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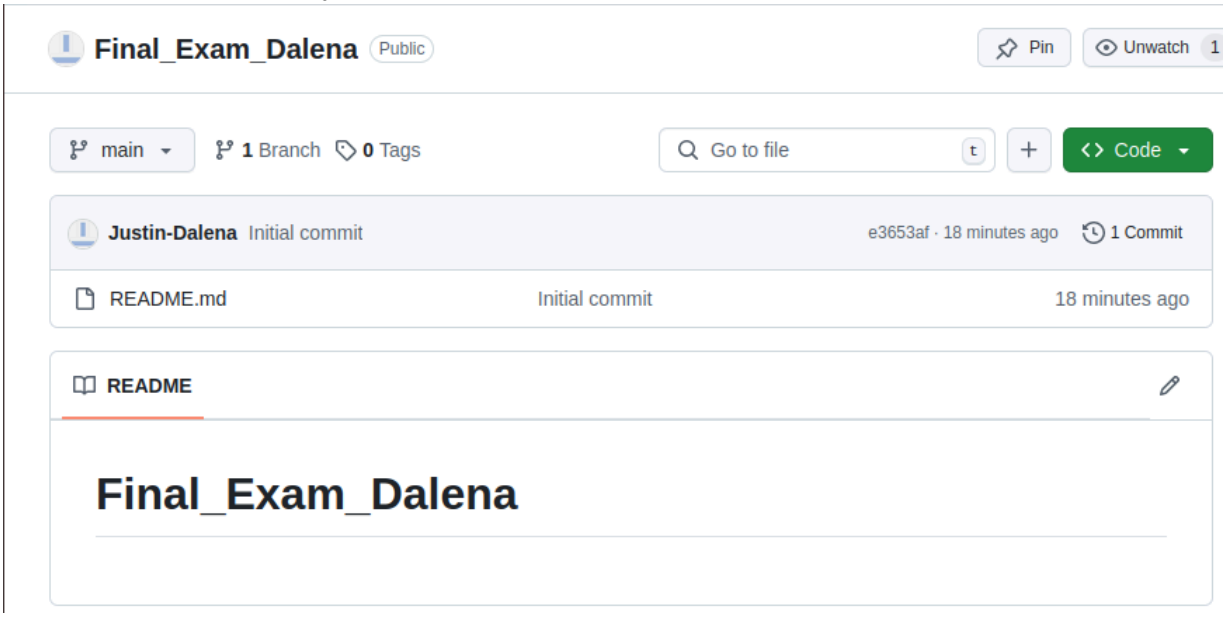
Section: CPE31S21	Instructor: Engr. Robin Valenzuela
Tools Needed:	
1. VM with Ubuntu, CentOS and Ansible installed 2. Web browser	
Procedure:	
1. Create a repository and label it as "Final_Exam_Surname" 2. Clone your new repository in your VM 3. Create an Ansible playbook that does the following with 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) 5. For your final exam to be counted, please paste your repository link as an answer in this exam. Note: Extra points if you will implement the said services via containerization.	

DOCUMENTATION:

I created a new repository named Final_Exam_Dalena.



Copied the ssh key of the new repository to clone it in my terminal.

```
justin@workstation:~$ git clone git@github.com:Justin-Dalena/Final_Exam_Dalena.git
Cloning into 'Final_Exam_Dalena'...
Warning: Permanently added the ECDSA host key for IP address '4.237.22.38' to the list of known hosts.
remote: Enumerating objects: 3, done.
remote: Counting objects: 100% (3/3), done.
remote: Total 3 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
Receiving objects: 100% (3/3), done.
justin@workstation:~$ cd Final_Exam_Dalena/
justin@workstation:~/Final_Exam_Dalena$ ls
README.md
```

