# Fall-2018 CMPE 272 Enterprise Software Platforms

# Assignment- 1(Ansible)

## Assignment Requirements

1) Configure Ansible to deploy webserver, and bring it up a port 80 with a web page that is publically accessible that displays the message: “Hello World”.

2) Include in the Ansible playbook, plays to deploy and undeploy the resources

## Team

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**Program:** Masters in Software Engineering, Spl Data Science

**Github Repository:** https://github.com/SammyDexters/ESP

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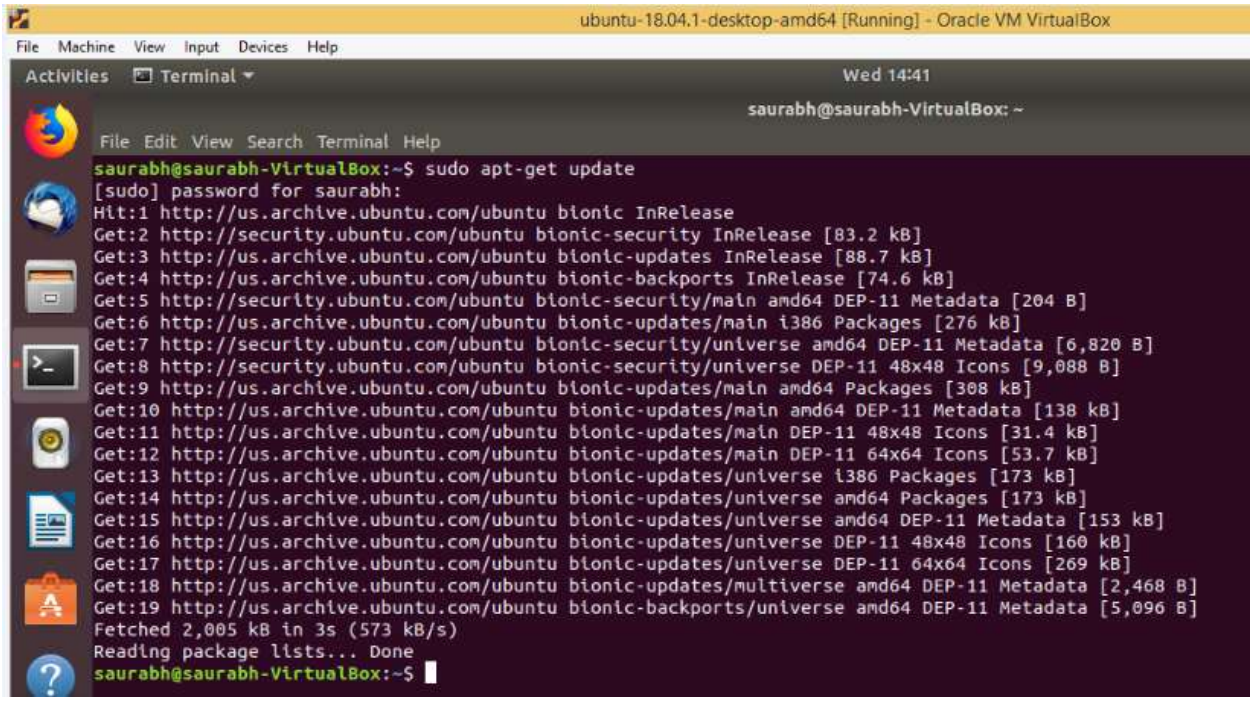
Following is a step by step detailed guide to install Ansible. Then deploy & undeploy required resources with snapshots.

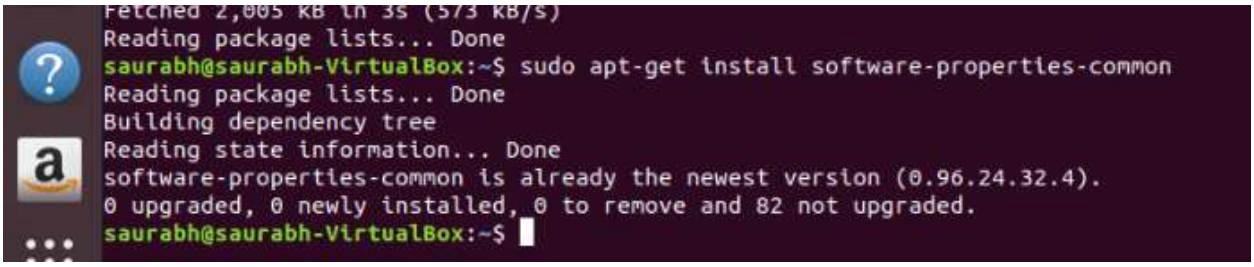
### Installation of Ansible

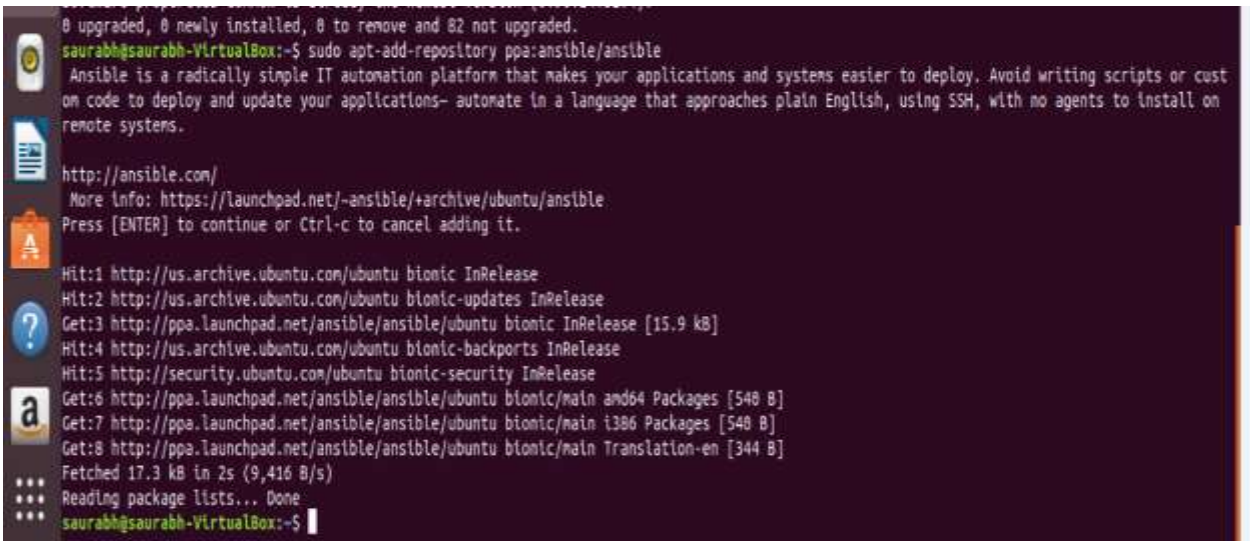
Ansible is open source software that allows, configuration management, application deployment and automation of tasks.

