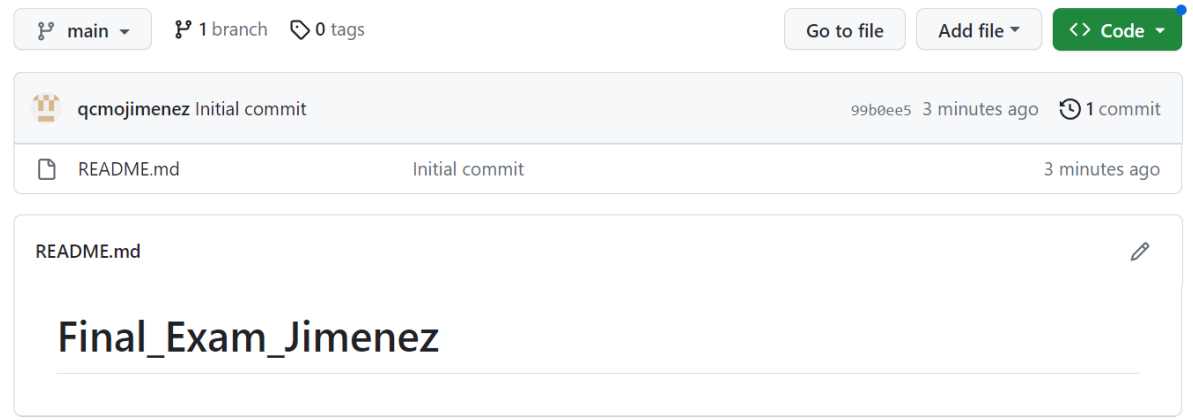
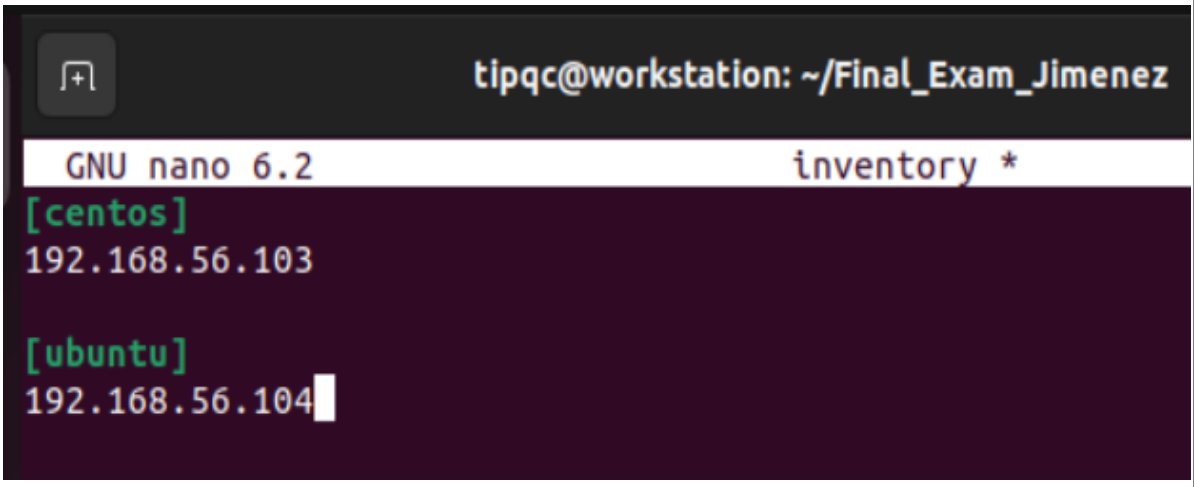
Tools Needed:
1. VM with Ubuntu, CentOS and Ansible installed 2. Web browser
Procedure:
1. Create a repository and label it as "Final_Exam_Surname" 2. Clone your new repository in your VM 3. Create an Ansible playbook that does the following with an input of a config.yaml file and structure inventory 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) 3.3 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) 6. For your final exam to be counted, please paste your repository link as an answer in this exam.
OUTPUTS

Creating repository and cloning to workstation




```
tipqc@workstation:~$ git clone git@github.com:qcmojimenez/Final_Exam_Jimenez
Cloning into 'Final_Exam_Jimenez'...
remote: Enumerating objects: 3, done.
remote: Counting objects: 100% (3/3), done.
remote: Total 3 (delta 0), reused 0 (delta 0), pack-reused 0
Receiving objects: 100% (3/3), done.
tipqc@workstation:~$ cd Final_Exam_Jimenez
tipqc@workstation:~/Final_Exam_Jimenez$
```

Creating inventory and ansible.cfg using sudo nano command



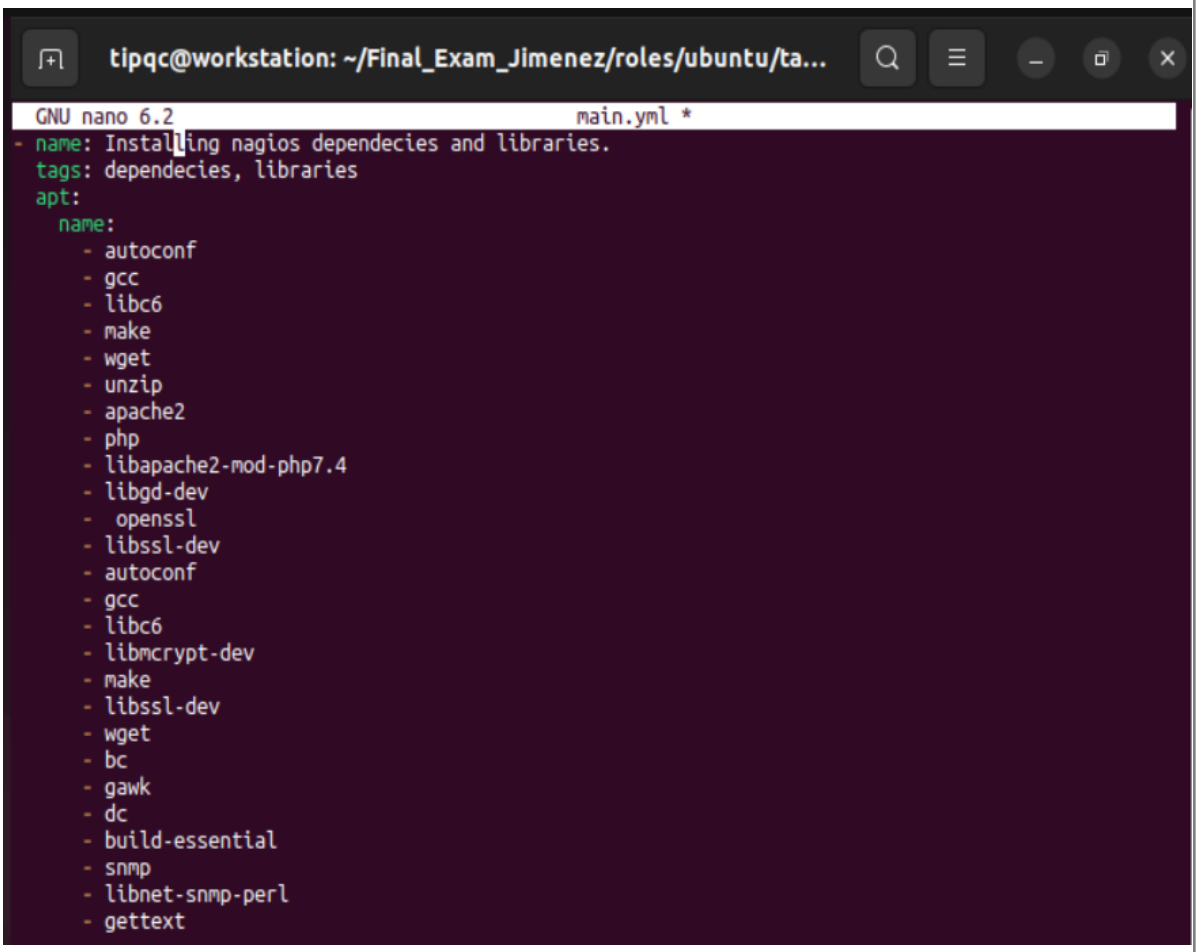
```
tipqc@workstation: ~/Final_Exam_Jimenez
  GNU nano 6.2                                ansible.cfg *
[defaults]

inventory = inventory
host_key_checking = False

deprecation_warnings = False

ansible_user = tipqc
private_key_file = ~/.ssh/id_rsa.pub
```

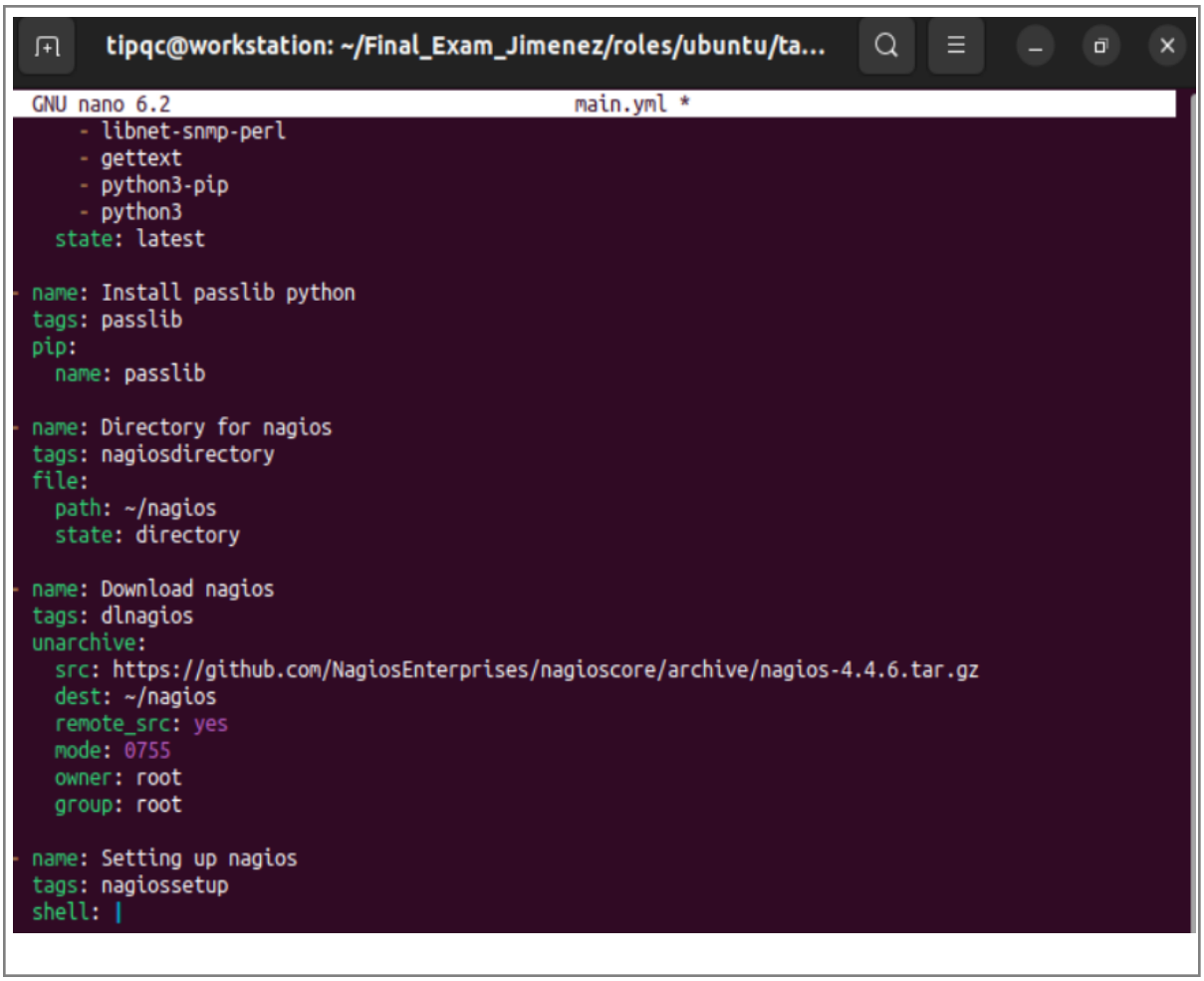
Creating directories for roles using mkdir command

