Connecting an external volume (EBS) to an instance and attaching it to another instance in different availability zone using snapshot.

Amazon Elastic Block Storage (EBS)

It is a **block-level storage** service. It provides persistent storage volumes that can be attached to Amazon EC2 instances. It offers different volume types to cater to various use cases and performance requirements.

The available volume types include

1. **SSD**
   - General Purpose (SSD)
   - Provisioned IOPS (SSD)
2. **HDD**
   - Throughput Optimized HDD
   - Cold HDD
3. **Magnetic** (Previous versions)

EBS volumes are designed for **high durability** and **availability.**
The data stored on EBS volumes is automatically replicated within a specific Availability Zone (AZ) to protect against failures. You can also enable point-in-time snapshots of EBS volumes for further data protection and recovery.

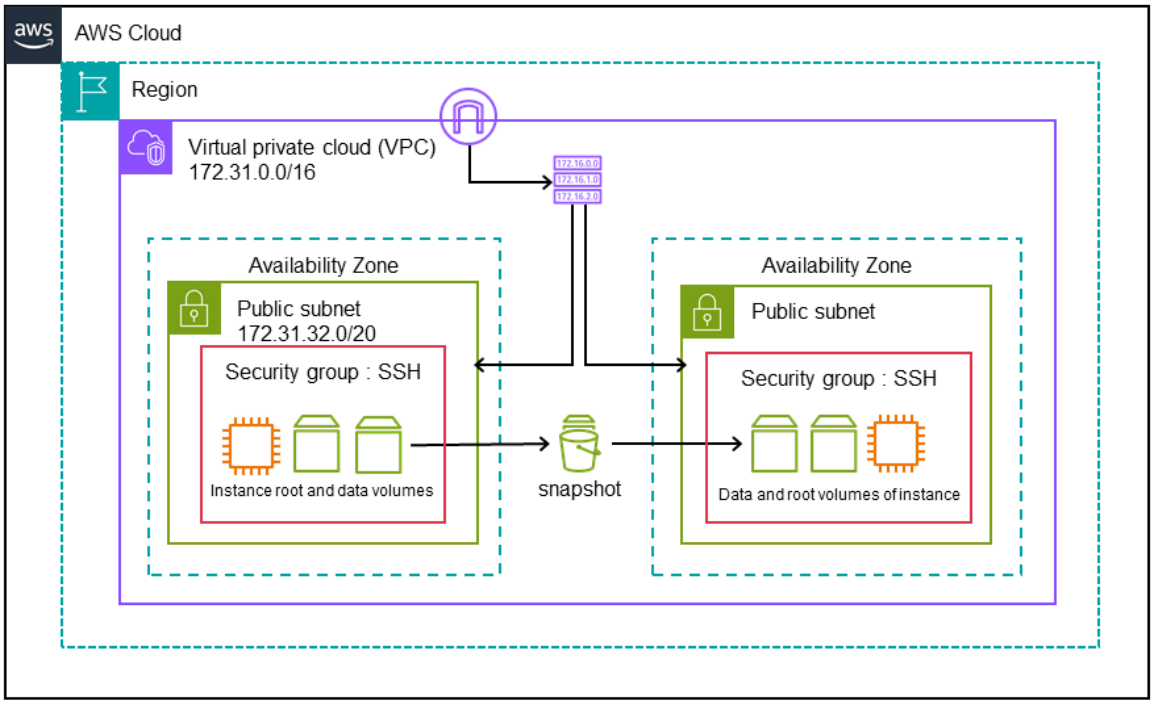
EBS Multi-Attach for shared access to EBS volumes among multiple EC2 instances.
Each volume type offers different performance characteristics and pricing options.

Snapshots

It refers to a **point-in-time copy** of an Amazon Elastic Block Store (EBS) volume**.**

