Cloud Computing LAB FILE

Name:- Patel Yash Pankajbhai

Branch:- ICT(H4)

Roll No. :-19BIT134

Experiment-2

Aim:

To create and access VM instances and demonstrate various components such as EC2, AWS.

Apparatus:

Browser

Theory:

What is Amazon EC2?

Amazon Elastic Compute Cloud (Amazon EC2) provides scalable computing capacity in the Amazon Web Services (AWS) Cloud. Using Amazon EC2 eliminates your need to invest in hardware up front, so you can develop and deploy applications faster. You can use Amazon EC2 to launch as many or as few virtual servers as you need, configure security and networking, and manage storage. Amazon EC2 enables you to scale up or down to handle changes in requirements or spikes in popularity, reducing your need to forecast traffic.

For more information about cloud computing, see What is cloud computing

Procedure:

Set up to use Amazon EC2

Complete the tasks in this section to get set up for launching an Amazon EC2 instance for the first time:

1. Sign up for AWS
2. Create a key pair
3. Create a security group

When you are finished, you will be ready for the Amazon EC2 Getting started tutorial.

Sign up for AWS

When you sign up for Amazon Web Services, your AWS account is automatically signed up for all services in AWS , including Amazon EC2. You are charged only for the services that you use.

With Amazon EC2, you pay only for what you use. If you are a new AWS customer, you can get started with Amazon EC2 for free. For more information, see AWS Free Tier.

If you have an AWS account already, skip to the next task. If you don't have an AWS account, use the following procedure to create one.

To create an AWS account

1. Open https://portal.aws.amazon.com/billing/signup.
2. Follow the online instructions.

Create a key pair

AWS uses public-key cryptography to secure the login information for your instance. A Linux instance has no password; you use a key pair to log in to your instance securely. You specify the name of the key pair when you launch your

instance, then provide the private key when you log in using SSH.

If you haven't created a key pair already, you can create one by using the Amazon EC2 console. Note that if you plan to launch instances in multiple Regions, you'll need to create a key pair in each Region. For more information about Regions, see Regions and Zones.

To create your key pair

1. Open the Amazon EC2 console at https://console.aws.amazon.com/ec2/.
2. In the navigation pane, choose **Key Pairs**.
3. Choose **Create key pair**.
4. For **Name**, enter a descriptive name for the key pair. Amazon EC2 associates the public key with the name that you specify as the key name. A key name can include up to 255 ASCII characters. It can't include leading or trailing spaces.
5. For **Key pair type**, choose either **RSA** or **ED25519**. Note that **ED25519** keys are not supported for Windows instances, EC2 Instance Connect, or EC2 Serial Console.
6. For **Private key file format**, choose the format in which to save the private key. To save the private key in a format that can be used with OpenSSH, choose **pem**. To save the private key in a format that can be used with PuTTY, choose **ppk**.

   If you chose **ED25519** in the previous step, the **Private key file format** options do not appear, and the private key format defaults to **pem**.
7. Choose **Create key pair**.
8. The private key file is automatically downloaded by your browser. The base file name is the name you specified as the name of your key pair, and the file name extension is determined by the file format you chose. Save the private key file in a safe place

Important

This is the only chance for you to save the private key file.

9. If you will use an SSH client on a macOS or Linux computer to connect to your Linux instance, use the following command to set the permissions of your private key file so that only you can read it.

```
chmod 400 my-key-pair.pem
```

If you do not set these permissions, then you cannot connect to your instance using this key pair. For more information, see Error: Unprotected private key file.

For more information, see Amazon EC2 key pairs and Linux instances.

Tutorial: Get started with Amazon EC2 Linux instances

Use this tutorial to get started with Amazon Elastic Compute Cloud (Amazon EC2). You'll learn how to launch, connect to, and use a Linux instance. An *instance* is a virtual server in the AWS Cloud. With Amazon EC2, you can set up and configure the operating system and applications that run on your instance.

When you sign up for AWS, you can get started with Amazon EC2 using the AWS Free Tier. If you created your AWS account less than 12 months ago, and have not already exceeded the free tier benefits for Amazon EC2, it will not cost you anything to complete this tutorial, because we help you select options that are within the free tier benefits. Otherwise, you'll incur the standard Amazon EC2 usage fees from the time that you launch the instance until you terminate the instance (which is the final task of this tutorial), even if it remains idle.

