

Tools Needed:
<ol style="list-style-type: none">1. VM with Ubuntu, CentOS and Ansible installed2. Web browser
Procedure:
<ol style="list-style-type: none">1. Create a repository and label it as "Final_Exam_Surname"2. Clone your new repository in your VM3. Create an Ansible playbook that does the following with an input of a config.yaml file and structure inventory file.<ol style="list-style-type: none">3.1 Install and configure one enterprise service that can be installed in Debian and Centos servers3.2 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 GitHub5. 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

main 1 branch 0 tags

Go to file Add file <> Code

qcmojimenez Initial commit 99b0ee5 3 minutes ago 1 commit

README.md Initial commit 3 minutes ago

README.md

Final_Exam_Jimenez

```
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 inventory *

```
[centos]
192.168.56.103

[ubuntu]
192.168.56.104
```

```
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
```

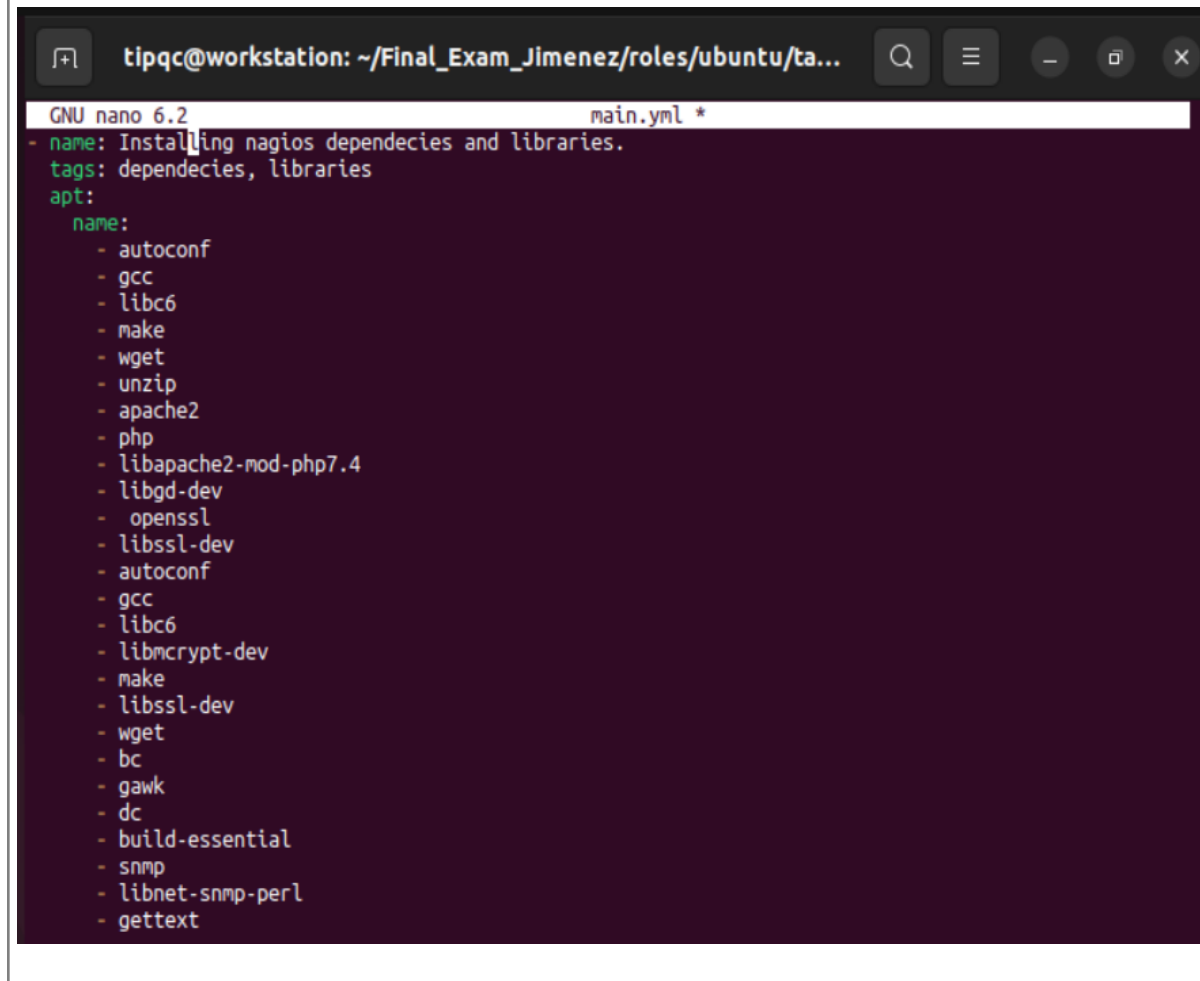
Creating directories for roles using mkdir command

```
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:



