

Course-End Project : Web Application Deployment Using Ansible

Objective

To create an automation script to deploy an application using Ansible and Jinja2 template

Problem Statement and Motivation

Real-time scenario:

You have joined as a DevOps engineer in XYZ Pvt. Ltd. It is a platform where individuals can create their profile and start blogging on various topics. The application is ready to be hosted on a server.

You are tasked with implementing an Ansible script to deploy this application on a remote Nginx server.

Industry Relevance

The following tools used in this project serve specific purposes within the industry:

1. Ansible: Ansible automates IT tasks, streamlining configuration management, application deployment, and orchestration. It uses simple, human-readable YAML files called playbooks, allowing easy setup and management of complex IT environments.

Tasks

The following tasks outline the process of deploying web application on a remote server:

1. Create an inventory file to define the remote server(s)

```
[webserver]
```

```
54.86.245.130
```

```
Create ansible.cfg
```

```
[defaults]
```

```
Inventory = /home/ansiuser/cep1inventory
```

```
|ansiuser@ip-172-31-33-201:~$ vi cep1inventory
```

```
|ansiuser@ip-172-31-33-201:~$ vi cep1inventory  
ansiuser@ip-172-31-33-201:~$ vi ansible.cfg
```

```
X Applications ansiuser@ip-172-31-33-...  
File Edit View Search Terminal Help  
[webserver]  
54.86.245.130
```

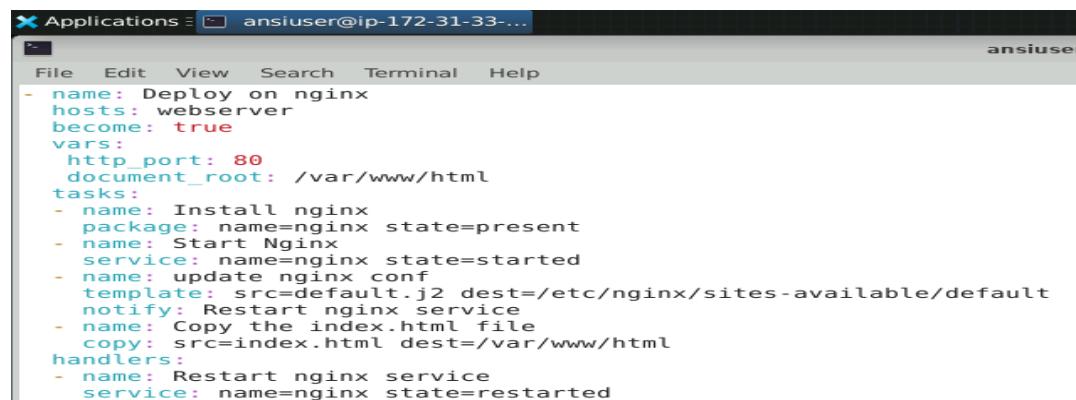
```
X Applications ansiuser@ip-172-31-33-...  
File Edit View Search Terminal Help  
[defaults]  
inventory = /home/ansiuser/cep1inventory
```

2. Write a YAML playbook with tasks for installing Nginx, copying web application files, deploying the Nginx configuration, and enabling the site

playbookNginx.yml

```
- name: Deploy on nginx
hosts: webserver
become: true
vars:
  http_port: 80
  document_root: /var/www/html
tasks:
- name: Install nginx
  package: name=nginx state=present
- name: Start Nginx
  service: name=nginx state=started
- name: update nginx conf
  template: src=default.j2 dest=/etc/nginx/sites-available/default
  notify: Restart nginx service
- name: Copy the index.html file
  copy: src=index.html dest=/var/www/html
handlers:
- name: Restart nginx service
  service: name=nginx state=restarted
```

ansiuser@ip-172-31-33-201:~\$ vi playbooknginx.yml



The screenshot shows a terminal window titled "Applications" with the command "ansiuser@ip-172-31-33-..." in the title bar. The window contains the YAML code for the playbook, which defines a role named "Deploy on nginx" for a "webserver" host. It includes variables for port and document root, and a series of tasks for installing Nginx, starting it, updating its configuration, copying an index.html file, and finally restarting the service.

