ANSIBLE ASSIGNMENT 5

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Assignment: Ansible Cluster With Test & Prod Roles (Java + MySQL Deployment)

Problem Statement

Create a 5-node Ansible cluster with:

- test group (2 nodes) → Install Java

- prod group (2 nodes) → Install MySQL

- Using Ansible Roles for modular automation

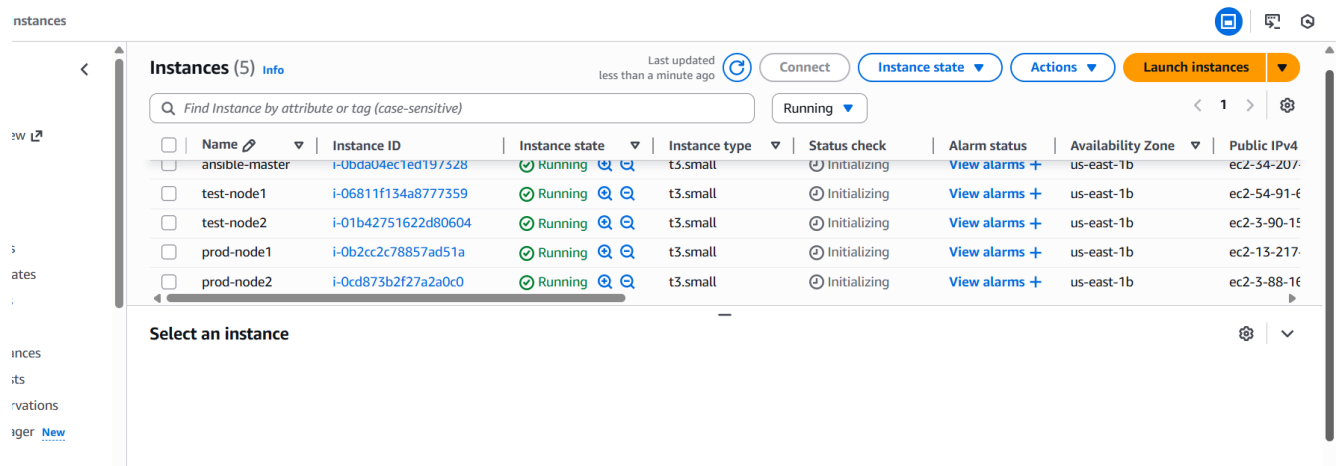
TASK 1: Launch 5 EC2 Ubuntu Instances

Instances:

- ansible-master

- test-node1

- test-node2

- prod-node1

- prod-node2

All launched with the same keypair and connected using EC2 Instance Connect.

Install Ansible on Master Node

sudo apt update -y

sudo apt install ansible -y

```
ubuntu@ip-10-0-15-124:~$ sudo apt update -y
sudo apt install ansible -y
Hit:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble InRelease
Get:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates InRelease [126 kB]
Get:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports InRelease [126 kB]
Get:4 http://security.ubuntu.com/ubuntu noble-security InRelease [126 kB]
Get:5 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/universe amd64 Packages [15.0 MB]
Get:6 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/universe Translation-en [5982 kB]
Get:7 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/universe amd64 Components [3871 kB]
Get:8 http://security.ubuntu.com/ubuntu noble-security/main amd64 Packages [1378 kB]
Get:9 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/universe amd64 c-n-f Metadata [301 kB]
Get:10 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/multiverse amd64 Packages [269 kB]
Get:11 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/multiverse Translation-en [118 kB]
Get:12 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/multiverse amd64 Components [35.0 kB]
Get:13 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/multiverse amd64 c-n-f Metadata [8328 B]
Get:14 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 Packages [1675 kB]
Get:15 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main Translation-en [309 kB]
Get:16 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 Components [175 kB]
Get:17 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 c-n-f Metadata [15.8 kB]
Get:18 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/universe amd64 Packages [1501 kB]
Get:19 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/universe Translation-en [304 kB]
Get:20 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/universe amd64 Components [378 kB]
```

TASK 2: Create Ansible Inventory Directory

On the master node:

sudo mkdir -p /etc/ansible

sudo touch /etc/ansible/hosts

```
ubuntu@ip-10-0-15-124:~$ sudo mkdir -p /etc/ansible
sudo touch /etc/ansible/hosts
```

TASK 3: Upload Private Key to Master Node

On your local computer → open your .pem key → copy entire contents.