The screenshot shows a terminal window with a dark background. The title bar at the top reads "tipqc@workstation: ~/Final_Exam_Jimenez/roles/ubuntu/ta...". The terminal content shows the GNU nano 6.2 editor editing a file named "main.yml". The file contains a YAML snippet for a role named "Installing nagios dependencies and libraries". The snippet includes a "tags" field and an "apt" section with a list of package names.

```
GNU nano 6.2 main.yml *
- name: Installing nagios dependencies and libraries.
  tags: dependencies, 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 dependencies and libraries.
  tags: dependencies, 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

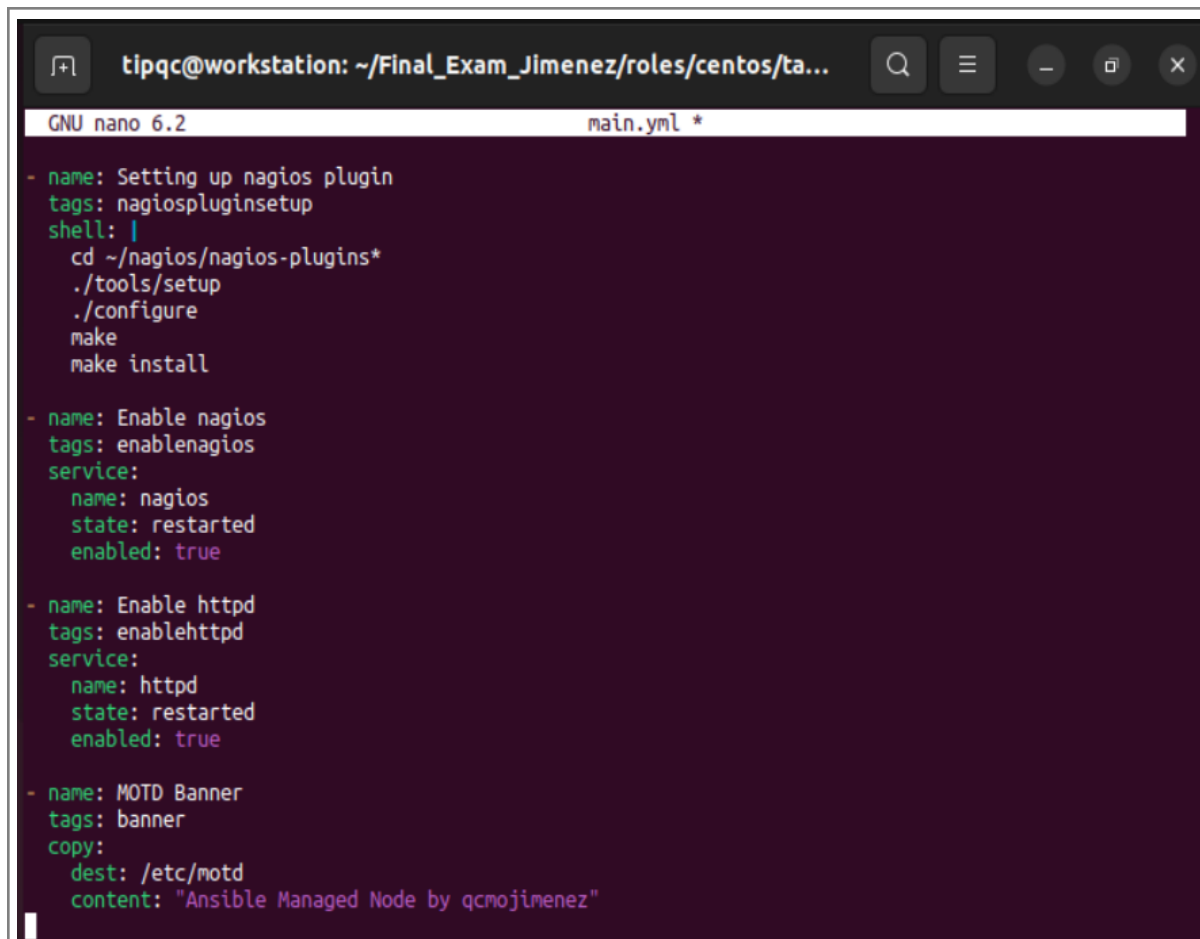
- name: Setting up nagios
  tags: nagiossetup
  shell: |
    cd ~/nagios/nagioscore-**
    ./configure
    make all
    make install-groups-users
    usermod -a -G nagios apache
```

```
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:
```



