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Course/Section: CPE212/CPE31S2	Date Submitted: December 4, 2024
Instructor: Engr. Robin Valenzuela	Semester and SY: 1st Sem 2024-2025

FINALS EXAMINATION

Tools Needed:

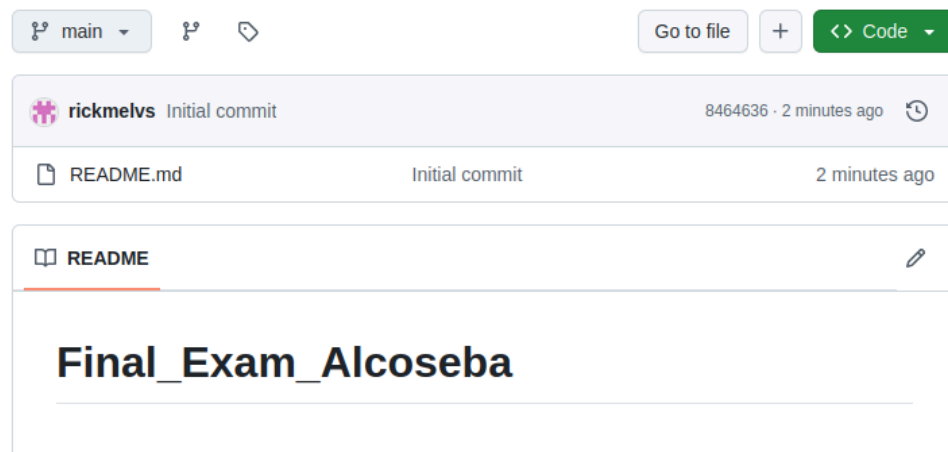
1. VM with Ubuntu, CentOS and Ansible installed
2. Web browser

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.

1. Creating The Repository



2. Cloning the Repository using git clone

```
rickpcc@Workstation:~$ git clone git@github.com:rickmelvs/Final_Exam_Alcoseba.git
Cloning into 'Final_Exam_Alcoseba'...
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.
```

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

- Creating Inventory and ansible.cfg

```
rickpcc@Workstation:~/Final_Exam_Alcoseba$ cat inventory
[ubuntu]
192.168.56.111

[centos]
192.168.56.116 ansible_user=ralcoseba
rickpcc@Workstation:~/Final_Exam_Alcoseba$ cat ansible.cfg
[defaults]
inventory = inventory
remote_user = rickpcc
host_key_checking = True
deprecation_warnings=False
rickpcc@Workstation:~/Final_Exam_Alcoseba$
```

- Directory Tree

```
rickpcc@Workstation:~/Final_Exam_Alcoseba$ tree
.
├── ansible.cfg
├── inventory
├── README.md
└── roles
    ├── apache
    │   └── tasks
    ├── motd
    │   └── tasks
    └── prometheus
        └── tasks

7 directories, 3 files
rickpcc@Workstation:~/Final_Exam_Alcoseba$
```