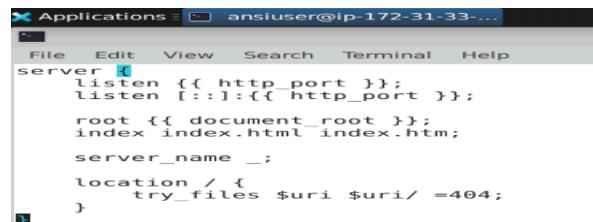
```
ansiuser@ip-172-31-33-201:~$ vi playbooknginx.yml
X Applications  ansiuser@ip-172-31-33-...
File Edit View Search Terminal Help
- name: Deploy on nginx
  hosts: webserver
  become: true
  vars:
    http_port: 80
    document_root: /var/www/html
  tasks:
    - name: Install nginx
      package: name=nginx state=present
    - name: Start Nginx
      service: name=nginx state=started
    - name: update nginx conf
      template: src=default.j2 dest=/etc/nginx/sites-available/default
      notify: Restart nginx service
    - name: Copy the index.html file
      copy: src=index.html dest=/var/www/html
  handlers:
    - name: Restart nginx service
      service: name=nginx state=restarted
```

3.Create a directory for templates and a Jinja2 template for the Nginx configuration

Default.j2 source code

```
server {  
    listen {{ http_port }};  
    listen [::]:{{ http_port }};  
  
    root {{ document_root }};  
    index index.html index.htm;  
  
    server_name _;  
  
    location / {  
        try_files $uri $uri/ =404;  
    }  
}
```

```
| ansiuser@ip-172-31-33-201:~$ mkdir templates  
| ansiuser@ip-172-31-33-201:~$ vi templates/default.j2
```



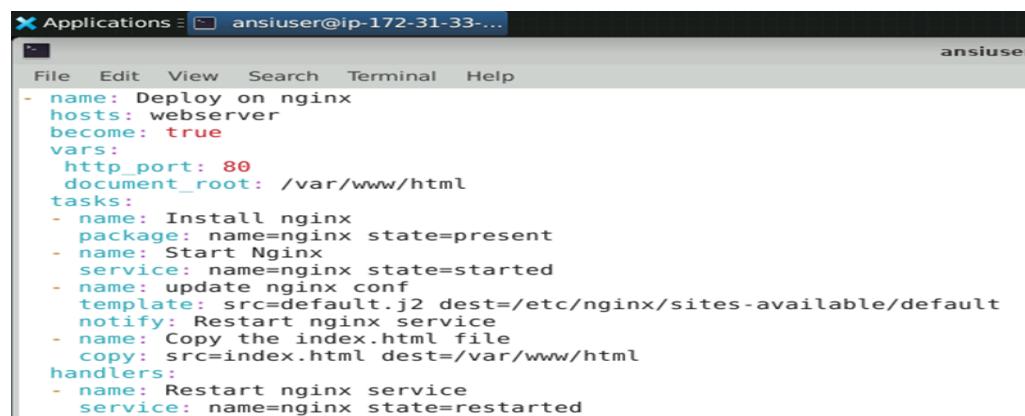
A screenshot of a terminal window titled "Applications". The window contains the Nginx configuration code from the previous step. The code defines a single server block with two listening ports (HTTP and HTTPS), a root directory, and a default index file. It also includes a catch-all location block for handling 404 errors.

```
server {  
    listen {{ http_port }};  
    listen [::]:{{ http_port }};  
    root {{ document_root }};  
    index index.html index.htm;  
    server_name _;  
    location / {  
        try_files $uri $uri/ =404;  
    }  
}
```

4.Define variables in the playbook for application details and Nginx configuration

Playbooknginx source code in task 1

```
ansiuser@ip-172-31-33-201:~$ vi playbooknginx.yml
```



