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

1. Objectives

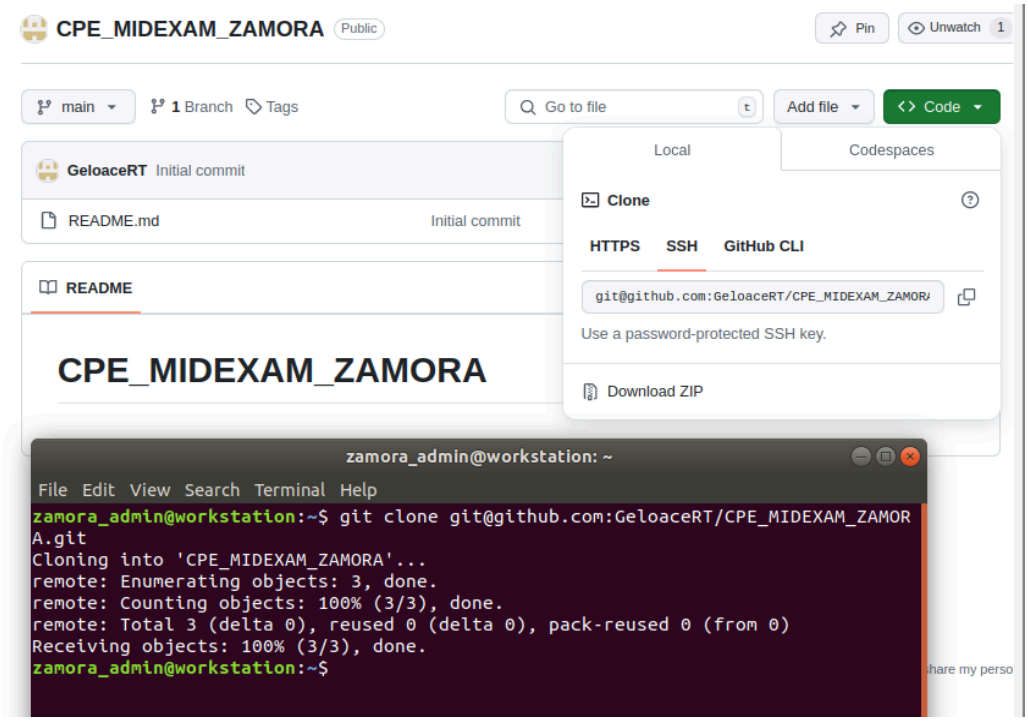
Create and design a workflow that installs, configure and manage enterprise availability, performance and log monitoring tools using Ansible as an Infrastructure as Code (IaC) tool.

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



- The creation of the Midterm Exam Repo.

2. Create an Ansible playbook that does the following with an input of a config.yml file and arranged Inventory file

```
zamora_admin@workstation:~/CPE_MIDEXAM_ZAMORA$ ls
ansible.cfg  inventory  README.md
zamora_admin@workstation:~/CPE_MIDEXAM_ZAMORA$
```

- Created a ansible.cfg and inventory

ansible.cfg

```
  GNU nano 2.9.3                    ansible.cfg

[defaults]
inventory = inventory
remote_user = zamora_admin
host_key_checking = True
```

- Content of the ansible.cfg

inventory

```
File  Edit  View  Search  Terminal  Help
  GNU nano 2.9.3                          inventory

[Ubuntu]
192.168.56.109
[CentOS]
192.168.56.110 ansible_user=azamora_admin
```

- content of the inventory

192.168.56.109 - Server 2
192.168.56.110 - CentOS Manage Node

```
zamora_admin@workstation:~/CPE_MIDEXAM_ZAMORA$ ansible all -m ping
192.168.56.109 | SUCCESS => {
    "changed": false,
    "ping": "pong"
}
192.168.56.110 | SUCCESS => {
    "changed": false,
    "ping": "pong"
}
zamora_admin@workstation:~/CPE_MIDEXAM_ZAMORA$
```

```
zamora_admin@workstation:~/CPE_MIDEXAM_ZAMORA$ ls
ansible.cfg  inventory  README.md  roles
zamora_admin@workstation:~/CPE_MIDEXAM_ZAMORA$
```

- Created roles folder to implement a role approach in ansible.

```
zamora_admin@workstation:~/CPE_MIDEXAM_ZAMORA$ ls
ansible.cfg  inventory  midterm.yml  README.md  roles
zamora_admin@workstation:~/CPE_MIDEXAM_ZAMORA$
```

- Created a midterm.yml to act as the main playbook.

3. Install the following:
   3.1 Install and configure Elastic Stack in separate hosts (Elastic Search, Kibana, Logstash) • Install Nagios in one host.

Elasticsearch (CentOS)

```
zamora_admin@workstation:~/CPE_MIDEXAM_ZAMORA/roles$ tree elasticsearch
elasticsearch
└── tasks
    ├── elasticsearch.yml.j2
    └── main.yml

1 directory, 2 files
zamora_admin@workstation:~/CPE_MIDEXAM_ZAMORA/roles$
```

Creation of the elasticsearch

```
---
- name: Install Java
  tags: elasticsearch
  yum:
    name: java-11-openjdk
    state: present
  when: ansible_distribution == "CentOS"

- name: Install EPEL repository
  tags: elasticsearch
  yum:
    name: epel-release
    state: latest
  when: ansible_distribution == "CentOS"

- name: Install Elastic Search YUM repository
  tags: elasticsearch
  yum_repository:
    name: elasticsearch
    description: Elasticsearch Repository
    baseurl: https://artifacts.elastic.co/packages/7.x/yum
    gpgcheck: yes
    gpgkey: https://artifacts.elastic.co/GPG-KEY-elasticsearch
    enabled: yes
  when: ansible_distribution == "CentOS"

- name: Install Elastic Search
  tags: elasticsearch
  dnf:
    name: elasticsearch
    state: present
  when: ansible_distribution == "CentOS"

- name: Configure Elastic Search
  tags: elasticsearch
  template:
    src: elasticsearch.yml.j2
    dest: /etc/elasticsearch/elasticsearch.yml
  when: ansible_distribution == "CentOS"

- name: Start Elastic Search
  tags: elasticsearch
  service:
    name: elasticsearch
    state: restarted
    enabled: yes
  when: ansible_distribution == "CentOS"
```

```
- name: Allow port 9200 through the firewall
  tags: elasticsearch
  command: firewall-cmd --zone=public --add-port=9200/tcp --permanent
  register: firewall_result
  ignore_errors: true
  when: ansible_distribution == "CentOS"
```

Content of main.yml

```
  GNU nano 2.9.3

# Elasticsearch Configuration

cluster.name: my-cluster
node.name: dev-node-1
network.host: 0.0.0.0
http.port: 9200
discovery.type: single-node
path.data: /var/lib/elasticsearch
path.logs: /var/log/elasticsearch
bootstrap.memory_lock: true
```

