

Virtualization:

It creates a virtual system which actually uses storage, operating compute (CPU, RAM) network resources of the host machine. A single computer can have multiple operating systems running parallelly all because of the virtualization layer.

Hypervisor:

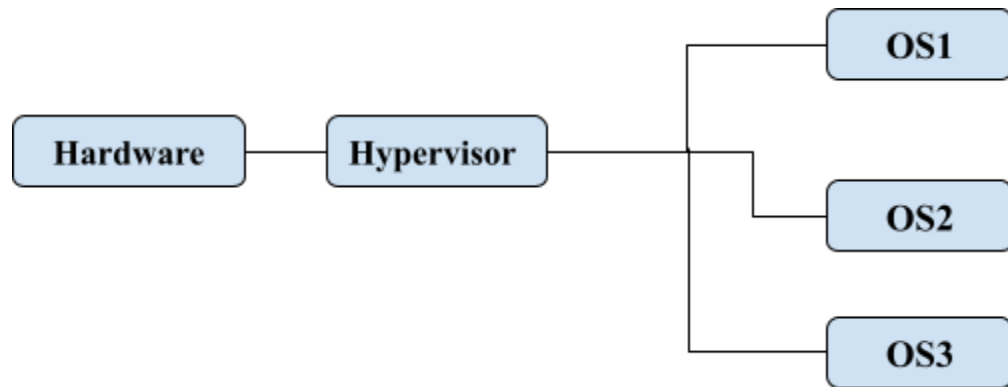
It is a form of virtualization software that is used to allocate the resource. It is hardware virtualization technique that allows multiple guest operating system to run on a single host machine at the same time.

It can also be referred to as virtual machine manager.

There are 2 types of hypervisor:

- **Type 1:**

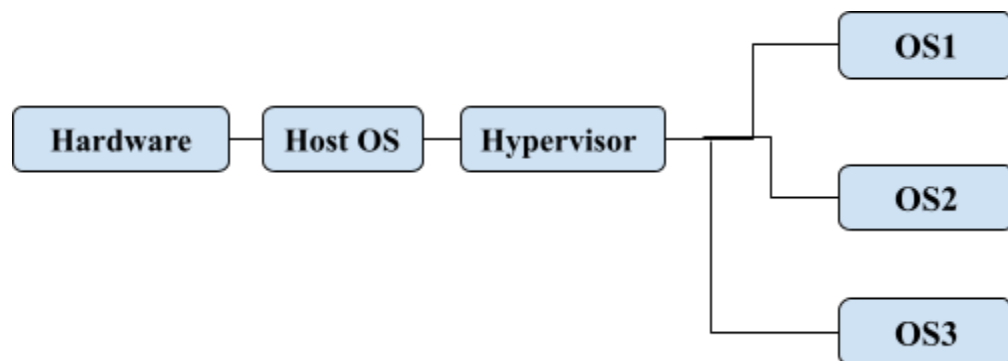
This runs directly on the host machine and it does not require any server based OS. It has direct access to hardware resources.



Eg. VMware

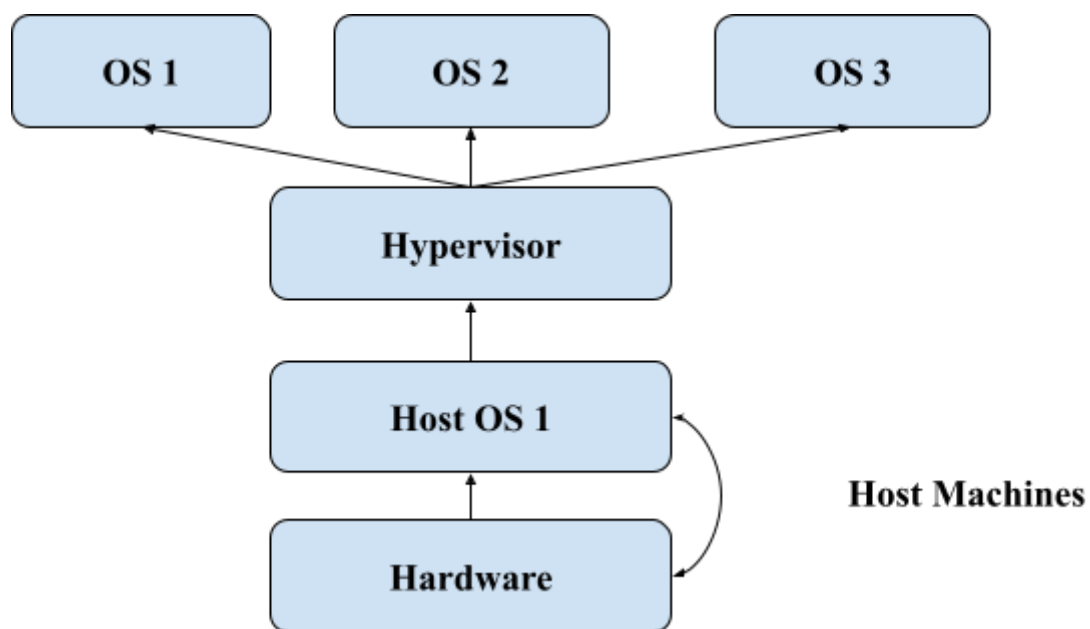
- **Type 2:**

Host operating systems run on the host system. This kind of hypervisor does not run directly on hardware. Rather than they require application on the host system. The software is installed on the operating system, the hypervisor makes hardware calls. Eg. Oracle Virtual Box, VMware workstation



Type of virtualization:

1. Hardware
2. Operating System
3. Server and storage OS



EC2:

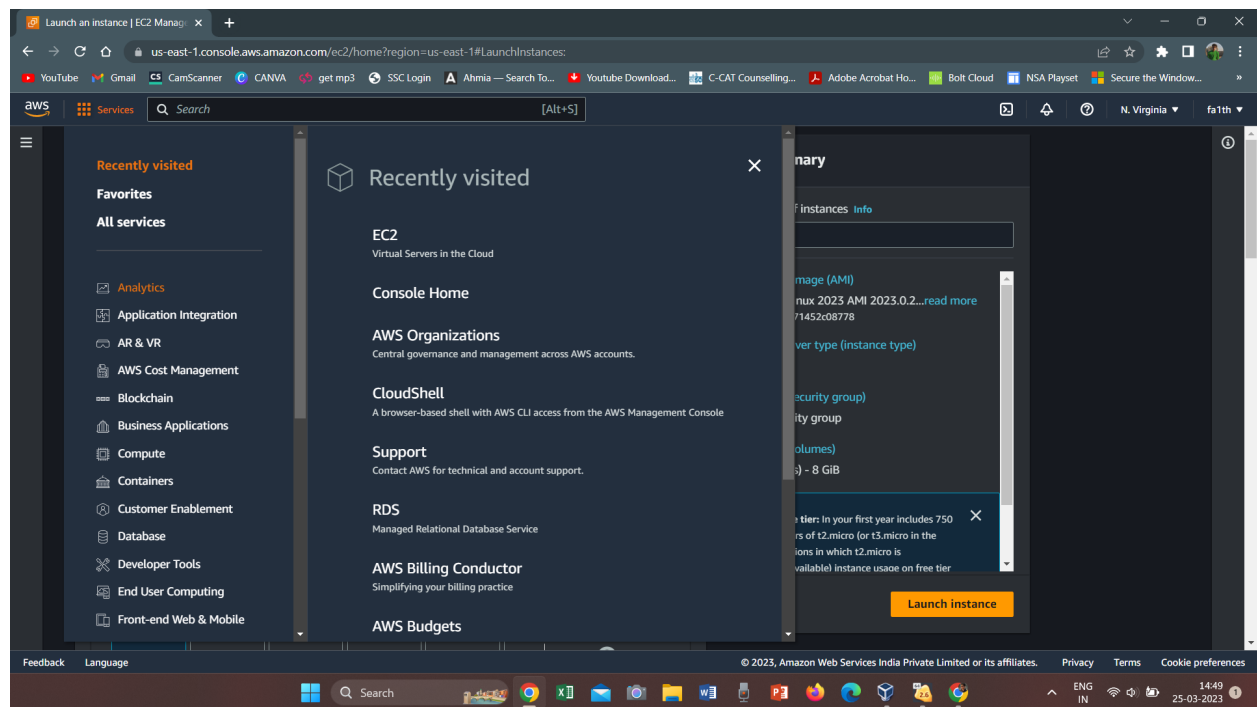
EC2 is a web service that provides secure and resizable compute capacity in the cloud. EC2 allows you to configure the capacity and also provide the complete control of computing resources. In this user can scale up and scale down resources as per their requirement. As user create an

environment or instance as per their requirement, this leads to less wastage of capacity. EC2 is a virtual machine hosted on AWS.

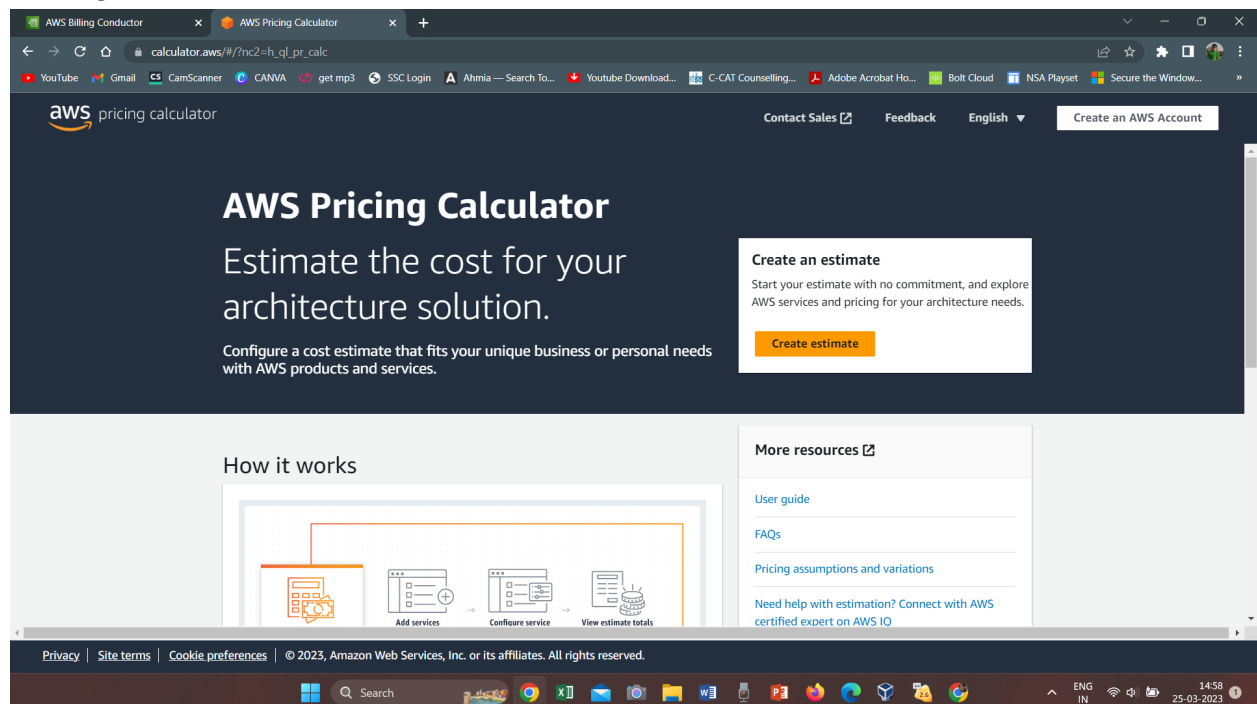
There are many pricing options in EC2.

1. **On demand:** These instances are mostly used for short term application or for unpredictable workload. Here we pay by hours or minutes or seconds depending upon the type of instance.
Application: Being developed on EC2.
This is the most flexible option to scale up and scale down.
2. **Reserved instance:** When the workload is fixed and the extra requirement is known then we use these kinds of pricing instances.
 - a. **Standard Reserved Instance:** Up to 70% of discount
 - b. **Convertible Reserved Instance:** Up to 55% of discount
 - c. **Scheduled Reserved Instance:** No discount
3. **Spot instance:** If you urgently need a large amount of computing capacity this is the best instance. You can purchase unused capacity at a discount of 90% as well. The fluctuation of pricing will be dependent on supply and demand.
4. **Dedicated instance:** A physical EC2 server is dedicated for the use, and this is the most expensive option.
5. **Saving plans:** Users get up to 72% of discount regardless of their instance type. The user can commit to specific requirements for 2-3 years.

Services in AWS



Pricing Calculator



Create estimate

Select Service

The screenshot shows the 'Select service' page in the AWS Pricing Calculator. The page is divided into two main sections: 'Step 1: Select service' and 'Step 2: Configure service'. In Step 1, there are two search methods: 'Search by location type' (selected) and 'Search all services'. Below these, there are dropdown menus for 'Choose a location type' (set to 'Region') and 'Choose a Region' (set to 'US East (Ohio)'). A search bar labeled 'Find Service' is also present. Below the search options, three service cards are displayed: 'AWS Application Migration Service', 'Amazon API Gateway', and 'Amazon AppFlow'. At the bottom of the page, a summary bar shows 'Upfront cost: 0.00 USD', 'Monthly cost: 0.00 USD', and 'Total 12 months cost: 0.00 USD (Includes upfront cost)'. A 'View summary' button is located on the right side of this bar. The page also includes a 'Bulk import' button in the top right corner and a 'Create an AWS Account' button in the top right corner of the header.

