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Course/Section: CPE31S1	Date Submitted: 4/2/2024
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Midterm Skills Exam: Install, Configure, and Manage Log Monitoring tools

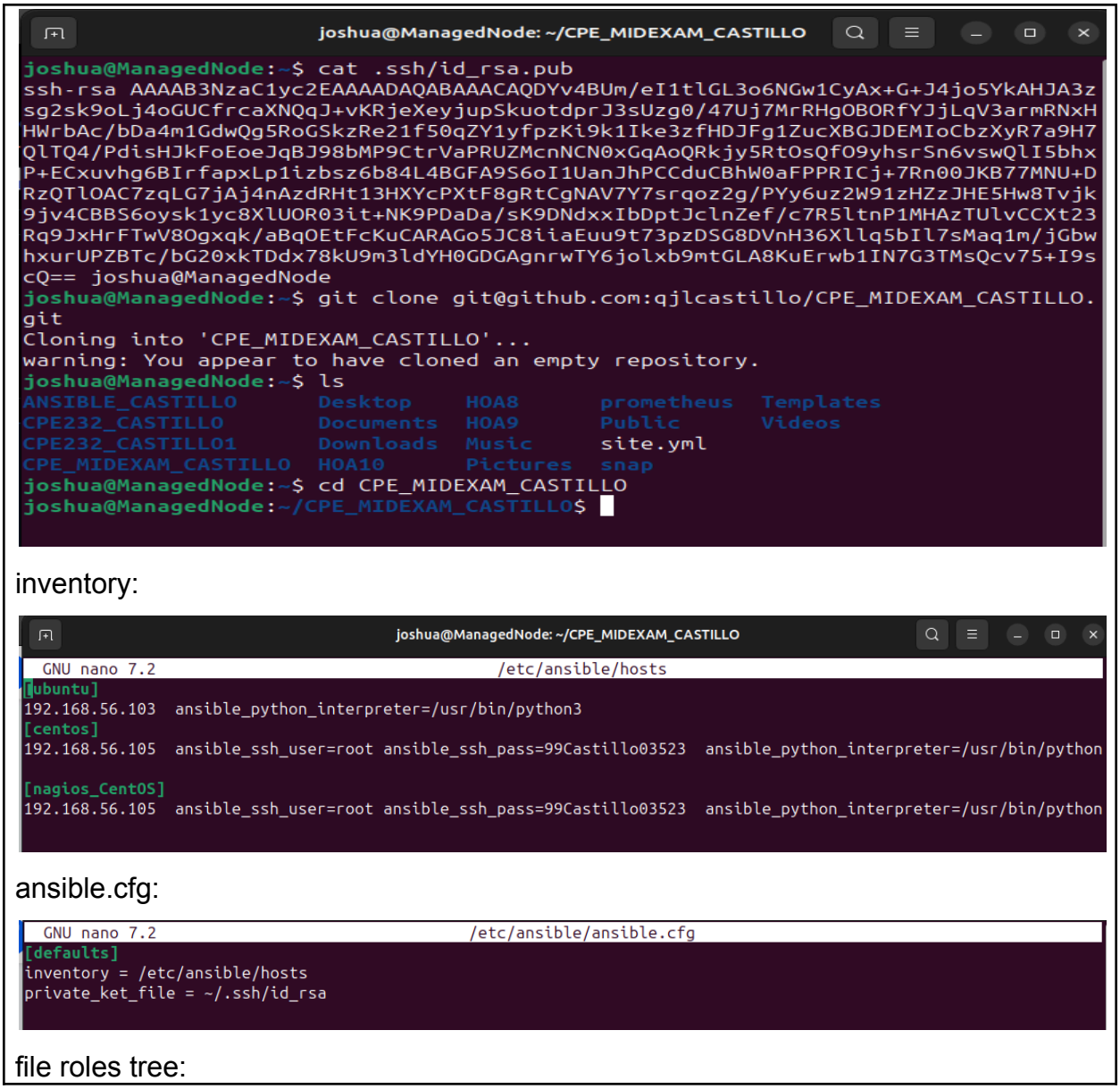
1. Objectives

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:
   Create an Ansible playbook that does the following with an input of a config.yaml file and arranged Inventory file:
   Install and configure Elastic Stack in separate hosts (Elastic Search, Kibana, Logstash) • Install Nagios in one host
   Install Grafana,Prometheus and Influxdb in seperate hosts (Influxdb,Grafana,Prometheus)
   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: I create a repository in your GitHub account and label it CPE_MIDEXAM_CASTILLO and then clone.



inventory:

ansible.cfg:

file roles tree:

```
joshua@ManagedNode:~/CPE_MIDEXAM_CASTILLO$ cd roles
joshua@ManagedNode:~/CPE_MIDEXAM_CASTILLO/roles$ tree
.
├── centos
│   └── tasks
│       └── main.yml
├── nagios_CentOS
│   ├── global_playbook.yml
│   ├── handlers
│   │   └── main.yml
│   ├── nagios.yml
│   ├── packages
│   │   └── main.yml
│   ├── start
│   │   ├── restart
│   │   │   └── main.yml
│   │   └── tasks
│   │       └── main.yml
│   └── tasks
│       └── main.yml
└── ubuntu
    └── tasks
        └── main.yml
```

I created a main playbook that will do all the tasks below (config.yml)

config.yml

```yaml
---

- hosts: all
  become: true
  pre_tasks:


  - name: install updates (CentOS)
    dnf:
      update_only: yes
      update_cache: yes
    when: ansible_distribution == "Centos"

  - name: install updates (Ubuntu)
    apt:
      upgrade: dist
      update_cache: yes
    when: ansible_distribution == "Ubuntu"
  - name: DPKG in Ubuntu Server
    shell: |
      dpkg --configure -a
    when: ansible_distribution == "Ubuntu"

  - name: Update in Ubuntu Server
    apt:
      update_cache: yes
      upgrade: yes
    when: ansible_distribution == "Ubuntu"
```

```
  - name: Install epel-release and dnf
    dnf:
      name:
        - epel-release
        - dnf
    when: ansible_distribution == "CentOS"

  - name: Update CentOS Server
    dnf:
      update_cache: yes
      name: "*"
      state: latest
    when: ansible_distribution == "CentOS"


- hosts: centos
  become: true
  roles:
    - centos

- hosts: ubuntu
  become: true
  roles:
    - ubuntu

- name: install nagios on CentOS
  hosts: nagios_CentOS
  become: true
  roles:
    - nagios_CentOS
```

Installation and configure Elastic Stack in separate hosts. (Elastic Search, Kibana, Logstash).

