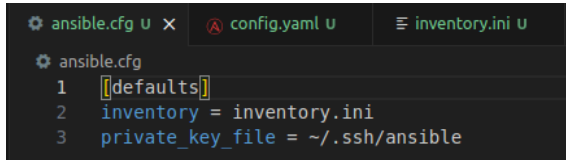
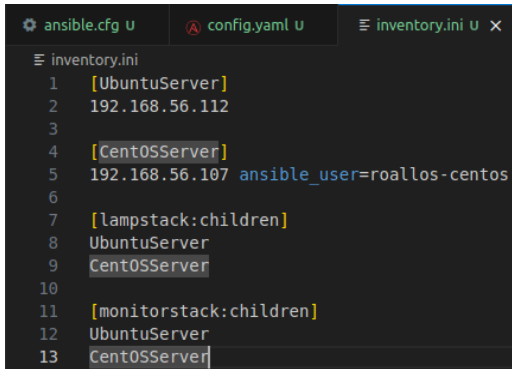


| | |
|---|--|
| Name: ROALLOS, Jean Gabriel Vincent G. | Date Performed: 10 / 10 / 2025 |
| Course/Section: CPE212 - CPE31S2 | Date Submitted: 10 / 10 / 2025 |
| Instructor: Robin Valenzuela | Semester and SY: 1st, 2025-2026 |
| Midterm Skills Exam: Install, Configure, and Manage Log Monitoring tools | |
| 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 | |
| <ol style="list-style-type: none"> 1. Create a repository in your GitHub account and label it CPE_MIDEXAM_SURNAME. 2. Clone the repository and do the following: <ol style="list-style-type: none"> 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) | |
| ansible.cfg file: | |
|  <pre> 1 [defaults] 2 inventory = inventory.ini 3 private_key_file = ~/.ssh/ansible </pre> | |
| inventory.ini file: | |
|  <pre> 1 [UbuntuServer] 2 192.168.56.112 3 4 [CentOSServer] 5 192.168.56.107 ansible_user=roallos-centos 6 7 [lampstack:children] 8 UbuntuServer 9 CentOSServer 10 11 [monitorstack:children] 12 UbuntuServer 13 CentOSServer </pre> | |

roles/monitorstack/tasks/main.yaml

```
ansible.cfg  config.yaml  inventory.ini  main.yaml .../lampstack/...  main.yaml .../monitorstack/... X

roles > monitorstack > tasks > main.yaml
1  ---
2  - name: Install InfluxDB (Ubuntu)
3    apt:
4      name: influxdb
5      state: latest
6    when: ansible_distribution == "Ubuntu"
7
8  - name: Install Prometheus (Ubuntu)
9    apt:
10     name: prometheus
11     state: latest
12   when: ansible_distribution == "Ubuntu"
13
14  - name: Download Grafana GPG key (Ubuntu)
15    shell:
16     cmd: wget -q -O - https://apt.grafana.com/gpg.key | apt-key add -
17   args:
18     warn: false
19   when: ansible_distribution == "Ubuntu"
20
21  - name: Add Grafana APT repository (Ubuntu)
22    apt_repository:
23     repo: deb https://apt.grafana.com stable main
24     state: present
25     filename: grafana
26   when: ansible_distribution == "Ubuntu"
27
28  - name: Install Grafana
29    apt:
30     name: grafana
31     state: latest
32   when: ansible_distribution == "Ubuntu"
33
34  - name: Start Grafana service
35    service:
36     name: grafana-server
37     state: started
38     enabled: true
39   when: ansible_distribution == "Ubuntu"
```

Installing monitorstack:

```

PLAY [monitorstack] *****

TASK [Gathering Facts] *****
ok: [192.168.56.112]
ok: [192.168.56.107]

TASK [monitorstack : Install InfluxDB (Ubuntu)] *****
skipping: [192.168.56.107]
ok: [192.168.56.112]

TASK [monitorstack : Install Prometheus (Ubuntu)] *****
skipping: [192.168.56.107]
ok: [192.168.56.112]

TASK [monitorstack : Download Grafana GPG key (Ubuntu)] *****
skipping: [192.168.56.107]
changed: [192.168.56.112]

TASK [monitorstack : Add Grafana APT repository (Ubuntu)] *****
skipping: [192.168.56.107]
ok: [192.168.56.112]

TASK [monitorstack : Install Grafana] *****
skipping: [192.168.56.107]
ok: [192.168.56.112]

TASK [monitorstack : Start Grafana service] *****
skipping: [192.168.56.107]
changed: [192.168.56.112]

PLAY RECAP *****
192.168.56.107      : ok=7    changed=1    unreachable=0    failed=0    skipped=8    rescued=0    ignored=0
192.168.56.112      : ok=12   changed=3    unreachable=0    failed=0    skipped=3    rescued=0    ignored=0