Configure the service and see the pricing

The screenshot shows the 'Configure Amazon EC2' page in the AWS Pricing Calculator. The page is divided into two main sections: 'Step 1: Select service' and 'Step 2: Configure service'. In Step 1, there are two search methods: 'Search by location type' (selected) and 'Search all services'. Below these, there are dropdown menus for 'Choose a location type' (set to 'Region') and 'Choose a Region' (set to 'US East (Ohio)'). A search bar labeled 'Find Service' is also present. Below the search options, three service cards are displayed: 'AWS Application Migration Service', 'Amazon API Gateway', and 'Amazon AppFlow'. At the bottom of the page, a summary bar shows 'Upfront cost: 0.00 USD', 'Monthly cost: 0.00 USD', and 'Total 12 months cost: 0.00 USD (Includes upfront cost)'. A 'View summary' button is located on the right side of this bar. The page also includes a 'Bulk import' button in the top right corner and a 'Create an AWS Account' button in the top right corner of the header.

Search EC2

The screenshot shows the AWS Management Console search results for 'ec2'. The left sidebar contains navigation links for EC2 Dashboard, EC2 Global View, Events, Tags, Limits, Instances, Images, and Elastic Block Store. The main content area displays search results for 'ec2', including Services (EC2, EC2 Image Builder, Amazon Inspector, AWS Firewall Manager) and Features (Dashboard, EC2 feature, Limits). The right sidebar shows Account attributes (Supported platforms, Default VPC, Settings, Zones, EC2 Serial Console, Default credit specification, Console experiments) and Explore AWS (10 Things You Can Do Today to Reduce AWS Costs, Save up to 90% on EC2 with Spot Instances).

Search results for 'ec2'

Services (See all 12 results)

- EC2** ☆ Virtual Servers in the Cloud
- EC2 Image Builder** ☆ A managed service to automate build, customize and deploy OS images
- Amazon Inspector** ☆ Continual vulnerability management at scale
- AWS Firewall Manager** ☆ Central management of firewall rules

Features (See all 53 results)

- Dashboard**
- EC2 feature**
- Limits**

Account attributes

- Supported platforms
 - VPC
- Default VPC
 - vpc-05c0c91d838a1e4e3
- Settings
 - EB5 encryption
- Zones
 - EC2 Serial Console
- Default credit specification
- Console experiments

Explore AWS

- 10 Things You Can Do Today to Reduce AWS Costs
 - Explore how to effectively manage your AWS costs without compromising on performance or capacity.
 - Learn more
- Save up to 90% on EC2 with Spot Instances

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Dashboard

The screenshot shows the AWS Management Console EC2 Dashboard. The left sidebar contains navigation links for EC2 Dashboard, EC2 Global View, Events, Tags, Limits, Instances, Images, and Elastic Block Store. The main content area displays the Resources section, showing a table of EC2 resources in the Asia Pacific (Mumbai) Region. The table includes columns for Instances (running), Elastic IPs, Load balancers, Snapshots, Auto Scaling Groups, Instances, Placement groups, Volumes, Dedicated Hosts, Key pairs, and Security groups. The right sidebar shows Account attributes (Supported platforms, Default VPC, Settings, Zones, EC2 Serial Console, Default credit specification, Console experiments) and Explore AWS (Enable Best Price-Performance with AWS Graviton2, Get Up to 40% Better Price Performance).

Resources

EC2 Global view

You are using the following Amazon EC2 resources in the Asia Pacific (Mumbai) Region:

Resource	Count
Instances (running)	0
Elastic IPs	0
Load balancers	0
Snapshots	0
Auto Scaling Groups	0
Instances	0
Placement groups	0
Volumes	0
Dedicated Hosts	0
Key pairs	0
Security groups	1

Launch instance

To get started, launch an Amazon EC2 instance, which is a virtual server in the cloud.

Launch instance **Migrate a server**

Service health

AWS Health Dashboard

Region: Asia Pacific (Mumbai)

Status: **This service is operating normally**

Account attributes

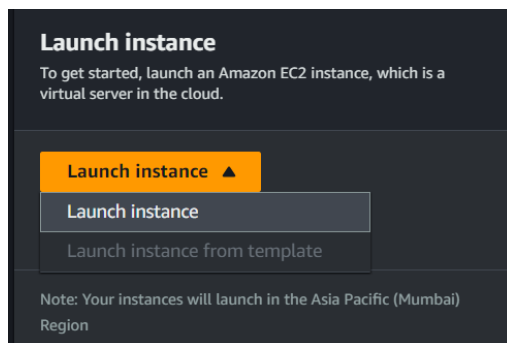
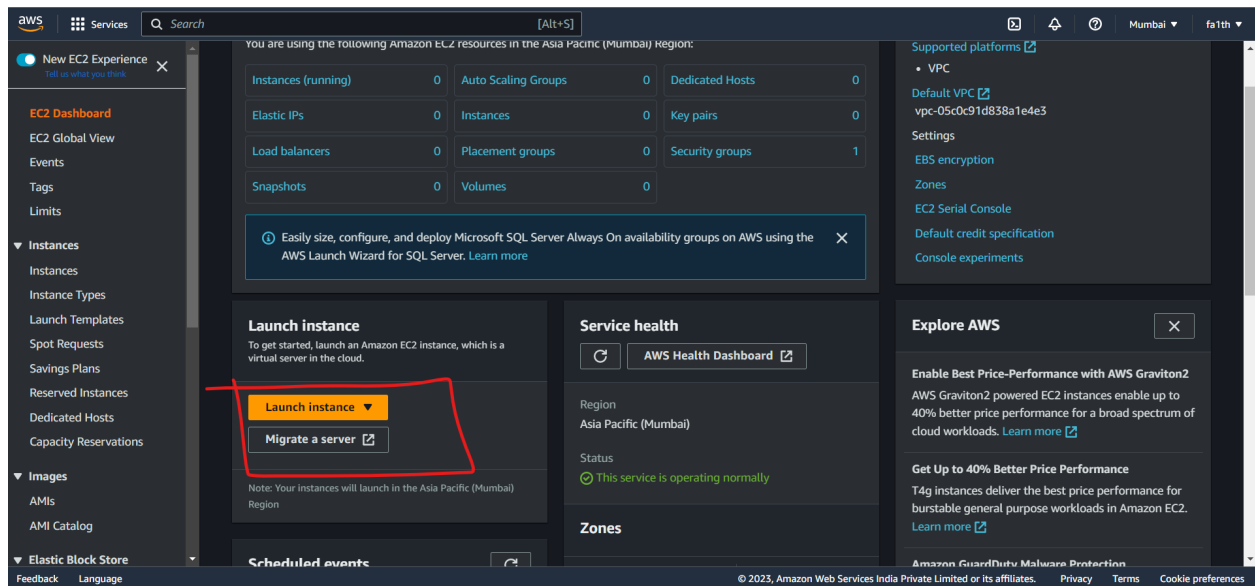
- Supported platforms
 - VPC
- Default VPC
 - vpc-05c0c91d838a1e4e3
- Settings
 - EB5 encryption
- Zones
 - EC2 Serial Console
- Default credit specification
- Console experiments