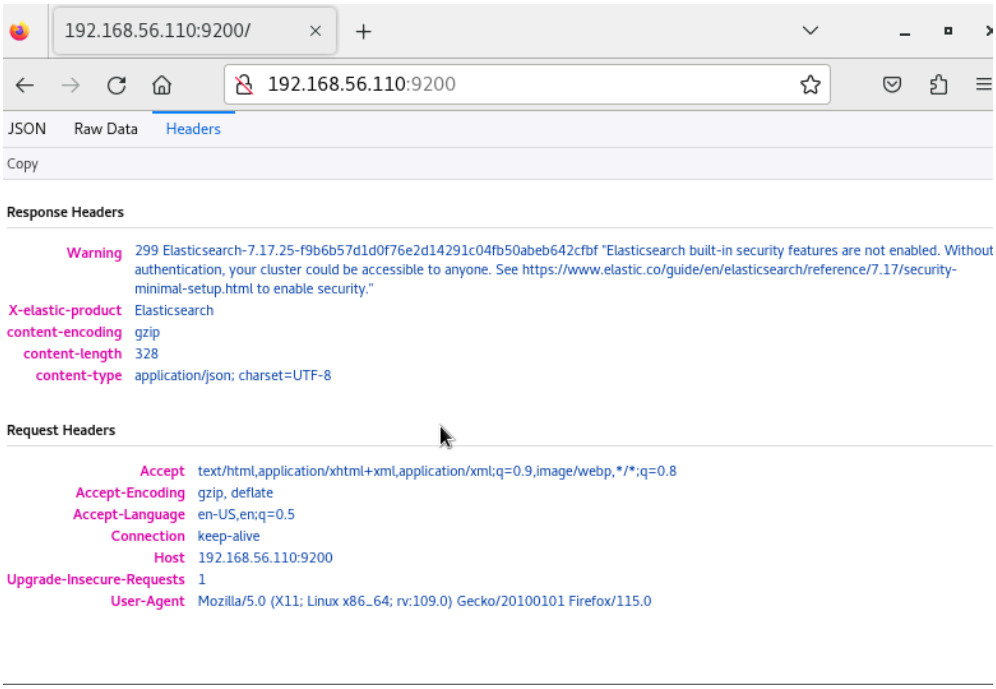
Config file for elasticsearch

Executing the playbook

```
PLAY [Install Elasticsearch] ***************************************************************

TASK [Gathering Facts] *********************************************************************
ok: [192.168.56.110]

TASK [elasticsearch : Install Java] ********************************************************
ok: [192.168.56.110]

TASK [elasticsearch : Install EPEL repository] *********************************************
ok: [192.168.56.110]

TASK [elasticsearch : Install Elastic Search YUM repository] *******************************
ok: [192.168.56.110]

TASK [elasticsearch : Install Elastic Search] **********************************************
ok: [192.168.56.110]

TASK [elasticsearch : Configure Elastic Search] ********************************************
ok: [192.168.56.110]

TASK [elasticsearch : Start Elastic Search] ************************************************
changed: [192.168.56.110]

TASK [elasticsearch : Allow port 9200 through the firewall] ********************************
changed: [192.168.56.110]

PLAY RECAP *********************************************************************************
192.168.56.109             : ok=4    changed=0    unreachable=0    failed=0
192.168.56.110             : ok=10   changed=2    unreachable=0    failed=0
```

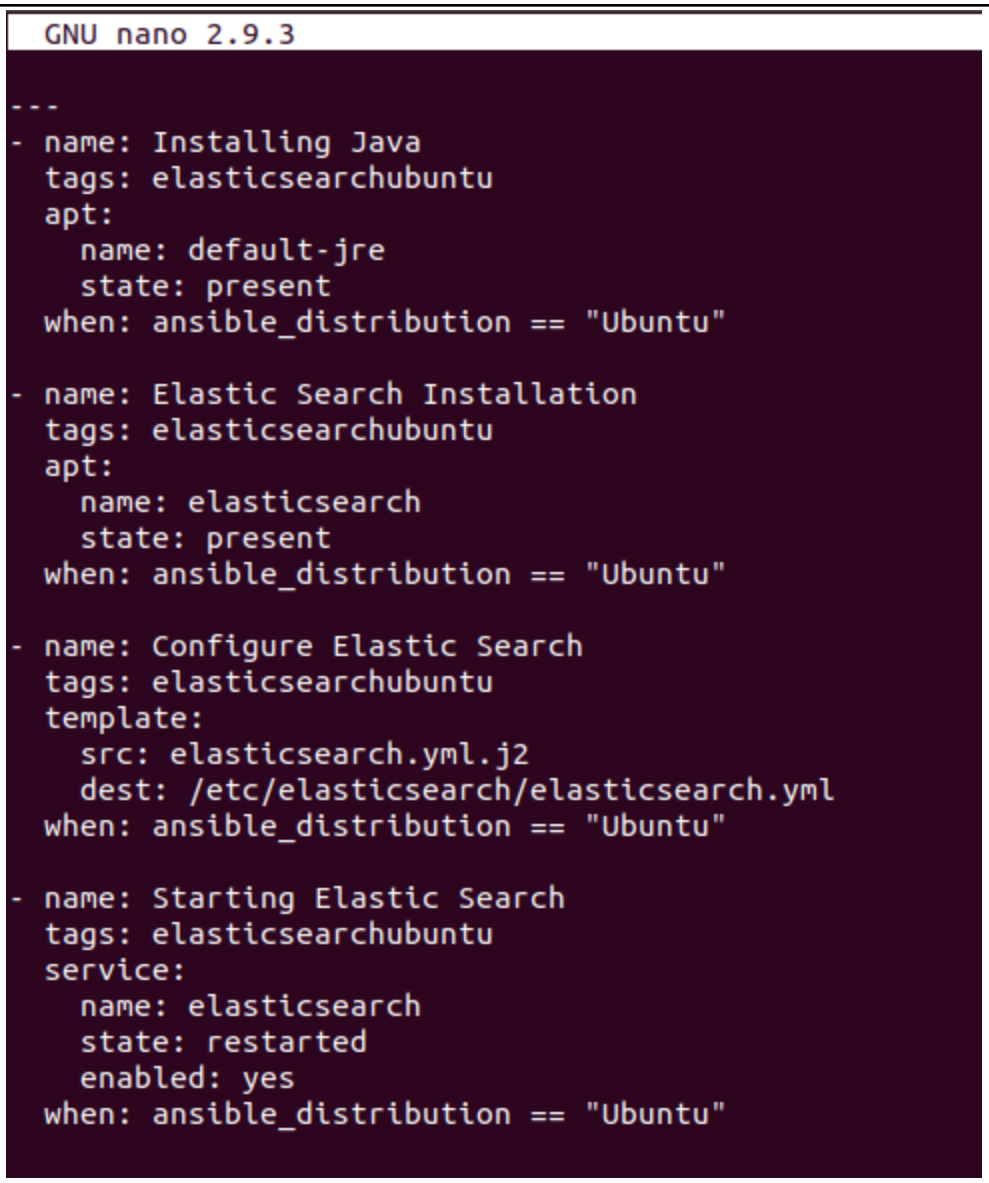
Proof of installation (Elasticsearch for CentOS)

```
azamora_admin@CentOS ~]$ systemctl status elasticsearch.service ticsearch
elasticsearch.service - Elasticsearch
   Loaded: loaded (/usr/lib/systemd/system/elasticsearch.service; enabled; vendor pr
: disabled)
   Active: active (running) since Wed 2024-11-06 09:43:22 PST; 12min ago
     Docs: https://www.elastic.co
 Main PID: 13000 (java)
    Tasks: 55
   CGroup: /system.slice/elasticsearch.service
           ├─13000 /usr/share/elasticsearch/jdk/bin/java -Xshare:auto -Des.networkac
           └─13159 /usr/share/elasticsearch/modules/x-pack-ml/platform/linux-x86_64/

Nov 06 09:42:28 CentOS systemd[1]: Starting Elasticsearch...
Nov 06 09:42:44 CentOS systemd-entrypoint[13000]: Nov 06, 2024 9:42:44 AM sun.util..
Nov 06 09:42:45 CentOS systemd-entrypoint[13000]: WARNING: COMPAT locale provider w.
Nov 06 09:43:22 CentOS systemd[1]: Started Elasticsearch.
Unit ticsearch.service could not be found.
Hint: Some lines were ellipsized, use -l to show in full.
azamora_admin@CentOS ~]$
```



```
zamora_admin@workstation:~/CPE_MIDEXAM_ZAMORA/roles/elasticsearchubuntu$ tree
.
└── tasks
    ├── elasticsearch.yml.j2
    └── main.yml

1 directory, 2 files
zamora_admin@workstation:~/CPE_MIDEXAM_ZAMORA/roles/elasticsearchubuntu$
```