192.168.56.105 (CentOS)

```
TASK [centos : Add Elasticsearch RPM repository GPG key] ****************************
changed: [192.168.56.105]

TASK [centos : Add the Elasticsearch YUM repository] ********************************
ok: [192.168.56.105]

TASK [centos : Install Elasticsearch] ***********************************************
ok: [192.168.56.105]

TASK [centos : Enable and start Elasticsearch service] ******************************
ok: [192.168.56.105]

TASK [centos : Install Kibana] ******************************************************
ok: [192.168.56.105]

TASK [centos : Enable and start Kibana service] *************************************
ok: [192.168.56.105]

TASK [centos : Install Logstash] ****************************************************
ok: [192.168.56.105]

TASK [centos : Enable and start Logstash service] ***********************************
ok: [192.168.56.105]
```

```
changed: [192.168.56.105] => (item=elasticsearch)
changed: [192.168.56.105] => (item=kibana)
```

systemctl command for verification (Elastic Search, Kibana, Logstash):

elastic:

```
[root@localhost ~]# systemctl status elasticsearch.service
● elasticsearch.service - Elasticsearch
   Loaded: loaded (/usr/lib/systemd/system/elasticsearch.service; enabled; vendor prese
t: disabled)
   Active: active (running) since Tue 2024-04-02 01:11:05 PST; 14s ago
     Docs: https://www.elastic.co
 Main PID: 11119 (java)
    Tasks: 68
   CGroup: /system.slice/elasticsearch.service
           ├─11119 /usr/share/elasticsearch/jdk/bin/java -Xshare:auto -Des.networkad...
           └─11323 /usr/share/elasticsearch/modules/x-pack-ml/platform/linux-x86_64/...
```

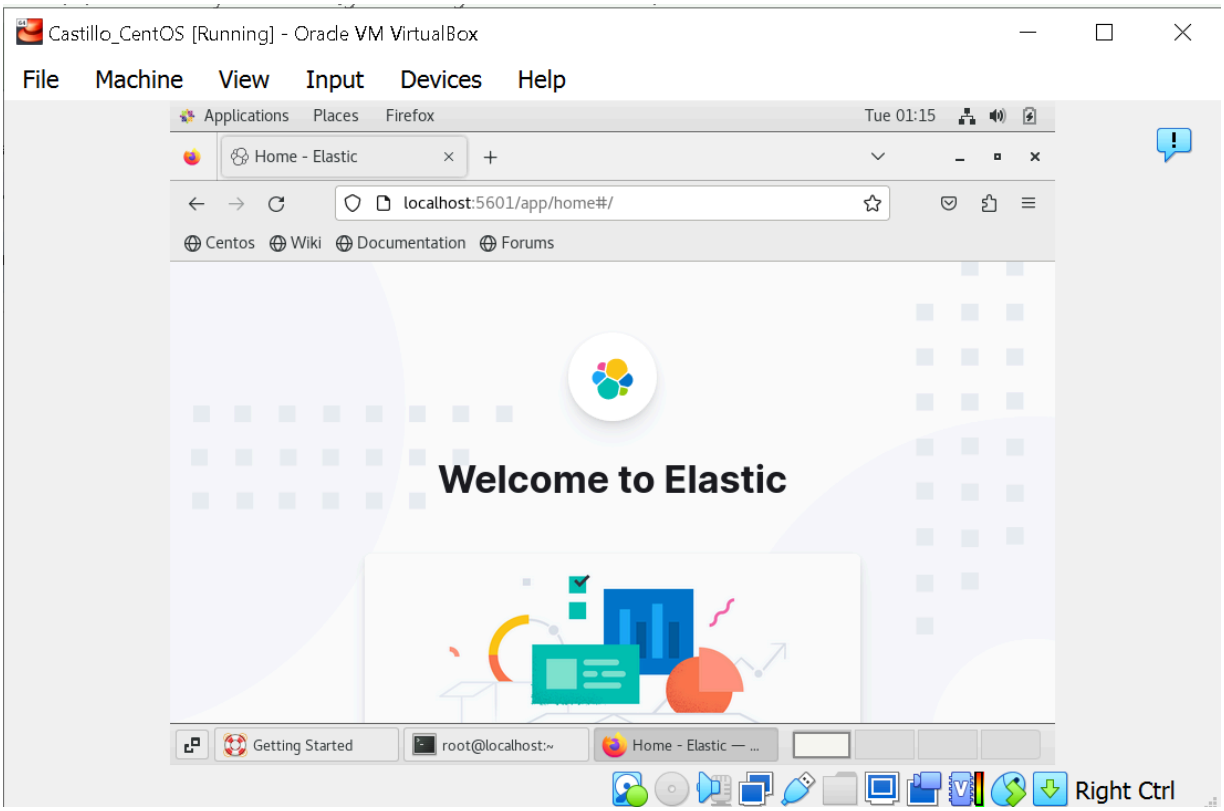
logstash:

```
● logstash.service - logstash
   Loaded: loaded (/etc/systemd/system/logstash.service; enabled; vendor preset: disabl
ed)
   Active: active (running) since Tue 2024-04-02 01:11:56 PST; 40s ago
 Main PID: 12984 (java)
    Tasks: 15
   CGroup: /system.slice/logstash.service
           └─12984 /usr/share/logstash/jdk/bin/java -Xms1g -Xmx1g -XX:+UseConcMarkSw...

Apr 02 01:11:56 localhost.localdomain systemd[1]: Started logstash.
Apr 02 01:11:57 localhost.localdomain logstash[12984]: Using bundled JDK: /usr/shar...k
Apr 02 01:11:58 localhost.localdomain logstash[12984]: OpenJDK 64-Bit Server VM war....
Hint: Some lines were ellipsized, use -l to show in full.
[root@localhost ~]#
```

kibana:

```
[root@localhost ~]# systemctl status kibana.service
● kibana.service - Kibana
   Loaded: loaded (/etc/systemd/system/kibana.service; enabled; vendor preset: disabled
)
   Active: active (running) since Tue 2024-04-02 01:11:14 PST; 2min 31s ago
     Docs: https://www.elastic.co
 Main PID: 12419 (node)
    Tasks: 11
   CGroup: /system.slice/kibana.service
           └─12419 /usr/share/kibana/bin/../node/bin/node /usr/share/kibana/bin/../s...
```

elasticsearch verification on browser:



192.168.56.103 (Ubuntu)

```
TASK [centos : Install necessary prerequisites] ************************************
ok: [192.168.56.105]

TASK [centos : Add Elasticsearch RPM repository GPG key] ***************************
changed: [192.168.56.105]

TASK [centos : Add the Elasticsearch YUM repository] *******************************
ok: [192.168.56.105]

TASK [centos : Install Elasticsearch] **********************************************
ok: [192.168.56.105]

TASK [centos : Enable and start Elasticsearch service] *****************************
ok: [192.168.56.105]

TASK [centos : Install Kibana] *****************************************************
ok: [192.168.56.105]

TASK [centos : Enable and start Kibana service] ************************************
ok: [192.168.56.105]
```

```
TASK [centos : Enable and start Logstash service] **********************************
ok: [192.168.56.105]

TASK [centos : Restart Elasticsearch and Kibana services] **************************
changed: [192.168.56.105] => (item=elasticsearch)
changed: [192.168.56.105] => (item=kibana)
```

systemctl command for verification (Elastic Search, Kibana, Logstash):

elasticsearch:

```
joshua@ManagedNode:~/CPE_MIDEXAM_CASTILLO$ systemctl status elasticsearch.service
● elasticsearch.service - Elasticsearch
     Loaded: loaded (/lib/systemd/system/elasticsearch.service; enabled; preset: enabled)
     Active: active (running) since Tue 2024-04-02 01:13:38 PST; 2min 31s ago
       Docs: https://www.elastic.co
   Main PID: 69173 (java)
      Tasks: 59 (limit: 4614)
     Memory: 1.9G
        CPU: 1min 10.777s
     CGroup: /system.slice/elasticsearch.service
             ├─69173 /usr/share/elasticsearch/jdk/bin/java -Xshare:auto -Des.networkaddress.>
             └─69355 /usr/share/elasticsearch/modules/x-pack-ml/platform/linux-x86_64/bin/co>
```

logstash:

```
joshua@ManagedNode:~/CPE_MIDEXAM_CASTILLO$ systemctl status logstash.service
● logstash.service - logstash
     Loaded: loaded (/etc/systemd/system/logstash.service; enabled; preset: enabled)
     Active: active (running) since Mon 2024-04-01 21:46:27 PST; 3h 30min ago
   Main PID: 6894 (java)
      Tasks: 22 (limit: 4614)
     Memory: 14.1M
        CPU: 54.080s
     CGroup: /system.slice/logstash.service
             └─6894 /usr/share/logstash/jdk/bin/java -Xms1g -Xmx1g -XX:+UseConcMarkSweepGC -
```

kibana:

```
joshua@ManagedNode:~/CPE_MIDEXAM_CASTILLO$ systemctl status kibana.service
● kibana.service - LSB: Kibana
     Loaded: loaded (/etc/init.d/kibana; generated)
     Active: active (exited) since Tue 2024-04-02 01:13:40 PST; 4min 45s ago
       Docs: man:systemd-sysv-generator(8)
        CPU: 5.586s
```

elasticsearch verification on browser:

install nagios in 1 host.

I used 192.168.56.105 (CentOS) for this task

nagios:

```
PLAY [nagios_CentOS] ***********************************************************************
*********************

TASK [Gathering Facts] *********************************************************************
*********************
ok: [192.168.56.105]

TASK [nagios_CentOS : Installing Nagios4 Dependencies and Libraries] ************************
*********************
ok: [192.168.56.105]

TASK [nagios_CentOS : Install passlib Python Package] ***************************************
*********************
ok: [192.168.56.105]

TASK [nagios_CentOS : Install passlib Python Package] ***************************************
*********************
ok: [192.168.56.105]

TASK [nagios_CentOS : Creating a directory for the downloaded files] ************************
*********************
ok: [192.168.56.105]
```

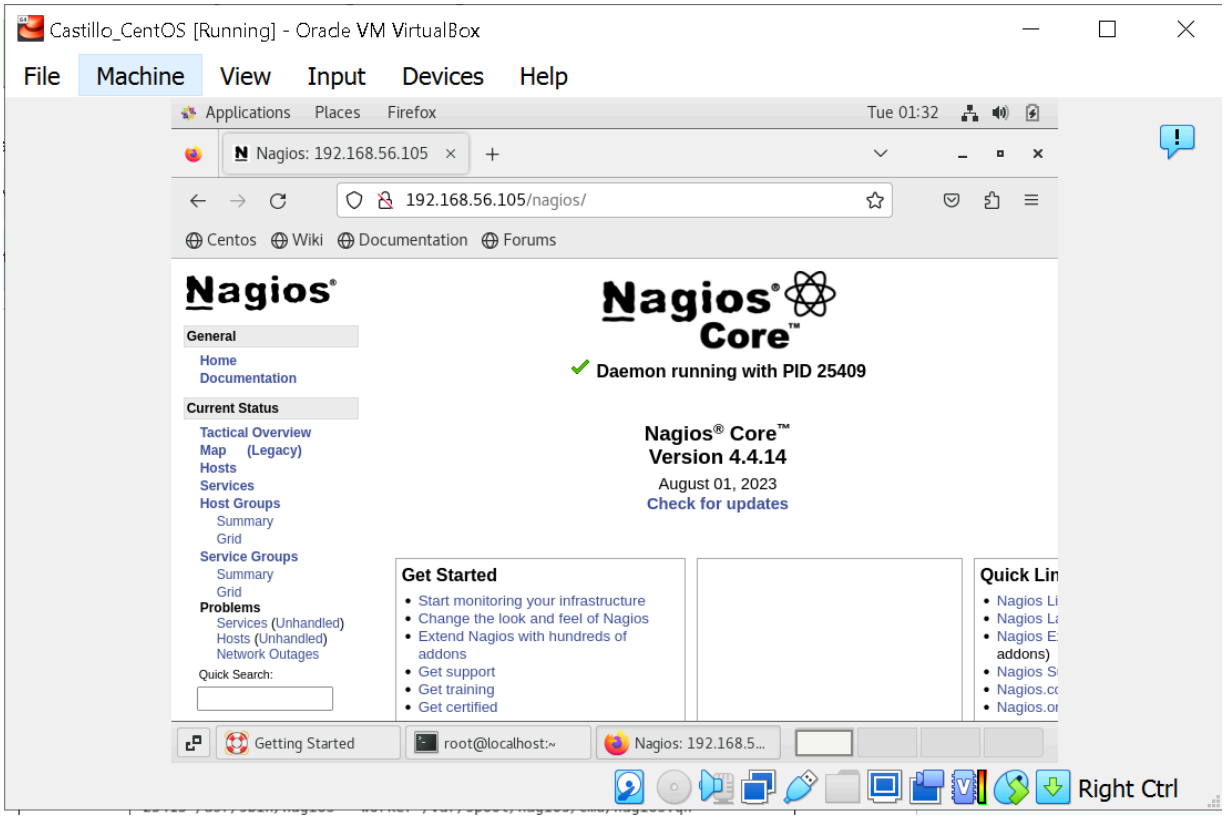
```
TASK [nagios_CentOS : Downloading and Extracting Nagios from Github] ************************
*********************
ok: [192.168.56.105]

TASK [nagios_CentOS : Adding Users and Groups, Compiling, and Installing in Nagios from Githu
b] *******************
changed: [192.168.56.105]

TASK [nagios_CentOS : Downloading and Extracting Nagios plugins from Github] ****************
*********************
ok: [192.168.56.105]

TASK [nagios_CentOS : Compiling and Installing Nagios plugins] ******************************
*********************
changed: [192.168.56.105]

TASK [nagios_CentOS : Confirmation of Nagios is enabled] ************************************
*********************
changed: [192.168.56.105]

TASK [nagios_CentOS : Confirmation of httpd is enabled] *************************************
*********************
changed: [192.168.56.105]
```

```
PLAY RECAP *********************************************************************************
*********************
192.168.56.103             : ok=1    changed=0    unreachable=0    failed=0    skipped=2    r
escued=0    ignored=0
192.168.56.105             : ok=14   changed=4    unreachable=0    failed=0    skipped=0    r
escued=0    ignored=0
```