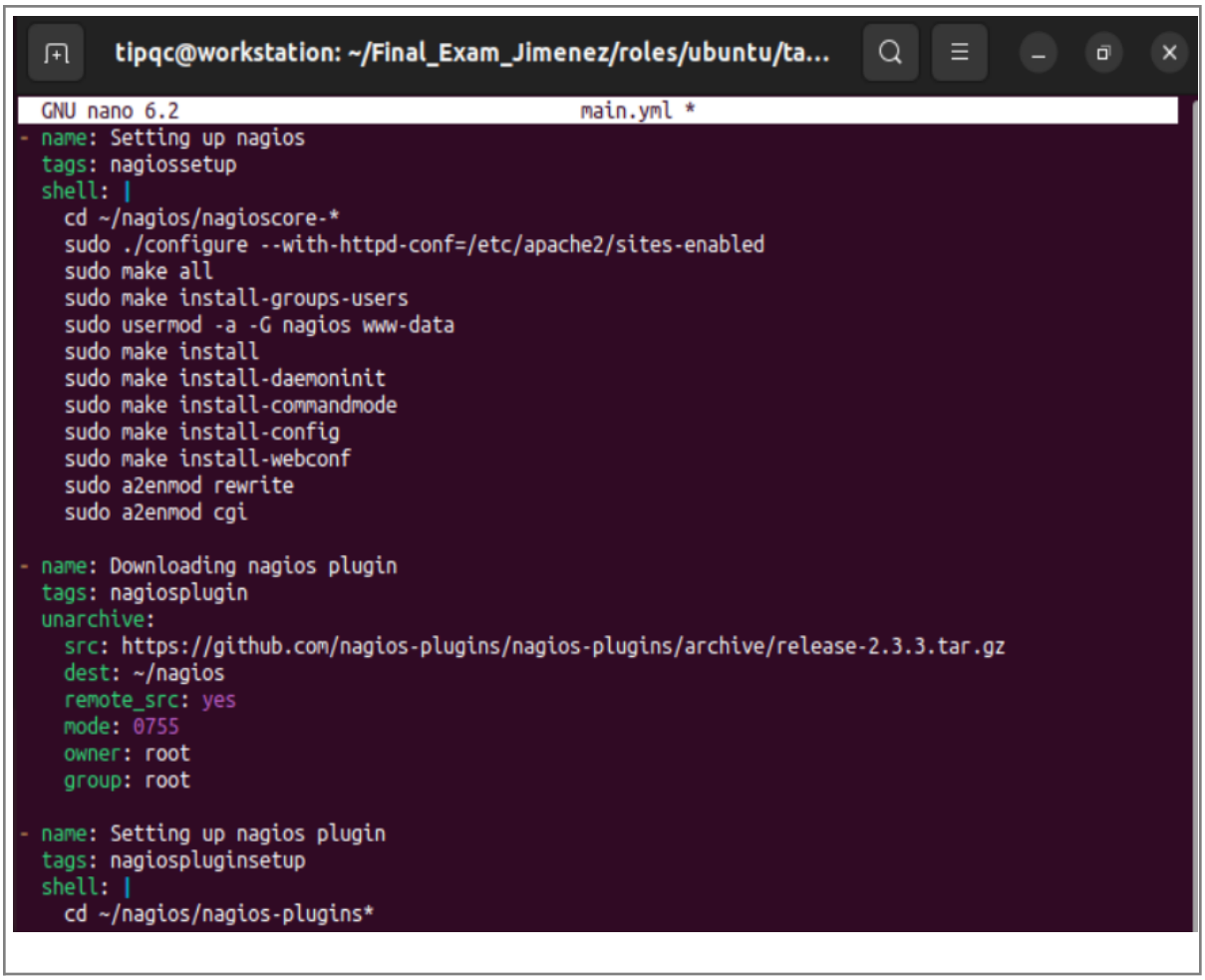
```
tipqc@workstation:~/Final_Exam_Jimenez$ mkdir roles
tipqc@workstation:~/Final_Exam_Jimenez$ mkdir roles/centos
tipqc@workstation:~/Final_Exam_Jimenez$ mkdir roles/centos/tasks
tipqc@workstation:~/Final_Exam_Jimenez$ mkdir roles/ubuntu
tipqc@workstation:~/Final_Exam_Jimenez$ mkdir roles/ubuntu/tasks
tipqc@workstation:~/Final_Exam_Jimenez$ tree
.
├── ansible.cfg
├── inventory
├── README.md
└── roles
    ├── centos
    │   └── tasks
    └── ubuntu
        └── tasks

5 directories, 3 files
tipqc@workstation:~/Final_Exam_Jimenez$
```

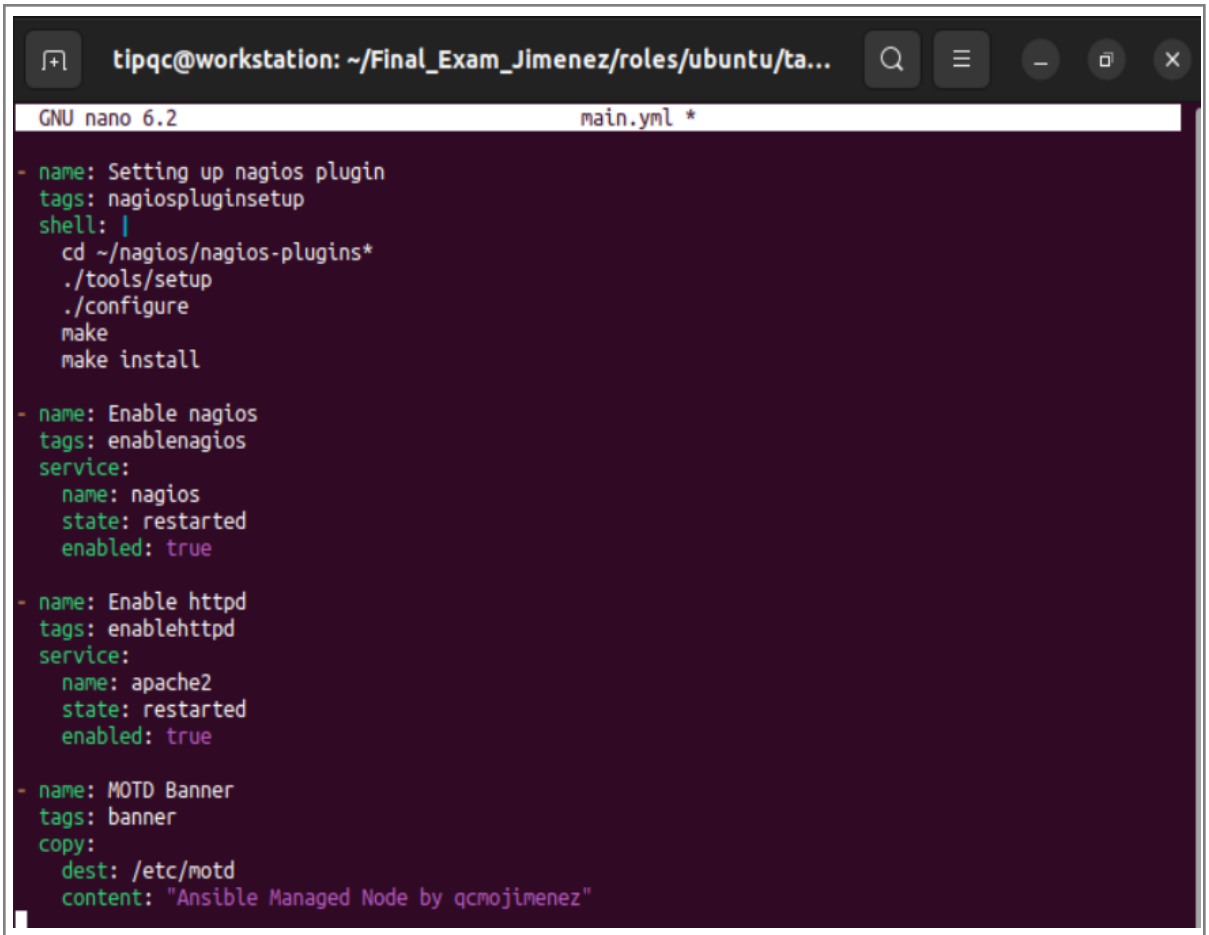
Creating instructions for each role with MOTD Banner using sudo nano command

For CentOS:

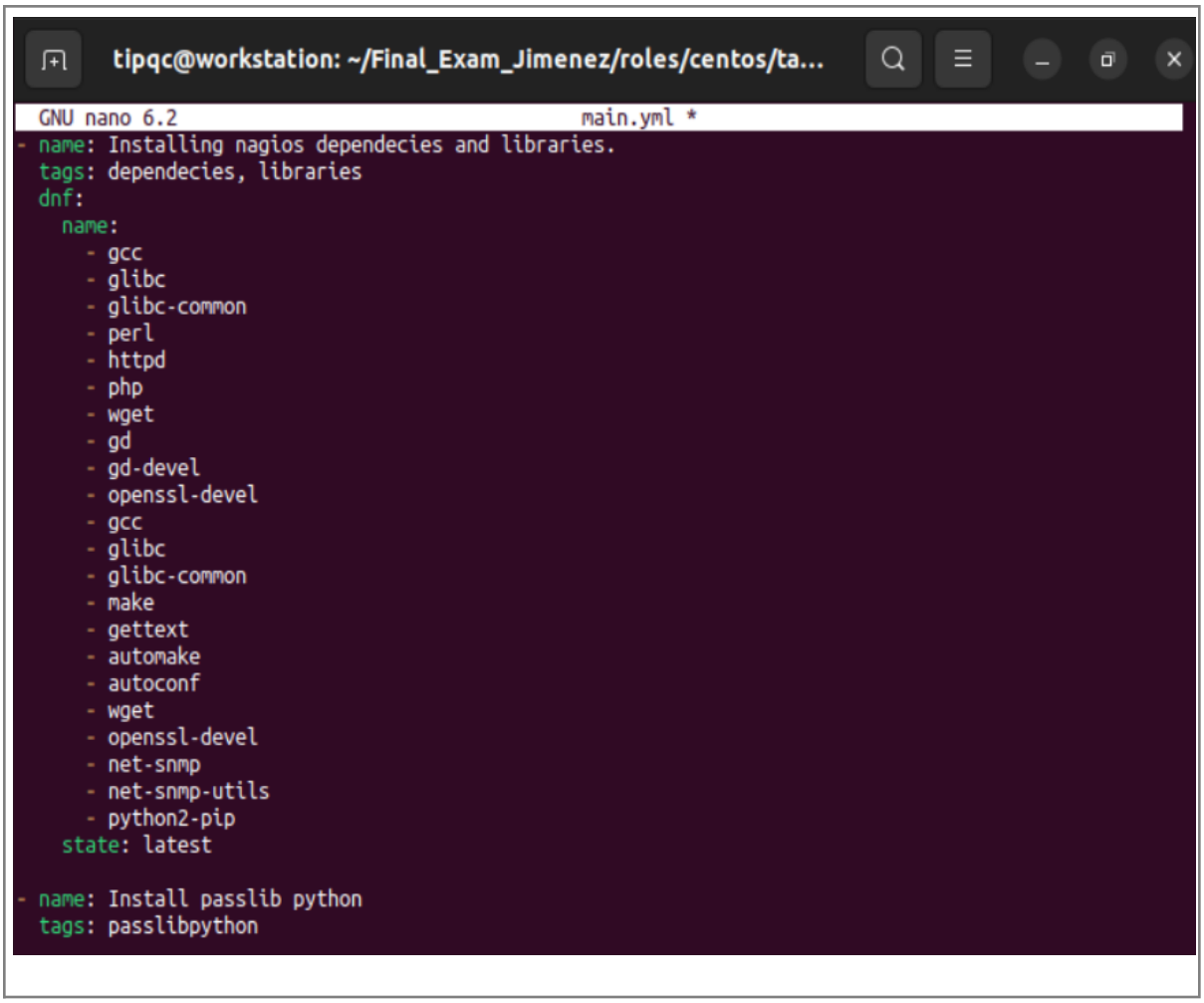

tipqc@workstation: ~/Final_Exam_Jimenez/roles/ubuntu/ta...
GNU nano 6.2 main.yml *
- name: Installing nagios dependecies and libraries.
tags: dependecies, libraries
apt:
name:
- autoconf
- gcc
- libc6
- make
- wget
- unzip
- apache2
- php
- libapache2-mod-php7.4
- libgd-dev
- openssl
- libssl-dev
- autoconf
- gcc
- libc6
- libmcrypt-dev
- make
- libssl-dev
- wget
- bc
- gawk
- dc
- build-essential
- snmp
- libnet-snmp-perl
- gettext