Pre-requisite: Ubuntu machine

Open terminal and use command “apt-get upgrade” that will fetch new versions of packages existing on the machine.  Also upgrade any supporting packages on the system.



## Install Ansible

From the terminal in Ubuntu machine, Install Ansible using the command,

***sudo apt-get install ansible***

```
saurabh@saurabh-VirtualBox:~$ sudo apt-get install ansible
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  libpython-stdlib python python-asn1crypto python-cffi-backe
  python-ipaddress python-jinja2 python-markupsafe python-min
  python-six python-yaml python2.7 python2.7-minimal sshpass
Suggested packages:
  python-doc python-tk python-crypto-doc python-cryptography-
  python-gssapi python-setuptools-doc python2.7-doc binfmt-su
The following NEW packages will be installed:
  ansible libpython-stdlib python python-asn1crypto python-cf
  python-idna python-ipaddress python-jinja2 python-markupsaf
  python-setuptools python-six python-yaml python2.7 python2.
0 upgraded, 23 newly installed, 0 to remove and 82 not upgrad
Need to get 6,783 kB of archives.
After this operation, 43.6 MB of additional disk space will b
Do you want to continue? [Y/n]
```

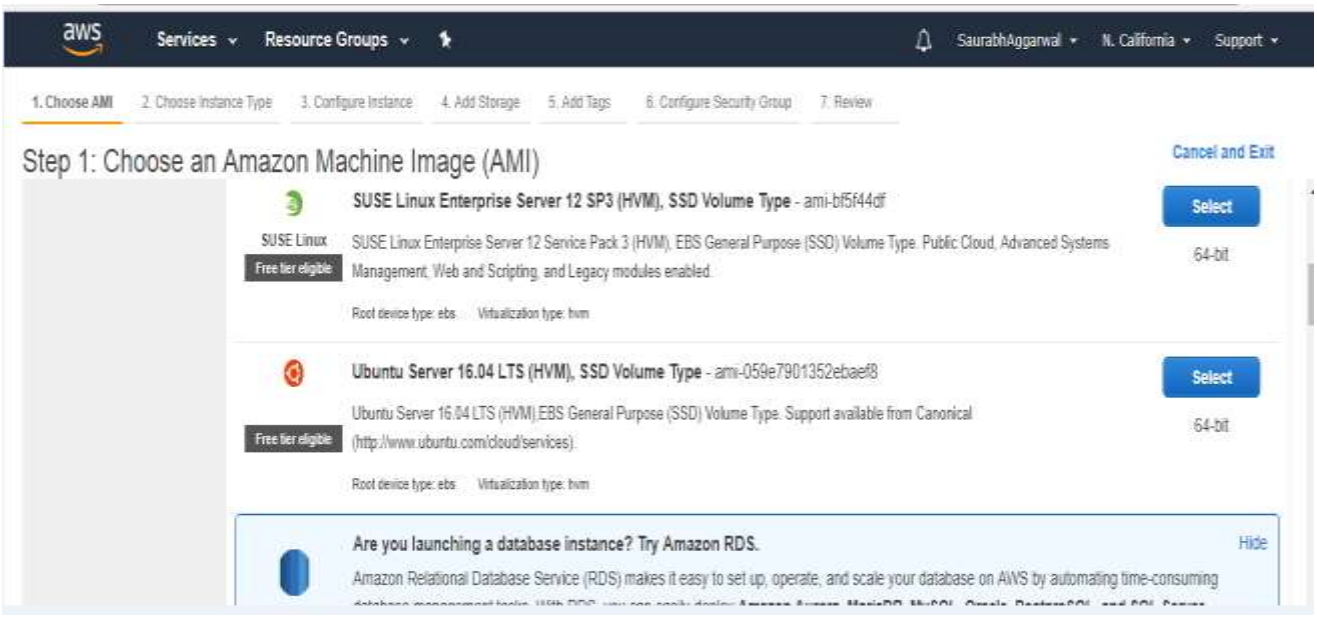
Press **Y** to continue installation of Ansible

```
Do you want to continue? [Y/n] y
Get:1 http://us.archive.ubuntu.com/ubuntu bionic/main amd64 python2.7-minimal amd64 2.7.15~rc1-1 [1,292 kB]
Get:2 http://ppa.launchpad.net/ansible/ansible/ubuntu bionic/main amd64 ansible all 2.6.3-1ppa~bionic [3,498 kB]
Get:3 http://us.archive.ubuntu.com/ubuntu bionic/main amd64 python-minimal amd64 2.7.15~rc1-1 [28.1 kB]
Get:4 http://us.archive.ubuntu.com/ubuntu bionic/main amd64 python2.7 amd64 2.7.15~rc1-1 [238 kB]
Get:5 http://us.archive.ubuntu.com/ubuntu bionic/main amd64 libpython-stdlib amd64 2.7.15~rc1-1 [7,620 B]
Get:6 http://us.archive.ubuntu.com/ubuntu bionic/main amd64 python amd64 2.7.15~rc1-1 [140 kB]
Get:7 http://us.archive.ubuntu.com/ubuntu bionic/main amd64 python-markupsafe amd64 1.0-1build1 [13.0 kB]
Get:8 http://us.archive.ubuntu.com/ubuntu bionic/main amd64 python-jinja2 all 2.10-1 [94.6 kB]
Get:9 http://us.archive.ubuntu.com/ubuntu bionic/main amd64 python-yaml amd64 3.12-1build2 [115 kB]
Get:10 http://us.archive.ubuntu.com/ubuntu bionic/main amd64 python-asn1crypto all 0.24.0-1 [72.7 kB]
Get:11 http://us.archive.ubuntu.com/ubuntu bionic/main amd64 python-cffi-backend amd64 1.11.5-1 [63.4 kB]
Get:12 http://us.archive.ubuntu.com/ubuntu bionic/main amd64 python-enum34 all 1.1.6-2 [34.8 kB]
Get:13 http://us.archive.ubuntu.com/ubuntu bionic/main amd64 python-idna all 2.6-1 [32.4 kB]
Get:14 http://us.archive.ubuntu.com/ubuntu bionic/main amd64 python-ipaddress all 1.0.17-1 [18.2 kB]
Get:15 http://us.archive.ubuntu.com/ubuntu bionic/main amd64 python-six all 1.11.0-2 [11.3 kB]
Get:16 http://us.archive.ubuntu.com/ubuntu bionic-updates/main amd64 python-cryptography amd64 2.1.4-1ubuntu1.2 [221 kB]
Get:17 http://us.archive.ubuntu.com/ubuntu bionic/main amd64 python-pyasn1 all 0.4.2-3 [46.7 kB]
Get:18 http://us.archive.ubuntu.com/ubuntu bionic/main amd64 python-paramiko all 2.0.0-1ubuntu1 [110 kB]
Get:19 http://us.archive.ubuntu.com/ubuntu bionic/main amd64 python-httplib2 all 0.9.2+dfsg-1 [34.6 kB]
Get:20 http://us.archive.ubuntu.com/ubuntu bionic/main amd64 python-crypto amd64 2.6.1-8ubuntu2 [244 kB]
Get:21 http://us.archive.ubuntu.com/ubuntu bionic/main amd64 python-pkg-resources all 39.0.1-2 [128 kB]
Get:22 http://us.archive.ubuntu.com/ubuntu bionic/main amd64 python-setuptools all 39.0.1-2 [329 kB]
Get:23 http://us.archive.ubuntu.com/ubuntu bionic/universe amd64 sshpass amd64 1.06-1 [10.5 kB]
Fetched 6,783 kB in 13s (523 kB/s)
```