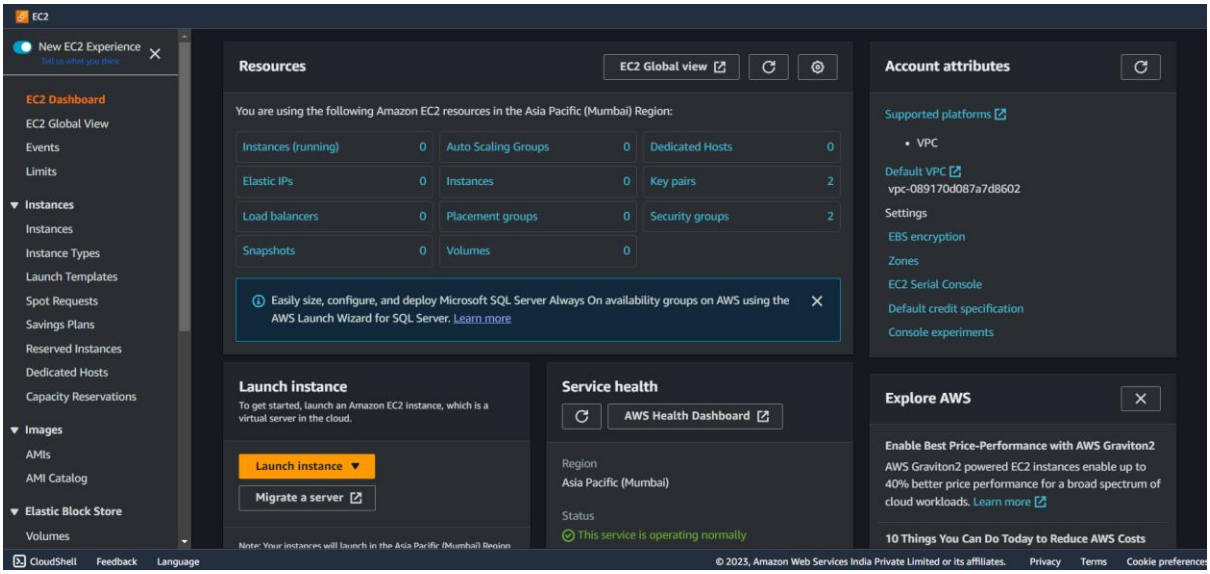
These are **incremental backups**, which means that only the blocks on the device that have changed after your most recent snapshot are saved to minimize the time.

Architecture



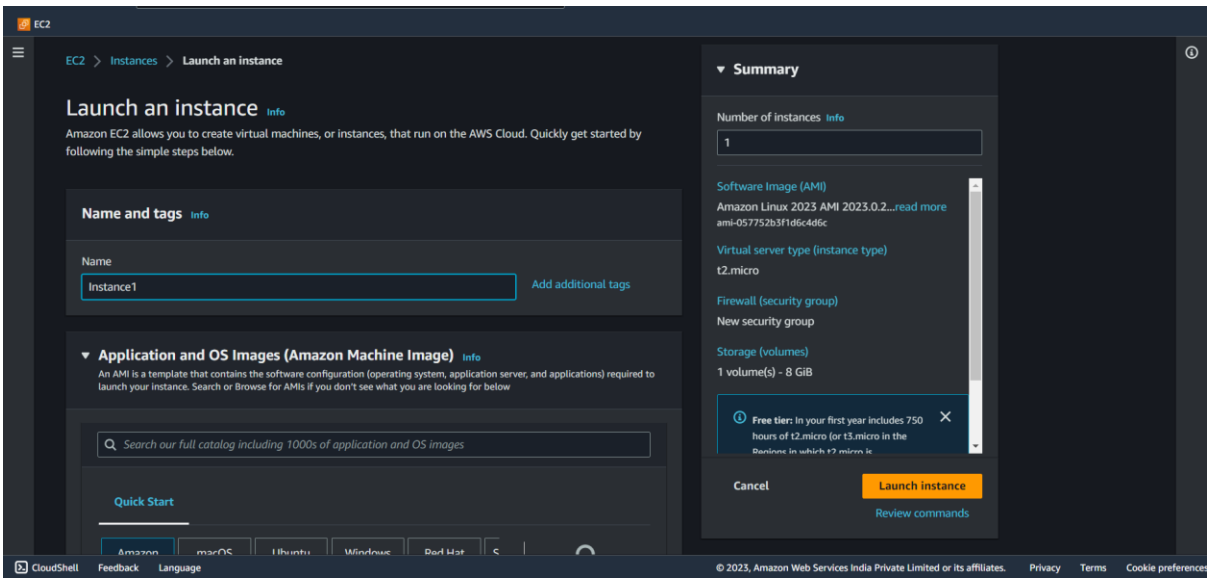
Steps to launch two instances in two different availability zones

1. First Log in to your AWS free tier account and open your **AWS management console** and click on services and select **compute** and Select **EC2**