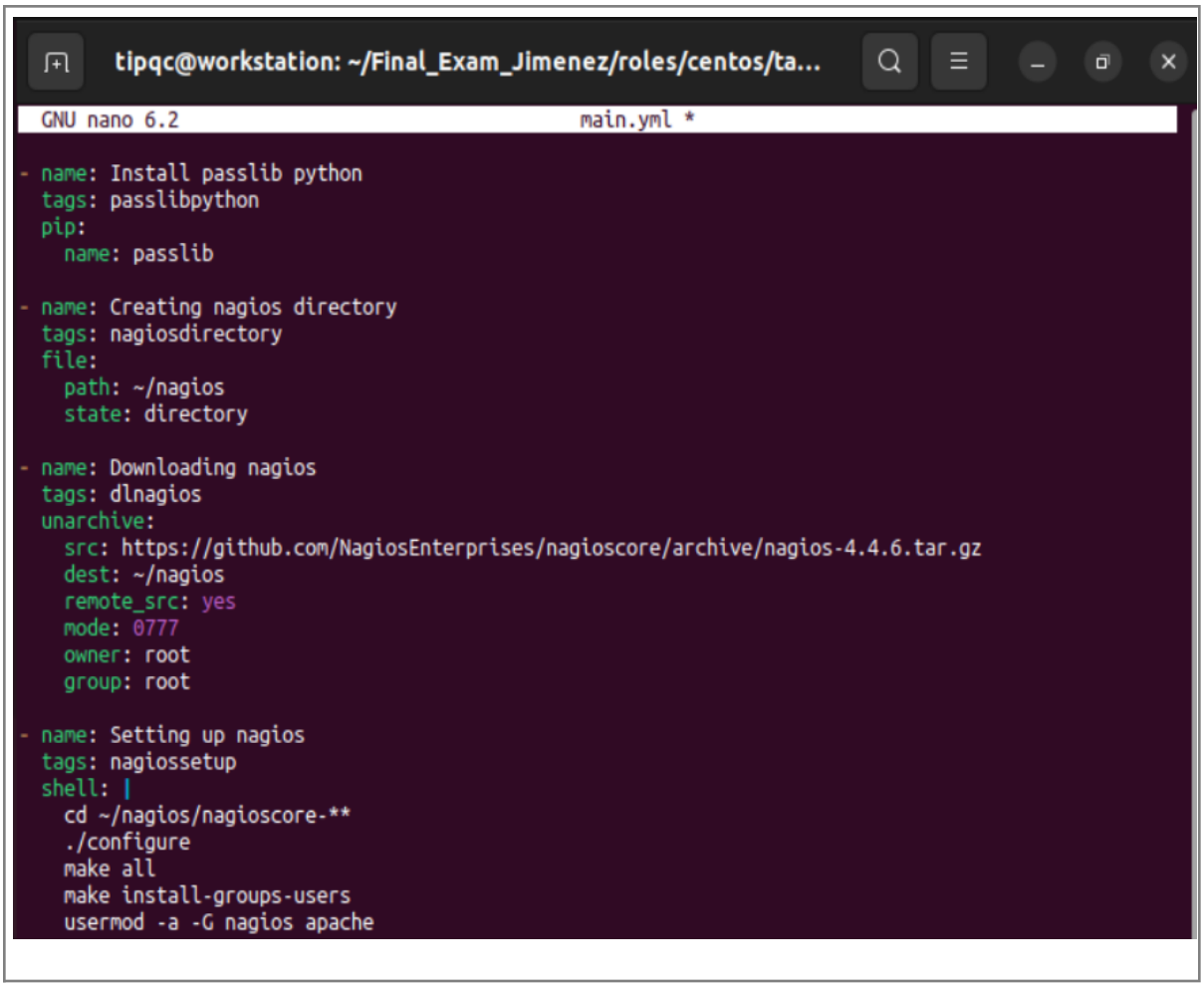

tipqc@workstation: ~/Final_Exam_Jimenez/roles/ubuntu/ta...
GNU nano 6.2 main.yml *
- libnet-snmp-perl
- gettext
- python3-pip
- python3
state: latest
- name: Install passlib python
tags: passlib
pip:
name: passlib
- name: Directory for nagios
tags: nagiosdirectory
file:
path: ~/nagios
state: directory
- name: Download nagios
tags: dlnagios
unarchive:
src: https://github.com/NagiosEnterprises/nagioscore/archive/nagios-4.4.6.tar.gz
dest: ~/nagios
remote_src: yes
mode: 0755
owner: root
group: root
- name: Setting up nagios
tags: nagiossetup
shell:

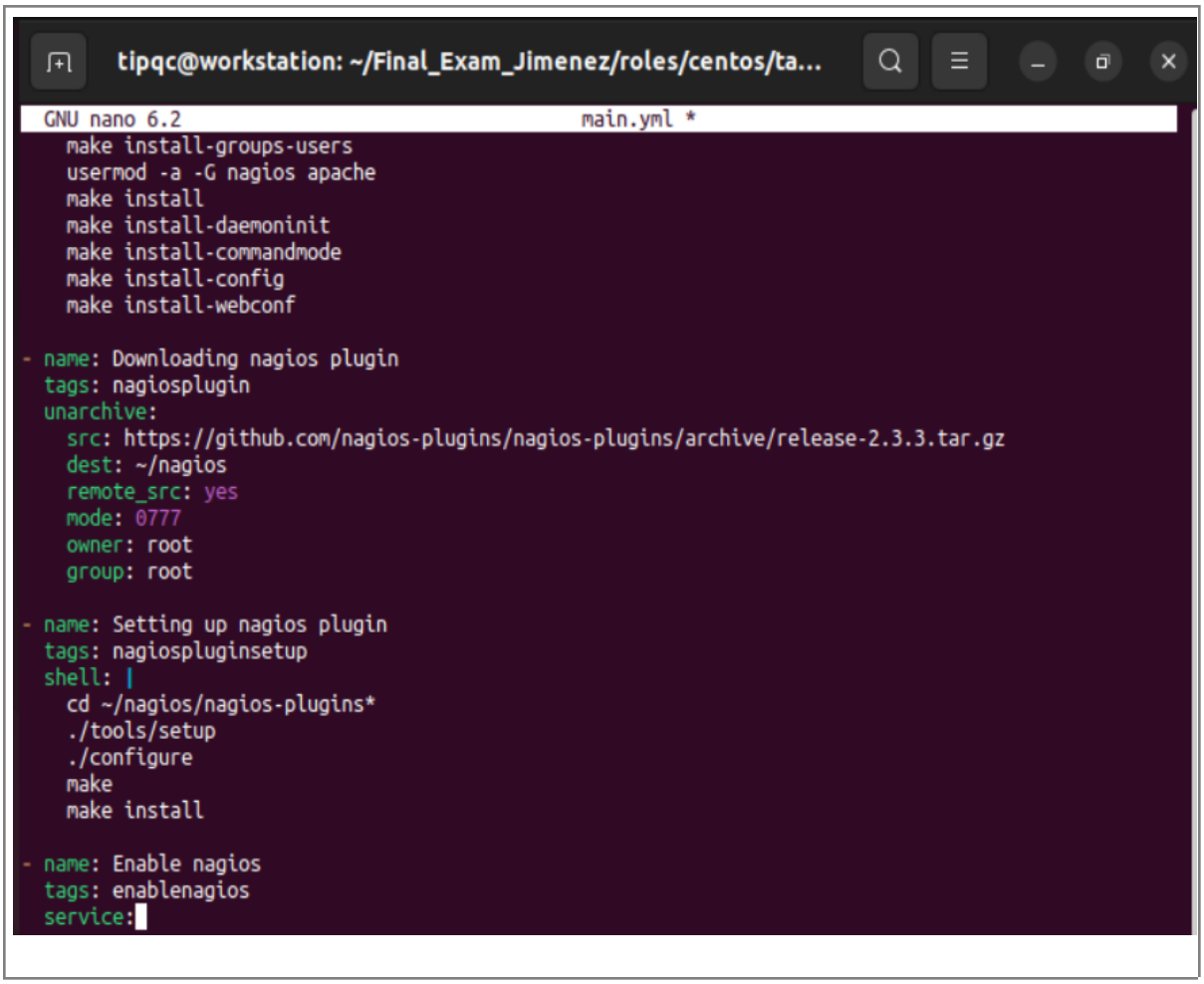

tipqc@workstation: ~/Final_Exam_Jimenez/roles/ubuntu/ta...
GNU nano 6.2 main.yml *
- name: Setting up nagios
tags: nagiossetup
shell: |
cd ~/nagios/nagioscore-*
sudo ./configure --with-httpd-conf=/etc/apache2/sites-enabled
sudo make all
sudo make install-groups-users
sudo usermod -a -G nagios www-data
sudo make install
sudo make install-daemoninit
sudo make install-commandmode
sudo make install-config
sudo make install-webconf
sudo a2enmod rewrite
sudo a2enmod cgi
- name: Downloading nagios plugin
tags: nagiosplugin
unarchive:
src: https://github.com/nagios-plugins/nagios-plugins/archive/release-2.3.3.tar.gz
dest: ~/nagios
remote_src: yes
mode: 0755
owner: root
group: root
- name: Setting up nagios plugin
tags: nagiospluginsetup
shell: |
cd ~/nagios/nagios-plugins*