systemctl command for verification:

```
[root@localhost ~]# systemctl status nagios
● nagios.service - Nagios Core 4.4.14
   Loaded: loaded (/usr/lib/systemd/system/nagios.service; enabled; vendor preset: disa
bled)
   Active: active (running) since Tue 2024-04-02 00:29:37 PST; 1h 1min ago
     Docs: https://www.nagios.org/documentation
  Process: 25404 ExecStopPost=/usr/bin/rm -f /var/spool/nagios/cmd/nagios.cmd (code=exi
ted, status=0/SUCCESS)
  Process: 25399 ExecStop=/usr/bin/kill -s TERM ${MAINPID} (code=exited, status=0/SUCCE
SS)
  Process: 25407 ExecStart=/usr/sbin/nagios -d /etc/nagios/nagios.cfg (code=exited, sta
tus=0/SUCCESS)
  Process: 25405 ExecStartPre=/usr/sbin/nagios -v /etc/nagios/nagios.cfg (code=exited,
status=0/SUCCESS)
 Main PID: 25409 (nagios)
    Tasks: 6
   CGroup: /system.slice/nagios.service
           ├─25409 /usr/sbin/nagios -d /etc/nagios/nagios.cfg
           ├─25410 /usr/sbin/nagios --worker /var/spool/nagios/cmd/nagios.qh
           ├─25411 /usr/sbin/nagios --worker /var/spool/nagios/cmd/nagios.qh
           ├─25412 /usr/sbin/nagios --worker /var/spool/nagios/cmd/nagios.qh
           ├─25413 /usr/sbin/nagios --worker /var/spool/nagios/cmd/nagios.qh
           └─25417 /usr/sbin/nagios -d /etc/nagios/nagios.cfg
```

nagios verification on browser:



Installation of Lamp Stack in separate hosts (Httpd + Php,Mariadb)
on CentOS:

```
TASK [centos : Start HTTPD] ****************************************************************
changed: [192.168.56.105]

TASK [centos : Install Apache] *************************************************************
ok: [192.168.56.105]

TASK [centos : Start Apache service] *******************************************************
ok: [192.168.56.105]

TASK [centos : Install MariaDB] ************************************************************
ok: [192.168.56.105]

TASK [centos : Start MariaDB service] ******************************************************
ok: [192.168.56.105]

TASK [centos : Install PHP] ****************************************************************
ok: [192.168.56.105]

TASK [centos : Restart Apache service] *****************************************************
changed: [192.168.56.105]
```

systemctl command for verification:

mariadb on CentOS:

```
● mariadb.service - MariaDB database server
   Loaded: loaded (/usr/lib/systemd/system/mariadb.service; enabled; vendor preset: dis
abled)
   Active: active (running) since Mon 2024-04-01 21:48:40 PST; 4h 27min ago
 Main PID: 1370 (mysqld_safe)
    Tasks: 20
   CGroup: /system.slice/mariadb.service
           ├─1370 /bin/sh /usr/bin/mysqld_safe --basedir=/usr
           └─1808 /usr/libexec/mysqld --basedir=/usr --datadir=/var/lib/mysql --plug...
```

httpd on CentOS:

```
[root@localhost ~]# 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 Tue 2024-04-02 02:16:31 PST; 16s ago
     Docs: man:httpd(8)
           man:apachectl(8)
  Process: 29715 ExecStop=/bin/kill -WINCH ${MAINPID} (code=exited, status=0/SUCCESS)
 Main PID: 29724 (httpd)
   Status: "Total requests: 0; Current requests/sec: 0; Current traffic:   0 B/sec"
    Tasks: 6
   CGroup: /system.slice/httpd.service
           ├─29724 /usr/sbin/httpd -DFOREGROUND
           ├─29725 /usr/sbin/httpd -DFOREGROUND
           ├─29726 /usr/sbin/httpd -DFOREGROUND
           ├─29727 /usr/sbin/httpd -DFOREGROUND
           ├─29728 /usr/sbin/httpd -DFOREGROUND
           └─29729 /usr/sbin/httpd -DFOREGROUND
```

php on CentOS:

```
[root@localhost ~]# php -v
PHP 5.4.16 (cli) (built: Apr  1 2020 04:07:17)
Copyright (c) 1997-2013 The PHP Group
Zend Engine v2.4.0, Copyright (c) 1998-2013 Zend Technologies
[root@localhost ~]#
```

on Ubuntu:

```
TASK [ubuntu : Start HTTPD] ****************************************************************
changed: [192.168.56.103]

TASK [ubuntu : Install Apache] *************************************************************
ok: [192.168.56.103]

TASK [ubuntu : Start Apache service] *******************************************************
ok: [192.168.56.103]

TASK [ubuntu : Install MariaDB] ************************************************************
changed: [192.168.56.103]

TASK [ubuntu : Start MariaDB service] ******************************************************
ok: [192.168.56.103]

TASK [ubuntu : Install PHP] ****************************************************************
ok: [192.168.56.103]

TASK [ubuntu : Restart Apache service] *****************************************************
changed: [192.168.56.103]
```

systemctl command for verification:

mariadb on Ubuntu:

```
joshua@ManagedNode:~/CPE_MIDEXAM_CASTILLO$ sudo systemctl status mariadb
● mariadb.service - MariaDB 10.11.6 database server
     Loaded: loaded (/lib/systemd/system/mariadb.service; enabled; preset: enabled)
     Active: active (running) since Tue 2024-04-02 02:18:14 PST; 2min 52s ago
       Docs: man:mariadbd(8)
             https://mariadb.com/kb/en/library/systemd/
   Main PID: 85221 (mariadbd)
     Status: "Taking your SQL requests now..."
      Tasks: 9 (limit: 4614)
     Memory: 85.9M
        CPU: 471ms
     CGroup: /system.slice/mariadb.service
             └─85221 /usr/sbin/mariadbd
```

