Name: Jaira Biane Maculada	**Date Performed:** 10/09/23
Course/Section:CPE232/CPE31S6	**Date Submitted:** 10/12/23
Instructor: Dr. Jonathan V. Taylar	**Semester and SY:** 1st Sem(2023-2024)

Activity 8: Install, Configure, and Manage Availability Monitoring tools

1. Objectives

Create and design a workflow that installs, configure and manage enterprise monitoring tools using Ansible as an Infrastructure as Code (IaC) tool.

2. Discussion

Availability monitoring is a type of monitoring tool that we use if the certain workload is up or reachable on our end. Site downtime can lead to loss of revenue, reputational damage and severe distress. Availability monitoring prevents adverse situations by checking the uptime of infrastructure components such as servers and apps and notifying the webmaster of problems before they impact on business.

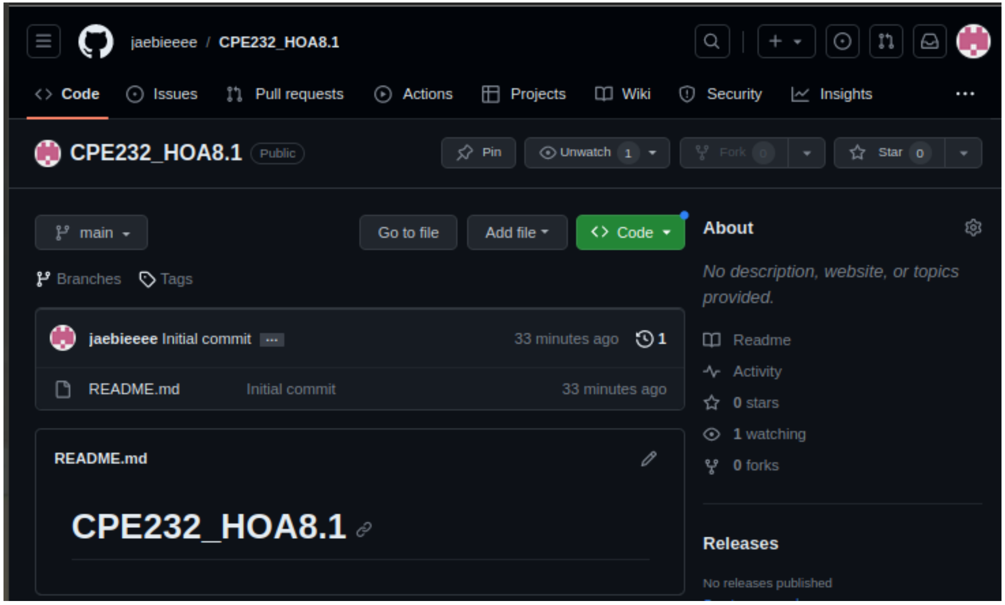
3. Tasks

1. Create a playbook that installs Nagios in both Ubuntu and CentOS. Apply the concept of creating roles.
2. Describe how you did step 1. (Provide screenshots and explanations in your report. Make your report detailed such that it will look like a manual.)
3. Show an output of the installed Nagios for both Ubuntu and CentOS.
4. Make sure to create a new repository in GitHub for this activity.

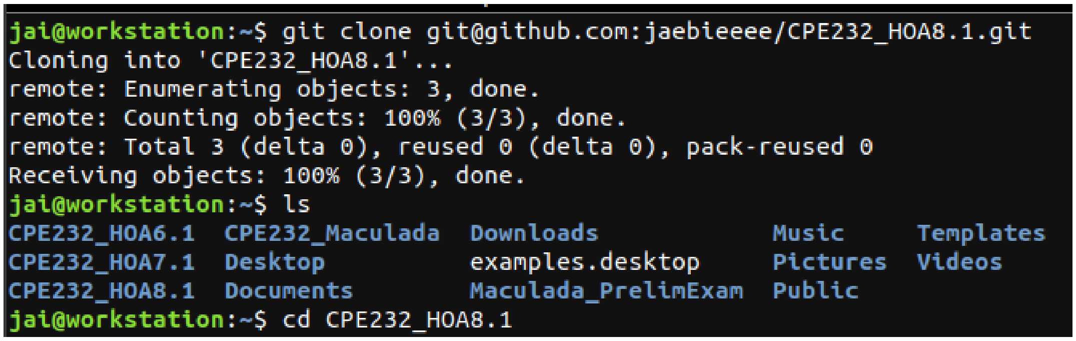
4. Output (screenshots and explanations)

Task 1: Create a File

1. Create a new repository for this Hands-On Activity.

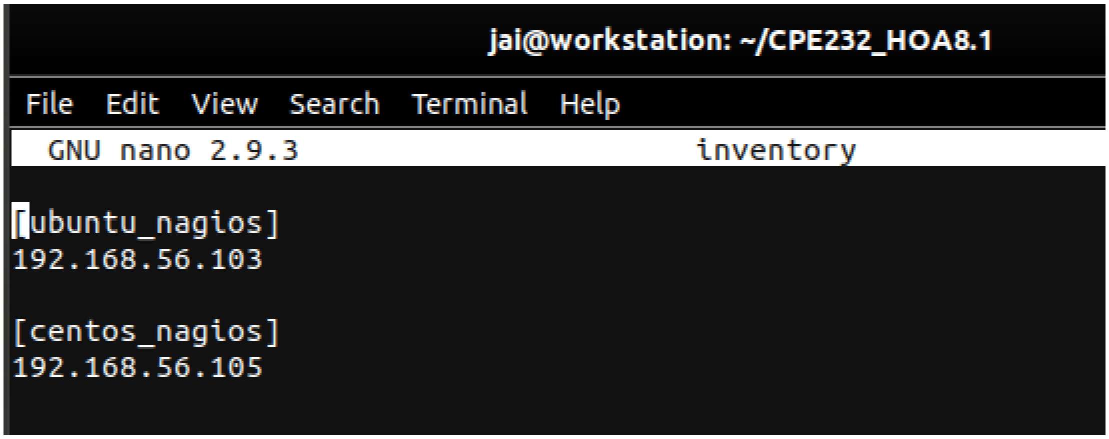


2. Clone the repository to the local machine.

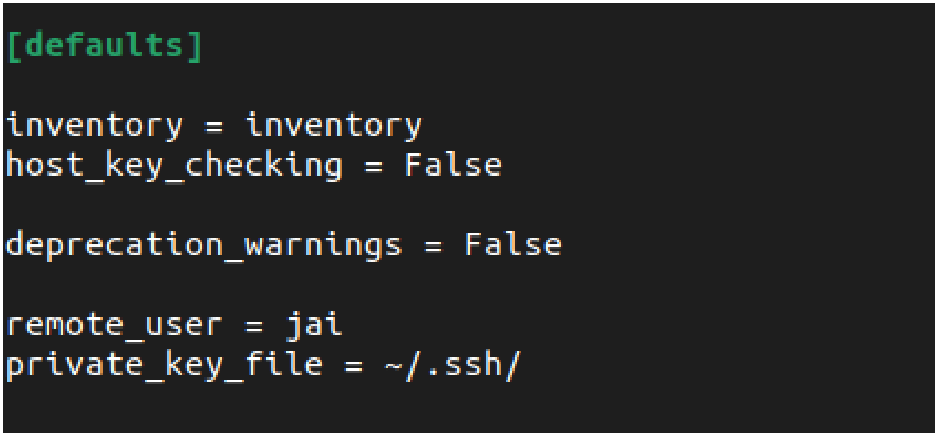


```
jai@workstation:~$ git clone git@github.com:jaebieeee/CPE232_HOA8.1.git
Cloning into 'CPE232_HOA8.1'...
remote: Enumerating objects: 3, done.
remote: Counting objects: 100% (3/3), done.
remote: Total 3 (delta 0), reused 0 (delta 0), pack-reused 0
Receiving objects: 100% (3/3), done.
jai@workstation:~$ ls
CPE232_HOA6.1  CPE232_Maculada  Downloads          Music     Templates
CPE232_HOA7.1  Desktop          examples.desktop   Pictures  Videos
CPE232_HOA8.1  Documents        Maculada_PrelimExam  Public
jai@workstation:~$ cd CPE232_HOA8.1
```

3. Create the ansible.cfg and inventory file (*must include one Ubuntu and CentOS*)


jai@workstation: ~/CPE232_HOA8.1
File Edit View Search Terminal Help
GNU nano 2.9.3 inventory

