CMPE 272 – HW#1 – ANSIBLE

TEAM SANKALP

Github: https://github.com/shireesh20/Sankalp_CMPE282

Team Members

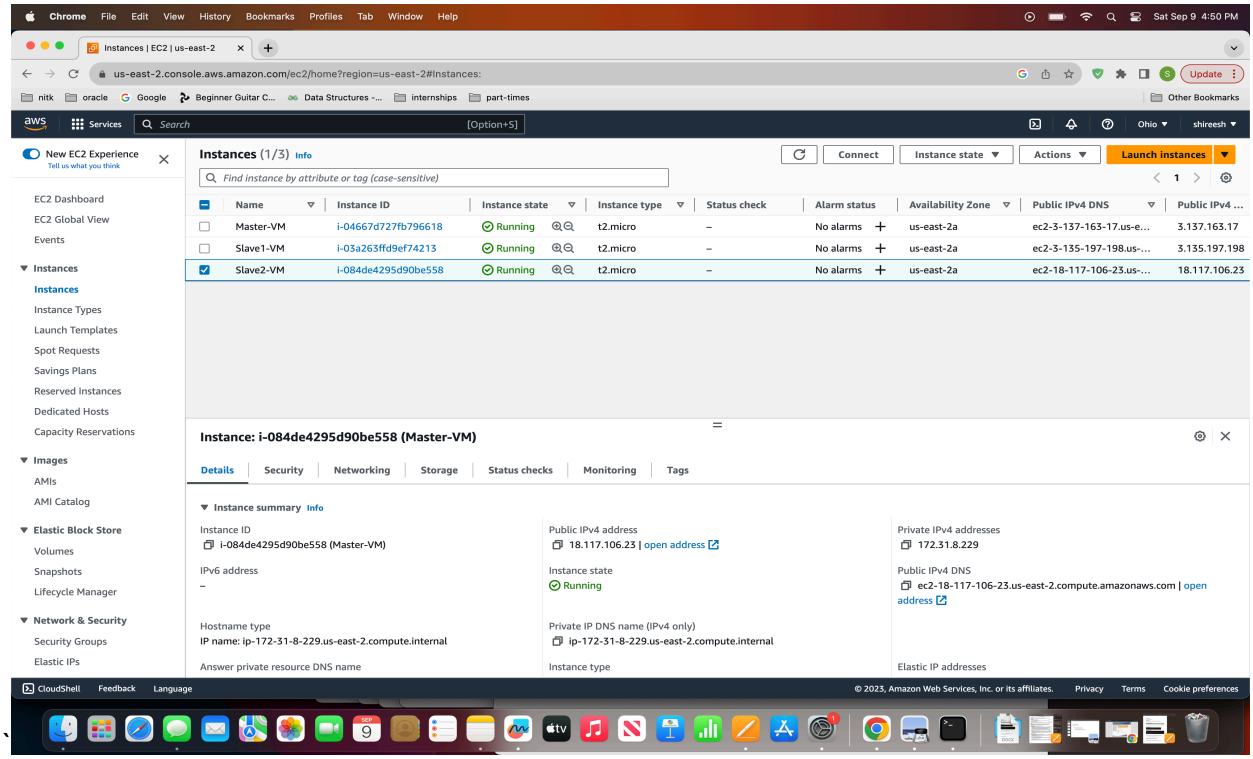
Bhargav Krishna Mullapudi

Shireesh Vennamaneni

Satya Ashish Veda

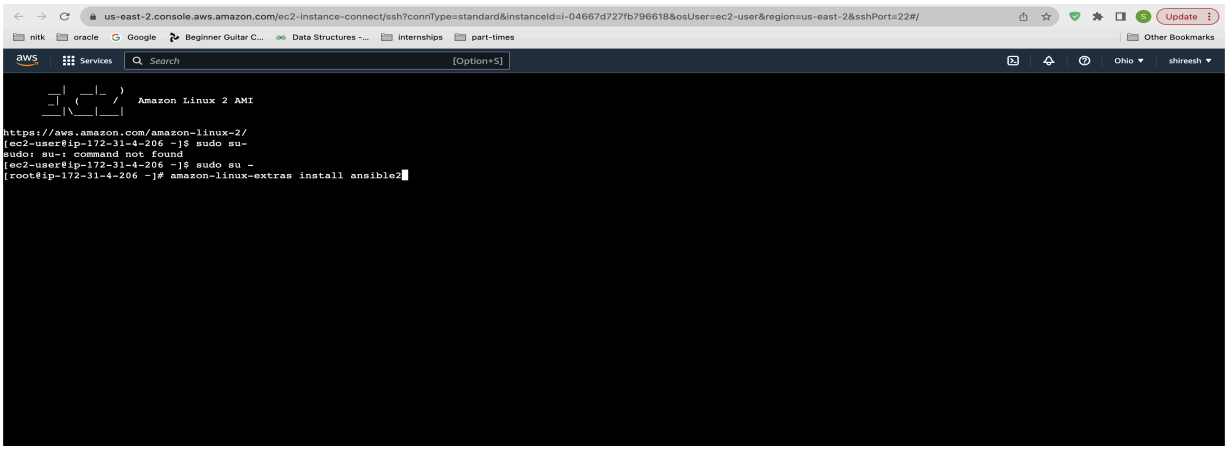
Mohith Girigowdara Girish

- Created 3 AWS Linux 2 EC2 instances
    - 1 Master
    - 2 Slaves



- Ansible is installed on Master VM using the command

  amazon-linux-extras install ansible2



- Verify if Ansible is installed using *ansible –version.*

```
[root@ip-172-31-4-206 ~]# ansible --version
ansible 2.9.23
  config file = /etc/ansible/ansible.cfg
  configured module search path = [u'/root/.ansible/plugins/modules', u'/usr/share/ansible/plugins/modules']
  ansible python module location = /usr/lib/python2.7/site-packages/ansible
  executable location = /usr/bin/ansible
  python version = 2.7.18 (default, Feb 28 2023, 02:51:06) [GCC 7.3.1 20180712 (Red Hat 7.3.1-15)]
[root@ip-172-31-4-206 ~]#
```

- Now that Ansible is installed on master, we need to establish communication to the slave VMs. By default, ssh doesn't work to these VMs. To establish the connection, there are several ways. We are adding the authorization key of Master VM to the authorized keys of Slave1 and Slave2. We generate rsa key pair in Master using *ssh-keygen*