- Creation of ubuntuelasticsearch folder



```
  GNU nano 2.9.3

---
- name: Installing Java
  tags: elasticsearchubuntu
  apt:
    name: default-jre
    state: present
  when: ansible_distribution == "Ubuntu"

- name: Elastic Search Installation
  tags: elasticsearchubuntu
  apt:
    name: elasticsearch
    state: present
  when: ansible_distribution == "Ubuntu"

- name: Configure Elastic Search
  tags: elasticsearchubuntu
  template:
    src: elasticsearch.yml.j2
    dest: /etc/elasticsearch/elasticsearch.yml
  when: ansible_distribution == "Ubuntu"

- name: Starting Elastic Search
  tags: elasticsearchubuntu
  service:
    name: elasticsearch
    state: restarted
    enabled: yes
  when: ansible_distribution == "Ubuntu"
```

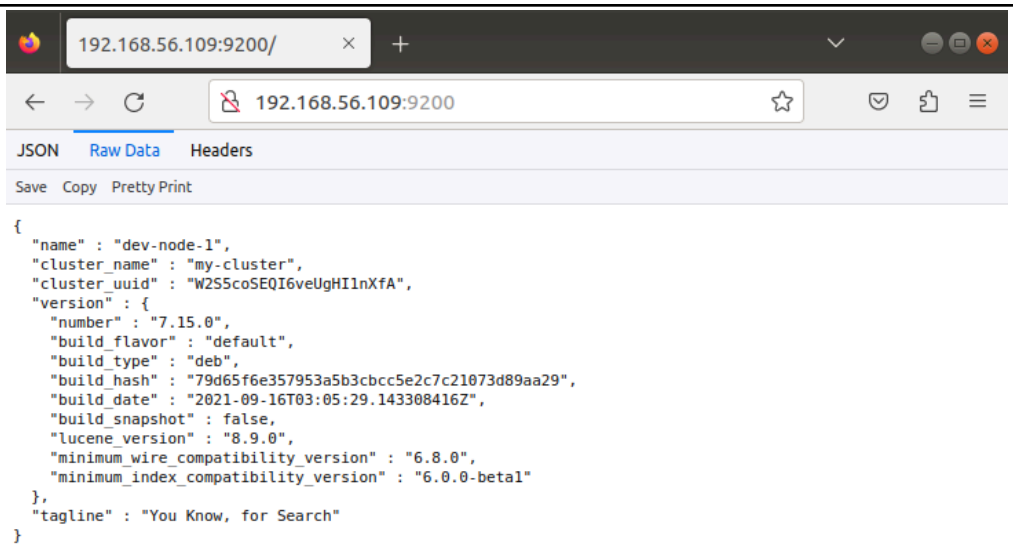
Elasticsearchubuntu main.yml

Elasticsearch(Ubuntu)

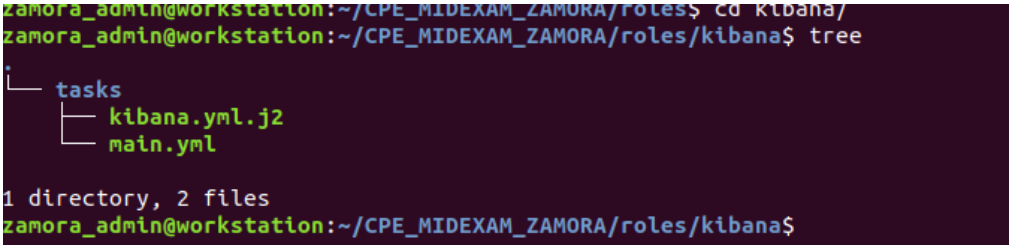
```
PLAY [Install Elasticsearch] ***************************************************

TASK [Gathering Facts] *********************************************************
ok: [192.168.56.109]

TASK [elasticsearchubuntu : Installing Java] ***********************************
ok: [192.168.56.109]

TASK [elasticsearchubuntu : Elastic Search Installation] ***********************
ok: [192.168.56.109]

TASK [elasticsearchubuntu : Configure Elastic Search] **************************
ok: [192.168.56.109]

TASK [elasticsearchubuntu : Starting Elastic Search] ***************************
changed: [192.168.56.109]

PLAY [Install Elasticsearch] ***************************************************

TASK [Gathering Facts] *********************************************************
ok: [192.168.56.110]

PLAY RECAP *********************************************************************
192.168.56.109             : ok=8    changed=1    unreachable=0    failed=0
192.168.56.110             : ok=3    changed=0    unreachable=0    failed=0
```

Proof of installation Ubuntu Server 2

```
zamora_admin@server2:~$ systemctl status elasticsearch
● elasticsearch.service - Elasticsearch
     Loaded: loaded (/usr/lib/systemd/system/elasticsearch.service; enabled; vend
    Drop-In: /etc/systemd/system/elasticsearch.service.d
             └─startup-timeout.conf
     Active: active (running) since Wed 2024-11-06 09:59:57 +08; 3min 58s ago
       Docs: https://www.elastic.co
   Main PID: 1206 (java)
      Tasks: 81 (limit: 4656)
     CGroup: /system.slice/elasticsearch.service
             ├─1206 /usr/share/elasticsearch/jdk/bin/java -Xshare:auto -Des.netwo
             └─2116 /usr/share/elasticsearch/modules/x-pack-ml/platform/linux-x86

Warning: Journal has been rotated since unit was started. Log output is incompl
lines 1-13/13 (END)
```



Kibana:



Creation of setup Kibana

```
  GNU nano 2.9.3                                          tasks/main.yml

---
- name: Add GPG key for Elastic APT repository
  tags: kibana
  apt_key:
    url: https://artifacts.elastic.co/GPG-KEY-elasticsearch
    state: present
  when: ansible_distribution == "Ubuntu"

- name: Add Kibana APT repository
  tags: kibana
  apt_repository:
    repo: "deb https://artifacts.elastic.co/packages/7.x/apt stable main"
    state: present
  when: ansible_distribution == "Ubuntu"

- name: Install specific version of Kibana
  tags: kibana
  apt:
    name: kibana
    state: present
  when: ansible_distribution == "Ubuntu"

- name: Create directory for Kibana systemd override
  tags: kibana
  file:
    path: /etc/systemd/system/kibana.service.d
    state: directory
    mode: '0755'
    owner: root
    group: root
  when: ansible_distribution == "Ubuntu"

- name: Check if the directory was created
  tags: kibana
  stat:
    path: /etc/systemd/system/kibana.service.d
  register: kibana_override_dir

- debug:
    msg: "Directory exists: {{ kibana_override_dir.stat.exists }}"

- name: Create Kibana service override configuration
  tags: kibana
  file:
    path: /etc/systemd/system/kibana.service.d/override.conf
    state: touch  # Ensures the file exists
    owner: root
```

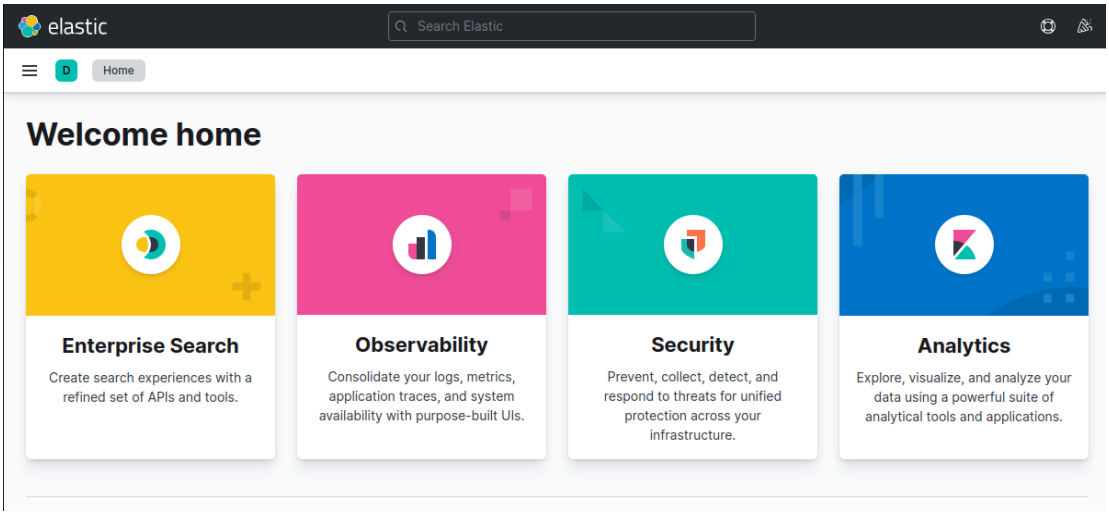
```
- name: Configure Kibana (Setting OpenSSL Legacy Provider)
  tags: kibana
  blockinfile:
    path: /etc/systemd/system/kibana.service.d/override.conf
    block: |
      [Service]
      Environment=NODE_OPTIONS=--openssl-legacy-provider
    owner: root
    group: root
    mode: '0644'
  when: ansible_distribution == "Ubuntu"

- name: Configure Kibana
  tags: kibana
  template:
    src: kibana.yml.j2
    dest: /etc/kibana/kibana.yml
  when: ansible_distribution == "Ubuntu"

- name: Reload systemd
  tags: kibana
  command: systemctl daemon-reload
  when: ansible_distribution == "Ubuntu"

- name: Enable Kibana service
  tags: kibana
  service:
    name: kibana
    state: restarted
  become: yes
  when: ansible_distribution == "Ubuntu"
```