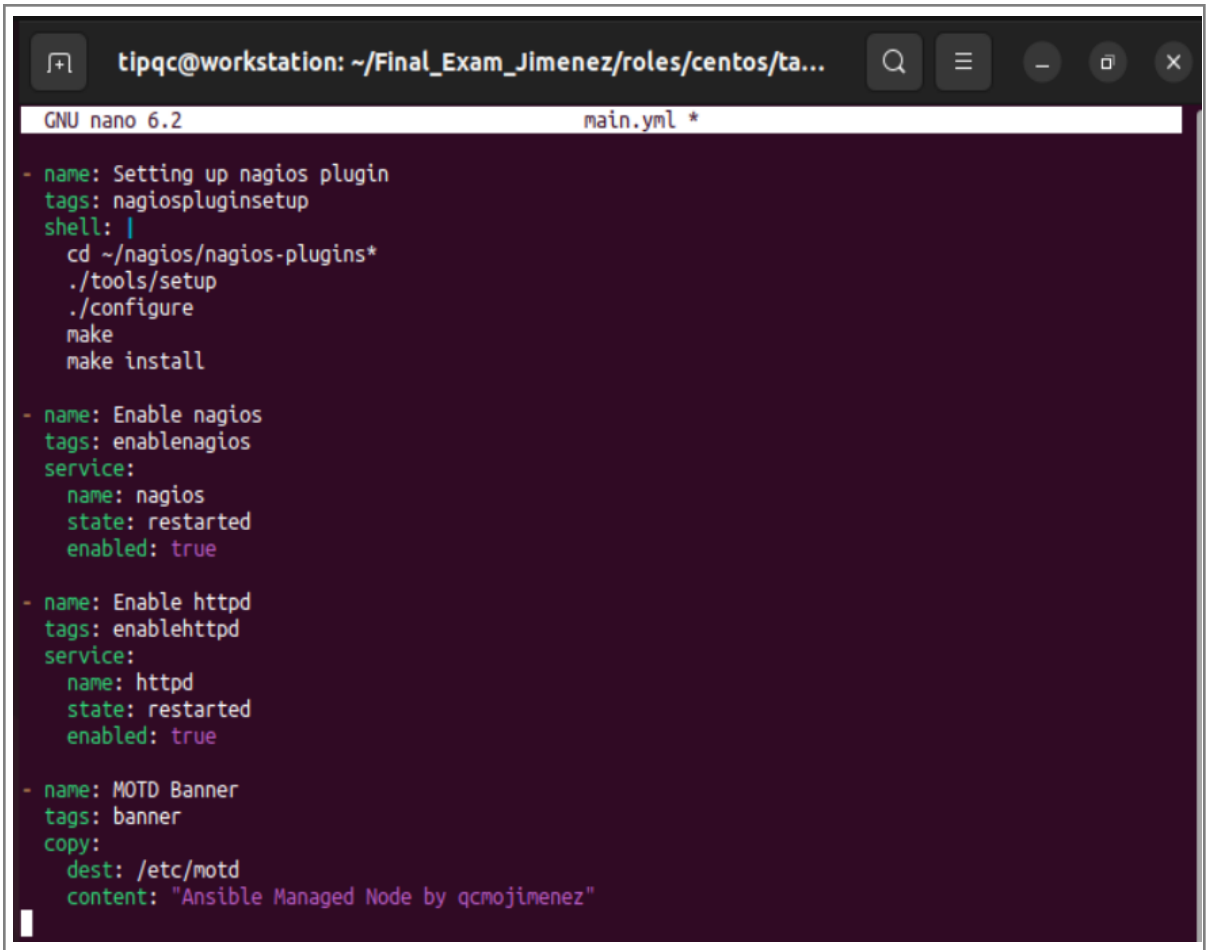

tipqc@workstation: ~/Final_Exam_Jimenez/roles/ubuntu/ta...
GNU nano 6.2 main.yml *
- name: Setting up nagios plugin
tags: nagiospluginsetup
shell: |
cd ~/nagios/nagios-plugins*
./tools/setup
./configure
make
make install
- name: Enable nagios
tags: enablenagios
service:
name: nagios
state: restarted
enabled: true
- name: Enable httpd
tags: enablehttpd
service:
name: apache2
state: restarted
enabled: true
- name: MOTD Banner
tags: banner
copy:
dest: /etc/motd
content: "Ansible Managed Node by qcmojimenez"

For Ubuntu:

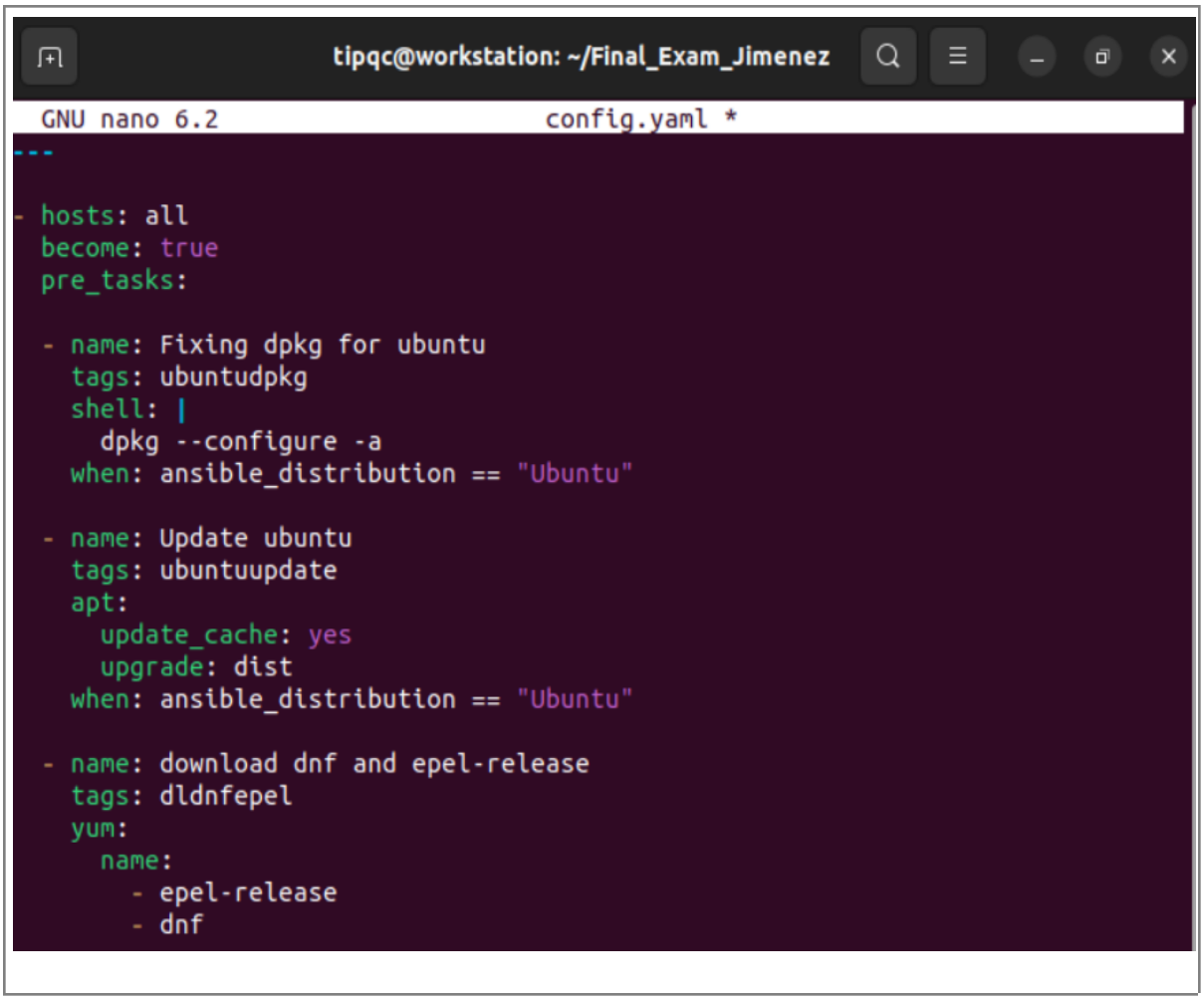

tipqc@workstation: ~/Final_Exam_Jimenez/roles/centos/ta...
GNU nano 6.2 main.yml *
- name: Installing nagios dependecies and libraries.
tags: dependecies, libraries
dnf:
name:
- gcc
- glibc
- glibc-common
- perl
- httpd
- php
- wget
- gd
- gd-devel
- openssl-devel
- gcc
- glibc
- glibc-common
- make
- gettext
- automake
- autoconf
- wget
- openssl-devel
- net-snmp
- net-snmp-utils
- python2-pip
state: latest
- name: Install passlib python
tags: passlibpython


tipqc@workstation: ~/Final_Exam_Jimenez/roles/centos/ta...
GNU nano 6.2 main.yml *
- name: Install passlib python
tags: passlibpython
pip:
name: passlib
- name: Creating nagios directory
tags: nagiosdirectory
file:
path: ~/nagios
state: directory
- name: Downloading nagios
tags: dlnagios
unarchive:
src: https://github.com/NagiosEnterprises/nagioscore/archive/nagios-4.4.6.tar.gz
dest: ~/nagios
remote_src: yes
mode: 0777
owner: root
group: root
- name: Setting up nagios
tags: nagiossetup
shell: |
cd ~/nagios/nagioscore-**
./configure
make all
make install-groups-users
usermod -a -G nagios apache

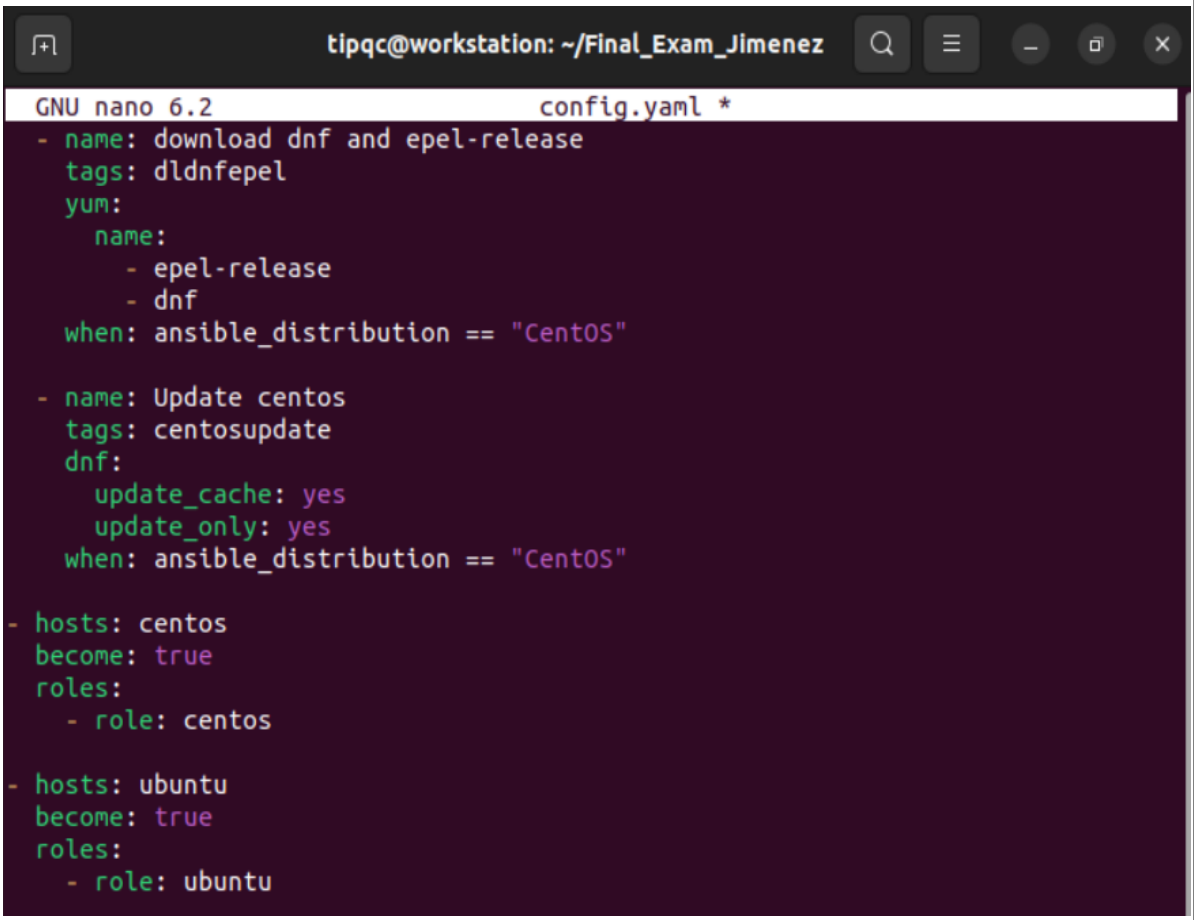

tipqc@workstation: ~/Final_Exam_Jimenez/roles/centos/ta...
GNU nano 6.2 main.yml *
make install-groups-users
usermod -a -G nagios apache
make install
make install-daemoninit
make install-commandmode
make install-config
make install-webconf
- name: Downloading nagios plugin
tags: nagiosplugin
unarchive:
src: https://github.com/nagios-plugins/nagios-plugins/archive/release-2.3.3.tar.gz
dest: ~/nagios
remote_src: yes
mode: 0777
owner: root
group: root
- name: Setting up nagios plugin
tags: nagiospluginsetup
shell: |
cd ~/nagios/nagios-plugins*
./tools/setup
./configure
make
make install
- name: Enable nagios
tags: enablenagios
service:



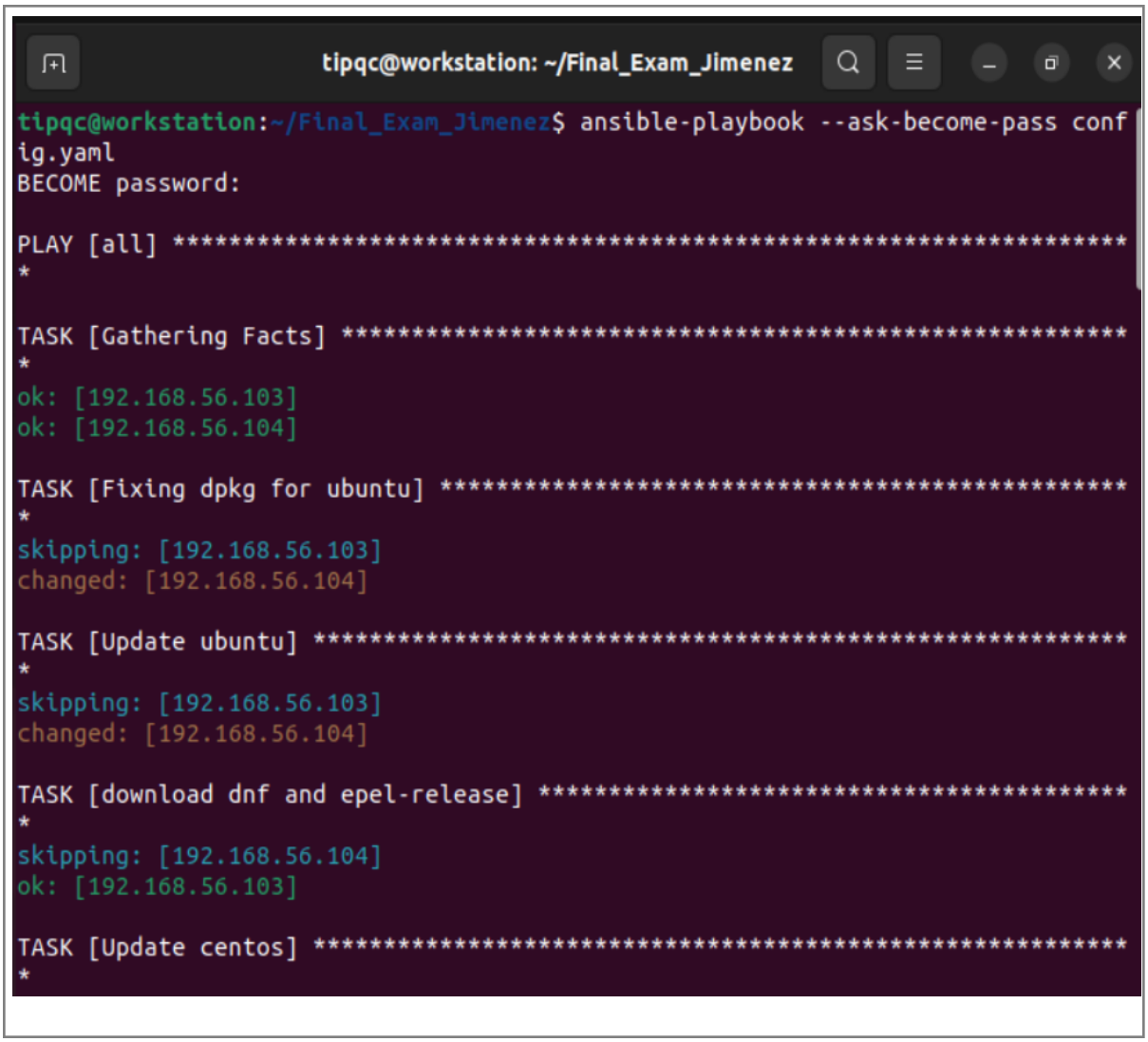
Creating a playbook that will run the role's instructions using sudo nano command

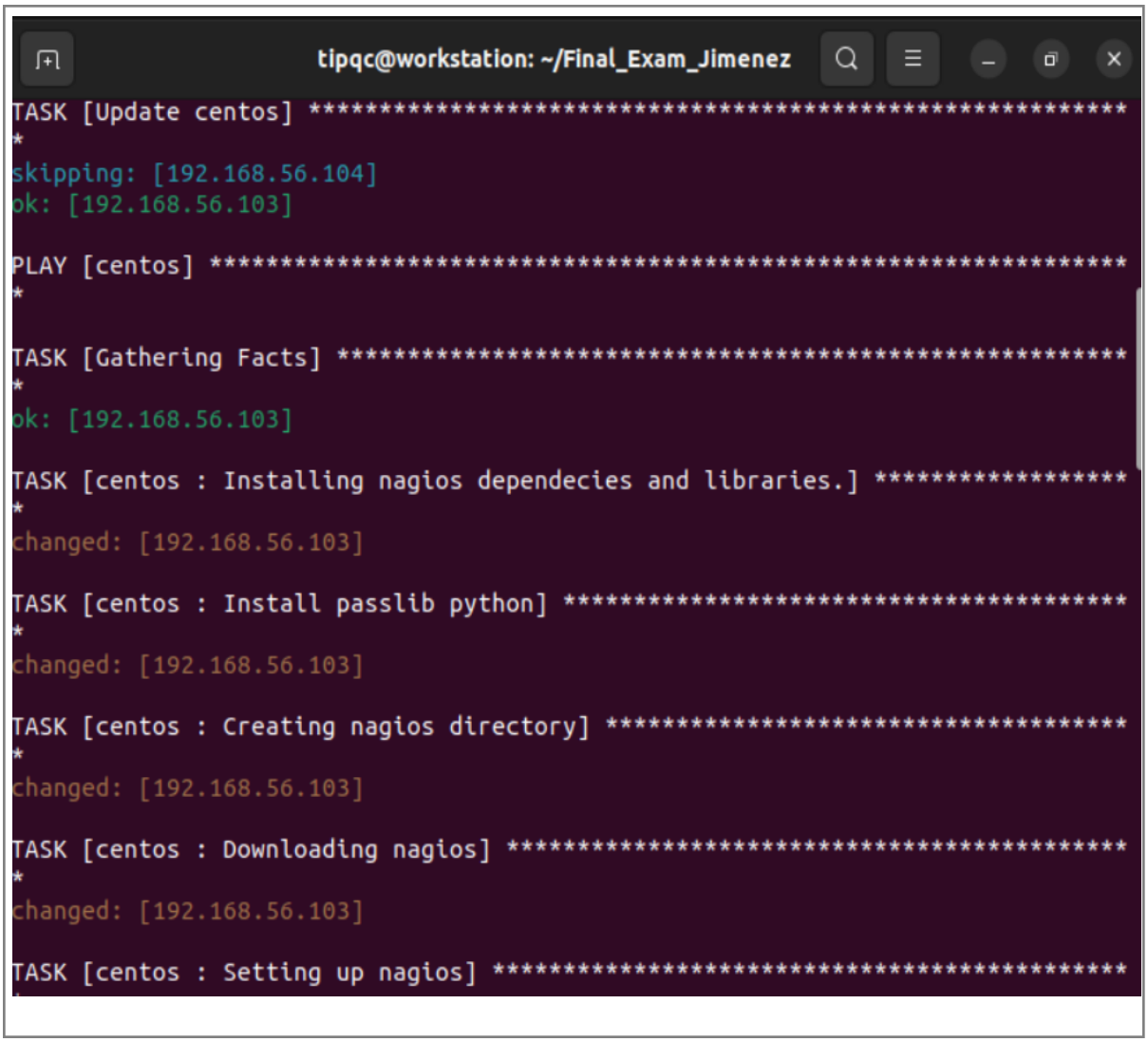

tipqc@workstation: ~/Final_Exam_Jimenez
GNU nano 6.2 config.yaml *

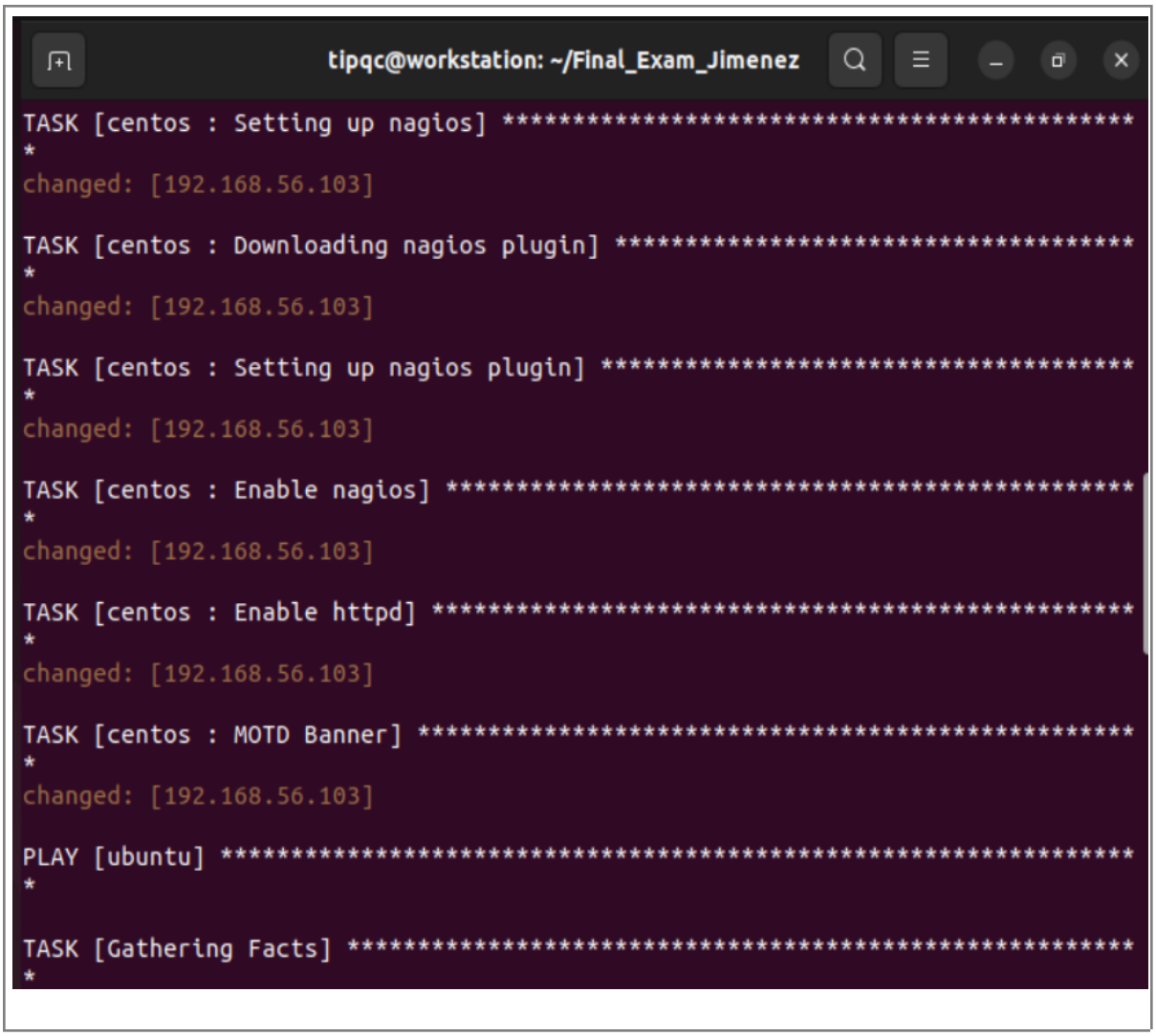
- hosts: all
become: true
pre_tasks:
- name: Fixing dpkg for ubuntu
tags: ubuntudpkg
shell: |
dpkg --configure -a
when: ansible_distribution == "Ubuntu"
- name: Update ubuntu
tags: ubuntuupdate
apt:
update_cache: yes
upgrade: dist
when: ansible_distribution == "Ubuntu"
- name: download dnf and epel-release
tags: dldnfepel
yum:
name:
- epel-release
- dnf

