

# Configure apache2 server using Ansible roles

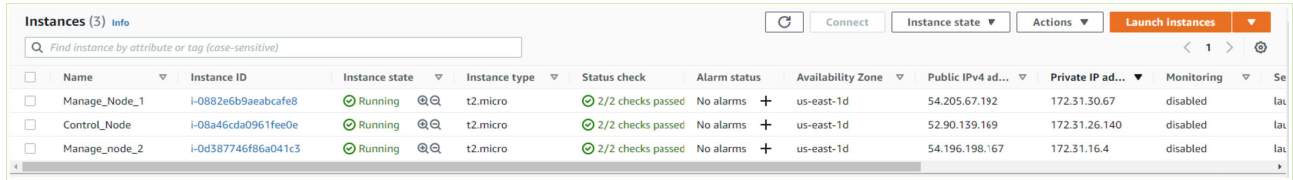
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## Step 1 :: Creating EC2 instances

Create three EC2 instances and name it as below

1. Ansible\_Control\_Node
2. Ansible\_Manage\_Node\_1
3. Ansible\_Manage\_Node\_2



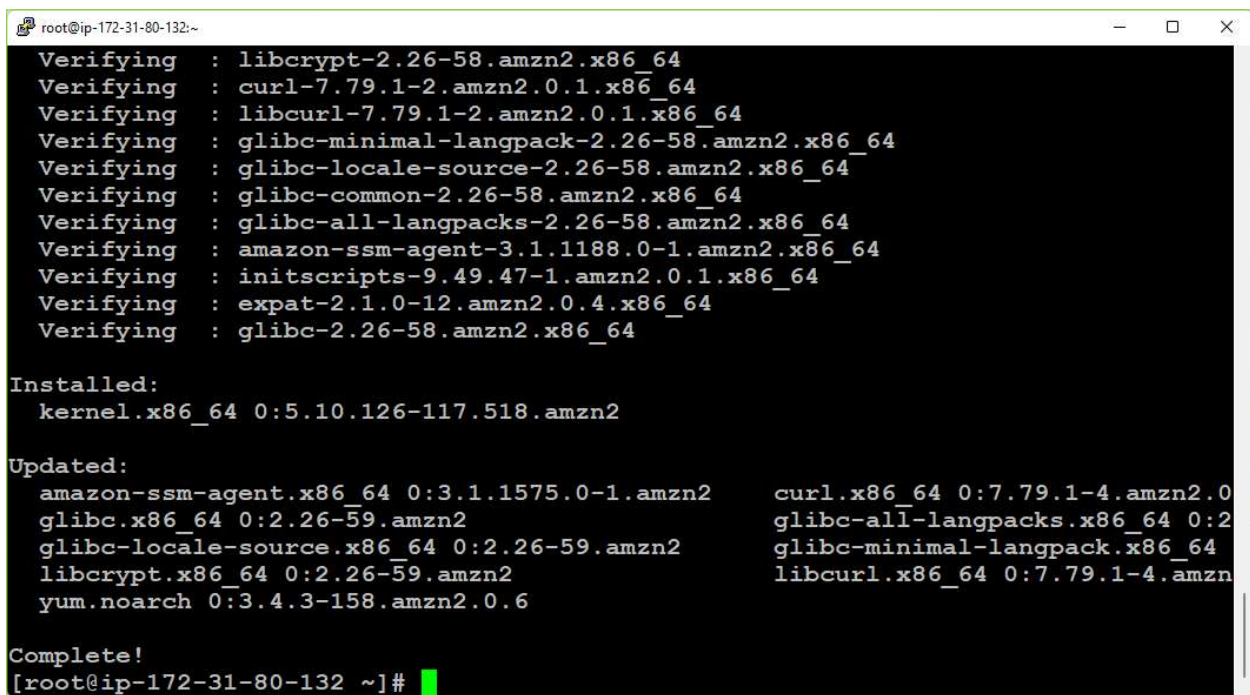
Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 ad...	Private IP ad...	Monitoring	Se
Manage_Node_1	i-0882e6b9aeabcafe8	Running	t2.micro	2/2 checks passed	No alarms	us-east-1d	54.205.67.192	172.31.30.67	disabled	lau
Control_Node	i-08a46cda0961fee0e	Running	t2.micro	2/2 checks passed	No alarms	us-east-1d	52.90.139.169	172.31.26.140	disabled	lau
Manage_node_2	i-0d387746f86a041c3	Running	t2.micro	2/2 checks passed	No alarms	us-east-1d	54.196.198.167	172.31.16.4	disabled	lau

