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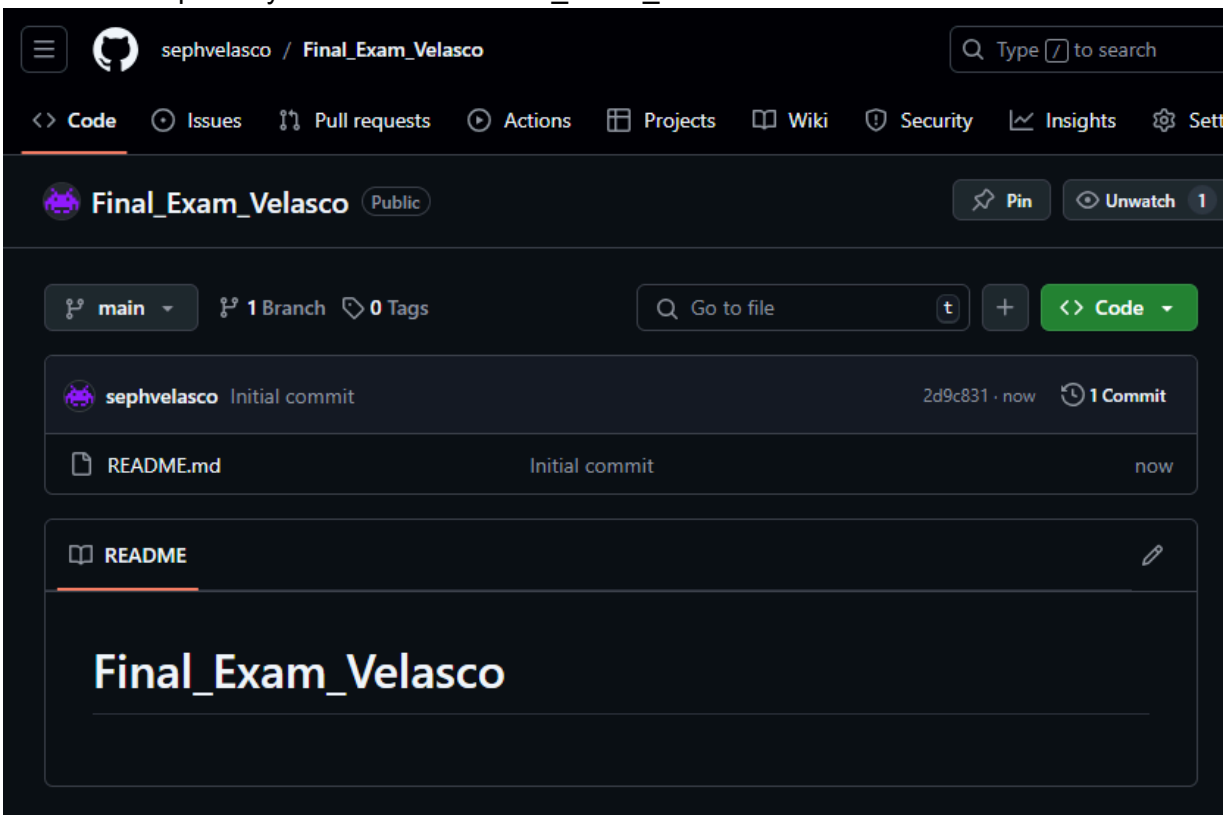
CPE31S2	Engr. Robin Valenzuela

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"    https://github.com/sephvelasco/Final_Exam_Velasco.git

2. Clone your new repository in your VM

```
sephvelasco@workstation:~$ cd CPE212
sephvelasco@workstation:~/CPE212$ git clone git@github.com:sephvelasco/Final_Exa
m_Velasco.git
Cloning into 'Final_Exam_Velasco'...
remote: Enumerating objects: 3, done.
remote: Counting objects: 100% (3/3), done.
Receiving objects: 100% (3/3), done.
remote: Total 3 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
sephvelasco@workstation:~/CPE212$ ls
Activity_10  Activity_4  Activity_7  Final_Exam_Velasco
activity_11  Activity_5  Activity_8  InstallDocker
Activity_2   Activity_6  Activity_9  Velasco_PrelimExam
sephvelasco@workstation:~/CPE212$
```