Contents

- Step 2: Connect to your instance
- Step 3: Clean up your instance
- Next steps

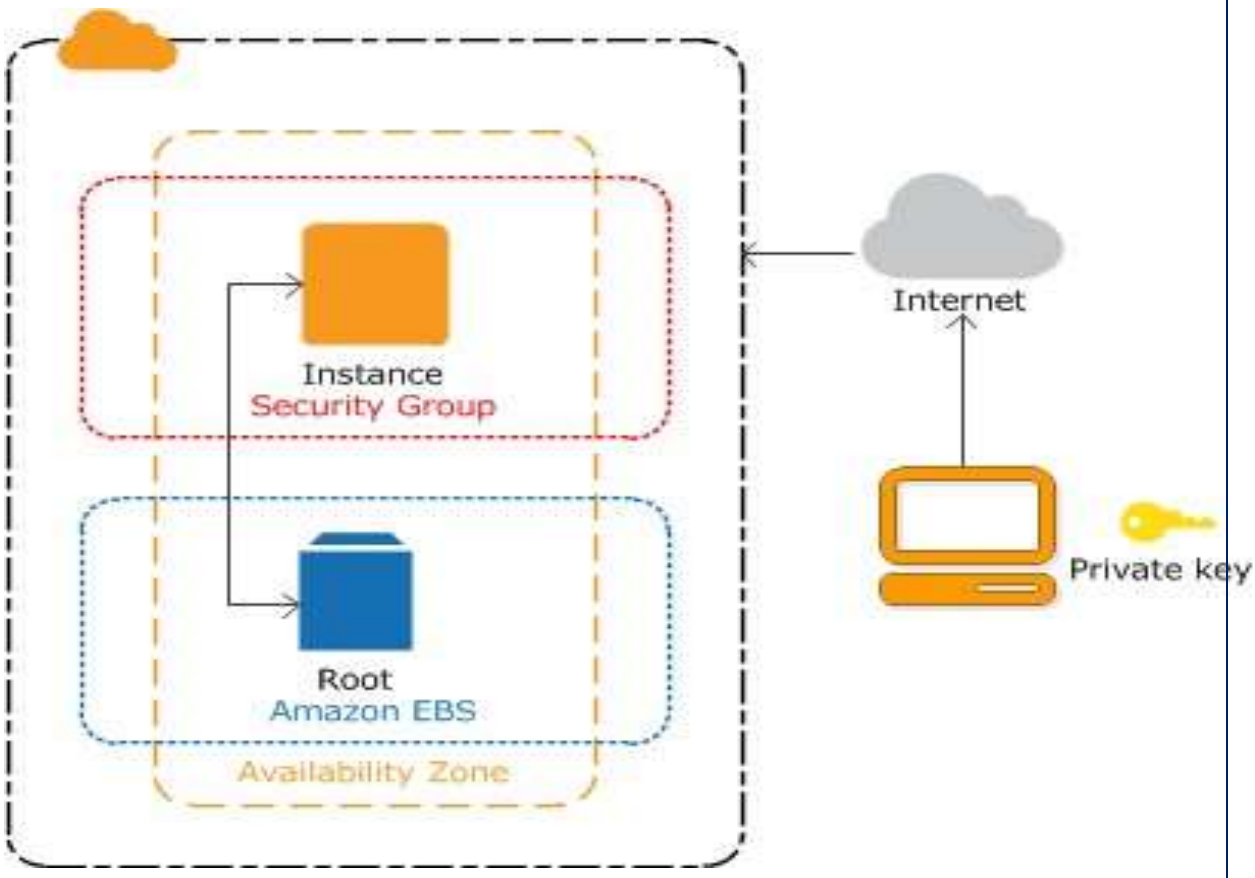
Related tutorials

- If you'd prefer to launch a Windows instance, see this tutorial in the *Amazon EC2 User Guide for Windows Instances*: Get started with Amazon EC2 Windows instances.
- If you'd prefer to use the command line, see this tutorial in the *AWS Command Line Interface User Guide*: Using Amazon EC2 through the AWS CLI.

Overview

The instance is an Amazon EBS-backed instance (meaning that the root volume is an EBS volume). You can either specify the Availability Zone in which your instance runs, or let Amazon EC2 select an Availability Zone for you. You can think of an Availability Zone as an isolated data center.

When you launch your instance, you secure it by specifying a key pair (to prove your identity) and a security group (which acts as a virtual firewall to control ingoing and outgoing traffic). When you connect to your instance, you must specify the private key of the key pair that you specified when launching your instance.



Prerequisites

Before you begin, be sure that you've completed the steps in Set up to use Amazon EC2.

Step 1: Launch an instance

You can launch a Linux instance using the AWS Management Console as described in the following procedure. This tutorial is intended to help you launch your first instance quickly, so it doesn't cover all possible options. For more information about the advanced options, see Launch an instance using the Launch Instance Wizard. For information about other ways to launch your instance, see Launch your instance.

To launch an instance

1. Open the Amazon EC2 console at https://console.aws.amazon.com/ec2/.
2. From the console dashboard, choose **Launch Instance**.

3. The **Choose an Amazon Machine Image (AMI)** page displays a list of basic configurations, called *Amazon Machine Images (AMIs)* that serve as templates for your instance. Select an HVM version of Amazon Linux 2. Notice that these AMIs are marked "Free tier eligible."
4. On the **Choose an Instance Type** page, you can select the hardware configuration of your instance. Select the t2.micro instance type, which is selected by default. The t2.micro instance type is eligible for the free tier. In Regions where t2.micro is unavailable, you can use a t3.micro instance under the free tier. For more information, see AWS Free Tier.
5. On the **Choose an Instance Type** page, choose **Review and Launch** to let the wizard complete the other configuration settings for you.
6. On the **Review Instance Launch** page, under **Security Groups**, you'll see that the wizard created and selected a security group for you. You can use this security group, or alternatively you can select the security group that you created when getting set up using the following steps:

a. Choose **Edit security groups**.
b. On the **Configure Security Group** page, ensure that **Select an existing security group** is selected.
c. Select your security group from the list of existing security groups, and then choose **Review and Launch**.

7. On the **Review Instance Launch** page, choose **Launch**.
8. When prompted for a key pair, select **Choose an existing key pair**, then select the key pair that you created when getting set up.

Warning

Don't select **Proceed without a key pair**. If you launch your instance without a key pair, then you can't connect to it.

When you are ready, select the acknowledgement check box, and then choose **Launch Instances**.

9. A confirmation page lets you know that your instance is launching. Choose **View Instances** to close the confirmation page and return to the console.

10. On the **Instances** screen, you can view the status of the launch. It takes a short time for an instance to launch. When you launch an instance, its initial state is pending. After the instance starts, its state changes to running and it receives a public DNS name. (If the **Public IPv4 DNS** column is hidden, choose the settings icon (⚙) in the top-right corner, toggle on **Public IPv4 DNS**, and choose **Confirm**.
11. It can take a few minutes for the instance to be ready so that you can connect to it. Check that your instance has passed its status checks; you can view this information in the **Status check** column.

Step 2: Connect to your instance

There are several ways to connect to your Linux instance. For more information, see Connect to your Linux instance.

Important

You can't connect to your instance unless you launched it with a key pair for which you have the .pem file and you launched it with a security group that allows SSH access from your computer. If you can't connect to your instance, see Troubleshoot connecting to your instance for assistance.

Step 3: Clean up your instance

After you've finished with the instance that you created for this tutorial, you should clean up by terminating the instance. If you want to do more with this instance before you clean up, see Next steps.

Important

Terminating an instance effectively deletes it; you can't reconnect to an instance after you've terminated it.

If you launched an instance that is not within the AWS Free Tier, you'll stop incurring charges for that instance as soon as the instance status changes to

shutting down or terminated. To keep your instance for later, but not incur charges, you can stop the instance now and then start it again later. For more information, see Stop and start your instance.