## Step 2 :: Installing Ansible

Install Ansible in Ansible\_Control\_Node

Update the rhel repo to latest

```
# yum update -y
```



```
root@ip-172-31-80-132:~  
Verifying : libcrypt-2.26-58.amzn2.x86_64  
Verifying : curl-7.79.1-2.amzn2.0.1.x86_64  
Verifying : libcurl-7.79.1-2.amzn2.0.1.x86_64  
Verifying : glibc-minimal-langpack-2.26-58.amzn2.x86_64  
Verifying : glibc-locale-source-2.26-58.amzn2.x86_64  
Verifying : glibc-common-2.26-58.amzn2.x86_64  
Verifying : glibc-all-langpacks-2.26-58.amzn2.x86_64  
Verifying : amazon-ssm-agent-3.1.1188.0-1.amzn2.x86_64  
Verifying : initscripts-9.49.47-1.amzn2.0.1.x86_64  
Verifying : expat-2.1.0-12.amzn2.0.4.x86_64  
Verifying : glibc-2.26-58.amzn2.x86_64  
  
Installed:  
kernel.x86_64 0:5.10.126-117.518.amzn2  
  
Updated:  
amazon-ssm-agent.x86_64 0:3.1.1575.0-1.amzn2  
curl.x86_64 0:7.79.1-4.amzn2.0  
glibc.x86_64 0:2.26-59.amzn2  
glibc-all-langpacks.x86_64 0:2.26-59.amzn2  
glibc-locale-source.x86_64 0:2.26-59.amzn2  
glibc-minimal-langpack.x86_64 0:2.26-59.amzn2  
libcrypt.x86_64 0:2.26-59.amzn2  
libcurl.x86_64 0:7.79.1-4.amzn2  
yum.noarch 0:3.4.3-158.amzn2.0.6  
  
Complete!  
[root@ip-172-31-80-132 ~]#
```

## Install Ansible using EPEL Repository

# wget <https://dl.fedoraproject.org/pub/epel/epel-release-latest-7.noarch.rpm>

```
root@ip-172-31-80-132:~  
[root@ip-172-31-80-132 ~]# wget https://dl.fedoraproject.org/pub/epel/epel-release-latest-7.noarch.rpm  
--2022-07-15 05:34:13-- https://dl.fedoraproject.org/pub/epel/epel-release-latest-7.noarch.rpm  
Resolving dl.fedoraproject.org (dl.fedoraproject.org)... 38.145.60.22, 38.145.60.23, 38.145.60.24  
Connecting to dl.fedoraproject.org (dl.fedoraproject.org)|38.145.60.22|:443... connected.  
HTTP request sent, awaiting response... 200 OK  
Length: 15608 (15K) [application/x-rpm]  
Saving to: 'epel-release-latest-7.noarch.rpm'  
  
100%[=====>] 15,608      --.-K/s   in 0s  
  
2022-07-15 05:34:13 (35.3 MB/s) - 'epel-release-latest-7.noarch.rpm' saved [15608/15608]  
  
[root@ip-172-31-80-132 ~]#
```