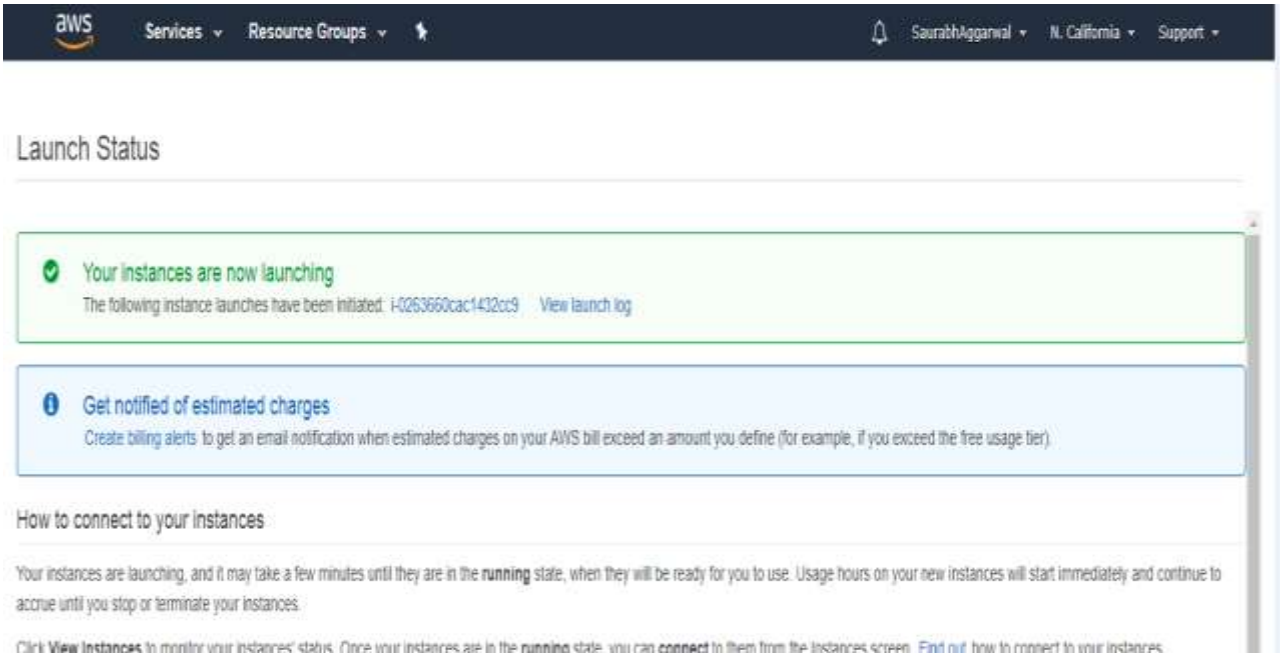
## Create an Amazon EC2 Instance and run

1) To make the web pages, allow accessible on the public domain, the web server is hosted on the amazon-cloud's EC2 instance.

2) Visit https://us-west-1.console.aws.amazon.com/ec2 create an amazon's free student account, along with a username and a password.
3) We chose free version available for Ubuntu Server 16.04 LTS 64 bit, 8GB for our EC2 instance.
4) Choose EC2 and launch an instance
5) Choose Port 80 from the dropdown menu for HTTP:// connection. Visit the Security Groups Tab for the EC2 instance. There edit the rules for enabling the PORT: 80. This will allow the HTTP:// connection requests.
6) EC2 will be running with Public DNS Information as displayed in snapshots.
7) Below are the snapshots for the steps applied from amazon's account.