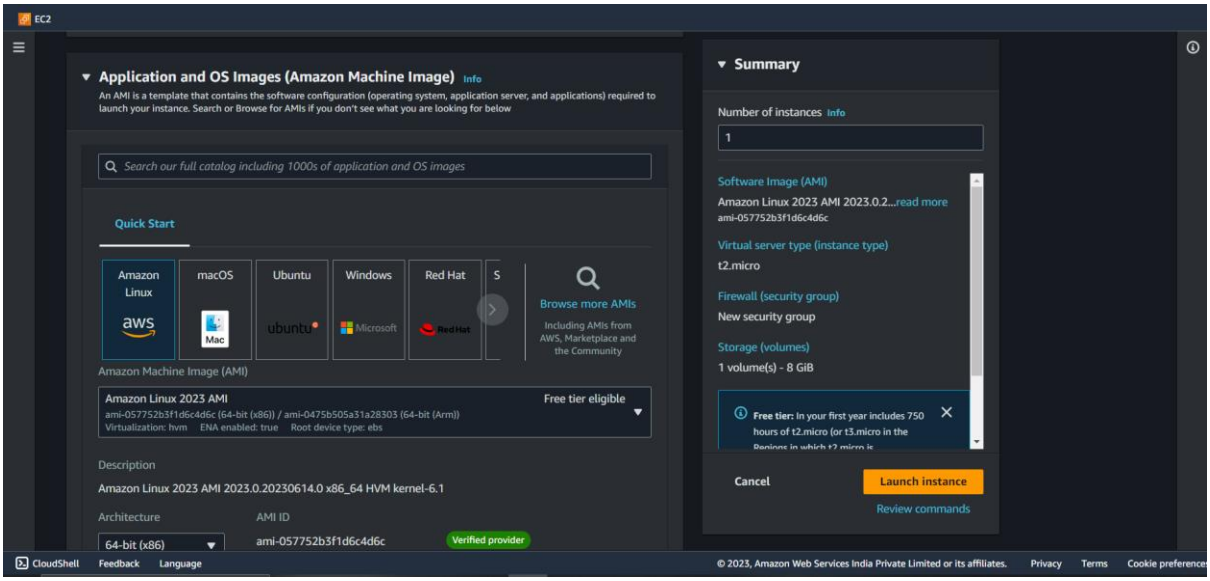


2. Click on **Launch an Instance** and open the EC2 launch pad.

Firstly **Name** you instance and add respective **tags** if required.

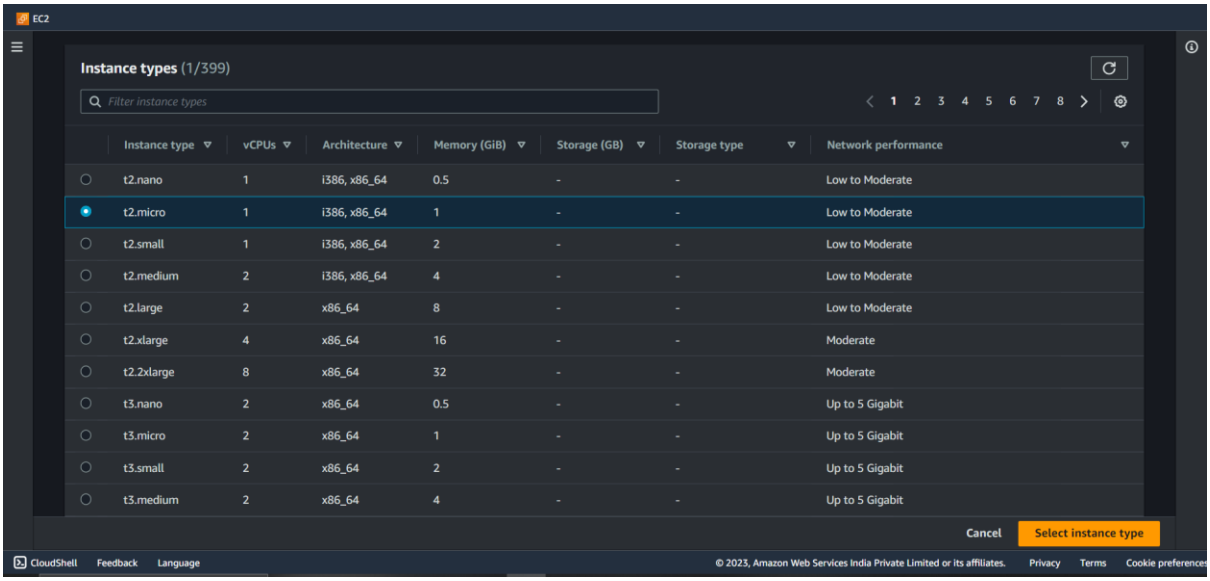


3. Select required **AMI** for your Virtual Machine here I chose **Amazon Linux** you can also browse different AMIs in the browse more AMIs section make sure it is FREE TIER ELIGIBLE if you're using a free tier account

