

## TASK – 26

### ANSIBLE WITH LOOP

**EC2 deployment through ansible:**

**Creating a IAM role and attach it to control node through actions in console**

The screenshot shows the AWS IAM Roles page. A green success message at the top says "Role Ansiiible\_role created." Below it, the "Ansiiible\_role" details are shown. The "Summary" section includes the creation date (December 29, 2025, 17:57 UTC+05:30), ARN (arn:aws:iam::002204026052:role/Ansiiible\_role), and instance profile ARN (arn:aws:iam::002204026052:instance-profile/Ansiiible\_role). The "Permissions" tab is selected, showing one managed policy named "AdministratorAccess". The "Trust relationships", "Tags", "Last Accessed", and "Revoke sessions" tabs are also present.

The screenshot shows the "Modify IAM role" page for the instance i-0e69c0c3f80b8a81c (Control\_node). It allows attaching a new IAM role. The "IAM role" dropdown is set to "Ansiiible\_role". Buttons for "Create new IAM role" (with a circular icon) and "Update IAM role" (with an orange background) are visible. Navigation links include CloudShell, Feedback, and Console Mobile App.

## Installing boto3 and botocore

```
[ec2-user@ip-172-31-3-249 ~]$ pip3 install --user boto3 botocore
Collecting boto3
  Downloading boto3-1.42.17-py3-none-any.whl (140 kB)
    |██████████| 140 kB 16.3 MB/s
Collecting botocore
  Downloading botocore-1.42.17-py3-none-any.whl (14.6 MB)
    |██████████| 14.6 MB 425 kB/s
Collecting s3transfer<0.17.0,>=0.16.0
  Downloading s3transfer-0.16.0-py3-none-any.whl (86 kB)
    |██████████| 86 kB 10.3 MB/s
Requirement already satisfied: jmespath<2.0.0,>=0.7.1 in /usr/lib/python3.9/site-packages (from boto3) (0.10.0)
Requirement already satisfied: python-dateutil<3.0.0,>=2.1 in /usr/lib/python3.9/site-packages (from botocore) (2.8.1)
Requirement already satisfied: urllib3<1.27,>=1.25.4 in /usr/lib/python3.9/site-packages (from botocore) (1.25.10)
Requirement already satisfied: six>=1.5 in /usr/lib/python3.9/site-packages (from python-dateutil<3.0.0,>=2.1->botocore) (1.15.0)
Installing collected packages: botocore, s3transfer, boto3
Successfully installed boto3-1.42.17 botocore-1.42.17 s3transfer-0.16.0
```

## Creating a yaml file for deploying the instance through ansible and run the playbook

```
[ec2-user@ip-172-31-3-249 ~]$ vi instance.yaml
[ec2-user@ip-172-31-3-249 ~]$ ansible-playbook -i inventory.txt instance.yaml

PLAY [Create EC2 Instance using Ansible] ****
TASK [Create EC2 instance] ****
changed: [localhost]

PLAY RECAP ****
localhost : ok=1    changed=1    unreachable=0    failed=0    s
skipped=0   rescued=0   ignored=0
```

### Code inside instance.yaml:

```
- name: Create EC2 Instance using Ansible
  hosts: localhost
  connection: local
  gather_facts: no

  vars:
    region: us-east-1
    instance_type: t3.micro
    key_name: ansiii
    image_id: ami-068c0051b15cdb816 # Amazon Linux 2 (Mumbai)
    security_group: my_sg
    instance_name: Ansible-EC2

  tasks:
    - name: Create EC2 instance
      amazon.aws.ec2_instance:
        name: "{{ instance_name }}"
        key_name: "{{ key_name }}"
        instance_type: "{{ instance_type }}"
        image_id: "{{ image_id }}"
        wait: yes
        region: "{{ region }}"
```

```

security_group: "{{ security_group }}"
count: 1
tags:
  Environment: Dev
  CreatedBy: Ansible

```

## Instance created successfully

The screenshot shows the AWS EC2 Instances page. The left sidebar navigation includes 'Instances', 'Images', 'Elastic Block Store', and 'Network & Security'. The main content area displays a table of instances with the following data:

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4
Mangade_node	i-04e920b950ab5a359	Running	t3.micro	3/3 checks passed	View alarms +	us-east-1a	ec2-3-235-1
Ansible-EC2	i-025af7af681f04bab	Running	t3.micro	Initializing	View alarms +	us-east-1a	ec2-18-213

Below the table, the details for the instance 'i-0e69c0c3f80b8a81c (Control\_node)' are shown. The 'Details' tab is selected, displaying the following information:

- Instance ID:** i-0e69c0c3f80b8a81c
- Public IPv4 address:** 3.222.205.138 | open address
- Private IPv4 addresses:** 172.31.3.249
- Public DNS:** ec2-3-222-205-138.compute-1.amazonaws.com | open address
- Instance state:** Running

## Tree:

"Ansible tree" refers to the standard directory structure for an Ansible project (especially roles) or the `ansible.builtin.tree` callback plugin that saves execution history as files, helping visualize playbooks or track events in a hierarchical format, crucial for understanding complex automation.

```
[ec2-user@ip-172-31-3-249 ~]$ sudo yum install tree
Last metadata expiration check: 1:03:52 ago on Mon Dec 29 11:49:43 2025.
Dependencies resolved.
=====
 Package      Architecture Version          Repository      Size
=====
Installing:
 tree        x86_64      1.8.0-6.amzn2023.0.2      amazonlinux    56 k

Transaction Summary
=====
Install 1 Package

Total download size: 56 k
Installed size: 113 k
Is this ok [y/N]: y
Downloading Packages:
tree-1.8.0-6.amzn2023.0.2.x86_64.rpm      1.3 MB/s | 56 kB   00:00
-----
Total                                         686 kB/s | 56 kB   00:00

Running transaction check
Transaction check succeeded.
Running transaction test
Transaction test succeeded.
Running transaction
Preparing           : 1/1
Installing         : tree-1.8.0-6.amzn2023.0.2.x86_64 1/1
Running scriptlet: tree-1.8.0-6.amzn2023.0.2.x86_64 1/1
Verifying          : tree-1.8.0-6.amzn2023.0.2.x86_64 1/1

Installed:
 tree-1.8.0-6.amzn2023.0.2.x86_64

Complete!
[ec2-user@ip-172-31-3-249 ~]$ tree
.
├── ansible.cfg
├── instance.yaml
└── inventory.txt
```

