.168.56.103]
TASK [elk_install : Prevent systemd service start operation from timing out Ubu
ntu] ***
ok: [192.168.56.103]
TASK [elk_install : Run daemon-reload for elasticsearch Ubuntu] ***************
*
ok: [192.168.56.103]
TASK [elk_install : Enable service Elasticsearch and ensure it is not masked (U
buntu)] ***
ok: [192.168.56.103]
TASK [elk_install : ensure elasticsearch is running Ubuntu] ******************
*
changed: [192.168.56.103]
TASK [elk_install : Install Logstash (Ubuntu)] *******************************
*
ok: [192.168.56.103]
TASK [elk_install : Run daemon-reload for logstash (Ubuntu)] *****************
*

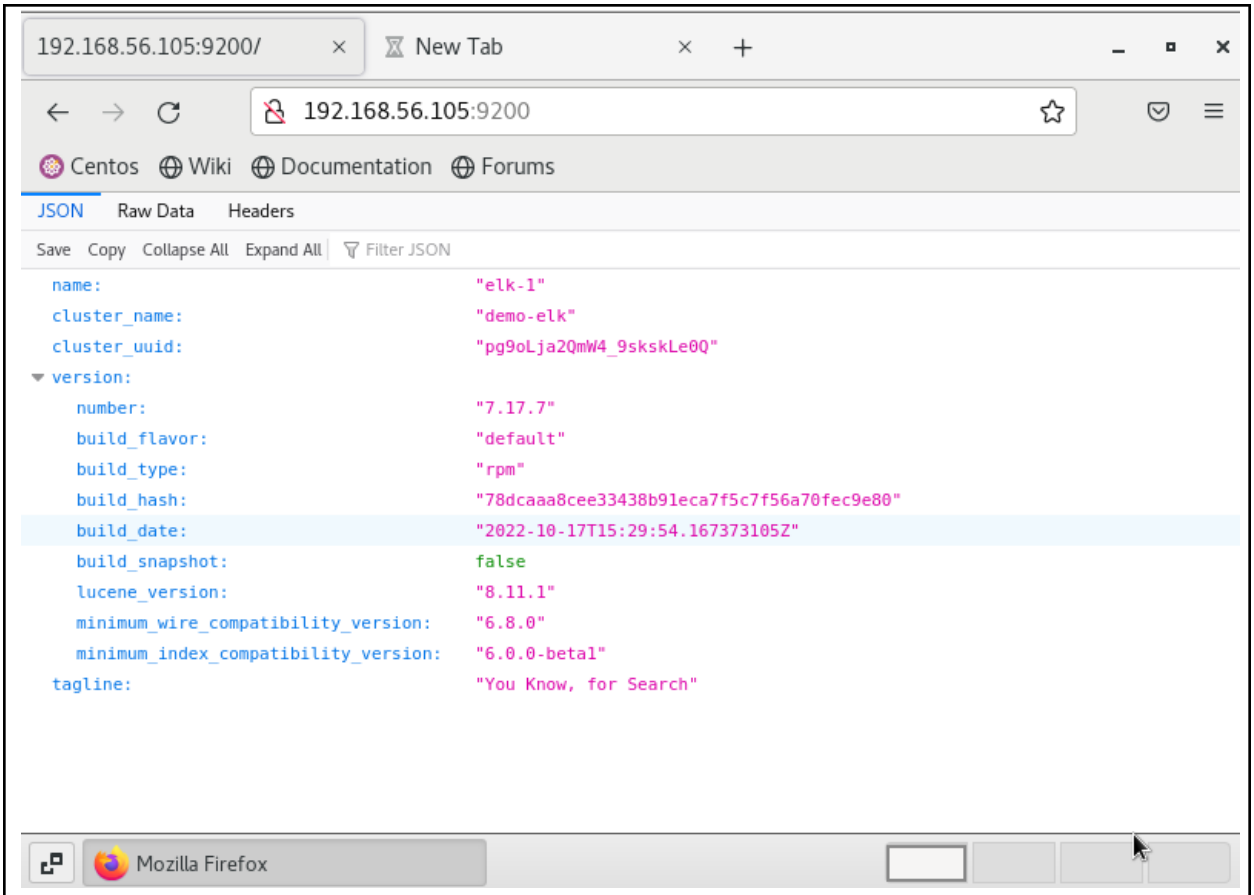

davonn@workstation: ~/CPE_MIDEXAM_ESCOBILLA
TASK [elk_install : Configure Kibana Add elasticsearch.hosts (Ubuntu)] *****
*
ok: [192.168.56.103]
TASK [elk_install : Run daemon-reload for kibana (Ubuntu)] ****************
*
ok: [192.168.56.103]
TASK [elk_install : Enable service Kibana (Ubuntu)] ***********************
*
ok: [192.168.56.103]
TASK [elk_install : Start Elasticsearch service] **************************
*
changed: [192.168.56.103]
TASK [elk_install : Start Kibana] ***
*
changed: [192.168.56.103]
PLAY RECAP **
*
192.168.56.103 : ok=31 changed=4 unreachable=0 failed=0
skipped=1 rescued=0 ignored=0
192.168.56.105 : ok=3 changed=0 unreachable=0 failed=1
skipped=1 rescued=0 ignored=0
davonn@workstation:~/CPE_MIDEXAM_ESCOBILLA$


192.168.56.103:9200
JSON
Raw Data
Headers
Save
Copy
Collapse All
Expand All
Filter JSON
name: "elk-1"
cluster_name: "demo-elk"
cluster_uuid: "Ns9KarmeSUWlfGdkSLhXYQ"
version:
number: "7.17.7"
build_flavor: "default"
build_type: "deb"
build_hash: "78dcaaa8cee33438b91eca7f5c7f56a70fec9e80"
build_date: "2022-10-17T15:29:54.167373105Z"
build_snapshot: false
lucene_version: "8.11.1"
minimum_wire_compatibility_version: "6.8.0"
minimum_index_compatibility_version: "6.0.0-beta1"
tagline: "You Know, for Search"
192.168.56.103:5601/app/home#/
elastic
D
Home
Welcome home
Enterprise Search
Create search experiences with a refined set of APIs and tools.
Right Ctrl

This is the execution of task elastic installment on ubuntu, plus the outputs.