Kibana Playbook

Executing the Play Kibana:

```
PLAY [Install Kibana] ***************************************************

TASK [Gathering Facts] ***************************************************
ok: [192.168.56.109]

TASK [kibana : Add GPG key for Elastic APT repository] *******************
ok: [192.168.56.109]

TASK [kibana : Add Kibana APT repository] ********************************
ok: [192.168.56.109]

TASK [kibana : Install specific version of Kibana] ***********************
ok: [192.168.56.109]

TASK [kibana : Create directory for Kibana systemd override] *************
changed: [192.168.56.109]

TASK [kibana : Check if the directory was created] ***********************
ok: [192.168.56.109]

TASK [kibana : Create Kibana service override configuration] *************
changed: [192.168.56.109]

TASK [kibana : Configure Kibana (Setting OpenSSL Legacy Provider)] *******
changed: [192.168.56.109]

TASK [kibana : Configure Kibana] *****************************************
changed: [192.168.56.109]

TASK [kibana : Reload systemd] *******************************************
changed: [192.168.56.109]

TASK [kibana : Enable Kibana service] ************************************
changed: [192.168.56.109]
```

Proof of installation:



Logstash:

```
zamora_admin@workstation:~/CPE_MIDEXAM_ZAMORA/roles$ tree logstash/
logstash/
└── tasks
    ├── logstash.conf.j2
    └── main.yml

1 directory, 2 files
zamora_admin@workstation:~/CPE_MIDEXAM_ZAMORA/roles$
```

```
 GNU nano 2.9.3                                                main.yml

- name: Install dependencies
  tags: logstash
  apt:
    name: gnupg
    state: present
    update_cache: yes
  become: yes

- name: Add Elastic APT repository key
  tags: logstash
  apt_key:
    url: https://artifacts.elastic.co/GPG-KEY-elasticsearch
    state: present

- name: Add Elastic APT repository
  tags: logstash
  apt_repository:
    repo: "deb https://artifacts.elastic.co/packages/7.x/apt stable main"
    state: present

- name: Install Logstash
  tags: logstash
  apt:
    name: logstash
    state: present

- name: Start and Enable Logstash service
  tags: logstash
  systemd:
    name: logstash
    enabled: yes
    state: started
```

```
  GNU nano 2.9.3

nput {
  beats {
    port => 5044
  }
}

filter {
  # Add any filters here
}

output {
  elasticsearch {
    hosts => ["http://192.168.56.104:9200"]
    index => "logstash-%{+YYYY.MM.dd}"
  }
}
```

Proof of Installation:

```
zamora_admin@server2:~$ systemctl status logstash
● logstash.service - logstash
   Loaded: loaded (/etc/systemd/system/logstash.service; enabled; vendor preset
   Active: active (running) since Wed 2024-11-06 10:19:22 +08; 1s ago
 Main PID: 11945 (java)
    Tasks: 16 (limit: 4656)
   CGroup: /system.slice/logstash.service
           └─11945 /usr/share/logstash/jdk/bin/java -Xms1g -Xmx1g -XX:+UseConcM
lines 1-7/7 (END)
```

Nagios:

```
zamora_admin@workstation:~/CPE_MIDEXAM_ZAMORA/roles/nagios$ tree
.
└── tasks
    └── main.yml

1 directory, 1 file
```

-Creation of nagios' role folder

```
  GNU nano 2.9.3                                                main.yml

---
  - name: Install required dependencies on Ubuntu
    tags: nagios
    apt:
      name:
        - gcc
        - libc6
        - make
        - wget
        - unzip
        - apache2
        - php
        - libgd-dev
        - openssl
        - libssl-dev
        - autoconf
        - bc
        - gawk
        - dc
        - build-essential
        - snmp
        - libnet-snmp-perl
        - gettext
      state: present
    when: ansible_distribution == "Ubuntu"

  - name: Download Nagios Core source code
    tags: nagios
    get_url:
      url: "https://assets.nagios.com/downloads/nagioscore/releases/nagios-4.5.6.tar.gz"
      dest: /tmp/nagios-4.5.6.tar.gz

  - name: Extract Nagios source code
    tags: nagios
    unarchive:
      src: /tmp/nagios-4.5.6.tar.gz
      dest: /tmp
      remote_src: yes
```

```
- name: Extract Nagios Plugins
  tags: nagios
  unarchive:
    src: /tmp/nagios-plugins-2.4.11.tar.gz
    dest: /tmp
    remote_src: yes

- name: Create Nagios group
  tags: nagios
  group:
    name: nagios

- name: Create Nagios user and group
  tags: nagios
  user:
    name: nagios
    group: nagios

- name: Create nagcmd group
  tags: nagios
  group:
    name: nagcmd
```

```
- name: Add nagios and apache/httpd users to nagcmd group
  tags: nagios
  user:
    name: "{{ item }}"
    groups: nagcmd
    append: yes
  loop:
    - nagios
    - "{{ 'www-data' if ansible_os_family == 'Debian' else 'apache' }}"

- name: Compile and install Nagios Core
  tags: nagios
  shell: |
    cd /tmp/nagios-4.5.6
    ./configure --with-command-group=nagcmd
    make all
    make install
    make install-init
    make install-commandmode
    make install-config
    make install-webconf
  args:
    creates: /usr/local/nagios/bin/nagios
```

```
- name: Set Nagios admin password
  tags: nagios
  command: htpasswd -b -c /usr/local/nagios/etc/htpasswd.users zamora_admin "sample"

- name: Enable and start Apache/Httpd service on Ubuntu
  tags: nagios
  service:
    name: apache2
    enabled: yes
    state: started
  when: ansible_distribution == "Ubuntu"


- name: Enable and start Nagios service
  tags: nagios
  service:
    name: nagios
    enabled: yes
    state: started

- name: Enable external command execution in Nagios
  tags: nagios
  lineinfile:
    path: /usr/local/nagios/etc/nagios.cfg
    regexp: '^#?check_external_commands='
    line: 'check_external_commands=1'

- name: Restart Nagios service to apply changes
  tags: nagios
  service:
    name: nagios
    state: restarted

- name: Restart Apache/Httpd to apply changes on Ubuntu
  tags: nagios
  service:
    name: apache2
    state: restarted
  when: ansible_distribution == "Ubuntu"
```

- The content of nagios' main.yml

```
- name: Install Nagios in Ubuntu
  hosts: Ubuntu
  become: yes
  roles:
    - nagios
```