3.1 Creating the playbook for installing an enterprise service (apache)

```
GNU nano 2.9.3                                main.yml
--
name: Install Apache
package:
  name: "{{ 'httpd' if ansible_os_family == 'RedHat' else 'apache2' }}"
  state: present

name: Start and enable Apache
service:
  name: "{{ 'httpd' if ansible_os_family == 'RedHat' else 'apache2' }}"
  state: started
  enabled: true

name: Deploy index.html
template:
  src: templates/index.html.j2
  dest: "{{ '/var/www/html/index.html' if ansible_os_family == 'RedHat' else '/var/www/html/index.html' }}"
  owner: root
  group: root
  mode: '0644'

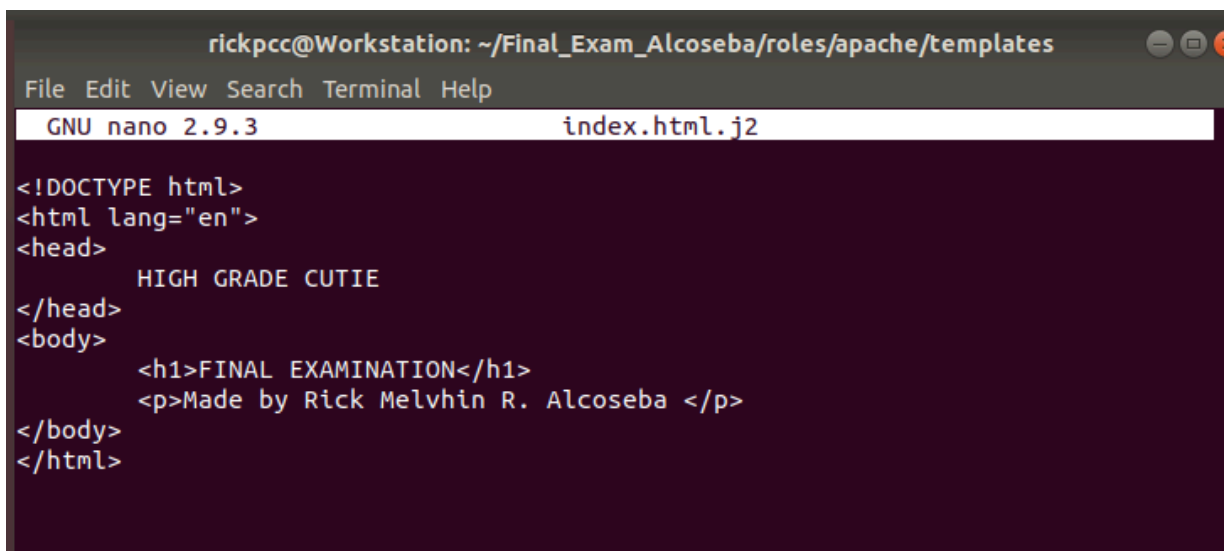
name: Ensure Apache document root permissions
file:
  path: "{{ '/var/www/html' }}"

[ Read 35 lines ]
^G Get Help      ^O Write Out    ^W Where Is     ^K Cut Text     ^J Justify
^X Exit          ^R Read File    ^\ Replace      ^U Uncut Text   ^T To Spell
```

```
state: directory
owner: apache
group: apache
mode: '0755'
recurse: yes
when: ansible_os_family == 'RedHat'

- name: Restart Apache to apply changes
  service:
    name: "{{ 'httpd' if ansible_os_family == 'RedHat' else 'apache2' }}"
    state: restarted
```

- Template (html for aesthetic purposes)



```
rickpcc@Workstation: ~/Final_Exam_Alcoseba/roles/apache/templates
File Edit View Search Terminal Help
GNU nano 2.9.3 index.html.j2

<!DOCTYPE html>
<html lang="en">
<head>
    HIGH GRADE CUTIE
</head>
<body>
    <h1>FINAL EXAMINATION</h1>
    <p>Made by Rick Melvhin R. Alcoseba </p>
</body>
</html>
```

3.2 Creating the playbook for installing a monitoring tool (Prometheus)

- Playbook for Debian (Ubuntu)

```
rickpcc@Workstation: ~/Final_Exam_Alcoseba/roles/prometheus/tasks
File Edit View Search Terminal Help
GNU nano 2.9.3 main.yml

- --
- name: Install required package
  apt:
    name: prometheus
    state: latest
    when: ansible_distribution == "Ubuntu"

- name: Enable Prometheus service
  service:
    name: prometheus
    state: restarted
    enabled: true
    when: ansible_distribution == "Ubuntu"

- name: Install Prometheus dependencies
  apt:
    name:
      - gcc
      - make
      - wget
      - libgd-dev
    state: latest
    when: ansible_distribution == "Ubuntu"

[ Read 23 lines ]
```

- Service file

```
rickpcc@Workstation:~/Final_Exam_Alcoseba/roles/prometheus_ubuntu/files$ cat prometheus.service
[Unit]
Description=Prometheus Monitoring
Wants=network-online.target
After=network-online.target

[Service]
User=root
ExecStart=/usr/bin/prometheus --config.file=/opt/prometheus
Restart=always

[Install]
WantedBy=multi-user.target
rickpcc@Workstation:~/Final_Exam_Alcoseba/roles/prometheus_ubuntu/files$
```