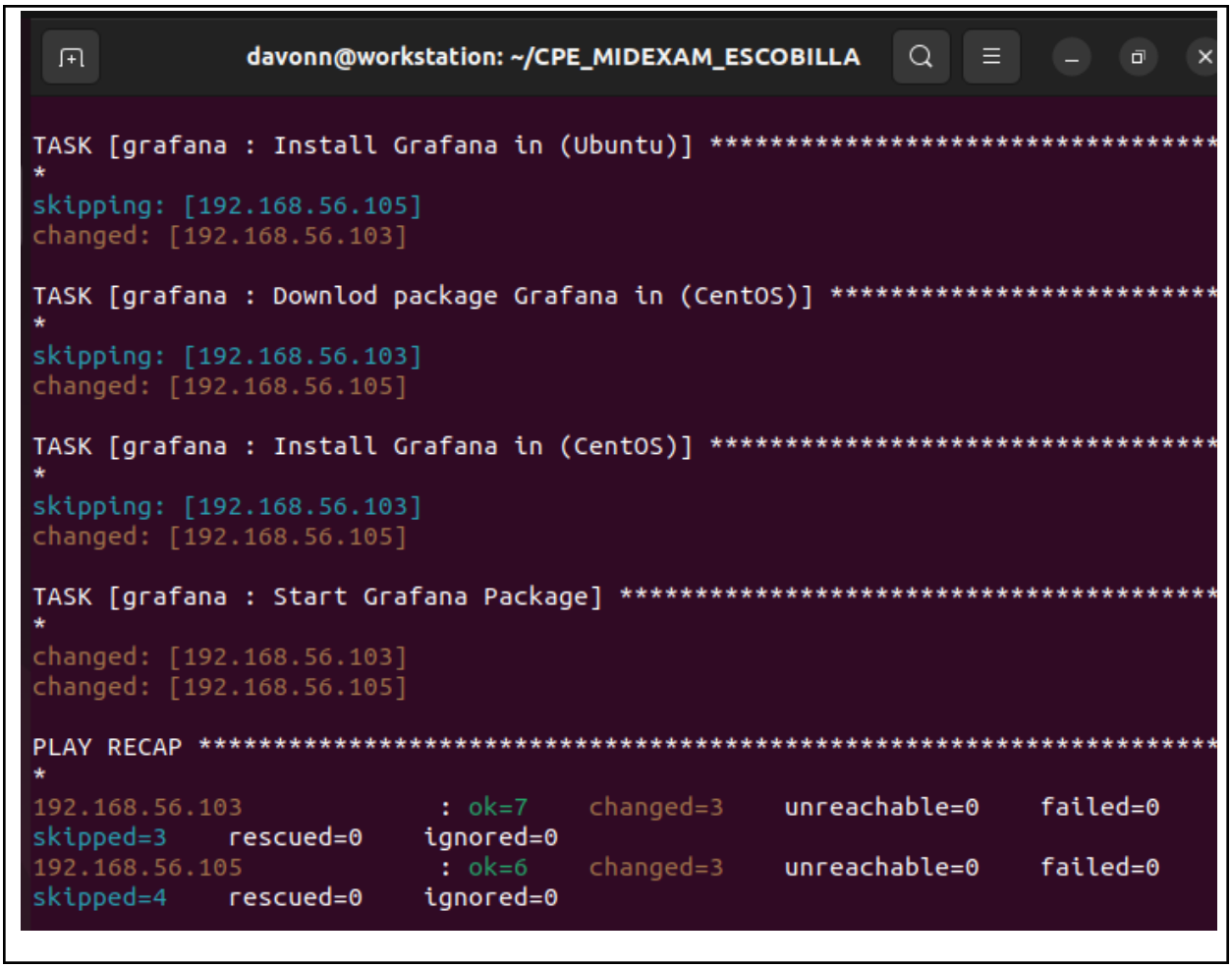


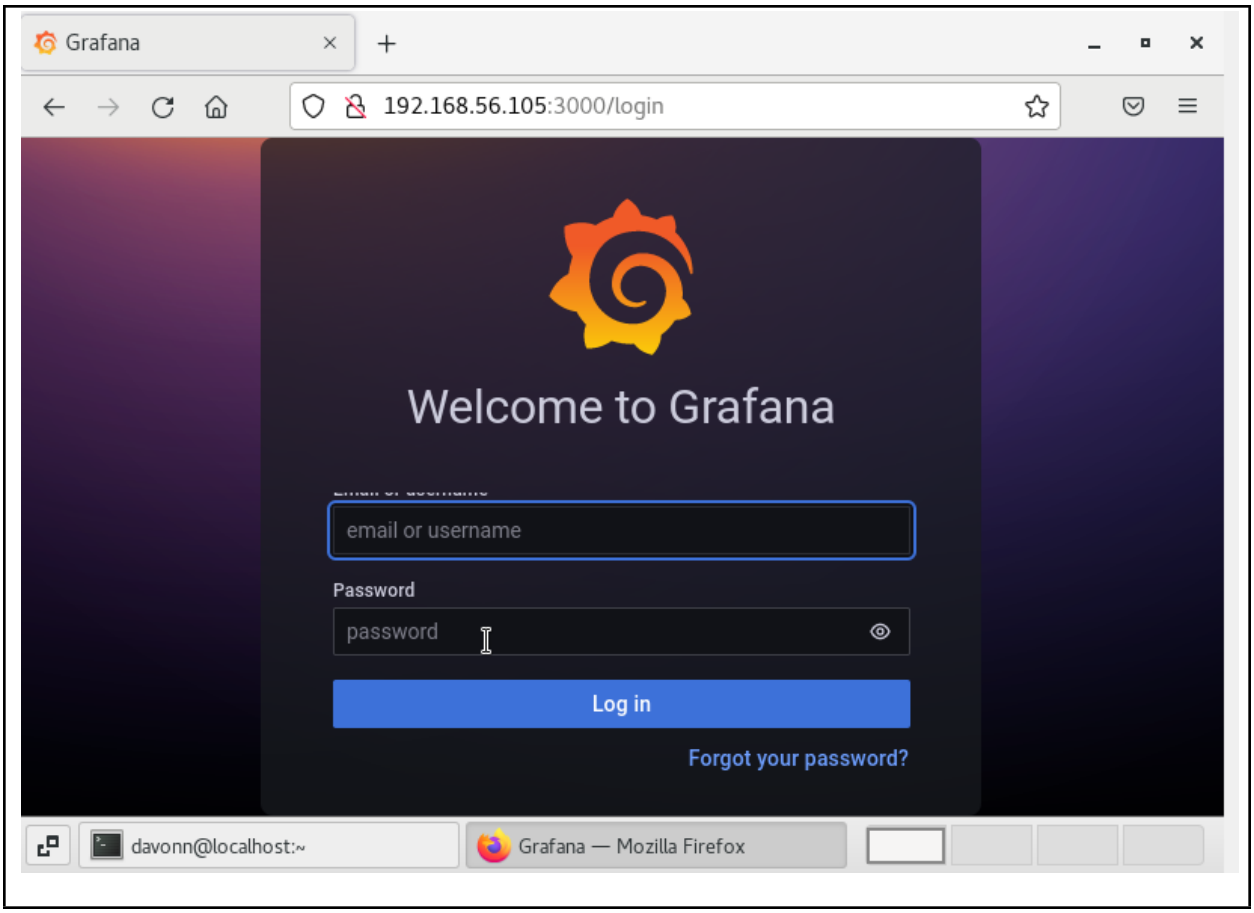

192.168.56.105:9200/
Browse integrations - Inte
192.168.56.105:5601/app/integrations/browse
Centos
Wiki
Documentation
Forums
elastic
Search Elastic
D
Integrations
Browse integrations
Integrations