Explore AWS

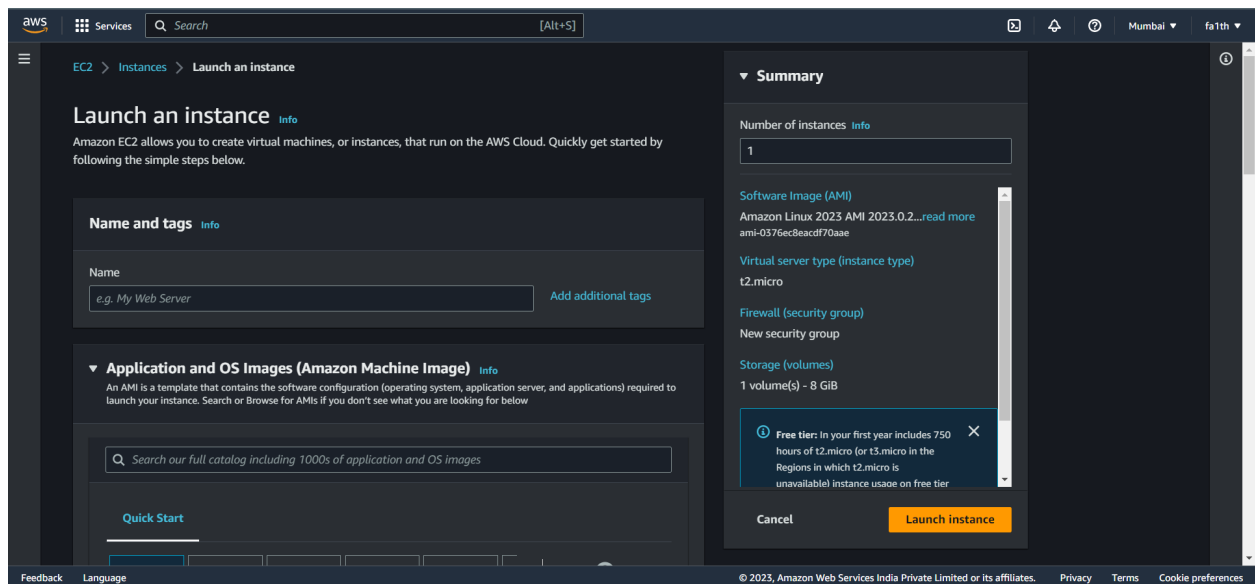
- Enable Best Price-Performance with AWS Graviton2
 - AWS Graviton2 powered EC2 instances enable up to 40% better price performance for a broad spectrum of cloud workloads.
 - Learn more
- Get Up to 40% Better Price Performance

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Click Launch Instance



This screen will show up



Give a suitable name to the instance

Name and tags [Info](#)

Name

prod-1

Add additional tags

Select from variety of OS images (AMI- Amazon Machine Image)

Use free-tier eligible

▼ **Application and OS Images (Amazon Machine Image)** [Info](#)

An AMI is a template that contains the software configuration (operating system, application server, and applications) required to launch your instance. Search or Browse for AMIs if you don't see what you are looking for below

Q Search our full catalog including 1000s of application and OS images

Quick Start

Amazon Linux

aws

macOS

Mac

Ubuntu

ubuntu

Windows

Microsoft

Red Hat

Red Hat

S

Browse more AMIs

Including AMIs from AWS, Marketplace and the Community

Amazon Machine Image (AMI)

Amazon Linux 2023 AMI

Free tier eligible

ami-0376ec8eacdf70aae (64-bit (x86), uefi-preferred) / ami-0405dec981e646696 (64-bit (Arm), uefi)

Virtualization: hvm ENA enabled: true Root device type: ebs

Description

Amazon Linux 2023 AMI 2023.0.20230322.0 x86_64 HVM kernel-6.1

Architecture

64-bit (x86)

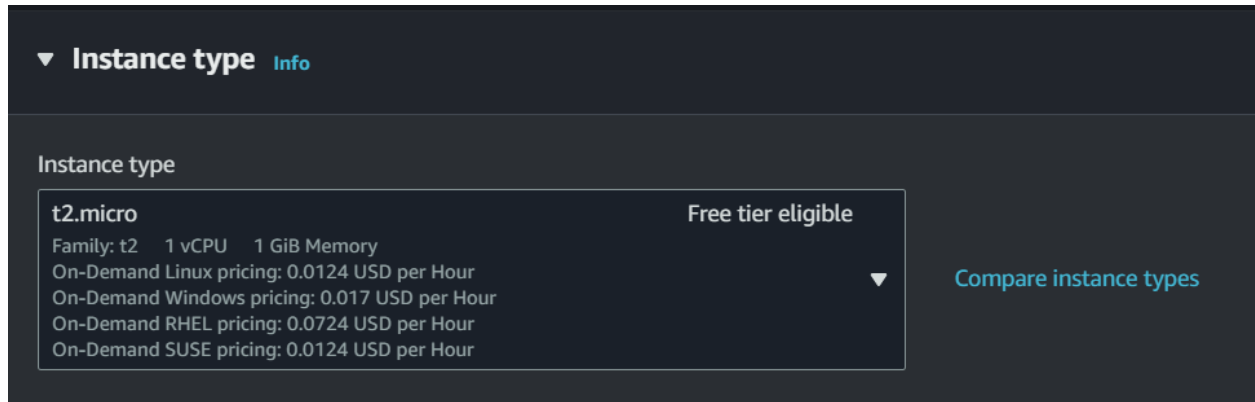
Boot mode

uefi-preferred

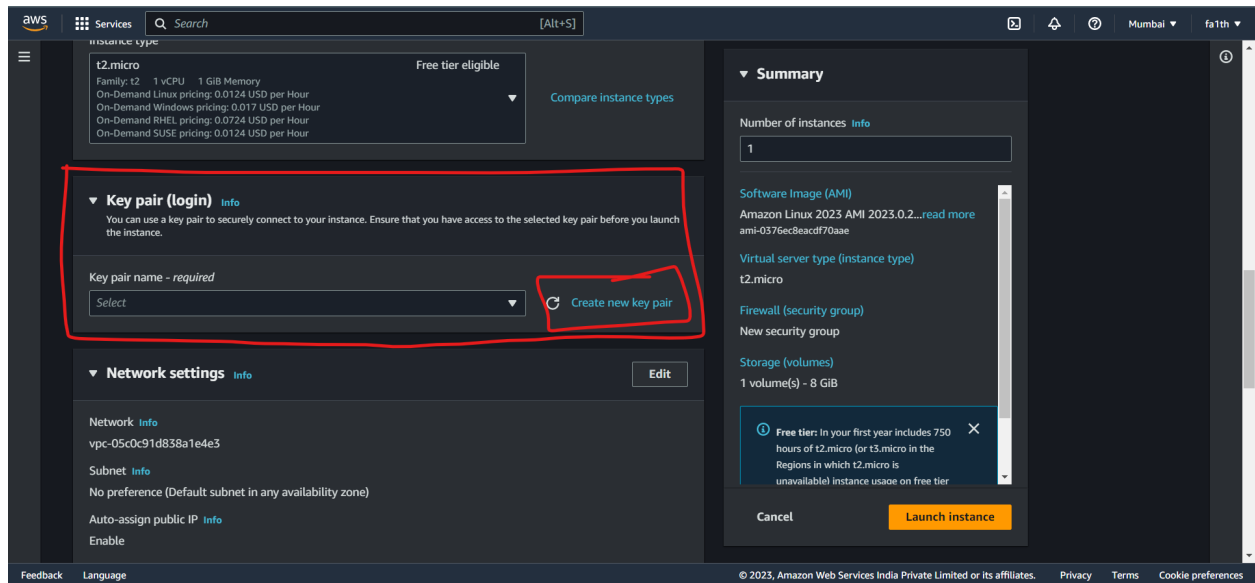
AMI ID

ami-0376ec8eacdf70aae

Verified provider



Select new key pair



Give key pair name

Select .ppk

Save it in a safe folder

This key pair will be used to connect to the instance using putty.