  This will generate id_rsa, id_rsa.pub files. Copy the content from id_rsa.pub and paste the same in the ~/.ssh/authorized_keys

```
[ec2-user@ip-172-31-4-206 .ssh]$ ssh-keygen
Generating public/private rsa key pair.
Enter file in which to save the key (/home/ec2-user/.ssh/id_rsa):
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /home/ec2-user/.ssh/id_rsa.
Your public key has been saved in /home/ec2-user/.ssh/id_rsa.pub.
The key fingerprint is:
SHA256:v5lhvVRhpXjptTusdIdo3zD2+CqzrucFkLkMnANCI6I ec2-user@ip-172-31-4-206.us-east-2.compute.internal
The key's randomart image is:
+---[RSA 2048]----+
|. ..+ .          .|
|.. . o o . o . + |
|E       = + . * .|
|         + o + o.|
|        S o . o. |
|         . . +...|
|          + =.*=.|
|         . B==o*o|
|          ====+o+|
+----[SHA256]-----+
```

```
[ec2-user@ip-172-31-4-206 .ssh]$ cat id_rsa.pub
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAABAQCvBx0f8yloJ6ClYyLy8IzdL4AtXBSQUmifa2midIq3onSfqpmzukeBbSSTFpItKLrDv67NHy42zkzANkiLhRXrw76LDkdCygYV23ky49m0PEFwzRR8+s8qY3WMiNWVWQ9LIsn4yPIzogLJrdSbBtj6
hnyYVkQ+XEi2b1EAFoxsQj1axXORkrfieLJcegynz7dJsrveL2vHr+5+z7t5ybDcniCyYaqUvS6Ss6jw9cphTw/eXWDOkhWUrvcPyoJcvK8yOhBjrip9rLAdQLPodSyHgqCje+foXn3hACnX8TeoYA4arrMhepeR8FESoQSX7zEmHcoSlbKV+fHEfJLm
779B ec2-user@ip-172-31-4-206.us-east-2.compute.internal
```

```
[ec2-user@ip-172-31-0-243 .ssh]$ cat authorized_keys
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAABAQDlS+focYKDvQtw9p+2N10GzR5OyvOk0dZPWBaUO8G3efVXBaUMcA8fpDaD9EQ6Mlpy9wNwtXmesXhlcksg4yYRyRDfqiHoknwE6hkhwORiAnE9kwKn7j+rK65tqrViXWvgqEi1TVmtFWhhVik/coMb
6zwb4cMCYQQQYReIvMahj08EpQ8RZlVNwAWXsyQGpgeAKIXLdFNib2l2sNYuNrgPqU9pAQstKXvKdQNNNlUaR4XXr7IJi/K2S2qIQvv/p6LrfupsGWlblWNDdYugJl5uIYXmlYbTezrucVPlifiDjiRU2p00t90MshHFc5Q4/8jE7EuSzOIUGwc7wGBv
d3il first-key-pair
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAABAQCvBx0f8yloJ6ClYyLy8IzdL4AtXBSQUmifa2midIq3onSfqpmzukeBbSSTFpItKLrDv67NHy42zkzANkiLhRXrw76LDkdCygYV23ky49m0PEFwzRR8+s8qY3WMiNWVWQ9LIsn4yPIzogLJrdSbBtj6
hnyYVkQ+XEi2b1EAFoxsQj1axXORkrfieLJcegynz7dJsrveL2vHr+5+z7t5ybDcniCyYaqUvS6Ss6jw9cphTw/eXWDOkhWUrvcPyoJcvK8yOhBjrip9rLAdQLPodSyHgqCje+foXn3hACnX8TeoYA4arrMhepeR8FESoQSX7zEmHcoSlbKV+fHEfJLm
779B ec2-user@ip-172-31-4-206.us-east-2.compute.internal
```

- Now, try ssh to the Slave VMs. Make sure it is successful.

```
[ec2-user@ip-172-31-4-206 .ssh]$ ssh ec2-3-135-197-198.us-east-2.compute.amazonaws.com
The authenticity of host 'ec2-3-135-197-198.us-east-2.compute.amazonaws.com (172.31.0.243)' can't be established.
ECDSA key fingerprint is SHA256:gf+OK/MLaPn86XAxIO8VaGV9N0c3hBVr3AKvBU/jOIM.
ECDSA key fingerprint is MD5:2f:18:33:d4:83:6e:88:11:f6:2a:70:40:9d:36:97:65.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added 'ec2-3-135-197-198.us-east-2.compute.amazonaws.com,172.31.0.243' (ECDSA) to the list of known hosts.
Last login: Sat Sep  9 23:58:10 2023 from ec2-3-16-146-4.us-east-2.compute.amazonaws.com

       __|  __|_  )
       _|  (     /   Amazon Linux 2 AMI
      ___|\___|___|

https://aws.amazon.com/amazon-linux-2/
5 package(s) needed for security, out of 22 available
Run "sudo yum update" to apply all updates.
[ec2-user@ip-172-31-0-243 ~]$
```

