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<b>Course/Section:</b> CPE31S1	<b>Date Submitted:</b> April 02, 2024
<b>Instructor:</b> Dr. Taylar	<b>Semester and SY:</b> 2nd Sem 23-24
<b>Midterm Skills Exam: Install, Configure, and Manage Log Monitoring tools</b>	
<b>1. Objectives</b>	
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.	
<b>2. Instructions</b>	
<ol style="list-style-type: none"> <li>1. Create a repository in your GitHub account and label it CPE_MIDEXAM_SURNAME.</li> <li>2. Clone the repository and do the following: <ol style="list-style-type: none"> <li>2.1. Create an Ansible playbook that does the following with an input of a config.yaml file and arranged Inventory file:</li> <li>2.2. Install and configure Elastic Stack in separate hosts (Elastic Search, Kibana, Logstash) • Install Nagios in one host</li> <li>2.3. Install Grafana,Prometheus and Influxdb in seperate hosts (Influxdb,Grafana,Prometheus)</li> <li>2.4. Install Lamp Stack in separate hosts (Httpd + Php,Mariadb)</li> </ol> </li> <li>3. Document all your tasks using this document. Provide proofs of all the ansible playbooks codes and successful installations.</li> <li>4. Document the push and commit from the local repository to GitHub.</li> <li>5. Finally, paste also the link of your GitHub repository in the documentation.</li> </ol>	

### 3. Output (screenshots and explanations)

#### a. Add the necessary files and its contents

```
jonjeous@localmachine-VirtualBox:~/CPE_MIDEXAM_RECTO$ ls
ansible.cfg  config.yml  inventory  README.md  roles
jonjeous@localmachine-VirtualBox:~/CPE_MIDEXAM_RECTO$ cat ansible.cfg
[defaults]
inventory = inventory
private_key_file = ~/.ssh/ansible
jonjeous@localmachine-VirtualBox:~/CPE_MIDEXAM_RECTO$ cat config.yml
---
- hosts: all
  become: true
  roles:
    - base

- hosts: elasticsearch
  become: true
  roles:
    - elasticsearch
    - grafana
    - lampstack

- hosts: kibana
  become: true
  roles:
    - kibana
    - nagios
```

```

- hosts: logstash
  become: true
  roles:
    - logstash
    - prometheus

- hosts: influxdb
  become: true
  roles:
    - influxdb
jonjeous@localmachine-VirtualBox:~/CPE_MIDEXAM_RECTO$ cat inventory
[ubuntu_servers]
192.168.56.113 #Server1
192.168.56.115 #Server2
192.168.56.114 #ManagedNode

[centos_servers]
192.168.56.116 #CentOS
```

```
[elasticsearch]
192.168.56.116 #Host4

[kibana]
192.168.56.113 #Host2

[logstash]
192.168.56.115 #Host3

[influxdb]
192.168.56.114 #Host1
jonjeous@localmachine-VirtualBox:~/CPE_MIDEXAM_RECTOS$
```

## b. Roles

```
jonjeous@localmachine-VirtualBox:~/CPE_MIDEXAM_RECTOS$ tree roles
roles
├── base
│   └── tasks
│       └── main.yml
├── elasticsearch
│   └── tasks
│       └── main.yml
├── grafana
│   └── tasks
│       └── main.yml
├── influxdb
│   └── tasks
│       └── main.yml
├── kibana
│   └── tasks
│       └── main.yml
├── lampstack
│   └── tasks
│       └── main.yml
├── logstash
│   └── tasks
│       └── main.yml
├── nagios
│   └── tasks
│       └── main.yml
└── prometheus
    ├── handlers
    │   └── main.yml
    └── tasks
        └── main.yml

19 directories, 10 files
jonjeous@localmachine-VirtualBox:~/CPE_MIDEXAM_RECTOS$
```