# yum install -y epel-release-latest-7.noarch.rpm

```
root@ip-172-31-80-132:~  
Installing:  
  epel-release      noarch      7-14      /epel-release-latest-7.noarch      25 k  
  
Transaction Summary  
-----  
Install 1 Package  
  
Total size: 25 k  
Installed size: 25 k  
Is this ok [y/d/N]: y  
Downloading packages:  
Running transaction check  
Running transaction test  
Transaction test succeeded  
Running transaction  
  Installing : epel-release-7-14.noarch      1/1  
  Verifying   : epel-release-7-14.noarch      1/1  
  
Installed:  
  epel-release.noarch 0:7-14  
  
Complete!  
[root@ip-172-31-80-132 ~]#
```

```
# yum update -y
```

```
root@ip-172-31-80-132:~  
From      : /etc/pki/rpm-gpg/RPM-GPG-KEY-EPEL-7  
Running transaction check  
Running transaction test  
Transaction test succeeded  
Running transaction  
  Installing : python2-simplejson-3.11.1-1.el7.x86_64                1/4  
  Installing : 1:python2-lockfile-0.11.0-17.el7.noarch              2/4  
  Erasing    : 1:python-lockfile-0.9.1-4.amzn2.noarch               3/4  
  Erasing    : python-simplejson-3.2.0-1.amzn2.0.2.x86_64           4/4  
  Verifying  : 1:python2-lockfile-0.11.0-17.el7.noarch              1/4  
  Verifying  : python2-simplejson-3.11.1-1.el7.x86_64              2/4  
  Verifying  : 1:python-lockfile-0.9.1-4.amzn2.noarch              3/4  
  Verifying  : python-simplejson-3.2.0-1.amzn2.0.2.x86_64          4/4  
  
Installed:  
  python2-lockfile.noarch 1:0.11.0-17.el7  
  python2-simplejson.x86_64 0:3.11.1-1.el7  
  
Replaced:  
  python-lockfile.noarch 1:0.9.1-4.amzn2  
  python-simplejson.x86_64 0:3.2.0-1.amzn2.0.2  
  
Complete!  
[root@ip-172-31-80-132 ~]#
```

```
# yum install python python-devel python-pip openssl ansible -y
```

```
root@ip-172-31-80-132:~  
Running transaction test  
Transaction test succeeded  
Running transaction  
  Installing : python2-httpplib2-0.18.1-3.el7.noarch                1/5  
  Installing : sshpass-1.06-1.el7.x86_64                          2/5  
  Installing : python-paramiko-2.1.1-0.10.el7.noarch               3/5  
  Installing : ansible-2.9.27-1.el7.noarch                        4/5  
  Installing : python2-pip-20.2.2-1.amzn2.0.3.noarch              5/5  
  Verifying  : python-paramiko-2.1.1-0.10.el7.noarch              1/5  
  Verifying  : python2-pip-20.2.2-1.amzn2.0.3.noarch              2/5  
  Verifying  : sshpass-1.06-1.el7.x86_64                         3/5  
  Verifying  : python2-httpplib2-0.18.1-3.el7.noarch              4/5  
  Verifying  : ansible-2.9.27-1.el7.noarch                        5/5  
  
Installed:  
  ansible.noarch 0:2.9.27-1.el7      python2-pip.noarch 0:20.2.2-1.amzn2.0.3  
  
Dependency Installed:  
  python-paramiko.noarch 0:2.1.1-0.10.el7  
  python2-httpplib2.noarch 0:0.18.1-3.el7  
  sshpass.x86_64 0:1.06-1.el7  
  
Complete!  
[root@ip-172-31-80-132 ~]#
```

```
# amazon-linux-extras install ansible2
```

```
root@ip-172-31-80-132:~  
43 livepatch available [ =stable ]  
44 python3.8 available [ =stable ]  
45 haproxy2 available [ =stable ]  
46 collectd available [ =stable ]  
47 aws-nitro-enclaves-cli available [ =stable ]  
48 R4 available [ =stable ]  
_ kernel-5.4 available [ =stable ]  
50 selinux-ng available [ =stable ]  
51 php8.0 available [ =stable ]  
52 tomcat9 available [ =stable ]  
53 unbound1.13 available [ =stable ]  
54 mariadb10.5 available [ =stable ]  
55 kernel-5.10=latest enabled [ =stable ]  
56 redis6 available [ =stable ]  
57 ruby3.0 available [ =stable ]  
58 postgresql12 available [ =stable ]  
59 postgresql13 available [ =stable ]  
60 mock2 available [ =stable ]  
61 dnsmasq2.85 available [ =stable ]  
62 kernel-5.15 available [ =stable ]  
63 postgresql14 available [ =stable ]  
64 firefox available [ =stable ]  
† Note on end-of-support. Use 'info' subcommand.  
[root@ip-172-31-80-132 ~]#
```

```
# ansible --version
```

```
root@ip-172-31-80-132:~  
[root@ip-172-31-80-132 ~]# ansible --version  
ansible 2.9.27  
  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, May 25 2022, 14:30:51) [GCC 7.3.1 20180712 (Red Hat 7.3.1-15)]  
[root@ip-172-31-80-132 ~]#
```