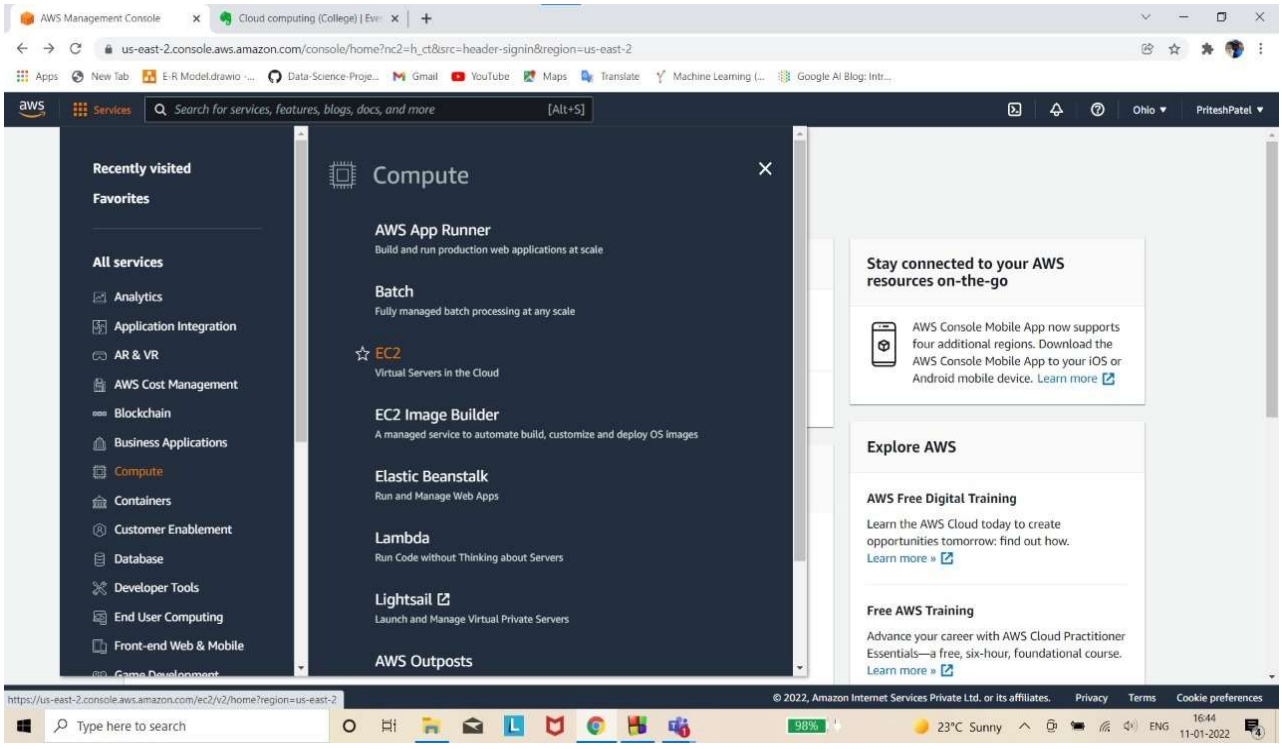
To terminate your instance

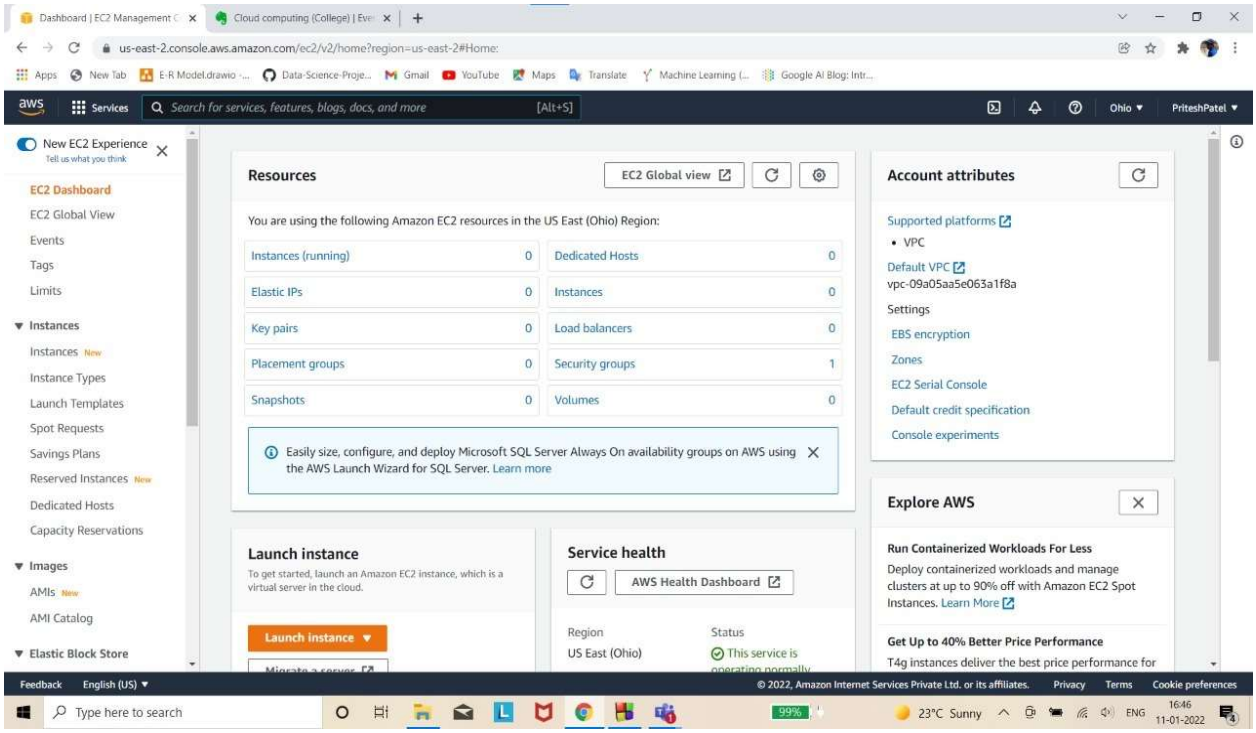
1. In the navigation pane, choose **Instances**. In the list of instances, select the instance.
2. Choose **Instance state**, **Terminate instance**.
3. Choose **Terminate** when prompted for confirmation

For more instruction visit:

https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/get-set-up-for-amazon-ec2.html