Choose an integration to start collecting and analyzing your data.
Browse integrations
Installed integrations
Web site crawler
Elastic APM
Endpoint Security
Browse integrations - Integrations - ...
Right Ctrl

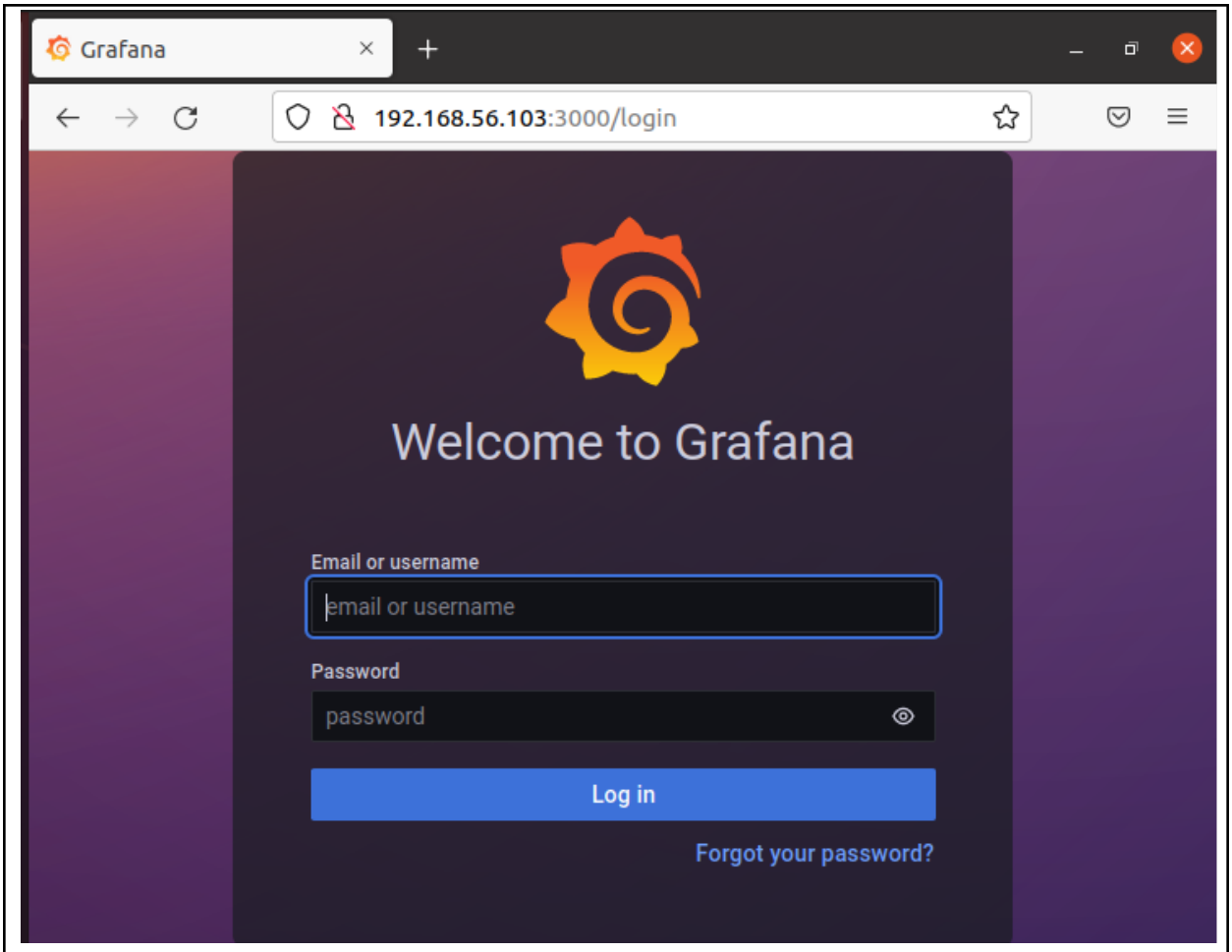


ElasticSearch installation on CentOS execution success, plus the output on CentOS.