### Step 3 :: Configuring Ansible in all nodes

```
# useradd ansadmin
```

```
# passwd ansadmin
```

```
root@ip-172-31-80-132:~  
[root@ip-172-31-80-132 ~]# useradd ansadmin  
[root@ip-172-31-80-132 ~]# passwd ansadmin  
Changing password for user ansadmin.  
New password:  
Retype new password:  
passwd: all authentication tokens updated successfully.  
[root@ip-172-31-80-132 ~]#
```



```
# visudo
Add below line
ansadmin    ALL=(ALL) NOPASSWD: ALL
```

```
## Same thing without a password
# ?wheel    ALL=(ALL)        NOPASSWD: ALL
ansadmin    ALL=(ALL)        NOPASSWD: ALL
```

```
# vi /etc/ssh/sshd_config
```

Uncomment the below line  
"PasswordAuthentication yes"

```
# To disable tunneled clear text passwords, change to no here!
PasswordAuthentication yes
#PermitEmptyPasswords no
PasswordAuthentication no
```

```
# service sshd restart
```

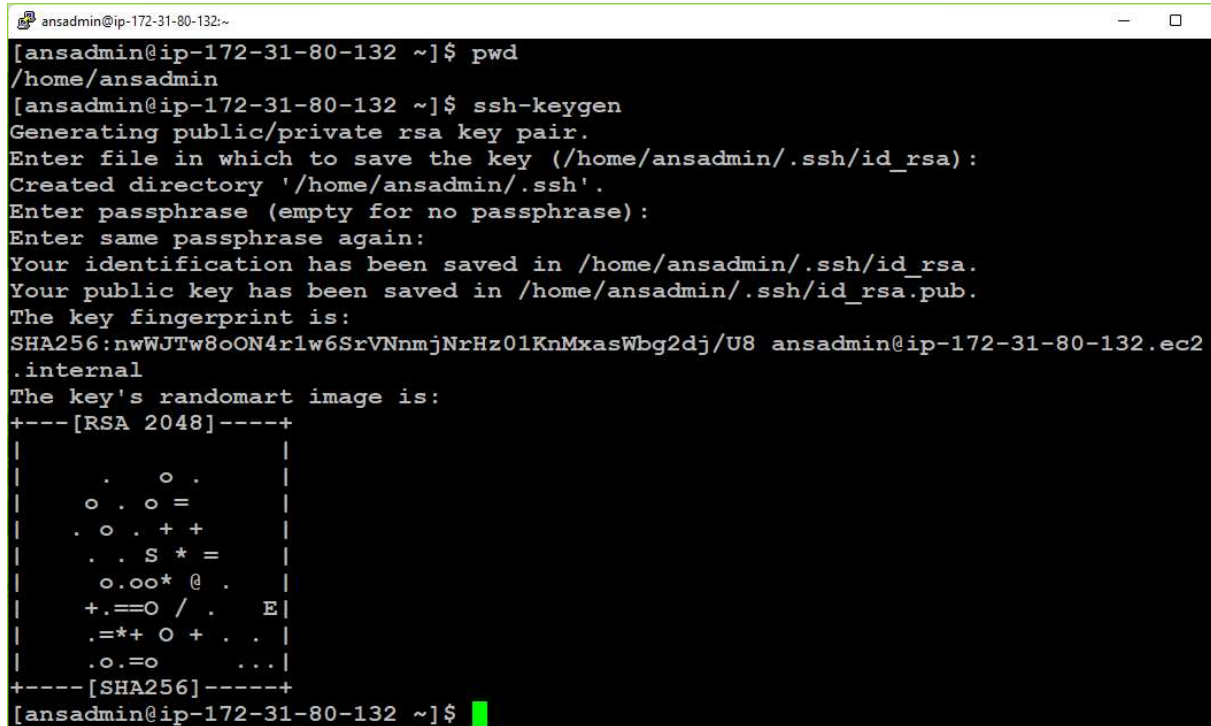
```
root@ip-172-31-80-132:~
[root@ip-172-31-80-132 ~]# service sshd restart
Redirecting to /bin/systemctl restart sshd.service
[root@ip-172-31-80-132 ~]#
```