Create key pair

Key pairs allow you to connect to your instance securely.

Enter the name of the key pair below. When prompted, store the private key in a secure and accessible location on your computer. **You will need it later to connect to your instance.** [Learn more](#)

Key pair name

Enter key pair name

The name can include upto 255 ASCII characters. It can't include leading or trailing spaces.

Key pair type

☒ RSA
RSA encrypted private and public key pair

☐ ED25519
ED25519 encrypted private and public key pair (Not supported for Windows instances)

Private key file format

☐ .pem
For use with OpenSSH

☒ .ppk
For use with PuTTY

CancelCreate key pair

Click on create key pair
The key file will be downloaded

Services

Search

[Alt+S]

prod_key.ppk

prod_key.ppk

You can use a key pair to securely connect to your instance. Ensure that you have access to the selected key pair before you launch the instance.

Key pair name - required

prod_key

Create new key pair

Network settings

Edit

Network

vpc-05c0c91d838a1e4e3

Subnet

No preference (Default subnet in any availability zone)

Auto-assign public IP

Enable

Firewall (security groups)

Create security group

Select existing security group

We'll create a new security group called 'launch-wizard-1' with the following rules:

Summary

Number of instances

1

Software Image (AMI)

Amazon Linux 2023 AMI 2023.0.2...read more

Virtual server type (instance type)

t2.micro

Firewall (security group)

New security group

Storage (volumes)

1 volume(s) - 8 GiB

Free tier: In your first year includes 750

Cancel

Launch instance

Feedback

Language

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Privacy

Terms

Cookie preferences

Keep the network settings as it is
Allow traffic - tick mark all 3 boxes

▼ Network settings Info

Edit

Network Info

vpc-05c0c91d838a1e4e3

Subnet Info

No preference (Default subnet in any availability zone)

Auto-assign public IP Info

Enable

Firewall (security groups) Info

A security group is a set of firewall rules that control the traffic for your instance. Add rules to allow specific traffic to reach your instance.

☒ Create security group

☐ Select existing security group

We'll create a new security group called 'launch-wizard-1' with the following rules:

☒ Allow SSH traffic from

Helps you connect to your instance

Anywhere
0.0.0.0/0

☒ Allow HTTPS traffic from the internet

To set up an endpoint, for example when creating a web server

☒ Allow HTTP traffic from the internet

To set up an endpoint, for example when creating a web server

Rules with source of 0.0.0.0/0 allow all IP addresses to access your instance. We recommend setting

×

Keep rest of the settings same

aws

Services

Search

[Alt+S]

Mumbai

fa1th

To set up an endpoint, for example when creating a web server

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.

×

▼ Configure storage Info

Advanced

1x 8 GiB gp3 Root volume (Not encrypted)

Free tier eligible customers can get up to 30 GB of EBS General Purpose (SSD) or Magnetic storage

×

Add new volume

0 x File systems

Edit

► Advanced details Info

▼ Summary

Number of instances Info

1

Software Image (AMI)

Amazon Linux 2023 AMI 2023.0.2...read more
ami-0376ec8eacdf70aae

Virtual server type (instance type)

t2.micro

Firewall (security group)

New security group

Storage (volumes)

1 volume(s) - 8 GiB

Free tier: In your first year includes 750

×

Cancel

Launch instance

Feedback

Language

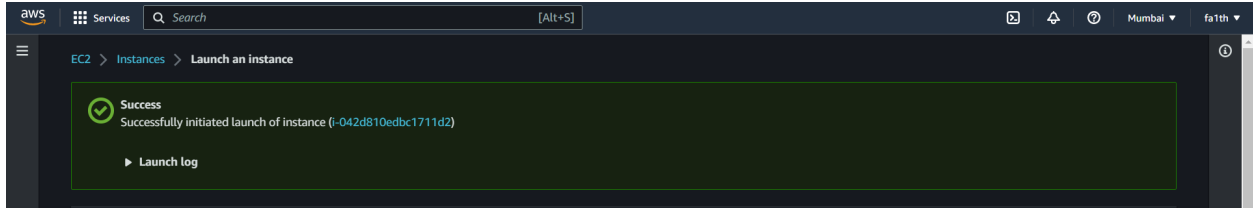
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Privacy