3. Create an Ansible playbook that does the following with an input of a config.yaml file and structure inventory file.

```
sephvelasco@workstation:~/CPE212/Final_Exam_Velasco$ cat inventory
[ubuntu]
192.168.56.11

[centos]
192.168.56.18   ansible_user=sephvelasco
```

Inventory File

3.1 Install and configure one enterprise service that can be installed in Debian and Centos servers

```
GNU nano 7.2
# Enterprise Service (Ubuntu)
- name: Add Enterprise Service GPG Key on Ubuntu (Docker)
  apt_key:
    url: https://download.docker.com/linux/ubuntu/gpg
    state: present
  when: ansible_distribution == "Ubuntu"

- name: Add Enterprise Service to APT Repository on Ubuntu (Docker)
  apt_repository:
    repo: "deb https://download.docker.com/linux/ubuntu focal stable"
    state: present
  when: ansible_distribution == "Ubuntu"

- name: Install Enterprise Serivce Prerequisites on Ubuntu (Docker)
  apt:
    name:
      - apt-transport-https
      - ca-certificates
      - curl
      - software-properties-common
      - python3-pip
      - virtualenv
      - python3-setuptools
    state: latest
  when: ansible_distribution == "Ubuntu"

- name: Install Enterprise Service on Ubuntu (Docker)
  apt:
    name: docker-ce
    state: latest
  when: ansible_distribution == "Ubuntu"
```

Docker Enterprise Service (Ubuntu)

```
# Enterprise Service (CentOS)
- name: Install Enterprise Service Prerequisites on CentOS
  yum:
    name:
      - yum-utils
      - device-mapper-persistent-data
      - lvm2
    state: latest
  when: ansible_distribution == "CentOS"

- name: Add Enterprise Service Repository to YUM on CentOS
  get_url:
    url: https://download.docker.com/linux/centos/docker-ce.repo
    dest: /etc/yum.repos.d/docker-ce.repo
  when: ansible_distribution == "CentOS"

- name: Install Enterprise Service on CentOS (Docker)
  yum:
    name: docker-ce
    state: latest
  when: ansible_distribution == "CentOS"

- name: Start Enterprise Service on CentOS (Docker)
  service:
    name: docker
    state: started
    enabled: yes
```

Docker Enterprise Service (CentOS)

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)

```
# Monitoring Service (Ubuntu)
- name: Install Monitoring Service on Ubuntu (Nagios)
  apt:
    name: nagios4
    state: latest
  when: ansible_distribution == "Ubuntu"

- name: Start Monitoring Service on Ubuntu (Nagios)
  service:
    name: nagios4
    state: started
    enabled: yes
  when: ansible_distribution == "Ubuntu"
```

Nagios Monitoring Service (Ubuntu)

```
# Monitoring Service (CentOS)
- name: Install Monitoring Service on CentOS (Nagios)
  yum:
    name: nagios
    state: latest
  when: ansible_distribution == "CentOS"

- name: Start Monitoring Service on CentOS (Nagios)
  service:
    name: nagios
    state: started
    enabled: yes
  when: ansible_distribution == "CentOS"
```

Nagios Monitoring Service (CentOS)