## c. Tasks for each role.

```
jonjeous@localmachine-VirtualBox:~/CPE_MIDEXAM_RECTO$ cat roles/base/tasks/main.yml
```

```
---
- name: update repository index (CentOS)
  tags: always
  yum:
    name: '*'
  when: ansible_distribution == "CentOS"

- name: install updates (Ubuntu)
  tags: always
  apt:
    update_cache: yes
  changed_when: false
  when: ansible_distribution == "Ubuntu"
  become: true
```

```
jonjeous@localmachine-VirtualBox:~/CPE_MIDEXAM_RECTO$ cat roles/elasticsearch/tasks/main.yml
```

```
---
- name: Add Elasticsearch RPM key (CentOS)
  rpm_key:
    key: https://artifacts.elastic.co/GPG-KEY-elasticsearch
    state: present
  when: ansible_distribution == "CentOS"
  become: true
```

```
- name: Add Elasticsearch repository (CentOS)
  yum_repository:
    name: elasticsearch
    description: Elasticsearch repository for 7.x packages
    baseurl: https://artifacts.elastic.co/packages/7.x/yum
    gpgkey: https://artifacts.elastic.co/GPG-KEY-elasticsearch
    state: present
  when: ansible_distribution == "CentOS"
  become: true

- name: Install Elasticsearch (CentOS)
  yum:
    name: elasticsearch
    state: present
  when: ansible_distribution == "CentOS"
  become: true
```

```
jonjeous@localmachine-VirtualBox:~/CPE_MIDEXAM_RECTO$ cat roles/kibana/tasks/main.yml
```

```
---
- name: Add Kibana APT key (Ubuntu)
  apt_key:
    url: https://artifacts.elastic.co/GPG-KEY-elasticsearch
    state: present
  when: ansible_distribution == "Ubuntu"
  become: true
```

```

- name: Add Kibana repository (Ubuntu)
  apt_repository:
    repo: deb https://artifacts.elastic.co/packages/7.x/apt stable main
    state: present
    update_cache: yes
  when: ansible_distribution == "Ubuntu"
  become: true

- name: Install Kibana (Ubuntu)
  apt:
    name: kibana
    state: present
  when: ansible_distribution == "Ubuntu"
  become: true
jonjeous@localmachine-VirtualBox:~/CPE_MIDEXAM_RECTO$ cat roles/logstash/tasks/
main.yml
---
- name: Add Logstash APT key (Ubuntu)
  apt_key:
    url: https://artifacts.elastic.co/GPG-KEY-elasticsearch
    state: present
  when: ansible_distribution == "Ubuntu"
  become: true

```

```

- name: Add Logstash repository (Ubuntu)
  apt_repository:
    repo: deb https://artifacts.elastic.co/packages/7.x/apt stable main
    state: present
    update_cache: yes
  when: ansible_distribution == "Ubuntu"
  become: true

- name: Install Logstash (Ubuntu)
  apt:
    name: logstash
    state: present
  when: ansible_distribution == "Ubuntu"
  become: true
jonjeous@localmachine-VirtualBox:~/CPE_MIDEXAM_RECTO$ cat roles/nagios/tasks/ma
in.yml
---
- name: Install Nagios on Ubuntu
  apt:
    name: nagios3
    state: present
  when: ansible_distribution == "Ubuntu"

```

```

- name: Enable and start Nagios service (Ubuntu)
  service:
    name: nagios3
    state: started
    enabled: yes
  when: ansible_distribution == "Ubuntu"

jonjeous@localmachine-VirtualBox:~/CPE_MIDEXAM_RECTO$ cat roles/prometheus/task
s/main.yml
---
- name: Install Prometheus on Ubuntu
  apt:
    name: prometheus
    state: present
  when: ansible_distribution == "Ubuntu"

- name: Start Prometheus service on Ubuntu
  systemd:
    name: prometheus
    state: started
  when: ansible_distribution == "Ubuntu"

```

```

jonjeous@localmachine-VirtualBox:~/CPE_MIDEXAM_RECTO$ cat roles/grafana/tasks/main.yml
- name: Add Grafana YUM repository
  yum_repository:
    name: grafana
    description: Grafana stable repository
    baseurl: https://packages.grafana.com/oss/rpm
    gpgcheck: yes
    gpgkey: https://packages.grafana.com/gpg.key
    enabled: yes
    state: present
  when: ansible_distribution == "CentOS"

- name: Install Grafana
  yum:
    name: grafana
    state: present
  when: ansible_distribution == "CentOS"

- name: Start Grafana service
  service:
    name: grafana-server
    state: started
    enabled: yes
  when: ansible_distribution == "CentOS"