- Playbook for Redhat (centos)

```
rickpcc@Workstation: ~/Final_Exam_Alcoseba/roles/prometheus_redhat/tasks
File Edit View Search Terminal Help
GNU nano 2.9.3 main.yml

---
- name: Install Prometheus dependencies on CentOS
  yum:
    name: curl
    state: present

- name: Download Prometheus binary on CentOS
  get_url:
    url: https://github.com/prometheus/prometheus/releases/download/v2.46.0/pr$
    dest: /tmp/prometheus.tar.gz

- name: Create the directory for Prometheus in /opt on CentOS
  file:
    path: /opt/prometheus
    state: directory
    mode: '0755'

- name: Extract Prometheus archive on CentOS
  unarchive:
    src: /tmp/prometheus.tar.gz
    dest: /opt/prometheus
    remote_src: yes

- name: Create Prometheus service file on CentOS
  copy:
    src: prometheus.service
    dest: /etc/systemd/system/prometheus.service
    mode: '0644'

- name: Reload systemd to register prometheus service
  systemd:
    daemon_reload: yes

- name: Start and enable Prometheus service on CentOS
  systemd:

^G Get Help      ^O Write Out    ^W Where Is     ^K Cut Text     ^J Justify
^X Exit          ^R Read File    ^\ Replace      ^U Uncut Text   ^T To Spell

name: prometheus
enabled: yes
state: started
```

- Service File

```
rickpcc@Workstation:~/Final_Exam_Alcoseba/roles/prometheus_redhat/files$ cat prometheus.service
[Unit]
Description=Prometheus Monitoring
Wants=network-online.target
After=network-online.target

[Service]
User=root
ExecStart=/usr/bin/prometheus --config.file=/opt/prometheus/prometheus.yml
Restart=always

[Install]
WantedBy=multi-user.target
rickpcc@Workstation:~/Final_Exam_Alcoseba/roles/prometheus_redhat/files$
```

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

```
rickpcc@Workstation:~/Final_Exam_Alcoseba/roles/motd/tasks$ cat main.yml
---
- name: Set MOTD
  copy:
    content: "Ansible Managed by Alcoseba"
    dest: /etc/motd
    owner: root
    group: root
    mode: 0644
rickpcc@Workstation:~/Final_Exam_Alcoseba/roles/motd/tasks$
```

```
rickpcc@Server1:~$ cat /etc/motd
Ansible Managed by Alcosebarickpcc@Server1:~$
```

4. running the main playbook to play all the task

-

```
rickpcc@Workstation: ~/Final_Exam_Alcoseba
File Edit View Search Terminal Help
rickpcc@Workstation:~/Final_Exam_Alcoseba$ ansible-playbook --ask-become-pass final_exam.yml
ECOME password:

LAY [all] *****

ASK [Gathering Facts] *****

k: [192.168.56.111]
k: [192.168.56.116]

ASK [Update repository index / install updates on CentOS] *****

kipping: [192.168.56.111]
k: [192.168.56.116]

ASK [Update repository index / install updates on Ubuntu] *****

kipping: [192.168.56.116]
k: [192.168.56.111]

LAY [Configure Ubuntu and CentOS servers] *****

ASK [Gathering Facts] *****

k: [192.168.56.111]
k: [192.168.56.116]
```



```
rickpcc@Workstation: ~/Final_Exam_Alcoseba
File Edit View Search Terminal Help
TASK [prometheus_ubuntu : Install required package] *****
*
skipping: [192.168.56.116]
ok: [192.168.56.111]

TASK [prometheus_ubuntu : Enable Prometheus service] *****
*
skipping: [192.168.56.116]
changed: [192.168.56.111]

TASK [prometheus_ubuntu : Install Prometheus dependencies] *****
*
skipping: [192.168.56.116]
ok: [192.168.56.111]

TASK [motd : Set MOTD] *****
*
ok: [192.168.56.116]
ok: [192.168.56.111]

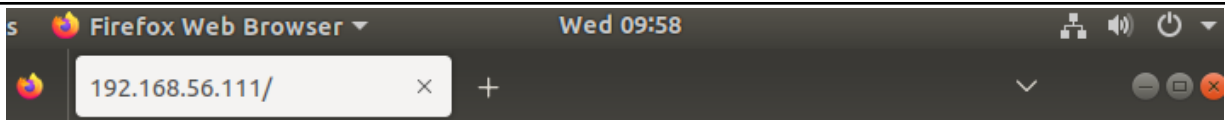
PLAY RECAP *****
*
192.168.56.111      : ok=18   changed=5   unreachable=0   failed=0
skipped=2   rescued=0   ignored=0
192.168.56.116      : ok=16   changed=5   unreachable=0   failed=0
skipped=4   rescued=0   ignored=0

rickpcc@Workstation:~/Final_Exam_Alcoseba$
```