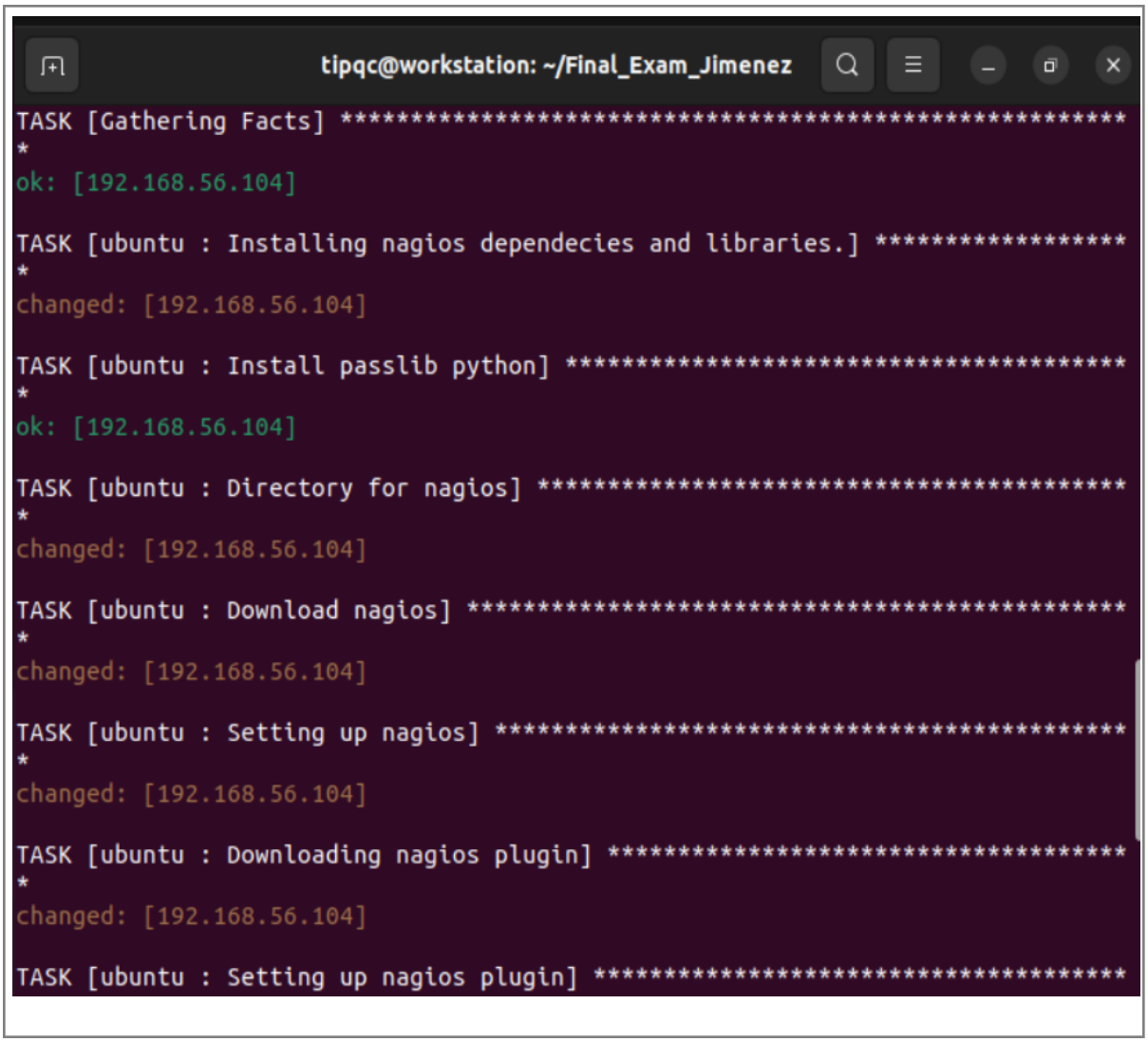


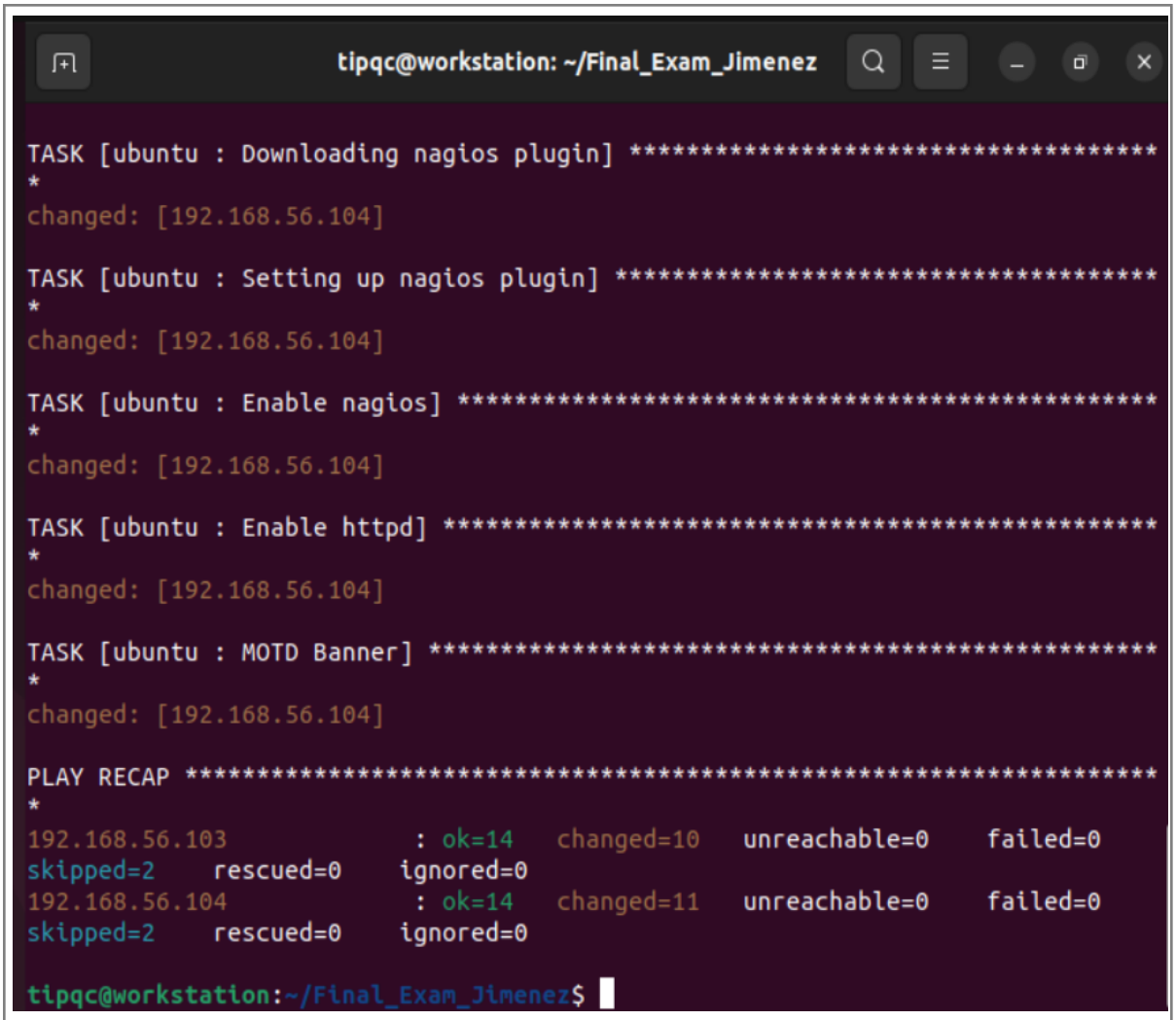
Running the playbook using ansible-playbook –ask-become-pass command


tipqc@workstation: ~/Final_Exam_Jimenez
tipqc@workstation:~/Final_Exam_Jimenez$ ansible-playbook --ask-become-pass conf
ig.yaml
BECOME password:
PLAY [all] **
*
TASK [Gathering Facts] **
*
ok: [192.168.56.103]
ok: [192.168.56.104]
TASK [Fixing dpkg for ubuntu] ***
*
skipping: [192.168.56.103]
changed: [192.168.56.104]
TASK [Update ubuntu] **
*
skipping: [192.168.56.103]
changed: [192.168.56.104]
TASK [download dnf and epel-release] **
*
skipping: [192.168.56.104]
ok: [192.168.56.103]
TASK [Update centos] **
*


tipqc@workstation: ~/Final_Exam_Jimenez
TASK [Update centos] ***
*
skipping: [192.168.56.104]
ok: [192.168.56.103]
PLAY [centos] **
*
TASK [Gathering Facts] ***
*
ok: [192.168.56.103]
TASK [centos : Installing nagios dependecies and libraries.] ******************
*
changed: [192.168.56.103]
TASK [centos : Install passlib python] ***
*
changed: [192.168.56.103]
TASK [centos : Creating nagios directory] **************************************
*
changed: [192.168.56.103]
TASK [centos : Downloading nagios] ***
*
changed: [192.168.56.103]
TASK [centos : Setting up nagios] **