The screenshot shows a terminal window with a dark background. The title bar at the top indicates the user is 'tipqc@workstation' and the current directory is '~/Final_Exam_Jimenez/roles/centos/ta...'. The terminal is running 'GNU nano 6.2' and editing a file named 'main.yml *'. The content of the file is an Ansible playbook with four tasks, each with a 'name' and 'tags' field, and some with a 'service' or 'copy' block. The tasks are: 1. 'Setting up nagios plugin' with tags 'nagiospluginsetup' and a shell script to run 'cd ~/nagios/nagios-plugins*', './tools/setup', './configure', 'make', and 'make install'. 2. 'Enable nagios' with tags 'enablenagios' and a service block for 'nagios' with state 'restarted' and enabled 'true'. 3. 'Enable httpd' with tags 'enablehttpd' and a service block for 'httpd' with state 'restarted' and enabled 'true'. 4. 'MOTD Banner' with tags 'banner' and a copy block for '/etc/motd' with content 'Ansible Managed Node by qcmojimenez'.

```
tipqc@workstation: ~/Final_Exam_Jimenez/roles/centos/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: httpd
    state: restarted
    enabled: true

- name: MOTD Banner
  tags: banner
  copy:
    dest: /etc/motd
    content: "Ansible Managed Node by qcmojimenez"
```

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: ubuntu dpkg
      shell: |
        dpkg --configure -a
      when: ansible_distribution == "Ubuntu"
    - name: Update ubuntu
      tags: ubuntu update
      apt:
        update_cache: yes
        upgrade: dist
      when: ansible_distribution == "Ubuntu"
    - name: download dnf and epel-release
      tags: dnf epel
      yum:
        name:
          - epel-release
          - dnf
```

```
tipqc@workstation: ~/Final_Exam_Jimenez
GNU nano 6.2 config.yaml *
- name: download dnf and epel-release
  tags: dldnfepel
  yum:
    name:
      - epel-release
      - dnf
  when: ansible_distribution == "CentOS"

- name: Update centos
  tags: centosupdate
  dnf:
    update_cache: yes
    update_only: yes
  when: ansible_distribution == "CentOS"

- hosts: centos
  become: true
  roles:
    - role: centos

- hosts: ubuntu
  become: true
  roles:
    - role: ubuntu
```

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 dependencies 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] *****
```

```
tipqc@workstation: ~/Final_Exam_Jimenez

TASK [ubuntu : Downloading nagios plugin] *****
*
changed: [192.168.56.104]

TASK [ubuntu : Setting up nagios plugin] *****
*
changed: [192.168.56.104]

TASK [ubuntu : Enable nagios] *****
*
changed: [192.168.56.104]

TASK [ubuntu : Enable httpd] *****
*
changed: [192.168.56.104]

TASK [ubuntu : MOTD Banner] *****
*
changed: [192.168.56.104]

PLAY RECAP *****
*
192.168.56.103      : ok=14   changed=10   unreachable=0   failed=0
skipped=2   rescued=0   ignored=0
192.168.56.104      : ok=14   changed=11   unreachable=0   failed=0
skipped=2   rescued=0   ignored=0
tipqc@workstation:~/Final_Exam_Jimenez$
```

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 preset: enabled)  
   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/SUCCESS)  
 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  
                                         └─40907 /usr/sbin/apache2 -k start  
                                           └─40908 /usr/sbin/apache2 -k start  
                                             └─40920 /usr/sbin/apache2 -k start
```

Show Applications

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 prese  
   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

```
tipqc@workstation: ~/Final_Exam_Jimenez
tipqc@workstation:~/Final_Exam_Jimenez$ ls
ansible.cfg  config.yaml  inventory  README.md  roles
tipqc@workstation:~/Final_Exam_Jimenez$ git add roles
tipqc@workstation:~/Final_Exam_Jimenez$ git add ansible.cfg
tipqc@workstation:~/Final_Exam_Jimenez$ git add config.yaml
tipqc@workstation:~/Final_Exam_Jimenez$ git add inventory
tipqc@workstation:~/Final_Exam_Jimenez$ git commit -m "FinalExam"
[main 3f625e9] FinalExam
 5 files changed, 267 insertions(+)
 create mode 100644 ansible.cfg
 create mode 100644 config.yaml
 create mode 100644 inventory
 create mode 100644 roles/centos/tasks/main.yml
 create mode 100644 roles/ubuntu/tasks/main.yml
tipqc@workstation:~/Final_Exam_Jimenez$ git push origin main
Enumerating objects: 13, done.
Counting objects: 100% (13/13), done.
Compressing objects: 100% (7/7), done.
Writing objects: 100% (12/12), 2.08 KiB | 532.00 KiB/s, done.
Total 12 (delta 1), reused 0 (delta 0), pack-reused 0
remote: Resolving deltas: 100% (1/1), done.
To github.com:qcmojimenez/Final_Exam_Jimenez
   99b0ee5..3f625e9  main -> main
tipqc@workstation:~/Final_Exam_Jimenez$
```

GITHUB REPOSITORY

https://github.com/qcmojimenez/Final_Exam_Jimenez