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Course/Section: CPE31S4	**Date Submitted:** 11/06/2023
Instructor: Dr. Jonathan Taylar	**Semester and SY:** 1st - 2023-2024

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

1. Objectives

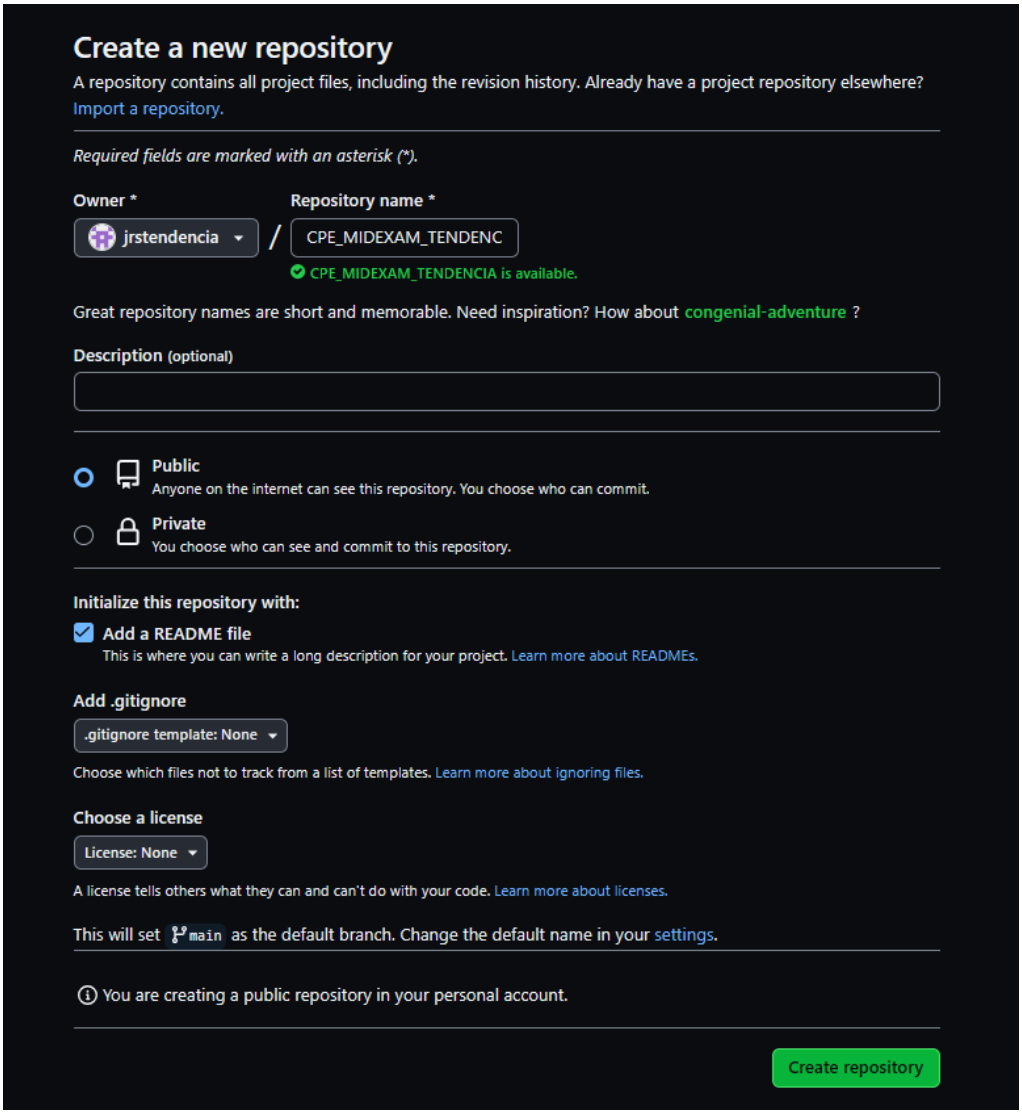
Create and design a workflow that installs, configure and manage enterprise availability, performance and log monitoring tools using Ansible as an Infrastructure as Code (IaC) tool.

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)

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


Create a new repository
A repository contains all project files, including the revision history. Already have a project repository elsewhere?
Import a repository.
Required fields are marked with an asterisk (*).
Owner *
Repository name *
jrstendencia
/
CPE_MIDEXAM_TENDENC
CPE_MIDEXAM_TENDENCIA is available.
Great repository names are short and memorable. Need inspiration? How about congenial-adventure ?
Description (optional)
Public
Anyone on the internet can see this repository. You choose who can commit.
Private
You choose who can see and commit to this repository.
Initialize this repository with:
Add a README file
This is where you can write a long description for your project. Learn more about READMEs.
Add .gitignore
.gitignore template: None
Choose which files not to track from a list of templates. Learn more about ignoring files.
Choose a license
License: None
A license tells others what they can and can't do with your code. Learn more about licenses.
This will set main as the default branch. Change the default name in your settings.
You are creating a public repository in your personal account.
Create repository


CPE_MIDEXAM_TENDENCIA
Public
Pin
Unwatch 1
main
1 branch
0 tags
Go to file
Add file
Code
jrstendencia Initial commit
f33a614 now
1 commit
README.md
Initial commit
now
README.md
CPE_MIDEXAM_TENDENCIA

2. Clone the repository and do the following:

```
tendencia@workstation:~$ git clone git@github.com:jrstendencia/CPE_MIDEXAM_TENDE
NCIA.git
Cloning into 'CPE_MIDEXAM_TENDENCIA'...
remote: Enumerating objects: 3, done.
remote: Counting objects: 100% (3/3), done.
remote: Total 3 (delta 0), reused 0 (delta 0), pack-reused 0
Receiving objects: 100% (3/3), done.
tendencia@workstation:~$ ls
Ansible_S4              HOA10  HOA8            Public
CPE232_JasminTendencia  HOA2   HOA8_Tendencia  snap
CPE_MIDEXAM_TENDENCIA   HOA4   HOA9            Templates
Desktop                 HOA5   HOA9_Final      Tendencia_PrelimExam
Documents               HOA6   Music           Videos
Downloads               HOA7   Pictures
```

2.1. Create an Ansible playbook that does the following with an input of a config.yaml file and arranged Inventory file:
ansible.cfg and inventory file:

```
tendencia@workstation:~/CPE_MIDEXAM_TENDENCIA$ cat ansible.cfg
[defaults]

inventory = inventory
host_key_checking = False

deprecation_warnings = False

remote_user = tendencia
private_key_file = ~/.ssh
tendencia@workstation:~/CPE_MIDEXAM_TENDENCIA$ cat inventory
[nagios_ubuntu]
192.168.56.103

[nagios_centos]
192.168.56.104

[elk_ubuntu]
192.168.56.103

[elk_centos]
192.168.56.104

[prometheus_ubuntu]
192.168.56.103

[prometheus_centos]
192.168.56.104
```

config.yml (playbook):

```yaml
---

- hosts: all
  become: true
  pre_tasks:

  - name: Configure dpkg (Ubuntu)
    shell: |
      dpkg --configure -a
    when: ansible_distribution == "Ubuntu"

  - name: Install dnf and epel-release (CentOS)
    yum:
      name:
        - dnf
        - epel-release
    when: ansible_distribution == "CentOS"

  - name: Install Updates (Ubuntu)
    apt:
      upgrade: dist
      update_cache: yes
    when: ansible_distribution == "Ubuntu"

  - name: Install Updates (CentOS)
    dnf:
      update_only: yes
      update_cache: yes
    when: ansible_distribution == "CentOS"

  - name: Install LAMP Stack (Ubuntu)
    tags: lamp,ubuntu
    apt:
      name:
        - apache2
        - libapache2-mod-php
        - mariadb-server
      state: latest
    when: ansible_distribution == "Ubuntu"

  - name: Install LAMP Stack (CentOS)
    tags: lamp,centos
    yum:
      name:
        - httpd
        - php
        - mariadb-server
      state: latest
    when: ansible_distribution == "CentOS"
```