5. Before Pushing all the changes to github, let's verify the installation if it's successful

Apache(ubuntu):

```
rickpcc@Server1:~$ cat /etc/motd
Ansible Managed by Alcosebarickpcc@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 Wed 2024-12-04 09:48:33 +08; 9min ago
   Main PID: 14134 (apache2)
     Tasks: 7 (limit: 1893)
    CGroup: /system.slice/apache2.service
            └─14134 /usr/sbin/apache2 -k start
               14140 /usr/sbin/apache2 -k start
               14142 /usr/sbin/apache2 -k start
               14144 /usr/sbin/apache2 -k start
               14146 /usr/sbin/apache2 -k start
               14147 /usr/sbin/apache2 -k start
               14399 /usr/sbin/apache2 -k start
```



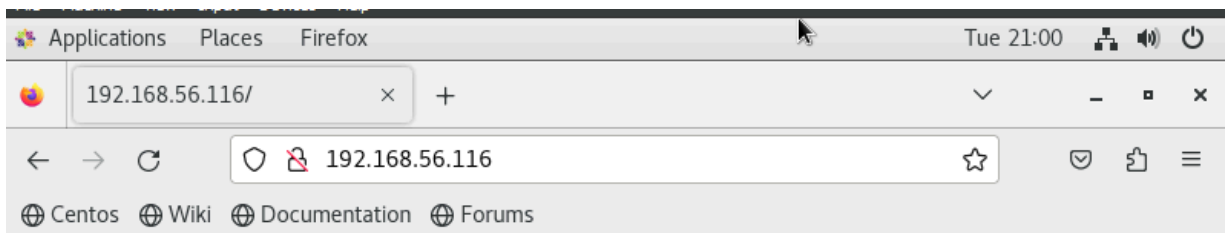
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Apache(centos):

```
[ralcoseba@localhost ~]$ apachectl status
* httpd.service - The Apache HTTP Server
   Loaded: loaded (/usr/lib/systemd/system/httpd.service; enabled; vendor preset: disabled)
   Active: active (running) since Tue 2024-12-03 20:48:35 EST; 11min ago
     Docs: man:httpd(8)
           man:apachectl(8)
  Main PID: 11312 (httpd)
    Status: "Total requests: 3; Current requests/sec: 0; Current traffic:  0 B/sec"
     Tasks: 7
   CGroup: /system.slice/httpd.service
           |-11312 /usr/sbin/httpd -DFOREGROUND
           |-11313 /usr/sbin/httpd -DFOREGROUND
           |-11314 /usr/sbin/httpd -DFOREGROUND
           |-11315 /usr/sbin/httpd -DFOREGROUND
           |-11316 /usr/sbin/httpd -DFOREGROUND
           |-11317 /usr/sbin/httpd -DFOREGROUND
           \-12420 /usr/sbin/httpd -DFOREGROUND
```