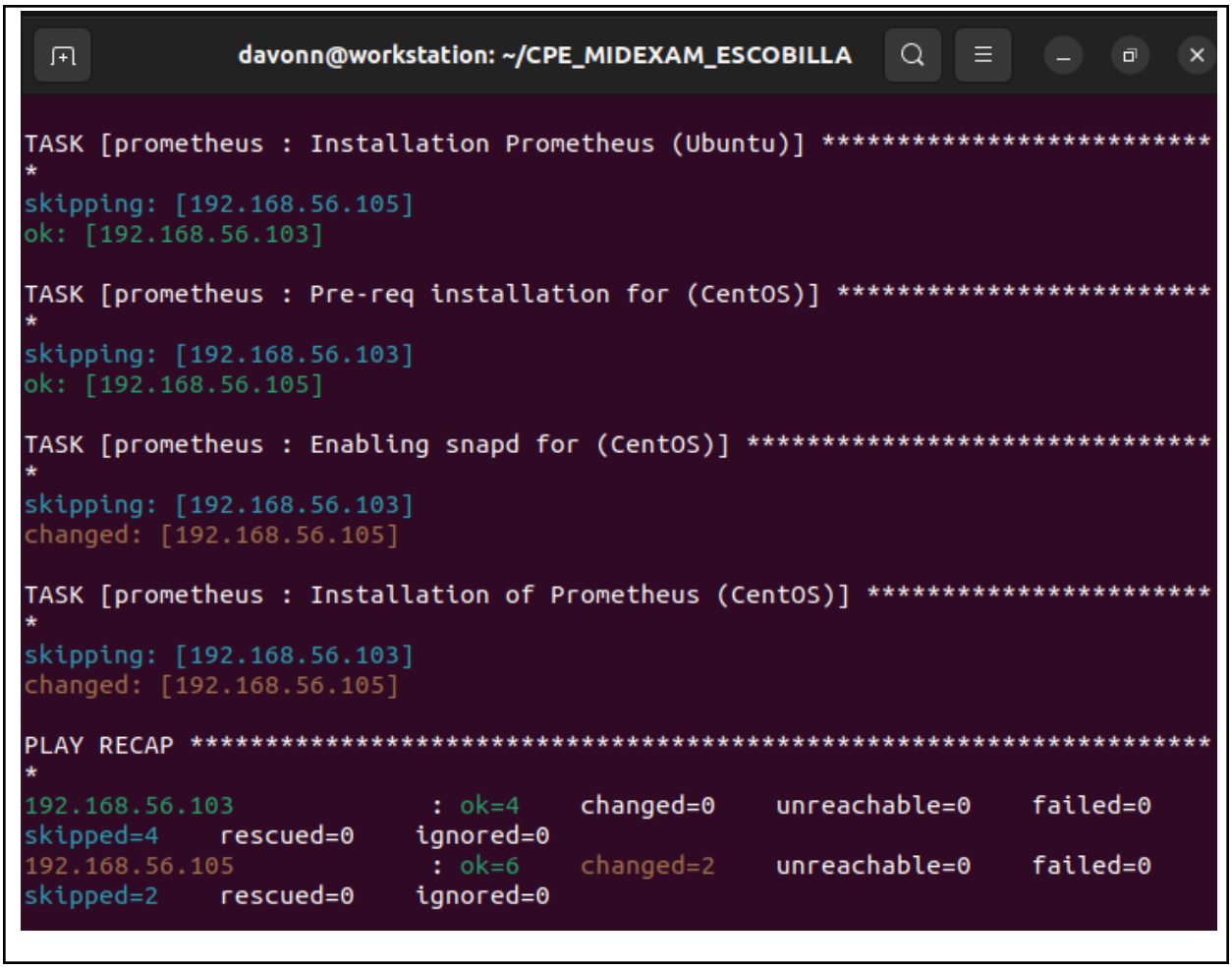
Nagios installation on Ubuntu and the output.