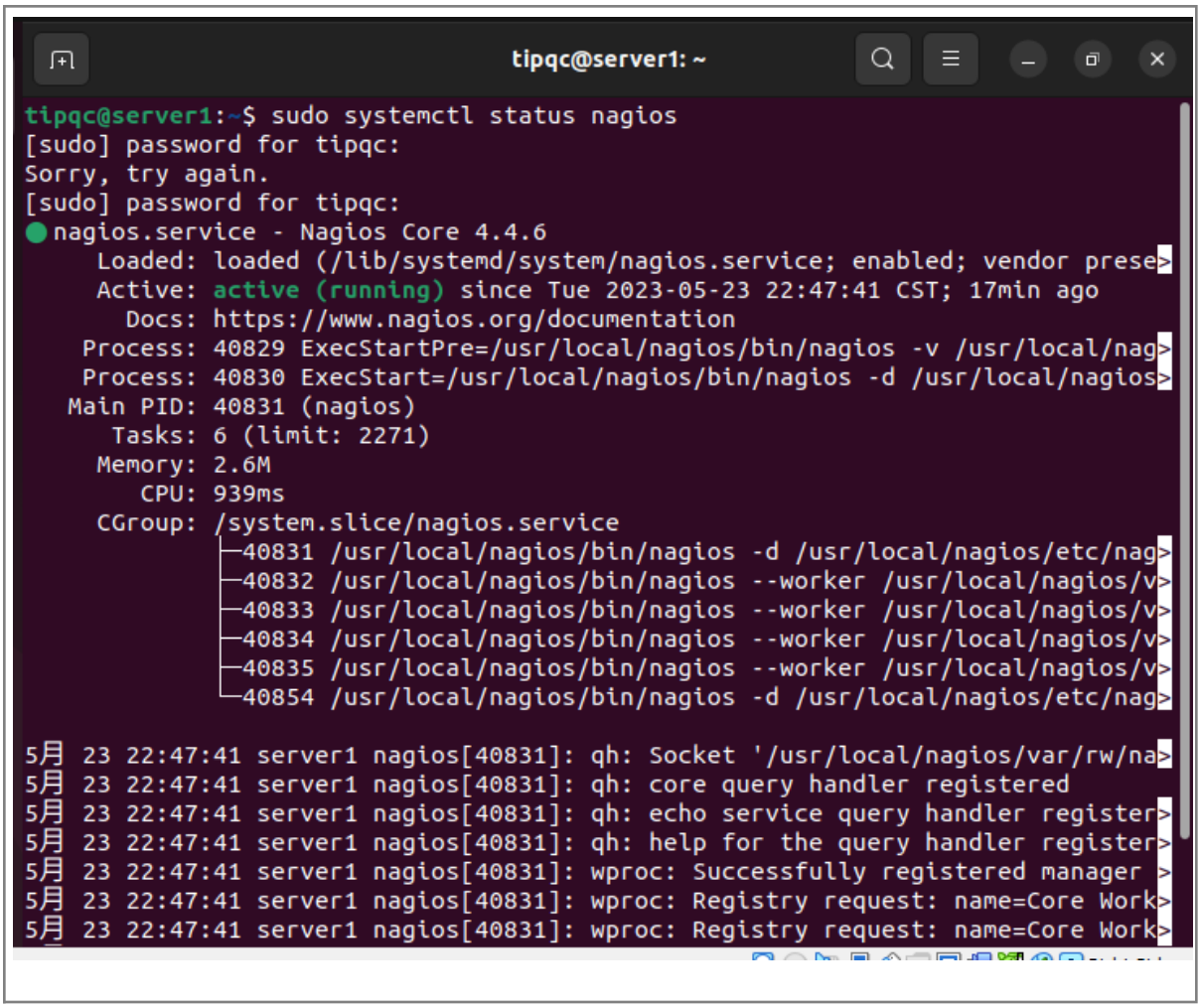

tipqc@workstation: ~/Final_Exam_Jimenez
TASK [centos : Setting up nagios] ***
*
changed: [192.168.56.103]
TASK [centos : Downloading nagios plugin] ***************************************
*
changed: [192.168.56.103]
TASK [centos : Setting up nagios plugin] **
*
changed: [192.168.56.103]
TASK [centos : Enable nagios] ***
*
changed: [192.168.56.103]
TASK [centos : Enable httpd] **
*
changed: [192.168.56.103]
TASK [centos : MOTD Banner] ***
*
changed: [192.168.56.103]
PLAY [ubuntu] ***
*
TASK [Gathering Facts] **
*

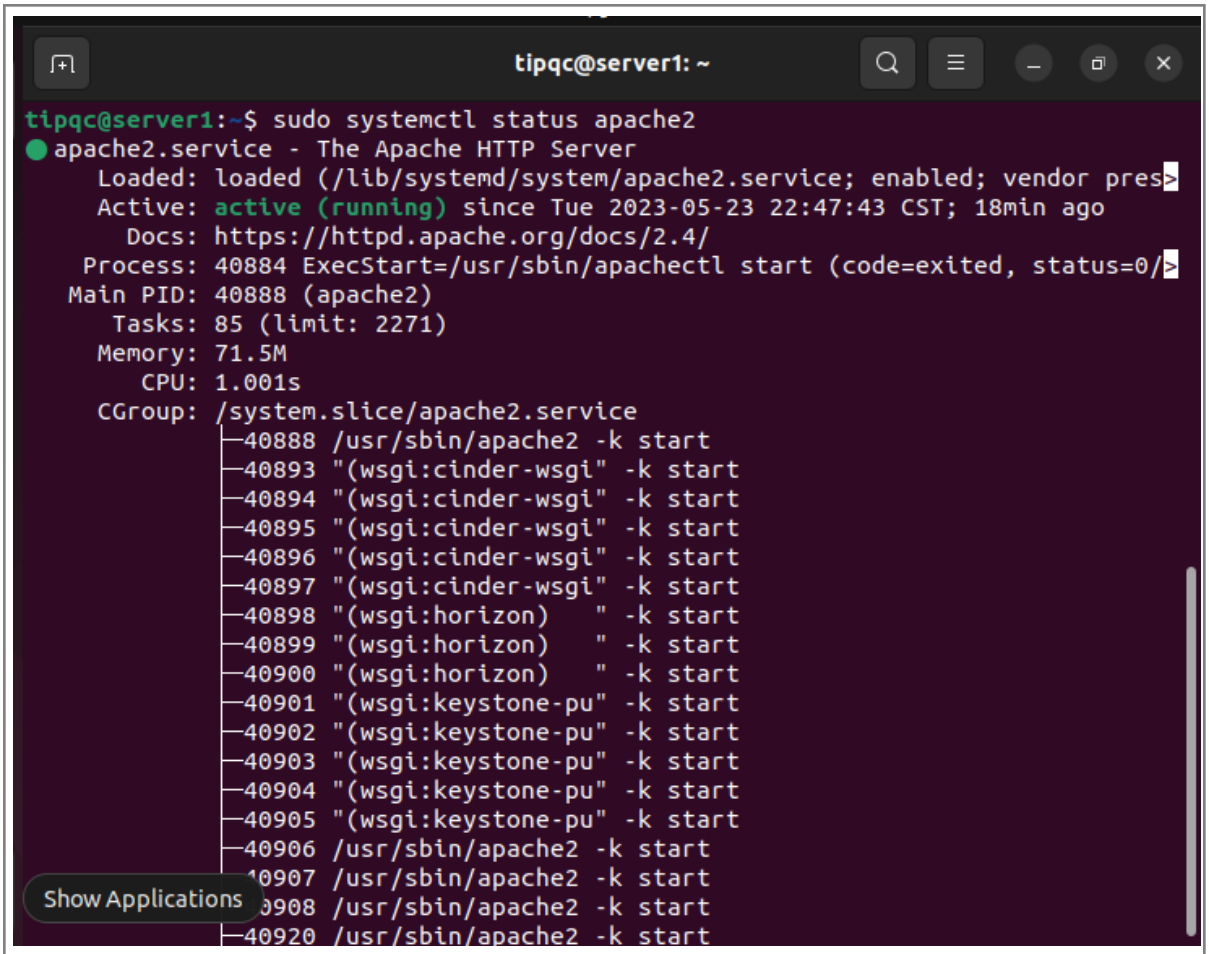

tipqc@workstation: ~/Final_Exam_Jimenez
TASK [Gathering Facts] ***
*
ok: [192.168.56.104]
TASK [ubuntu : Installing nagios dependecies and libraries.] ******************
*
changed: [192.168.56.104]
TASK [ubuntu : Install passlib python] ***
*
ok: [192.168.56.104]
TASK [ubuntu : Directory for nagios] ***
*
changed: [192.168.56.104]
TASK [ubuntu : Download nagios] **
*
changed: [192.168.56.104]
TASK [ubuntu : Setting up nagios] **
*
changed: [192.168.56.104]
TASK [ubuntu : Downloading nagios plugin] **************************************
*
changed: [192.168.56.104]
TASK [ubuntu : Setting up nagios plugin] ***************************************



