

CLOUD COMPUTING AND DEVOPS

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Assignment No 6: Write an ansible-playbook to install nginx on target servers

Theory:

1. What is yaml?

Ans. YAML is a human-readable data serialization language that is often used for writing configuration files. Depending on whom you ask, YAML stands for yet another markup language or YAML ain't markup language (a recursive acronym), which emphasizes that YAML is for data, not documents.

YAML is a popular programming language because it is designed to be easy to read and understand. It can also be used in conjunction with other programming languages.

Because of its flexibility and accessibility, YAML is used by the Ansible automation tool to create automation processes, in the form of Ansible Playbooks.

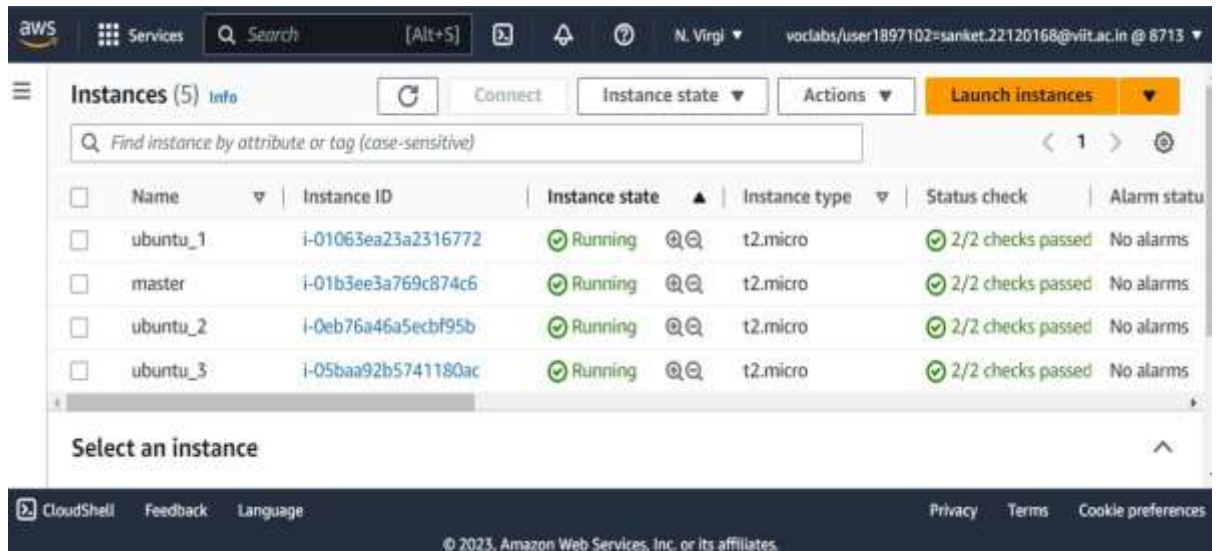
2. What is Ansible?

Ans. Ansible is a software tool that provides simple but powerful automation for cross-platform computer support. It is primarily intended for IT professionals, who use it for application deployment, updates on workstations and servers, cloud provisioning, configuration management, intra-service orchestration, and nearly anything a systems administrator does on a weekly or daily basis. Ansible doesn't depend on agent software and has no additional security infrastructure, so it's easy to deploy.

Ans.

Assignment 3: write an ansible-playbook to install nginx on servers.

Step 1: Create 4 ubuntu ec2 instances



Step 2: Connect to "Ansible-Master" server

```
ubuntu@ip-172-31-89-14: ~/s × + v
ubuntu_server_1_key.pem  ubuntu_server_1_key.pem:Zone.Identifier
root@SANKET-SUPEKAR:/cloud_devOps/Ansible# ssh -i "ubuntu_server_1_key.pem" ubuntu@ec2-54-159-203-69.compute-1.amazonaws.com
The authenticity of host 'ec2-54-159-203-69.compute-1.amazonaws.com (54.159.203.69)' is not yet known.
ED25519 key fingerprint is SHA256:g0LGBKNHgXRrtLEAk00RGBfVqEkFS4jwB7YsaNj2Vck.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
```