Created a new inventory.yml to properly list down my servers.

```
  GNU nano 2.9.3                                          inventory.yml

all:
  hosts:
    ubuntu_server:
      ansible_host: 192.168.56.142
      ansible_user: justin
      ansible_ssh_private_key_file: ~/.ssh/id_rsa.pub
    centos_server:
      ansible_host: 192.168.56.149
      ansible_user: jdalena
      ansible_ssh_private_key_file: ~/.ssh/id_rsa.pub
```

Checking to see if the newly created inventory will work on pinging both of my servers.

```
justin@workstation:~/Final_Exam_Dalena$ ansible all -m ping -i inventory.yml
ubuntu_server | SUCCESS => {
    "changed": false,
    "ping": "pong"
}
centos_server | SUCCESS => {
    "changed": false,
    "ping": "pong"
}
justin@workstation:~/Final_Exam_Dalena$
```

With the success of pinging both servers I can now proceed to create my ansible playbook for installing 1 enterprise and 1 monitoring tool to either of my servers.

```
 GNU nano 2.9.3                                ansible.yml

---
- name: Enterprise Service and Monitoring Setup
  hosts: all
  become: true
  gather_facts: true
  vars:
    username: "justin"
    apache_port: 80
    prometheus_version: "2.46.0"
  tasks:

    - name: Install Apache on Ubuntu
      apt:
        name: apache2
        state: present
      when: ansible_os_family is defined and ansible_os_family == "Debian"

    - name: Install Apache on Centos
      yum:
        name: httpd
        state: present
      when: ansible_os_family is defined and ansible_os_family == "RedHat"

    - name: Start and Enable Apache Service
      service:
        name: "{{ 'apache2' if ansible_os_family == 'Debian' else 'httpd' }}"
        state: started
        enabled: true

    - name: Configure Apache Port
      lineinfile:
        path: "{{ '/etc/apache2/ports.conf' if ansible_os_family is defined and ansible_os_family  == 'Debian' else '/etc/httpd/conf$
        regexp: "^Listen"
        line: "Listen {{ apache_port }}"
      notify: Restart Apache

    - name: Download Prometheus
      get_url:
        url: "https://github.com/prometheus/prometheus/releases/download/v{{ prometheus_version }}/prometheus-{{ prometheus_version $
        dest: /tmp/prometheus.tar.gz

    - name: Extract Prometheus
      unarchive:
```

```
 GNU nano 2.9.3                                    ansible.yml

      dest: /opt
      remote_src: true

  - name: Move Prometheus Files
    command:
      cmd: mv /opt/prometheus-{{ prometheus_version }}.linux-amd64 /opt/prometheus
    args:
      creates: /opt/prometheus

  - name: Create Prometheus User
    user:
      name: prometheus
      shell: /sbin/nologin

  - name: Set Prometheus Ownership
    file:
      path: /opt/prometheus
      owner: prometheus
      group: prometheus
      state: directory
      recurse: yes

  - name: Configure Prometheus as a Service
    copy:
      dest: /etc/systemd/system/prometheus.service
      content: |
        [Unit]
        Description=Prometheus Monitoring
        After=network.target

        [Service]
        User=prometheus
        ExecStart=/opt/prometheus/prometheus \
          --config.file=/opt/prometheus/prometheus.yml \
          --storage.tsdb.path=/opt/prometheus/data
        Restart=always

        [Install]
        WantedBy=multi-user.target

  - name: Reload systemd and Enable Prometheus
    systemd:
      daemon_reload: true
```

