

Lesson 07 Demo 01

Creating Ansible Roles

Objective: To create and configure Ansible roles for managing configurations

Tools required: Ansible, Ansible Vault, and VS Code

Prerequisites: None

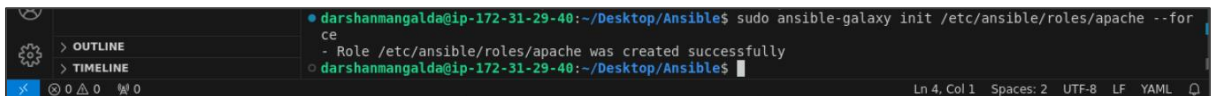
Steps to be followed:

1. Initialize the roles
2. Create and define tasks
3. Organize task execution
4. Create the index.html file
5. Verify the configuration
6. Execute the playbook
7. Check the index.html file in the browser

Step 1: Initialize the roles

1.1 Run the following command to initialize the Apache role directory:

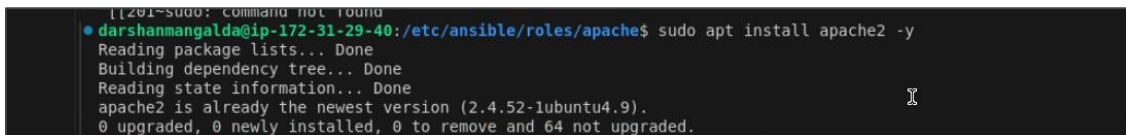
sudo ansible-galaxy init /etc/ansible/roles/apache --force



```
darshanmangalda@ip-172-31-29-40:~/Desktop/Ansible$ sudo ansible-galaxy init /etc/ansible/roles/apache --force
ce
- Role /etc/ansible/roles/apache was created successfully
darshanmangalda@ip-172-31-29-40:~/Desktop/Ansible$
```

1.2 Execute the following command to install the Apache HTTP server:

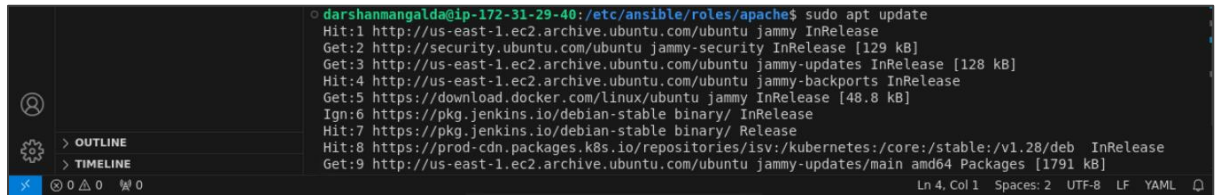
sudo apt install apache2 -y



```
11201~$ sudo: command not found
darshanmangalda@ip-172-31-29-40:/etc/ansible/roles/apache$ sudo apt install apache2 -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
apache2 is already the newest version (2.4.52-1ubuntu4.9).
0 upgraded, 0 newly installed, 0 to remove and 64 not upgraded.
```

1.3 Run the following command to update the HTTP server:

```
sudo apt update
```



```
darshanmangalda@ip-172-31-29-40:/etc/ansible/roles/apache$ sudo apt update
Hit:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy InRelease
Get:2 http://security.ubuntu.com/ubuntu jammy-security InRelease [129 kB]
Get:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates InRelease [128 kB]
Hit:4 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-backports InRelease
Get:5 https://download.docker.com/linux/ubuntu jammy InRelease [48.8 kB]
Ign:6 https://pkg.jenkins.io/debian-stable binary/ InRelease
Hit:7 https://pkg.jenkins.io/debian-stable binary/ Release
Hit:8 https://prod-cdn.packages.k8s.io/repositories/isv/kubernetes:/core:/stable:/v1.28/deb InRelease
Get:9 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 Packages [1791 kB]
```

Step 2: Create and define tasks

2.1 Execute the following command to navigate to the Apache role directory:

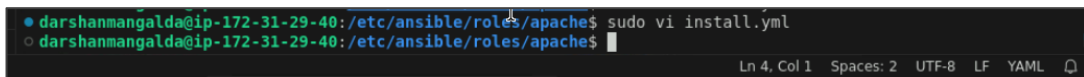
```
cd /etc/ansible/roles/apache
```



```
darshanmangalda@ip-172-31-29-40:~$ cd /etc/ansible/roles/apache
```

2.2 Run the following command to create an **install.yml** file:

```
sudo vi install.yml
```



```
darshanmangalda@ip-172-31-29-40:/etc/ansible/roles/apache$ sudo vi install.yml
darshanmangalda@ip-172-31-29-40:/etc/ansible/roles/apache$
```

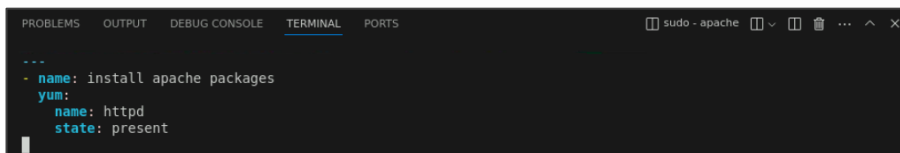
2.3 Add the following YAML script to the **install.yml** file:

```
- name: install apache packages
```

```
  yum:
```

```
    name: httpd
```

```
    state: present
```

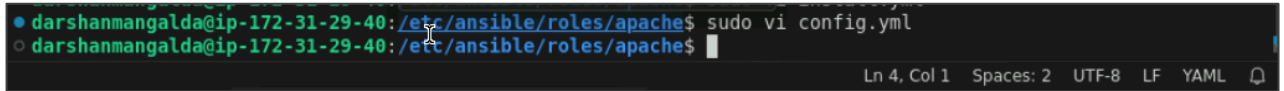


```
---
- name: install apache packages
  yum:
    name: httpd
    state: present
```

This script installs the Apache HTTP server package using the **yum** package manager.

2.4 Execute the following command to create and edit a configuration file:

sudo vi config.yml



```
darshanmangalda@ip-172-31-29-40: /etc/ansible/roles/apache$ sudo vi config.yml
darshanmangalda@ip-172-31-29-40: /etc/ansible/roles/apache$
```

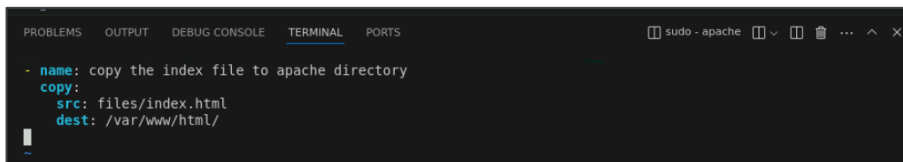
2.5 Add the following script to the **config.yml** file:

- name: copy the index file to apache directory

copy:

src: files/index.html

dest: /var/www/html/

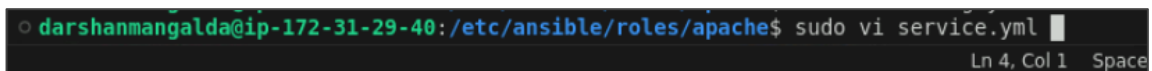


```
- name: copy the index file to apache directory
  copy:
    src: files/index.html
    dest: /var/www/html/
```

This script copies the **index.html** file from the local files directory to the **/var/www/html/** directory on the server.

2.6 Run the following command to create and edit the service task file:

sudo vi service.yml



```
darshanmangalda@ip-172-31-29-40: /etc/ansible/roles/apache$ sudo vi service.yml
```

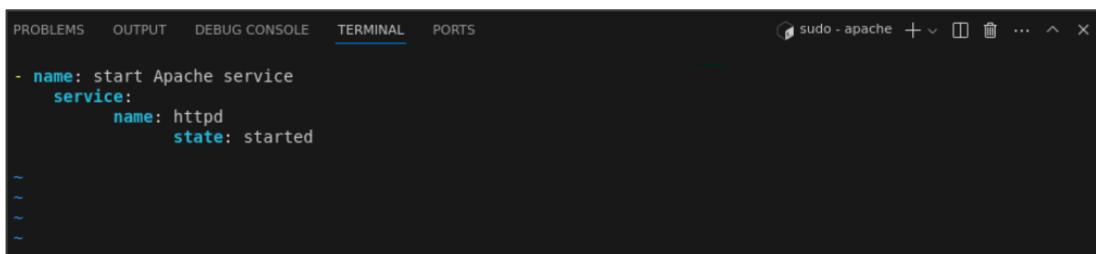
2.7 Add the following script to the **service.yml** file:

- name: start Apache service

service:

name: httpd

state: started



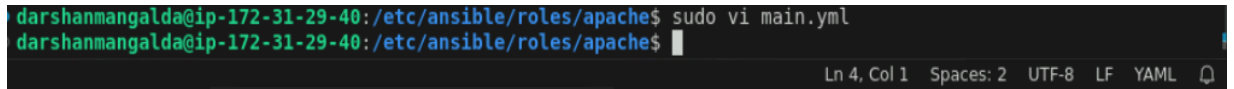
```
- name: start Apache service
  service:
    name: httpd
    state: started
```

This Ansible task ensures that the **HTTPD** Apache service is started.

Step 3: Organize task execution

3.1 Run the following command to create the **main.yml** file:

```
sudo vi main.yml
```



```
darshanmangalda@ip-172-31-29-40:/etc/ansible/roles/apache$ sudo vi main.yml
darshanmangalda@ip-172-31-29-40:/etc/ansible/roles/apache$
```

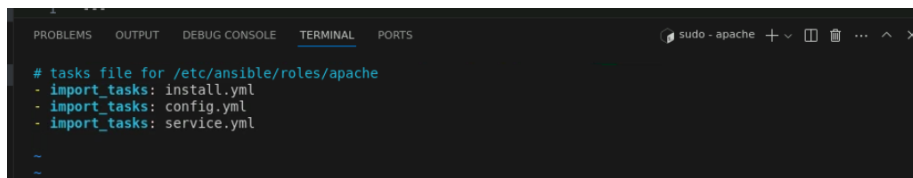
3.2 Add the following script in the **main.yml** file to specify the sequence of tasks:

```
# tasks file for /etc/ansible/roles/apache
```

```
- import_tasks: install.yml
```

```
- import_tasks: config.yml
```

```
- import_tasks: service.yml
```



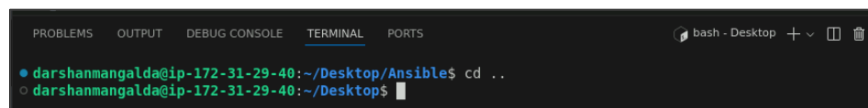
```
# tasks file for /etc/ansible/roles/apache
- import_tasks: install.yml
- import_tasks: config.yml
- import_tasks: service.yml
```

The code imports and runs tasks from `install.yml`, `config.yml`, and `service.yml` to install, configure, and manage the Apache server.

Step 4: Create the index.html file

4.1 Run the following command to exit from the current directory:

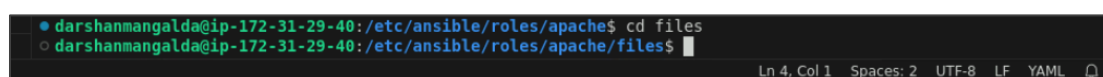
```
cd ..
```



```
darshanmangalda@ip-172-31-29-40:/etc/ansible/roles/apache$ cd ..
darshanmangalda@ip-172-31-29-40:~/Desktop/Ansible$
```

4.2 Run the following command to navigate inside the **files** directory:

```
cd files
```



```
darshanmangalda@ip-172-31-29-40:/etc/ansible/roles/apache$ cd files
darshanmangalda@ip-172-31-29-40:/etc/ansible/roles/apache/files$
```

4.3 Run the following command to create an **index.html** file:

```
sudo vi index.html
```

```
darshanmangalda@ip-172-31-29-40:/etc/ansible/roles/apache/files$ sudo vi index.html
darshanmangalda@ip-172-31-29-40:/etc/ansible/roles/apache/files$
```

4.4 Add the following script in the **index.html**:

```
<html>
<head>
  <title>Welcome</title>
</head>
<body>
  <h1>Hello, let's learn Ansible!</h1>
  <p>Welcome to the training</p>
</body>
</html>
```

```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
<html>
<head>
  <title>Welcome</title>
</head>
<body>
  <h1>Hello, let's learn Ansible!</h1>
  <p>Welcome to the training</p>
</body>
</html>
```

Note: Press esc, then type :wq to save and quit

Step 5: Verify the configuration

5.1 Run the following command to exit from the current directory:

```
cd ..
```

```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS bash - Desktop
darshanmangalda@ip-172-31-29-40:~/Desktop/Ansible$ cd ..
darshanmangalda@ip-172-31-29-40:~/Desktop$
```

5.2 Run the following command to navigate to the **apache** directory:

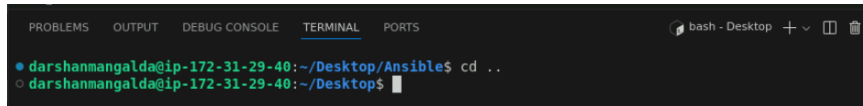
```
cd apache
```

```
darshanmangalda@ip-172-31-29-40:/etc/ansible/roles$ cd apache
```

Step 6: Execute the playbook

6.1 Run the following command to exit from the current directory:

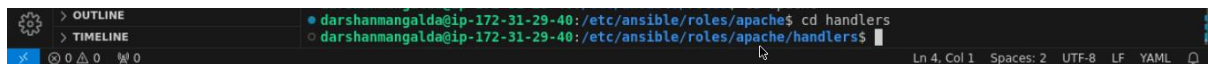
```
cd ..
```



```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
bash - Desktop + -
● darshanmangalda@ip-172-31-29-40:~/Desktop/Ansible$ cd ..
○ darshanmangalda@ip-172-31-29-40:~/Desktop$
```

6.2 Execute the following command to navigate inside the **handlers** directory:

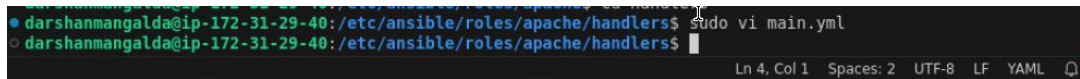
```
cd handlers
```



```
> OUTLINE
> TIMELINE
● darshanmangalda@ip-172-31-29-40:/etc/ansible/roles/apache$ cd handlers
○ darshanmangalda@ip-172-31-29-40:/etc/ansible/roles/apache/handlers$
```

6.3 Run the following command to edit the **main.yml** file:

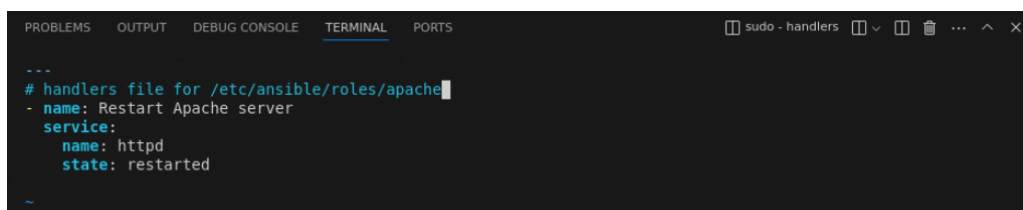
```
sudo vi main.yml
```



```
● darshanmangalda@ip-172-31-29-40:/etc/ansible/roles/apache/handlers$ sudo vi main.yml
○ darshanmangalda@ip-172-31-29-40:/etc/ansible/roles/apache/handlers$
```

6.4 Add the following script in the **main.yml** file:

```
# handlers file for /etc/ansible/roles/apache
- name: Restart Apache server
  service:
    name: httpd
    state: restarted
```



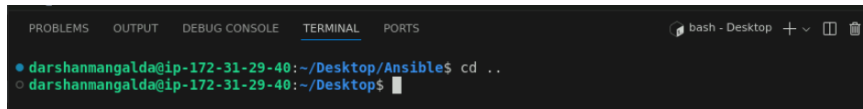
```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
sudo - handlers - + - ... ^ X
---
# handlers file for /etc/ansible/roles/apache
- name: Restart Apache server
  service:
    name: httpd
    state: restarted
~
```

The code restarts the Apache server using the **httpd** service.

Note: You have already created the service.yml file in the task. In the later part of the lab, we will remove the service.yml file and handlers will be used.

6.5 Run the following command to exit from the current directory:

```
cd ..
```



```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS bash - Desktop + - [x] [x]
● darshanmangalda@ip-172-31-29-40:~/Desktop/Ansible$ cd ..
○ darshanmangalda@ip-172-31-29-40:~/Desktop$
```

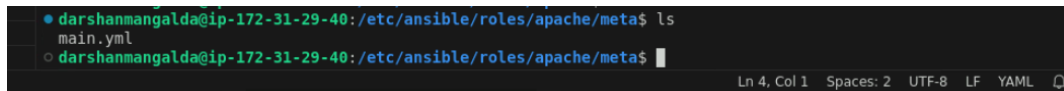
6.6 Execute the following command to navigate into the **meta** directory:

```
cd meta
```



```
● darshanmangalda@ip-172-31-29-40:/etc/ansible/roles/apache$ cd meta
○ darshanmangalda@ip-172-31-29-40:/etc/ansible/roles/apache/meta$
```

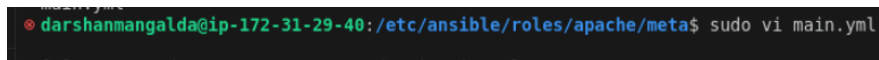
6.7 Run the **ls** command to list the contents in the directory



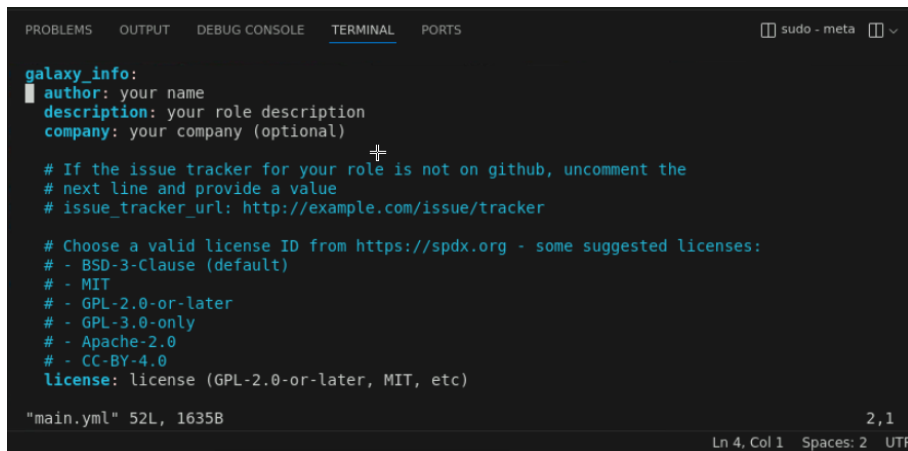
```
● darshanmangalda@ip-172-31-29-40:/etc/ansible/roles/apache/meta$ ls
main.yml
○ darshanmangalda@ip-172-31-29-40:/etc/ansible/roles/apache/meta$
```

6.8 Execute the following command to view the **main.yml** file:

```
sudo vi main.yml
```



```
● darshanmangalda@ip-172-31-29-40:/etc/ansible/roles/apache/meta$ sudo vi main.yml
```



```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS sudo - meta [x] [x]
galaxy_info:
  author: your name
  description: your role description
  company: your company (optional)

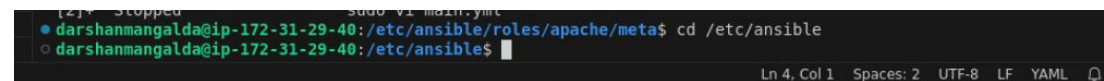
# If the issue tracker for your role is not on github, uncomment the
# next line and provide a value
# issue_tracker_url: http://example.com/issue/tracker

# Choose a valid license ID from https://spdx.org - some suggested licenses:
# - BSD-3-Clause (default)
# - MIT
# - GPL-2.0-or-later
# - GPL-3.0-only
# - Apache-2.0
# - CC-BY-4.0
license: license (GPL-2.0-or-later, MIT, etc)

"main.yml" 52L, 1635B 2,1
Ln 4, Col 1 Spaces: 2 UTF
```

6.9 Execute the following command to navigate to the **ansible** directory:

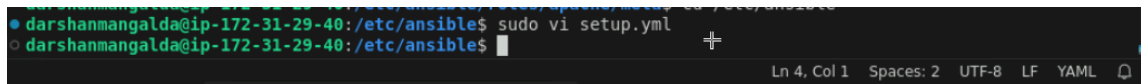
```
cd /etc/ansible
```



```
● darshanmangalda@ip-172-31-29-40:/etc/ansible/roles/apache/meta$ cd /etc/ansible
○ darshanmangalda@ip-172-31-29-40:/etc/ansible$
```

6.10 Run the following command to edit the **setup.yml** file:

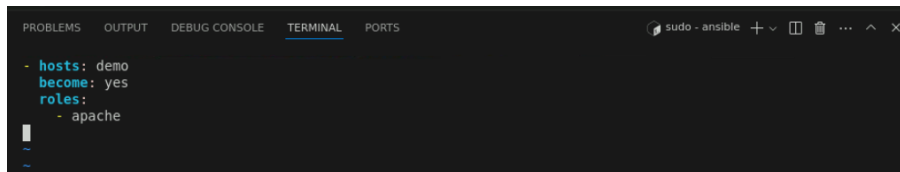
sudo vi setup.yml



```
darshanmangalda@ip-172-31-29-40:/etc/ansible$ sudo vi setup.yml
darshanmangalda@ip-172-31-29-40:/etc/ansible$
```

6.11 Add the following script in **setup.yml**:

```
- hosts: demo
  become: yes
  roles:
    - apache
```



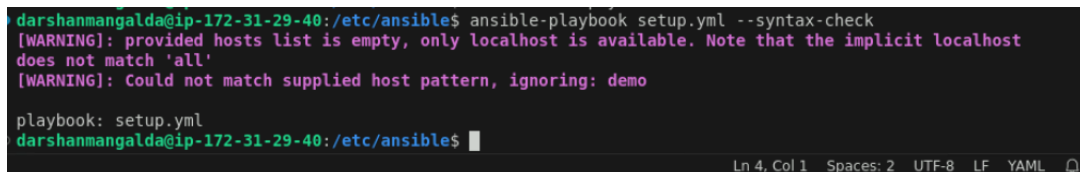
```
- hosts: demo
  become: yes
  roles:
    - apache
```

This code runs the Apache role on all hosts in the demo group with elevated privileges.

Note: If you have logged in as the root user (which means you have used 'sudo su'), you need to first run the 'exit' command before you can run the 'ansible-playbook' command.

6.12 Run the following command to check the syntax of the **setup.yml** playbook:

ansible-playbook setup.yml --syntax-check



```
darshanmangalda@ip-172-31-29-40:/etc/ansible$ ansible-playbook setup.yml --syntax-check
[WARNING]: provided hosts list is empty, only localhost is available. Note that the implicit localhost
does not match 'all'
[WARNING]: Could not match supplied host pattern, ignoring: demo

playbook: setup.yml
darshanmangalda@ip-172-31-29-40:/etc/ansible$
```

This means there are no errors, and we can now execute the YAML file.

6.13 Run the following command to execute the **setup.yml** playbook:

ansible-playbook -v setup.yml

```
darshanmangalda@ip-172-31-29-40:/etc/ansible$ ansible-playbook -v setup.yml
Using /etc/ansible/ansible.cfg as config file
[WARNING]: provided hosts list is empty, only localhost is available. Note that the implicit localhost
does not match 'all'
[WARNING]: Could not match supplied host pattern, ignoring: demo

PLAY [demo] *****
skipping: no hosts matched

PLAY RECAP *****
darshanmangalda@ip-172-31-29-40:/etc/ansible$
```

Step 7: Check the index.html file in the browser

7.1 Run the following command to check the IP address of the server:

hostname -I

```
ravitulsianisim@ip-172-31-67-38:/etc/ansible/roles/apache/files$ hostname -I
172.31.67.38 172.17.0.1
ravitulsianisim@ip-172-31-67-38:/etc/ansible/roles/apache/files$
```

7.2 Open a web browser and navigate to the IP address of the server. If the IP address is **172.31.67.38**, enter the following URL in the browser:



By following the above steps, you have successfully created and executed an Ansible role to install and configure the Apache HTTP server. This process included initializing roles, defining and organizing tasks, and deploying the configuration. You can now verify the setup by accessing the index.html file through your server's IP address in a web browser. This approach ensures clarity, modularity, and ease of management for your infrastructure using Ansible roles.