The part in midterm.yml to run the nagios folder

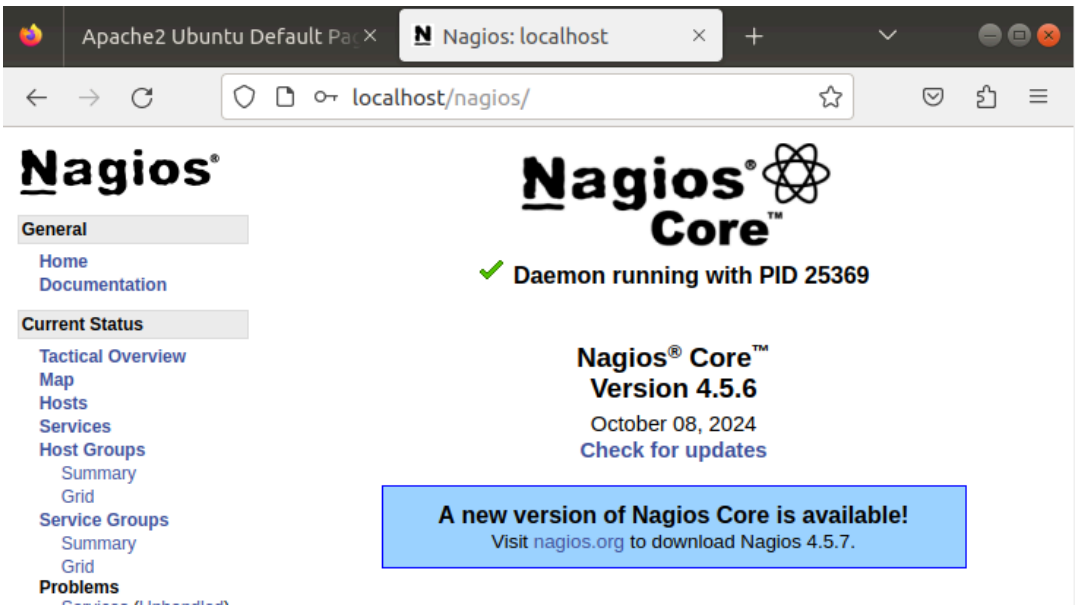
Executing the nagios playbook

```
PLAY [Install Nagios in Ubuntu] ************************************************

TASK [Gathering Facts] *********************************************************
ok: [192.168.56.109]

TASK [nagios : Install required dependencies on Ubuntu] ************************
ok: [192.168.56.109]

TASK [nagios : Download Nagios Core source code] *******************************
changed: [192.168.56.109]

TASK [nagios : Extract Nagios source code] *************************************
changed: [192.168.56.109]

TASK [nagios : Download Nagios Plugins] ****************************************
changed: [192.168.56.109]

TASK [nagios : Extract Nagios Plugins] *****************************************
changed: [192.168.56.109]

TASK [nagios : Create Nagios group] ********************************************
ok: [192.168.56.109]

TASK [nagios : Create Nagios user and group] ***********************************
ok: [192.168.56.109]

TASK [nagios : Create nagcmd group] ********************************************
ok: [192.168.56.109]

TASK [nagios : Add nagios and apache/httpd users to nagcmd group] **************
ok: [192.168.56.109] => (item=nagios)
ok: [192.168.56.109] => (item=www-data)

TASK [nagios : Compile and install Nagios Core] ********************************
ok: [192.168.56.109]

TASK [nagios : Install Nagios Plugins] *****************************************
ok: [192.168.56.109]

TASK [nagios : Set Nagios admin password] **************************************
changed: [192.168.56.109]
```

```
TASK [nagios : Enable and start Apache/Httpd service on Ubuntu] ************************
ok: [192.168.56.109]

TASK [nagios : Enable and start Nagios service] ************************************
ok: [192.168.56.109]

TASK [nagios : Enable external command execution in Nagios] ****************************
ok: [192.168.56.109]

TASK [nagios : Restart Nagios service to apply changes] ********************************
changed: [192.168.56.109]

TASK [nagios : Restart Apache/Httpd to apply changes on Ubuntu] ************************
changed: [192.168.56.109]

PLAY RECAP *************************************************************************
192.168.56.109             : ok=19   changed=7    unreachable=0    failed=0
192.168.56.110             : ok=1    changed=0    unreachable=0    failed=0
```

Proof of Installation:
Nagios in Ubuntu Server 2

```
zamora_admin@server2:~$ systemctl status nagios
● nagios.service - Nagios Core 4.5.6
     Loaded: loaded (/lib/systemd/system/nagios.service; enabled; vendor preset:
     Active: active (running) since Wed 2024-11-06 08:53:32 +08; 4min 7s ago
       Docs: https://www.nagios.org/documentation
    Process: 25366 ExecStopPost=/bin/rm -f /usr/local/nagios/var/rw/nagios.cmd (c
    Process: 25365 ExecStop=/bin/kill -s TERM ${MAINPID} (code=exited, status=0/S
    Process: 25368 ExecStart=/usr/local/nagios/bin/nagios -d /usr/local/nagios/et
    Process: 25367 ExecStartPre=/usr/local/nagios/bin/nagios -v /usr/local/nagios
   Main PID: 25369 (nagios)
      Tasks: 8 (limit: 4656)
     CGroup: /system.slice/nagios.service
             ├─25369 /usr/local/nagios/bin/nagios -d /usr/local/nagios/etc/nagios
             ├─25370 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/
             ├─25371 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/
             ├─25372 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/
             ├─25373 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/
             ├─25374 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/
             ├─25375 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/
             └─25419 /usr/local/nagios/bin/nagios -d /usr/local/nagios/etc/nagios
lines 1-19/19 (END)
```



3.2 Install Grafana,Prometheus and Influxdb in seperate hosts (Influxdb,Grafana,Prometheus).

Create two directory one is ubuntuprometheus and centosprometheus

```
zamora_admin@workstation:~/CPE_MIDEXAM_ZAMORA$ ls roles
apache  centosprometheus  mariadb  nagios  php  ubuntuprometheus
zamora_admin@workstation:~/CPE_MIDEXAM_ZAMORA$
```

```
zamora_admin@workstation:~/CPE_MIDEXAM_ZAMORA$ tree roles/centosprometheus/
roles/centosprometheus/
└── tasks
    └── main.yml

1 directory, 1 file
zamora_admin@workstation:~/CPE_MIDEXAM_ZAMORA$
```

```
zamora_admin@workstation:~/CPE_MIDEXAM_ZAMORA$ tree roles/ubuntuprometheus/
roles/ubuntuprometheus/
└── tasks
    └── main.yml

1 directory, 1 file
zamora_admin@workstation:~/CPE_MIDEXAM_ZAMORA$
```

```
  GNU nano 2.9.3                                    tasks/main.yml

---
 - name: Install Prometheus (CentOS)
   tags: prometheus
   unarchive:
     src: https://github.com/prometheus/prometheus/releases/download/v2.30.0/prometheus-2.30.0.linux-amd64.tar.gz
     dest: /usr/local/bin
     remote_src: yes
     mode: 0755
     owner: root
     group: root
   when: ansible_distribution == "CentOS"

 - name: Copy Prometheus binaries
   tags: prometheus
   copy:
     src: /usr/local/bin/prometheus-2.30.0.linux-amd64/prometheus
     dest: /usr/local/bin/prometheus
     mode: 0755
     remote_src: yes
   when: ansible_distribution == "CentOS"

 - name: Copy Promtool binaries
   tags: prometheus
   copy:
     src: /usr/local/bin/prometheus-2.30.0.linux-amd64/prometheus
     dest: /usr/local/bin/promtool
     mode: 0755
     remote_src: yes
   when: ansible_distribution == "CentOS"

 - name: Create Prometheus directories
   tags: prometheus
   file:
     path: "{{ item }}"
     state: directory
   loop:
     - /etc/prometheus
     - /var/lib/prometheus
   when: ansible_distribution == "CentOS"

 - name: Copy prometheus.yml to /etc/prometheus
   tags: prometheus
   command: cp /usr/local/bin/prometheus-2.30.0.linux-amd64/prometheus.yml /etc/prometheus
   when: ansible_distribution == "CentOS"
```

```
- name: Copy consoles directory to /etc/prometheus
  tags: prometheus
  command: cp -r /usr/local/bin/prometheus-2.30.0.linux-amd64/consoles /etc/prometheus
  when: ansible_distribution == "CentOS"

- name: Copy console_libraries directory to /etc/prometheus
  tags: prometheus
  command: cp -r /usr/local/bin/prometheus-2.30.0.linux-amd64/console_libraries /etc/prometheus
  when: ansible_distribution == "CentOS"
```