## Step 4 :: Setup PasswordLess login

Setup PasswordLess login to all the Manage Nodes from Control node via ansadmin user

```
# su - ansadmin
```

```
$ ssh-keygen
```



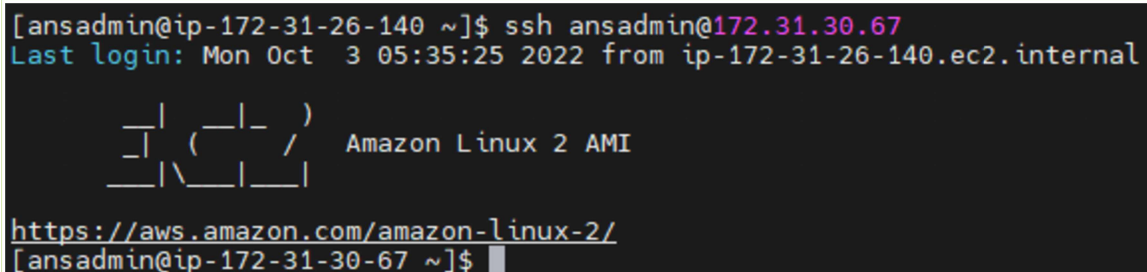
```
ansadmin@ip-172-31-80-132:~  
[ansadmin@ip-172-31-80-132 ~]$ pwd  
/home/ansadmin  
[ansadmin@ip-172-31-80-132 ~]$ ssh-keygen  
Generating public/private rsa key pair.  
Enter file in which to save the key (/home/ansadmin/.ssh/id_rsa):  
Created directory '/home/ansadmin/.ssh'.  
Enter passphrase (empty for no passphrase):  
Enter same passphrase again:  
Your identification has been saved in /home/ansadmin/.ssh/id_rsa.  
Your public key has been saved in /home/ansadmin/.ssh/id_rsa.pub.  
The key fingerprint is:  
SHA256:nwWJT8oON4rlw6SrVNmjNrHz0lKnMxasWbg2dj/U8 ansadmin@ip-172-31-80-132.ec2  
.internal  
The key's randomart image is:  
+---[RSA 2048]-----+  
|  
| . o . |  
| o . o = |  
| . o . + + |  
| . . S * = |  
| o.o.o* @ . |  
| +.==O / . E |  
| .=*+ O + . . |  
| .o.=o ... |  
+---[SHA256]-----+  
[ansadmin@ip-172-31-80-132 ~]$
```

Copy the public key to Manage Nodes

```
$ ssh-copy-id -i /home/ansadmin/.ssh/id_rsa.pub ansadmin@172.31.30.67
```

```
$ ssh-copy-id -i /home/ansadmin/.ssh/id_rsa.pub ansadmin@172.31.16.4
```