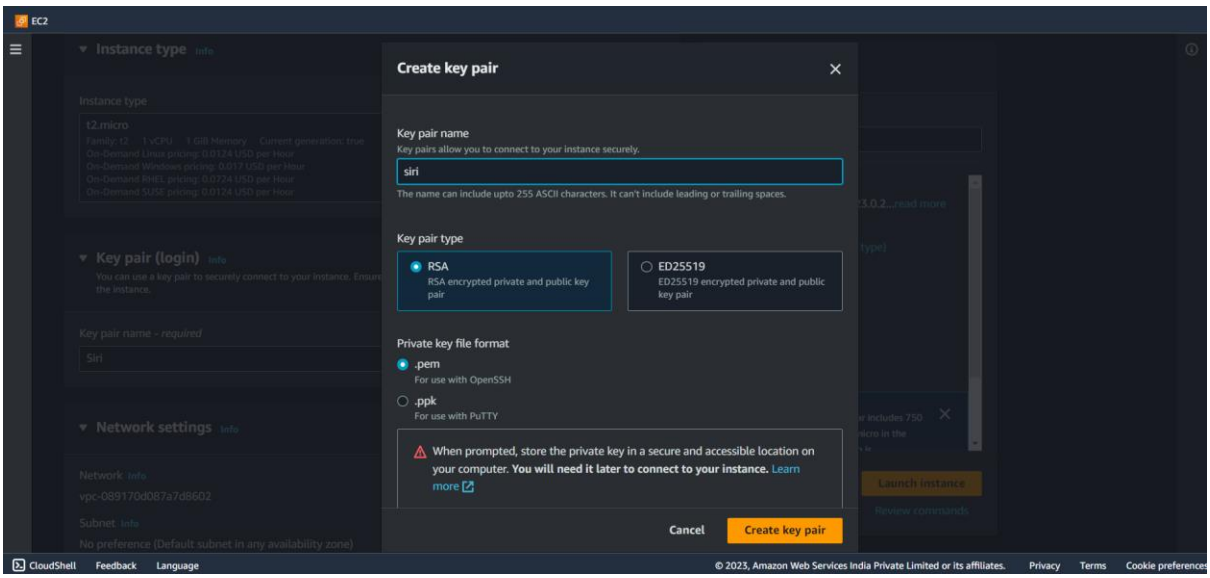


4. Select Required **Instance type** (Hardware configuration)

Instance types refer to the various configurations of virtual machines available in AWS. Each instance type has specific combinations of **CPU, memory, storage, and networking capacity** to meet different workload requirements for your virtual machine AWS provides various instance types with different configuration as follows.



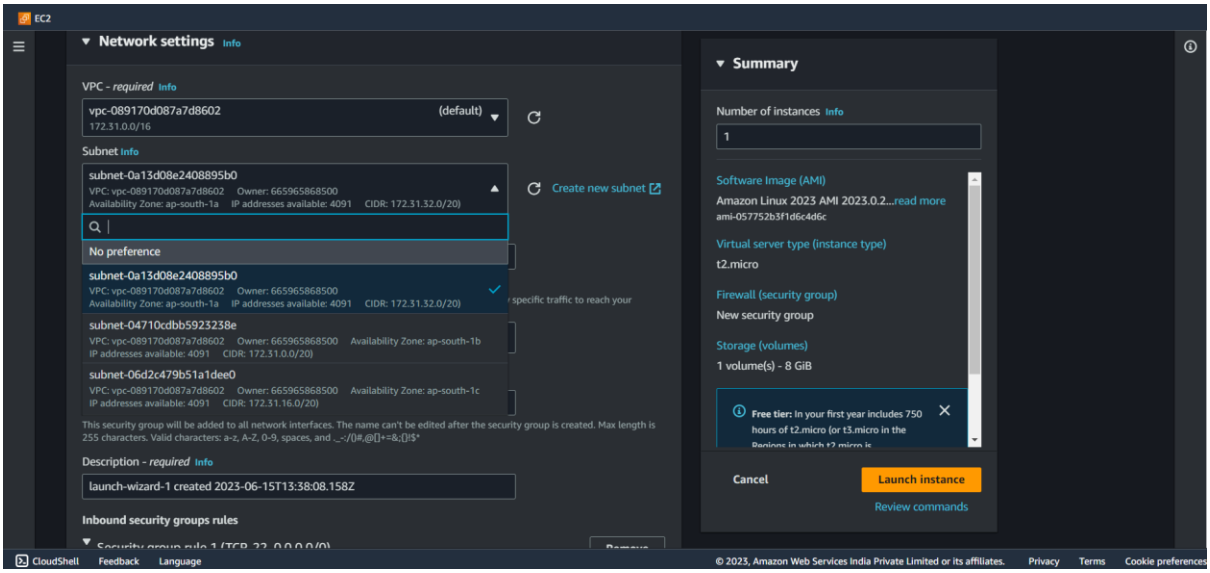
5. Create a **key pair** or use an existing key pair to encrypt and decrypt and authenticate your server. (Make sure you have respective **.pem** file when you use a key pair for accessing the instance it is called **Private Key** and AWS validates it with the **Public key** which they have)