After creating an ansible playbook that will install and start the services of the program on each server, I ran the ansible playbook.

```
justin@workstation:~/Final_Exam_Dalena$ ansible-playbook --ask-become-pass ansible.yml -i inventory
SUDO password:

PLAY [Enterprise Service and Monitoring Setup] *********************************************************

TASK [Gathering Facts] *********************************************************************************
ok: [ubuntu_server]
 [WARNING]: Module invocation had junk after the JSON data: AttributeError("module 'platform' has no attribute
'dist'")

ok: [centos_server]

TASK [Install Apache on Ubuntu] ************************************************************************
skipping: [centos_server]
ok: [ubuntu_server]

TASK [Install Apache on Centos] ************************************************************************
skipping: [ubuntu_server]
skipping: [centos_server]

TASK [Start and Enable Apache Service] *****************************************************************
fatal: [centos_server]: FAILED! => {"msg": "The task includes an option with an undefined variable. The error was: 'an
sible_os_family' is undefined\n\nThe error appears to have been in '/home/justin/Final_Exam_Dalena/ansible.yml': line
24, column 7, but may\nbe elsewhere in the file depending on the exact syntax problem.\n\nThe offending line appears t
o be:\n\n\n    - name: Start and Enable Apache Service\n      ^ here\n"}
ok: [ubuntu_server]

TASK [Configure Apache Port] ***************************************************************************
ok: [ubuntu_server]

TASK [Download Prometheus] *****************************************************************************
ok: [ubuntu_server]
```

```
TASK [Start and Enable Apache Service] *****************************************************************
fatal: [centos_server]: FAILED! => {"msg": "The task includes an option with an undefined variable. The error was: 'ans
' is undefined\n\nThe error appears to have been in '/home/justin/Final_Exam_Dalena/ansible.yml': line 24, column 7, bu
where in the file depending on the exact syntax problem.\n\nThe offending line appears to be:\n\n\n    - name: Start an
e Service\n      ^ here\n"}
ok: [ubuntu_server]

TASK [Configure Apache Port] ***************************************************************************
ok: [ubuntu_server]

TASK [Download Prometheus] *****************************************************************************
ok: [ubuntu_server]

TASK [Extract Prometheus] ******************************************************************************
ok: [ubuntu_server]

TASK [Move Prometheus Files] ***************************************************************************
ok: [ubuntu_server]

TASK [Create Prometheus User] **************************************************************************
ok: [ubuntu_server]

TASK [Set Prometheus Ownership] ************************************************************************
ok: [ubuntu_server]

TASK [Configure Prometheus as a Service] ***************************************************************
ok: [ubuntu_server]

TASK [Reload systemd and Enable Prometheus] ************************************************************
ok: [ubuntu_server]

TASK [Update MOTD] *************************************************************************************
ok: [ubuntu_server]
        to retry, use: --limit @/home/justin/Final_Exam_Dalena/ansible.retry

PLAY RECAP *********************************************************************************************
centos_server              : ok=1    changed=0    unreachable=0    failed=1
ubuntu_server              : ok=12   changed=0    unreachable=0    failed=0
```

I was able to run the ansible.yml but the centos server did have a problem with running the commands. On the other side the ubuntu server was successful on every commands within the ansible playbook.

Proofs on my ubuntu server

```
justin@Server1:~$ systemctl status apache2
● apache2.service - The Apache HTTP Server
     Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor preset:
    Drop-In: /lib/systemd/system/apache2.service.d
             └─apache2-systemd.conf
     Active: active (running) since Fri 2024-12-13 08:42:02 PST; 2h 8min ago
   Main PID: 2325 (apache2)
      Tasks: 6 (limit: 2318)
     CGroup: /system.slice/apache2.service
             ├─2325 /usr/sbin/apache2 -k start
             ├─4612 /usr/sbin/apache2 -k start
             ├─4613 /usr/sbin/apache2 -k start
             ├─4614 /usr/sbin/apache2 -k start
             ├─4615 /usr/sbin/apache2 -k start
             └─4616 /usr/sbin/apache2 -k start

Dec 13 08:41:37 Server1 systemd[1]: Starting The Apache HTTP Server...
Dec 13 08:42:02 Server1 apachectl[1074]: AH00558: apache2: Could not reliably d
Dec 13 08:42:02 Server1 systemd[1]: Started The Apache HTTP Server.
Dec 13 08:46:33 Server1 systemd[1]: Reloading The Apache HTTP Server.
Dec 13 08:47:09 Server1 apachectl[4449]: AH00558: apache2: Could not reliably d
Dec 13 08:47:09 Server1 systemd[1]: Reloaded The Apache HTTP Server.
lines 1-21/21 (END)
```