**Enable Port 80 for HTTP Requests**

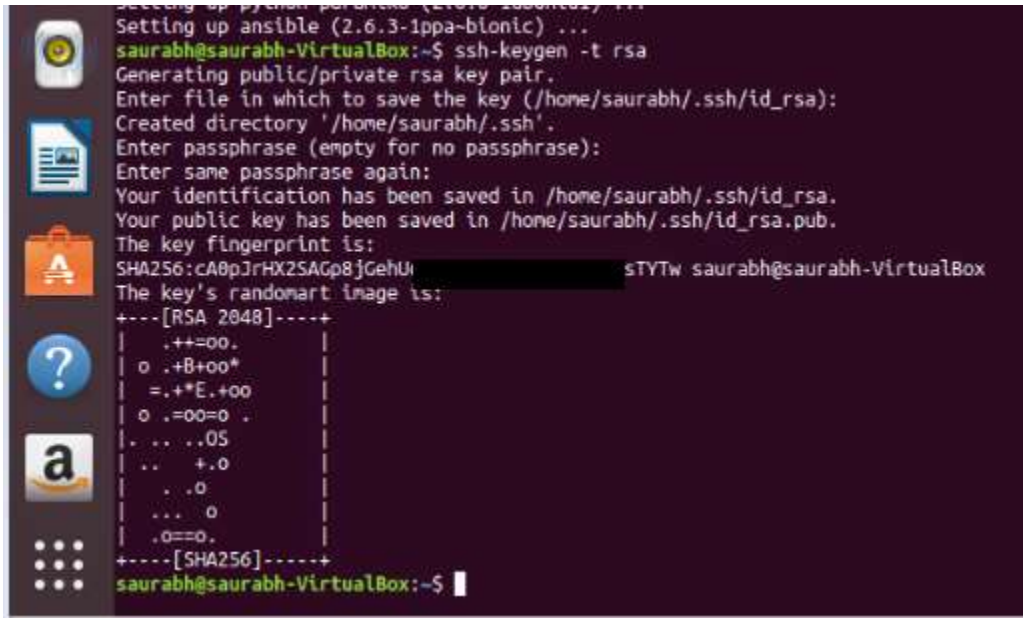

Amazon's EC2 instance is setup and now running and can be accessed with the url

http://ec2-54-193-6-253.us-west-1.compute.amazonaws.com


## SSH Key Generation

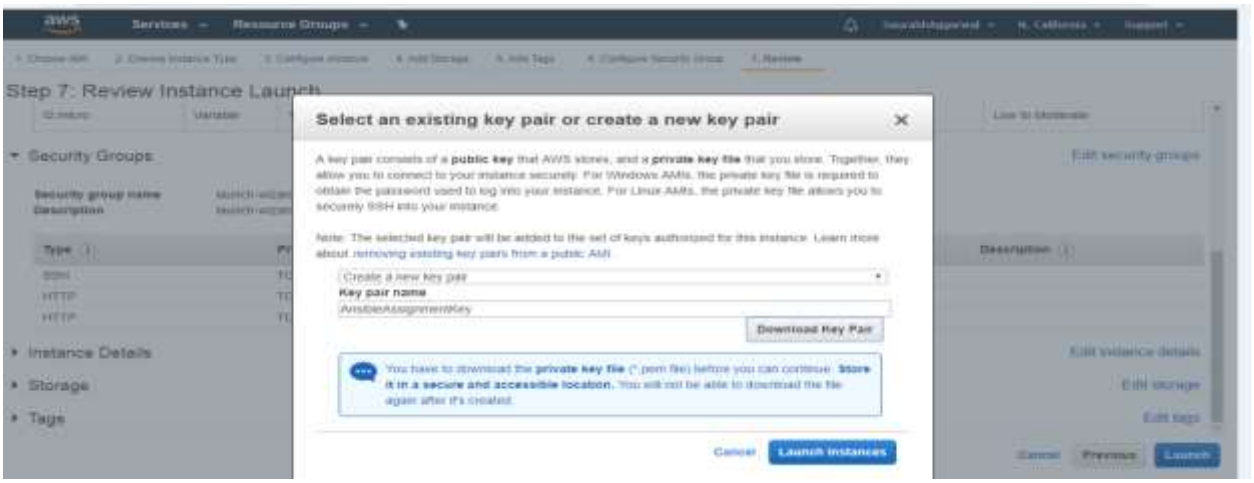
Generate RSA public/private key pair using the following command. SSH keys can be used to establish a secure connection.

***Ssh-keygen –t rsa***




1) Public key so generated will be saved in the location user/.ssh/id_rsa.pub.

2) Permissions will be required to be reduced which are assigned to the ".pem" file as it should only access to privileged users. In our case "AnsibleAssignmnetKey.pem" is the file-name.