Step 3: Install ansible

```
ubuntu@ip-172-31-89-14:~$ sudo apt install software-properties-common
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
software-properties-common is already the newest version (0.99.22.6).
software-properties-common set to manually installed.
0 upgraded, 0 newly installed, 0 to remove and 12 not upgraded.
ubuntu@ip-172-31-89-14:~$ sudo apt-add-respository ppa:ansible/ansible
sudo: apt-add-respository: command not found
ubuntu@ip-172-31-89-14:~$ sudo apt-add-repository ppa:ansible/ansible
Repository: 'deb https://ppa.launchpadcontent.net/ansible/ansible/ubuntu/ jammy main'
Description:
Ansible is a radically simple IT automation platform that makes your applications and systems easier
to deploy. Avoid writing scripts or custom code to deploy and update your applications- automate in
a language that approaches plain English, using SSH, with no agents to install on remote systems.

http://ansible.com/
```

```
ubuntu@ip-172-31-89-14:~$ sudo apt install ansible
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  ansible-core python3-jmespath python3-kerberos python3-nacl
  python3-ntlm-auth python3-packaging python3-paramiko
  python3-requests-kerberos python3-requests-ntlm python3-resolvelib
  python3-winrm python3-xlrd python3-xmldict sshpass
Suggested packages:
  python-nacl-doc python3-gssapi python3-invoke
The following NEW packages will be installed:
  python3-ntlm-auth python3-paramiko
Selecting previously unselected package python3-ntlm-auth.
Preparing to unpack .../07-python3-ntlm-auth_1.4.0-1_all.deb ...
Unpacking python3-ntlm-auth (1.4.0-1) ...
Selecting previously unselected package python3-paramiko.
Preparing to unpack .../08-python3-paramiko_2.9.3-0ubuntu1_all.deb ...
```

Step 4: Generate a ssh key on Ansible-master using command

```
ubuntu@ip-172-31-89-14: ~/$ cd .ssh
ubuntu@ip-172-31-89-14: ~/.ssh$ ls
authorized_keys
ubuntu@ip-172-31-89-14: ~/.ssh$ cd ..
ubuntu@ip-172-31-89-14:~$ ssh ubuntu@3.92.183.49
The authenticity of host '3.92.183.49 (3.92.183.49)' can't be established.
ED25519 key fingerprint is SHA256:iuBURHnTjFVS5V+gZe8cgSODLCMqoxFo9AAYngwzvkc.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '3.92.183.49' (ED25519) to the list of known hosts.
ubuntu@3.92.183.49: Permission denied (publickey).
ubuntu@ip-172-31-89-14:~$ cd .ssh
ubuntu@ip-172-31-89-14: ~/.ssh$ ls
authorized_keys  known_hosts
ubuntu@ip-172-31-89-14: ~/.ssh$ ssh-keygen
Generating public/private rsa key pair.
Enter file in which to save the key (/home/ubuntu/.ssh/id_rsa):
```

Step 5: Now login to Ansible-master and try to connect to ansible server using command

```
ubuntu@ip-172-31-89-14:~/.ssh$ ssh ubuntu@3.92.183.49
Welcome to Ubuntu 22.04.2 LTS (GNU/Linux 5.15.0-1031-aws x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/advantage

System information as of Sat Apr  8 08:41:54 UTC 2023

System load:  0.0                       Processes:            99
Usage of /:   22.7% of 7.57GB           Users logged in:     1
Memory usage: 25%                       IPv4 address for eth0: 172.31.83.59
Swap usage:   0%

 * Introducing Expanded Security Maintenance for Applications.
   Receive updates to over 25,000 software packages with your
   Ubuntu Pro subscription. Free for personal use.

   https://ubuntu.com/aws/pro

Expanded Security Maintenance for Applications is not enabled.

15 updates can be applied immediately.
12 of these updates are standard security updates.
To see these additional updates run: apt list --upgradable

Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status
```