On master:

nano ~/.ssh/mykey.pem

Paste key → Save → Exit.

Set correct permissions:

chmod 400 ~/.ssh/mykey.pem

```
sudo touch /etc/ansible/hosts
ubuntu@ip-10-0-15-124:~$ nano ~/.ssh/mykey.pem
```

AvzMhASCcyBP6ON68uvb5HT+91/ej9tykLNR4TTjT0yTlmUbERcP3J0yV29x+b4U
/LsOuT9YXSs+vA8Nx3vW3szd/ntkc7xxixCPig2AmXHZScXqZ1fcTLQz5mlAWwtx
LBzSOiE9iPDNbVJsBnzdVeCeFEusOASidpN71/brAoGBAJ77cu9PqsTwRoJJnohU
c2ZHi6KR6EXLhA2dTcQKB8L1XZ3Sw+4uxW7CAZeDd+3NDRDair3OgJ2ygsecv1U2
XpCdnC+/cLVP/hNjBLlI3CIsd09yMw6CaZPZ8iQufk0hyyrVwRiiFgwvESxWeTlW
Uh+QJqXocqKok18piFUY/+KtAoGBALHwOVadbYF3CY4kk4OryCNwJVTcsMqO2oDn
js9LFHLA2rZUZxDjX3FsVtiKi8rTrg32pH7+KMDktYLIUTZ+y7fhpqFJeMe6bLAS
e+LzdEN1hAduuYhlOgGktXmsTXJEy2NkR0YHUUgDy85fS/MWGp1XOpl8h7x52ubx
YvE5cRfXAoGAd32ZDRwOBZsSSOkS59yWk/flM+hlumKEKsjbWZQhwmXQ+cTaRjtY
KbuX5nIB5EwvMAgHO6jYSk/VVhCe1rgQSaZU3WLxsv8vZbQoduT9fTuBEBD/hjyv
TM7O53sdHVvLj46JcIH7DS9Ms10A513mZZJzOqamkcNFALT8nWpDvOc=
-----END RSA PRIVATE KEY-----

```
ubuntu@ip-10-0-15-124:~$ nano ~/.ssh/mykey.pem
ubuntu@ip-10-0-15-124:~$ chmod 400 ~/.ssh/mykey.pem
ubuntu@ip-10-0-15-124:~$
```

 TASK 4: Open Inventory File and Configure Groups

sudo nano /etc/ansible/hosts

Paste:

[test]

10.0.1.10 ansible_user=ubuntu ansible_ssh_private_key_file=/home/ubuntu/.ssh/mykey.pem

10.0.1.11 ansible_user=ubuntu ansible_ssh_private_key_file=/home/ubuntu/.ssh/mykey.pem

[prod]

10.0.2.20 ansible_user=ubuntu ansible_ssh_private_key_file=/home/ubuntu/.ssh/mykey.pem

10.0.2.21 ansible_user=ubuntu ansible_ssh_private_key_file=/home/ubuntu/.ssh/mykey.pem

Test connectivity:

ansible all -m ping

```
ubuntu@ip-10-0-15-124:~$ sudo nano /etc/ansible/hosts
```

```
  GNU nano 7.2                                                    /etc/ansible/hosts *
[test]
10.0.15.189 ansible_user=ubuntu ansible_ssh_private_key_file=/home/ubuntu/.ssh/mykey.pem
10.0.9.99 ansible_user=ubuntu ansible_ssh_private_key_file=/home/ubuntu/.ssh/mykey.pem

[prod]
10.0.1.167 ansible_user=ubuntu ansible_ssh_private_key_file=/home/ubuntu/.ssh/mykey.pem
10.0.14.193 ansible_user=ubuntu ansible_ssh_private_key_file=/home/ubuntu/.ssh/mykey.pem
```

```
ubuntu@ip-10-0-15-124:~$ ansible all -m ping
The authenticity of host '10.0.14.193 (10.0.14.193)' can't be established.
ED25519 key fingerprint is SHA256:oWZryEYwfNhtjZmrdw9tZpPl89cQn3L+T/Zb4Op/QyY.
This key is not known by any other names.
The authenticity of host '10.0.15.189 (10.0.15.189)' can't be established.
ED25519 key fingerprint is SHA256:EfGrNPKHTY2gR2EWavMRxW2IiBNiq38mgsU7iUUaEq4.
This key is not known by any other names.
The authenticity of host '10.0.9.99 (10.0.9.99)' can't be established.
ED25519 key fingerprint is SHA256:Wz44yW0PJ0P7XMOn9/DwuVCp7CGg4Kvn6Pny4u5YwqM.
This key is not known by any other names.
The authenticity of host '10.0.1.167 (10.0.1.167)' can't be established.
ED25519 key fingerprint is SHA256:HqscMmrr+s7Xk/wlt42dOn5tJNU7Fr4blIWcSH7OCOM.
This key is not known by any other names.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Please type 'yes', 'no' or the fingerprint: yes
10.0.9.99 | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": false,
    "ping": "pong"
}
```