httpd on Ubuntu:

```
● apache2.service - The Apache HTTP Server
     Loaded: loaded (/lib/systemd/system/apache2.service; enabled; preset: enabled)
     Active: active (running) since Tue 2024-04-02 02:18:22 PST; 8min ago
       Docs: https://httpd.apache.org/docs/2.4/
   Main PID: 85457 (apache2)
      Tasks: 6 (limit: 4614)
     Memory: 13.9M
        CPU: 120ms
     CGroup: /system.slice/apache2.service
             ├─85457 /usr/sbin/apache2 -k start
             ├─85458 /usr/sbin/apache2 -k start
             ├─85459 /usr/sbin/apache2 -k start
             ├─85460 /usr/sbin/apache2 -k start
             ├─85461 /usr/sbin/apache2 -k start
             └─85462 /usr/sbin/apache2 -k start
```

php on Ubuntu:

```
joshua@ManagedNode:~/CPE_MIDEXAM_CASTILLO$ php -v
PHP 8.2.10-2ubuntu1 (cli) (built: Sep  5 2023 14:37:47) (NTS)
Copyright (c) The PHP Group
Zend Engine v4.2.10, Copyright (c) Zend Technologies
    with Zend OPcache v8.2.10-2ubuntu1, Copyright (c), by Zend Technologies
```

Installation of Grafana,Prometheus and Influxdb in seperate hosts (Influxdb,Grafana,Prometheus)
for CentOS:

prometheus for CentOS:

```
TASK [centos : Create directory] ***********************************************
****************************
ok: [192.168.56.105]

TASK [centos : Download Prometheus] ********************************************
****************************
ok: [192.168.56.105]

TASK [centos : Add executables of Prometheus in a path] ************************
****************************
changed: [192.168.56.105]

TASK [centos : Copy Prometheus file] *******************************************
****************************
ok: [192.168.56.105]
```

Grafana for CentOS:

```
TASK [centos : Copying the Influxdb repository file] ***************************
ok: [192.168.56.105]

TASK [centos : Adding the executables to the PATH] *****************************
changed: [192.168.56.105]

TASK [centos : Downloading Grafana package] ************************************
ok: [192.168.56.105]

TASK [centos : Installing Grafana] *********************************************
ok: [192.168.56.105]

TASK [centos : Enabling Grafana service] ***************************************
ok: [192.168.56.105]

TASK [centos : Modifying service file] *****************************************
ok: [192.168.56.105]

TASK [centos : Making sure that Grafana service is started and enabled] ********
ok: [192.168.56.105]
```

influxdb for CentOS:

```
TASK [centos : Adding the executables to the PATH] ****************
changed: [192.168.56.105]

TASK [centos : Install InfluxDB] **********************************
changed: [192.168.56.105]
```

systemctl command for verification:

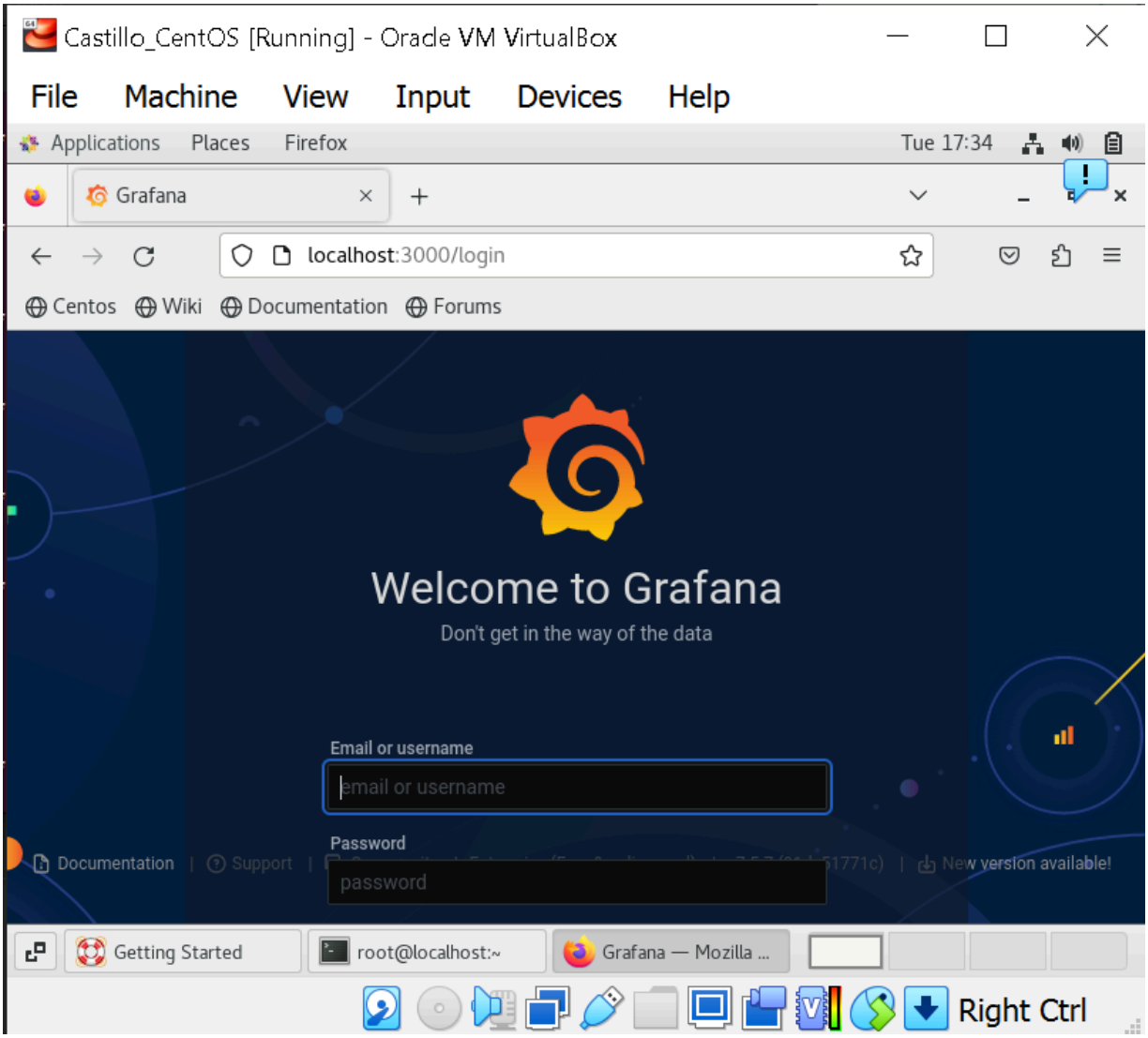
Grafana for CentOS:

```
[root@localhost ~]# sudo systemctl status grafana-server.service
● grafana-server.service - Grafana instance
   Loaded: loaded (/usr/lib/systemd/system/grafana-server.service; enabled; vendor pres
et: disabled)
   Active: active (running) since Tue 2024-04-02 06:48:09 PST; 16s ago
     Docs: http://docs.grafana.org
 Main PID: 9926 (grafana-server)
   CGroup: /system.slice/grafana-server.service
           └─9926 /usr/sbin/grafana-server --config=/etc/grafana/grafana.ini --pidfi...

Apr 02 06:48:09 localhost.localdomain grafana-server[9926]: {"@level":"debug","@mess...
Apr 02 06:48:09 localhost.localdomain grafana-server[9926]: {"@level":"debug","@mess...
Apr 02 06:48:09 localhost.localdomain grafana-server[9926]: {"@level":"debug","@mess...
Apr 02 06:48:09 localhost.localdomain grafana-server[9926]: {"@level":"debug","@mess...
Apr 02 06:48:09 localhost.localdomain grafana-server[9926]: {"@level":"debug","@mess...
Apr 02 06:48:09 localhost.localdomain grafana-server[9926]: {"@level":"debug","@mess...
Apr 02 06:48:09 localhost.localdomain grafana-server[9926]: {"@level":"debug","@mess...
Apr 02 06:48:09 localhost.localdomain grafana-server[9926]: {"@level":"debug","@mess...
Apr 02 06:48:09 localhost.localdomain grafana-server[9926]: t=2024-04-02T06:48:09+08...
Apr 02 06:48:09 localhost.localdomain grafana-server[9926]: t=2024-04-02T06:48:09+08...
Hint: Some lines were ellipsized, use -l to show in full.
[root@localhost ~]# systemctl status influxdb
Unit influxdb.service could not be found.
[root@localhost ~]# 
```