Test the PasswordLess login from control node to manage nodes



```
[ansadmin@ip-172-31-26-140 ~]$ ssh ansadmin@172.31.30.67  
Last login: Mon Oct 3 05:35:25 2022 from ip-172-31-26-140.ec2.internal  
  
 _ | ( _ | _ )  
 _ | ( _ | _ ) / Amazon Linux 2 AMI  
 _ | \ _ | _ |  
  
https://aws.amazon.com/amazon-linux-2/  
[ansadmin@ip-172-31-30-67 ~]$
```

```
[ansadmin@ip-172-31-26-140 ~]$ ssh ansadmin@172.31.16.4
Last login: Mon Oct  3 05:35:29 2022 from ip-172-31-26-140.ec2.internal

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

https://aws.amazon.com/amazon-linux-2/
No packages needed for security; 2 packages available
Run "sudo yum update" to apply all updates.
[ansadmin@ip-172-31-16-4 ~]$
```

## Step 5 :: Managing inventory file on Master

Add the below lines at end of file /etc/ansible/hosts

```
# vi /etc/ansible/hosts
```

```
172.31.30.67
172.31.16.4
```

```
[webserver]
172.31.30.67
```

```
[dbserver]
172.31.16.4
```

## Step 6 :: Perform Ping test from Control Node to Manage Nodes from ansadmin user

```
$ ansible all -m ping
```

```
[ansadmin@ip-172-31-26-140 ~]$ ansible all -m ping
[WARNING]: Platform linux on host 172.31.16.4 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.
172.31.16.4 | SUCCESS => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python"
  },
  "changed": false,
  "ping": "pong"
}
[WARNING]: Platform linux on host 172.31.30.67 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.
172.31.30.67 | SUCCESS => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python"
  },
  "changed": false,
  "ping": "pong"
}
[ansadmin@ip-172-31-26-140 ~]$
```

## Step 7 :: Creating a role named apache

Create a role named apache via ansadmin user

```
$ ansible-galaxy init roles/apache
```



```
$ ls -al roles/apache/
```

```
[ansadmin@ip-172-31-26-140 ~]$ ls -al roles/apache/
total 8
drwxrwxr-x 10 ansadmin ansadmin 154 Oct 3 06:36 .
drwxrwxr-x 3 ansadmin ansadmin 20 Oct 3 06:36 ..
drwxrwxr-x 2 ansadmin ansadmin 22 Oct 3 06:36 defaults
drwxrwxr-x 2 ansadmin ansadmin 6 Oct 3 06:36 files
drwxrwxr-x 2 ansadmin ansadmin 22 Oct 3 06:36 handlers
drwxrwxr-x 2 ansadmin ansadmin 22 Oct 3 06:36 meta
-rw-rw-r-- 1 ansadmin ansadmin 1328 Oct 3 06:36 README.md
drwxrwxr-x 2 ansadmin ansadmin 22 Oct 3 06:36 tasks
drwxrwxr-x 2 ansadmin ansadmin 6 Oct 3 06:37 templates
drwxrwxr-x 2 ansadmin ansadmin 39 Oct 3 06:36 tests
-rw-rw-r-- 1 ansadmin ansadmin 539 Oct 3 06:36 .travis.yml
drwxrwxr-x 2 ansadmin ansadmin 22 Oct 3 06:36 vars
[ansadmin@ip-172-31-26-140 ~]$
```

### **Step 8 :: Creating a template**

Create a template to print fqdn and ip address of the server

```
$ vi roles/apache/templates/template.j2
```

My hostname is {{ ansible\_fqdn }} on {{ansible\_default\_ipv4.address}}

### **Step 9 :: Creating tasks**

Create a tasks yaml file to install and configure apache server

```
$ vi roles/apache/tasks/main.yml
```

```
- name: install httpd package
```

```
  yum:
```

```
    name:
```

```
      - httpd
```

```
      - firewalld
```

```
    state: present
```

```
- name: start service httpd
```

```
  service:
```

```
    name: httpd
```

```
    state: started
```

```
    enabled: yes
```

```
- name: start service firewalld
```

```
service:
  name: firewalld
  state: started
  enabled: yes
- name: firewall rule
  firewalld:
    service: http
    state: enabled
    permanent: true
    immediate: yes
- template:
  src: template.j2
  dest: /var/www/html/index.html
```

### ***Step 10 :: Creating the main playbook***

```
$ vi apache_role.yml
```

```
---
```

```
- name: apache deploy
  hosts: all
  roles:
    - apache
```