```

Proof of Installed Services:

```

roallos-ubuntu@server1: ~
❏
roallos-ubuntu@server1:~$ systemctl status influxdb
● influxdb.service - InfluxDB is an open-source, distributed, time series database
   Loaded: loaded (/lib/systemd/system/influxdb.service; enabled; vendor preset: enabled)
   Active: active (running) since Fri 2025-10-10 19:04:22 +08; 7min ago
     Docs: man:influxd(1)
  Main PID: 11866 (influxd)
    Tasks: 11 (limit: 4624)
   Memory: 5.7M
   CGroup: /system.slice/influxdb.service
           └─11866 /usr/bin/influxd -config /etc/influxdb/influxdb.conf

roallos-ubuntu@server1:~$ systemctl status prometheus
● prometheus.service - Monitoring system and time series database
   Loaded: loaded (/lib/systemd/system/prometheus.service; enabled; vendor preset: enabled)
   Active: active (running) since Fri 2025-10-10 19:04:53 +08; 6min ago
     Docs: https://prometheus.io/docs/introduction/overview/
  Main PID: 14082 (prometheus)
    Tasks: 10 (limit: 4624)
   Memory: 22.5M
   CGroup: /system.slice/prometheus.service
           └─14082 /usr/bin/prometheus

roallos-ubuntu@server1:~$ systemctl status grafana-server
● grafana-server.service - Grafana instance
   Loaded: loaded (/usr/lib/systemd/system/grafana-server.service; enabled; vendor preset: enabled)
   Active: active (running) since Fri 2025-10-10 19:09:02 +08; 2min 46s ago
     Docs: http://docs.grafana.org
  Main PID: 22143 (grafana)
    Tasks: 14 (limit: 4624)
   Memory: 132.9M
   CGroup: /system.slice/grafana-server.service
           └─22143 /usr/share/grafana/bin/grafana server --config=/etc/grafana/grafana.ini --pidfile=/run/grafana
roallos-ubuntu@server1:~$

```

I have installed the required services in the monitorstack (influxdb, prometheus, grafana/grafana-server), although only in the Ubuntu system because I had trouble working with the CentOS dependencies (GPG key and additional repositories).

roles/lampstack/tasks/main.yaml:

```
roles > lampstack > tasks > main.yaml
1  ---
2  - name: Install Apache2 (httpd), PHP, and MariaDB for Ubuntu Servers
3    tags: apache,apache2,ubuntu
4    apt:
5      name:
6        - apache2
7        - libapache2-mod-php
8        - mariadb-server
9      state: latest
10     update_cache: yes
11     when: ansible_distribution == "Ubuntu"
12
13  - name: Install Apache2 (httpd), PHP, and MariaDB for CentOS Servers
14    tags: apache,centos,httpd
15    dnf:
16      name:
17        - httpd
18        - php
19        - mariadb-server
20      state: latest
21      update_cache: yes
22      when: ansible_distribution == "CentOS"
23
24  - name: Start httpd (CentOS)
25    tags: apache, centos, httpd
26    service:
27      name: httpd
28      state: started
29      when: ansible_distribution == "CentOS"
30
31  - name: MariaDB Restarting/Enabling
32    service:
33      name: mariadb
34      state: restarted
35      enabled: true
36
```

This Ansible playbook installs the required services for the lamp stack group (httpd/apache, php, mariadb). I made sure to install the latest version by declaring the 'state: latest' during install. Because CentOS defaults to not starting installed services (httpd and mariadb), there were extra plays to start and restart specific services, making sure that they are enabled and up.