3) Run the below command

   ***chmod 400 AnsibleAssignmnetKey.pem***

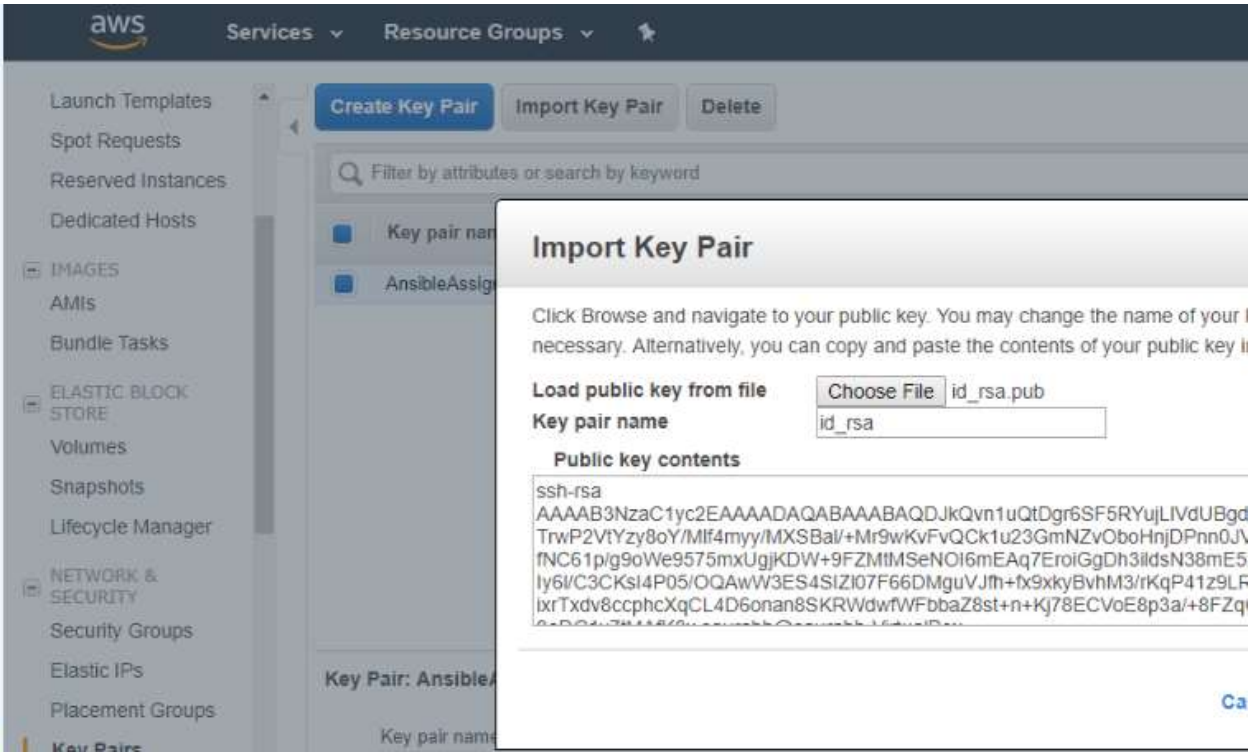
4) To allow communication between our local machine and the Ec2 instance, run the below command to allow the communication.

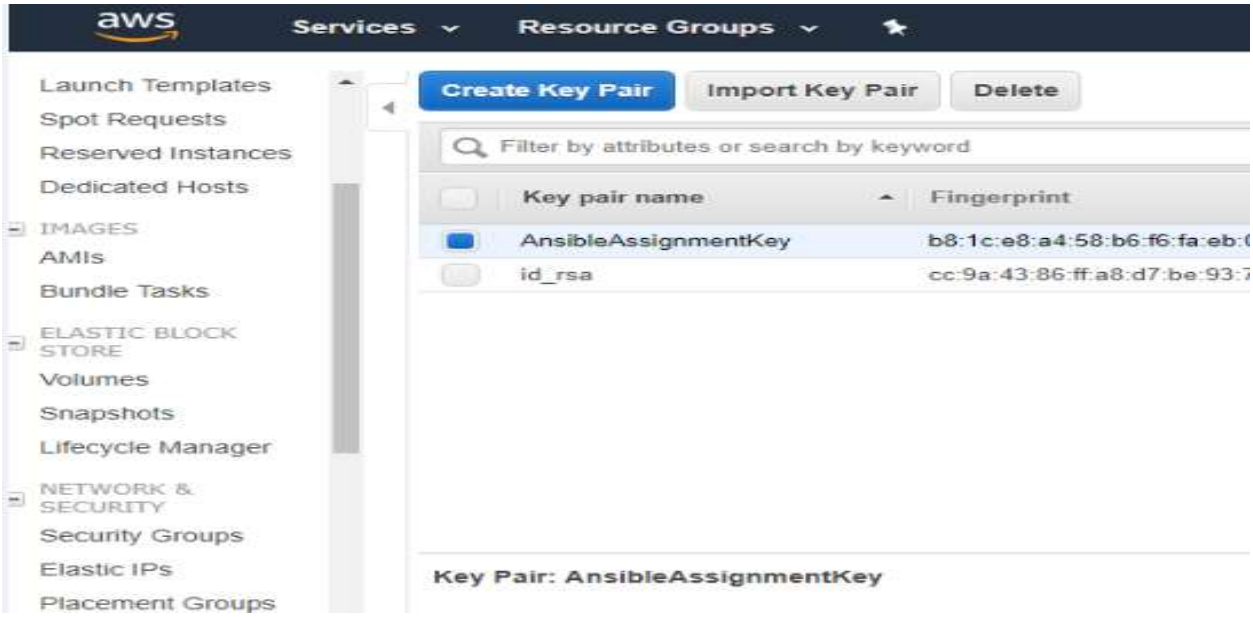
   ***Ssh –i  AnsibleAssignmnetKey.pem ubuntu@IPAddress_Amazon_EC2_Instance***

```
saurabh@saurabh-VirtualBox:~$ ls
Desktop  Documents  Downloads  examples.desktop  Music  Pictures  Public  Templates  Videos
saurabh@saurabh-VirtualBox:~$ cd Desktop
saurabh@saurabh-VirtualBox:~/Desktop$ ls
AnsibleAssignmentKey.pem
saurabh@saurabh-VirtualBox:~/Desktop$ chmod 400 AnsibleAssignmentKey.pem
saurabh@saurabh-VirtualBox:~/Desktop$ ssh -i AnsibleAssignmentKey.pem ubuntu@54.193.6.253
The authenticity of host '54.193.6.253 (54.193.6.253)' can't be established.
ECDSA key fingerprint is SHA256:itv5WI7RcL7wInf5T1GQgkLRCfOgq3COzcOYeSkDLiE.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '54.193.6.253' (ECDSA) to the list of known hosts.
Welcome to Ubuntu 16.04.5 LTS (GNU/Linux 4.4.0-1065-aws x86_64)

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

  Get cloud support with Ubuntu Advantage Cloud Guest:
    http://www.ubuntu.com/business/services/cloud

0 packages can be updated.
0 updates are security updates.



The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.
```

5) Navigate to AWS Console now and import the public key.