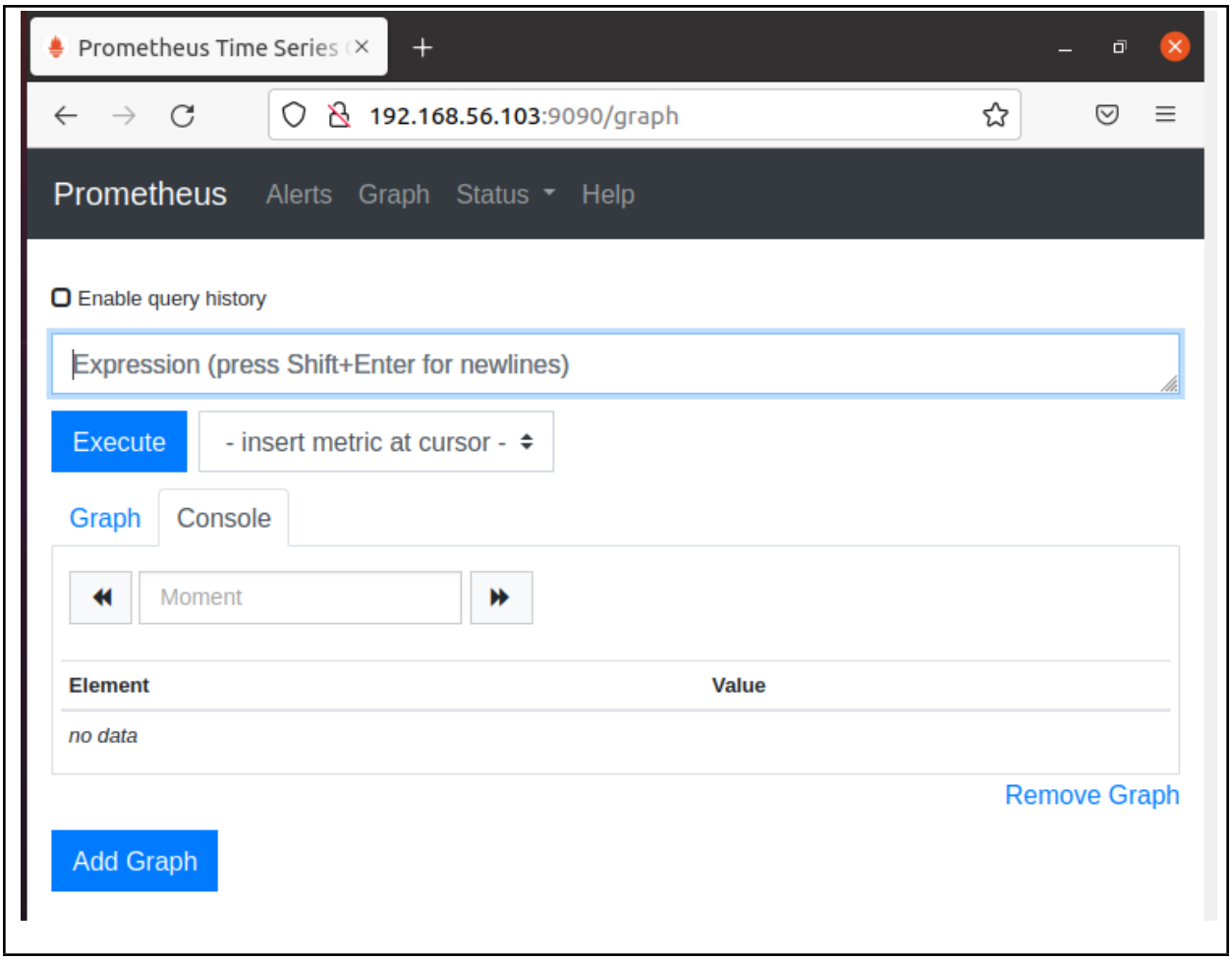

davonn@workstation: ~/CPE_MIDEXAM_ESCOBILLA
TASK [grafana : Install Grafana in (Ubuntu)] **********
*
skipping: [192.168.56.105]
changed: [192.168.56.103]
TASK [grafana : Downlod package Grafana in (CentOS)] **********
*
skipping: [192.168.56.103]
changed: [192.168.56.105]
TASK [grafana : Install Grafana in (CentOS)] **********
*
skipping: [192.168.56.103]
changed: [192.168.56.105]
TASK [grafana : Start Grafana Package] **********
*
changed: [192.168.56.103]
changed: [192.168.56.105]
PLAY RECAP **********
*
192.168.56.103 : ok=7 changed=3 unreachable=0 failed=0
skipped=3 rescued=0 ignored=0
192.168.56.105 : ok=6 changed=3 unreachable=0 failed=0
skipped=4 rescued=0 ignored=0

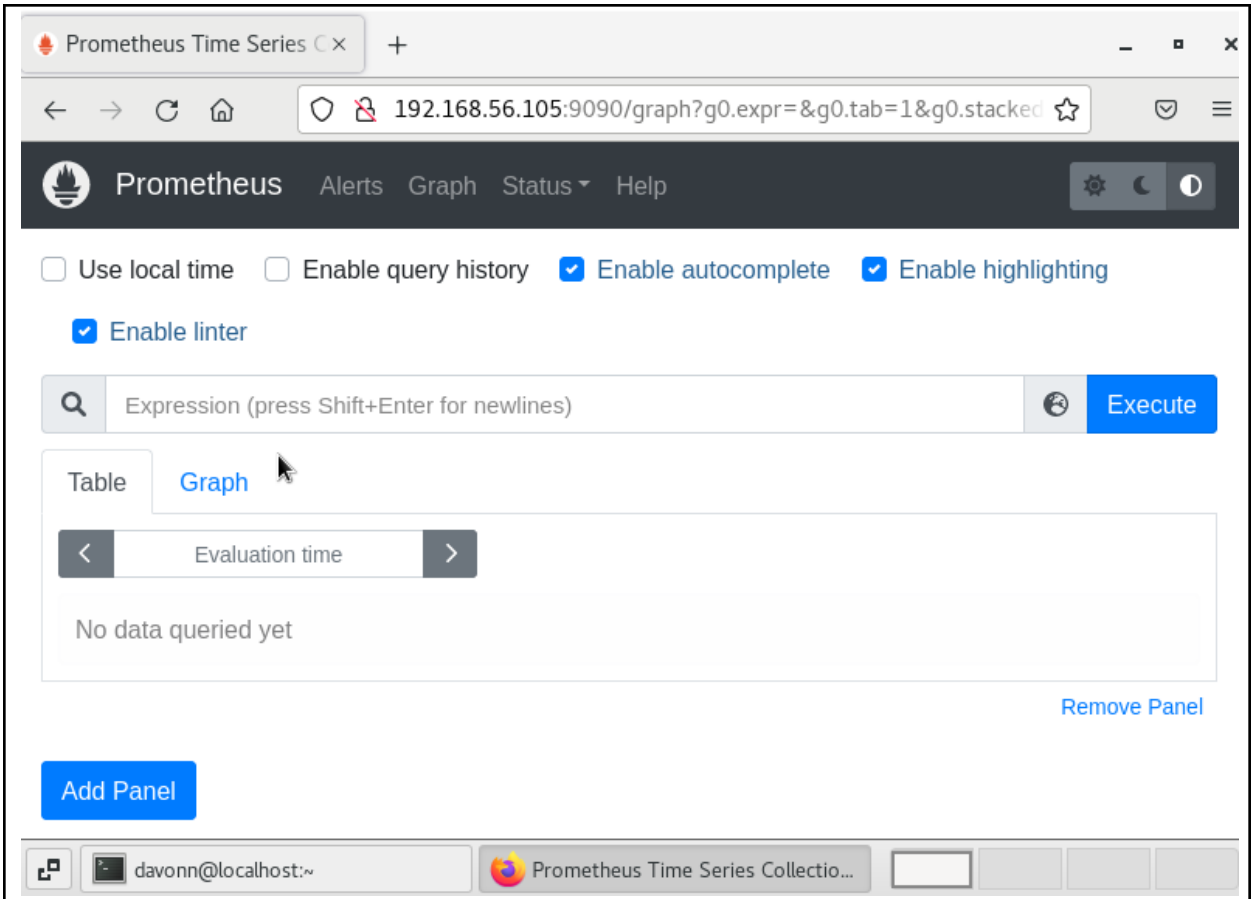

Grafana
192.168.56.105:3000/login
Welcome to Grafana
email or username
Password
password
Log in
Forgot your password?
davonn@localhost:~
Grafana — Mozilla Firefox