Observation: -

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New EC2 Experience
Tell us what you think
EC2 Dashboard
EC2 Global View
Events
Tags
Limits
Instances
Instances New
Instance Types
Launch Templates
Spot Requests
Savings Plans
Reserved Instances New
Dedicated Hosts
Capacity Reservations
Images
AMIs New
AMI Catalog
Elastic Block Store
Resources
EC2 Global view
You are using the following Amazon EC2 resources in the US East (Ohio) Region:
Instances (running) 0
Dedicated Hosts 0
Elastic IPs 0
Instances 0
Key pairs 0
Load balancers 0
Placement groups 0
Security groups 1
Snapshots 0
Volumes 0
Easily size, configure, and deploy Microsoft SQL Server Always On availability groups on AWS using the AWS Launch Wizard for SQL Server. Learn more
Account attributes
Supported platforms
• VPC
Default VPC
vpc-09a05aa5e063a1f8a
Settings
EBS encryption
Zones
EC2 Serial Console
Default credit specification
Console experiments
Explore AWS
Run Containerized Workloads For Less
Deploy containerized workloads and manage clusters at up to 90% off with Amazon EC2 Spot Instances. Learn More
Get Up to 40% Better Price Performance
T4g instances deliver the best price performance for
Launch instance
To get started, launch an Amazon EC2 instance, which is a virtual server in the cloud.
Launch instance
Service health
AWS Health Dashboard
Region
US East (Ohio)
Status
This service is
Feedback
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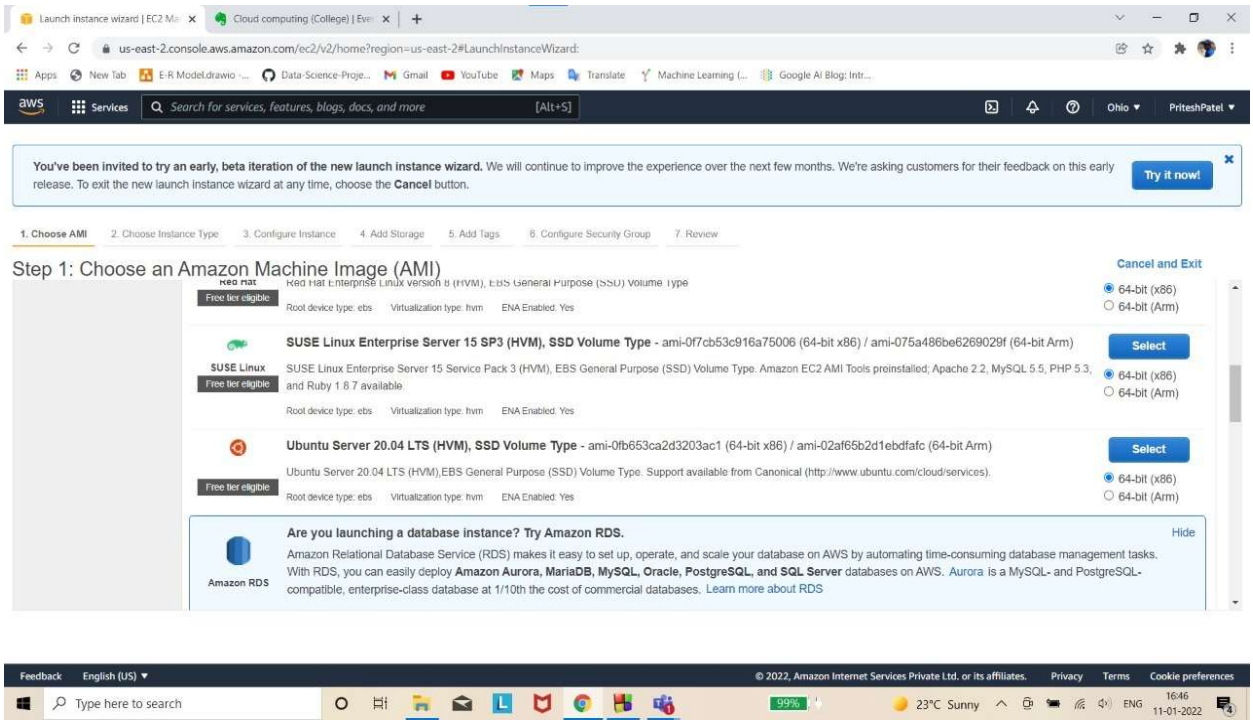
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You've been invited to try an early, beta iteration of the new launch instance wizard. We will continue to improve the experience over the next few months. We're asking customers for their feedback on this early release. To exit the new launch instance wizard at any time, choose the Cancel button.
Try it now!
1. Choose AMI
2. Choose Instance Type
3. Configure Instance
4. Add Storage
5. Add Tags
6. Configure Security Group
7. Review
Step 1: Choose an Amazon Machine Image (AMI)
Cancel and Exit
Red Hat
Free tier eligible
Red Hat Enterprise Linux version 8 (HVM), EBS General Purpose (SSD) Volume Type
Root device type: ebs
Virtualization type: hvm
ENA Enabled: Yes
64-bit (x86)