## Step 11 :: Running the role

\$ ansible-playbook apache\_role.yml

```
[ansadmin@ip-172-31-26-140 ~]$ ansible-playbook apache_role.yml

PLAY [apache deploy] *****

TASK [Gathering Facts] *****
[WARNING]: Platform linux on host 172.31.16.4 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: [172.31.16.4]
[WARNING]: Platform linux on host 172.31.30.67 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: [172.31.30.67]

TASK [apache : install httpd package] *****
ok: [172.31.30.67]
ok: [172.31.16.4]

TASK [apache : start service httpd] *****
ok: [172.31.16.4]
ok: [172.31.30.67]

TASK [apache : start service firewallld] *****
ok: [172.31.30.67]
changed: [172.31.16.4]

TASK [apache : firewall rule] *****
ok: [172.31.30.67]
changed: [172.31.16.4]

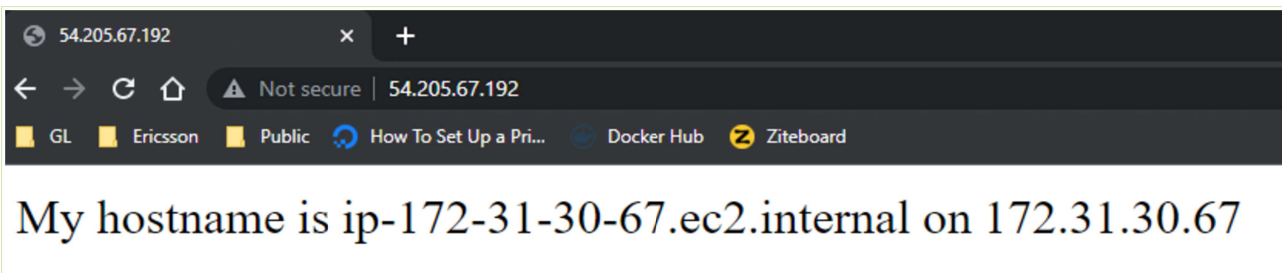
TASK [apache : template] *****
changed: [172.31.16.4]
ok: [172.31.30.67]

PLAY RECAP *****
172.31.16.4      : ok=6    changed=3    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
172.31.30.67    : ok=6    changed=0    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0

[ansadmin@ip-172-31-26-140 ~]$
```

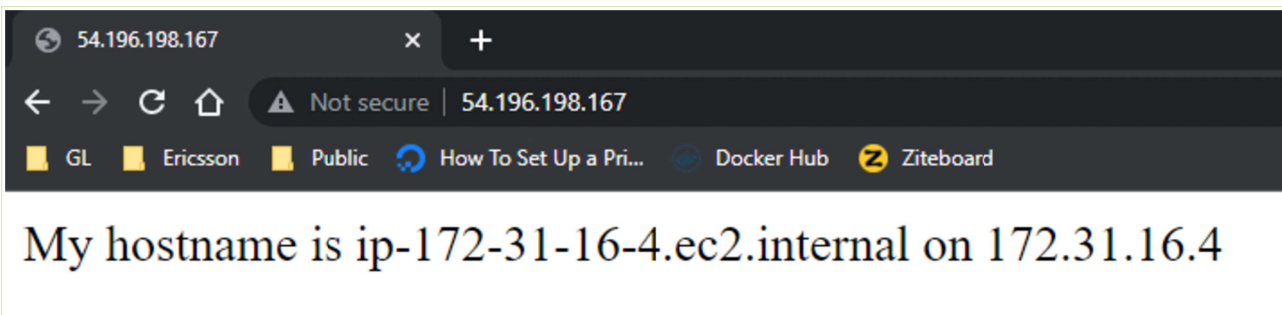
## Step 12 :: Result

Manage\_node\_1



My hostname is ip-172-31-30-67.ec2.internal on 172.31.30.67

Manage\_Node\_2



My hostname is ip-172-31-16-4.ec2.internal on 172.31.16.4