- Now, list the IP addresses of Slave VMs in */etc/ansible/hosts* file

```
## blue.example.com
## 192.168.100.1
## 192.168.100.10

# Ex 2: A collection of hosts belonging to the 'webservers' group

## [webservers]
## alpha.example.org
## beta.example.org
## 192.168.1.100
## 192.168.1.110

# If you have multiple hosts following a pattern you can specify
# them like this:

## www[001:006].example.com

# Ex 3: A collection of database servers in the 'dbservers' group

## [dbservers]
##
## db01.intranet.mydomain.net
## db02.intranet.mydomain.net
## 10.25.1.56
## 10.25.1.57

# Here's another example of host ranges, this time there are no
# leading 0s:

## db-[99:101]-node.example.com
[webserver1]
3.135.197.198
[webserver2]
18.117.106.23
"/etc/ansible/hosts" 47L, 1069B
```

We have put VM1 in webserver1 group and VM2 in webserver2 group. Alternatively, we can put both in same group by giving hostnames also.

- Now, try ping to all the servers and see if it is working using the command

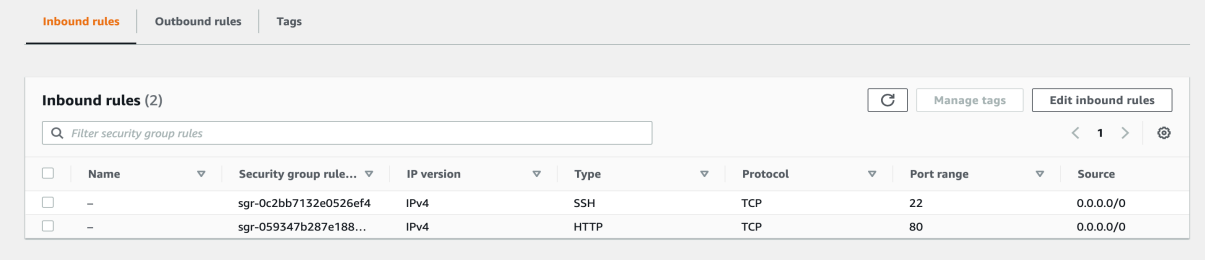
  ansible –m ping all – Will ping to all the servers in the hosts file

```
[ec2-user@ip-172-31-4-206 .ssh]$ ansible -m ping all
[WARNING]: Platform linux on host 18.223.106.66 is using the discovered Python interpreter at /usr/bin/python, but future installation of another Python interpreter could change this. See
https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html for more information.
18.223.106.66 | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python"
    },
    "changed": false,
    "ping": "pong"
}
[WARNING]: Platform linux on host 18.119.121.39 is using the discovered Python interpreter at /usr/bin/python, but future installation of another Python interpreter could change this. See
https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html for more information.
18.119.121.39 | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python"
    },
    "changed": false,
    "ping": "pong"
}
```

- Now, create a playbook file that connects to the servers, installs apache webserver on them and sends the html file to the servers. The HTML file sends 1 or 2 based on the server group.

```
---
- name: Deploy Web Server
  hosts: webserver1:webserver2
  become: yes
  vars:
    slave_num: "{{ '1' if 'webserver1' in group_names else '2' }}"
  tasks:
    - name: Install Apache
      yum:
        name: httpd
        state: present

    - name: Create a html file
      copy:
        content: |
          <!DOCTYPE html>
          <html>
          <head>
              <title>Hello World from SJSU-{{ slave_num }}</title>
          </head>
          <body>
              <h1>Hello World from SJSU-{{ slave_num }}</h1>
          </body>
          </html>
        dest: /var/www/html/index.html

    - name: Start Apache service
      service:
        name: httpd
        state: started
~
~
~
~
"playbook2.yml" [readonly] 30L, 694B
```

- To verify, we need to hit the http url of both the servers. But, for that to work, http on port 80 must be enabled on both the servers. So, edit the security group and add 0.0.0.0/0