6) In Amazon's EC2 control instance tab look for Network and Security and press Key Pairs tab.
7) Click on Import Key Pair.  Search for the location ssh/id_rsa.pub and import as mentioned below:



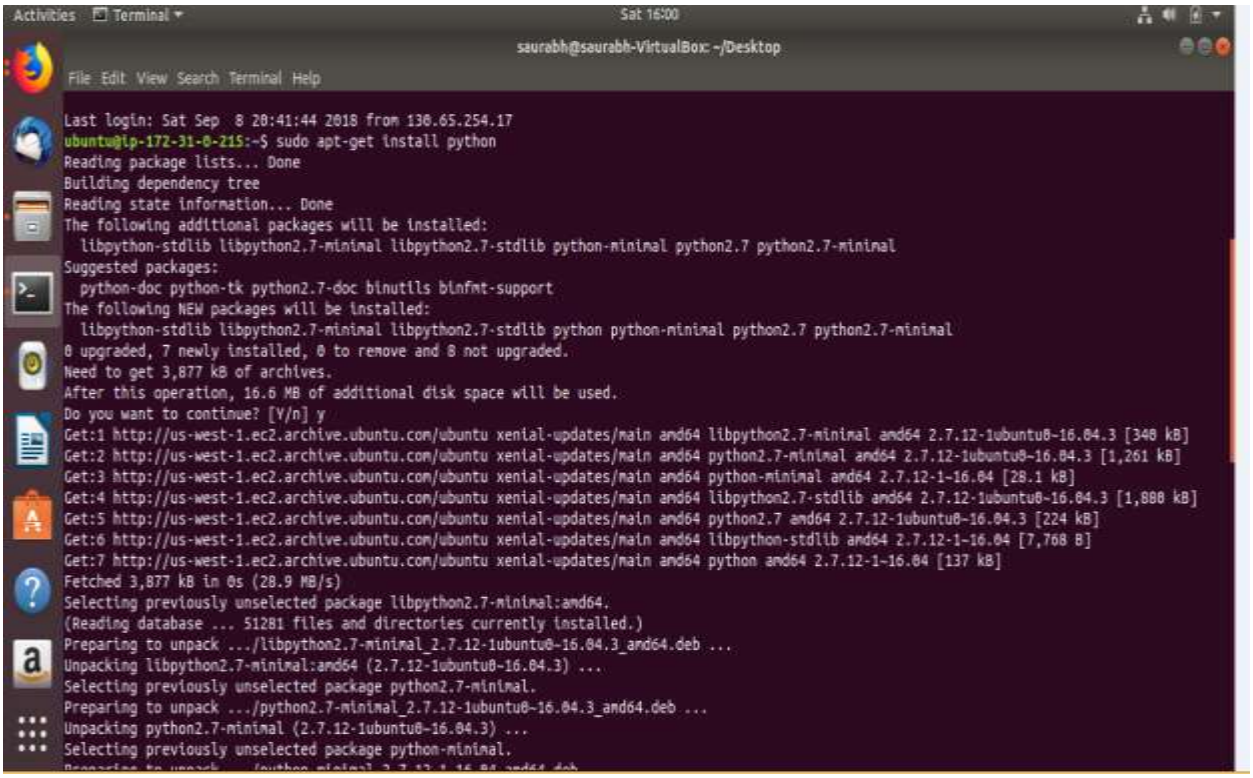




Install VIM for Ubuntu to allow editing in files

```
saurabh@saurabh-VirtualBox:/etc/ansible$ sudo apt-get install vim
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  vim-runtime
Suggested packages:
  ctags vim-doc vim-scripts
The following NEW packages will be installed:
  vim vim-runtime
0 upgraded, 2 newly installed, 0 to remove and 82 not upgraded.
Need to get 6,589 kB of archives.
After this operation, 32.0 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://us.archive.ubuntu.com/ubuntu bionic/main amd64 vim-runtime all 2:8.0.1453-1ubuntu1 [5,437 kB]
Get:2 http://us.archive.ubuntu.com/ubuntu bionic/main amd64 vim amd64 2:8.0.1453-1ubuntu1 [1,152 kB]
Fetched 6,589 kB in 13s (514 kB/s)
Selecting previously unselected package vim-runtime.
(Reading database ... 129726 files and directories currently installed.)
Preparing to unpack .../vim-runtime_2%3a8.0.1453-1ubuntu1_all.deb ...
Adding 'diversion of /usr/share/vim/vim80/doc/help.txt to /usr/share/vim/vim80/doc/help.txt.vim-tiny by vim-runtime'
Adding 'diversion of /usr/share/vim/vim80/doc/tags to /usr/share/vim/vim80/doc/tags.vim-tiny by vim-runtime'
Unpacking vim-runtime (2:8.0.1453-1ubuntu1) ...
Selecting previously unselected package vim.
Preparing to unpack .../vim_2%3a8.0.1453-1ubuntu1_amd64.deb ...
Unpacking vim (2:8.0.1453-1ubuntu1) ...
```