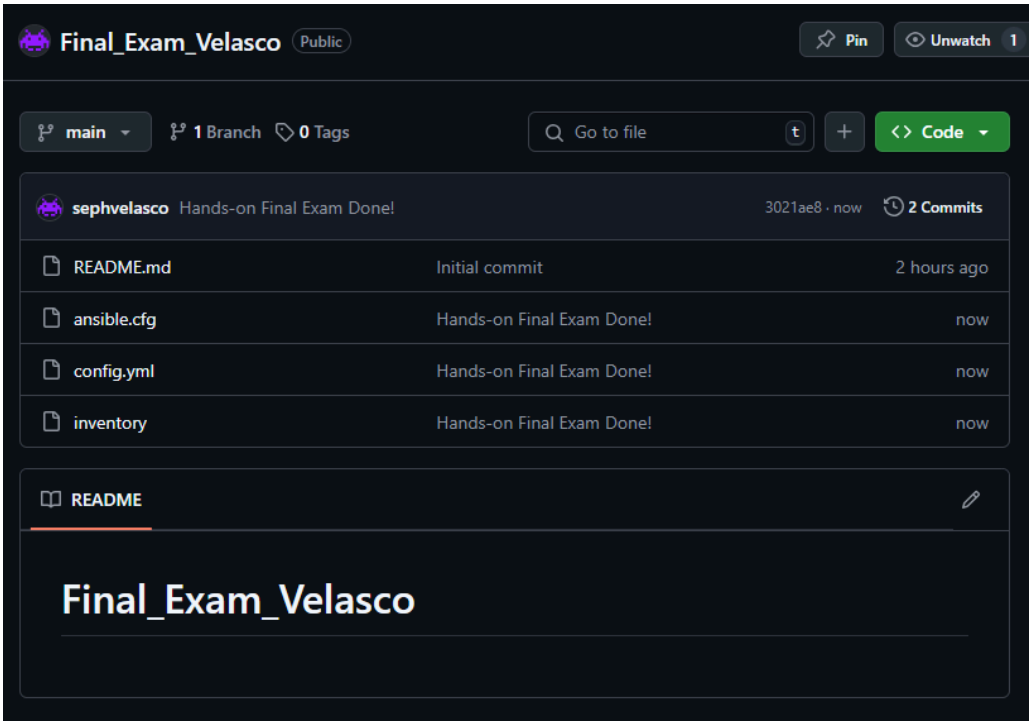
3.3 Change Motd as "Ansible Managed by <username>"

```yaml
# Message of the Day
- name: Message of the Day
  debug:
    msg: Ansible Managed by @sephvelasco

- name: Banner Message of the Day
  copy:
    content: "Ansible Managed by @sephvelasco\n"
    dest: /etc/motd
```

4. Push and commit your files in GitHub

```
sephvelasco@workstation:~/CPE212/Final_Exam_Velasco$ git add --all
sephvelasco@workstation:~/CPE212/Final_Exam_Velasco$ git commit -m "Hands-on Final Exam Done!"
[main 3021ae8] Hands-on Final Exam Done!
 3 files changed, 134 insertions(+)
 create mode 100644 ansible.cfg
 create mode 100644 config.yml
 create mode 100644 inventory
sephvelasco@workstation:~/CPE212/Final_Exam_Velasco$ git push origin main
Enumerating objects: 6, done.
Counting objects: 100% (6/6), done.
Delta compression using up to 2 threads
Compressing objects: 100% (5/5), done.
Writing objects: 100% (5/5), 1.22 KiB | 209.00 KiB/s, done.
Total 5 (delta 0), reused 0 (delta 0), pack-reused 0
To github.com:sephvelasco/Final_Exam_Velasco.git
   2d9c831..3021ae8  main -> main
sephvelasco@workstation:~/CPE212/Final_Exam_Velasco$
```