```

```

jonjeous@localmachine-VirtualBox:~/CPE_MIDEXAM_RECTO$ cat roles/influxdb/tasks/main.yml
---
- name: Install InfluxDB
  apt:
    name: influxdb
    state: present
  when: ansible_distribution == "Ubuntu"

- name: Start InfluxDB service
  service:
    name: influxdb
    state: started
    enabled: yes
  when: ansible_distribution == "Ubuntu"

jonjeous@localmachine-VirtualBox:~/CPE_MIDEXAM_RECTO$ cat roles/lampstacl/tasks/main.yml
cat: roles/lampstacl/tasks/main.yml: No such file or directory
jonjeous@localmachine-VirtualBox:~/CPE_MIDEXAM_RECTO$ cat roles/lampstack/tasks/main.yml
---
- name: install apache and php for CentOS
  tags: apache,centos,httpd
  yum:
    name:
      - httpd
      - php

```

```

    state: latest
    update_cache: yes
    when: ansible_distribution == "CentOS"

- name: start httpd (CentOS)
  tags: apache, centos, httpd
  service:
    name: httpd
    state: started
  when: ansible_distribution == "CentOS"

- name: install mariadb package (CentOS)
  tags: centos, db, mariadb
  yum:
    name: mariadb-server
    state: latest
  when: ansible_distribution == "CentOS"

- name: "Mariadb- Restarting/Enabling"
  service:
    name: mariadb
    state: restarted
    enabled: true
jonjeous@localmachine-VirtualBox:~/CPE_MIDEXAM_RECTO$

```

d. Run the playbook.

```

jonjeous@localmachine-VirtualBox:~/CPE_MIDEXAM_RECTO$ ansible-playbook --ask-be
come-pass config.yml
SUDO password:

PLAY [all] *****
*

TASK [Gathering Facts] *****
*
ok: [192.168.56.113]
ok: [192.168.56.115]
ok: [192.168.56.114]
ok: [192.168.56.116]

TASK [base : update repository index (CentOS)] *****
*
skipping: [192.168.56.113]
skipping: [192.168.56.115]
skipping: [192.168.56.114]
ok: [192.168.56.116]

```

```
TASK [base : install updates (Ubuntu)] *****
*
skipping: [192.168.56.116]
ok: [192.168.56.113]
ok: [192.168.56.115]
ok: [192.168.56.114]

PLAY [elasticsearch] *****
*

TASK [Gathering Facts] *****
*
ok: [192.168.56.116]

TASK [elasticsearch : Add Elasticsearch RPM key (CentOS)] *****
*
ok: [192.168.56.116]

TASK [elasticsearch : Add Elasticsearch repository (CentOS)] *****
*
ok: [192.168.56.116]

TASK [elasticsearch : Install Elasticsearch (CentOS)] *****
*
ok: [192.168.56.116]
```

```
TASK [grafana : Add Grafana YUM repository] *****
*
ok: [192.168.56.116]

TASK [grafana : Install Grafana] *****
*
ok: [192.168.56.116]

TASK [grafana : Start Grafana service] *****
*
ok: [192.168.56.116]

TASK [lampstack : install apache and php for CentOS] *****
*
ok: [192.168.56.116]

TASK [lampstack : start httpd (CentOS)] *****
*
ok: [192.168.56.116]

TASK [lampstack : install mariadb package (CentOS)] *****
*
ok: [192.168.56.116]
```



```
TASK [lampstack : Mariadb- Restarting/Enabling] *****
*
changed: [192.168.56.116]

PLAY [kibana] *****
*

TASK [Gathering Facts] *****
*
ok: [192.168.56.113]

TASK [kibana : Add Kibana APT key (Ubuntu)] *****
*
ok: [192.168.56.113]

TASK [kibana : Add Kibana repository (Ubuntu)] *****
*
ok: [192.168.56.113]

TASK [kibana : Install Kibana (Ubuntu)] *****
*
ok: [192.168.56.113]

TASK [nagios : Install Nagios on Ubuntu] *****
*
ok: [192.168.56.113]
```

```
TASK [nagios : Enable and start Nagios service (Ubuntu)] *****
*
ok: [192.168.56.113]

PLAY [logstash] *****
*

TASK [Gathering Facts] *****
*
ok: [192.168.56.115]

TASK [logstash : Add Logstash APT key (Ubuntu)] *****
*
ok: [192.168.56.115]

TASK [logstash : Add Logstash repository (Ubuntu)] *****
*
ok: [192.168.56.115]

TASK [logstash : Install Logstash (Ubuntu)] *****
*
ok: [192.168.56.115]

TASK [prometheus : Install Prometheus on Ubuntu] *****
*
ok: [192.168.56.115]
```

```

TASK [prometheus : Start Prometheus service on Ubuntu] *****
*
ok: [192.168.56.115]

PLAY [influxdb] *****
*

TASK [Gathering Facts] *****
*
ok: [192.168.56.114]

TASK [influxdb : Install InfluxDB] *****
*
changed: [192.168.56.114]

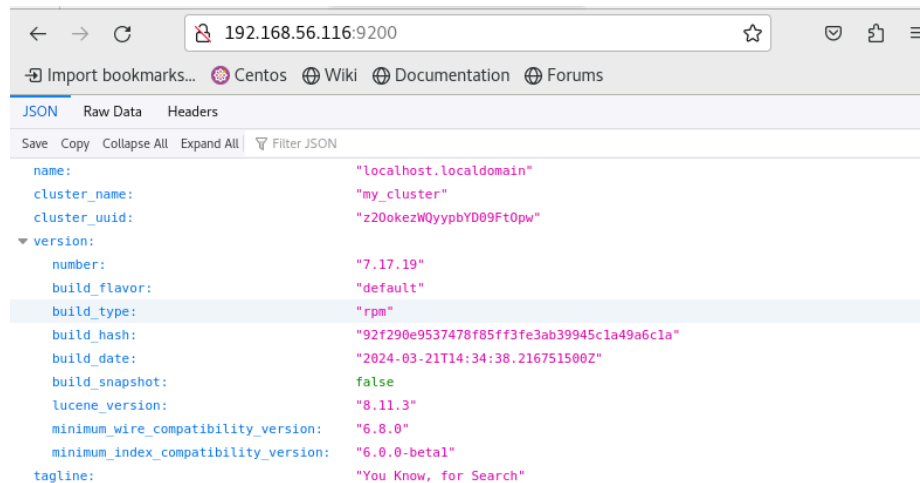
TASK [influxdb : Start InfluxDB service] *****
*
ok: [192.168.56.114]

PLAY RECAP *****
*
192.168.56.113      : ok=8    changed=0    unreachable=0    failed=0
192.168.56.114      : ok=5    changed=1    unreachable=0    failed=0
192.168.56.115      : ok=8    changed=0    unreachable=0    failed=0
192.168.56.116      : ok=13   changed=1    unreachable=0    failed=0
jonjeous@localmachine-VirtualBox:~/CPE_MIDEXAM_RECTO$