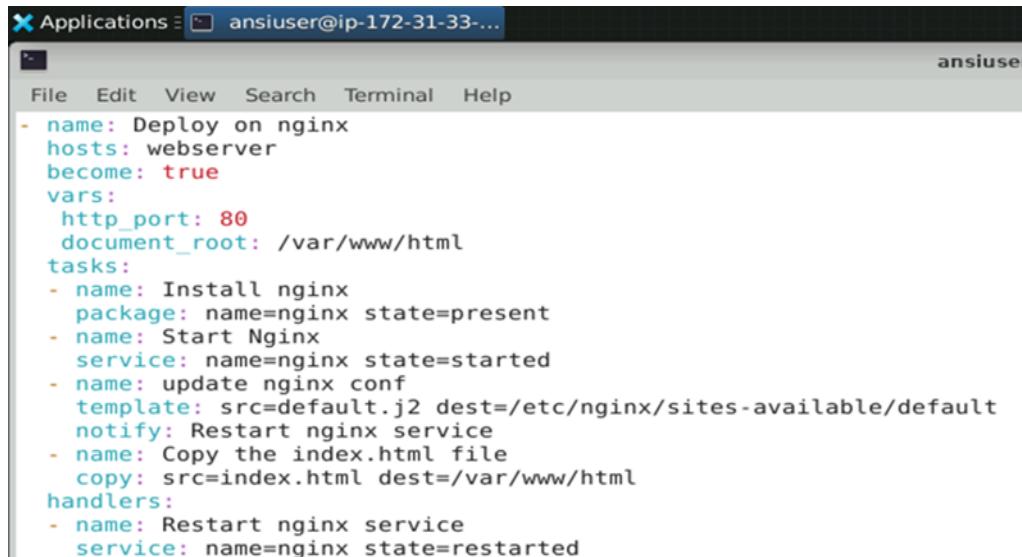
A screenshot of a terminal window titled "Applications". The window displays an Ansible playbook named "playbooknginx.yml". The playbook defines a task to deploy an application on an Nginx webserver. It specifies the name of the deployment, the hosts, and the become user. The task itself involves installing Nginx, starting it, updating its configuration with a Jinja2 template, restarting the service, and copying an index.html file to the document root.

```
- name: Deploy on nginx  
  hosts: webserver  
  become: true  
  vars:  
    http_port: 80  
    document_root: /var/www/html  
  tasks:  
    - name: Install nginx  
      package: name=nginx state=present  
    - name: Start Nginx  
      service: name=nginx state=started  
    - name: update nginx conf  
      template: src=default.j2 dest=/etc/nginx/sites-available/default  
      notify: Restart nginx service  
    - name: Copy the index.html file  
      copy: src=index.html dest=/var/www/html  
  handlers:  
    - name: Restart nginx service  
      service: name=nginx state=restarted
```

5. Include tasks in the playbook for installing Nginx, copying application files, deploying Nginx configuration, and enabling the Nginx site

Playbooknginx source code in task 1

```
|ansiuser@ip-172-31-33-201:~$ vi playbooknginx.yml
```



```
ansiuser@ip-172-31-33-201:~$ vi playbooknginx.yml

File Edit View Search Terminal Help
- name: Deploy on nginx
  hosts: webserver
  become: true
  vars:
    http_port: 80
    document_root: /var/www/html
  tasks:
    - name: Install nginx
      package: name=nginx state=present
    - name: Start Nginx
      service: name=nginx state=started
    - name: update nginx conf
      template: src=default.j2 dest=/etc/nginx/sites-available/default
      notify: Restart nginx service
    - name: Copy the index.html file
      copy: src=index.html dest=/var/www/html
  handlers:
    - name: Restart nginx service
      service: name=nginx state=restarted
```

Index.html source code:

```
<!DOCTYPE html>

<html lang="en">
<head>
  <meta charset="UTF-8">
  <title>Sammy the Shark's Site</title>
  <style>
    body {
      background-color: #d0f0f7; /* light ocean blue */
      font-family: 'Segoe UI', Tahoma, Geneva, Verdana, sans-serif;
      margin: 0;
      padding: 0;
      text-align: center;
      color: #003f5c;
    }
    header {
      padding: 40px 0;
      background-color: #90e0ef;
    }
```

```
h1 {  
    font-size: 3em;  
    margin-bottom: 0.2em;  
}  
  
h2 {  
    font-size: 2em;  
    margin-top: 0;  
    color: #0077b6;  
}  
  
.marquee {  
    font-size: 1.3em;  
    color: #0077b6;  
    margin: 20px 0;  
}  
  
.content {  
    padding: 40px 20px;  
}  
  
.footer {  
    margin-top: 40px;  
    font-size: 1em;  
    color: #5e6472;  
}  
  
img {  
    max-width: 300px;  
    margin: 20px auto;  
}  
  
</style>  
  
</head>  
  
<body>  
  
<header>  
  
<div class="marquee">  
    <marquee behavior="scroll" direction="left">Welcome to Sammy the Shark's Awesome  
    Site!</marquee>
```

```

</div>

<h1>Sammy the Shark</h1>

<h2>Learning to Swim Through the Web 🐬 </h2>

</header>

<div class="content">

    <p>This site was deployed using <strong>Ansible</strong> on an <strong>AWS EC2</strong>
    instance.</p>

    <p><strong>Created by:</strong> Phillip Moleke</p>

    <p><strong>Project:</strong> Course-End Project — Configuration Management with Ansible
    and Terraform</p>

</div>

<div class="footer">

    © 2025 Sammy the Shark | Powered by NGINX & Ansible

</div>

</body>

</html>