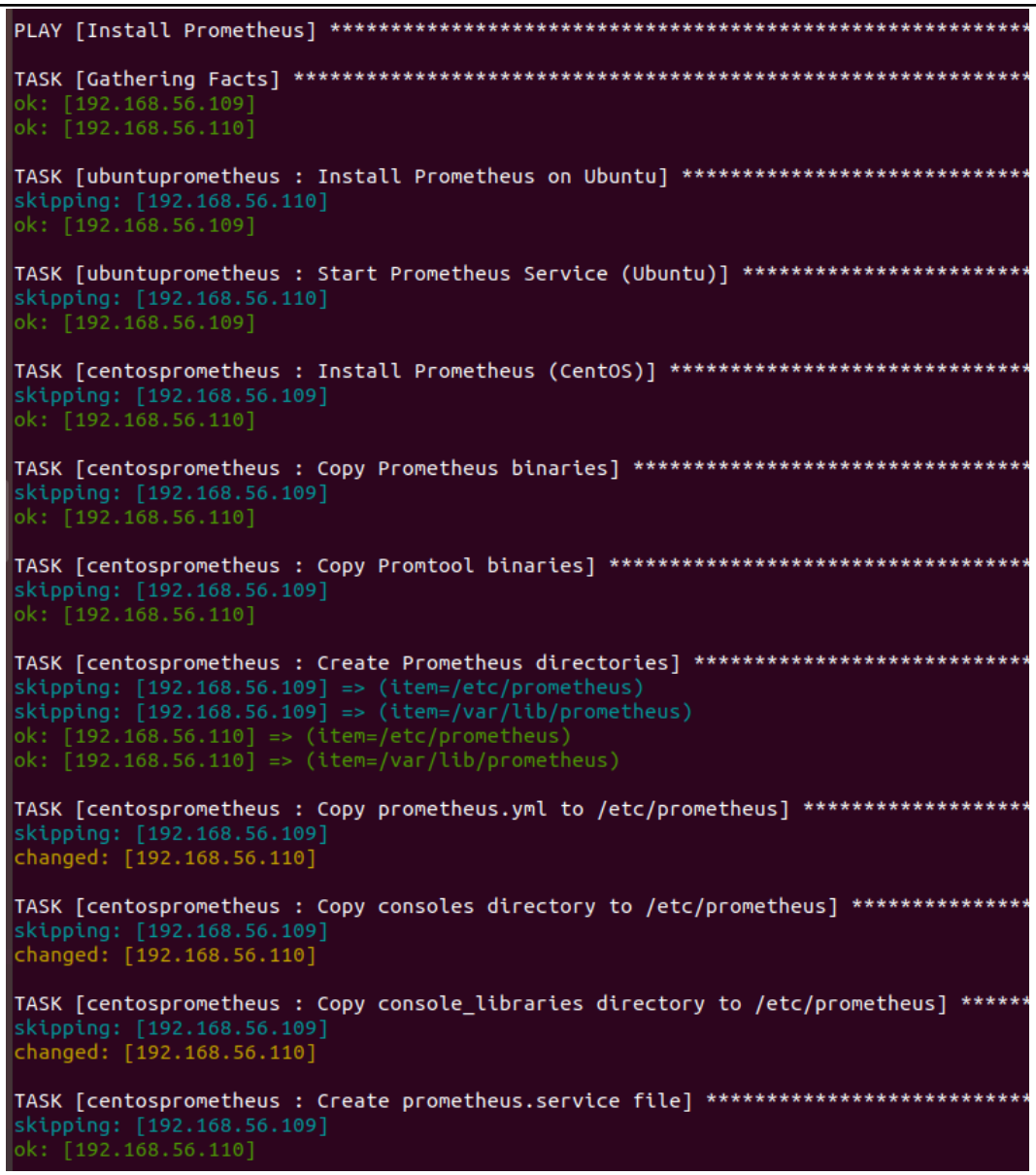
```
- name: Create prometheus.service file
  tags: prometheus
  copy:
    dest: /etc/systemd/system/prometheus.service
    content: |
      [Unit]
      Description=Prometheus
      Wants=network-online.target
      After=network-online.target

      [Service]
      User=root
      Group=root
      Type=simple
      ExecStart=/usr/local/bin/prometheus \
              --config.file /etc/prometheus/prometheus.yml \
              --storage.tsdb.path /var/lib/prometheus \
              --web.console.templates=/etc/prometheus/consoles \
              --web.console.libraries=/etc/prometheus/console_libraries \

      [Install]
      WantedBy=multi-user.target
  when: ansible_distribution == "CentOS"

- name: Reload systemd
  tags: prometheus
  command: systemctl daemon-reload
  when: ansible_distribution == "CentOS"

- name: Start Prometheus Service
  tags: prometheus
  systemd:
     name: prometheus
     enabled: yes
     state: started
  when: ansible_distribution == "CentOS"
```

The contents of the centosprometheus's main.yml

```
  GNU nano 2.9.3                                          tasks/main.yml

---
- name: Install Prometheus on Ubuntu
  tags: prometheus
  apt:
    name: prometheus
    state: latest
  when: ansible_distribution == "Ubuntu"

- name: Start Prometheus Service (Ubuntu)
  tags: prometheus
  systemd:
    name: prometheus
    enabled: yes
    state: started
  when: ansible_distribution == "Ubuntu"
```

The contents of the ubuntuprometheus's main.yml

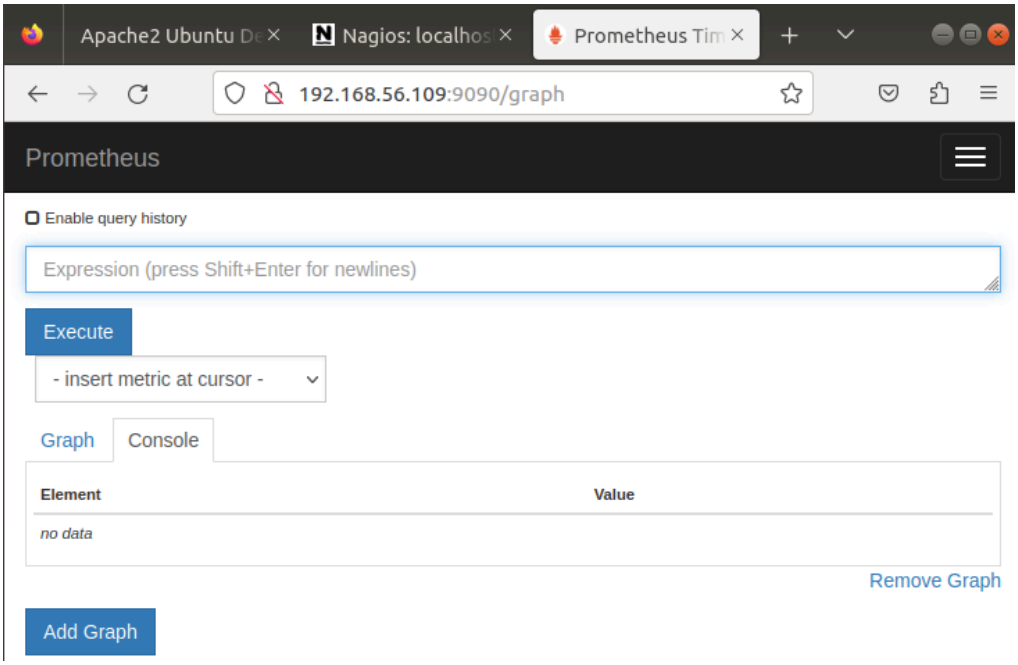
Executing the prometheus play:



Proof of Installation (Prometheus)