```

e. Check if it is installed properly

## 1. Elastic Search

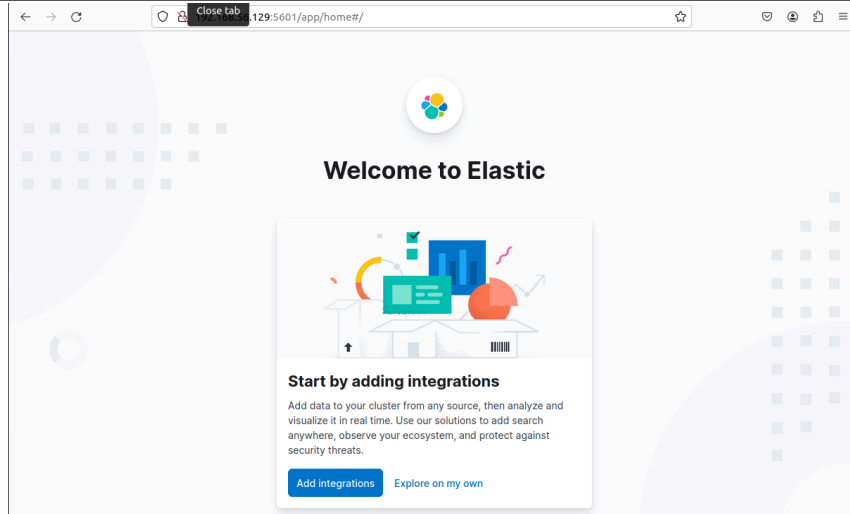


```

{
  "name": "localhost.localdomain",
  "cluster_name": "my_cluster",
  "cluster_uuid": "z20okezWQyypbYD09Ft0pw",
  "version": {
    "number": "7.17.19",
    "build_flavor": "default",
    "build_type": "rpm",
    "build_hash": "92f290e9537478f85ff3fe3ab39945c1a49a6c1a",
    "build_date": "2024-03-21T14:34:38.216751500Z",
    "build_snapshot": false,
    "lucene_version": "8.11.3",
    "minimum_wire_compatibility_version": "6.8.0",
    "minimum_index_compatibility_version": "6.0.0-beta1",
    "tagline": "You Know, for Search"
  }
}