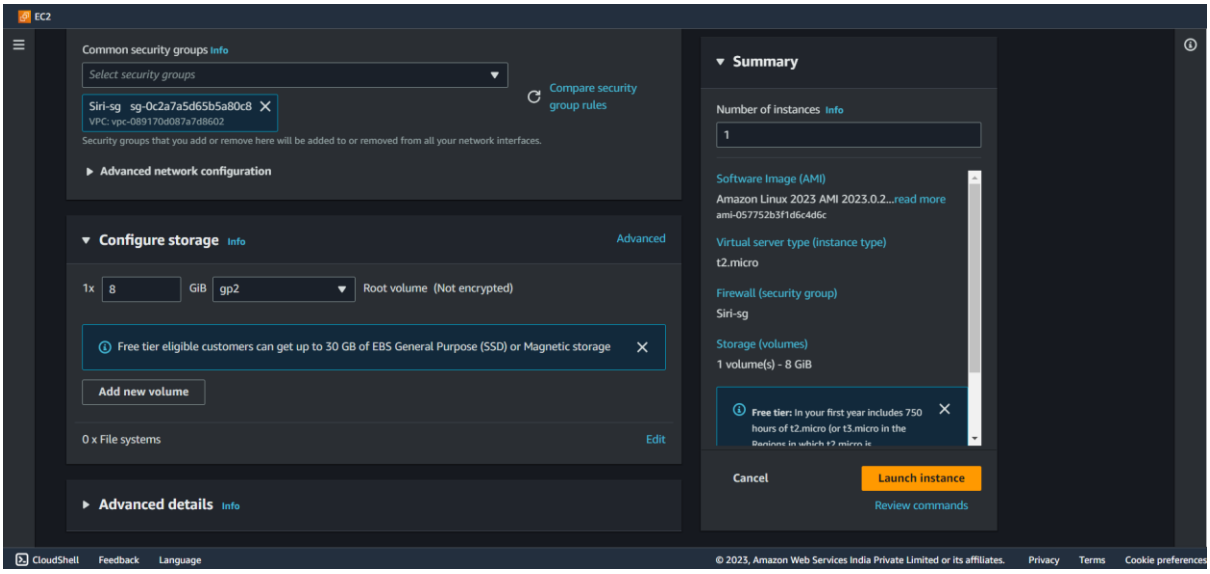
6. Set the required **network settings** regarding VPC and which availability zone you want to create your instance and also **firewalls** required to control the traffic and also **security group rules** to allow specific traffic to reach your instance.

   Create two instance in two different availability zones

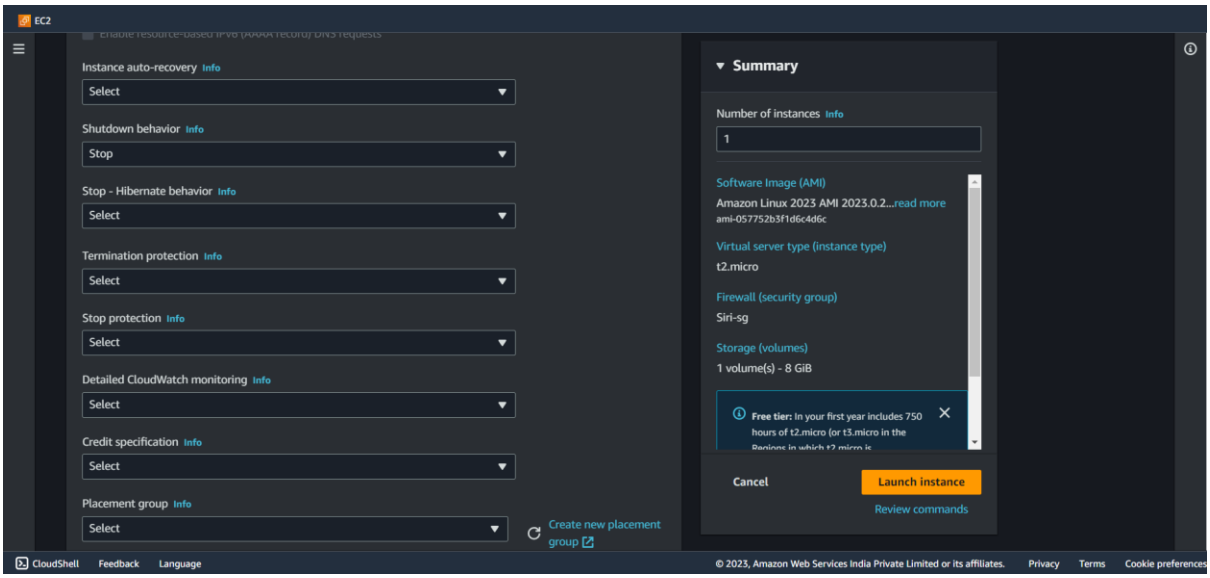
   Here I created Instance1 in **ap-south-1a** and Instance2 in **ap-south-1b**