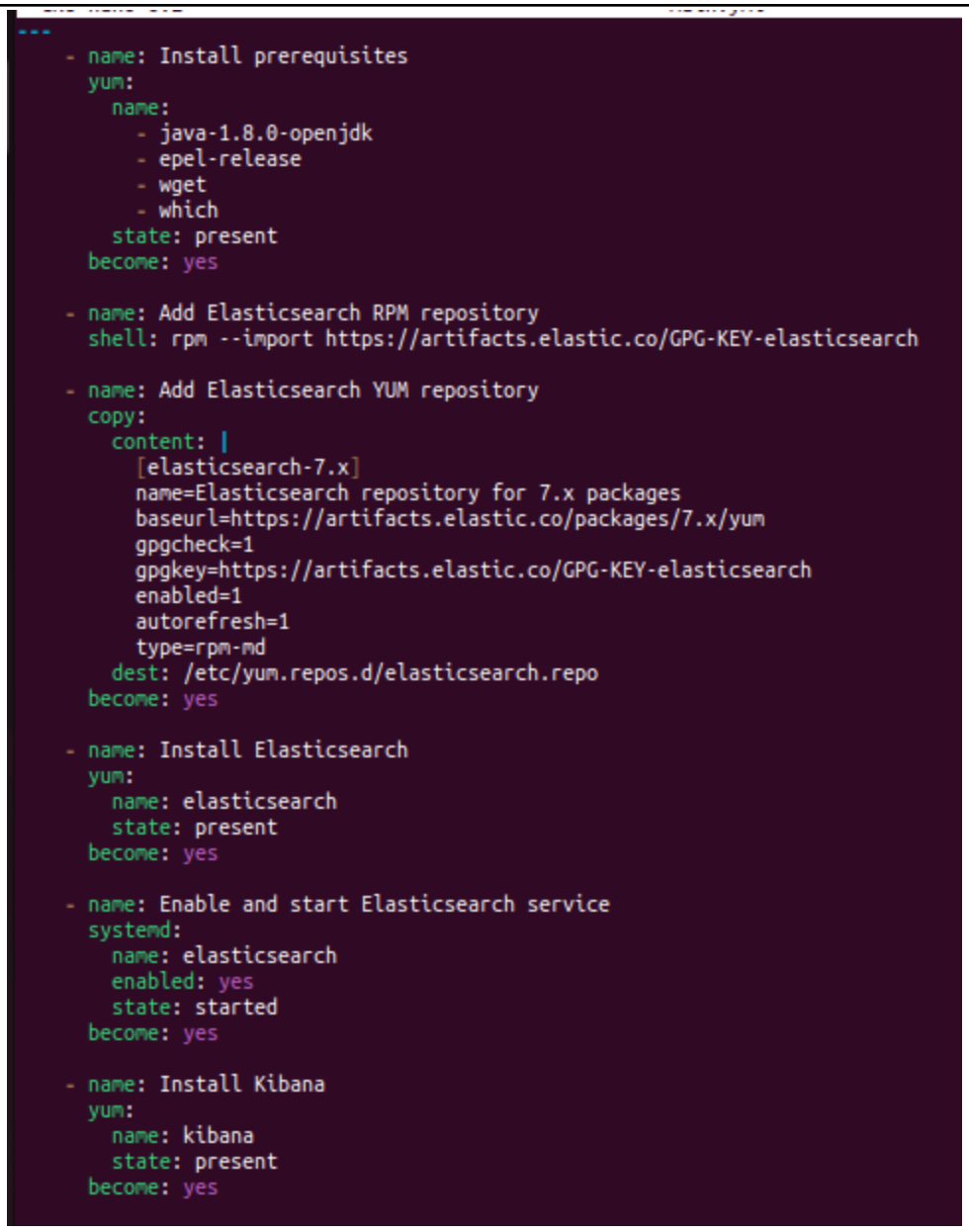
```
  - name: "MariaDB- Restarting/Enabling"
    service:
      name: mariadb
      state: restarted
      enabled: true

- hosts: nagios_ubuntu
  become: true
  roles:
    - nagios_ubuntu

- hosts: nagios_centos
  become: true
  roles:
    - nagios_centos

- hosts: prometheus_ubuntu
  become: true
  roles:
    - prometheus_ubuntu

- hosts: prometheus_centos
  become: true
  roles:
    - prometheus_centos

- hosts: elastic_ubuntu
  become: true
  roles:
    - elastic_ubuntu

- hosts: elastic_centos
  become: true
  roles:
    - elastic_centos
```

2.2. Install and configure Elastic Stack in separate hosts (Elastic Search, Kibana, Logstash)
Elastic (Ubuntu):

```yaml
---
  - name: Install prerequisites
    apt:
      name:
        - default-jre
        - apt-transport-https
        - curl
        - software-properties-common
      state: present
    become: yes

  - name: Add Elasticsearch APT repository 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: present
    become: yes

  - name: Enable and start Elasticsearch service
    systemd:
      name: elasticsearch
      enabled: yes
      state: started
    become: yes

  - name: Install Kibana
    apt:
      name: kibana
      state: present
    become: yes

  - name: Enable and start Kibana service
    systemd:
      name: kibana
      enabled: yes
      state: started
    become: yes
```

```
- name: Install Logstash
  apt:
    name: logstash
    state: present
  become: yes

- name: Enable and start Logstash service
  systemd:
    name: logstash
    enabled: yes
    state: started
  become: yes

- name: Restart Elasticsearch and Kibana
  systemd:
    name: "{{ item }}"
    state: restarted
  loop:
    - elasticsearch
    - kibana
```

Elastic (CentOS):



```
---
  - name: Install prerequisites
    yum:
      name:
        - java-1.8.0-openjdk
        - epel-release
        - wget
        - which
      state: present
    become: yes

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

  - name: Add Elasticsearch YUM repository
    copy:
      content: |
        [elasticsearch-7.x]
        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
    yum:
      name: elasticsearch
      state: present
    become: yes

  - name: Enable and start Elasticsearch service
    systemd:
      name: elasticsearch
      enabled: yes
      state: started
    become: yes

  - name: Install Kibana
    yum:
      name: kibana
      state: present
    become: yes
```

```yaml
- name: Enable and start Kibana service
  systemd:
    name: kibana
    enabled: yes
    state: started
  become: yes

- name: Install Logstash
  yum:
    name: logstash
    state: present
  become: yes

- name: Enable and start Logstash service
  systemd:
    name: logstash
    enabled: yes
    state: started
  become: yes

- name: Restart Elasticsearch and Kibana
  systemd:
    name: "{{ item }}"
    state: restarted
  loop:
    - elasticsearch
    - kibana
```

• Install Nagios in one host

Nagios (Ubuntu):

```yaml
---
- name: nagios libraries and dependencies (Ubuntu)
  tags: ubuntu, 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

- name: passlib package
  pip:
    name: passlib

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

- name: downloading 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: downloading nagios plugins
  unarchive:
    src: https://github.com/nagios-plugins/nagios-plugins/archive/release-2.3.3.tar.gz
    dest: ~/nagios
    remote_src: yes
```

```
    mode: 0777
    owner: root
    group: root

- name: install, compile, adding users and groups
  shell: |
    cd ~/nagios/nagioscore-*
    sudo ./configure --with-httpd-conf=/etc/apache2/sites-enabled
    sudo make all
    sudo make install-groups-users
    sudo usermod -a -G nagios www-data
    sudo make install
    sudo make install-daemoninit
    sudo make install-commandmode
    sudo make install-config
    sudo make install-webconf
    sudo a2enmod rewrite
    sudo a2enmod cgi

- name: compile and install plugins
  shell: |
    cd ~/nagios/nagios-plugins*
    ./tools/setup
    ./configure
    make
    make install

- name: adding users to nagios
  community.general.htpasswd:
    path: /usr/local/nagios/etc/htpasswd.users
    name: admin
    password: admin

- name: Nagios Start/Enable Check
  service:
    name: nagios
    state: restarted
    enabled: true

- name: Apache/httpd Start/Enable check
  service:
    name: apache2
    state: restarted
    enabled: true
```