TASK 5: Create Ansible Roles

Move to roles directory:

mkdir roles

cd roles

```
ubuntu@ip-10-0-15-124:~$ mkdir roles
cd roles
ubuntu@ip-10-0-15-124:~/roles$
```

Role 1: Java Role (for test group)

ansible-galaxy init role_java

Edit tasks:

nano role_java/tasks/main.yml

Paste:

- name: Install Java on Test Nodes

  apt:

    name: default-jdk

    state: present

    update_cache: yes

```
cd roles
ubuntu@ip-10-0-15-124:~/roles$ ansible-galaxy init role_java
- Role role_java was created successfully
ubuntu@ip-10-0-15-124:~/roles$
```

```
ubuntu@ip-10-0-15-124:~/roles$ ls
role_java
ubuntu@ip-10-0-15-124:~/roles$ nano role_java/tasks/main.yml
```

```
  GNU nano 7.2
---
- name: Install Java on Test Nodes
  apt:
    name: default-jdk
    state: present
    update_cache: yes

# tasks file for role_java
```

Role 2: MySQL Role (for prod group)

ansible-galaxy init role_mysql

Edit tasks:

nano role_mysql/tasks/main.yml

Paste:

- name: Install MySQL Server on Prod Nodes

  apt:

    name: mysql-server

    state: present

    update_cache: yes

```
ubuntu@ip-10-0-15-124:~/roles$ ansible-galaxy init role_mysql
- Role role_mysql was created successfully
ubuntu@ip-10-0-15-124:~/roles$
```

```
ubuntu@ip-10-0-15-124:~/roles$ ls
role_java  role_mysql
ubuntu@ip-10-0-15-124:~/roles$ nano role_mysql/tasks/main.yml
```

```
  GNU nano 7.2
---
- name: Install MySQL Server on Prod Nodes
  apt:
    name: mysql-server
    state: present
    update_cache: yes

# tasks file for role_mysql
```

TASK 6: Create Main Ansible Playbook

Go to home directory:

cd ~

nano site.yml

Paste:

- name: Install Java on Test Nodes

  hosts: test

  become: yes

  roles:

    - role_java

- name: Install MySQL on Prod Nodes

  hosts: prod

  become: yes

```
    roles:
      - role_mysql
```

```
ubuntu@ip-10-0-15-124:~/roles$ cd ..
ubuntu@ip-10-0-15-124:~$ nano site.yml
```

```
  GNU nano 7.2
---
- name: Install Java on Test Nodes
  hosts: test
  become: yes
  roles:
      - role_java

- name: Install MySQL on Prod Nodes
  hosts: prod
  become: yes
  roles:
      - role_mysql
```

TASK 7: Run the Playbook

ansible-playbook site.yml

Expected result:

changed=1 failed=0

```
ubuntu@ip-10-0-15-124:~$ ansible-playbook site.yml

PLAY [Install Java on Test Nodes] ************************************************************************

TASK [Gathering Facts] **********************************************************************************
ok: [10.0.9.99]
ok: [10.0.15.189]

TASK [role_java : Install Java on Test Nodes] ***********************************************************
ok: [10.0.9.99]
ok: [10.0.15.189]

PLAY [Install MySQL on Prod Nodes] *********************************************************************

TASK [Gathering Facts] **********************************************************************************
ok: [10.0.1.167]
ok: [10.0.14.193]

TASK [role_mysql : Install MySQL Server on Prod Nodes] ************************************************
ok: [10.0.1.167]
changed: [10.0.14.193]

PLAY RECAP **********************************************************************************************
10.0.1.167          : ok=2    changed=0    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
10.0.14.193         : ok=2    changed=1    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
10.0.15.189         : ok=2    changed=0    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
10.0.9.99           : ok=2    changed=0    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
```

i-0bda04ec1ed197328 (ansible-master)