Step 6: copy the public key which is in .ssh folder into "authorized keys" on ansible-server1

connect to ansible-server1 and again give command

```
ubuntu@ip-172-31-83-59: ~/$ python3 --version
Python 3.10.6
ubuntu@ip-172-31-83-59: ~/$ cd .ssh
ubuntu@ip-172-31-83-59: ~/.ssh$ ls
authorized_keys
ubuntu@ip-172-31-83-59: ~/.ssh$ sudo nano authorized_keys

ubuntu@ip-172-31-83-59: ~/.ssh$ cat authorized_keys
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAQDJxmZ8H1C7FJqGjTVr0BCGYrqgB7KBnYyenTWQCmyc5gt+xPX/
6yh6biManD15lDG0eYuQggakxzp9J3Ax89vp6oJj01cmca0VBZ41d8XEQ8FMv+9g4yLFngkCF5Rs9BAqMo4EBsWb
dPLUl0jwQD4BMntm3ASmMhJ8CrBZxcvk3FJzdEZudsH2Fgs47dI5oLGhs/dGi9thz0M+viEaMEqhkh07+84QcTr9
JhBBPePRLi6iVqF+j0HKalC3ZFUQHk9eFqvYS7LYErz4XzUfKWivumWqwbB1tMSVL00sdPLNEy9gN6w810X6n+/6
32FU8hDFbWh+mJSqJlqion6cyLEN ubuntu_server_1_key
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAQgQCXRXtfn6z10gB5SyyvM3k5zhSyF3X6AnKH+Uz1jRGDRUtQVTRm7
+39F+AX5ZA686qan+mx18ofFs7mKN+0WUSV96iB06Q0rgvXuaFcGy9+i5h6rHtA8v48efQiFZMRXkksrwQDTi90h
kFQ5kNspGl830hna4dq+I/D6bgJyY45mMxx08KG0I3GfZ70r5zExLMVUVb9es9Gg8FcGpIXxUIaBNfS2lKBGwy6
X6IGYeMnJ0iNypvL6SnZhJeeT2/XaptyhI9EntudfzE0K2sBV10/ZduuKnDvTecbHjcY3HkodPE3RjC3p9jhgxr
bBhpRZsxYCxKQYlYrAKcge06NUT0QMLL2Plab9mFLUwsD7wc2NezHRtVSAzaEhcHuwmeH672U0ttgWxfhqjy8j+T
zdCsoeWBIYw62oXAsmjNjbWeCQEpN0FJmRte5mswq46WI1HjhkUhpNx+C9WR/kotm5Nb5hQzdAygEI704oKQQV95
vIu998BDYnKzjNamz7dLttSU= ubuntu@ip-172-31-89-14
ubuntu@ip-172-31-83-59: ~/.ssh$
```

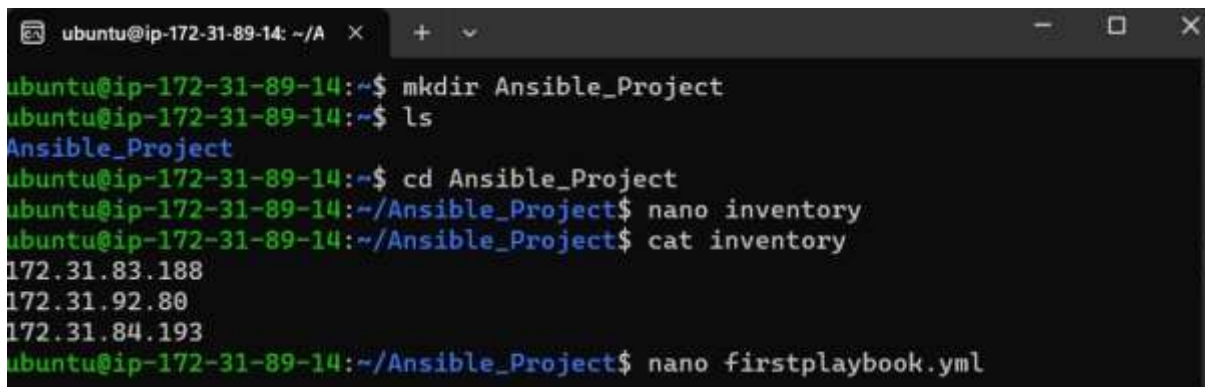

Create a playbook on Ansible-master

Step 1:- connect to "Ansible-Master"