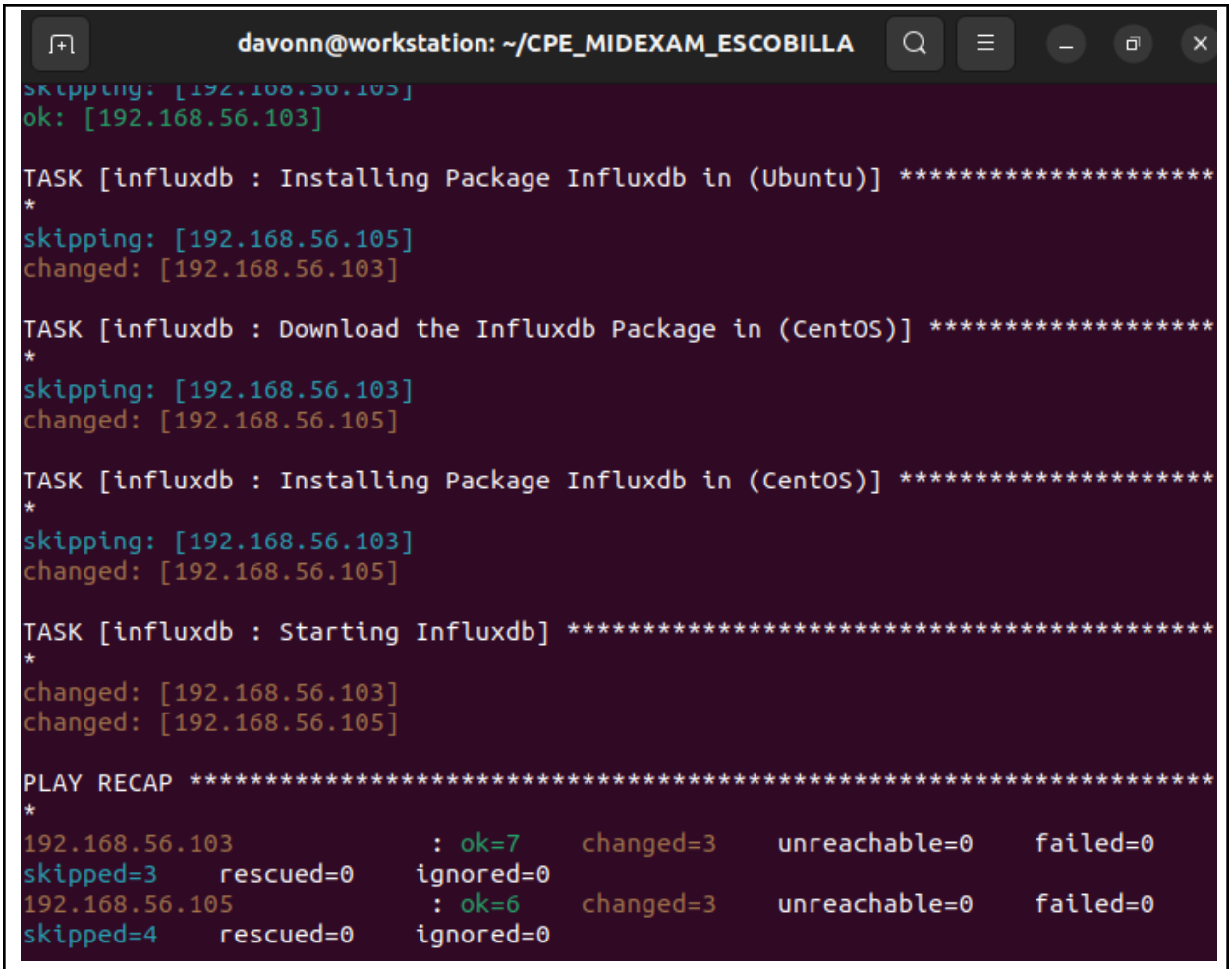
Grafana installation on Ubuntu and CentOS plus output.


davonn@workstation: ~/CPE_MIDEXAM_ESCOBILLA
TASK [prometheus : Installation Prometheus (Ubuntu)] ***********************
*
skipping: [192.168.56.105]
ok: [192.168.56.103]
TASK [prometheus : Pre-req installation for (CentOS)] ***********************
*
skipping: [192.168.56.103]
ok: [192.168.56.105]
TASK [prometheus : Enabling snapd for (CentOS)] *****************************
*
skipping: [192.168.56.103]
changed: [192.168.56.105]
TASK [prometheus : Installation of Prometheus (CentOS)] *********************
*
skipping: [192.168.56.103]
changed: [192.168.56.105]
PLAY RECAP ***
*
192.168.56.103 : ok=4 changed=0 unreachable=0 failed=0
skipped=4 rescued=0 ignored=0
192.168.56.105 : ok=6 changed=2 unreachable=0 failed=0
skipped=2 rescued=0 ignored=0