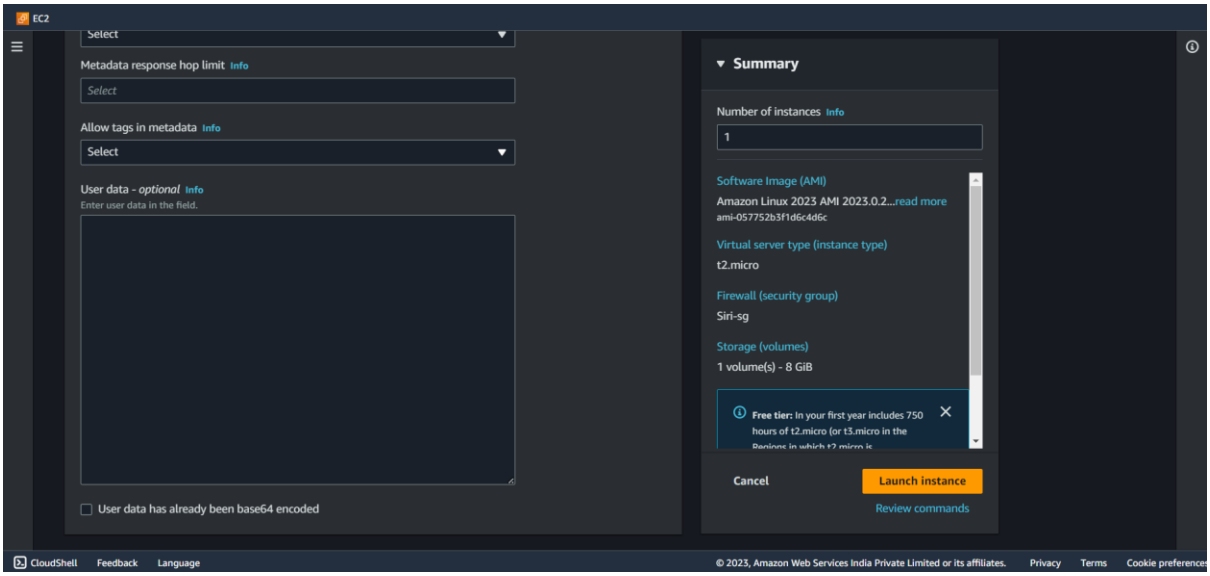
7. Select Required **Configurational storage** for you instance which will be your root volume where information of all your Packages, OS and etc., are stored.