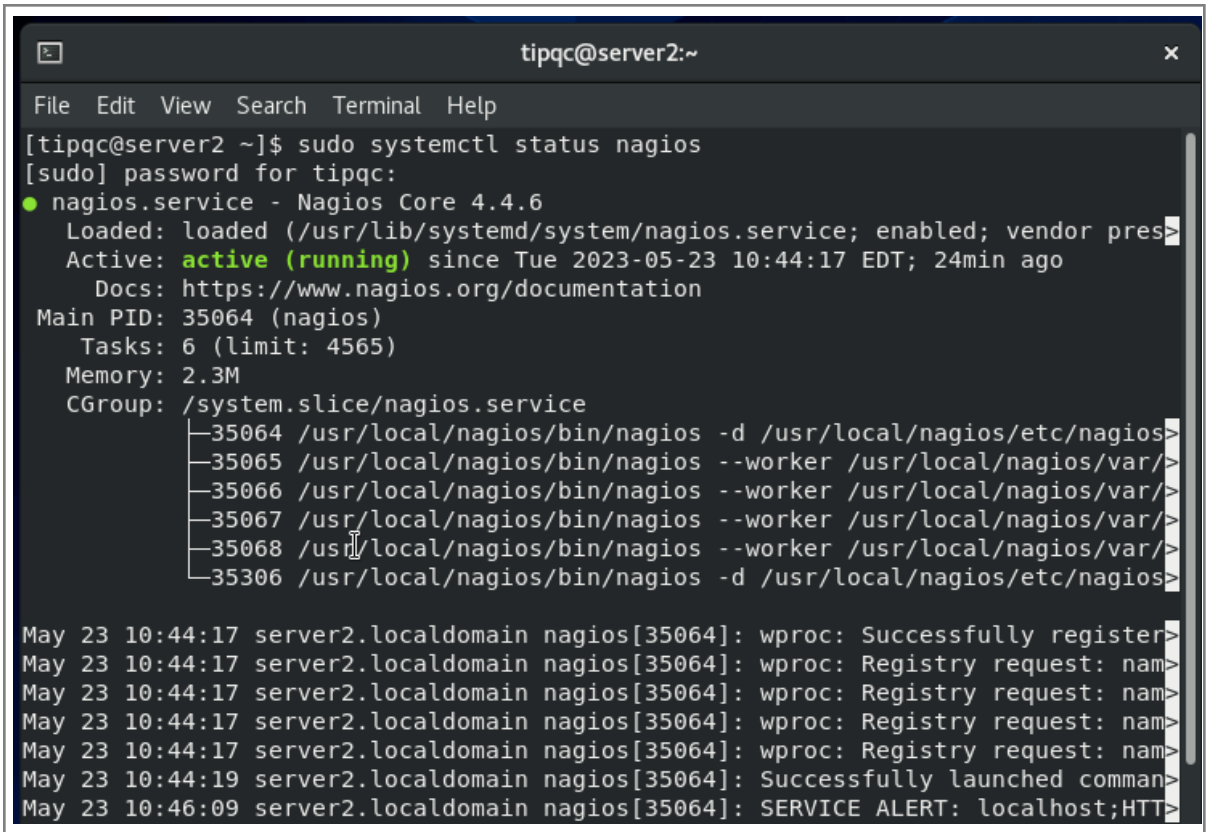
Proof of successful run

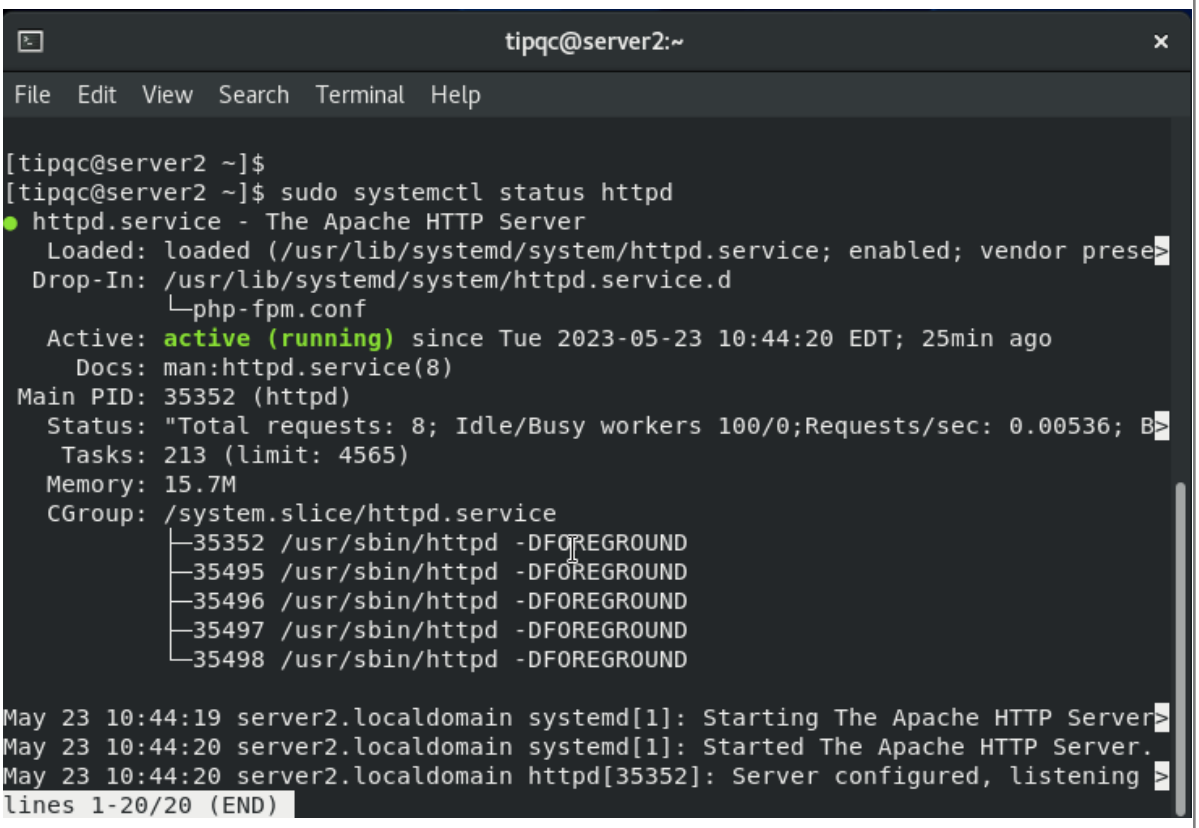
For ubuntu


tipqc@server1: ~
tipqc@server1:~$ sudo systemctl status nagios
[sudo] password for tipqc:
Sorry, try again.
[sudo] password for tipqc:
nagios.service - Nagios Core 4.4.6
Loaded: loaded (/lib/systemd/system/nagios.service; enabled; vendor prese>
Active: active (running) since Tue 2023-05-23 22:47:41 CST; 17min ago
Docs: https://www.nagios.org/documentation
Process: 40829 ExecStartPre=/usr/local/nagios/bin/nagios -v /usr/local/nag>
Process: 40830 ExecStart=/usr/local/nagios/bin/nagios -d /usr/local/nagios>
Main PID: 40831 (nagios)
Tasks: 6 (limit: 2271)
Memory: 2.6M
CPU: 939ms
CGroup: /system.slice/nagios.service
├─40831 /usr/local/nagios/bin/nagios -d /usr/local/nagios/etc/nag>
├─40832 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/v>
├─40833 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/v>
├─40834 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/v>
├─40835 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/v>
└─40854 /usr/local/nagios/bin/nagios -d /usr/local/nagios/etc/nag>
5月 23 22:47:41 server1 nagios[40831]: qh: Socket '/usr/local/nagios/var/rw/na>
5月 23 22:47:41 server1 nagios[40831]: qh: core query handler registered
5月 23 22:47:41 server1 nagios[40831]: qh: echo service query handler register>
5月 23 22:47:41 server1 nagios[40831]: qh: help for the query handler register>
5月 23 22:47:41 server1 nagios[40831]: wproc: Successfully registered manager >
5月 23 22:47:41 server1 nagios[40831]: wproc: Registry request: name=Core Work>
5月 23 22:47:41 server1 nagios[40831]: wproc: Registry request: name=Core Work>

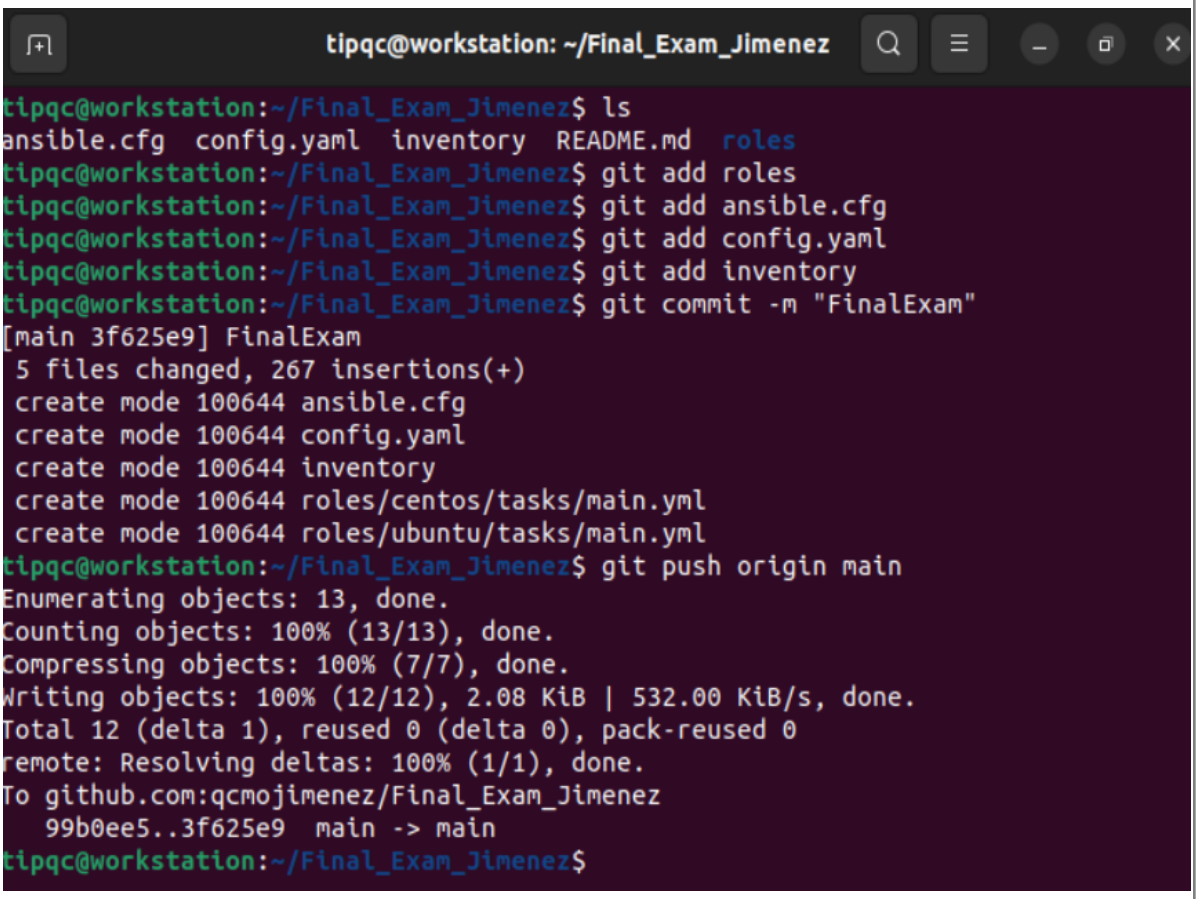

tipqc@server1: ~
tipqc@server1:~$ sudo systemctl status apache2
apache2.service - The Apache HTTP Server
Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor pres>
Active: active (running) since Tue 2023-05-23 22:47:43 CST; 18min ago
Docs: https://httpd.apache.org/docs/2.4/
Process: 40884 ExecStart=/usr/sbin/apachectl start (code=exited, status=0/>
Main PID: 40888 (apache2)
Tasks: 85 (limit: 2271)
Memory: 71.5M
CPU: 1.001s
CGroup: /system.slice/apache2.service
├─40888 /usr/sbin/apache2 -k start
├─40893 "(wsgi:cinder-wsgi" -k start
├─40894 "(wsgi:cinder-wsgi" -k start
├─40895 "(wsgi:cinder-wsgi" -k start
├─40896 "(wsgi:cinder-wsgi" -k start
├─40897 "(wsgi:cinder-wsgi" -k start
├─40898 "(wsgi:horizon) " -k start
├─40899 "(wsgi:horizon) " -k start
├─40900 "(wsgi:horizon) " -k start
├─40901 "(wsgi:keystone-pu" -k start
├─40902 "(wsgi:keystone-pu" -k start
├─40903 "(wsgi:keystone-pu" -k start
├─40904 "(wsgi:keystone-pu" -k start
├─40905 "(wsgi:keystone-pu" -k start
├─40906 /usr/sbin/apache2 -k start
Show Applications
├─40920 /usr/sbin/apache2 -k start

For centos


tipqc@server2:~
File Edit View Search Terminal Help
[tipqc@server2 ~]$ sudo systemctl status nagios
[sudo] password for tipqc:
● nagios.service - Nagios Core 4.4.6
Loaded: loaded (/usr/lib/systemd/system/nagios.service; enabled; vendor pres>
Active: active (running) since Tue 2023-05-23 10:44:17 EDT; 24min ago
Docs: https://www.nagios.org/documentation
Main PID: 35064 (nagios)
Tasks: 6 (limit: 4565)
Memory: 2.3M
CGroup: /system.slice/nagios.service
├─35064 /usr/local/nagios/bin/nagios -d /usr/local/nagios/etc/nagios>
├─35065 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/>
├─35066 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/>
├─35067 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/>
├─35068 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/>
└─35306 /usr/local/nagios/bin/nagios -d /usr/local/nagios/etc/nagios>
May 23 10:44:17 server2.localdomain nagios[35064]: wproc: Successfully register>
May 23 10:44:17 server2.localdomain nagios[35064]: wproc: Registry request: nam>
May 23 10:44:17 server2.localdomain nagios[35064]: wproc: Registry request: nam>
May 23 10:44:17 server2.localdomain nagios[35064]: wproc: Registry request: nam>
May 23 10:44:17 server2.localdomain nagios[35064]: wproc: Registry request: nam>
May 23 10:44:19 server2.localdomain nagios[35064]: Successfully launched comman>
May 23 10:46:09 server2.localdomain nagios[35064]: SERVICE ALERT: localhost;HTT>


tipqc@server2:~
File Edit View Search Terminal Help
[tipqc@server2 ~]$
[tipqc@server2 ~]$ sudo systemctl status httpd
● httpd.service - The Apache HTTP Server
Loaded: loaded (/usr/lib/systemd/system/httpd.service; enabled; vendor prese>
Drop-In: /usr/lib/systemd/system/httpd.service.d
└─php-fpm.conf
Active: active (running) since Tue 2023-05-23 10:44:20 EDT; 25min ago
Docs: man:httpd.service(8)
Main PID: 35352 (httpd)
Status: "Total requests: 8; Idle/Busy workers 100/0;Requests/sec: 0.00536; B>
Tasks: 213 (limit: 4565)
Memory: 15.7M
CGroup: /system.slice/httpd.service
├─35352 /usr/sbin/httpd -DFOREGROUND
├─35495 /usr/sbin/httpd -DFOREGROUND
├─35496 /usr/sbin/httpd -DFOREGROUND
├─35497 /usr/sbin/httpd -DFOREGROUND
└─35498 /usr/sbin/httpd -DFOREGROUND
May 23 10:44:19 server2.localdomain systemd[1]: Starting The Apache HTTP Server>
May 23 10:44:20 server2.localdomain systemd[1]: Started The Apache HTTP Server.
May 23 10:44:20 server2.localdomain httpd[35352]: Server configured, listening >
lines 1-20/20 (END)

Pushing to github repository



GITHUB REPOSITORY

https://github.com/qcmojimenez/Final_Exam_Jimenez