```

## 2. Kibana

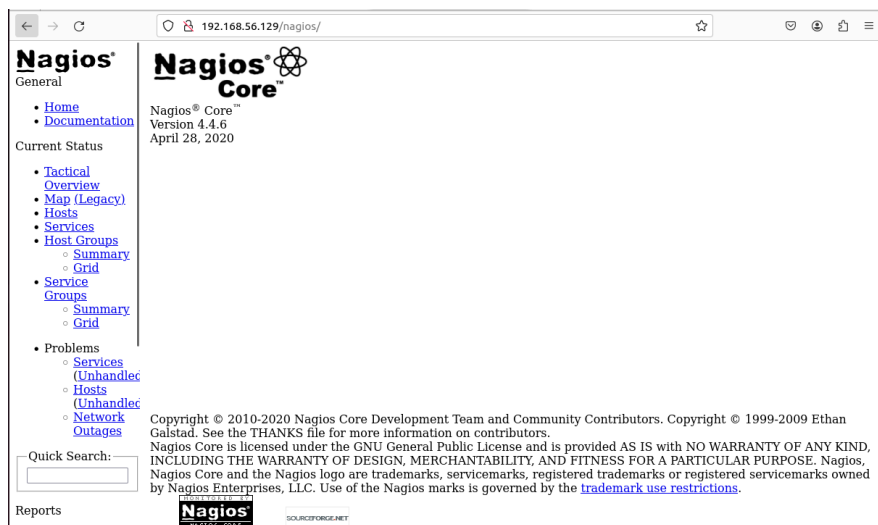


### 3. Logstash

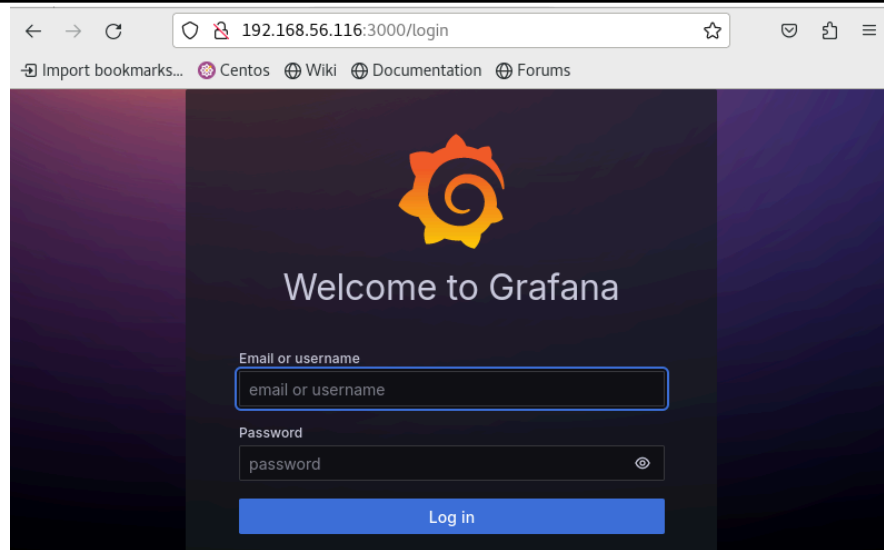
```
jonjeous@server2-VirtualBox:~$ sudo systemctl status logstash
● logstash.service - logstash
   Loaded: loaded (/etc/systemd/system/logstash.service; disabled; vendor prese
   Active: active (running) since Tue 2024-04-02 17:19:42 PST; 1s ago
     Main PID: 7109 (logstash)
        Tasks: 18 (limit: 2318)
      CGroup: /system.slice/logstash.service
              └─7109 /bin/bash /usr/share/logstash/bin/logstash --path.settings /e
                 7121 /usr/share/logstash/jdk/bin/java -cp /usr/share/logstash/logs

Apr 02 17:19:42 server2-VirtualBox systemd[1]: Started logstash.
Apr 02 17:19:42 server2-VirtualBox logstash[7109]: Using bundled JDK: /usr/shar
lines 1-11/11 (END)
```