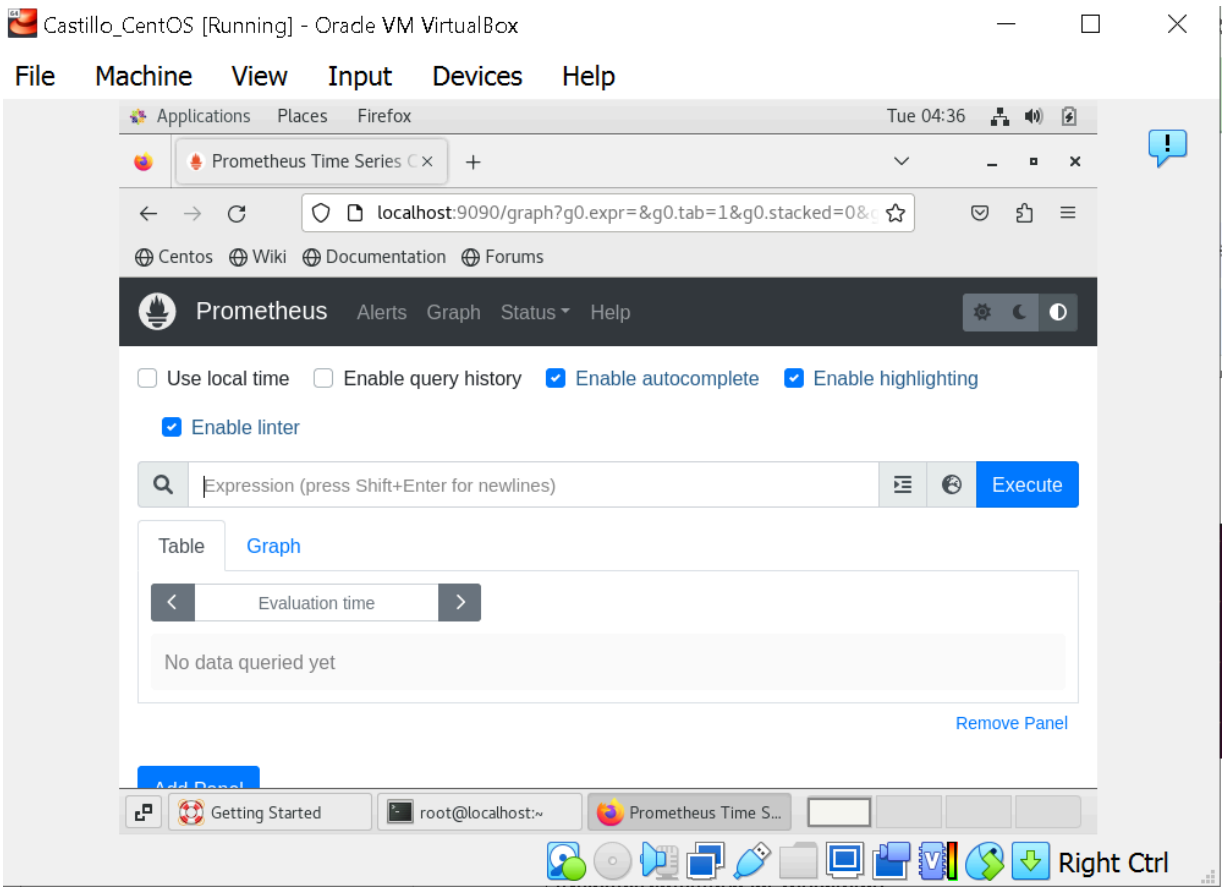
influxdb for CentOS:

```
[root@localhost ~]# systemctl status influxdb
● influxdb.service - InfluxDB is an open-source, distributed, time series database
   Loaded: loaded (/usr/lib/systemd/system/influxdb.service; enabled; vendor preset: di
sabled)
   Active: active (running) since Tue 2024-04-02 18:15:21 PST; 21s ago
     Docs: https://docs.influxdata.com/influxdb/
  Process: 5542 ExecStart=/usr/lib/influxdb/scripts/influxd-systemd-start.sh (code=exit
ed, status=0/SUCCESS)
 Main PID: 5543 (influxd)
    Tasks: 8
   CGroup: /system.slice/influxdb.service
           └─5543 /usr/bin/influxd

Apr 02 18:15:20 localhost.localdomain influxd-systemd-start.sh[5542]: ts=2024-04-02T...
Apr 02 18:15:20 localhost.localdomain influxd-systemd-start.sh[5542]: ts=2024-04-02T...
Apr 02 18:15:20 localhost.localdomain influxd-systemd-start.sh[5542]: ts=2024-04-02T...
Apr 02 18:15:20 localhost.localdomain influxd-systemd-start.sh[5542]: ts=2024-04-02T...
Apr 02 18:15:20 localhost.localdomain influxd-systemd-start.sh[5542]: ts=2024-04-02T...
Apr 02 18:15:20 localhost.localdomain influxd-systemd-start.sh[5542]: ts=2024-04-02T...
Apr 02 18:15:20 localhost.localdomain influxd-systemd-start.sh[5542]: ts=2024-04-02T...
Apr 02 18:15:20 localhost.localdomain influxd-systemd-start.sh[5542]: ts=2024-04-02T...
Apr 02 18:15:20 localhost.localdomain influxd-systemd-start.sh[5542]: ts=2024-04-02T...
Apr 02 18:15:21 localhost.localdomain systemd[1]: Started InfluxDB is an open-sourc....
Hint: Some lines were ellipsized, use -l to show in full.
[root@localhost ~]#
```