- Now, run the playbook file using the command *ansible-playbook playbook2.yml*

```
[ec2-user@ip-172-31-4-206 ansible]$ ansible-playbook playbook2.yml

PLAY [Deploy Web Server] ***********************************************************************************************************************************************************************************************

TASK [Gathering Facts] *************************************************************************************************************************************************************************************************
[WARNING]: Platform linux on host 18.223.106.66 is using the discovered Python interpreter at /usr/bin/python, but future installation of another Python interpreter could change this. See
https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html for more information.
ok: [18.223.106.66]
[WARNING]: Platform linux on host 18.119.121.39 is using the discovered Python interpreter at /usr/bin/python, but future installation of another Python interpreter could change this. See
https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html for more information.
ok: [18.119.121.39]

TASK [Install Apache] **************************************************************************************************************************************************************************************************
ok: [18.119.121.39]
ok: [18.223.106.66]

TASK [Create a html file] **********************************************************************************************************************************************************************************************
ok: [18.223.106.66]
ok: [18.119.121.39]

TASK [Start Apache service] ********************************************************************************************************************************************************************************************
changed: [18.223.106.66]
changed: [18.119.121.39]

PLAY RECAP *************************************************************************************************************************************************************************************************************
18.119.121.39              : ok=4    changed=1    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
18.223.106.66              : ok=4    changed=1    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
```

- Verify http to VM1

Hello World from SJSU-1

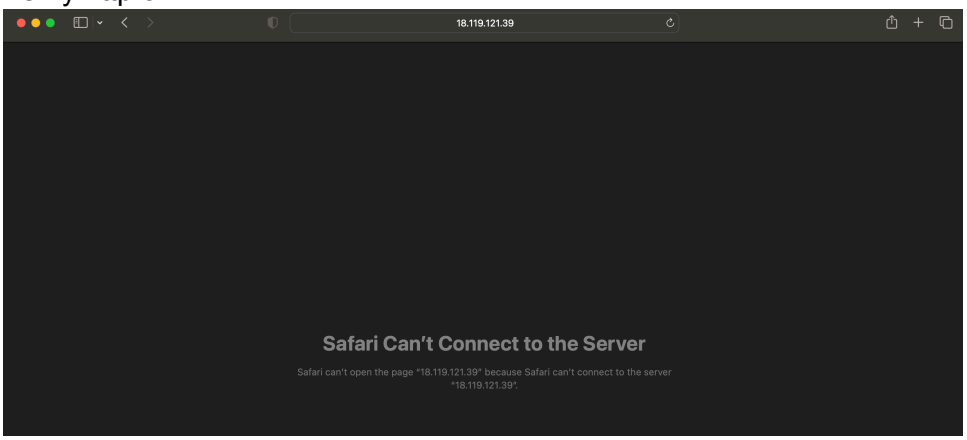
- Verify http to VM2

Hello World from SJSU-2

- Now, run the undeploy playbook and verify the same again

```
[ec2-user@ip-172-31-4-206 ansible]$ ansible-playbook playbook_undeploy.yml

PLAY [Deploy Web Server] ***********************************************************************************************************************************************************************

TASK [Gathering Facts] *************************************************************************************************************************************************************************
[WARNING]: Platform linux on host 18.119.121.39 is using the discovered Python interpreter at /usr/bin/python, but future installation of another Python interpreter could change this. See
https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html for more information.
ok: [18.119.121.39]
[WARNING]: Platform linux on host 18.223.106.66 is using the discovered Python interpreter at /usr/bin/python, but future installation of another Python interpreter could change this. See
https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html for more information.
ok: [18.223.106.66]

TASK [Stop Apache service] *********************************************************************************************************************************************************************
changed: [18.119.121.39]
changed: [18.223.106.66]

TASK [Remove index.html file] ******************************************************************************************************************************************************************
changed: [18.119.121.39]
changed: [18.223.106.66]

PLAY RECAP *************************************************************************************************************************************************************************************
18.119.121.39              : ok=3    changed=2    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
18.223.106.66              : ok=3    changed=2    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
```

- Verify http on VM



- Verify http on VM2