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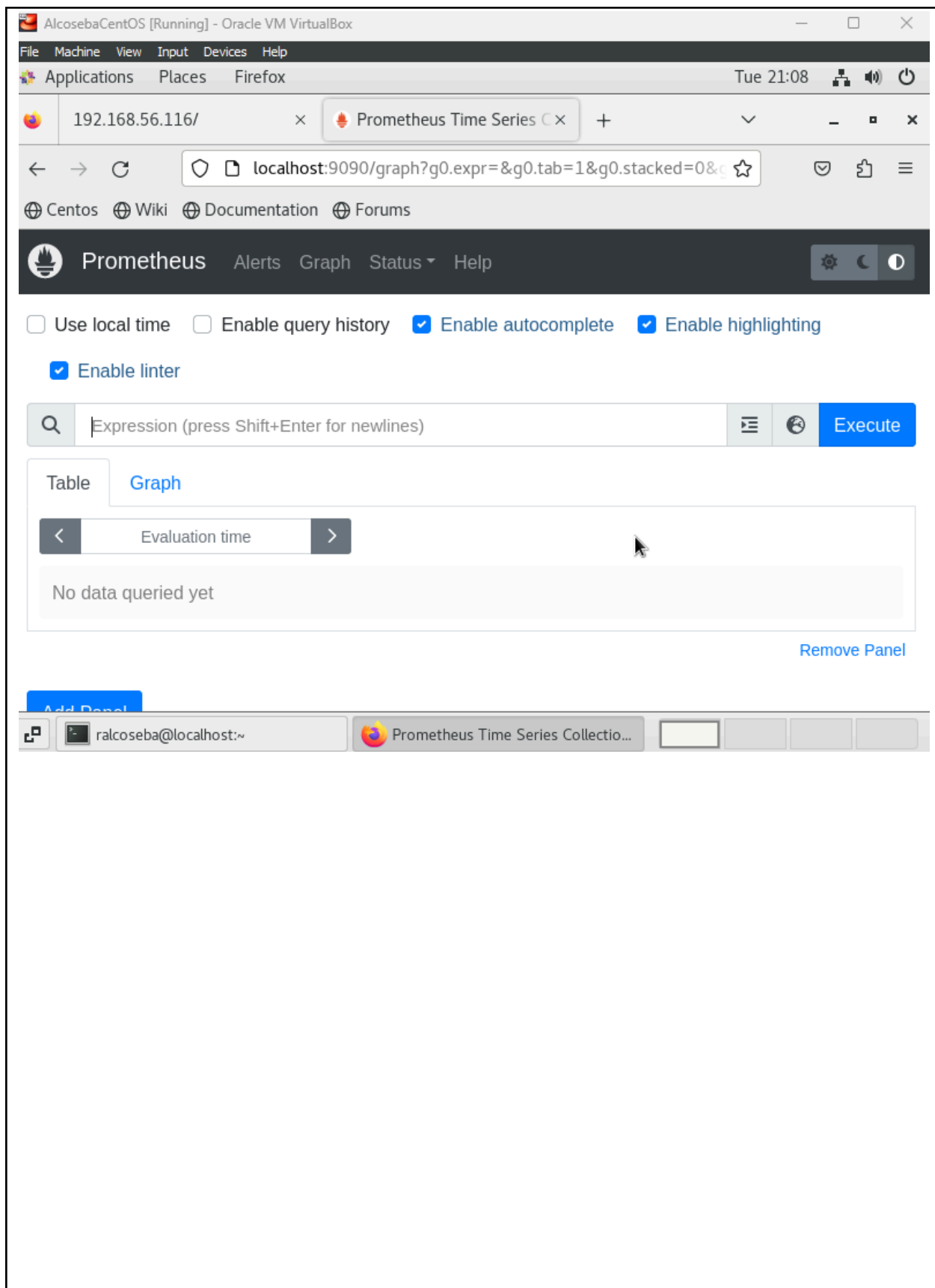
Prometheus(Ubuntu):

```
rickpcc@Server1:~$ systemctl status service prometheus
Unit service.service could not be found.
● prometheus.service - Prometheus Monitoring
   Loaded: loaded (/etc/systemd/system/prometheus.service; enabled; vendor preset: enabled)
   Active: active (running) since Wed 2024-12-04 08:46:48 +08; 3min 29s ago
 Main PID: 7239 (prometheus)
    Tasks: 8 (limit: 1893)
   CGroup: /system.slice/prometheus.service
           └─7239 /usr/bin/prometheus --config.file=/etc/prometheus/prometheus.
```