web browser verification on grafana:



prometheus verification on browser for CentOS:



for Ubuntu:

prometheus for Ubuntu:

```
TASK [ubuntu : Create directory] ***************************************************
ok: [192.168.56.103]

TASK [ubuntu : Download Prometheus] ************************************************
ok: [192.168.56.103]

TASK [ubuntu : Add executables of Prometheus in a path] ****************************
changed: [192.168.56.103]

TASK [ubuntu : Copy Prometheus file] ***********************************************
ok: [192.168.56.103]
```

Grafana for ubuntu:

```
TASK [ubuntu : install prerequisite packages] **********************************
changed: [192.168.56.103]

TASK [ubuntu : import GPG key] *************************************************
changed: [192.168.56.103]

TASK [ubuntu : add repository for stable releases] *****************************
changed: [192.168.56.103]
```

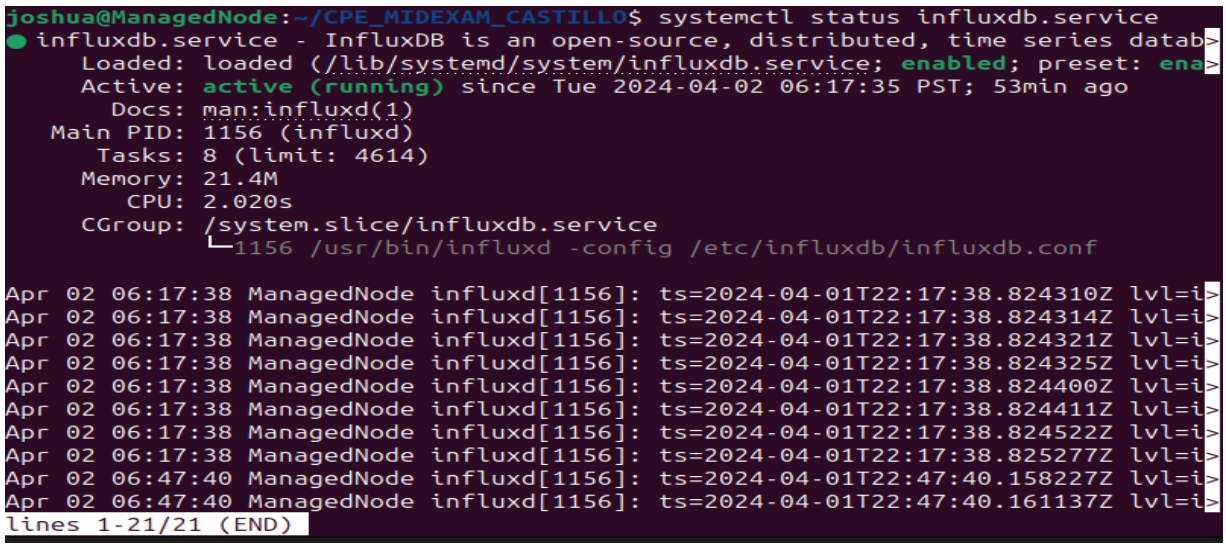
influxdb for ubuntu:

```
TASK [ubuntu : Installing dependencies] ****************************************
ok: [192.168.56.103]

TASK [ubuntu : Adding Influxdb in the repository] ******************************
changed: [192.168.56.103]

TASK [ubuntu : Adding InfluxDB repository] *************************************
ok: [192.168.56.103]

TASK [ubuntu : Installing InfluxDB] ********************************************
ok: [192.168.56.103]

TASK [ubuntu : Making sure that InfluxDB is enabled and started] ***************
ok: [192.168.56.103]
```

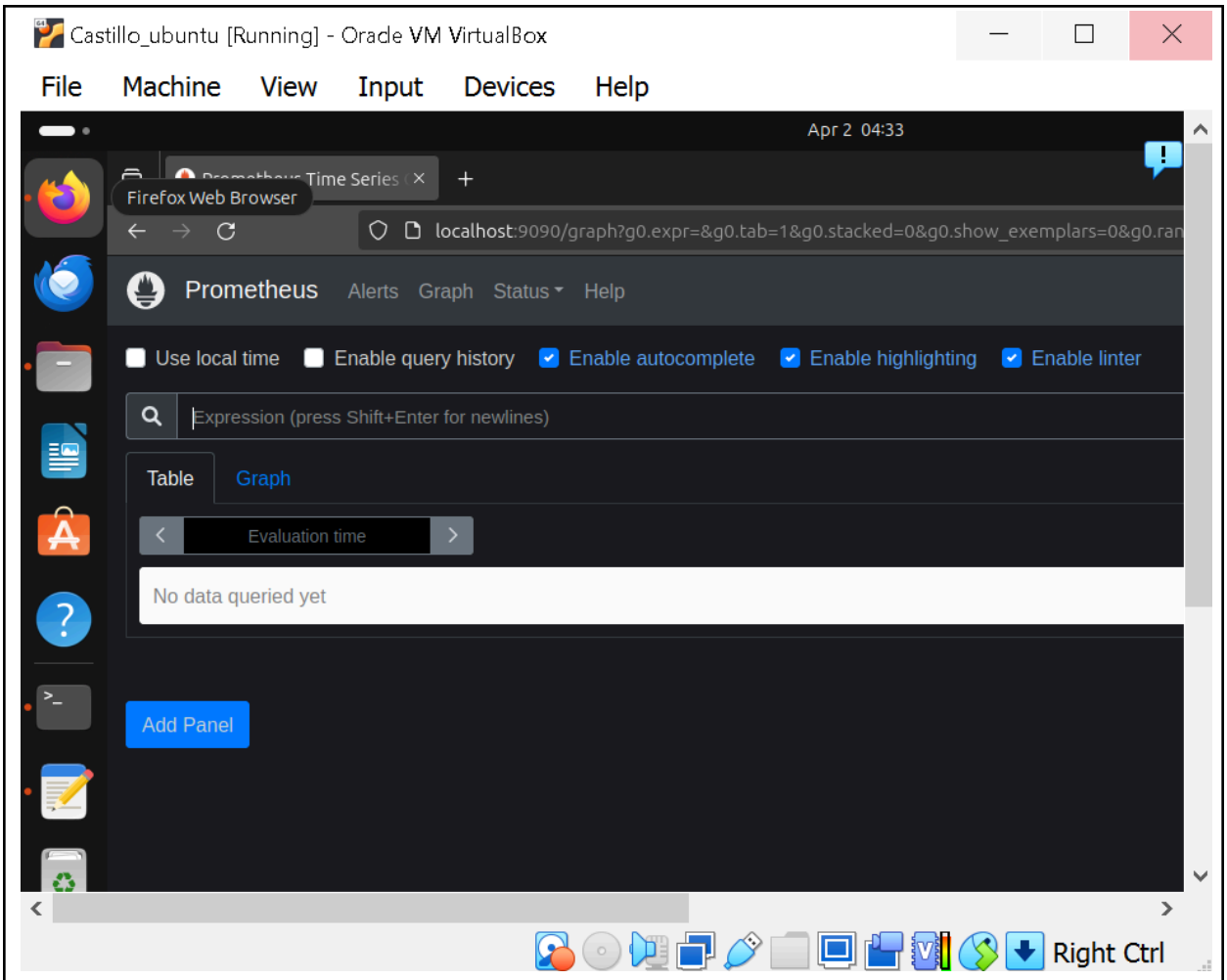
systemctl command for verification:

Grafana for ubuntu:

InfluxDB for ubuntu:



prometheus verification on browser:



git add . and git status:

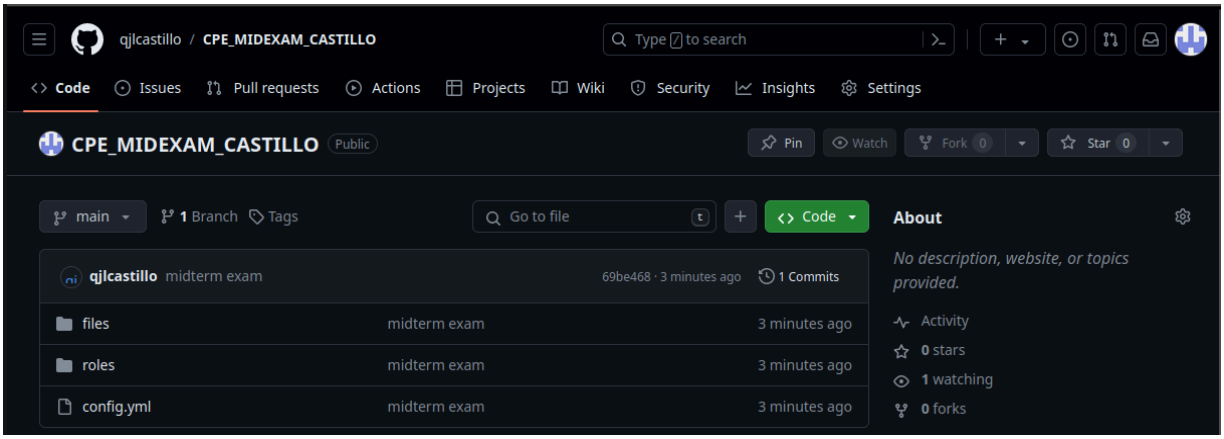
```
joshua@ManagedNode:~/CPE_MIDEXAM_CASTILLO$ git add .
joshua@ManagedNode:~/CPE_MIDEXAM_CASTILLO$ git status
On branch main

No commits yet

Changes to be committed:
  (use "git rm --cached <file>..." to unstage)
        new file:   config.yml
        new file:   files/kibana.repo
        new file:   files/prometheus.service
        new file:   roles/centos/tasks/main.yml
        new file:   roles/nagios_CentOS/global_playbook.yml
        new file:   roles/nagios_CentOS/handlers/main.yml
        new file:   roles/nagios_CentOS/nagios.yml
        new file:   roles/nagios_CentOS/packages/main.yml
        new file:   roles/nagios_CentOS/start/restart/main.yml
        new file:   roles/nagios_CentOS/start/tasks/main.yml
        new file:   roles/nagios_CentOS/tasks/main.yml
        new file:   roles/ubuntu/tasks/main.yml
```

git commit -m “midterm exam”:

```
joshua@ManagedNode:~/CPE_MIDEXAM_CASTILLO$ git commit -m "midterm exam"
[main (root-commit) 69be468] midterm exam
 12 files changed, 610 insertions(+)
 create mode 100644 config.yml
 create mode 100644 files/kibana.repo
 create mode 100644 files/prometheus.service
 create mode 100644 roles/centos/tasks/main.yml
 create mode 100644 roles/nagios_CentOS/global_playbook.yml
 create mode 100644 roles/nagios_CentOS/handlers/main.yml
 create mode 100644 roles/nagios_CentOS/nagios.yml
 create mode 100644 roles/nagios_CentOS/packages/main.yml
 create mode 100644 roles/nagios_CentOS/start/restart/main.yml
 create mode 100644 roles/nagios_CentOS/start/tasks/main.yml
 create mode 100644 roles/nagios_CentOS/tasks/main.yml
 create mode 100644 roles/ubuntu/tasks/main.yml
```

git push and git pull:

```
joshua@ManagedNode:~/CPE_MIDEXAM_CASTILLO$ git push
Enumerating objects: 27, done.
Counting objects: 100% (27/27), done.
Delta compression using up to 2 threads
Compressing objects: 100% (18/18), done.
Writing objects: 100% (27/27), 4.81 KiB | 1.20 MiB/s, done.
Total 27 (delta 1), reused 0 (delta 0), pack-reused 0
remote: Resolving deltas: 100% (1/1), done.
To github.com:qjlcastillo/CPE_MIDEXAM_CASTILLO.git
 * [new branch]      main -> main
joshua@ManagedNode:~/CPE_MIDEXAM_CASTILLO$ git pull
Already up to date.
joshua@ManagedNode:~/CPE_MIDEXAM_CASTILLO$
```



GitHub link: git@github.com:qjlcastillo/CPE_MIDEXAM_CASTILLO.git

Conclusions: in general we were able to apply all the previous activities and synthesize to Create and design a single workflow that installs, configure and manage enterprise availability, performance and log monitoring tools using Ansible as an Infrastructure as Code (IaC) tool. there are some unfamiliar monitoring tools and database such Grafana and Influxdb but was able to properly install them by troubleshooting.