Nagios (CentOS):

```yaml
---
- name: Installing nagios dependecies and libraries
  tags: dependecies, 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
      - python2-pip
    state: latest

- name: Install passlib python package
  pip:
    name: passlib

- name: Creating a directory (where the downloaded files will be stored)
  file:
    path: ~/nagios
    state: directory

- name: Downloading and extracting 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: Compiling, installing, and adding users and groups in nagios
  shell: |
    cd ~/nagios/nagioscore-**
    ./configure
    make all
    make install-groups-users
    usermod -a -G nagios apache
    make install
    make install-daemoninit
    make install-commandmode
    make install-config
    make install-webconf
- name: Downloading and extracting Nagios plugins
  unarchive:
    src: https://github.com/nagios-plugins/nagios-plugins/archive/release-2.3.3.tar.gz
    dest: ~/nagios
    remote_src: yes
    mode: 0777
    owner: root
    group: root

- name: Compiling and installing plugins
  shell: |
    cd ~/nagios/nagios-plugins*
    ./tools/setup
    ./configure
    make
    make install
- name: Add a user to a password file and ensure permissions are set
  community.general.htpasswd:
    path: /usr/local/nagios/etc/htpasswd.users
    name: admin
    password: admin

- name: Making sure that nagios is started and enabled
  service:
    name: nagios
    state: restarted
    enabled: true

- name: Making sure that httpd is started and enabled
  service:
    name: httpd
    state: restarted
    enabled: true
```

2.3. Install Grafana,Prometheus and Influxdb in seperate hosts (Influxdb,Grafana,Prometheus)
Ubuntu:

```yaml
---
# This is the Prometheus playbook for Ubuntu
- name: Install Prometheus (Ubuntu)
  apt:
    name: prometheus
    state: latest

- name: Prometheus Start/Enable Check service
  service:
    name: prometheus
    state: restarted
    enabled: true

- name: Apache Start/Enable Check
  service:
    name: prometheus
    state: restarted
    enabled: true
```

CentOS:

```yaml
---
- 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: Install Prometheus (CentOS)
  unarchive:
    src: https://github.com/prometheus/prometheus/releases/download/v2.8.1/prometheus-2.8.1.linux-amd64.tar.gz
    dest: ~/prometheus
    remote_src: yes
    mode: 0777
    owner: root
    group: root

- name: Configuring Prometheus
  shell: |
    cd ~/prometheus/prometheus*
    cp -r . /usr/local/bin/prometheus

- name: Create Prometheus Config File
  copy:
    content: |
      global:
        scrape_interval: 10s

      scrape_configs:
        - job_name: 'prometheus_master'
          scrape_interval: 5s
          static_configs:
            - targets: ['localhost:9090']
    dest: /etc/prometheus/prometheus.yml
    owner: prometheus
    group: prometheus

- name: Change Ownership of Prometheus Config File
  shell: chown prometheus:prometheus /etc/prometheus/prometheus.yml
```

```
- name: Configure Prometheus Service File
  copy:
    content: |
      [Unit]
      Description=Prometheus
      Wants=network-online.target
      After=network-online.target

      [Service]
      User=prometheus
      Group=prometheus
      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
    dest: /etc/systemd/system/prometheus.service
    owner: root
    group: root

- name: Reload systemd service
  shell: systemctl daemon-reload

- name: Start Prometheus service
  service:
    name: prometheus
    state: started
```

2.4. Install Lamp Stack in separate hosts (Httpd + Php,Mariadb)
Ubuntu:

```
- name: Install LAMP Stack (Ubuntu)
  tags: lamp,ubuntu
  apt:
    name:
      - apache2
      - libapache2-mod-php
      - mariadb-server
    state: latest
  when: ansible_distribution == "Ubuntu"
```

CenOS:

```
- name: Install LAMP Stack (CentOS)
  tags: lamp,centos
  yum:
    name:
      - httpd
      - php
      - mariadb-server
    state: latest
  when: ansible_distribution == "CentOS"
```

tree of all the roles created:

```
tendencia@workstation:~/CPE_MIDEXAM_TENDENCIA$ tree
.
├── ansible.cfg
├── inventory
├── README.md
└── roles
    ├── elastic_centos
    │   └── tasks
    │       └── main.yml
    ├── elastic_ubuntu
    │   └── tasks
    │       └── main.yml
    ├── nagios_centos
    │   └── tasks
    │       └── main.yml
    ├── nagios_ubuntu
    │   └── tasks
    │       └── main.yml
    ├── prometheus_centos
    │   └── tasks
    │       └── main.yml
    └── prometheus_ubuntu
        └── tasks
            └── main.yml

13 directories, 9 files
```

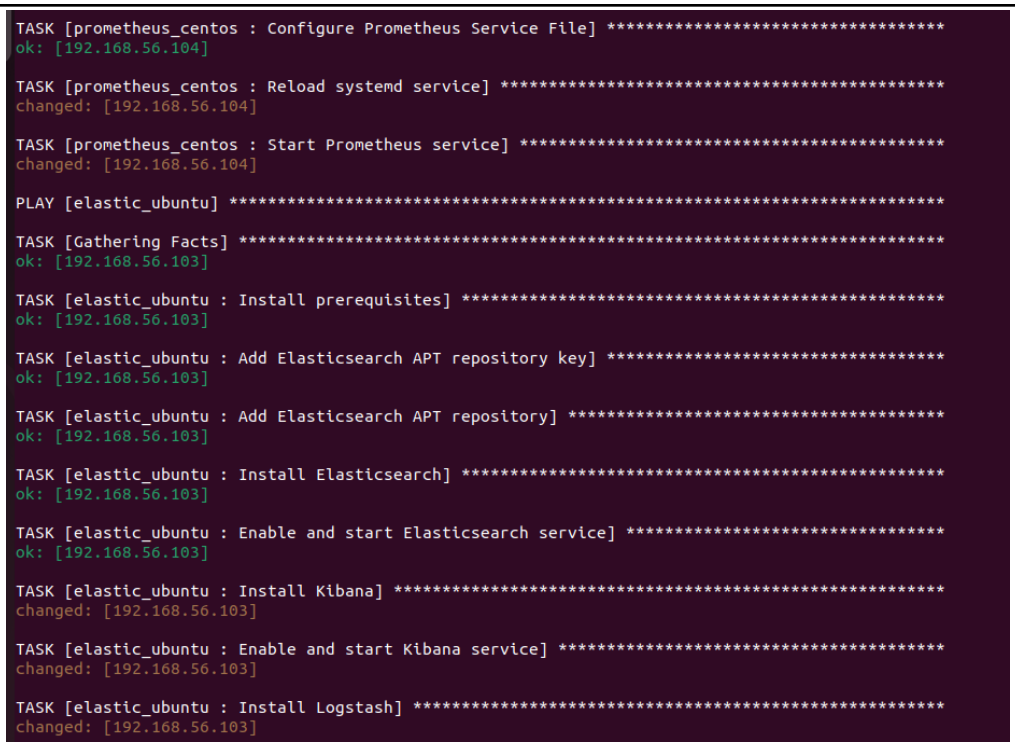
3. Run the command *ansible-playbook –ask-become-pass config.yml*.
   Output:

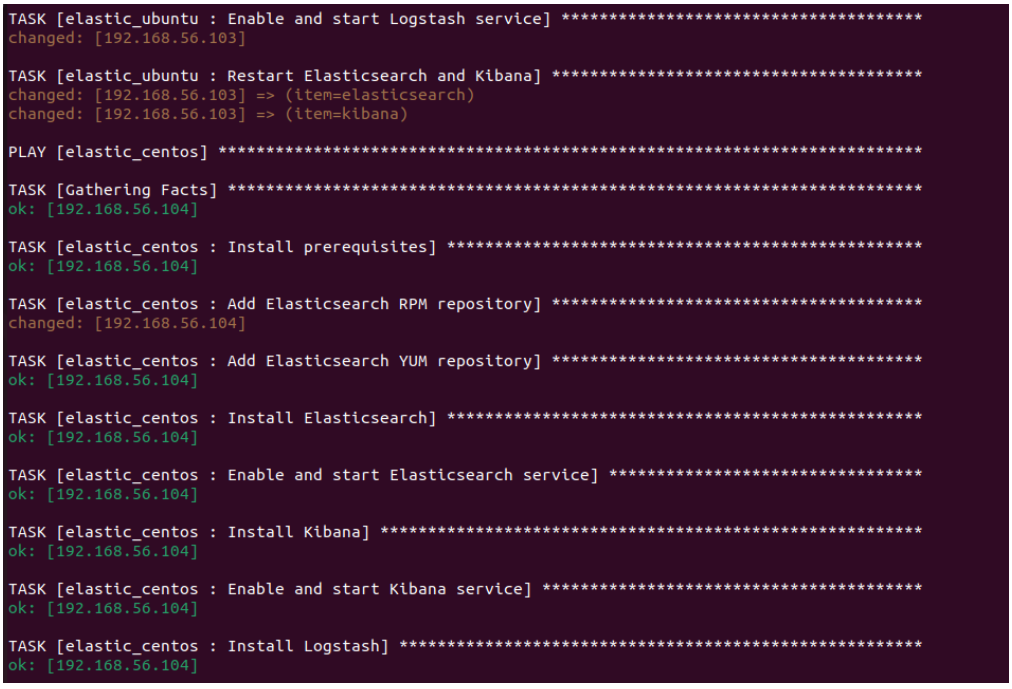
```
tendencia@workstation:~/CPE_MIDEXAM_TENDENCIA$ ansible-playbook -i inventory config.yml --ask-become-pass -T 60
BECOME password:

PLAY [all] *********************************************************************************

TASK [Gathering Facts] *********************************************************************
ok: [192.168.56.103]
ok: [192.168.56.104]

TASK [Configure dpkg (Ubuntu)] *************************************************************
skipping: [192.168.56.104]
changed: [192.168.56.103]

TASK [Install dnf and epel-release (CentOS)] ***********************************************
skipping: [192.168.56.103]
ok: [192.168.56.104]

TASK [Install Updates (Ubuntu)] ************************************************************
skipping: [192.168.56.104]
ok: [192.168.56.103]

TASK [Install Updates (CentOS)] ************************************************************
skipping: [192.168.56.103]
ok: [192.168.56.104]

TASK [Install LAMP Stack (Ubuntu)] *********************************************************
skipping: [192.168.56.104]
ok: [192.168.56.103]

TASK [Install LAMP Stack (CentOS)] *********************************************************
skipping: [192.168.56.103]
ok: [192.168.56.104]

TASK [MariaDB- Restarting/Enabling] ********************************************************
changed: [192.168.56.103]
changed: [192.168.56.104]
```

```
PLAY [nagios_ubuntu] ***********************************************************************

TASK [Gathering Facts] *********************************************************************
ok: [192.168.56.103]

TASK [nagios_ubuntu : nagios libraries and dependencies (Ubuntu)] **************************
ok: [192.168.56.103]

TASK [nagios_ubuntu : passlib package] *****************************************************
ok: [192.168.56.103]

TASK [nagios_ubuntu : nagios directory PATH] ***********************************************
ok: [192.168.56.103]

TASK [nagios_ubuntu : downloading nagios] **************************************************
ok: [192.168.56.103]

TASK [nagios_ubuntu : downloading nagios plugins] ******************************************
ok: [192.168.56.103]

TASK [nagios_ubuntu : install, compile, adding users and groups] ***************************
changed: [192.168.56.103]

TASK [nagios_ubuntu : compile and install plugins] *****************************************
changed: [192.168.56.103]

TASK [nagios_ubuntu : adding users to nagios] **********************************************
ok: [192.168.56.103]

TASK [nagios_ubuntu : Nagios Start/Enable Check] *******************************************
changed: [192.168.56.103]

TASK [nagios_ubuntu : Apache/httpd Start/Enable check] *************************************
changed: [192.168.56.103]
```

```
PLAY [nagios_centos] ***********************************************************************

TASK [Gathering Facts] *********************************************************************
ok: [192.168.56.104]

TASK [nagios_centos : Installing nagios dependecies and libraries] *************************
ok: [192.168.56.104]

TASK [nagios_centos : Install passlib python package] **************************************
ok: [192.168.56.104]

TASK [nagios_centos : Creating a directory (where the downloaded files will be stored)] ********
ok: [192.168.56.104]

TASK [nagios_centos : Downloading and extracting Nagios] ***********************************
ok: [192.168.56.104]

TASK [nagios_centos : Compiling, installing, and adding users and groups in nagios] ************
changed: [192.168.56.104]

TASK [nagios_centos : Downloading and extracting Nagios plugins] ***************************
ok: [192.168.56.104]

TASK [nagios_centos : Compiling and installing plugins] ************************************
changed: [192.168.56.104]

TASK [nagios_centos : Add a user to a password file and ensure permissions are set] ************
ok: [192.168.56.104]

TASK [nagios_centos : Making sure that nagios is started and enabled] **************************
changed: [192.168.56.104]

TASK [nagios_centos : Making sure that httpd is started and enabled] ***************************
changed: [192.168.56.104]
```

```
PLAY [prometheus_ubuntu] *******************************************************************

TASK [Gathering Facts] *********************************************************************
ok: [192.168.56.103]

TASK [prometheus_ubuntu : Install Prometheus (Ubuntu)] *************************************
ok: [192.168.56.103]

TASK [prometheus_ubuntu : Prometheus Start/Enable Check service] ***************************
changed: [192.168.56.103]

TASK [prometheus_ubuntu : Apache Start/Enable Check] ***************************************
changed: [192.168.56.103]

PLAY [prometheus_centos] *******************************************************************

TASK [Gathering Facts] *********************************************************************
ok: [192.168.56.104]

TASK [prometheus_centos : Prometheus PATH directory] ***************************************
ok: [192.168.56.104]

TASK [prometheus_centos : Creating directory for Prometheus files] *************************
ok: [192.168.56.104]

TASK [prometheus_centos : Install Prometheus (CentOS)] *************************************
ok: [192.168.56.104]

TASK [prometheus_centos : Configuring Prometheus] ******************************************
changed: [192.168.56.104]

TASK [prometheus_centos : Create Prometheus Config File] ***********************************
ok: [192.168.56.104]

TASK [prometheus_centos : Change Ownership of Prometheus Config File] **********************
changed: [192.168.56.104]
```