Prometheus(Centos):

```
[ralcoseba@localhost ~]$ systemctl status service prometheus
Unit service.service could not be found.
● prometheus.service - Prometheus Monitoring
   Loaded: loaded (/etc/systemd/system/prometheus.service; enabled; vendor preset: disabled)
   Active: active (running) since Tue 2024-12-03 18:53:43 EST; 2h 10min ago
 Main PID: 1207 (prometheus)
    CGroup: /system.slice/prometheus.service
           └─1207 /usr/local/bin/prometheus --config.file=/etc/prometheus/prometheus...

Dec 03 18:55:15 localhost.localdomain prometheus[1207]: ts=2024-12-03T23:55:15.848Z...s
Dec 03 20:50:32 localhost.localdomain systemd[1]: Current command vanished from the....
Dec 03 20:55:27 localhost.localdomain prometheus[1207]: ts=2024-12-04T01:55:27.291Z...s
Dec 03 20:55:27 localhost.localdomain prometheus[1207]: ts=2024-12-04T01:55:27.332Z...E
Dec 03 20:55:27 localhost.localdomain prometheus[1207]: ts=2024-12-04T01:55:27.400Z...Z
Dec 03 20:55:27 localhost.localdomain prometheus[1207]: ts=2024-12-04T01:55:27.413Z...J
Dec 03 20:55:27 localhost.localdomain prometheus[1207]: ts=2024-12-04T01:55:27.422Z...Q
Dec 03 20:55:27 localhost.localdomain prometheus[1207]: ts=2024-12-04T01:55:27.425Z...X
Dec 03 20:55:27 localhost.localdomain prometheus[1207]: ts=2024-12-04T01:55:27.458Z...9
Dec 03 20:55:27 localhost.localdomain prometheus[1207]: ts=2024-12-04T01:55:27.486Z...s
Hint: Some lines were ellipsized, use -l to show in full.
```



6. Pushing into github repo

```
rickpcc@Workstation:~/Final_Exam_Alcoseba$ git add ansible.cfg
rickpcc@Workstation:~/Final_Exam_Alcoseba$ git add finalexam.yml
rickpcc@Workstation:~/Final_Exam_Alcoseba$ git add inventory
rickpcc@Workstation:~/Final_Exam_Alcoseba$ git add roles
rickpcc@Workstation:~/Final_Exam_Alcoseba$ git commit -m "FINAL EXAM ALCOSEBA"
[main 882f81f] FINAL EXAM ALCOSEBA
10 files changed, 176 insertions(+)
create mode 100644 ansible.cfg
create mode 100644 finalexam.yml
create mode 100644 inventory
create mode 100644 roles/apache/tasks/main.yml
create mode 100644 roles/apache/templates/index.html.j2
create mode 100644 roles/motd/tasks/main.yml
create mode 100644 roles/prometheus_redhat/files/prometheus.service
create mode 100644 roles/prometheus_redhat/tasks/main.yml
create mode 100644 roles/prometheus_ubuntu/files/prometheus.service
create mode 100644 roles/prometheus_ubuntu/tasks/main.yml
rickpcc@Workstation:~/Final_Exam_Alcoseba$ git push
Counting objects: 24, done.
Delta compression using up to 2 threads.
Compressing objects: 100% (16/16), done.
Writing objects: 100% (24/24), 2.85 KiB | 2.85 MiB/s, done.
Total 24 (delta 1), reused 0 (delta 0)
remote: Resolving deltas: 100% (1/1), done.
To github.com:rickmelvs/Final_Exam_Alcoseba.git
   8464636..882f81f  main -> main
rickpcc@Workstation:~/Final_Exam_Alcoseba$
```

main



Go to file



<> Code



rickmelvs FINAL EXAM ALCOSEBA

882f81f · 3 minutes ago



roles

FINAL EXAM ALCOSEBA

3 minutes ago



README.md

Initial commit

2 hours ago



ansible.cfg

FINAL EXAM ALCOSEBA

3 minutes ago



finalexam.yml

FINAL EXAM ALCOSEBA

3 minutes ago



inventory

FINAL EXAM ALCOSEBA

3 minutes ago



README



Final_Exam_Alcoseba