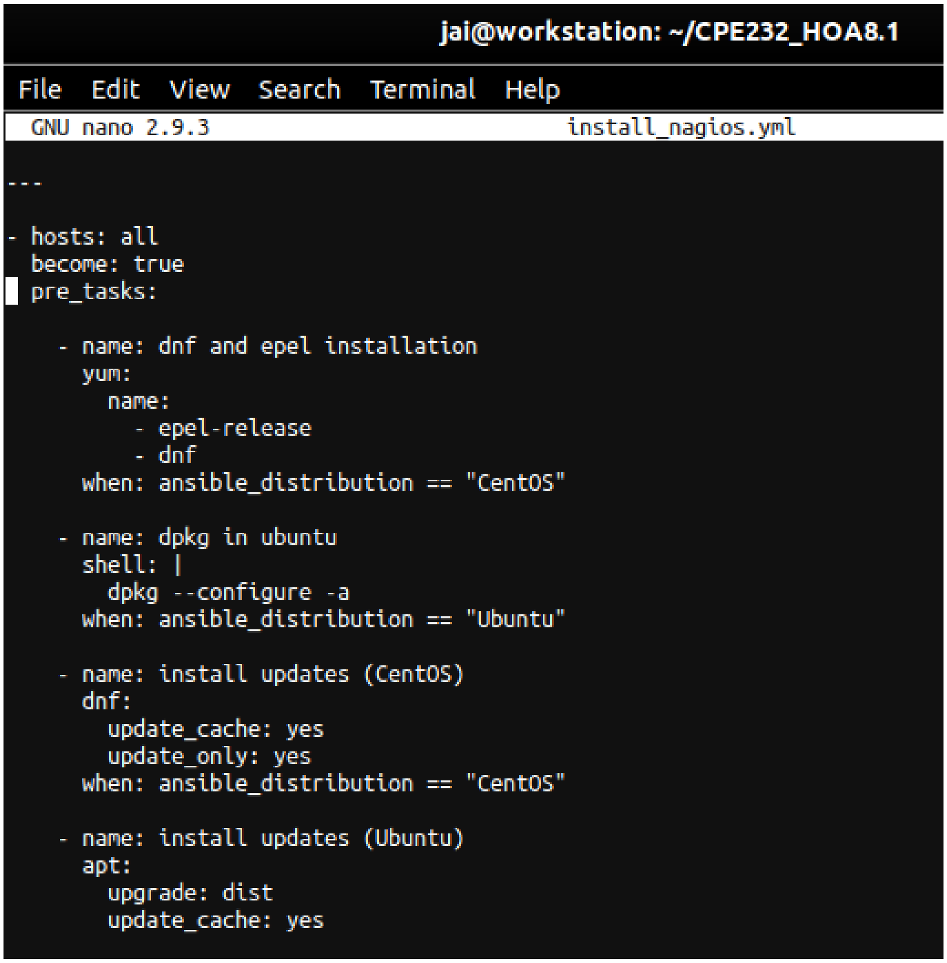
```
[ubuntu_nagios]
192.168.56.103

[centos_nagios]
192.168.56.105
```



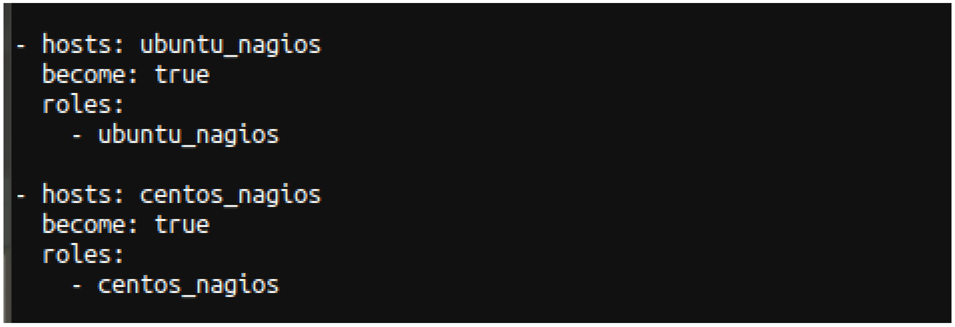
```
[defaults]

inventory = inventory
host_key_checking = False

deprecation_warnings = False

remote_user = jai
private_key_file = ~/.ssh/
```

Task 2: Create Playbook for Installing Nagios in Ubuntu and CentOS

1. Create a playbook and name it install_nagios.yml.

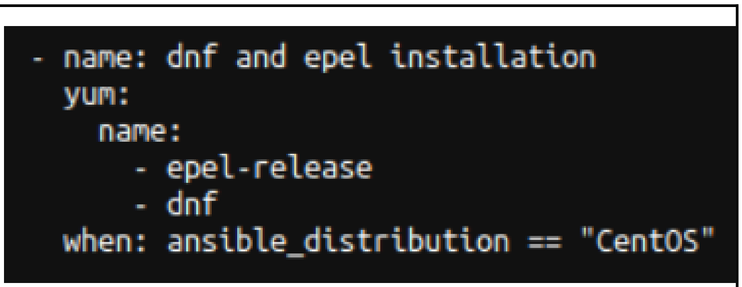


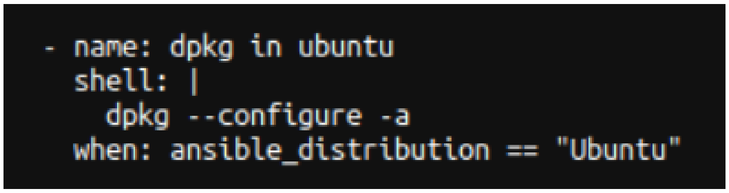
```
 GNU nano 2.9.3                          install_nagios.yml

---

- hosts: all
  become: true
  pre_tasks:

    - name: dnf and epel installation
      yum:
        name:
          - epel-release
          - dnf
      when: ansible_distribution == "CentOS"

    - name: dpkg in ubuntu
      shell: |
        dpkg --configure -a
      when: ansible_distribution == "Ubuntu"

    - name: install updates (CentOS)
      dnf:
        update_cache: yes
        update_only: yes
      when: ansible_distribution == "CentOS"

    - name: install updates (Ubuntu)
      apt:
        upgrade: dist
        update_cache: yes
```

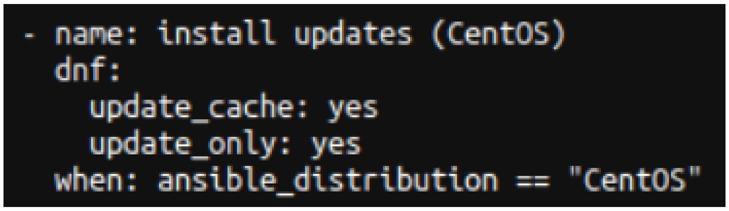


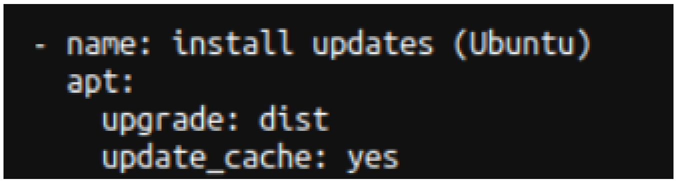
```
- hosts: ubuntu_nagios
  become: true
  roles:
    - ubuntu_nagios

- hosts: centos_nagios
  become: true
  roles:
    - centos_nagios
```

Code explanation:

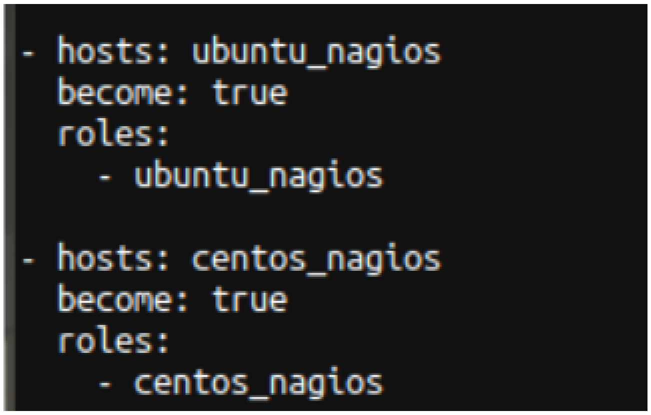
It checks if the target system is CentOS, and if so, it instlls two packages which are the"epel-release" and "dnf" using the "dnf" module. This is very useful for managing software on CentOS systems.	
	`- name: dnf and epel installation`
	`  yum:`
	`    name:`
	`      - epel-release`
	`      - dnf`
	`  when: ansible_distribution == "CentOS"`

dpkg -- configure -a command is used to repair any broken or pending package installations. It only runs when the target system is running Ubuntu which makes it useful for maintaining packages onUbuntu servers.	
	`- name: dpkg in ubuntu`
	`  shell: |`
	`    dpkg --configure -a`
	`  when: ansible_distribution == "Ubuntu"`

It refreshes the package cache (update_cache) as well as updtes only the installed packages (update_only). This task runs when the trget system is CentOS in order to make sure thatCentOS servers stay updated wth the latest package updates.	
	`- name: install updates (CentOS)`
	`  dnf:`
	`    update_cache: yes`
	`    update_only: yes`
	`  when: ansible_distribution == "CentOS"`

It upgrades all packages to their latest versions (upgrade: dist) and refreshes the package cache (update_cache). This	
	`- name: install updates (Ubuntu)`
	`  apt:`
	`    upgrade: dist`
	`    update_cache: yes`

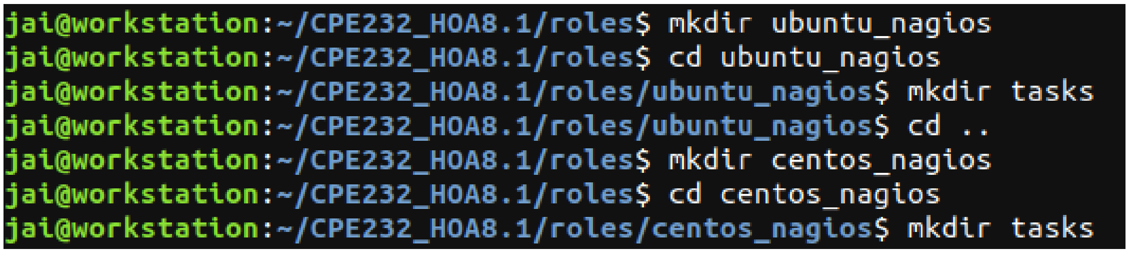
task runs only when the target system is Ubuntu in order to make sure tht Ubuntu servers are kept updated with the latest package updates.	