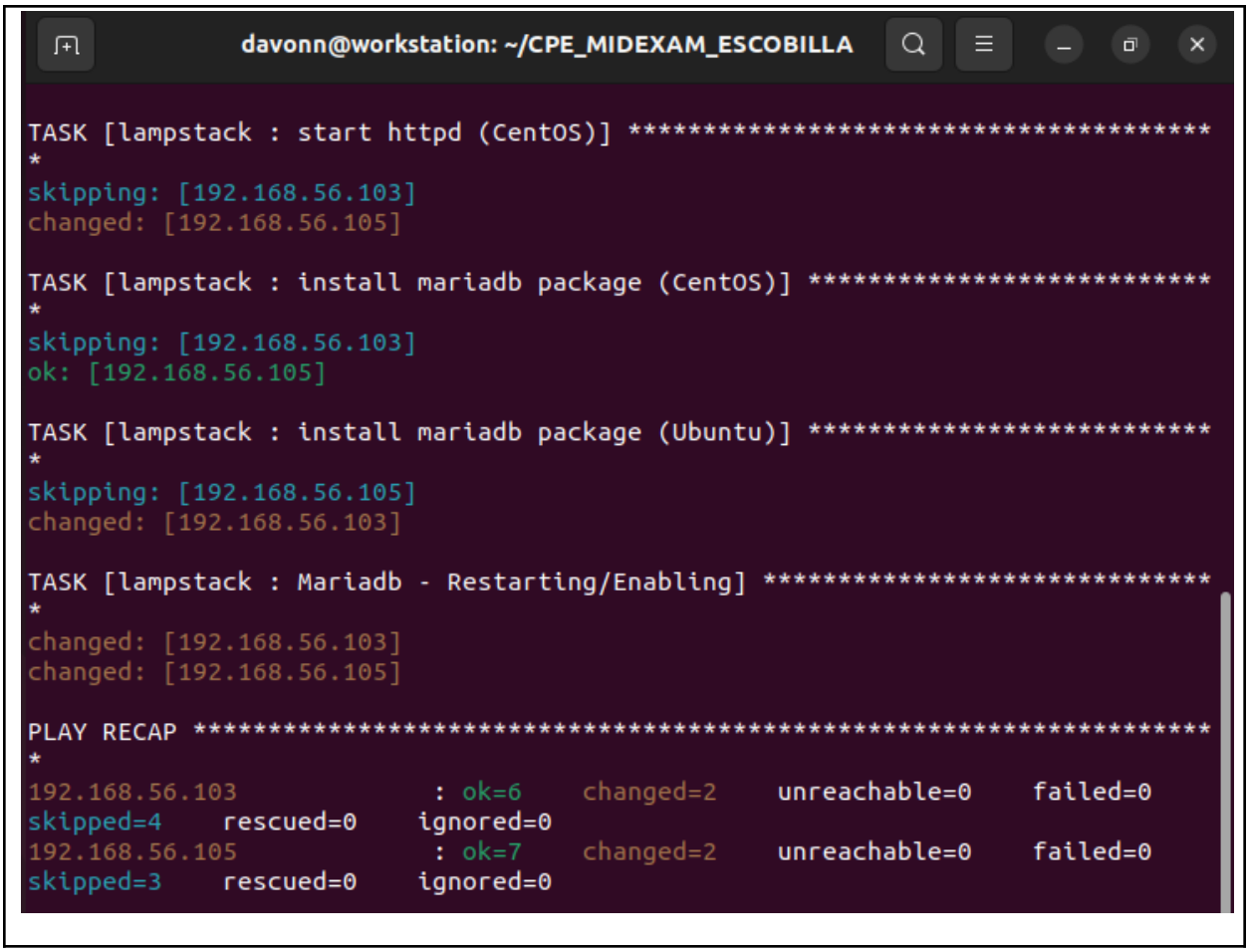

Prometheus Time Series
192.168.56.103:9090/graph
Prometheus
Alerts
Graph
Status
Help
Enable query history
Expression (press Shift+Enter for newlines)
Execute
- insert metric at cursor -
Graph
Console
Moment
Element
Value
no data
Remove Graph
Add Graph

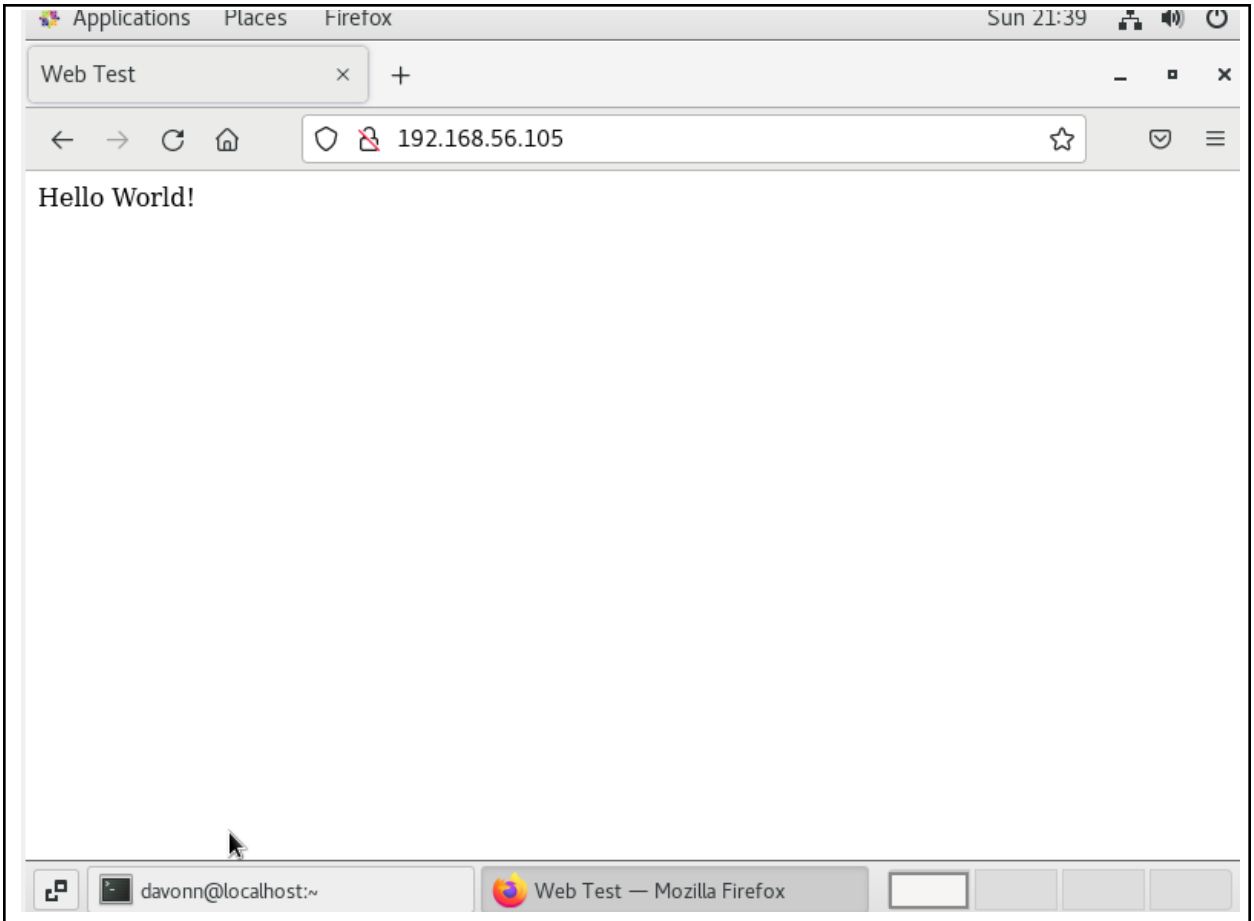


Prometheus installation using the playbook and the output on Ubuntu and CentOS.