5. Make sure to show evidence of input (codes) process (codes successfully running) and output (evidence of installation)

```
sephvelasco@workstation:~/CPE212/Final_Exam_Velasco$ ansible-playbook config.yml --ask-become-pass
BECOME password:

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

TASK [Gathering Facts] *********************************************************************************
[WARNING]: Platform linux on host 192.168.56.11 is using the discovered Python interpreter at /usr/b
Python interpreter could change the meaning of that path. See https://docs.ansible.com/ansible-
core/2.17/reference_appendices/interpreter_discovery.html for more information.
ok: [192.168.56.11]
[WARNING]: Platform linux on host 192.168.56.18 is using the discovered Python interpreter at /usr/b
Python interpreter could change the meaning of that path. See https://docs.ansible.com/ansible-
core/2.17/reference_appendices/interpreter_discovery.html for more information.
ok: [192.168.56.18]

TASK [Message of the Day] ******************************************************************************
ok: [192.168.56.11] => {
    "msg": "Ansible Managed by @sephvelasco"
}
ok: [192.168.56.18] => {
    "msg": "Ansible Managed by @sephvelasco"
}

TASK [Banner Message of the Day] ***********************************************************************
ok: [192.168.56.11]
ok: [192.168.56.18]

TASK [Update Packages] *********************************************************************************
changed: [192.168.56.11]
ok: [192.168.56.18]

TASK [Add Enterprise Service GPG Key on Ubuntu (Docker)] ***********************************************
skipping: [192.168.56.18]
ok: [192.168.56.11]
```

```
TASK [Add Enterprise Service to APT Repository on Ubuntu (Docker)] *************************************
skipping: [192.168.56.18]
ok: [192.168.56.11]

TASK [Install Enterprise Serivce Prerequisites on Ubuntu (Docker)] *************************************
skipping: [192.168.56.18]
ok: [192.168.56.11]

TASK [Install Enterprise Service on Ubuntu (Docker)] ***************************************************
skipping: [192.168.56.18]
ok: [192.168.56.11]

TASK [Start Enterprise Service on Ubuntu (Docker)] *****************************************************
skipping: [192.168.56.18]
ok: [192.168.56.11]

TASK [Install Monitoring Service on Ubuntu (Nagios)] ***************************************************
skipping: [192.168.56.18]
ok: [192.168.56.11]

TASK [Start Monitoring Service on Ubuntu (Nagios)] *****************************************************
skipping: [192.168.56.18]
ok: [192.168.56.11]

TASK [Install Enterprise Service Prerequisites on CentOS] **********************************************
skipping: [192.168.56.11]
ok: [192.168.56.18]

TASK [Add Enterprise Service Repository to YUM on CentOS] **********************************************
skipping: [192.168.56.11]
ok: [192.168.56.18]

TASK [Install Enterprise Service on CentOS (Docker)] ***************************************************
skipping: [192.168.56.11]
ok: [192.168.56.18]
```

```
TASK [Start Enterprise Service on CentOS (Docker)] ******************************************************
ok: [192.168.56.11]
ok: [192.168.56.18]

TASK [Install Monitoring Service on CentOS (Nagios)] ****************************************************
skipping: [192.168.56.11]
ok: [192.168.56.18]

TASK [Start Monitoring Service on CentOS (Nagios)] ******************************************************
skipping: [192.168.56.11]
ok: [192.168.56.18]

PLAY RECAP **********************************************************************************************
192.168.56.11              : ok=12   changed=1    unreachable=0    failed=0    skipped=5    rescued=0    ignored=0
192.168.56.18              : ok=10   changed=0    unreachable=0    failed=0    skipped=7    rescued=0    ignored=0

sephvelasco@workstation:~/CPE212/Final_Exam_Velasco$
```

Working Ansible Playbook

```
sephvelasco@server1:~$ cat /etc/motd
Ansible Managed by @sephvelasco
sephvelasco@server1:~$
```

```
[sephvelasco@localhost ~]$ cat /etc/motd
Ansible Managed by @sephvelasco
[sephvelasco@localhost ~]$
```