It uses roles and the playbook first installs in Ubuntu and then in CentOS which allws Nagios monitoring on both. The "become: true" option grants administrative privileges to execute tasks.	
	`- hosts: ubuntu_nagios`
	`  become: true`
	`  roles:`
	`    - ubuntu_nagios`
	
	`- hosts: centos_nagios`
	`  become: true`
	`  roles:`
	`    - centos_nagios`

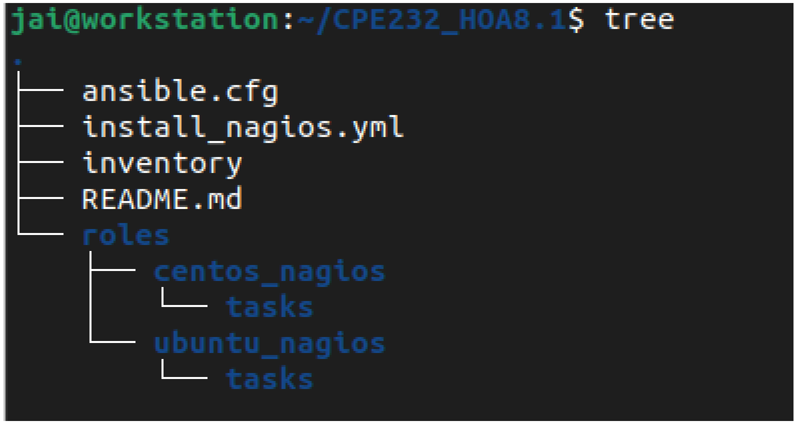
2. Save the file and exit.

Task 3: Create Roles

1. Create a new directory and name its roles. Enter the roles directory and create new directories: centos_nagios and ubuntu_nagios. For each directory, create a directory and name it tasks.

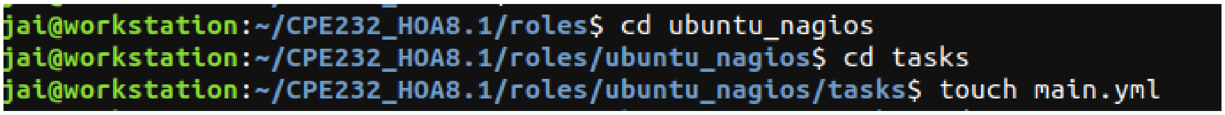


```
jai@workstation:~/CPE232_HOA8.1/roles$ mkdir ubuntu_nagios
jai@workstation:~/CPE232_HOA8.1/roles$ cd ubuntu_nagios
jai@workstation:~/CPE232_HOA8.1/roles/ubuntu_nagios$ mkdir tasks
jai@workstation:~/CPE232_HOA8.1/roles/ubuntu_nagios$ cd ..
jai@workstation:~/CPE232_HOA8.1/roles$ mkdir centos_nagios
jai@workstation:~/CPE232_HOA8.1/roles$ cd centos_nagios
jai@workstation:~/CPE232_HOA8.1/roles/centos_nagios$ mkdir tasks
```

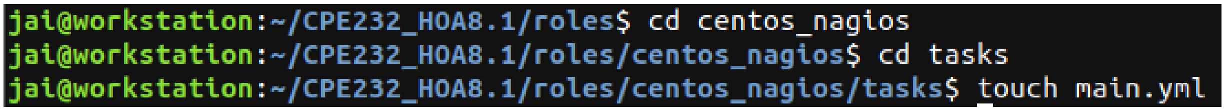


```
jai@workstation:~/CPE232_HOA8.1$ tree
.
├── ansible.cfg
├── install_nagios.yml
├── inventory
├── README.md
└── roles
    ├── centos_nagios
    │   └── tasks
    └── ubuntu_nagios
        └── tasks
```

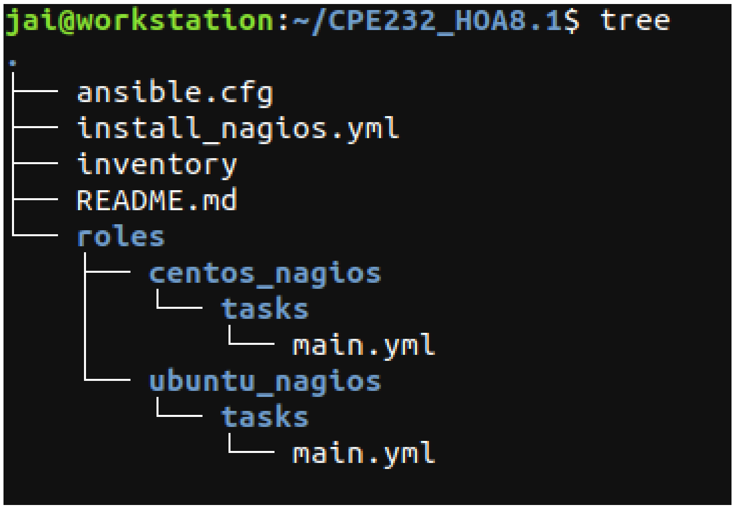
2. In each of the tasks for the two directory (*centos_nagios and ubuntu_nagios),* create another file and name it main.yml.



```
jai@workstation:~/CPE232_HOA8.1/roles$ cd ubuntu_nagios
jai@workstation:~/CPE232_HOA8.1/roles/ubuntu_nagios$ cd tasks
jai@workstation:~/CPE232_HOA8.1/roles/ubuntu_nagios/tasks$ touch main.yml
```

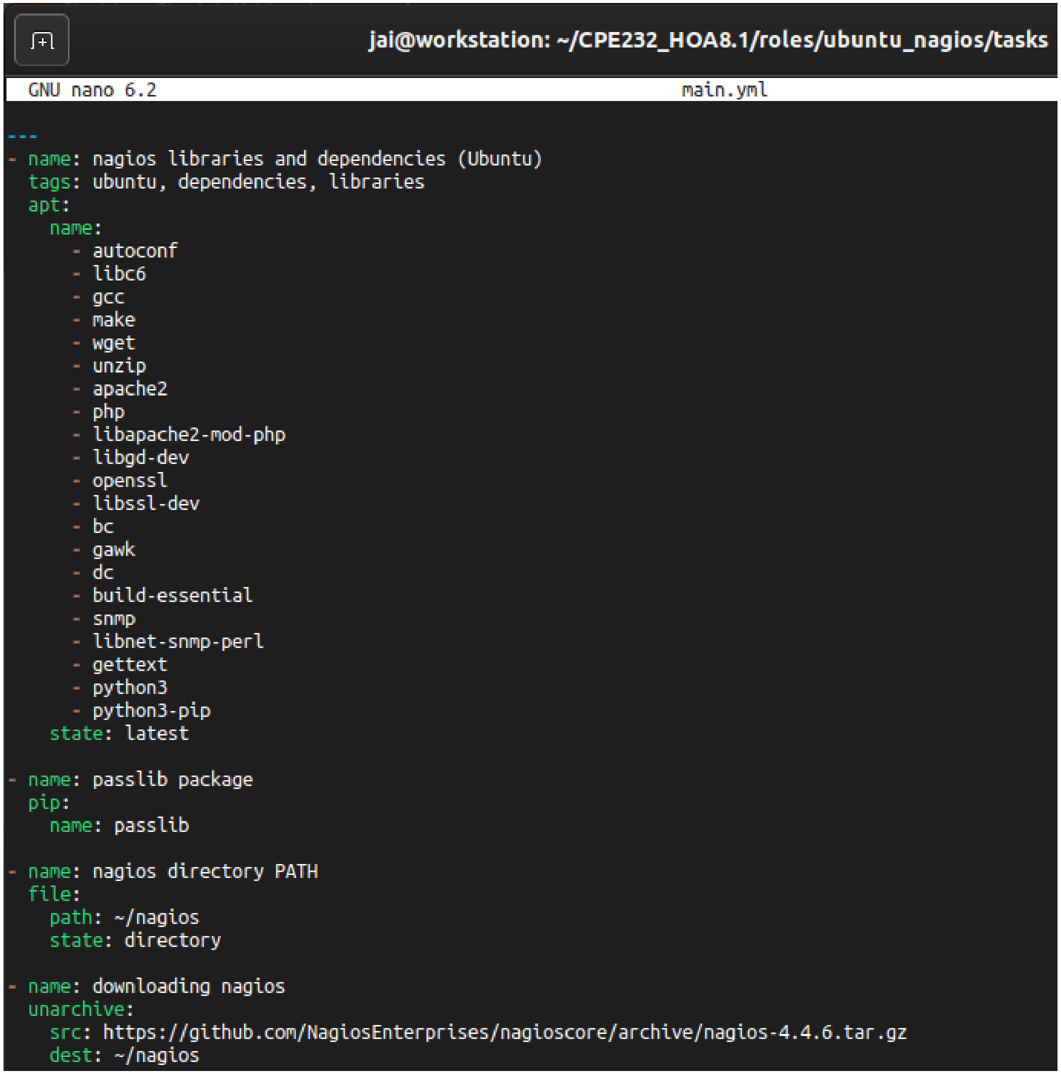


```
jai@workstation:~/CPE232_HOA8.1/roles$ cd centos_nagios
jai@workstation:~/CPE232_HOA8.1/roles/centos_nagios$ cd tasks
jai@workstation:~/CPE232_HOA8.1/roles/centos_nagios/tasks$ touch main.yml
```



```
jai@workstation:~/CPE232_HOA8.1$ tree
.
├── ansible.cfg
├── install_nagios.yml
├── inventory
├── README.md
└── roles
    ├── centos_nagios
    │   └── tasks
    │       └── main.yml
    └── ubuntu_nagios
        └── tasks
            └── main.yml
```