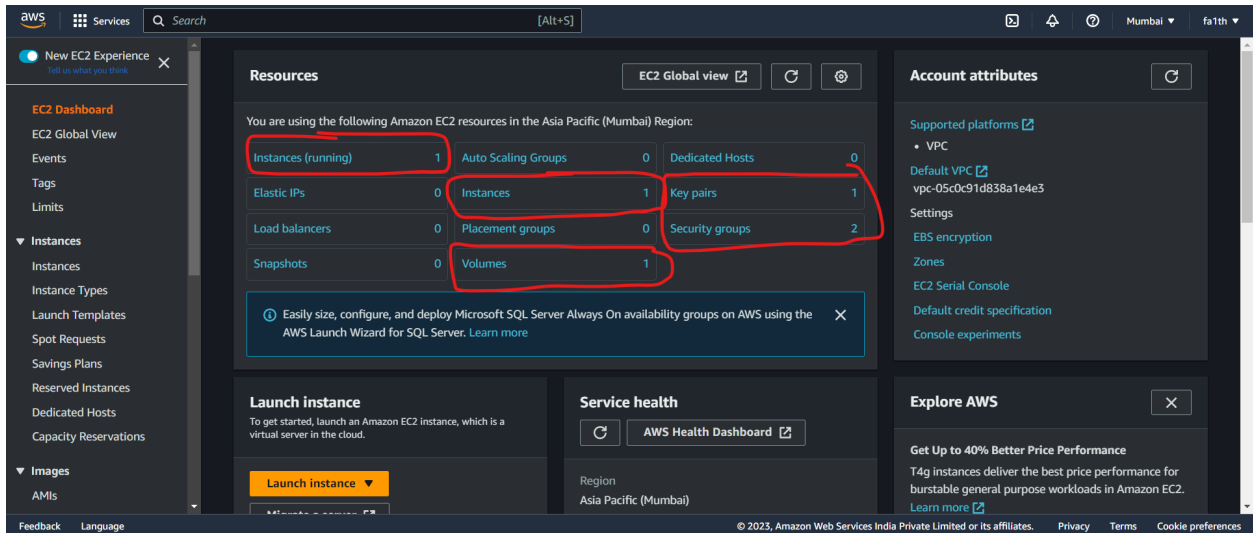
Terms

Cookie preferences

Launch instance

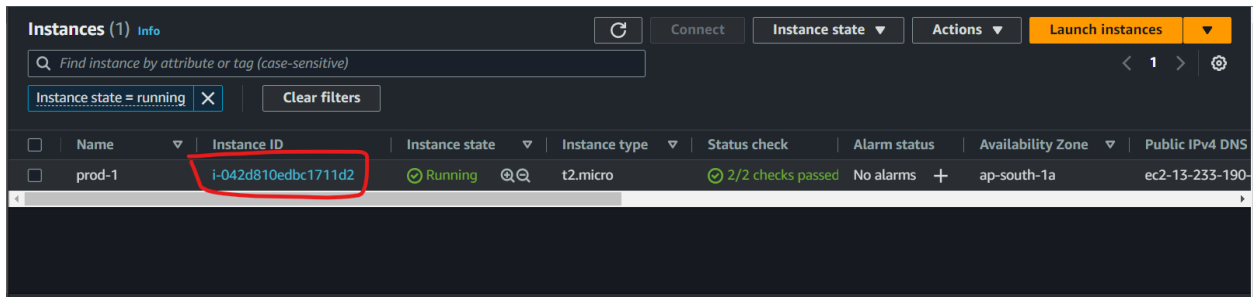


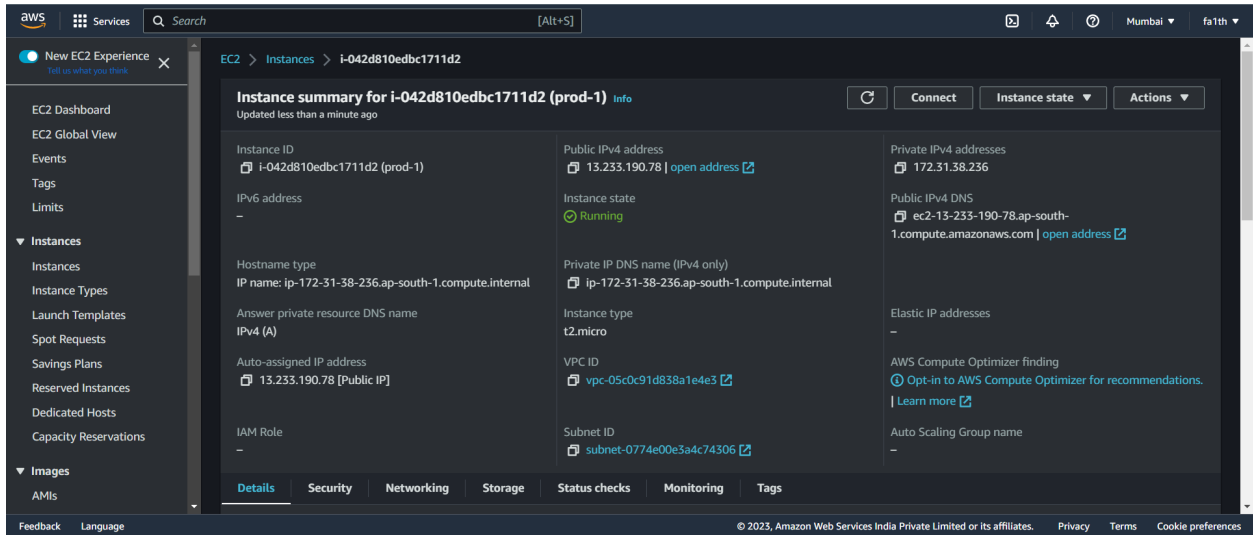
Go to dashboard and check if the instance is running