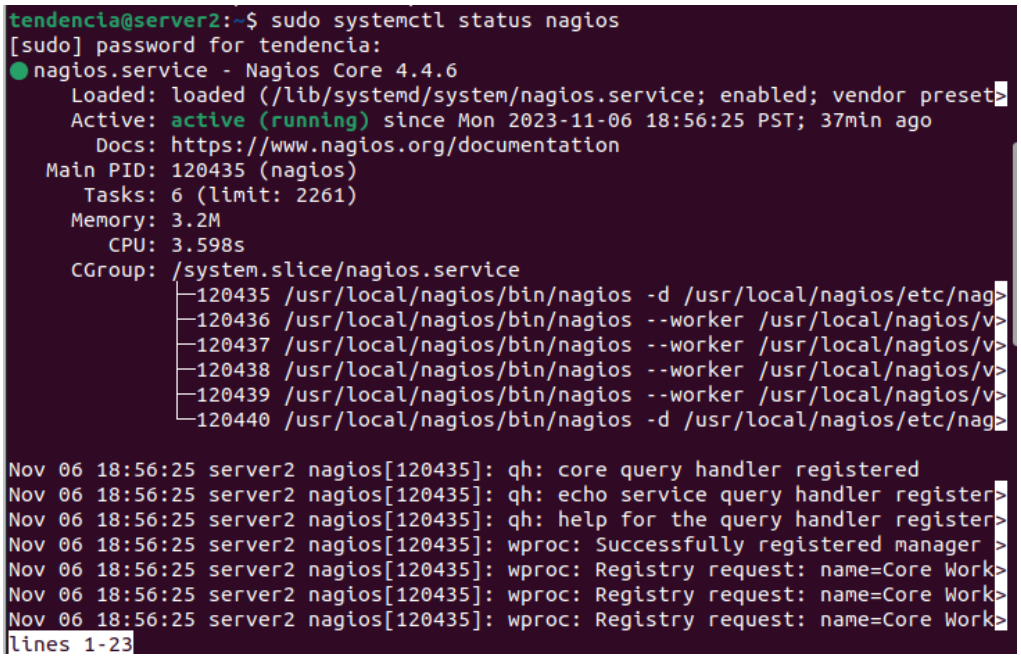


The needed tasks provided in the playbook run successfully.

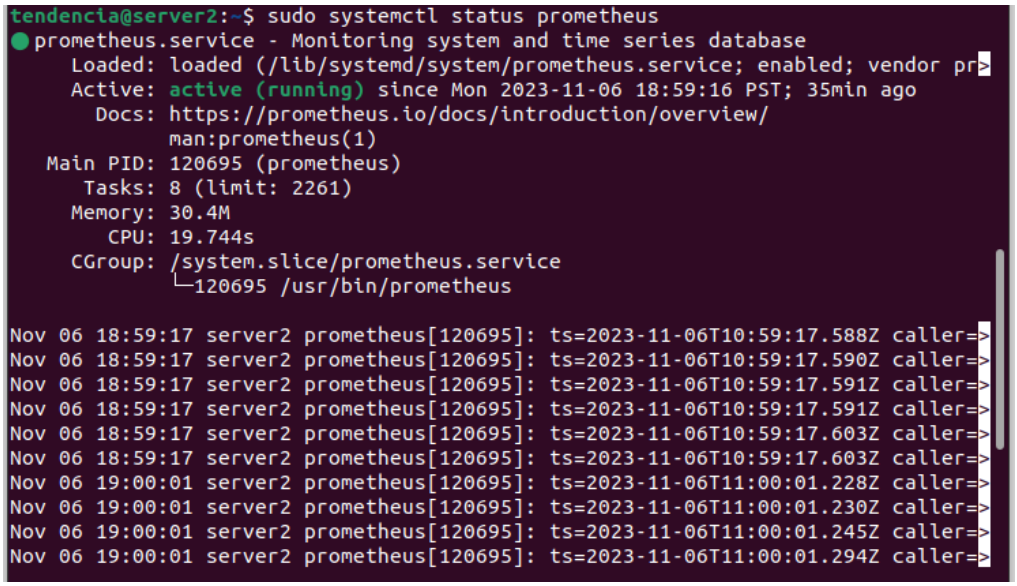
4. Verification of installation.

Ubuntu

Nagios:



Prometheus:



Elastic Stack (logstash):

```
tendencia@server2:~$ sudo systemctl status logstash
● logstash.service - logstash
     Loaded: loaded (/etc/systemd/system/logstash.service; enabled; vendor pres>
     Active: active (running) since Mon 2023-11-06 19:34:39 PST; 6s ago
   Main PID: 124029 (java)
      Tasks: 15 (limit: 2261)
     Memory: 308.9M
        CPU: 9.217s
     CGroup: /system.slice/logstash.service
             └─124029 /usr/share/logstash/jdk/bin/java -Xms1g -Xmx1g -XX:+UseCo>

Nov 06 19:34:39 server2 systemd[1]: Started logstash.
Nov 06 19:34:39 server2 logstash[124029]: Using bundled JDK: /usr/share/logstas>
Nov 06 19:34:39 server2 logstash[124029]: OpenJDK 64-Bit Server VM warning: Opt>
```

Elastic Stack (kibana):

```
tendencia@server2:~$ sudo systemctl status kibana
● kibana.service - Kibana
     Loaded: loaded (/etc/systemd/system/kibana.service; enabled; vendor preset>
     Active: active (running) since Mon 2023-11-06 19:19:23 PST; 15min ago
       Docs: https://www.elastic.co
   Main PID: 122437 (node)
      Tasks: 11 (limit: 2261)
     Memory: 243.6M
        CPU: 1min 55.068s
     CGroup: /system.slice/kibana.service
             └─122437 /usr/share/kibana/bin/../node/bin/node /usr/share/kibana/>

Nov 06 19:19:23 server2 systemd[1]: Started Kibana.
Nov 06 19:19:24 server2 kibana[122437]: Kibana is currently running with legacy>
```

Elastic Stack (elasticsearch):

```
tendencia@server2:~$ sudo systemctl status elasticsearch
● elasticsearch.service - Elasticsearch
     Loaded: loaded (/lib/systemd/system/elasticsearch.service; enabled; vendor>
     Active: active (running) since Mon 2023-11-06 19:19:10 PST; 21min ago
       Docs: https://www.elastic.co
   Main PID: 122151 (java)
      Tasks: 64 (limit: 2261)
     Memory: 803.1M
        CPU: 5min 20.004s
     CGroup: /system.slice/elasticsearch.service
             ├─122151 /usr/share/elasticsearch/jdk/bin/java -Xshare:auto -Des.n>
             └─122350 /usr/share/elasticsearch/modules/x-pack-ml/platform/linux>

Nov 06 19:18:09 server2 systemd[1]: Starting Elasticsearch...
Nov 06 19:18:30 server2 systemd-entrypoint[122151]: Nov 06, 2023 7:18:30 PM sun>
Nov 06 19:18:30 server2 systemd-entrypoint[122151]: WARNING: COMPAT locale prov>
Nov 06 19:19:10 server2 systemd[1]: Started Elasticsearch.
lines 1-16/16 (END)
```