Install Python using the command

***Sudo apt-get install python***



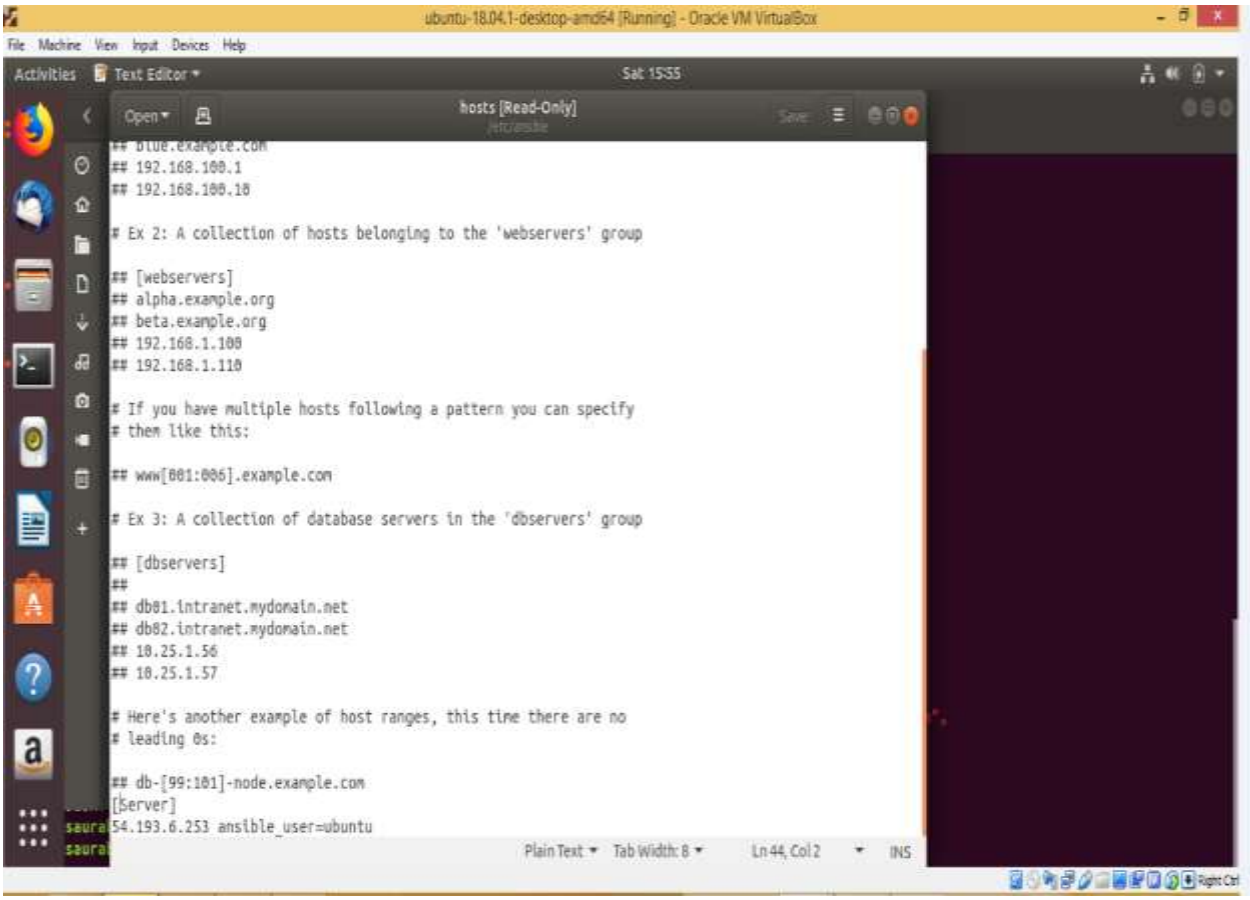

Update the Hosts File, in etc/Ansible/ and provide the server information as following

A “hosts” file in Ansible folder is required give information to Ansible for which hosts or the server to have a communication with.

Go to the directory /etc/Ansible and open the file using vim filename command.

Edit the file with following command now:

**[Server]**
***IPAddress_Server Ansible_user=ubuntu***




Also update the Config File in .ssh/ folder with the following command.


Check Ansible Ping Connection All

```
saurabh@saurabh-VirtualBox:~/Desktop$ ansible -m ping all
54.193.6.253 | SUCCESS => {
    "changed": false,
    "ping": "pong"
}
saurabh@saurabh-VirtualBox:~/Desktop$
```

**Creating a Playbook**

Playbooks are a set of *"YAML"* files that tells the number of tasks which are to be performed on the host being connected to.

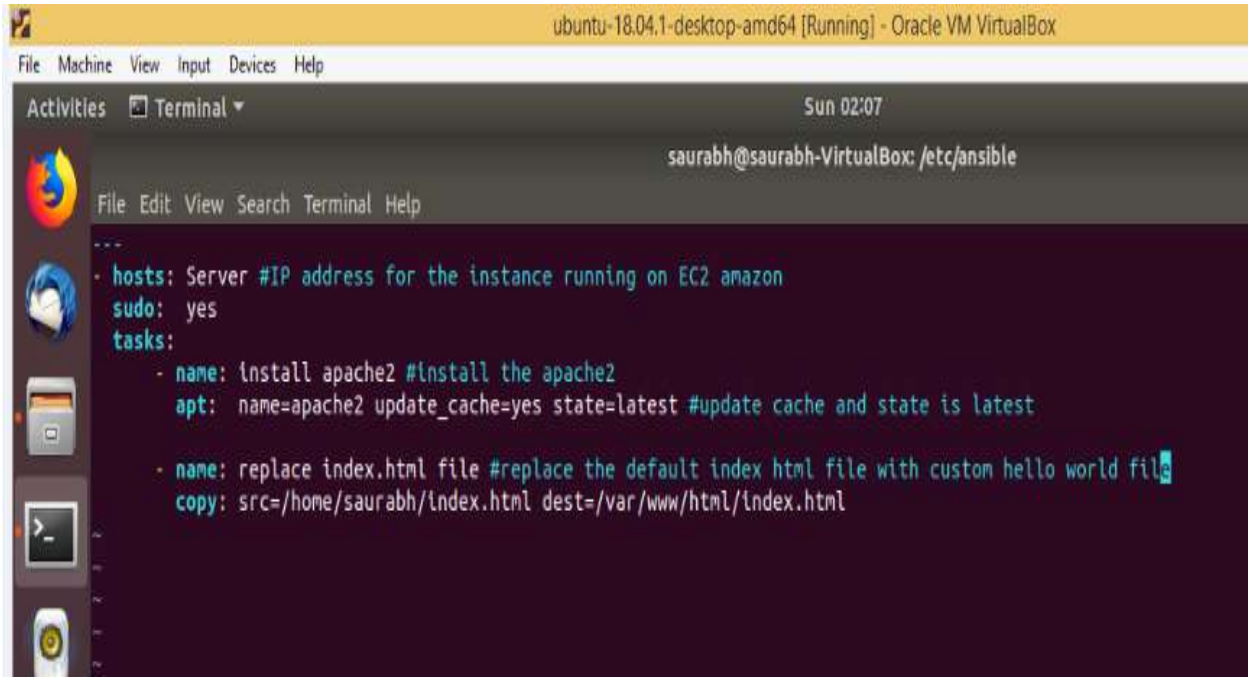
Create a yaml file names- ***"install_resource_apache.yml"***

```
saurabh@saurabh-VirtualBox:~/Desktop$ cd ..
saurabh@saurabh-VirtualBox:~$ cd /etc/ansible
saurabh@saurabh-VirtualBox:/etc/ansible$ sudo vim install_resource_apache.yml
[sudo] password for saurabh:
saurabh@saurabh-VirtualBox:/etc/ansible$ cd ..
saurabh@saurabh-VirtualBox:/etc$ cd ..
```

Create an HTML file called- index.html with the following text- "Hello Ansible World!!"