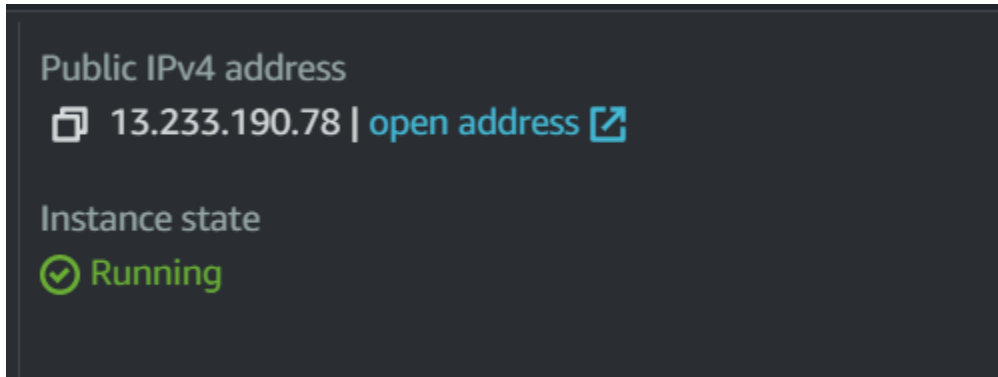
Click on running instances

Click on instance ID



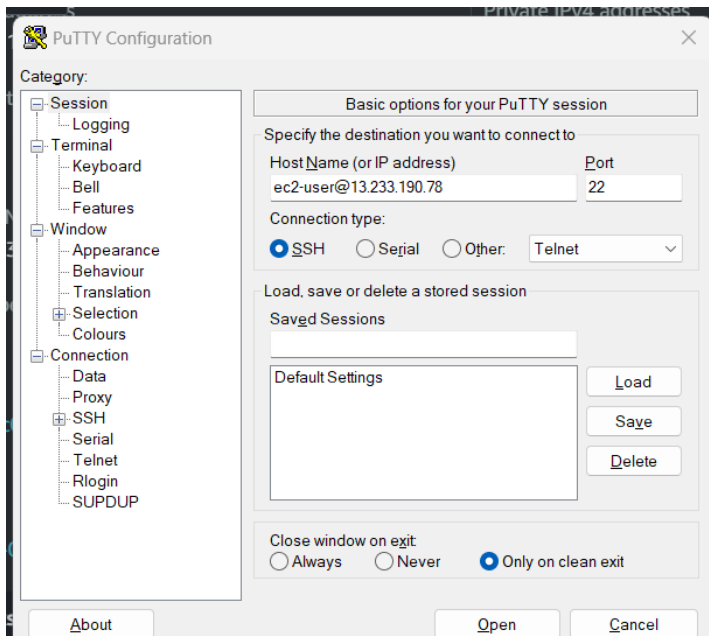


Copy Public ipv4 address

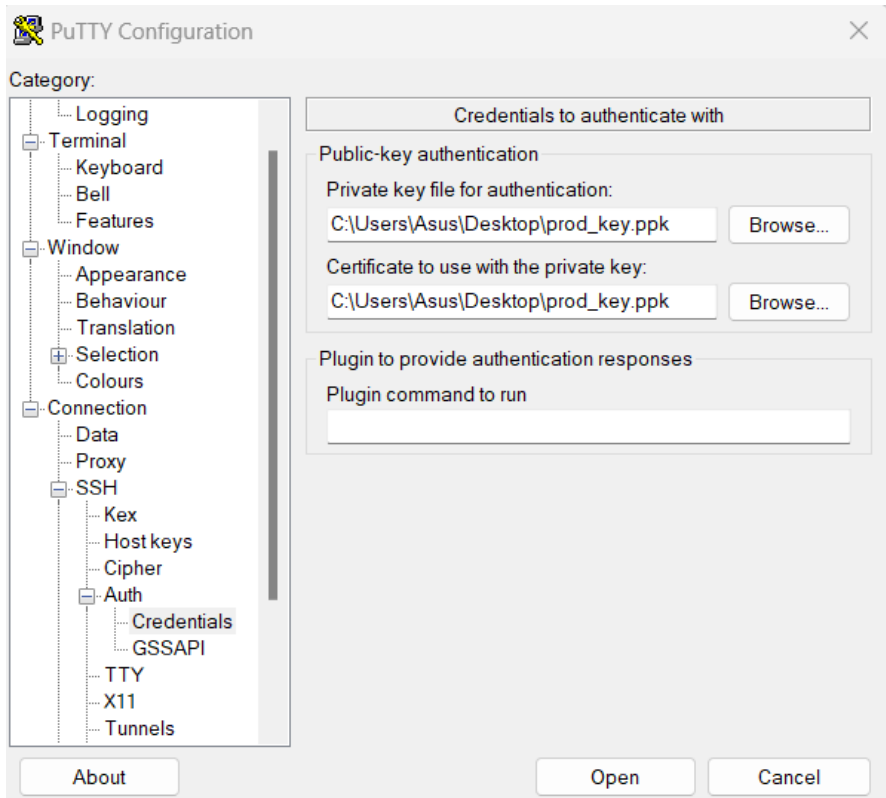


Open putty and write the ip in hostname

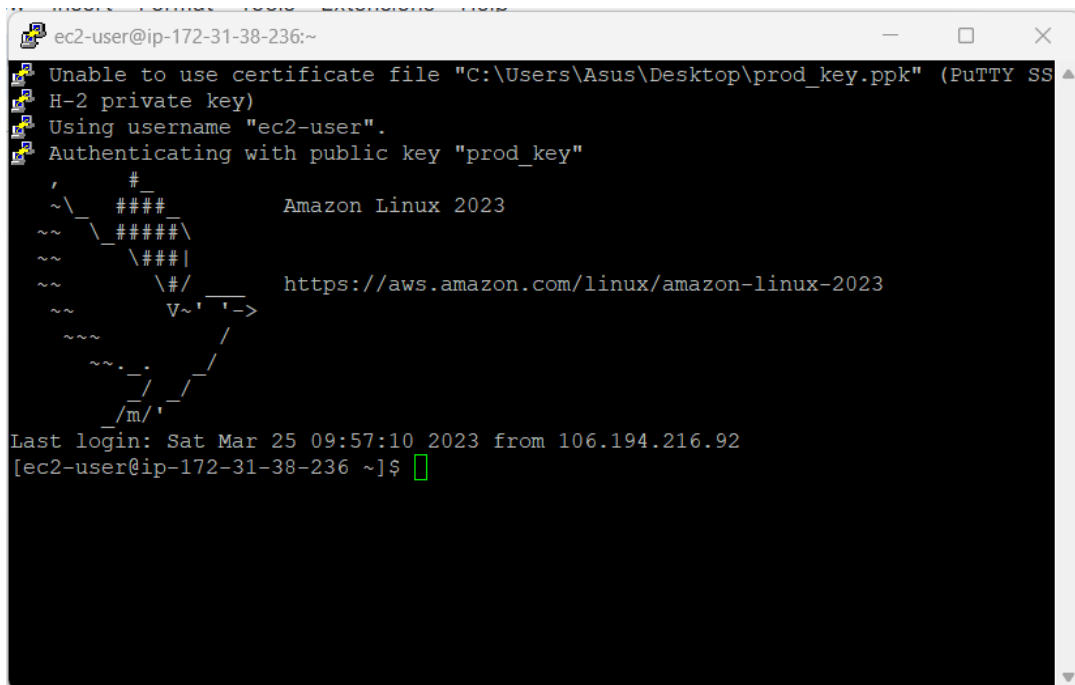
ec2-user@ipaddress



Add key and certificate
Select SSH from left panel
SSH>Auth>Credentials



Hit open and it will open up



Enter root : `sudo -i`

Update : `yum update -y`

```
root@ip-172-31-38-236:~  
[ec2-user@ip-172-31-38-236 ~]$ sudo root  
sudo: root: command not found  
[ec2-user@ip-172-31-38-236 ~]$ sudo -i  
[root@ip-172-31-38-236 ~]# yum update -y  
Last metadata expiration check: 0:16:47 ago on Sat Mar 25 09:46:01 2023.  
Dependencies resolved.  
Nothing to do.  
Complete!  
[root@ip-172-31-38-236 ~]#
```

Install httpd : `yum install httpd -y`

```
[root@ip-172-31-38-236 ~]# yum install httpd -y  
Last metadata expiration check: 0:18:06 ago on Sat Mar 25 09:46:01 2023.  
Dependencies resolved.  
=====
```

Package	Arch	Version	Repository	Size
---------	------	---------	------------	------

```
=====
```

Installing:				
httpd	x86_64	2.4.56-1.amzn2023	amazonlinux	48 k
Installing dependencies:				
apr	x86_64	1.7.2-2.amzn2023.0.2	amazonlinux	129 k
apr-util	x86_64	1.6.3-1.amzn2023.0.1	amazonlinux	98 k
generic-logos-httpd	noarch	18.0.0-12.amzn2023.0.3	amazonlinux	19 k
httpd-core	x86_64	2.4.56-1.amzn2023	amazonlinux	1.4 M
httpd-filesystem	noarch	2.4.56-1.amzn2023	amazonlinux	15 k
httpd-tools	x86_64	2.4.56-1.amzn2023	amazonlinux	82 k
libbrotli	x86_64	1.0.9-4.amzn2023.0.2	amazonlinux	315 k
mailcap	noarch	2.1.49-3.amzn2023.0.3	amazonlinux	33 k

```
Installing weak dependencies:
```

