

Lab 10: Ansible Roles for Application Deployment

- **Objective:** Organize Ansible playbooks using roles. Create an Ansible role for installing Jenkins, docker, openshift CLI 'OC'.

An Ansible Role is a way to organize and reuse Ansible configurations effectively. It provides a structured format for organizing playbooks and related files, enabling modularity, scalability, and maintainability of automation scripts

1-create the required directory structure for roles.

```
ahmed@ahmed-VMware-Virtual-Platform:~/Downloads/lab4/lab4.1$ tree
.
├── ahmed.pem
├── ansible.cfg
├── inventory
├── playbook
│   ├── deploy.yml
│   └── roles
│       ├── docker
│       │   ├── defaults
│       │   │   └── main.yml
│       │   └── tasks
│       │       └── main.yml
│       ├── jenkins
│       │   ├── defaults
│       │   │   └── main.yml
│       │   └── tasks
│       │       └── main.yml
│       └── openshift_cli
│           ├── defaults
│           │   └── main.yml
│           └── tasks
│               └── main.yml
└── 12 directories, 10 files
```

Manage ansible.cfg

```
[defaults]
inventory = ./inventory
remote_user = ubuntu
private_key_file = ~/Downloads/lab4/lab4.1/ahmed.pem
roles_path = ./playbook/roles

[privilege_escalation]
become= true
become_method= sudo
become_user= root
become_ask_pass= false
~
~
~
```

Configuration playbook

```
--
- hosts: all
  become: true
  roles:
    - jenkins
    - docker
    - openshift_cli
```

Jenkins playbook:

```
tasks file for jenkins
- name: Update apt cache
  apt:
    update_cache: yes

- name: Install Java for Jenkins
  apt:
    name: openjdk-17-jdk
    state: present

- name: Add Jenkins repository key
  ansible.builtin.apt_key:
    url: https://pkg.jenkins.io/debian/jenkins.io-2023.key
    state: present

- name: Add Jenkins repository
  ansible.builtin.apt_repository:
    repo: 'deb https://pkg.jenkins.io/debian binary/'
    state: present

- name: Install Jenkins
  apt:
    name: jenkins
    state: present

- name: Start and enable Jenkins service
  ansible.builtin.systemd:
    name: jenkins
    state: started
    enabled: yes
```

Docker playbook

```
tasks file for docker
- name: Install required packages for Docker
  apt:
    name: "{{ item }}"
    state: present
  loop:
    - apt-transport-https
    - ca-certificates
    - curl
    - software-properties-common

- name: Add Docker GPG key
  ansible.builtin.apt_key:
    url: https://download.docker.com/linux/ubuntu/gpg
    state: present

- name: Add Docker repository
  ansible.builtin.apt_repository:
    repo: 'deb [arch=amd64] https://download.docker.com/linux/ubuntu {{ ansible_distribution_release }} stable'
    state: present

- name: Update apt cache
  apt:
    update_cache: yes

- name: Install Docker
  apt:
    name: docker-ce
    state: present

- name: Start and enable Docker service
  ansible.builtin.systemd:
    name: docker
    state: started
    enabled: yes

- name: Add user to Docker group
```

Oc playbook

```
--
- name: Download oc binary
  get_url:
    url: https://mirror.openshift.com/pub/openshift-v4/clients/ocp/latest/openshift-client-linux.tar.gz
    dest: /tmp/openshift-client-linux.tar.gz

- name: Extract oc binary
  unarchive:
    src: /tmp/openshift-client-linux.tar.gz
    dest: /usr/local/bin
    remote_src: yes

- name: Set executable permissions for oc
  file:
    path: /usr/local/bin/oc
```

Command

```
ahmed@ahmed-VMware-Virtual-Platform:~/Downloads/lab4/lab4.1$ ansible-playbook -i inventory ./playbook/deploy.yml
PLAY [all] >
```

Running

```
(_) \_____) \
  ||-----w ||
  ||         ||

c2-54-91-123-1.compute-1.amazonaws.com : ok=17  changed=4  unreachable=0  failed=0  skipped=0  rescued=0  ignored=0
```

Output

```
ubuntu@ip-172-31-28-249:~$ docker ps
CONTAINER ID   IMAGE     COMMAND   CREATED   STATUS    PORTS   NAMES
ubuntu@ip-172-31-28-249:~$

ubuntu@ip-172-31-28-249:~$ oc version
Client Version: 4.17.7
Kustomize Version: v5.0.4-0.20230601165947-6ce0bf390ce3

ubuntu@ip-172-31-28-249:~$
Last login: Wed Dec  4 12:34:35 2024 from 196.198.6.106
ubuntu@ip-172-31-28-249:~$ systemctl status jenkins
* jenkins.service - Jenkins Continuous Integration Server
   Loaded: loaded (/usr/lib/systemd/system/jenkins.service; enabled; preset: enabled)
   Active: active (running) since Wed 2024-12-04 12:14:35 UTC; 21min ago
     Main PID: 33990 (java)
        Tasks: 38 (limit: 1130)
      Memory: 290.2M (peak: 361.6M)
         CPU: 17.752s
      CGroup: /system.slice/jenkins.service
              └─33990 /usr/bin/java -Djava.awt.headless=true -jar /usr/share/java/jenkins.war --webroot=/var/cache/jenkins/war --httpPort=8080

Dec 04 12:14:29 ip-172-31-28-249 jenkins[33990]: fcf506e3f6b74630841f8db5628aa23f
Dec 04 12:14:29 ip-172-31-28-249 jenkins[33990]: This may also be found at: /var/lib/jenkins/secrets/initialAdminPassword
Dec 04 12:14:29 ip-172-31-28-249 jenkins[33990]: *****
Dec 04 12:14:29 ip-172-31-28-249 jenkins[33990]: *****
Dec 04 12:14:29 ip-172-31-28-249 jenkins[33990]: *****
Dec 04 12:14:29 ip-172-31-28-249 jenkins[33990]: *****
Dec 04 12:14:35 ip-172-31-28-249 jenkins[33990]: 2024-12-04 12:14:35.679+0000 [id=30] INFO jenkins.InitReactorRunner$1onAttained: Completed initialization
Dec 04 12:14:35 ip-172-31-28-249 jenkins[33990]: 2024-12-04 12:14:35.705+0000 [id=23] INFO hudson.lifecycle.Lifecycle$onReady: Jenkins is fully up and running
Dec 04 12:14:35 ip-172-31-28-249 systemd[1]: Started jenkins.service - Jenkins Continuous Integration Server.
```