Lamp Stack:

```
tendencia@server2:~$ sudo systemctl status apache2
● apache2.service - The Apache HTTP Server
     Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor prese>
     Active: active (running) since Mon 2023-11-06 18:56:25 PST; 46min ago
       Docs: https://httpd.apache.org/docs/2.4/
   Main PID: 120478 (apache2)
      Tasks: 6 (limit: 2261)
     Memory: 2.6M
        CPU: 763ms
     CGroup: /system.slice/apache2.service
             ├─120478 /usr/sbin/apache2 -k start
             ├─120481 /usr/sbin/apache2 -k start
             ├─120483 /usr/sbin/apache2 -k start
             ├─120484 /usr/sbin/apache2 -k start
             ├─120485 /usr/sbin/apache2 -k start
             └─120487 /usr/sbin/apache2 -k start

Nov 06 18:56:25 server2 systemd[1]: Starting The Apache HTTP Server...
Nov 06 18:56:25 server2 apachectl[120477]: AH00558: apache2: Could not reliably>
Nov 06 18:56:25 server2 systemd[1]: Started The Apache HTTP Server.
```

```
tendencia@server2:~$ sudo systemctl status mysql
● mariadb.service - MariaDB 10.6.12 database server
     Loaded: loaded (/lib/systemd/system/mariadb.service; enabled; vendor prese>
     Active: active (running) since Mon 2023-11-06 18:54:40 PST; 47min ago
       Docs: man:mariadbd(8)
             https://mariadb.com/kb/en/library/systemd/
   Main PID: 102999 (mariadbd)
     Status: "Taking your SQL requests now..."
      Tasks: 8 (limit: 2261)
     Memory: 1.5M
        CPU: 2.780s
     CGroup: /system.slice/mariadb.service
             └─102999 /usr/sbin/mariadbd

Nov 06 18:54:40 server2 mariadbd[102999]: 2023-11-06 18:54:40 0 [Note] /usr/sbi>
Nov 06 18:54:40 server2 mariadbd[102999]: Version: '10.6.12-MariaDB-0ubuntu0.22>
Nov 06 18:54:40 server2 systemd[1]: Started MariaDB 10.6.12 database server.
Nov 06 18:54:40 server2 /etc/mysql/debian-start[103015]: Upgrading MySQL tables>
Nov 06 18:54:40 server2 /etc/mysql/debian-start[103018]: Looking for 'mariadb' >
Nov 06 18:54:40 server2 /etc/mysql/debian-start[103018]: Looking for 'mariadb-c>
Nov 06 18:54:40 server2 /etc/mysql/debian-start[103018]: This installation of M>
Nov 06 18:54:40 server2 /etc/mysql/debian-start[103018]: There is no need to ru>
Nov 06 18:54:40 server2 /etc/mysql/debian-start[103018]: You can use --force if>
Nov 06 18:54:40 server2 /etc/mysql/debian-start[103034]: Triggering myisam-reco>
lines 1-23/23 (END)
```

CentOS

Nagios:

```
[tendencia@centoslocal ~]$ sudo systemctl status nagios
● nagios.service - Nagios Core 4.4.6
   Loaded: loaded (/usr/lib/systemd/system/nagios.service; enabled; vendor preset: disa
bled)
   Active: active (running) since Mon 2023-11-06 18:52:06 PST; 39min ago
     Docs: https://www.nagios.org/documentation
 Main PID: 8648 (nagios)
    Tasks: 6
   CGroup: /system.slice/nagios.service
           ├─8648 /usr/local/nagios/bin/nagios -d /usr/local/nagios/etc/nagios.cfg
           ├─8649 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nag...
           ├─8650 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nag...
           ├─8651 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nag...
           ├─8652 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nag...
           └─8655 /usr/local/nagios/bin/nagios -d /usr/local/nagios/etc/nagios.cfg

Nov 06 19:11:33 centoslocal nagios[8650]: job 9 (pid=15394): read() returned error 11
Nov 06 19:16:33 centoslocal nagios[8648]: SERVICE NOTIFICATION: nagiosadmin;localh...94
Nov 06 19:16:33 centoslocal nagios[8648]: SERVICE ALERT: localhost;Current Load;OK...94
Nov 06 19:16:33 centoslocal nagios[8652]: job 12 (pid=16293): read() returned error 11
Nov 06 19:21:33 centoslocal nagios[8648]: SERVICE ALERT: localhost;Current Load;WA...03
Nov 06 19:22:33 centoslocal nagios[8648]: SERVICE ALERT: localhost;Current Load;WA...03
Nov 06 19:23:33 centoslocal nagios[8648]: SERVICE ALERT: localhost;Current Load;WA...05
Nov 06 19:24:33 centoslocal nagios[8648]: SERVICE NOTIFICATION: nagiosadmin;localh...07
Nov 06 19:24:33 centoslocal nagios[8648]: SERVICE ALERT: localhost;Current Load;WA...07
Nov 06 19:24:33 centoslocal nagios[8650]: job 16 (pid=17840): read() returned error 11
```

Prometheus:

Elastic Stack (logstash):

```
[tendencia@centoslocal ~]$ sudo systemctl status logstash
● logstash.service - logstash
   Loaded: loaded (/etc/systemd/system/logstash.service; enabled; vendor preset: disabl
ed)
   Active: active (running) since Mon 2023-11-06 19:32:48 PST; 5s ago
 Main PID: 19306 (java)
    Tasks: 15
   CGroup: /system.slice/logstash.service
           └─19306 /usr/share/logstash/jdk/bin/java -Xms1g -Xmx1g -XX:+UseConcMarkSw...

Nov 06 19:32:48 centoslocal systemd[1]: Started logstash.
Nov 06 19:32:48 centoslocal logstash[19306]: Using bundled JDK: /usr/share/logstash/jdk
Nov 06 19:32:48 centoslocal logstash[19306]: OpenJDK 64-Bit Server VM warning: Opt...e.
Hint: Some lines were ellipsized, use -l to show in full.
```

Elastic Stack (kibana):

```
[tendencia@centoslocal ~]$ sudo systemctl status kibana
● kibana.service - Kibana
   Loaded: loaded (/etc/systemd/system/kibana.service; enabled; vendor preset: disabled
)
   Active: active (running) since Mon 2023-11-06 19:08:37 PST; 24min ago
     Docs: https://www.elastic.co
 Main PID: 14927 (node)
    Tasks: 11
   CGroup: /system.slice/kibana.service
           └─14927 /usr/share/kibana/bin/../node/bin/node /usr/share/kibana/bin/../s...

Nov 06 19:08:37 centoslocal systemd[1]: Started Kibana.
Nov 06 19:08:43 centoslocal kibana[14927]: Kibana is currently running with legacy...er
Hint: Some lines were ellipsized, use -l to show in full.
```

Elastic Stack (elasticsearch):

```
[tendencia@centoslocal ~]$ sudo systemctl status elasticsearch
● elasticsearch.service - Elasticsearch
   Loaded: loaded (/usr/lib/systemd/system/elasticsearch.service; enabled; vendor prese
t: disabled)
   Active: active (running) since Mon 2023-11-06 19:08:18 PST; 24min ago
     Docs: https://www.elastic.co
 Main PID: 14435 (java)
    Tasks: 67
   CGroup: /system.slice/elasticsearch.service
           ├─14435 /usr/share/elasticsearch/jdk/bin/java -Xshare:auto -Des.networkad...
           └─14684 /usr/share/elasticsearch/modules/x-pack-ml/platform/linux-x86_64/...

Nov 06 19:06:31 centoslocal systemd[1]: Starting Elasticsearch...
Nov 06 19:07:24 centoslocal systemd-entrypoint[14435]: Nov 06, 2023 7:07:23 PM sun....>
Nov 06 19:07:24 centoslocal systemd-entrypoint[14435]: WARNING: COMPAT locale provi...e
Nov 06 19:08:18 centoslocal systemd[1]: Started Elasticsearch.
Hint: Some lines were ellipsized, use -l to show in full.
```

Lamp Stack:

```
[tendencia@centoslocal ~]$ sudo 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 Mon 2023-11-06 18:52:08 PST; 45min ago
     Docs: man:httpd(8)
           man:apachectl(8)
 Main PID: 8767 (httpd)
   Status: "Total requests: 9; Current requests/sec: 0; Current traffic:   0 B/sec"
    Tasks: 7
   CGroup: /system.slice/httpd.service
           ├─ 8767 /usr/sbin/httpd -DFOREGROUND
           ├─ 8768 /usr/sbin/httpd -DFOREGROUND
           ├─ 8769 /usr/sbin/httpd -DFOREGROUND
           ├─ 8770 /usr/sbin/httpd -DFOREGROUND
           ├─ 8771 /usr/sbin/httpd -DFOREGROUND
           ├─ 8772 /usr/sbin/httpd -DFOREGROUND
           └─11781 /usr/sbin/httpd -DFOREGROUND

Nov 06 18:52:08 centoslocal systemd[1]: Stopped The Apache HTTP Server.
Nov 06 18:52:08 centoslocal systemd[1]: Starting The Apache HTTP Server...
Nov 06 18:52:08 centoslocal httpd[8767]: AH00558: httpd: Could not reliably determ...ge
Nov 06 18:52:08 centoslocal systemd[1]: Started The Apache HTTP Server.
Hint: Some lines were ellipsized, use -l to show in full.
```