Install httpd : `yum install httpd -y`

Start httpd : `systemctl start httpd`

Check httpd service running : `systemctl status httpd`


```
root@ip-172-31-38-236:~  
Complete!  
[root@ip-172-31-38-236 ~]# systemctl start httpd  
[root@ip-172-31-38-236 ~]# systemctl status httpd  
● httpd.service - The Apache HTTP Server  
   Loaded: loaded (/usr/lib/systemd/system/httpd.service; disabled; preset: d  
   Active: active (running) since Sat 2023-03-25 10:06:03 UTC; 6s ago  
     Docs: man:httpd.service(8)  
  Main PID: 25810 (httpd)  
    Status: "Started, listening on: port 80"  
   Tasks: 177 (limit: 1112)  
  Memory: 12.8M  
    CPU: 70ms  
   CGroup: /system.slice/httpd.service  
           └─25810 /usr/sbin/httpd -DFOREGROUND  
             └─25811 /usr/sbin/httpd -DFOREGROUND  
               └─25812 /usr/sbin/httpd -DFOREGROUND  
                 └─25813 /usr/sbin/httpd -DFOREGROUND  
                   └─25814 /usr/sbin/httpd -DFOREGROUND  
  
Mar 25 10:06:03 ip-172-31-38-236.ap-south-1.compute.internal systemd[1]: Starti  
Mar 25 10:06:03 ip-172-31-38-236.ap-south-1.compute.internal systemd[1]: Starte  
Mar 25 10:06:03 ip-172-31-38-236.ap-south-1.compute.internal httpd[25810]: Serv  
lines 1-19/19 (END)
```

systemctl enable httpd

```
[root@ip-172-31-38-236 ~]# systemctl start httpd  
[root@ip-172-31-38-236 ~]# systemctl enable httpd  
Created symlink /etc/systemd/system/multi-user.target.wants/httpd.service → /usr  
/lib/systemd/system/httpd.service.  
[root@ip-172-31-38-236 ~]#
```

cd /var/www/html

vi index.html

```
root@ip-172-31-38-236:/var/www/html  
Mar 25 10:06:03 ip-172-31-38-236.ap-south-1.compute.internal systemd[1]: Starti  
Mar 25 10:06:03 ip-172-31-38-236.ap-south-1.compute.internal systemd[1]: Starte  
Mar 25 10:06:03 ip-172-31-38-236.ap-south-1.compute.internal httpd[25810]: Serv  
~  
~  
~  
lines 1-19/19 (END)  
[1]+  Stopped                  systemctl status httpd  
[root@ip-172-31-38-236 ~]# systemctl start httpd  
[root@ip-172-31-38-236 ~]# systemctl enable httpd  
Created symlink /etc/systemd/system/multi-user.target.wants/httpd.service → /usr  
/lib/systemd/system/httpd.service.  
[root@ip-172-31-38-236 ~]# pwd  
/root  
[root@ip-172-31-38-236 ~]# exit  
logout  
There are stopped jobs.  
[root@ip-172-31-38-236 ~]# cd /var/www/html  
[root@ip-172-31-38-236 html]# ls  
[root@ip-172-31-38-236 html]#
```

Write a small html code inside the file

```
root@ip-172-31-38-236:/var/www/html
```

```
<html>  
<body>  
    <h1> Hello this is heading /h1  
</body>  
</html>
```

```
systemctl start httpd
```

```
systemctl enable httpd
```

```

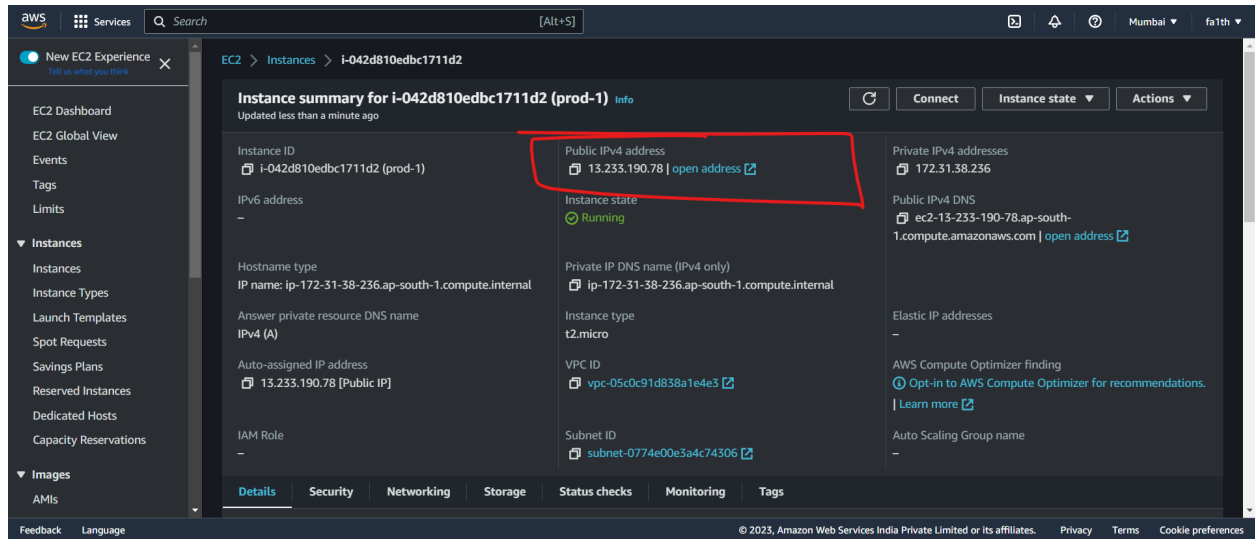
root@ip-172-31-38-236:var/www/html
[root@ip-172-31-38-236 html]# systemctl status httpd
● httpd.service - The Apache HTTP Server
   Loaded: loaded (/usr/lib/systemd/system/httpd.service; enabled; preset: disabled)
   Active: active (running) since Sat 2023-03-25 10:06:03 UTC; 7min ago
     Docs: man:httpd.service(8)
  Main PID: 25810 (httpd)
    Status: "Total requests: 0; Idle/Busy workers 100/0;Requests/sec: 0; Bytes served/sec: 0"
    Tasks: 177 (limit: 1112)
   Memory: 12.8M
      CPU: 340ms
  CGroup: /system.slice/httpd.service
          └─25810 /usr/sbin/httpd -DFOREGROUND
            └─25811 /usr/sbin/httpd -DFOREGROUND
              └─25812 /usr/sbin/httpd -DFOREGROUND
                └─25813 /usr/sbin/httpd -DFOREGROUND
                  └─25814 /usr/sbin/httpd -DFOREGROUND

Mar 25 10:06:03 ip-172-31-38-236.ap-south-1.compute.internal systemd[1]: Starting httpd.service
Mar 25 10:06:03 ip-172-31-38-236.ap-south-1.compute.internal systemd[1]: Started httpd.service
Mar 25 10:06:03 ip-172-31-38-236.ap-south-1.compute.internal httpd[25810]: Server configured, li
lines 1-19/19 (END)
[2]+  Stopped                  systemctl status httpd

```

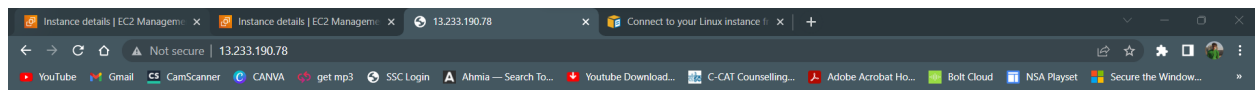
Open dashboard

Copy the public ip address



Paste it in browser

The html code will run and show the output



Hello this is heading