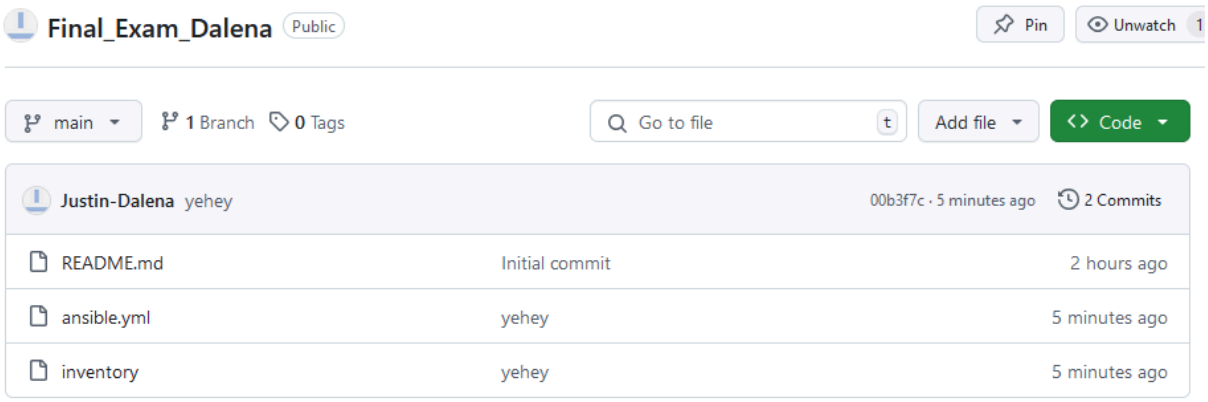
```
justin@Server1:~$ cat /etc/motd
Ansible Managed by justinjustin@Server1:~$
```

The files i used was push and added to my github account

```
justin@workstation:~/Final_Exam_Dalena$ git commit ansible.yml inventory
[main 00b3f7c] yehey
 2 files changed, 101 insertions(+)
 create mode 100644 ansible.yml
 create mode 100644 inventory
```

```
justin@workstation:~/Final_Exam_Dalena$ git push

Counting objects: 4, done.
Delta compression using up to 3 threads.
Compressing objects: 100% (4/4), done.
Writing objects: 100% (4/4), 1.27 KiB | 1.27 MiB/s, done.
Total 4 (delta 0), reused 0 (delta 0)
To github.com:Justin-Dalena/Final_Exam_Dalena.git
   e3653af..00b3f7c  main -> main
```



To conclude this examination given to me, I was able to create and properly execute the ansible playbook to my ubuntu server. On the other hand my centos server had a problem with its dependencies, I tried manually updating and upgrading my centos server yet it did not come to a fruition.

```
[jdalena@server2 ~]$ sudo yum update
[sudo] password for jdalena:
Updating Subscription Management repositories.
Unable to read consumer identity

This system is not registered with an entitlement server. You can use "rhc" or "
subscription-manager" to register.

Repository baseos is listed more than once in the configuration
Repository appstream is listed more than once in the configuration
CentOS Stream 9 - Base                          7.6 kB/s | 8.3 kB     00:01
Errors during downloading metadata for repository 'baseos':
  - Status code: 404 for http://mirror.centos.org/centos/stream/9-stream/BaseOS/
x86_64/os/repodata/repomd.xml (IP: 64.150.179.24)
Error: Failed to download metadata for repo 'baseos': Cannot download repomd.xml
: Cannot download repodata/repomd.xml: All mirrors were tried
```

GITHUB LINK:
https://github.com/Justin-Dalena/Final_Exam_Dalena