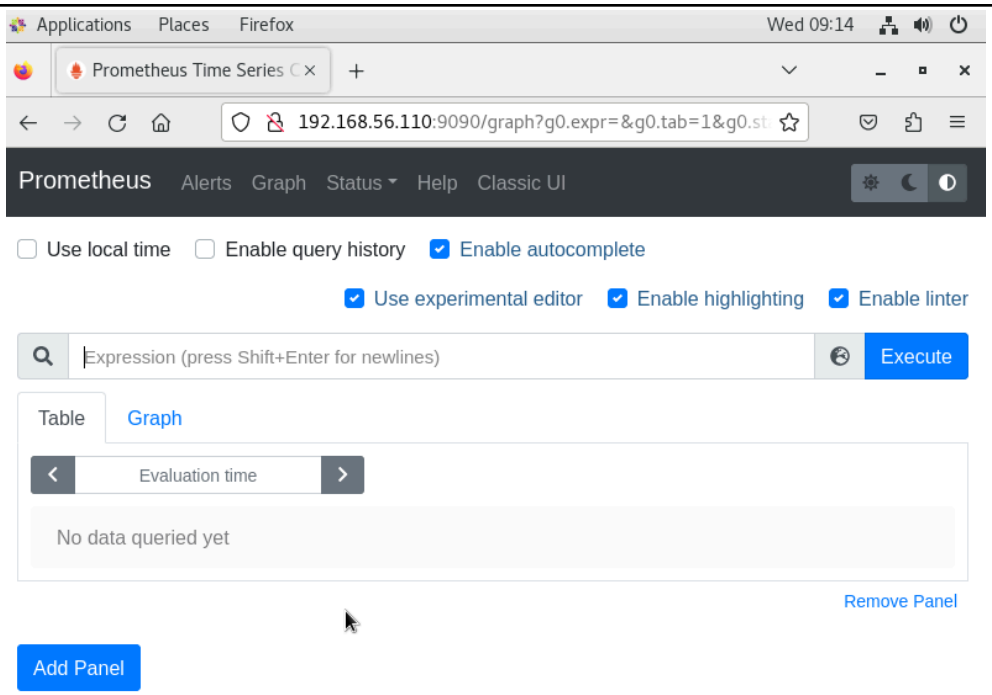
Ubuntu (Server 2):

```
zamora_admin@server2:~$ systemctl status prometheus
● prometheus.service - Monitoring system and time series database
     Loaded: loaded (/lib/systemd/system/prometheus.service; enabled; vendor pres
     Active: active (running) since Wed 2024-11-06 07:23:26 +08; 1h 49min ago
       Docs: https://prometheus.io/docs/introduction/overview/
   Main PID: 836 (prometheus)
      Tasks: 12 (limit: 4656)
     CGroup: /system.slice/prometheus.service
             └─836 /usr/bin/prometheus

Warning: Journal has been rotated since unit was started. Log output is incompl
lines 1-10/10 (END)
```



CentOS (Node 1):

```
[azamora_admin@CentOS ~]$ systemctl status prometheus
● prometheus.service - Prometheus
   Loaded: loaded (/etc/systemd/system/prometheus.service; enabled; vendor preset: disa
bled)
   Active: active (running) since Wed 2024-11-06 07:24:29 PST; 1h 49min ago
 Main PID: 1169 (prometheus)
    Tasks: 7
   CGroup: /system.slice/prometheus.service
           └─1169 /usr/local/bin/prometheus --config.file /etc/prometheus/prometheus...

Nov 06 07:26:13 CentOS prometheus[1169]: level=info ts=2024-11-05T23:26:13.657Z ca...7s
Nov 06 07:26:13 CentOS prometheus[1169]: level=info ts=2024-11-05T23:26:13.658Z ca…74µs
Nov 06 07:26:14 CentOS prometheus[1169]: level=info ts=2024-11-05T23:26:14.632Z ca...00
Nov 06 07:26:16 CentOS prometheus[1169]: level=info ts=2024-11-05T23:26:16.107Z ca...1s
Nov 06 07:26:20 CentOS prometheus[1169]: level=info ts=2024-11-05T23:26:20.467Z ca...1s
Nov 06 07:26:20 CentOS prometheus[1169]: level=info ts=2024-11-05T23:26:20.628Z ca...KW
Nov 06 07:26:21 CentOS prometheus[1169]: level=info ts=2024-11-05T23:26:21.134Z ca...6W
Nov 06 07:26:27 CentOS prometheus[1169]: level=info ts=2024-11-05T23:26:27.356Z ca...5s
Nov 06 07:26:27 CentOS prometheus[1169]: level=info ts=2024-11-05T23:26:27.714Z ca...61
Nov 06 07:26:28 CentOS prometheus[1169]: level=info ts=2024-11-05T23:26:28.448Z ca...A4
Hint: Some lines were ellipsized, use -l to show in full.
[azamora_admin@CentOS ~]$
```



3.3 Install Lamp Stack in separate hosts (Httpd + Php,Mariadb)

```
zamora_admin@workstation:~/CPE_MIDEXAM_ZAMORA/roles/apache$ tree
.
└── tasks
    └── main.yml

1 directory, 1 file
zamora_admin@workstation:~/CPE_MIDEXAM_ZAMORA/roles/apache$
```

Creation of apache/httpd role folder.

```
zamora_admin@workstation:~/CPE_MIDEXAM_ZAMORA/roles/php$ tree
.
└── tasks
    └── main.yml

1 directory, 1 file
```

Creation of php role folder.

```
zamora_admin@workstation:~/CPE_MIDEXAM_ZAMORA/roles/mariadb$ tree
.
└── tasks
    └── main.yml

1 directory, 1 file
zamora_admin@workstation:~/CPE_MIDEXAM_ZAMORA/roles/mariadb$
```

Creation of mariadb role folder.

```
---
- name: Install Apache in Ubuntu (httpd)
  tags: apache2
  become: yes
  apt:
    name: apache2
    state: latest
  when: ansible_distribution == "Ubuntu"

- name: Install Apache in CentOS (httpd)
  tags: apache2
  become: yes
  dnf:
    name: httpd
    state: latest
  when: ansible_distribution == "CentOS"
```

```
- name: start httpf (CentOS)
  tags: apache2
  service:
    name: httpd
    state: started
  when: ansible_distribution == "CentOS"

- name: Allow port 9200 through the firewall
  tags: apache2
  command: firewall-cmd --add-port=80/tcp --permanent
  register: firewall_result
  ignore_errors: true
```

The content of apache's main.yml

```
  GNU nano 2.9.3                          midterm.yml

- name: Install Grafana
  hosts: Ubuntu, CentOS
  roles:
    - grafana

- name: Install httpd,php,mariadb
  hosts: Ubuntu,CentOS
  become: yes
  roles:
    - apache
    - php
    - mariadb
```

- The part in the midterm.yml of running the httpd, php, mariadb.

```
  GNU nano 2.9.3                              main.yml

---
- name: Install PHP in Ubuntu
  tags: php
  become: yes
  apt:
    name: php
    state: present
  when: ansible_distribution == "Ubuntu"

- name: Install PHP in CentOS
  tags: php
  become: yes
  yum:
    name: php
    state: present
  when: ansible_distribution == "CentOS"
```

- The content of php main.yml

```
  GNU nano 2.9.3                              main.yml

---
- name: Install MariaDB
  tags: mariadb
  become: yes
  apt:
    name: mariadb-server
    state: present
  when: ansible_distribution == "Ubuntu"

- name: Install MariaDB
  tags: mariadb
  become: yes
  yum:
    name: mariadb-server
    state: present
  when: ansible_distribution == "CentOS"
```