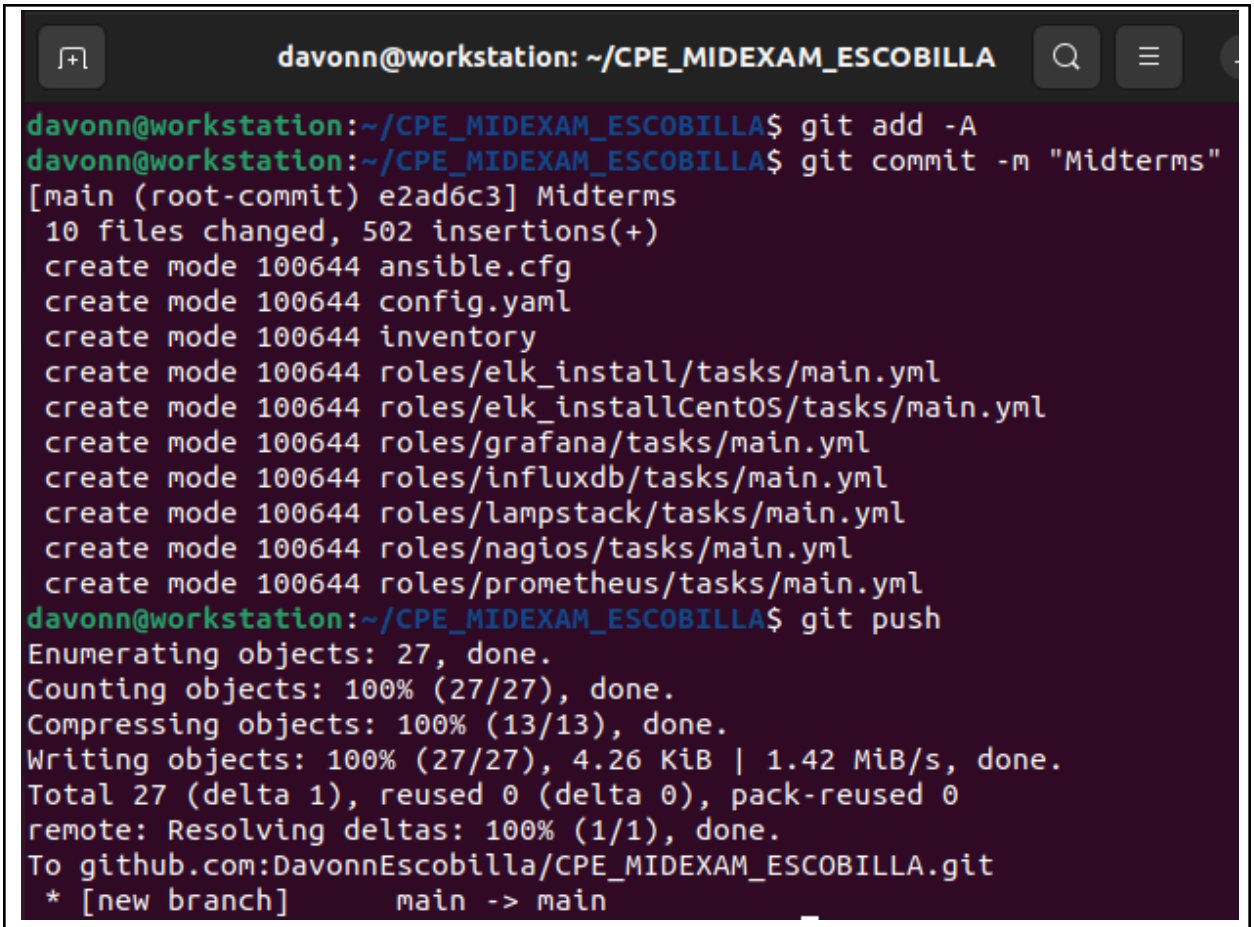
Execution of influxdb task on both CentOS and Ubuntu. No output since it is already in grafana.


davonn@workstation: ~/CPE_MIDEXAM_ESCOBILLA
TASK [lampstack : start httpd (CentOS)] ************************************
*
skipping: [192.168.56.103]
changed: [192.168.56.105]
TASK [lampstack : install mariadb package (CentOS)] ***************************
*
skipping: [192.168.56.103]
ok: [192.168.56.105]
TASK [lampstack : install mariadb package (Ubuntu)] ***************************
*
skipping: [192.168.56.105]
changed: [192.168.56.103]
TASK [lampstack : Mariadb - Restarting/Enabling] ******************************
*
changed: [192.168.56.103]
changed: [192.168.56.105]
PLAY RECAP ***
*
192.168.56.103 : ok=6 changed=2 unreachable=0 failed=0
skipped=4 rescued=0 ignored=0
192.168.56.105 : ok=7 changed=2 unreachable=0 failed=0
skipped=3 rescued=0 ignored=0




```
davonn@server1:~$ mariadb --version
mariadb  Ver 15.1 Distrib 10.3.34-MariaDB, for debian-linux-gnu (x86_64) using
readline 5.2
```

Lampstack installation on CentOS and Ubuntu plus a mariadb version on Ubuntu. Below the task executions are the output.



Finally perform the following commands in order to save the work on the repository.

GitHub link: https://github.com/DavonnEscobilla/CPE_MIDEXAM_ESCOBILLA.git

Conclusions: (link your conclusion from the objective)

Upon creating the midterm examination, it is evident that the previous activity about roles and tools that can be used to enhance work efficiency helps me to have a successful run. Ansible playbooks are a very complex system unless you have managed the organization of each task in every role. The only problem that kept me in a difficult situation is the constant worry that the amount of installation process on the control nodes might cause crash errors on my pc since it is not optimized for running multiple virtual machines. So in order to remove this constant worry, I have come up with a solution of running each task one by one so that my computer can handle the load. I have managed to complete the activity without crashing on my end, overall having roles to set up the tasks can be a very helpful tool in order to identify the problem and

immediately solve it. It is a very challenging exam and I somehow enjoyed configuring these tasks.

EVALUATION: