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Section: CPE232-CPE31S24

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Tools Needed:
1. VM with Ubuntu, CentOS and Ansible installed 2. Web browser
Procedure:
1. Create a repository and label it as "Final_Exam_Surname" 2. Clone your new repository in your VM 3. Create an Ansible playbook that does the following with an input of a config.yaml file and structure inventory file. 3.1 Install and configure one enterprise service that can be installed in Debian and Centos servers 3.2 Install and configure one monitoring tool that can be installed in Debian and Centos servers (if it is a stack there should be option of different host) 4.4 Change Motd as "Ansible Managed by <username>" 4. Push and commit your files in GitHub 5. Make sure to show evidence of input (codes) process (codes successfully running) and output (evidence of installation). Create a word document report for this final exam. For your final exam to be counted, please paste your repository link as an answer in your report. No point will be given if you forgot to paste your repo link. Note: Extra points if you will implement the said services via containerization. GitHub repository link https://github.com/qictbello/Final_Exam_Bello Codes

```
  GNU nano 6.2                          inventory *
[debian]
server1
[centos]
servercent
```

```
  GNU nano 6.2                          ansible.cfg
[defaults]
command_warnings=False
deprecation_warnings=False
inventory=inventory
private_key_file = ~/.ssh/ansible
```

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These are the codes for the structure of ansible

```
  GNU nano 6.2                                  dockerfile
FROM ubuntu
MAINTAINER ubuntuhost <qictbello@tip.edu.ph>

ARG DEBIAN_FRONTEND=noninteractive

RUN apt update; apt dist-upgrade -y

RUN apt install -y apache2 htop

COPY index.html /var/www/html/

EXPOSE 80

ENTRYPOINT apache2ctl -D FOREGROUND
```

Here we created an example of a website html that will be deployed and run in our servers

```
  GNU nano 6.2                                  index.html
<html>
<head>
  <title> Bello The Great </title>
</head>
<body>
  <p> This can be any website that will be hosted on servers</body>
</html>
```

We will be using apache2 as an enterprise service where we host website for example and htop for monitoring tools.

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```
  GNU nano 6.2
---
- hosts: all
  become: true
  pre_tasks:

  -  name: update repository index CentOS
     dnf:
       update_cache: yes
     changed_when: false
     when: ansible_distribution == "CentOS"

  -  name: update repository index Ubuntu
     apt:
       upgrade: dist
       update_cache: yes
     changed_when: false
     when: ansible_distribution == "Ubuntu"

- hosts: all
  become: true
  tasks:

  -  name: install docker ubuntu
     apt:
       name: docker.io
       state: latest
     when: ansible_distribution == "Ubuntu"
```

```
  -  name: install docker centos
     shell: 'curl -fsSL https://get.docker.com/ | sh'
     when: ansible_distribution == "CentOS"

  -  name: install docker sdk ubuntu
     apt:
       name: python3-docker
       update_cache: yes
       cache_valid_time: 3600
     when: ansible_distribution == "Ubuntu"

  -  name: docker permission ubuntu
     shell: 'sudo usermod -aG docker $USER'
     when: ansible_distribution == "Ubuntu"

  -  name: install docker sdk centos
     yum:
       name: python-docker-py
       update_cache: yes
     when: ansible_distribution == "CentOS"

  -  name: docker permission centos
     shell: 'sudo usermod -aG docker $(whoami)'
     when: ansible_distribution == "CentOS"
```

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```
- name: start and enable docker
  service:
    name: docker
    state: started

- name: cpy dockerfile
  copy: src=dockerfile dest=/tmp/path/

- name: cpy index
  copy: src=index.html dest=/tmp/path/

- name: docker build
  docker_image:
    name: apachehtop
    build:
      path: /tmp/path/
      args:
        listen_port: 8080
    source: build

- name: MOTD deployer default
  copy:
     content: "Ansible Managed node by Bello\n"
     dest: /etc/motd
```

We will run it into both servers

```
ubuntuhost@workstation:~/Final_Exam_Bello$ ansible-playbook --ask-become-pass config.yaml
BECOME password:

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

TASK [Gathering Facts] *********************************************************
ok: [servercent]
ok: [server1]

TASK [update repository index CentOS] ******************************************
skipping: [server1]
ok: [servercent]

TASK [update repository index Ubuntu] ******************************************
skipping: [servercent]
ok: [server1]

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

TASK [Gathering Facts] *********************************************************
ok: [server1]
ok: [servercent]

TASK [install docker ubuntu] ***************************************************
skipping: [servercent]
ok: [server1]

TASK [install docker centos] ***************************************************
skipping: [server1]
changed: [servercent]
```

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```
TASK [install docker sdk ubuntu] ***********************************************
skipping: [servercent]
ok: [server1]

TASK [docker permission ubuntu] ************************************************
skipping: [servercent]
changed: [server1]

TASK [install docker sdk centos] ***********************************************
skipping: [server1]
ok: [servercent]

TASK [docker permission centos] ************************************************
skipping: [server1]
changed: [servercent]

TASK [start and enable docker] *************************************************
ok: [servercent]
ok: [server1]

TASK [cpy dockerfile] **********************************************************
ok: [servercent]
ok: [server1]

TASK [cpy index] ***************************************************************
changed: [servercent]
changed: [server1]

TASK [docker build] ************************************************************
changed: [server1]
changed: [servercent]
```

```
TASK [MOTD deployer default] ****************************************************
ok: [servercent]
ok: [server1]

PLAY RECAP *********************************************************************
server1                    : ok=11   changed=3    unreachable=0    failed=0    skipped=4    rescued=0    ignored=0
servercent                 : ok=11   changed=4    unreachable=0    failed=0    skipped=4    rescued=0    ignored=0
```

Next, we will run it and check if apache is running, and we can use the monitoring tool

```
ubuntuhost@workstation:~/Final_Exam_Bello$ ssh servercent
Last login: Sat Dec 10 09:48:25 2022 from 192.168.56.102
Ansible Managed node by Bello
[ubuntuhost@localhost ~]$
```

MOTD is shown every login

```
ubuntuhost@workstation:~/Final_Exam_Bello$ ssh servercent
Last login: Sat Dec 10 09:48:25 2022 from 192.168.56.102
Ansible Managed node by Bello
[ubuntuhost@localhost ~]$ docker run -d -it -p 1234:80 apachehtop
ab21676c687f6877ef65c997a023f889361d7cf89d946f4d27f583f5f72aa9d1
[ubuntuhost@localhost ~]$ docker ps
CONTAINER ID   IMAGE        COMMAND                  CREATED          STATUS          PORTS                                   NAMES
ab21676c687f   apachehtop   "/bin/sh -c 'apache2…"   33 seconds ago   Up 31 seconds   0.0.0.0:1234->80/tcp, :::1234->80/tcp   epic_volhard
[ubuntuhost@localhost ~]$
```

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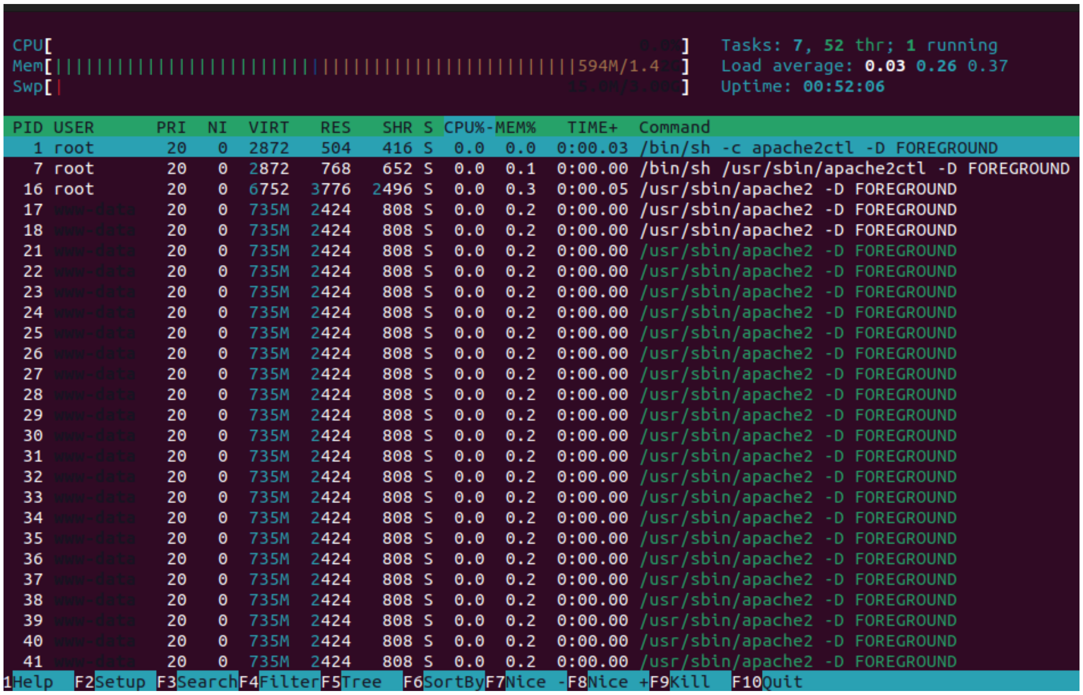
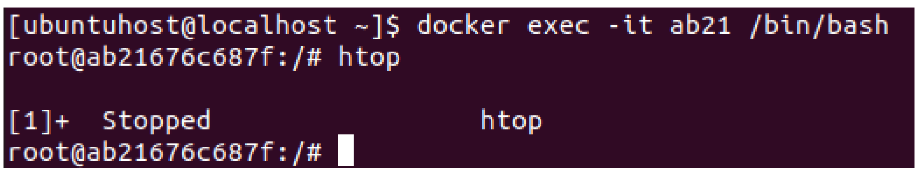
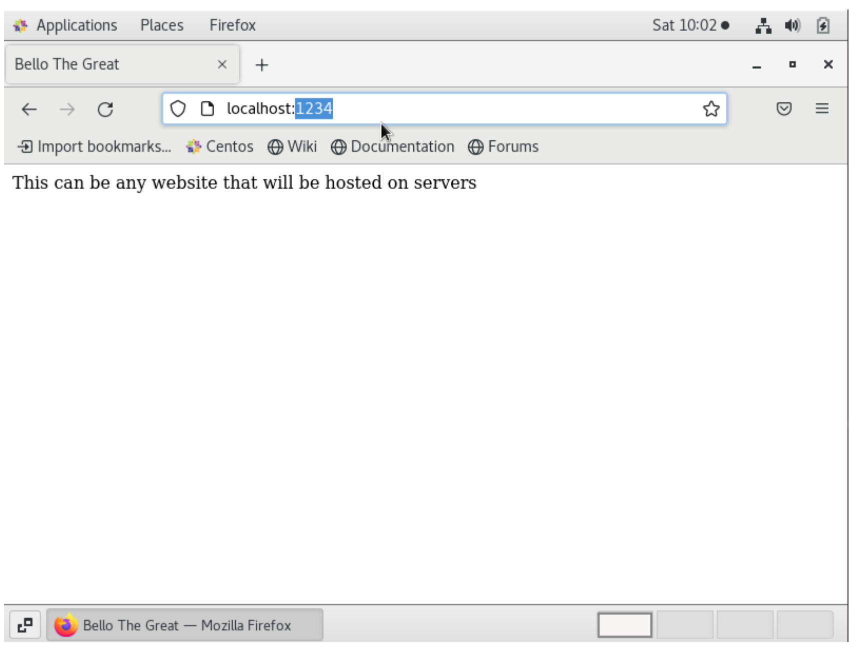




In cent os the htop monitoring shows that only apache2 is running in our container next, we will access it in our website if it runs.



It shows the index html that we created and deployed, this is inside the container

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Next, we will do it in our Ubuntu

```
ubuntuhost@workstation:~/Final_Exam_Bello$ ssh server1
Welcome to Ubuntu 22.04.1 LTS (GNU/Linux 5.15.0-56-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/advantage

0 updates can be applied immediately.

Ansible Managed node by Bello
Last login: Sat Dec 10 09:48:26 2022 from 192.168.56.102
ubuntuhost@server1:~$ docker run -d -it -p 1234:80 apachehtop
a4adb1fb41817f5f5862544f3bb05342fd4f0b409a64a02b8b8ce8273c197b10
```

Here you can see that the motd is changed and we run the image we built and deploy using ansible playbook

```
ubuntuhost@server1:~$ docker images
REPOSITORY         TAG       IMAGE ID       CREATED          SIZE
apachehtop         latest    b642fb16f54b   20 minutes ago   226MB
ubuntu             latest    6b7dfa7e8fdb   25 hours ago     77.8MB
containeransible   latest    d291c28423cb   3 weeks ago      512MB
ubuntu             <none>    a8780b506fa4   5 weeks ago      77.8MB
ubuntuhost@server1:~$ docker ps
CONTAINER ID   IMAGE        COMMAND                  CREATED          STATUS
      PORTS                                  NAMES
a4adb1fb4181   apachehtop   "/bin/sh -c 'apache2…"   20 seconds ago   Up 17 seco
nds   0.0.0.0:1234->80/tcp, :::1234->80/tcp   gracious_hugle
ubuntuhost@server1:~$
```

This shows that it is running, now we will try to access the container and test the apache and htop if it can monitor running services in our container

```
ubuntuhost@server1:~$ docker exec -it a4 /bin/bash
root@a4adb1fb4181:/#
```

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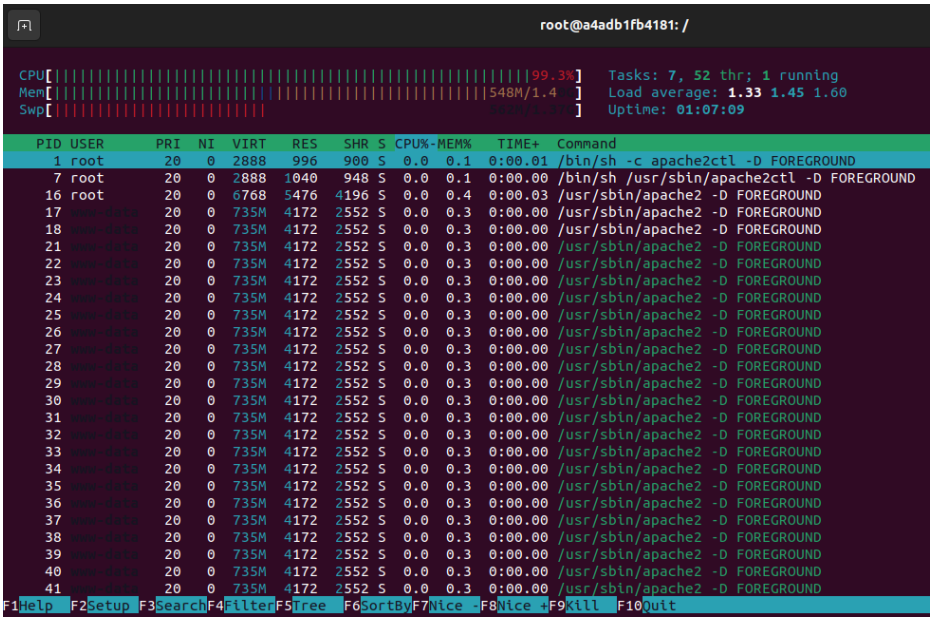
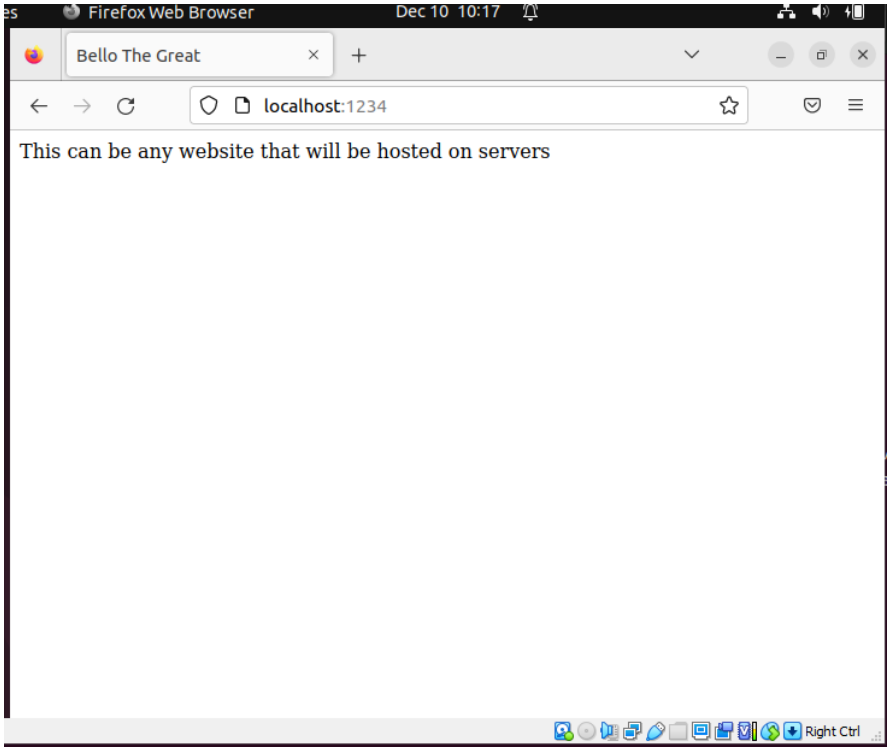


Here you can see only apache2 is running and getting monitored



This shows that apache and htop are running in this container

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In summary, we deployed containers using docker and help of ansible playbook. We chose apache as enterprise service where we host website services in our servers. We used htop as a monitoring tool to monitor the processes in the container.

Updating repository

```
ubuntuhost@workstation:~/Final_Exam_Bello$ git add -A
ubuntuhost@workstation:~/Final_Exam_Bello$ git commit -m "Final Exam"
[main 88592c5] Final Exam
 5 files changed, 108 insertions(+)
 create mode 100644 ansible.cfg
 create mode 100644 config.yaml
 create mode 100644 dockerfile
 create mode 100644 index.html
 create mode 100644 inventory
ubuntuhost@workstation:~/Final_Exam_Bello$ git push
Enumerating objects: 8, done.
Counting objects: 100% (8/8), done.
Compressing objects: 100% (6/6), done.
Writing objects: 100% (7/7), 1.39 KiB | 475.00 KiB/s, done.
Total 7 (delta 0), reused 0 (delta 0), pack-reused 0
To github.com:qictbello/Final_Exam_Bello.git
   a84b8ea..88592c5  main -> main
ubuntuhost@workstation:~/Final_Exam_Bello$
```

GitHub repository link

https://github.com/qictbello/Final_Exam_Bello