64-bit (Arm)
SUSE Linux Enterprise Server 15 SP3 (HVM), SSD Volume Type - ami-0f7cb53c916a75006 (64-bit x86) / ami-075a486be6269029f (64-bit Arm)
SUSE Linux
Free tier eligible
SUSE Linux Enterprise Server 15 Service Pack 3 (HVM), EBS General Purpose (SSD) Volume Type. Amazon EC2 AMI Tools preinstalled; Apache 2.2, MySQL 5.5, PHP 5.3, and Ruby 1.8.7 available.
Root device type: ebs
Virtualization type: hvm
ENA Enabled: Yes
Select
64-bit (x86)
64-bit (Arm)
Ubuntu Server 20.04 LTS (HVM), SSD Volume Type - ami-0fb653ca2d3203ac1 (64-bit x86) / ami-02af65b2d1ebdfafc (64-bit Arm)
Ubuntu Server 20.04 LTS (HVM),EBS General Purpose (SSD) Volume Type. Support available from Canonical (http://www.ubuntu.com/cloud/services).
Free tier eligible
Root device type: ebs
Virtualization type: hvm
ENA Enabled: Yes
Select
64-bit (x86)
64-bit (Arm)
Are you launching a database instance? Try Amazon RDS.
Hide
Amazon RDS
Amazon Relational Database Service (RDS) makes it easy to set up, operate, and scale your database on AWS by automating time-consuming database management tasks. With RDS, you can easily deploy Amazon Aurora, MariaDB, MySQL, Oracle, PostgreSQL, and SQL Server databases on AWS. Aurora is a MySQL- and PostgreSQL-compatible, enterprise-class database at 1/10th the cost of commercial databases. Learn more about RDS
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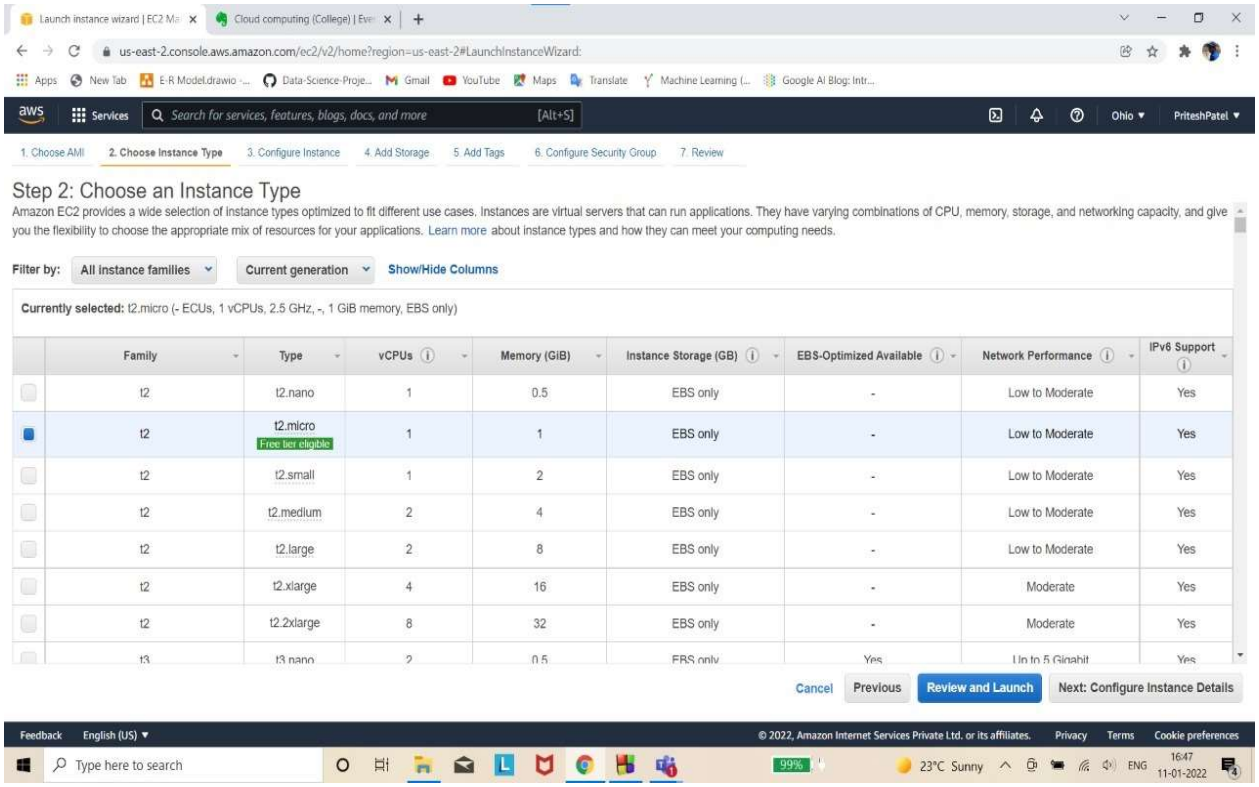
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Ohio
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1. Choose AMI
2. Choose Instance Type
3. Configure Instance
4. Add Storage
5. Add Tags
6. Configure Security Group
7. Review
Step 2: Choose an Instance Type
Amazon EC2 provides a wide selection of instance types optimized to fit different use cases. Instances are virtual servers that can run applications. They have varying combinations of CPU, memory, storage, and networking capacity, and give you the flexibility to choose the appropriate mix of resources for your applications. Learn more about instance types and how they can meet your computing needs.
Filter by:
All instance families
Current generation
Show/Hide Columns
Currently selected: t2.micro (- ECUs, 1 vCPUs, 2.5 GHz, -, 1 GiB memory, EBS only)