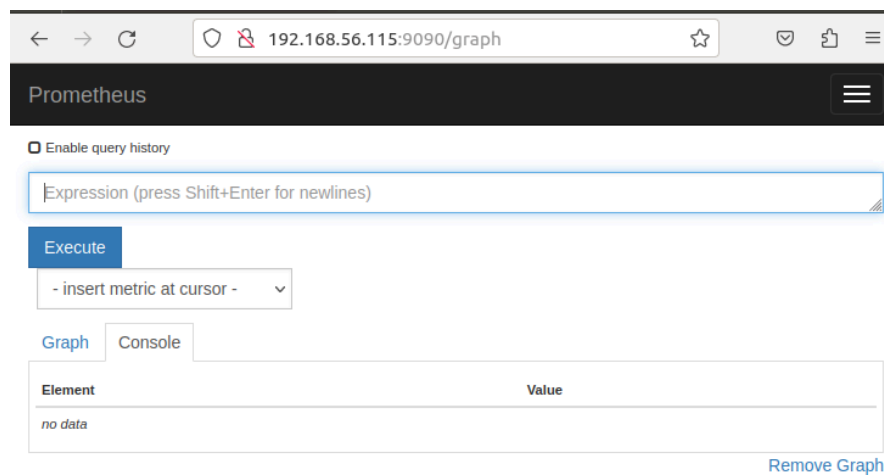
### 4. Nagios



### 5. Grafana



## 6. Prometheus



## 7. Influxdb

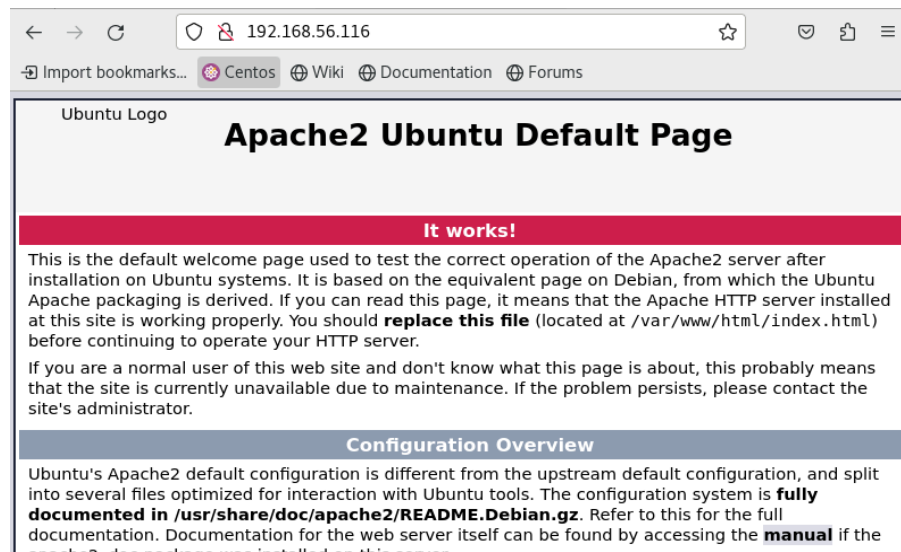
```

jonjeous@localmachine-VirtualBox:~/CPE_MIDEXAM_RECTO$ sudo systemctl status inf
luxdb
● influxdb.service - InfluxDB is an open-source, distributed, time series datab
   Loaded: loaded (/lib/systemd/system/influxdb.service; enabled; vendor preset
   Active: active (running) since Tue 2024-04-02 16:57:18 PST; 13min ago
     Docs: man:influxd(1)
    Main PID: 8323 (influxd)
      Tasks: 11 (limit: 4656)
    CGroup: /system.slice/influxdb.service
            └─8323 /usr/bin/influxd -config /etc/influxdb/influxdb.conf

Apr 02 16:57:18 localmachine-VirtualBox influxd[8323]: [shard-precreation] 2024
Apr 02 16:57:18 localmachine-VirtualBox influxd[8323]: [snapshot] 2024/04/02 16
Apr 02 16:57:18 localmachine-VirtualBox influxd[8323]: [continuous_querier] 202
Apr 02 16:57:18 localmachine-VirtualBox influxd[8323]: [httpd] 2024/04/02 16:57
Apr 02 16:57:18 localmachine-VirtualBox influxd[8323]: [httpd] 2024/04/02 16:57
Apr 02 16:57:18 localmachine-VirtualBox influxd[8323]: [httpd] 2024/04/02 16:57
Apr 02 16:57:18 localmachine-VirtualBox influxd[8323]: [retention] 2024/04/02 1
Apr 02 16:57:18 localmachine-VirtualBox influxd[8323]: [run] 2024/04/02 16:57:1
Apr 02 16:57:18 localmachine-VirtualBox influxd[8323]: [monitor] 2024/04/02 16:
Apr 02 16:57:30 localmachine-VirtualBox influxd[8323]: [shard] 2024/04/02 16:57
lines 1-19/19 (END)