Step 2:-create a new folder "ansible-project" using command

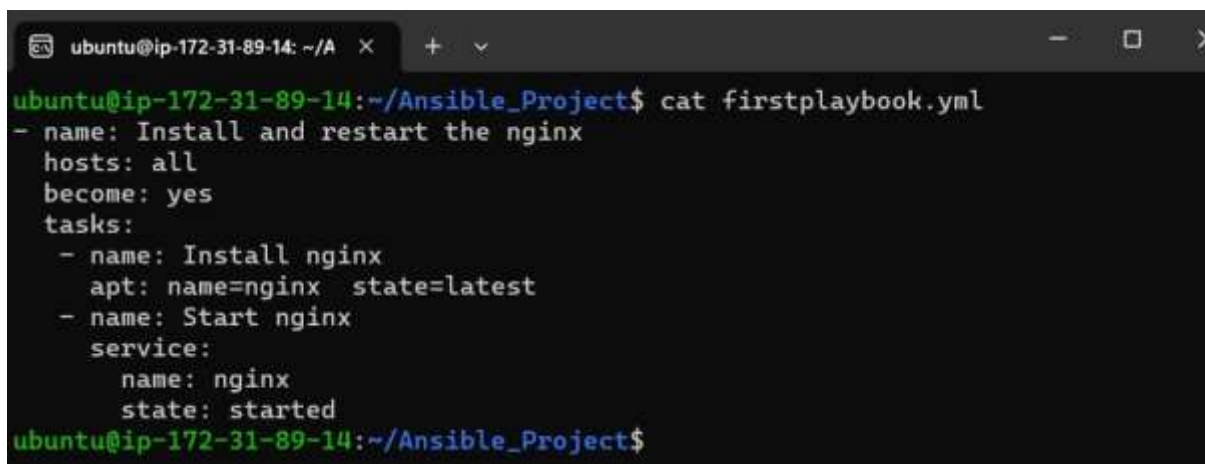
Step 3:

- a) > cd ansible-project
- b) > nano inventory
- c) > write a private IP of "Ansible-server1" into inventory
- d) > write a private IP of "Ansible-server2" into inventory
- e) > write a private IP of "Ansible-server3" into inventory



```
ubuntu@ip-172-31-89-14: ~/A x + v
ubuntu@ip-172-31-89-14:~$ mkdir Ansible_Project
ubuntu@ip-172-31-89-14:~$ ls
Ansible_Project
ubuntu@ip-172-31-89-14:~$ cd Ansible_Project
ubuntu@ip-172-31-89-14:~/Ansible_Project$ nano inventory
ubuntu@ip-172-31-89-14:~/Ansible_Project$ cat inventory
172.31.83.188
172.31.92.80
172.31.84.193
ubuntu@ip-172-31-89-14:~/Ansible_Project$ nano firstplaybook.yml
```

Step 1: Create a new file called "first-playbook.yml"



```
ubuntu@ip-172-31-89-14: ~/A x + v
ubuntu@ip-172-31-89-14:~/Ansible_Project$ cat firstplaybook.yml
- name: Install and restart the nginx
  hosts: all
  become: yes
  tasks:
    - name: Install nginx
      apt: name=nginx state=latest
    - name: Start nginx
      service:
        name: nginx
        state: started
ubuntu@ip-172-31-89-14:~/Ansible_Project$
```

Verify the output:

connect to any ansible-server1

```
ubuntu@ip-172-31-92-80: ~$ sudo systemctl status nginx
nginx.service - A high performance web server and a reverse proxy server
   Loaded: loaded (/lib/systemd/system/nginx.service; enabled; vendor preset: enabled)
   Active: active (running) since Sat 2023-04-08 10:22:16 UTC; 18s ago
     Docs: man:nginx(8)
   Process: 2313 ExecStartPre=/usr/sbin/nginx -t -q -g daemon on; master_process on; (code=exited, status=0/SUCCESS)
   Process: 2314 ExecStart=/usr/sbin/nginx -g daemon on; master_process on; (code=exited, status=0/SUCCESS)
   Main PID: 2407 (nginx)
    Tasks: 2 (limit: 1141)
   Memory: 6.1M
      CPU: 24ms
   CGroup: /system.slice/nginx.service
           └─2407 "nginx: master process /usr/sbin/nginx -g daemon on; master_process on;"
             └─2418 "nginx: worker process"

Apr 08 10:22:16 ip-172-31-92-80 systemd[1]: Starting A high performance web server and a reverse proxy server...
Apr 08 10:22:16 ip-172-31-92-80 systemd[1]: Started A high performance web server and a reverse proxy server.
lines 1-16/16 (END)
```