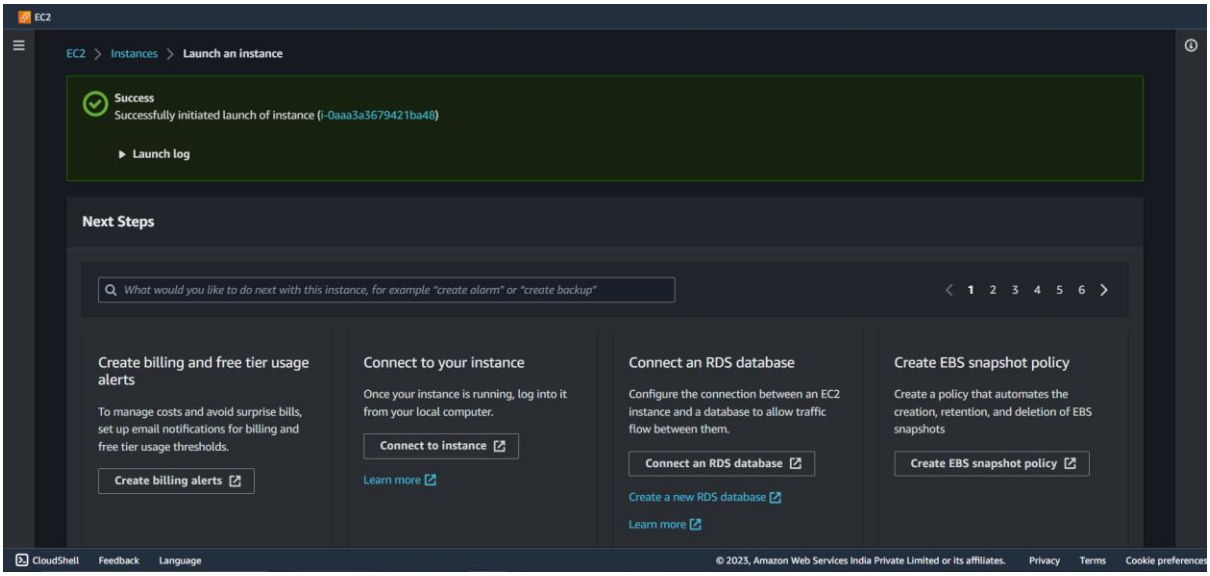
8. You can set advanced settings if you need like DOT (**Delete on Termination** on/off) which will delete/wont delete the root volume when you terminate the instance. **Termination Protection** which helps prevent accidental termination of critical resources. **AWS Cloud watch** is a monitoring and observability service. It enables you to collect and track metrics, collect and monitor log files, and set alarms on specific metrics or log events



9. You can add any **user data** if required to pre boot any program on your ec2 instance



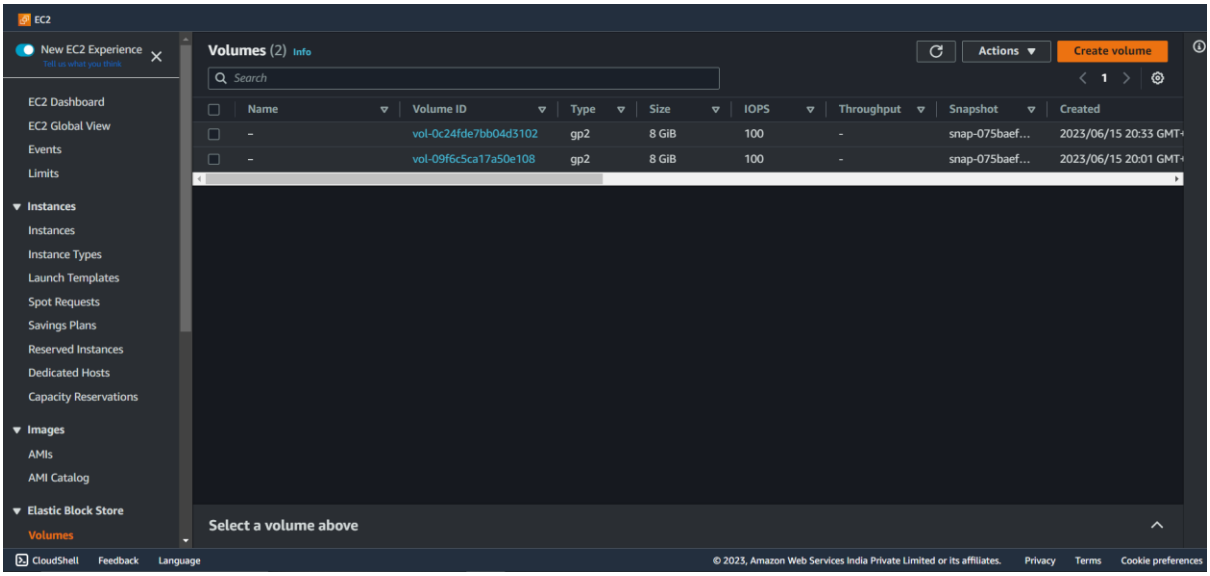
10. Click on **Launch Instance** to launch your EC2 instance and you must be able to few a successfully launched sign with the Instance ID. Then click on the Instance ID to view your instance