Message of the Day (Ubuntu & CentOS)

```
sephvelasco@server1:~$ sudo systemctl status docker
[sudo] password for sephvelasco:
● docker.service - Docker Application Container Engine
     Loaded: loaded (/usr/lib/systemd/system/docker.service; enabled; preset: enabled)
     Active: active (running) since Wed 2024-11-13 08:21:24 PST; 3 weeks 0 days ago
TriggeredBy: ● docker.socket
       Docs: https://docs.docker.com
   Main PID: 44311 (dockerd)
      Tasks: 10
     Memory: 71.3M (peak: 160.1M)
        CPU: 9.990s
     CGroup: /system.slice/docker.service
             └─44311 /usr/bin/dockerd -H fd:// --containerd=/run/containerd/containerd.sock
```

```
[sephvelasco@localhost ~]$ sudo systemctl status docker
[sudo] password for sephvelasco:
● docker.service - Docker Application Container Engine
     Loaded: loaded (/usr/lib/systemd/system/docker.service; enabled; preset: disabled)
     Active: active (running) since Wed 2024-12-04 09:16:57 PST; 25min ago
TriggeredBy: ● docker.socket
       Docs: https://docs.docker.com
   Main PID: 72878 (dockerd)
      Tasks: 10
     Memory: 24.9M
        CPU: 359ms
     CGroup: /system.slice/docker.service
             └─72878 /usr/bin/dockerd -H fd:// --containerd=/run/containerd/containerd.sock
```

Enterprise Service (Ubuntu & CentOS)

```
sephvelasco@server1:~$ sudo systemctl status nagios4
● nagios4.service - nagios4
     Loaded: loaded (/usr/lib/systemd/system/nagios4.service; enabled; preset: enabled)
     Active: active (running) since Wed 2024-10-16 10:34:28 PST; 1 month 18 days ago
       Docs: man:nagios4
   Main PID: 17337 (nagios4)
      Tasks: 6 (limit: 4616)
     Memory: 4.5M (peak: 6.5M)
        CPU: 13.821s
     CGroup: /system.slice/nagios4.service
             ├─17337 /usr/sbin/nagios4 /etc/nagios4/nagios.cfg
             ├─17338 /usr/sbin/nagios4 --worker /var/lib/nagios4/rw/nagios.qh
             ├─17339 /usr/sbin/nagios4 --worker /var/lib/nagios4/rw/nagios.qh
             ├─17340 /usr/sbin/nagios4 --worker /var/lib/nagios4/rw/nagios.qh
             ├─17341 /usr/sbin/nagios4 --worker /var/lib/nagios4/rw/nagios.qh
             └─17342 /usr/sbin/nagios4 /etc/nagios4/nagios.cfg
```

```
[sephvelasco@localhost ~]$ sudo systemctl status nagios
● nagios.service - Nagios Core 4.4.14
     Loaded: loaded (/usr/lib/systemd/system/nagios.service; enabled; preset: disabled)
     Active: active (running) since Wed 2024-12-04 09:17:33 PST; 27min ago
       Docs: https://www.nagios.org/documentation
   Main PID: 74352 (nagios)
      Tasks: 8 (limit: 23005)
     Memory: 25.4M
        CPU: 1.013s
     CGroup: /system.slice/nagios.service
             ├─74352 /usr/sbin/nagios -d /etc/nagios/nagios.cfg
             ├─74353 /usr/sbin/nagios --worker /var/spool/nagios/cmd/nagios.qh
             ├─74354 /usr/sbin/nagios --worker /var/spool/nagios/cmd/nagios.qh
             ├─74355 /usr/sbin/nagios --worker /var/spool/nagios/cmd/nagios.qh
             ├─74356 /usr/sbin/nagios --worker /var/spool/nagios/cmd/nagios.qh
             ├─74381 /usr/sbin/nagios -d /etc/nagios/nagios.cfg
             ├─86196 /usr/lib64/nagios/plugins/check_ping -H 127.0.0.1 -w 100.0,20% -c 500.0,60% -p 5
             └─86197 /usr/bin/ping -n -U -w 10 -c 5 127.0.0.1
```

Monitoring Service (Ubuntu & CentOS)

6. For your final exam to be counted, please paste your repository link as an answer in this exam.
https://github.com/sephvelasco/Final_Exam_Velasco.git

Note: Extra points if you will implement the said services via containerization.