The file should be placed at /home/Saurabh/index.html

Open the playbook install_resource_apache.yml and insert the commands as following:




This playbook performs the following tasks:

1) **Install apache2** *:* installs the apache2 on the server
2) **[Server] ,** here refers to the hosts information in the hosts file already setup earlier
3) **Replace index.html** will place our index file with message Hello Ansible World to the hosts url at dest address /var/www/html/index.html

**Deploying the Resources**

Run the playbook install_resource_apache.yml using the command

***Ansible-playbook install_resource_apache.yml***

```
saurabh@saurabh-VirtualBox:/etc/ansible$ ansible-playbook install_resource_apach
e.yml
[DEPRECATION WARNING]: Instead of sudo/sudo_user, use become/become_user and
make sure become_method is 'sudo' (default). This feature will be removed in
version 2.6. Deprecation warnings can be disabled by setting
deprecation_warnings=False in ansible.cfg.

PLAY [Server] ******************************************************************

TASK [Gathering Facts] *********************************************************
ok: [54.193.6.253]

TASK [install apache2] *********************************************************
ok: [54.193.6.253]

PLAY RECAP *********************************************************************
54.193.6.253               : ok=2    changed=0    unreachable=0    failed=0

saurabh@saurabh-VirtualBox:/etc/ansible$
```

Hit the following url now to See the “Hello Ansible World !!” html being displayed after resource deployed yml playbook is run.

http://ec2-54-193-6-253.us-west-1.compute.amazonaws.com


## Undeploying the resources

Create the playbook to undeploy the resources

```
---

- hosts: Server #IP Address for the hosts, EC2 instance running on amazon
  become: true
  gather_facts: true
  sudo: yes

  #tasks for deleteing the html file index.html and unistall the apache server2
  tasks:

    - name: Delete index.html file #task to delete the html file present
      file: path=/var/www/html/index.html state=absent

    - name: uninstall the apache packages that are installed #task to uninstall the apache2 server
      yum: name=httpd state=absent
```

The tasks defined in playbook will delete the index file hosted and will uninstall the apache server instance.

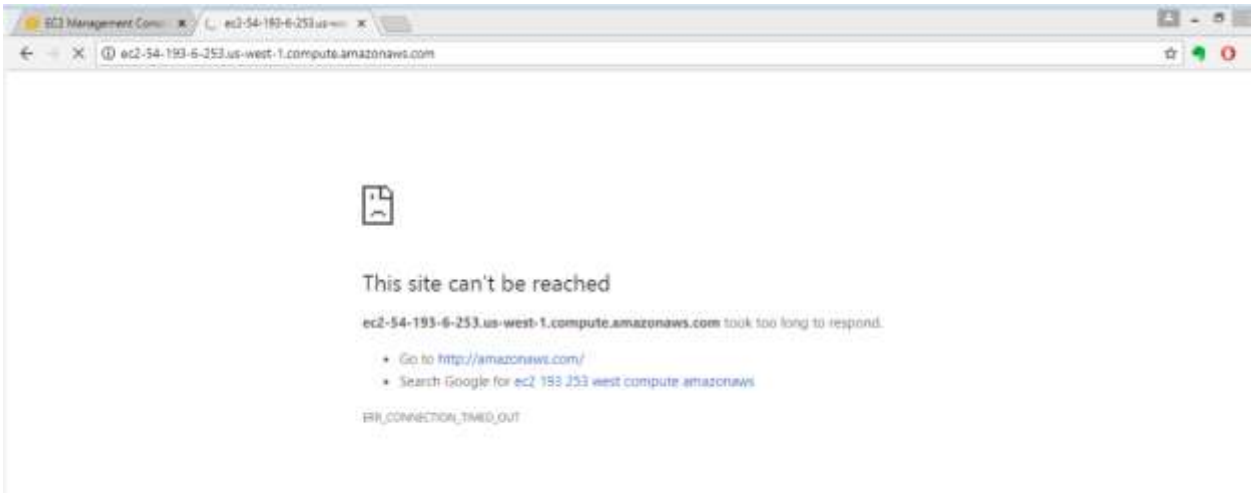
Run the playbook uninstall_resource_apache.yml using the command

***Ansible-playbook uninstall_resource_apache.yml***

```
saurabh@saurabh-VirtualBox:/etc/ansible$ sudo vim uninstall_resource_apache.yml
saurabh@saurabh-VirtualBox:/etc/ansible$ ansible-playbook uninstall_resource_apache.yml
```

```
PLAY [Server] ******************************************************************

TASK [Gathering Facts] *********************************************************
ok: [54.193.6.253]

TASK [apache2] *****************************************************************
ok: [54.193.6.253]

PLAY RECAP *********************************************************************
54.193.6.253               : ok=2    changed=0    unreachable=0    failed=0

saurabh@saurabh-VirtualBox:/etc/ansible$
```

Hit the URL again to see the following output


ec2-54-193-6-253.us-west-1.compute.amazonaws.com
This site can't be reached
ec2-54-193-6-253.us-west-1.compute.amazonaws.com took too long to respond.
Go to http://amazonaws.com/
Search Google for ec2 193 253 west compute amazonaws
ERR_CONNECTION_TIMED_OUT