Family
Type
vCPUs
Memory (GiB)
Instance Storage (GB)
EBS-Optimized Available
Network Performance
IPv6 Support
t2 t2.nano 1 0.5 EBS only - Low to Moderate Yes
t2 t2.micro Free tier eligible 1 1 EBS only - Low to Moderate Yes
t2 t2.small 1 2 EBS only - Low to Moderate Yes
t2 t2.medium 2 4 EBS only - Low to Moderate Yes
t2 t2.large 2 8 EBS only - Low to Moderate Yes
t2 t2.xlarge 4 16 EBS only - Moderate Yes
t2 t2.2xlarge 8 32 EBS only - Moderate Yes
t3 t3.nano 2 0.5 EBS only Yes Up to 5 Gigabit Yes
Cancel
Previous
Review and Launch
Next: Configure Instance Details
Feedback
English (US)
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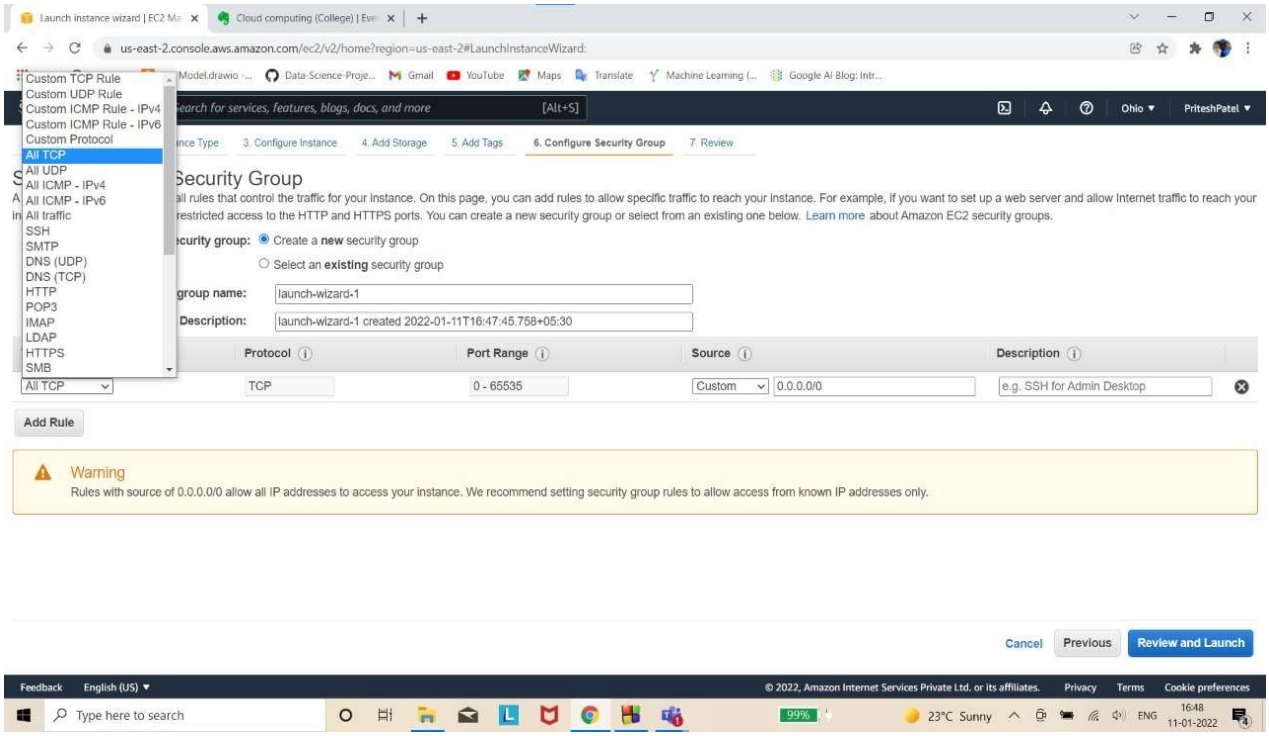
Launch instance wizard | EC2 Ma
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us-east-2.console.aws.amazon.com/ec2/v2/home?region=us-east-2#LaunchInstanceWizard:
Custom TCP Rule
Custom UDP Rule
Custom ICMP Rule - IPv4
Custom ICMP Rule - IPv6
Custom Protocol
All TCP
All UDP
All ICMP - IPv4
All ICMP - IPv6
All traffic
SSH
SMTP
DNS (UDP)
DNS (TCP)
HTTP
POP3
IMAP
LDAP
HTTPS
SMB
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3. Configure Instance
4. Add Storage
5. Add Tags
6. Configure Security Group
7. Review
Security Group
all rules that control the traffic for your instance. On this page, you can add rules to allow specific traffic to reach your instance. For example, if you want to set up a web server and allow Internet traffic to reach your restricted access to the HTTP and HTTPS ports. You can create a new security group or select from an existing one below. Learn more about Amazon EC2 security groups.
curity group:
Create a new security group
Select an existing security group
group name:
launch-wizard-1
Description:
launch-wizard-1 created 2022-01-11T16:47:45.758+05:30
Protocol
Port Range
Source
Description
All TCP
TCP
0 - 65535
Custom
0.0.0.0/0
e.g. SSH for Admin Desktop
Add Rule
Warning
Rules with source of 0.0.0.0/0 allow all IP addresses to access your instance. We recommend setting security group rules to allow access from known IP addresses only.
Cancel
Previous
Review and Launch
Feedback
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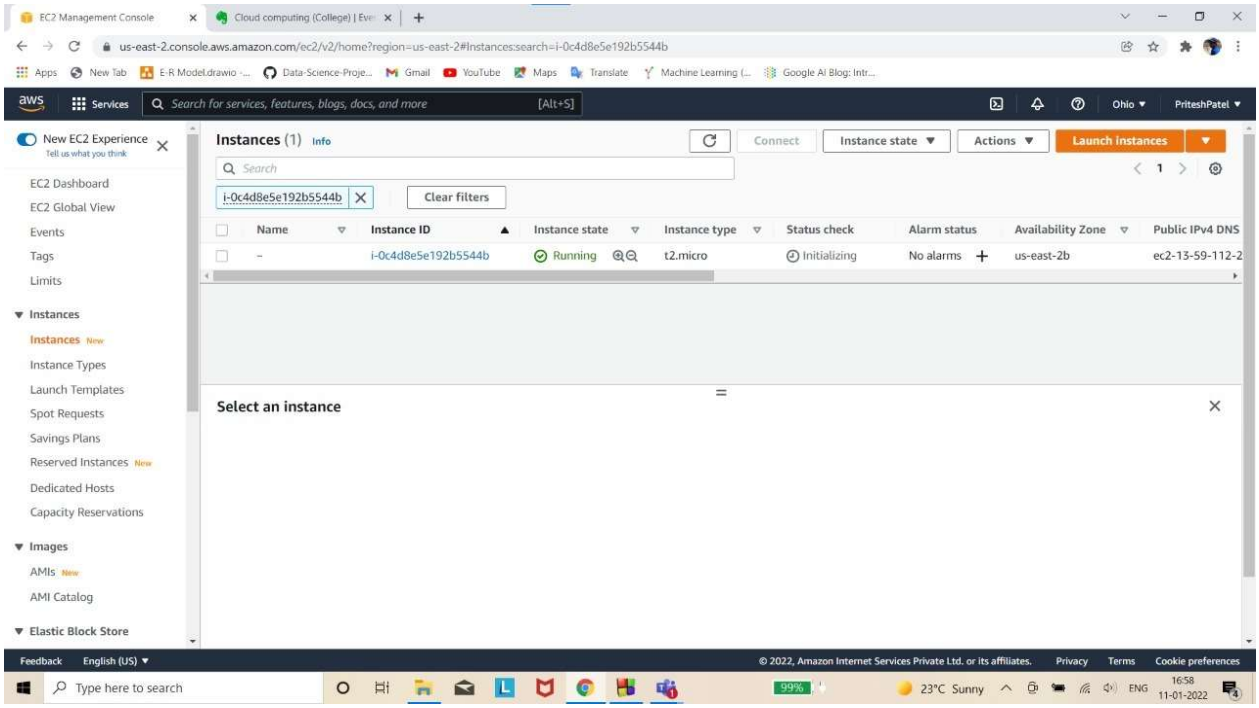