```

## 8. HTTPD



← → ↻ 192.168.56.116 ☆ 🔒 📄 ☰

Import bookmarks... Centos Wiki Documentation Forums

Ubuntu Logo

# Apache2 Ubuntu Default Page

**It works!**

This is the default welcome page used to test the correct operation of the Apache2 server after installation on Ubuntu systems. It is based on the equivalent page on Debian, from which the Ubuntu Apache packaging is derived. If you can read this page, it means that the Apache HTTP server installed at this site is working properly. You should **replace this file** (located at `/var/www/html/index.html`) before continuing to operate your HTTP server.

If you are a normal user of this web site and don't know what this page is about, this probably means that the site is currently unavailable due to maintenance. If the problem persists, please contact the site's administrator.

### Configuration Overview

Ubuntu's Apache2 default configuration is different from the upstream default configuration, and split into several files optimized for interaction with Ubuntu tools. The configuration system is **fully documented in `/usr/share/doc/apache2/README.Debian.gz`**. Refer to this for the full documentation. Documentation for the web server itself can be found by accessing the **manual** if the `apache2` dependencies were installed on this system.

## 9. MariaDB

```

Active: active (running) since Tue 2024-04-02 16:57:02 PST; 50min ago
Process: 9516 ExecStartPost=/usr/libexec/mariadb-wait-ready $MAINPID (code=ex
ited, status=0/SUCCESS)
Process: 9480 ExecStartPre=/usr/libexec/mariadb-prepare-db-dir %n (code=exite
d, status=0/SUCCESS)
Main PID: 9515 (mysqld_safe)
Tasks: 21
CGroup: /system.slice/mariadb.service
└─9515 /bin/sh /usr/bin/mysqld_safe --basedir=/usr
   └─9680 /usr/libexec/mysqld --basedir=/usr --datadir=/var/lib/mysq...

Apr 02 16:57:00 localhost.localdomain systemd[1]: Starting MariaDB database ...
Apr 02 16:57:00 localhost.localdomain mariadb-prepare-db-dir[9480]: Database...
Apr 02 16:57:00 localhost.localdomain mariadb-prepare-db-dir[9480]: If this ...
Apr 02 16:57:00 localhost.localdomain mysqld_safe[9515]: 240402 16:57:00 mys...
Apr 02 16:57:00 localhost.localdomain mysqld_safe[9515]: 240402 16:57:00 mys...
Apr 02 16:57:02 localhost.localdomain systemd[1]: Started MariaDB database s...
Hint: Some lines were ellipsized, use -l to show in full.
[jonjeous@localhost ~]$ mysql -u root
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 9
Server version: 5.5.68-MariaDB MariaDB Server


Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MariaDB [(none)]>

```


#### f. Commit changes to github



**CPE\_MIDEXAM\_RECTO**
Public
Pin
Unwatch 1

main
1 Branch
0 Tags

Add file
Code

File	Commit	Time
roles	MIDTERMS	now
README.md	Initial commit	yesterday
ansible.cfg	MIDTERMS	yesterday
config.yml	MIDTERMS	now
inventory	MIDTERMS	now


**jonjeous**
MIDTERMS
e68616a · now
4 Commits


**README**

## CPE\_MIDEXAM\_RECTO

#### GitHub link:

[https://github.com/jonjeous/CPE\\_MIDEXAM\\_RECTO.git](https://github.com/jonjeous/CPE_MIDEXAM_RECTO.git)

#### Conclusions: (link your conclusion from the objective)

In conclusion, the goal was to develop a workflow using Ansible as a tool to set up and manage monitoring systems for enterprise availability, performance, and logs. This approach aims to simplify processes, improve efficiency, and ensure smooth operations across IT environments. By completing this activity, we've laid the groundwork for more streamlined infrastructure management, better responsiveness to business needs, and enhanced system resilience.