## Changing the port number of httpd using ansible:

### Code of httpd.yaml

```
---
- name: Install and configure Apache httpd
  hosts: all
  become: yes

  vars:
    httpd_port: 8080 # Change port here

  tasks:
    - name: Install httpd
      yum:
        name: httpd
        state: present

    - name: Change httpd port
      lineinfile:
        path: /etc/httpd/conf/httpd.conf
        regexp: '^Listen '
        line: "Listen {{ httpd_port }}"
```

```

backup: yes

- name: Start and enable httpd
  service:
    name: httpd
    state: restarted
    enabled: yes

```

## Creating a yaml file httpd.yaml for changing port number to 8080

```

[ec2-user@ip-172-31-3-249 ~]$ vi httpd.yaml
[ec2-user@ip-172-31-3-249 ~]$ ansible-playbook -i inventory.txt httpd.yaml

PLAY [Install and configure Apache httpd] *****

TASK [Gathering Facts] *****
[WARNING]: Platform linux on host 44.215.111.23 is using the discovered Python interpreter at /usr/bin/python3.9, but future installation of another Python interpreter could change the meaning of that path. See https://docs.ansible.com/ansible-core/2.15/reference_appendices/interpreter_discovery.html for more information.
ok: [44.215.111.23]
[WARNING]: Platform linux on host 3.235.13.44 is using the discovered Python interpreter at /usr/bin/python3.9, but future installation of another Python interpreter could change the meaning of that path. See https://docs.ansible.com/ansible-core/2.15/reference_appendices/interpreter_discovery.html for more information.
ok: [3.235.13.44]
[WARNING]: Platform linux on host 44.202.75.73 is using the discovered Python interpreter at /usr/bin/python3.9, but future installation of another Python interpreter could change the meaning of that path. See https://docs.ansible.com/ansible-core/2.15/reference_appendices/interpreter_discovery.html for more information.
ok: [44.202.75.73]

TASK [Install httpd] *****
ok: [44.215.111.23]
ok: [44.202.75.73]
ok: [3.235.13.44]

TASK [Change httpd port] *****
changed: [44.215.111.23]
changed: [44.202.75.73]
changed: [3.235.13.44]

TASK [Start and enable httpd] *****
changed: [44.202.75.73]
changed: [3.235.13.44]
changed: [44.215.111.23]

PLAY RECAP *****
3.235.13.44      : ok=4    changed=2    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
44.202.75.73     : ok=4    changed=2    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
44.215.111.23    : ok=4    changed=2    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0

```

## Output of managed nodes after changing the port number of httpd



It works!



## ***Ansible loops:***

Ansible loops are a core feature for running a single task multiple times with different input values, which helps reduce code duplication and improves playbook readability and scalability. The modern and recommended keyword for this is loop.

### **Code of dev.yaml:**

```
---
- hosts: all
  remote_user: ec2-user
  become: yes

  tasks:
    - name: Install packages one by one
      yum:
        name: "{{ item }}"
        state: present
    loop:
      - php
      - unzip
      - wget
```

## Created a yaml file of loops and installed the packages

```
[ec2-user@ip-172-31-3-249 ~]$ vi loop.yaml
[ec2-user@ip-172-31-3-249 ~]$ ansible-playbook -i inventory.txt loop.yaml

PLAY [all] ****
TASK [Gathering Facts] ****
[WARNING]: Platform linux on host 44.215.111.23 is using the discovered Python interpreter at /usr/bin/python3.9, but future installation of another Python interpreter could change the meaning of that path. See https://docs.ansible.com/ansible-core/2.15/reference_appendices/interpreter_discovery.html for more information.
ok: [44.215.111.23]
[WARNING]: Platform linux on host 3.235.13.44 is using the discovered Python interpreter at /usr/bin/python3.9, but future installation of another Python interpreter could change the meaning of that path. See https://docs.ansible.com/ansible-core/2.15/reference_appendices/interpreter_discovery.html for more information.
ok: [3.235.13.44]
[WARNING]: Platform linux on host 44.202.75.73 is using the discovered Python interpreter at /usr/bin/python3.9, but future installation of another Python interpreter could change the meaning of that path. See https://docs.ansible.com/ansible-core/2.15/reference_appendices/interpreter_discovery.html for more information.
ok: [44.202.75.73]

TASK [Install packages one by one] ****
changed: [44.215.111.23] => (item=php)
changed: [44.202.75.73] => (item=php)
changed: [3.235.13.44] => (item=php)
ok: [44.215.111.23] => (item=unzip)
ok: [3.235.13.44] => (item=unzip)
ok: [44.202.75.73] => (item=unzip)
ok: [44.215.111.23] => (item=wget)
ok: [3.235.13.44] => (item=wget)
ok: [44.202.75.73] => (item=wget)

PLAY RECAP ****
3.235.13.44      : ok=2    changed=1    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
44.202.75.73     : ok=2    changed=1    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
44.215.111.23    : ok=2    changed=1    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
```