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New EC2 Experience
Tell us what you think
EC2 Dashboard
EC2 Global View
Events
Tags
Limits
Instances
Instances New
Instance Types
Launch Templates
Spot Requests
Savings Plans
Reserved Instances New
Dedicated Hosts
Capacity Reservations
Images
AMIs New
AMI Catalog
Elastic Block Store
Instances (1) Info
Connect
Instance state
Actions
Launch instances
Search
i-0c4d8e5e192b5544b
Clear filters
Name
Instance ID
Instance state
Instance type
Status check
Alarm status
Availability Zone
Public IPv4 DNS
-
i-0c4d8e5e192b5544b
Running
t2.micro
Initializing
No alarms
us-east-2b
ec2-13-59-112-2
Select an instance
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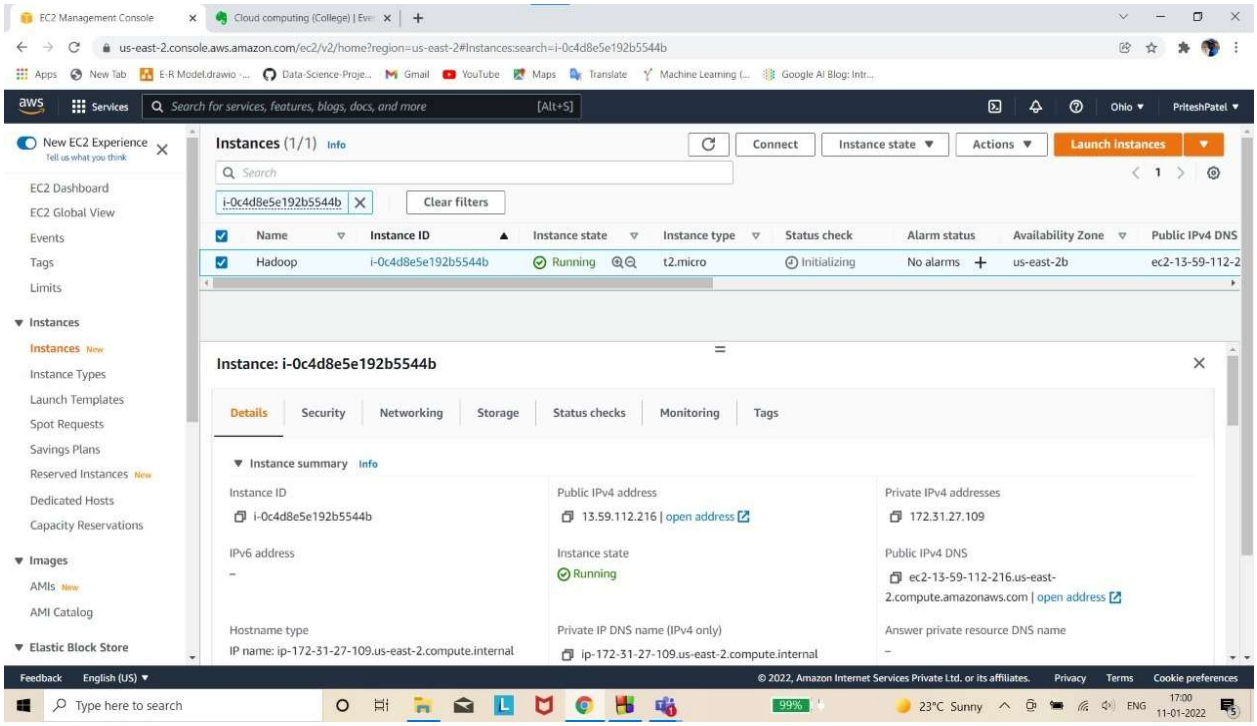
EC2 Management Console
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us-east-2.console.aws.amazon.com/ec2/v2/home?region=us-east-2#Instances:search=i-0c4d8e5e192b5544b
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Tell us what you think
EC2 Dashboard
EC2 Global View
Events
Tags
Limits
Instances
Instances New
Instance Types
Launch Templates
Spot Requests
Savings Plans
Reserved Instances New
Dedicated Hosts
Capacity Reservations
Images
AMIs New
AMI Catalog
Elastic Block Store
Instances (1/1) Info
Connect
Instance state
Actions
Launch instances
Search
i-0c4d8e5e192b5544b
Clear filters
Name
Instance ID
Instance state
Instance type
Status check
Alarm status
Availability Zone
Public IPv4 DNS
Hadoop
i-0c4d8e5e192b5544b
Running
t2.micro
Initializing
No alarms
us-east-2b
ec2-13-59-112-2
Instance: i-0c4d8e5e192b5544b
Details
Security
Networking
Storage
Status checks
Monitoring
Tags
Instance summary Info
Instance ID
i-0c4d8e5e192b5544b
Public IPv4 address
13.59.112.216 | open address
Private IPv4 addresses
172.31.27.109
IPv6 address
-
Instance state
Running
Public IPv4 DNS
ec2-13-59-112-216.us-east-2.compute.amazonaws.com | open address
Hostname type
IP name: ip-172-31-27-109.us-east-2.compute.internal
Private IP DNS name (IPv4 only)
ip-172-31-27-109.us-east-2.compute.internal
Answer private resource DNS name
-
Feedback
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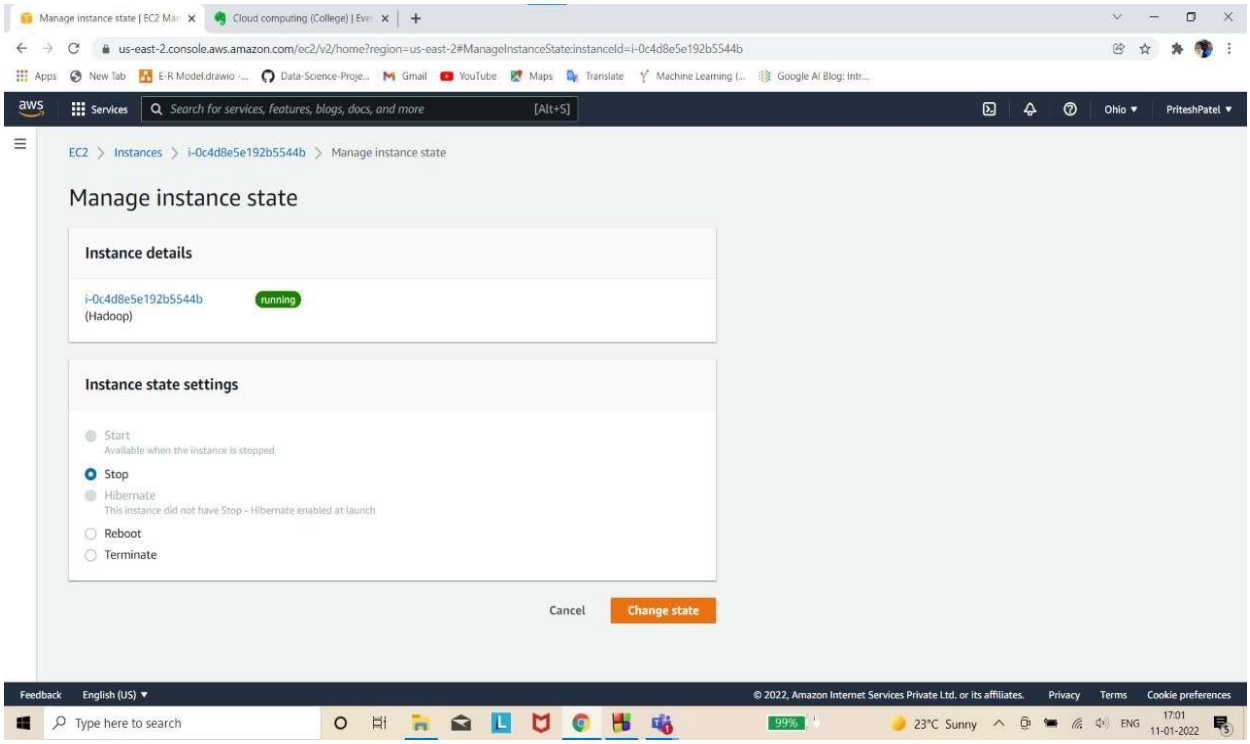
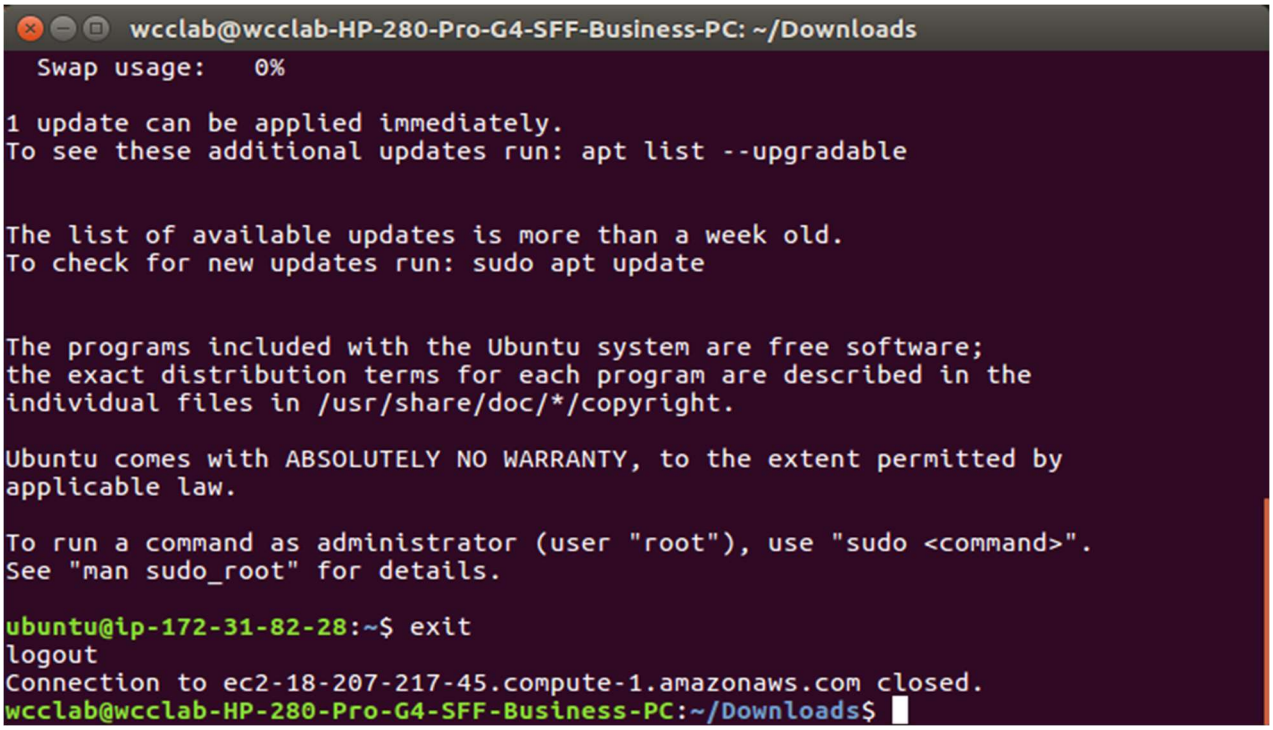