Installing Lampstack:

```
roallos-ubuntu@workstation:~/CPE_MIDEXAM_ROALLOSS$ ansible-playbook config.yaml -K
information. This feature will be removed in version 2.12. Deprecation warnings can be disabled by setting deprecation_warnings=False in ansible.cfg.
ok: [192.168.56.112]
[DEPRECATION WARNING]: Distribution centos 9 on host 192.168.56.107 should use /usr/libexec/platform-python, but is using /usr/bin/python for backward compatibility with prior Ansible releases. A future Ansible release will default to using the discovered platform python for this host. See https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html for more information. This feature will be removed in version 2.12. Deprecation warnings can be disabled by setting deprecation_warnings=False in ansible.cfg.
ok: [192.168.56.107]

TASK [Install Updates (CentOS)] *****
skipping: [192.168.56.112]
ok: [192.168.56.107]

TASK [Install Updates (Ubuntu)] *****
skipping: [192.168.56.107]
ok: [192.168.56.112]

PLAY [lampstack] *****

TASK [Gathering Facts] *****
ok: [192.168.56.112]
ok: [192.168.56.107]

TASK [lampstack : Install Apache2 (httpd), PHP, and MariaDB for Ubuntu Servers] *****
skipping: [192.168.56.107]
ok: [192.168.56.112]

TASK [lampstack : Install Apache2 (httpd), PHP, and MariaDB for CentOS Servers] *****
skipping: [192.168.56.112]
changed: [192.168.56.107]

TASK [lampstack : Start httpd (CentOS)] *****
skipping: [192.168.56.112]
changed: [192.168.56.107]

TASK [lampstack : MariaDB Restarting/Enabling] *****
changed: [192.168.56.107]
changed: [192.168.56.112]

PLAY RECAP *****
192.168.56.107      : ok=6    changed=3    unreachable=0    failed=0    skipped=2    rescued=0    ignored=0
192.168.56.112      : ok=5    changed=1    unreachable=0    failed=0    skipped=3    rescued=0    ignored=0

roallos-ubuntu@workstation:~/CPE_MIDEXAM_ROALLOSS$
```

Proof of Installed Services:

```
roallos-ubuntu@server1:~$ systemctl status mariadb
● mariadb.service - MariaDB 10.3.39 database server
   Loaded: loaded (/lib/systemd/system/mariadb.service; enabled; vendor preset: enabled)
   Active: active (running) since Fri 2025-10-10 17:25:35 +08; 2min 25s ago
     Docs: man:mysqld(8)
           https://mariadb.com/kb/en/library/systemd/
   Process: 6444 ExecStartPre=/usr/bin/install -m 755 -o mysql -g root -d /var/run/mysql (code=exited, status=0)
   Process: 6453 ExecStartPre=/bin/sh -c systemctl unset-environment _WSREP_START_POSITION (code=exited, status=0)
   Process: 6455 ExecStartPre=/bin/sh -c [ ! -e /usr/bin/galera_recovery ] && VAR= || VAR='cd /usr/bin/..; /usr/bin/galera_recovery' (code=exited, status=0)
   Process: 6544 ExecStartPost=/bin/sh -c systemctl unset-environment _WSREP_START_POSITION (code=exited, status=0)
   Process: 6546 ExecStartPost=/etc/mysql/debian-start (code=exited, status=0/SUCCESS)
  Main PID: 6513 (mysqld)
    Status: "Taking your SQL requests now..."
     Tasks: 31 (limit: 4624)
    Memory: 63.6M
   CGroup: /system.slice/mariadb.service
           └─6513 /usr/sbin/mysqld

roallos-ubuntu@server1:~$ systemctl status apache2
● apache2.service - The Apache HTTP Server
   Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor preset: enabled)
   Active: active (running) since Fri 2025-10-10 16:33:48 +08; 54min ago
     Docs: https://httpd.apache.org/docs/2.4/
   Process: 870 ExecStart=/usr/sbin/apachectl start (code=exited, status=0/SUCCESS)
  Main PID: 986 (apache2)
     Tasks: 6 (limit: 4624)
    Memory: 16.5M
   CGroup: /system.slice/apache2.service
           └─986 /usr/sbin/apache2 -k start
             └─1018 /usr/sbin/apache2 -k start
               └─1019 /usr/sbin/apache2 -k start
                 └─1020 /usr/sbin/apache2 -k start
                   └─1021 /usr/sbin/apache2 -k start
                     └─1022 /usr/sbin/apache2 -k start

Warning: some journal files were not opened due to insufficient permissions.
roallos-ubuntu@server1:~$ php -v
PHP 7.4.3-4ubuntu2.29 (cli) (built: Mar 25 2025 18:57:03) ( NTS )
Copyright (c) The PHP Group
Zend Engine v3.4.0, Copyright (c) Zend Technologies
with Zend OPcache v7.4.3-4ubuntu2.29, Copyright (c), by Zend Technologies
roallos-ubuntu@server1:~$
```

```
roallos-centos@vbox:~  
[roallos-centos@vbox ~]$ systemctl status httpd  
● httpd.service - The Apache HTTP Server  
   Loaded: loaded (/usr/lib/systemd/system/httpd.service; disabled; preset: disabled)  
   Drop-In: /usr/lib/systemd/system/httpd.service.d  
            └─php-fpm.conf  
   Active: active (running) since Fri 2025-10-10 17:25:32 PST; 4min 11s ago  
     Docs: man:httpd.service(8)  
   Main PID: 6581 (httpd)  
   Status: "Total requests: 0; Idle/Busy workers 100/0; Requests/sec: 0; Bytes served/sec: 0 B/sec"  
     Tasks: 177 (limit: 22981)  
   Memory: 18.5M (peak: 18.9M)  
      CPU: 534ms  
   CGroup: /system.slice/httpd.service  
            └─6581 /usr/sbin/httpd -DFOREGROUND  
               6588 /usr/sbin/httpd -DFOREGROUND  
               6589 /usr/sbin/httpd -DFOREGROUND  
               6590 /usr/sbin/httpd -DFOREGROUND  
               6591 /usr/sbin/httpd -DFOREGROUND  
  
Oct 10 17:25:32 vbox systemd[1]: Starting The Apache HTTP Server...  
Oct 10 17:25:32 vbox httpd[6581]: AH00558: httpd: Could not reliably determine the server's fully qualified domain name, using fe80::a00:27ff:fe92:770c%enp0s2  
Oct 10 17:25:32 vbox httpd[6581]: Server configured, listening on: port 80  
Oct 10 17:25:32 vbox systemd[1]: Started The Apache HTTP Server.  
[roallos-centos@vbox ~]$ systemctl status mariadb  
● mariadb.service - MariaDB 10.5 database server  
   Loaded: loaded (/usr/lib/systemd/system/mariadb.service; enabled; preset: disabled)  
   Active: active (running) since Fri 2025-10-10 17:25:34 PST; 4min 18s ago  
     Docs: man:mariadb(8)  
           https://mariadb.com/kb/en/library/systemd/  
   Process: 6877 ExecStartPre=/usr/libexec/mariadb-check-socket (code=exited, status=0/SUCCESS)  
   Process: 6999 ExecStartPre=/usr/libexec/mariadb-prepare-db-dir mariadb.service (code=exited, status=0/SUCCESS)  
   Process: 7051 ExecStartPost=/usr/libexec/mariadb-check-upgrade (code=exited, status=0/SUCCESS)  
   Main PID: 7034 (mariadb)  
   Status: "Taking your SQL requests now..."  
     Tasks: 8 (limit: 22981)  
   Memory: 70.1M (peak: 71.2M)  
      CPU: 371ms  
   CGroup: /system.slice/mariadb.service  
            └─7034 /usr/libexec/mariadb --basedir=/usr  
  
Oct 10 17:25:33 vbox systemd[1]: Starting MariaDB 10.5 database server...  
Oct 10 17:25:33 vbox mariadb-prepare-db-dir[6999]: Database MariaDB is probably initialized in /var/lib/mysql already, nothing is done.  
Oct 10 17:25:33 vbox mariadb-prepare-db-dir[6999]: If this is not the case, make sure the /var/lib/mysql is empty before running mariadb-prepare-db-dir.  
Oct 10 17:25:34 vbox systemd[1]: Started MariaDB 10.5 database server.  
[roallos-centos@vbox ~]$ php -v  
PHP 8.0.30 (cli) (built: Apr 28 2025 09:28:14) ( NTS gcc x86_64 )  
Copyright (c) The PHP Group  
Zend Engine v4.0.30, Copyright (c) Zend Technologies  
    with Zend OPcache v8.0.30, Copyright (c), by Zend Technologies  
[roallos-centos@vbox ~]$
```

GitHub link:

https://github.com/jgvroallos/CPE_MIDEXAM_ROALLOS/tree/main

Conclusions: (link your conclusion from the objective)

In this midterm examination, I have (partially) installed the necessary IaC services to the managed nodes. Although I have some difficulties in setting up and translating the local commands to run through Ansible playbooks especially in the CentOS managed node.