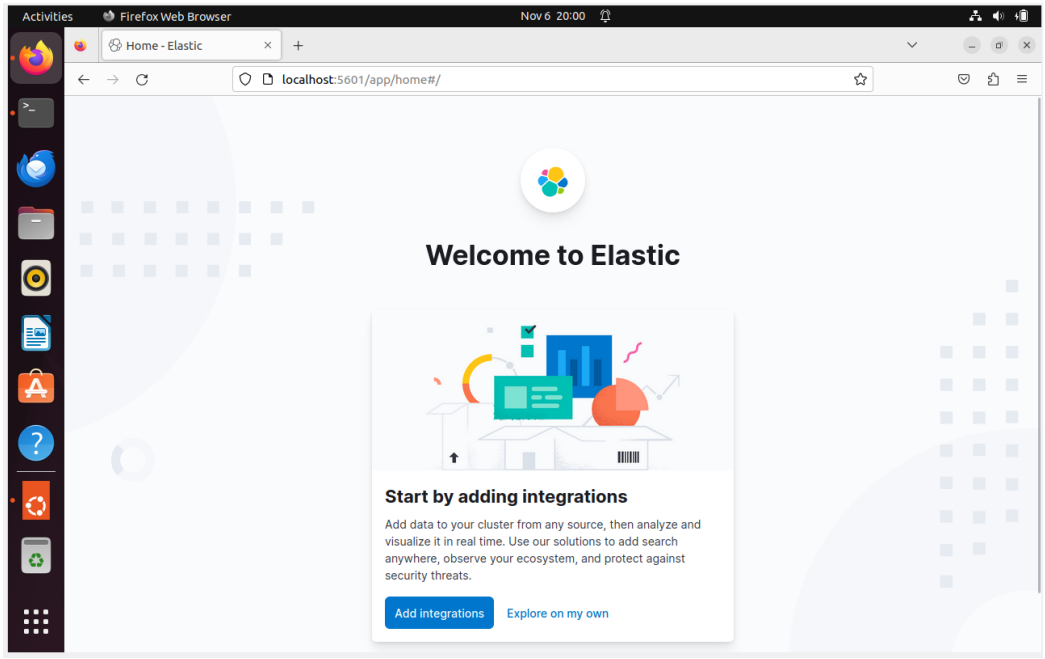
```
[tendencia@centoslocal ~]$ sudo systemctl status mariadb
● mariadb.service - MariaDB database server
   Loaded: loaded (/usr/lib/systemd/system/mariadb.service; enabled; vendor preset: dis
abled)
   Active: active (running) since Mon 2023-11-06 18:47:44 PST; 50min ago
 Main PID: 20165 (mysqld_safe)
    Tasks: 20
   CGroup: /system.slice/mariadb.service
           ├─20165 /bin/sh /usr/bin/mysqld_safe --basedir=/usr
           └─20331 /usr/libexec/mysqld --basedir=/usr --datadir=/var/lib/mysql --plu...

Nov 06 18:47:42 centoslocal systemd[1]: Stopped MariaDB database server.
Nov 06 18:47:42 centoslocal systemd[1]: Starting MariaDB database server...
Nov 06 18:47:42 centoslocal mariadb-prepare-db-dir[20131]: Database MariaDB is proba...
Nov 06 18:47:42 centoslocal mariadb-prepare-db-dir[20131]: If this is not the case, ...
Nov 06 18:47:42 centoslocal mysqld_safe[20165]: 231106 18:47:42 mysqld_safe Logging....
Nov 06 18:47:42 centoslocal mysqld_safe[20165]: 231106 18:47:42 mysqld_safe Startin...l
Nov 06 18:47:44 centoslocal systemd[1]: Started MariaDB database server.
Hint: Some lines were ellipsized, use -l to show in full.
```

Web Interface (Ubuntu)

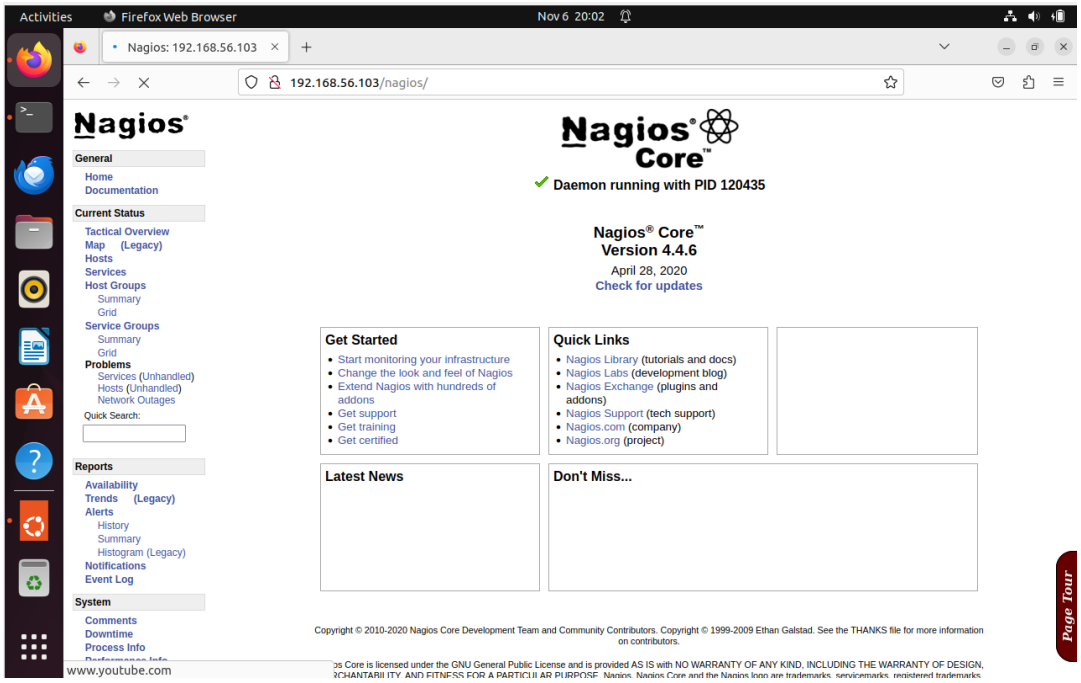
Lamp Stack:

Content of the apache page since it has been changed in the previous hands on activity before.

Elastic Stack:



Nagios:

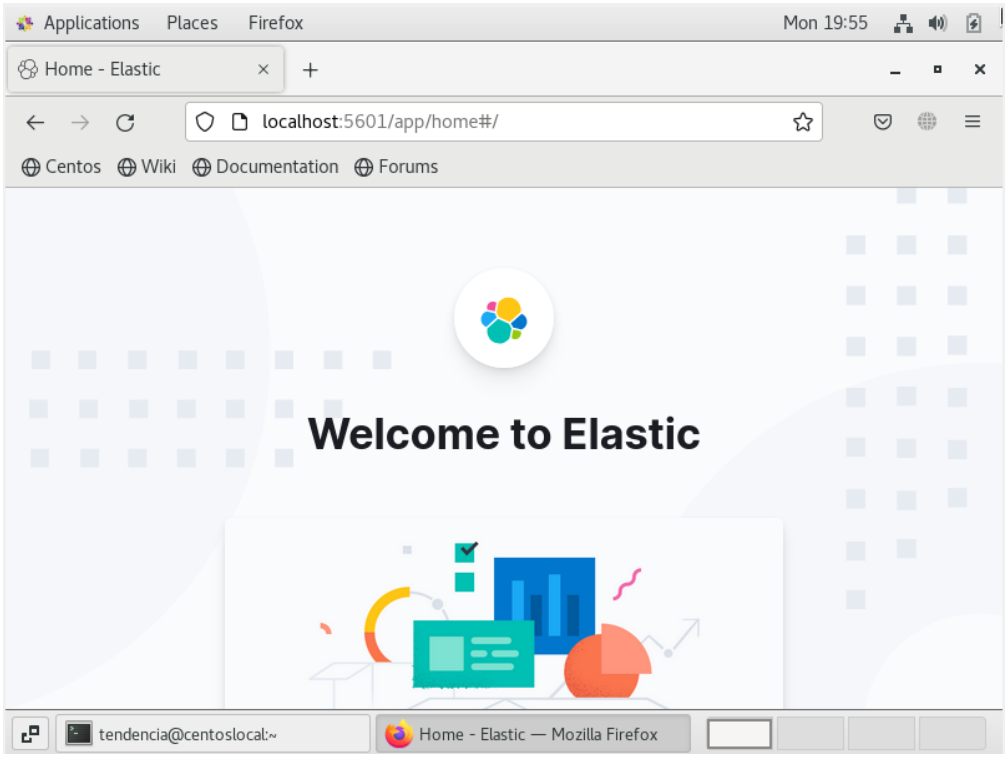


Web Interface (CentOS)

Lamp Stack:

Again, the site of apache that has been modified before.

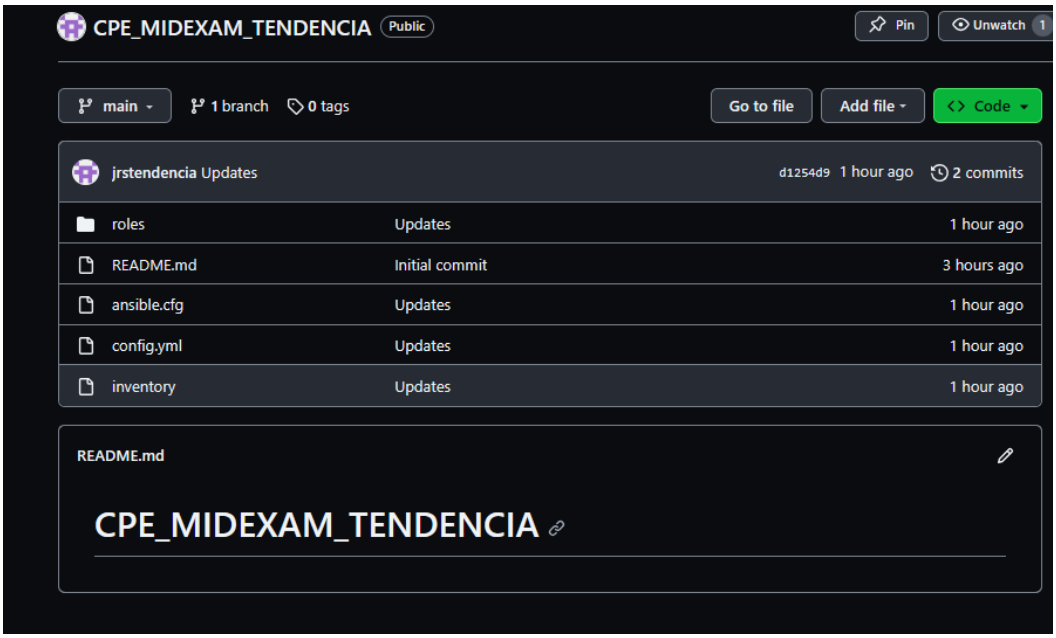
Elastic Stack:

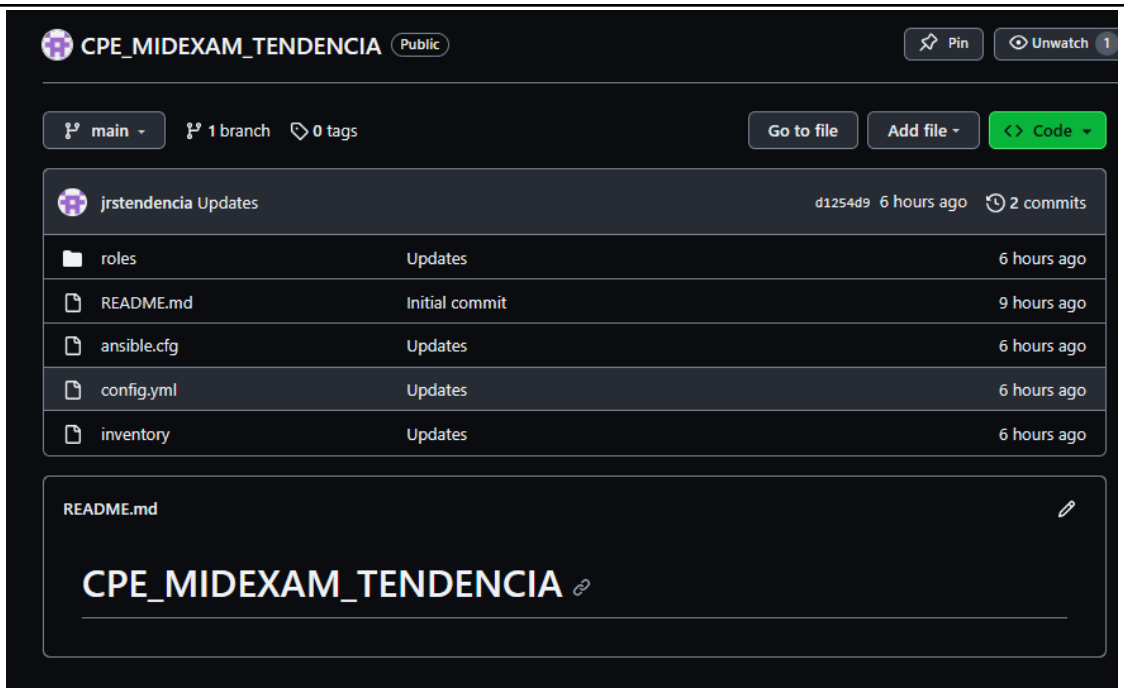


Nagios:

5. Commit changes to GitHub.

```
tendencia@workstation:~/CPE_MIDEXAM_TENDENCIA$ git add *
tendencia@workstation:~/CPE_MIDEXAM_TENDENCIA$ git commit -m "Updates"
[main d1254d9] Updates
 9 files changed, 537 insertions(+)
 create mode 100644 ansible.cfg
 create mode 100644 config.yml
 create mode 100644 inventory
 create mode 100644 roles/elastic_centos/tasks/main.yml
 create mode 100644 roles/elastic_ubuntu/tasks/main.yml
 create mode 100644 roles/nagios_centos/tasks/main.yml
 create mode 100644 roles/nagios_ubuntu/tasks/main.yml
 create mode 100644 roles/prometheus_centos/tasks/main.yml
 create mode 100644 roles/prometheus_ubuntu/tasks/main.yml
```





Note: Nothing changed here after pushing to github earlier, the playbook was just rerun with a good internet connection in the study hall.

GitHub link: *https://github.com/jrstendencia/CPE_MIDEXAM_TENDENCIA.git*

Conclusions: (link your conclusion from the objective)

In conclusion, the created Ansible playbook in this activity enables the installation, configuration, and management of key enterprise availability, performance, and log monitoring tools, aligning with the principles of Infrastructure as Code (IaC). By creating distinct playbooks for Elastic Stack, Nagios, Grafana, Prometheus, InfluxDB, and LAMP Stack, we have established a systematic approach to automating the setup of these critical monitoring components across separate hosts. This workflow streamlines infrastructure management, enhances scalability, and ensures consistent, reliable monitoring solutions, ultimately contributing to enhanced system availability, performance, and log analysis in an efficient and reproducible manner.