Result: -

```
wcclab@wcclab-HP-280-Pro-G4-SFF-Business-PC: ~/Downloads
wcclab@wcclab-HP-280-Pro-G4-SFF-Business-PC:~/Downloads$ -i Newpair.pem ubuntu@h
ttp://ec2-18-207-217-45.compute-1.amazonaws.com/
-i: command not found
wcclab@wcclab-HP-280-Pro-G4-SFF-Business-PC:~/Downloads$ ssh -i Newpair.pem ubun
tu@http://ec2-18-207-217-45.compute-1.amazonaws.com/
ssh: Could not resolve hostname http://ec2-18-207-217-45.compute-1.amazonaws.com
/: Name or service not known
wcclab@wcclab-HP-280-Pro-G4-SFF-Business-PC:~/Downloads$ -i Newpair.pem ubuntu@e
c2-18-207-217-45.compute-1.amazonaws.com
-i: command not found
wcclab@wcclab-HP-280-Pro-G4-SFF-Business-PC:~/Downloads$ ssh -i Newpair.pem ubun
tu@ec2-18-207-217-45.compute-1.amazonaws.com
The authenticity of host 'ec2-18-207-217-45.compute-1.amazonaws.com (18.207.217.
45)' can't be established.
ECDSA key fingerprint is SHA256:KejASRa4Ak+yD8hE2ccvVMbvKAnsbQ/p2BxplgH5Who.
Are you sure you want to continue connecting (yes/no)? y
Please type 'yes' or 'no': yes
Warning: Permanently added 'ec2-18-207-217-45.compute-1.amazonaws.com,18.207.217
.45' (ECDSA) to the list of known hosts.
@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@
@         WARNING: UNPROTECTED PRIVATE KEY FILE!          @
@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@
Permissions 0664 for 'Newpair.pem' are too open.
It is required that your private key files are NOT accessible by others.
```

```
wcclab@wcclab-HP-280-Pro-G4-SFF-Business-PC: ~/Downloads
The authenticity of host 'ec2-18-207-217-45.compute-1.amazonaws.com (18.207.217.
45)' can't be established.
ECDSA key fingerprint is SHA256:KejASRa4Ak+yD8hE2ccvVMbvKAnsbQ/p2BxplgH5Who.
Are you sure you want to continue connecting (yes/no)? y
Please type 'yes' or 'no': yes
Warning: Permanently added 'ec2-18-207-217-45.compute-1.amazonaws.com,18.207.217
.45' (ECDSA) to the list of known hosts.
@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@
@         WARNING: UNPROTECTED PRIVATE KEY FILE!          @
@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@
Permissions 0664 for 'Newpair.pem' are too open.
It is required that your private key files are NOT accessible by others.
This private key will be ignored.
Load key "Newpair.pem": bad permissions
Permission denied (publickey).
wcclab@wcclab-HP-280-Pro-G4-SFF-Business-PC:~/Downloads$ chmod 400 Newpair.pem
wcclab@wcclab-HP-280-Pro-G4-SFF-Business-PC:~/Downloads$ ssh -i Newpair.pem ubun
tu@ec2-18-207-217-45.compute-1.amazonaws.com
Welcome to Ubuntu 20.04.3 LTS (GNU/Linux 5.11.0-1022-aws x86_64)

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

```
wcclab@wcclab-HP-280-Pro-G4-SFF-Business-PC: ~/Downloads
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/advantage

  System information as of Mon Jan 10 09:26:34 UTC 2022

  System load:  0.0               Processes:             100
  Usage of /:   18.4% of 7.69GB   Users logged in:       0
  Memory usage: 19%               IPv4 address for eth0: 172.31.82.28
  Swap usage:   0%

1 update can be applied immediately.
To see these additional updates run: apt list --upgradable


The list of available updates is more than a week old.
To check for new updates run: sudo apt update


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.
```



We have completely made connection of VM instance by remotely.

Conclusion:

In this Experiment, we learnt that how to make an free tier account on AWS account. Also learnt some functionalities of AWS services such as How to create VM instance, how to run the VM instance and how to connect the VM instance by remotely (on ubuntu).