PublicIPs: 34.207.172.143   PrivateIPs: 10.0.15.124

Verification

On Test Nodes

java -version

On Prod Nodes

systemctl status mysql

```
ubuntu@ip-10-0-15-189:~$ java -version
openjdk version "21.0.9" 2025-10-21
OpenJDK Runtime Environment (build 21.0.9+10-Ubuntu-124.04)
OpenJDK 64-Bit Server VM (build 21.0.9+10-Ubuntu-124.04, mixed mode, sharing)
ubuntu@ip-10-0-15-189:~$
```

i-06811f134a8777359 (test-node1)

PublicIPs: 54.91.62.241   PrivateIPs: 10.0.15.189

```
ubuntu@ip-10-0-9-99:~$ java -version
openjdk version "21.0.9" 2025-10-21
OpenJDK Runtime Environment (build 21.0.9+10-Ubuntu-124.04)
OpenJDK 64-Bit Server VM (build 21.0.9+10-Ubuntu-124.04, mixed mode, sharing)
ubuntu@ip-10-0-9-99:~$
```

i-01b42751622d80604 (test-node2)

PublicIPs: 3.90.153.178   PrivateIPs: 10.0.9.99

```
ubuntu@ip-10-0-1-167:~$ systemctl status mysql
● mysql.service - MySQL Community Server
     Loaded: loaded (/usr/lib/systemd/system/mysql.service; enabled; preset: enabled)
     Active: active (running) since Fri 2025-12-12 12:27:51 UTC; 2min 56s ago
    Process: 2862 ExecStartPre=/usr/share/mysql/mysql-systemd-start pre (code=exited, status=0/SUCCESS)
   Main PID: 2875 (mysqld)
     Status: "Server is operational"
      Tasks: 37 (limit: 2204)
     Memory: 363.4M (peak: 378.1M)
        CPU: 2.224s
     CGroup: /system.slice/mysql.service
             └─2875 /usr/sbin/mysqld

Dec 12 12:27:50 ip-10-0-1-167 systemd[1]: Starting mysql.service - MySQL Community Server...
Dec 12 12:27:51 ip-10-0-1-167 systemd[1]: Started mysql.service - MySQL Community Server.
ubuntu@ip-10-0-1-167:~$
```

i-0b2cc2c78857ad51a (prod-node1)

PublicIPs: 13.217.113.39   PrivateIPs: 10.0.1.167

```
ubuntu@ip-10-0-14-193:~$ systemctl status mysql
● mysql.service - MySQL Community Server
     Loaded: loaded (/usr/lib/systemd/system/mysql.service; enabled; preset: enabled)
     Active: active (running) since Fri 2025-12-12 12:28:57 UTC; 2min 13s ago
    Process: 2370 ExecStartPre=/usr/share/mysql/mysql-systemd-start pre (code=exited, status=0/SUCCESS)
   Main PID: 2382 (mysqld)
     Status: "Server is operational"
      Tasks: 37 (limit: 2204)
     Memory: 361.1M (peak: 377.9M)
        CPU: 2.213s
     CGroup: /system.slice/mysql.service
             └─2382 /usr/sbin/mysqld

Dec 12 12:28:56 ip-10-0-14-193 systemd[1]: Starting mysql.service - MySQL Community Server...
Dec 12 12:28:57 ip-10-0-14-193 systemd[1]: Started mysql.service - MySQL Community Server.
ubuntu@ip-10-0-14-193:~$
```

i-0cd873b2f27a2a0c0 (prod-node2)

PublicIPs: 3.88.16.80   PrivateIPs: 10.0.14.193

Conclusion

Successfully created:

A 5-node Ansible cluster

Grouped hosts under test and prod

Created roles for:

 Java installation (test)

 MySQL installation (prod)

 Automated deployments using Ansible roles

 Verified correct installation per group