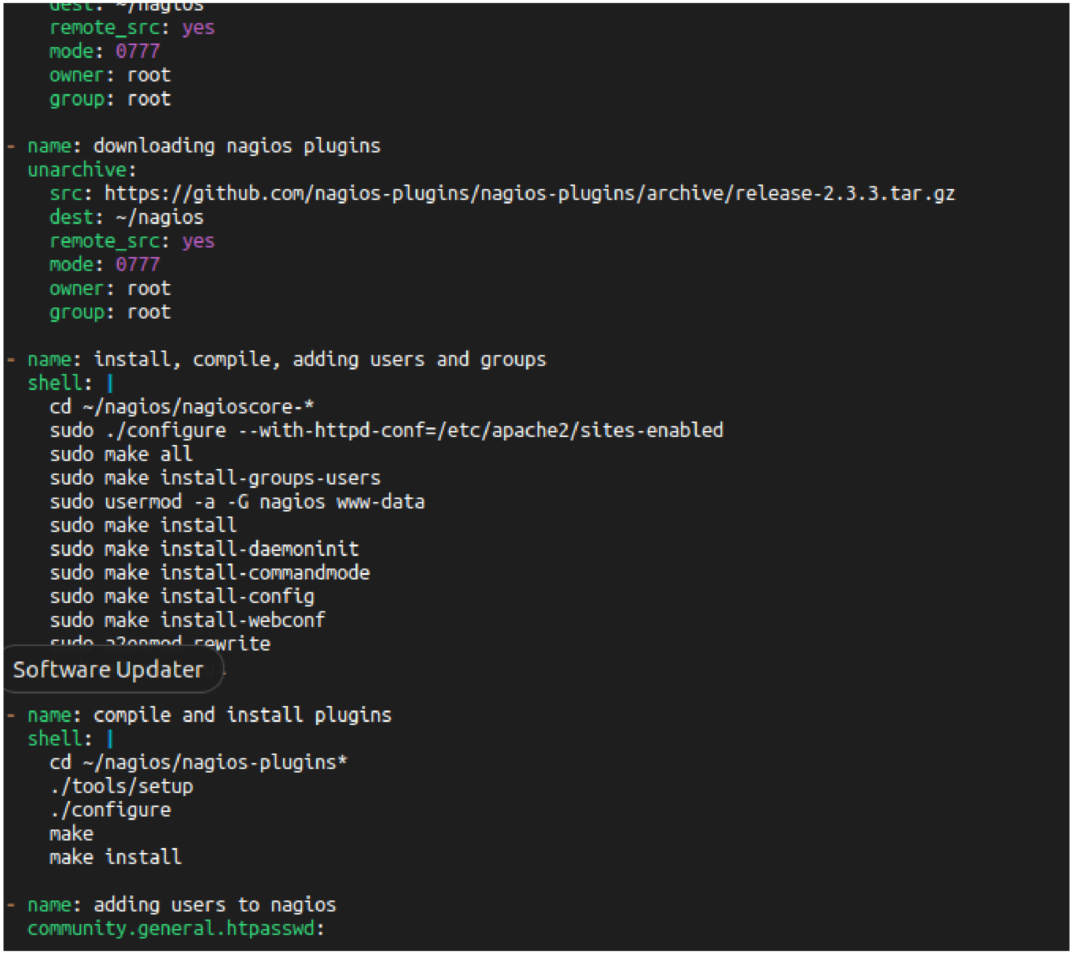
3. Copy the code to the main.yml of the Ubuntu subdirectory.



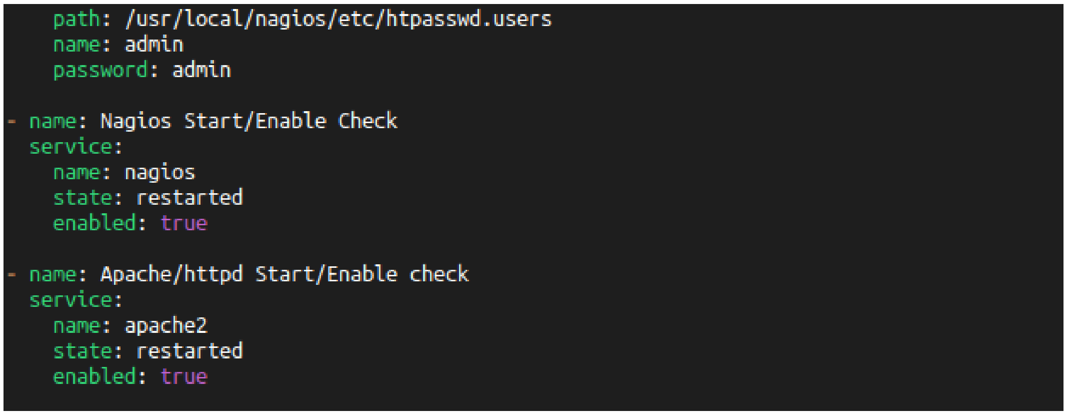
jai@workstation: ~/CPE232_HOA8.1/roles/ubuntu_nagios/tasks

GNU nano 6.2 main.yml

```
---
- name: nagios libraries and dependencies (Ubuntu)
  tags: ubuntu, dependencies, libraries
  apt:
    name:
      - autoconf
      - libc6
      - gcc
      - make
      - wget
      - unzip
      - apache2
      - php
      - libapache2-mod-php
      - libgd-dev
      - openssl
      - libssl-dev
      - bc
      - gawk
      - dc
      - build-essential
      - snmp
      - libnet-snmp-perl
      - gettext
      - python3
      - python3-pip
    state: latest

- name: passlib package
  pip:
    name: passlib

- name: nagios directory PATH
  file:
    path: ~/nagios
    state: directory

- name: downloading nagios
  unarchive:
    src: https://github.com/NagiosEnterprises/nagioscore/archive/nagios-4.4.6.tar.gz
    dest: ~/nagios
```

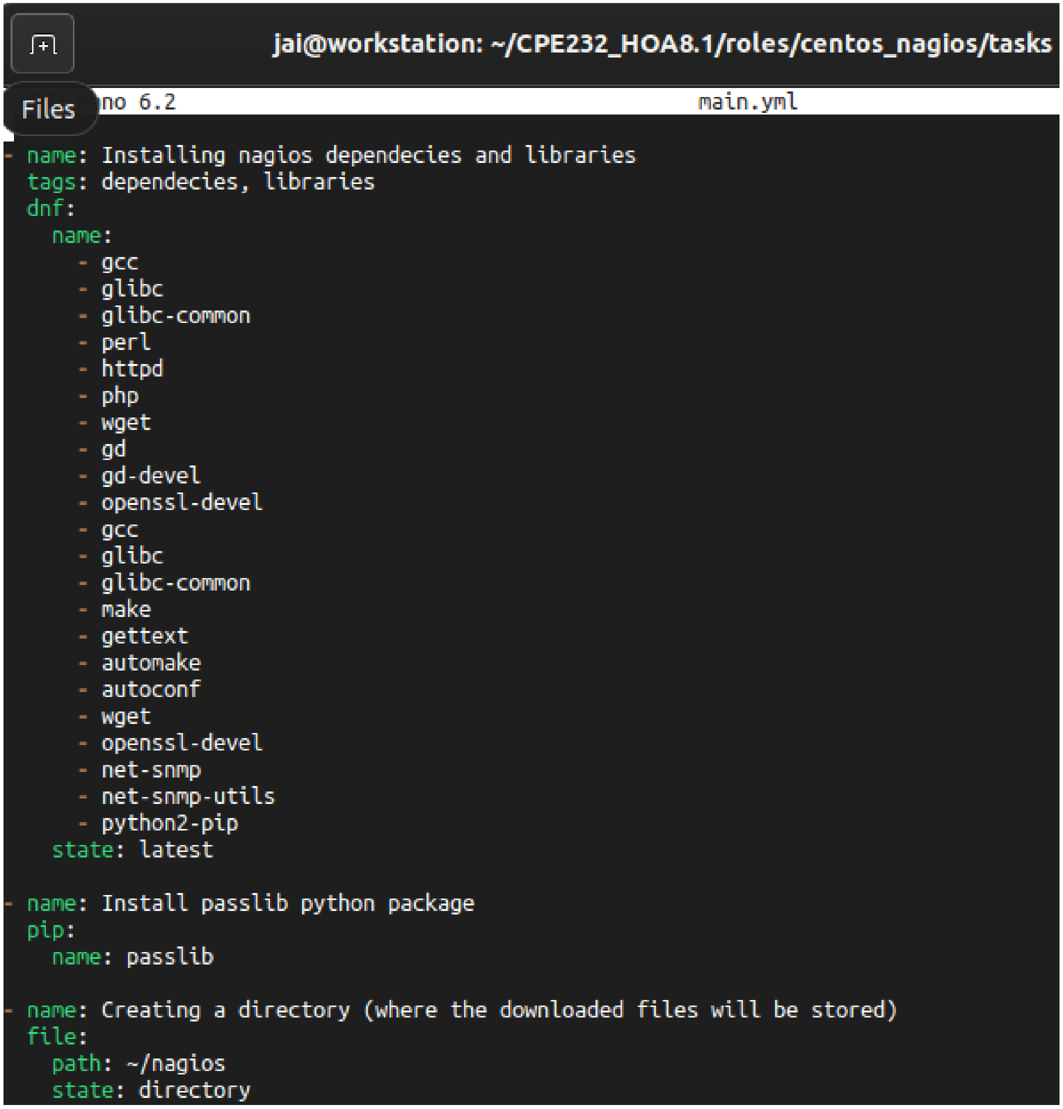


```
    dest: ~/nagios
    remote_src: yes
    mode: 0777
    owner: root
    group: root

- name: downloading nagios plugins
  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: install, compile, adding users and groups
  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

- name: compile and install plugins
  shell: |
    cd ~/nagios/nagios-plugins*
    ./tools/setup
    ./configure
    make
    make install

- name: adding users to nagios
  community.general.htpasswd:
```

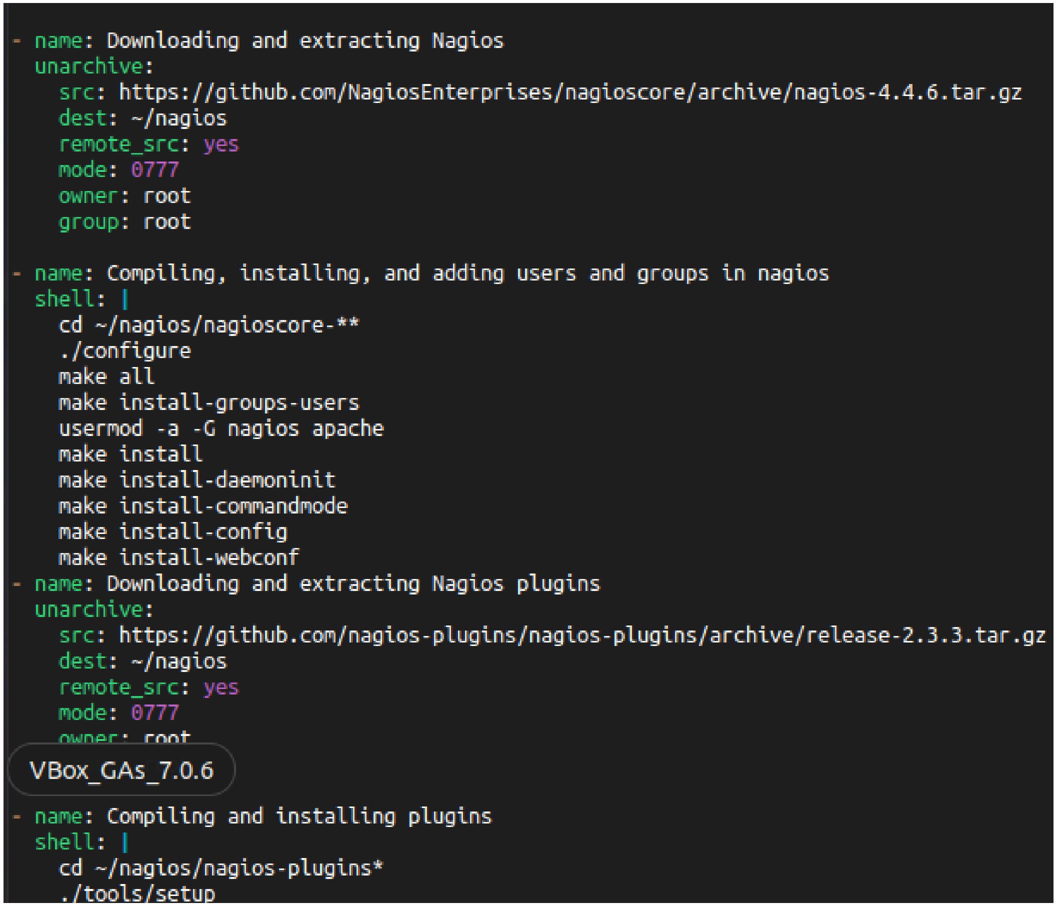


```
    path: /usr/local/nagios/etc/htpasswd.users
    name: admin
    password: admin

- name: Nagios Start/Enable Check
  service:
    name: nagios
    state: restarted
    enabled: true

- name: Apache/httpd Start/Enable check
  service:
    name: apache2
    state: restarted
    enabled: true
```

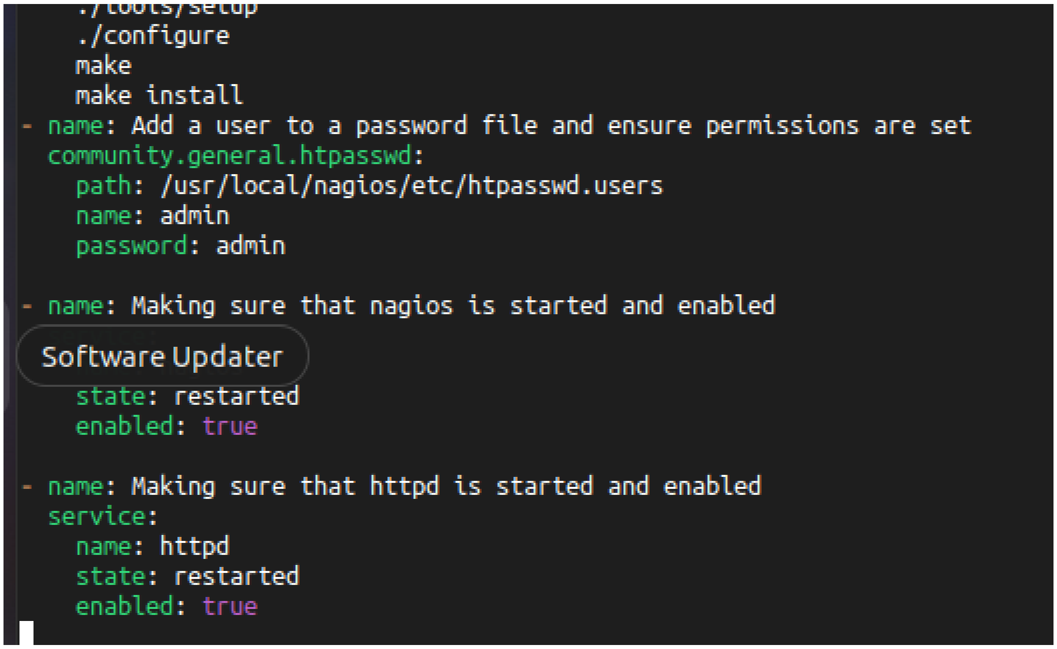
4. Copy the code to the main.yml of the CentOS subdirectory.



```
no 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 package
  pip:
    name: passlib

- name: Creating a directory (where the downloaded files will be stored)
  file:
    path: ~/nagios
    state: directory
```



```
- name: Downloading and extracting Nagios
  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: Compiling, installing, and adding users and groups in nagios
  shell: |
    cd ~/nagios/nagioscore-**
    ./configure
    make all
    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 and extracting Nagios plugins
  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

- name: Compiling and installing plugins
  shell: |
    cd ~/nagios/nagios-plugins*
    ./tools/setup
```

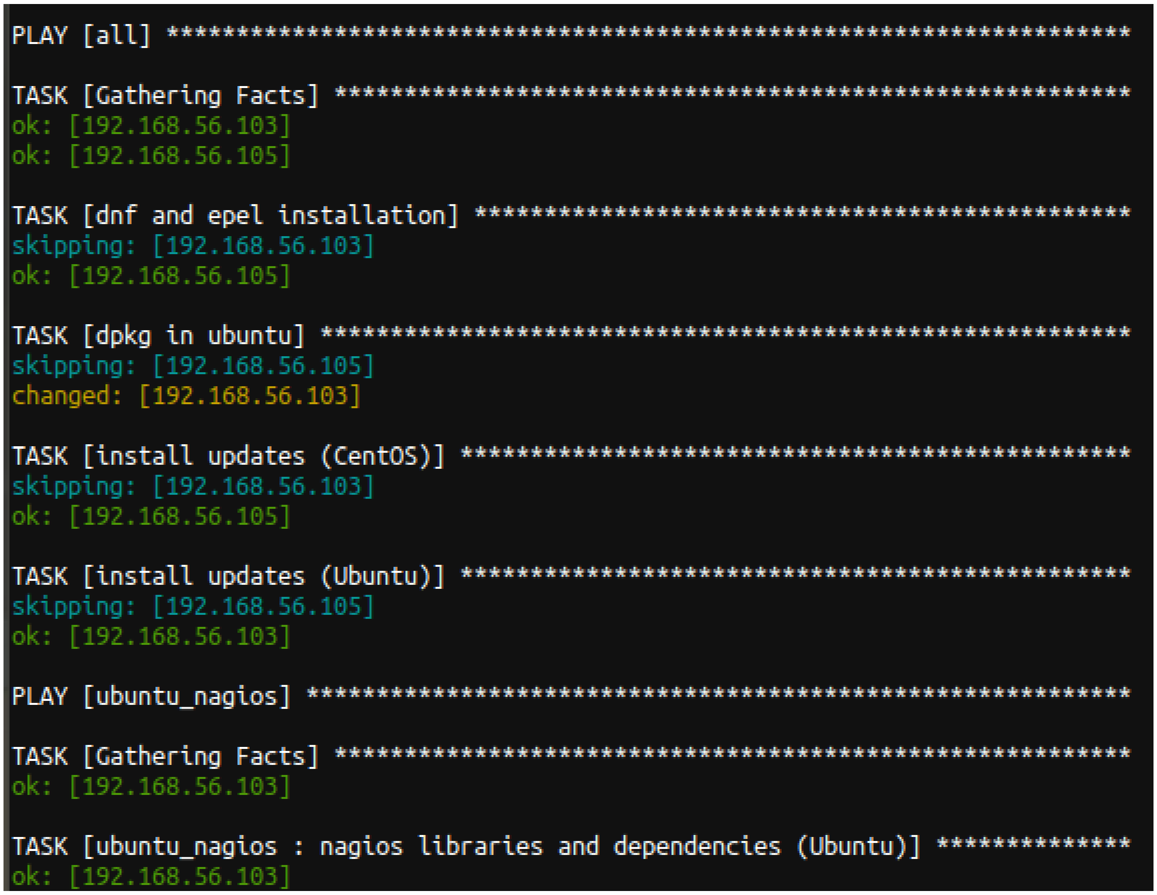


```
    ./tools/setup
    ./configure
    make
    make install
- name: Add a user to a password file and ensure permissions are set
  community.general.htpasswd:
    path: /usr/local/nagios/etc/htpasswd.users
    name: admin
    password: admin

- name: Making sure that nagios is started and enabled

    state: restarted
    enabled: true

- name: Making sure that httpd is started and enabled
  service:
    name: httpd
    state: restarted
    enabled: true
```

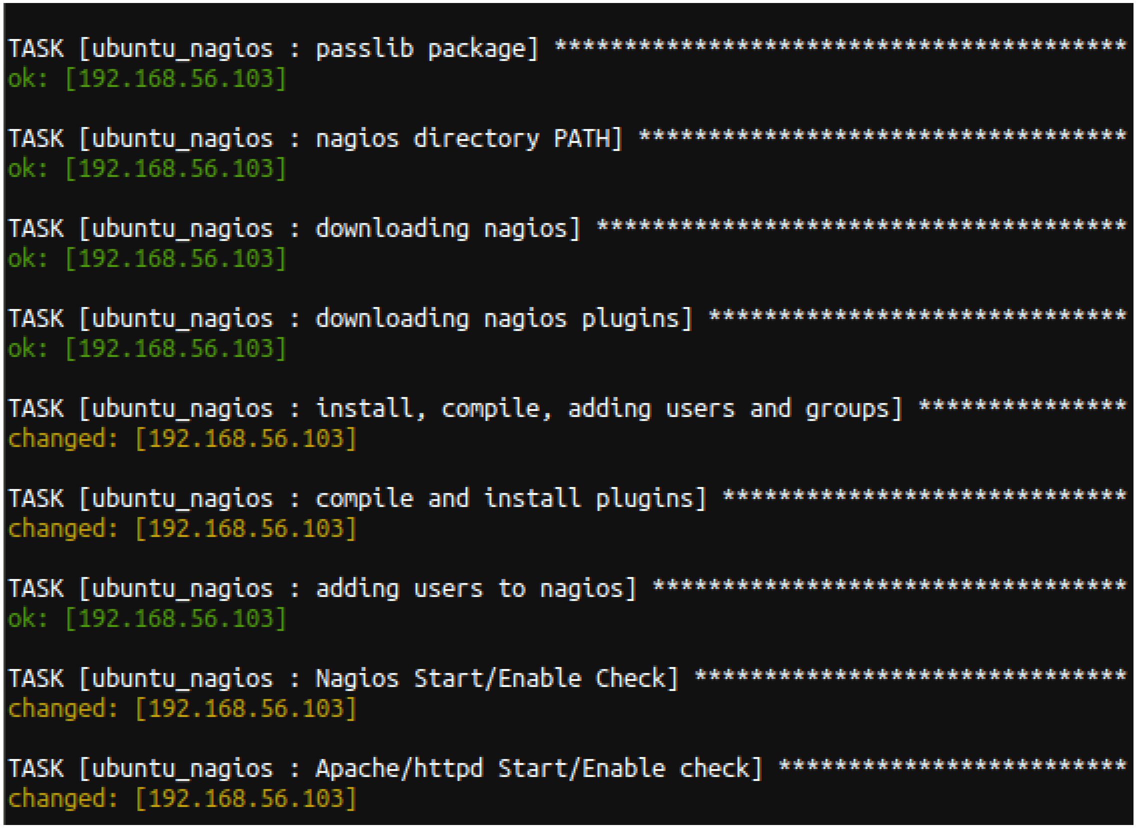
Task 4: Run and Verify

1. Run the command ansible-playbook - - ask-become-pass install_nagios.yml to completely install Nagios in both Ubuntu server and CentOS.

UBUNTU_NAGIOS

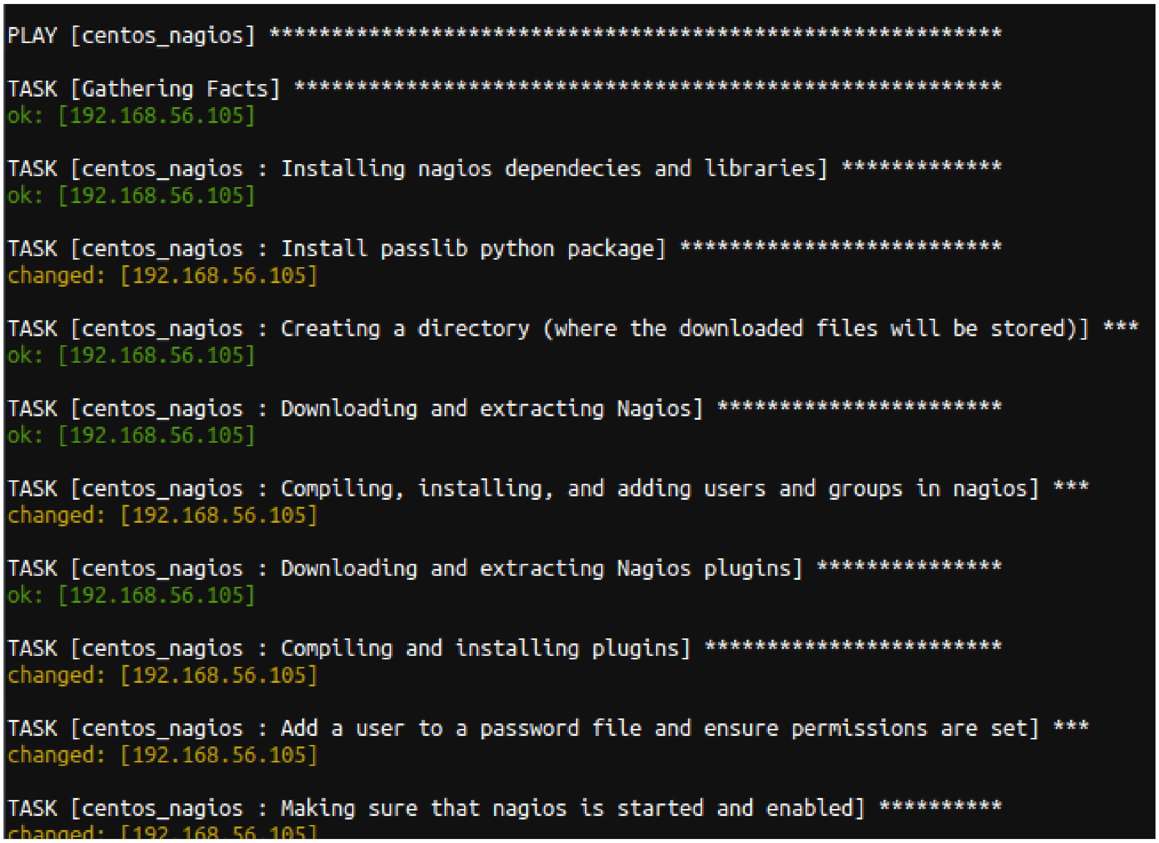


```
PLAY [all] *********************************************************************

TASK [Gathering Facts] *********************************************************
ok: [192.168.56.103]
ok: [192.168.56.105]

TASK [dnf and epel installation] ***********************************************
skipping: [192.168.56.103]
ok: [192.168.56.105]

TASK [dpkg in ubuntu] **********************************************************
skipping: [192.168.56.105]
changed: [192.168.56.103]

TASK [install updates (CentOS)] ************************************************
skipping: [192.168.56.103]
ok: [192.168.56.105]

TASK [install updates (Ubuntu)] ************************************************
skipping: [192.168.56.105]
ok: [192.168.56.103]

PLAY [ubuntu_nagios] ***********************************************************

TASK [Gathering Facts] *********************************************************
ok: [192.168.56.103]

TASK [ubuntu_nagios : nagios libraries and dependencies (Ubuntu)] **************
ok: [192.168.56.103]
```

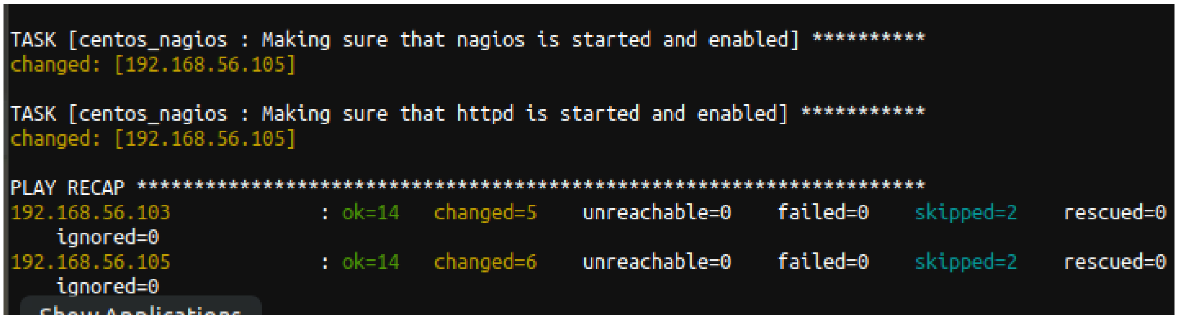


```
TASK [ubuntu_nagios : passlib package] *****************************************
ok: [192.168.56.103]

TASK [ubuntu_nagios : nagios directory PATH] ***********************************
ok: [192.168.56.103]

TASK [ubuntu_nagios : downloading nagios] **************************************
ok: [192.168.56.103]

TASK [ubuntu_nagios : downloading nagios plugins] ******************************
ok: [192.168.56.103]

TASK [ubuntu_nagios : install, compile, adding users and groups] ***************
changed: [192.168.56.103]

TASK [ubuntu_nagios : compile and install plugins] *****************************
changed: [192.168.56.103]

TASK [ubuntu_nagios : adding users to nagios] **********************************
ok: [192.168.56.103]

TASK [ubuntu_nagios : Nagios Start/Enable Check] *******************************
changed: [192.168.56.103]

TASK [ubuntu_nagios : Apache/httpd Start/Enable check] *************************
changed: [192.168.56.103]
```

CENTOS_NAGIOS



```
PLAY [centos_nagios] ***********************************************************

TASK [Gathering Facts] *********************************************************
ok: [192.168.56.105]

TASK [centos_nagios : Installing nagios dependecies and libraries] *************
ok: [192.168.56.105]

TASK [centos_nagios : Install passlib python package] **************************
changed: [192.168.56.105]

TASK [centos_nagios : Creating a directory (where the downloaded files will be stored)] ***
ok: [192.168.56.105]

TASK [centos_nagios : Downloading and extracting Nagios] ***********************
ok: [192.168.56.105]

TASK [centos_nagios : Compiling, installing, and adding users and groups in nagios] ***
changed: [192.168.56.105]

TASK [centos_nagios : Downloading and extracting Nagios plugins] ***************
ok: [192.168.56.105]

TASK [centos_nagios : Compiling and installing plugins] ************************
changed: [192.168.56.105]

TASK [centos_nagios : Add a user to a password file and ensure permissions are set] ***
changed: [192.168.56.105]

TASK [centos_nagios : Making sure that nagios is started and enabled] **********
changed: [192.168.56.105]
```

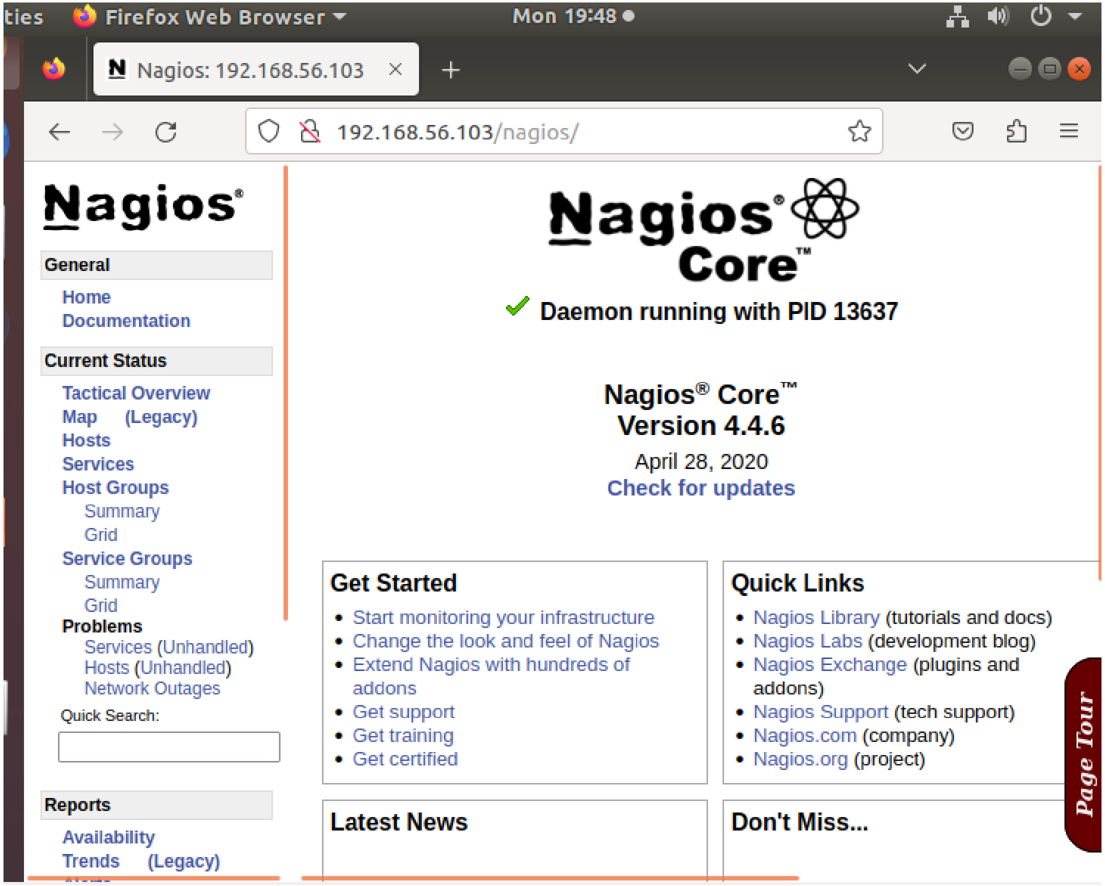


```
TASK [centos_nagios : Making sure that nagios is started and enabled] **********
changed: [192.168.56.105]

TASK [centos_nagios : Making sure that httpd is started and enabled] ***********
changed: [192.168.56.105]

PLAY RECAP *********************************************************************
192.168.56.103             : ok=14   changed=5    unreachable=0    failed=0    skipped=2    rescued=0
    ignored=0
192.168.56.105             : ok=14   changed=6    unreachable=0    failed=0    skipped=2    rescued=0
    ignored=0
```

2. Show the screenshot of the Nagios in both Server 2 and CentOS, by simply typing its ip address in the web browser and /nagios.

OUTPUT:

SERVER2:



Nagios®

General

- Home
- Documentation

Current Status

- Tactical Overview
- Map (Legacy)
- Hosts
- Services
- Host Groups
  - Summary
  - Grid
- Service Groups
  - Summary
  - Grid
- Problems
  - Services (Unhandled)
  - Hosts (Unhandled)
  - Network Outages

Quick Search:

Reports

- Availability
- Trends (Legacy)

Nagios® Core™

✓ Daemon running with PID 13637

Nagios® Core™
Version 4.4.6
April 28, 2020
Check for updates

Get Started

- Start monitoring your infrastructure
- Change the look and feel of Nagios
- Extend Nagios with hundreds of addons
- Get support
- Get training
- Get certified

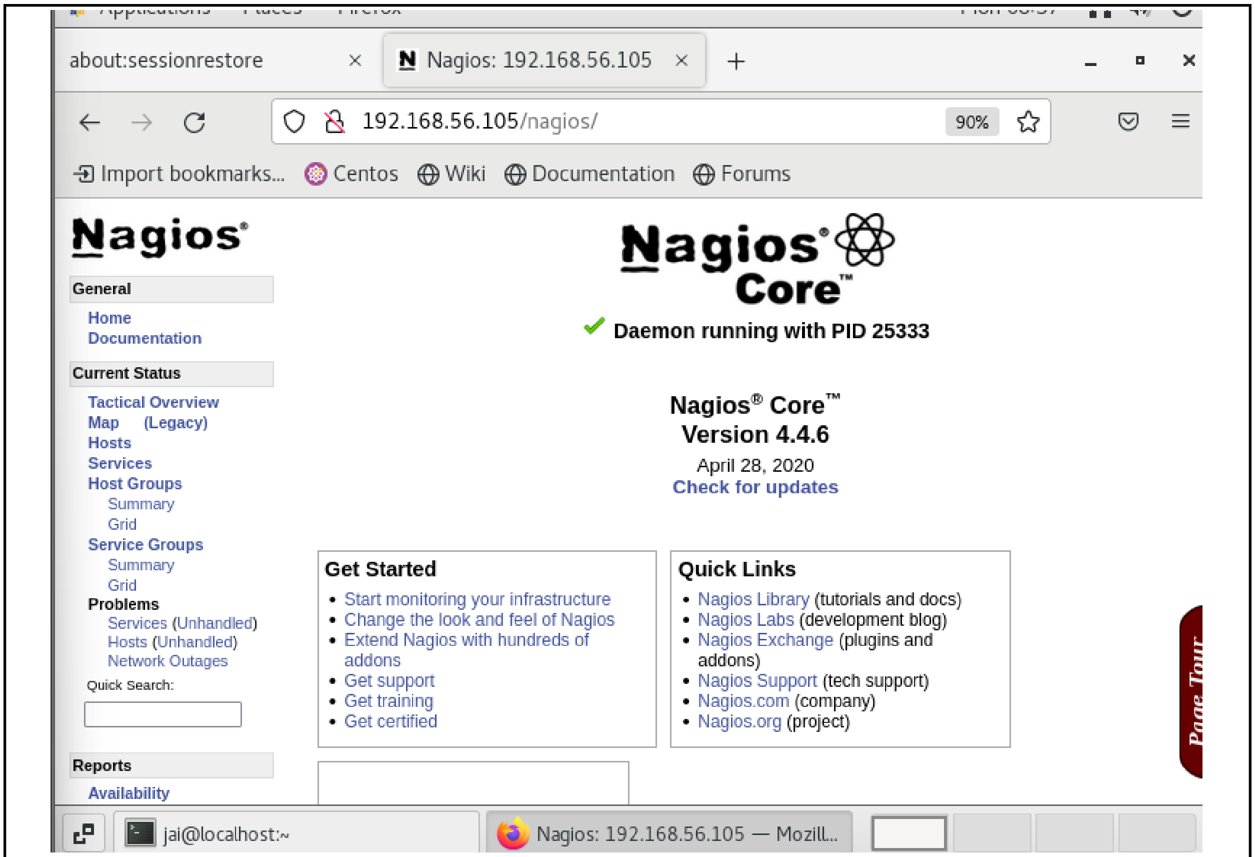
Quick Links

- Nagios Library (tutorials and docs)
- Nagios Labs (development blog)
- Nagios Exchange (plugins and addons)
- Nagios Support (tech support)
- Nagios.com (company)
- Nagios.org (project)

Latest News

Don't Miss...

CENTOS



Daemon running with PID 25333

Nagios® Core™
Version 4.4.6
April 28, 2020
Check for updates

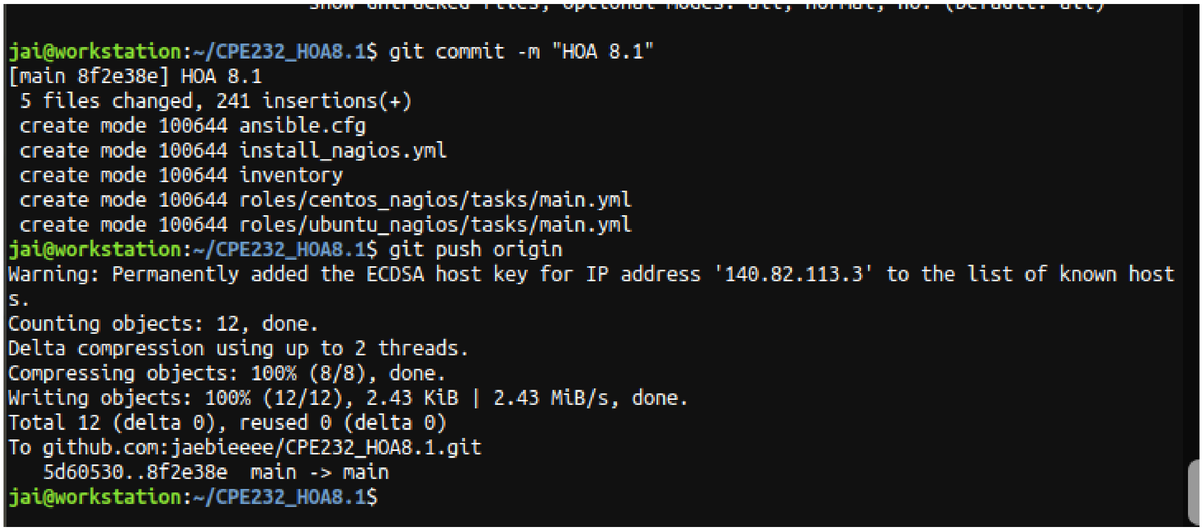
Get Started

- Start monitoring your infrastructure
- Change the look and feel of Nagios
- Extend Nagios with hundreds of addons
- Get support
- Get training
- Get certified

Quick Links

- Nagios Library (tutorials and docs)
- Nagios Labs (development blog)
- Nagios Exchange (plugins and addons)
- Nagios Support (tech support)
- Nagios.com (company)
- Nagios.org (project)

3. Upload it in the github.



```
jai@workstation:~/CPE232_HOA8.1$ git commit -m "HOA 8.1"
[main 8f2e38e] HOA 8.1
 5 files changed, 241 insertions(+)
 create mode 100644 ansible.cfg
 create mode 100644 install_nagios.yml
 create mode 100644 inventory
 create mode 100644 roles/centos_nagios/tasks/main.yml
 create mode 100644 roles/ubuntu_nagios/tasks/main.yml
jai@workstation:~/CPE232_HOA8.1$ git push origin
Warning: Permanently added the ECDSA host key for IP address '140.82.113.3' to the list of known host
s.
Counting objects: 12, done.
Delta compression using up to 2 threads.
Compressing objects: 100% (8/8), done.
Writing objects: 100% (12/12), 2.43 KiB | 2.43 MiB/s, done.
Total 12 (delta 0), reused 0 (delta 0)
To github.com:jaebieeee/CPE232_HOA8.1.git
   5d60530..8f2e38e  main -> main
jai@workstation:~/CPE232_HOA8.1$
```

GITHUB LINK: https://github.com/jaebieeee/CPE232_HOA8.1.git

Reflections:

Answer the following:

1. What are the benefits of having an availability monitoring tool?
    - The first benefit of this is that it immediately notifying the user when something goes wrong and in that way the user will be able to locate and resolve issues before they escalate.Aside form that, in terms of user’s experience, availability monitoring tool assist in maintaining service reliability, which results in happier users and safeguards the reputation of the user’s business.

Conclusions:

After performing this activity, I can honestly say that so far, this was the hardest among all the Hands-On Activity that we did. I could say that no matter how well-detailed and good your code in your playbook is, if your PC has a "tantrum,” then things will be more difficult since you will lose patience here by trying different ways to debug it. On the other hand, this activity made me realize that tere are many advantages to installing Nagios on both CentOS and Ubuntu. It offers thorough system monitoring and provides real-time information on network performance and application availability. With this, admnistrators are better equipped to identify problems early, avoid downtime, and guarantee a seamless user experience. Nagios is a crucial resource for businesses and organizations since it works well across all Linux distributions. To conclude all of these, this activity is quite challenging for me, but the happiness I felt once I accmplished everything without encountering any errors was priceless.