```

```
|ansiuser@ip-172-31-33-201:~$ vi files/index.html
```

```

X Applications - ansiuser@ip-172-31-33-201: ~
File Edit View Search Terminal Help
ansiuser@ip-172-31-33-201: ~
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <title>Sammy the Shark's Site</title>
    <style>
        body {
            background-color: #d0f0f7; /* light ocean blue */
            font-family: 'Segoe UI', Tahoma, Geneva, Verdana, sans-serif;
            margin: 0;
            padding: 0;
            text-align: center;
            color: #003f5c;
        }
        header {
            padding: 40px 0;
            background-color: #90e0ef;
        }
        h1 {
            font-size: 3em;
            margin-bottom: 0.2em;
        }
        h2 {
            font-size: 2em;
            margin-top: 0;
            color: #0077b6;
        }
        .marquee {
            font-size: 1.3em;
            color: #0077b6;
            margin: 20px 0;
        }
    </style>
</head>
<body>
    <header>
        <h1>Sammy the Shark</h1>
        <h2>Learning to Swim Through the Web 🐬 </h2>
    </header>
    <div class="content">
        
        <p>This site was deployed using <strong>Ansible</strong> on an <strong>AWS EC2</strong>
        instance.</p>
        <p><strong>Created by:</strong> Phillip Moleke</p>
        <p><strong>Project:</strong> Course-End Project — Configuration Management with Ansible
        and Terraform</p>
    </div>
    <div class="footer">
        © 2025 Sammy the Shark | Powered by NGINX & Ansible
    </div>
</body>
</html>

```

6. Execute the playbook to deploy the web application on the remote server

```
| ansiuser@ip-172-31-33-201:~$ ansible-playbook playbooknginx.yml
```

```
ansiuser@ip-172-31-33-201:~$ ansible-playbook playbooknginx.yml
PLAY [Deploy on nginx] ****
TASK [Gathering Facts] ****
ok: [54.86.245.130]

TASK [Install nginx] ****
changed: [54.86.245.130]

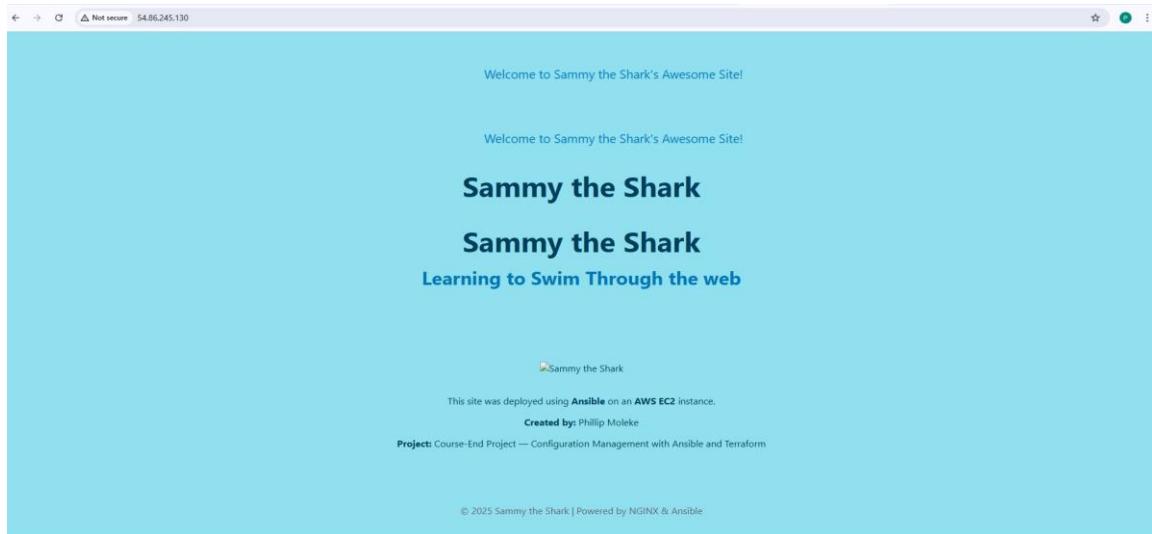
TASK [Start Nginx] ****
ok: [54.86.245.130]

TASK [update nginx conf] ****
changed: [54.86.245.130]

TASK [Copy the index.html file] ****
changed: [54.86.245.130]

RUNNING HANDLER [Restart nginx service] ****
changed: [54.86.245.130]

PLAY RECAP ****
54.86.245.130      : ok=6    changed=4    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
```



Done.

Thank you

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Date: April 2025