- The content of mariadb main.yml

Executing apache, php, and mariadb

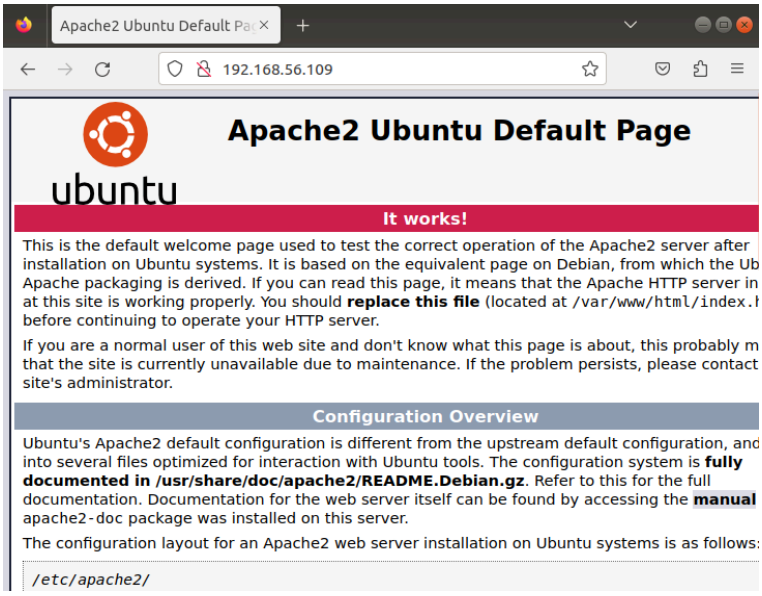
```
zamora_admin@workstation:~/CPE_MIDEXAM_ZAMORA$ ansible-playbook --tags "apache2, php, mariadb" --ask-become-pass midterm.yml
SUDO password:

PLAY [Install httpd,php,mariadb] ***************************************

TASK [Gathering Facts] *************************************************
ok: [192.168.56.110]
ok: [192.168.56.109]

TASK [apache : Install Apache in Ubuntu (httpd)] ***********************
skipping: [192.168.56.110]
ok: [192.168.56.109]

TASK [apache : Install Apache in CentOS (httpd)] ***********************
skipping: [192.168.56.109]
ok: [192.168.56.110]

TASK [apache : start httpf (CentOS)] ***********************************
skipping: [192.168.56.109]
ok: [192.168.56.110]

TASK [apache : Allow port 9200 through the firewall] *******************
skipping: [192.168.56.109]
changed: [192.168.56.110]

TASK [php : Install PHP in Ubuntu] *************************************
skipping: [192.168.56.110]
ok: [192.168.56.109]

TASK [php : Install PHP in CentOS] *************************************
skipping: [192.168.56.109]
ok: [192.168.56.110]

TASK [mariadb : Install MariaDB] ***************************************
skipping: [192.168.56.110]
ok: [192.168.56.109]

TASK [mariadb : Install MariaDB] ***************************************
skipping: [192.168.56.109]
ok: [192.168.56.110]
```

```
PLAY RECAP *************************************************************************
192.168.56.109             : ok=4    changed=0    unreachable=0    failed=0
192.168.56.110             : ok=6    changed=1    unreachable=0    failed=0

zamora_admin@workstation:~/CPE_MIDEXAM_ZAMORA$
```

Proof of installation:

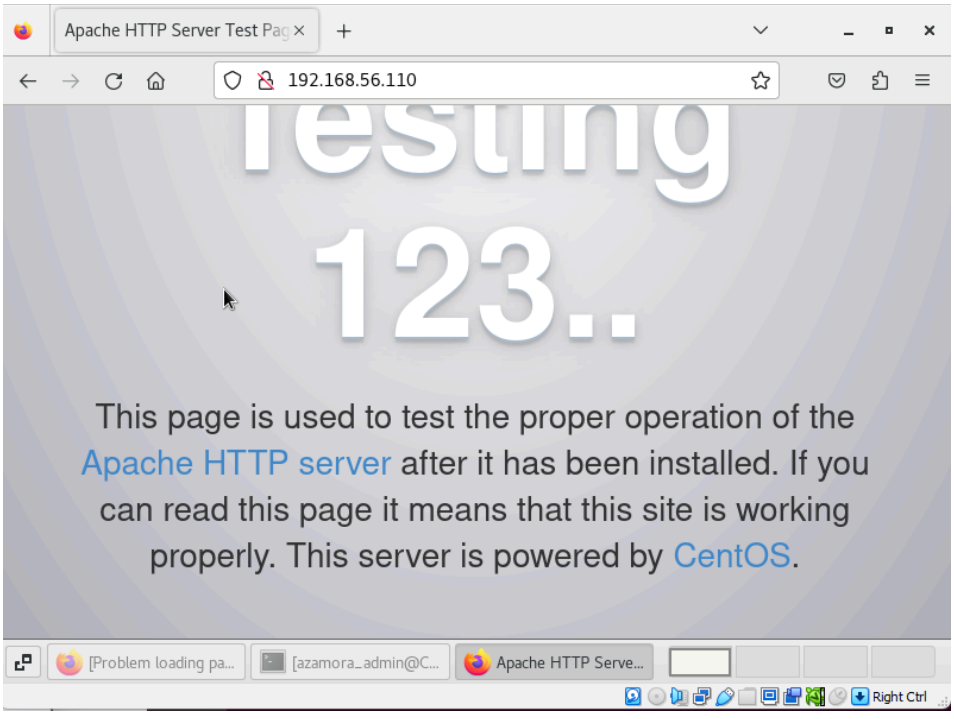
Apache 2 (Ubuntu Server 2)

```
zamora_admin@server2:~$ systemctl status apache2
● apache2.service - The Apache HTTP Server
     Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor preset:
    Drop-In: /lib/systemd/system/apache2.service.d
             └─apache2-systemd.conf
     Active: active (running) since Wed 2024-11-06 07:23:54 +08; 1h 19min ago
    Process: 2809 ExecReload=/usr/sbin/apachectl graceful (code=exited, status=0/
    Process: 958 ExecStart=/usr/sbin/apachectl start (code=exited, status=0/SUCCE
   Main PID: 1316 (apache2)
      Tasks: 7 (limit: 4656)
     CGroup: /system.slice/apache2.service
             ├─ 1316 /usr/sbin/apache2 -k start
             ├─ 2814 /usr/sbin/apache2 -k start
             ├─ 2815 /usr/sbin/apache2 -k start
             ├─ 2816 /usr/sbin/apache2 -k start
             ├─ 2817 /usr/sbin/apache2 -k start
             ├─ 2818 /usr/sbin/apache2 -k start
             └─19622 /usr/sbin/apache2 -k start

Warning: Journal has been rotated since unit was started. Log output is incompl
lines 1-19/19 (END)
```



HTTPD (CentOS Node 1)

```
[azamora_admin@CentOS ~]$ systemctl status httpd
● httpd.service - The Apache HTTP Server
   Loaded: loaded (/usr/lib/systemd/system/httpd.service; enabled; vendor preset: disab
led)
   Active: active (running) since Wed 2024-11-06 07:24:44 PST; 1h 17min ago
     Docs: man:httpd(8)
           man:apachectl(8)
 Main PID: 1185 (httpd)
   Status: "Total requests: 19; Current requests/sec: 0; Current traffic:   0 B/sec"
    Tasks: 7
   CGroup: /system.slice/httpd.service
           ├─1185 /usr/sbin/httpd -DFOREGROUND
           ├─1750 /usr/sbin/httpd -DFOREGROUND
           ├─1751 /usr/sbin/httpd -DFOREGROUND
           ├─1752 /usr/sbin/httpd -DFOREGROUND
           ├─1753 /usr/sbin/httpd -DFOREGROUND
           ├─1754 /usr/sbin/httpd -DFOREGROUND
           └─2112 /usr/sbin/httpd -DFOREGROUND

Nov 06 07:24:30 CentOS systemd[1]: Starting The Apache HTTP Server...
Nov 06 07:24:39 CentOS httpd[1185]: AH00558: httpd: Could not reliably determine ...age
Nov 06 07:24:44 CentOS systemd[1]: Started The Apache HTTP Server.
Hint: Some lines were ellipsized, use -l to show in full.
[azamora_admin@CentOS ~]$
```



GitHub link:

https://github.com/GeloaceRT/CPE_MIDEXAM_ZAMORA

Conclusions: (link your conclusion from the objective)
In this exam, I've learned to install monitoring tools efficiently using ansible's role approach. In this way, it is faster and organized in terms of installing, configuring, and testing the installed tool. I've seen how you need to be careful in configuring each role to install the tools perfectly and efficiently. I've faced many difficulties and etc. like errors in configuration, j2 files, and even links. I've concluded in this activity that this fulfills the objective and ILO'S.