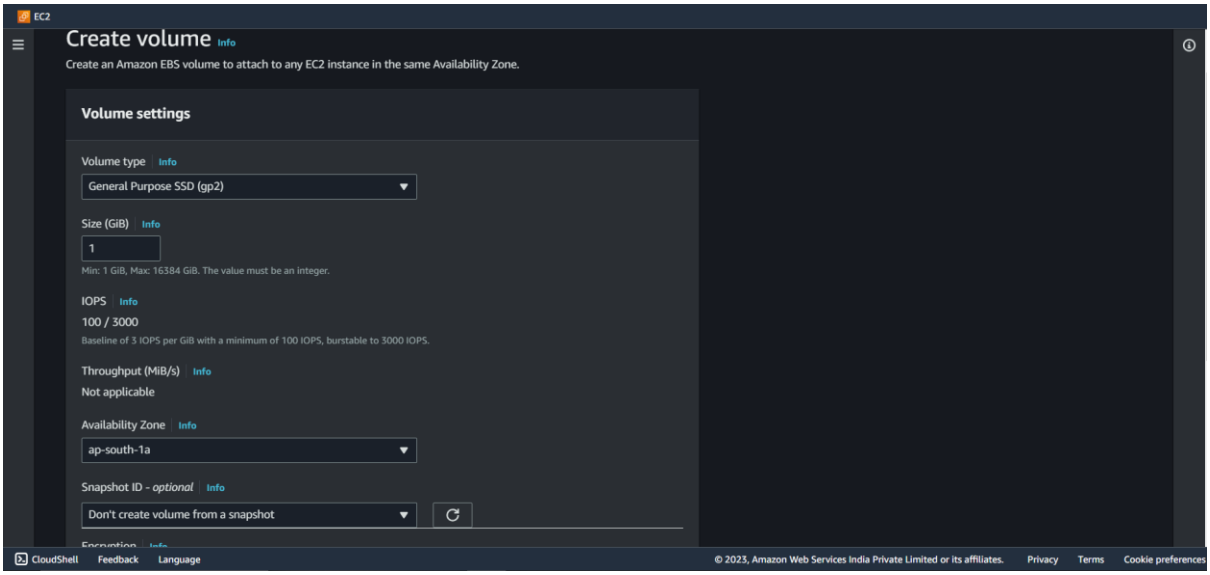
Similarly launch another instance in ap-south-1b availability zone by following above steps.

Adding an EBS volume to Instance 1

1. For creating an extra volume navigate to **Elastic block store section** on left side and select **volumes** and on the top right corner select **create volume**.

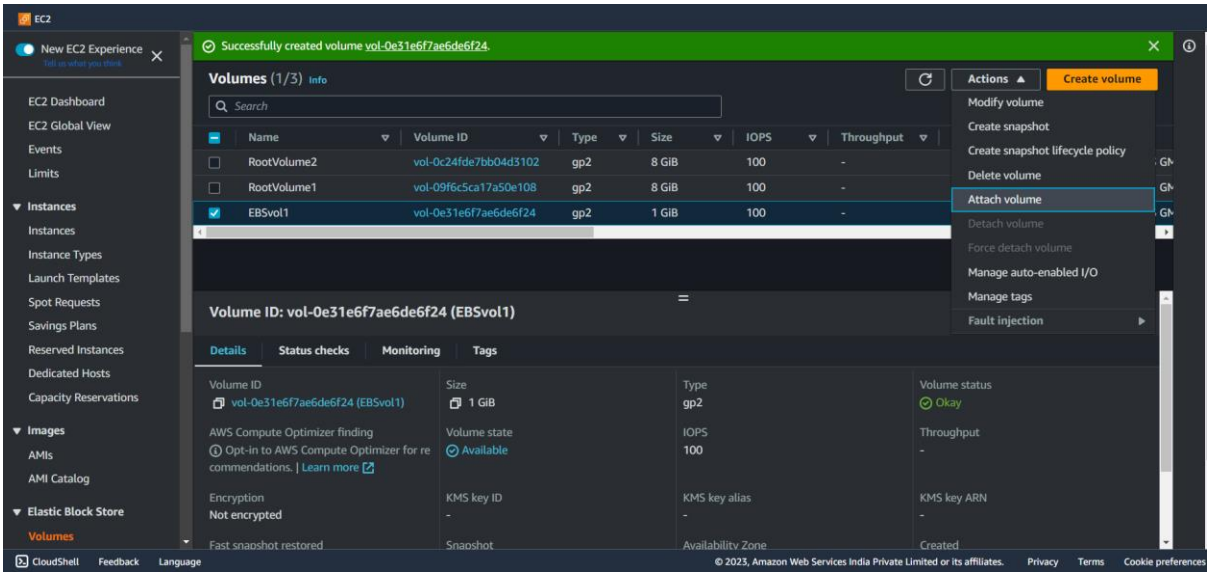


2. Now create an extra volume by selecting **volume type** and **size** and **availability zone** and press on create volume.

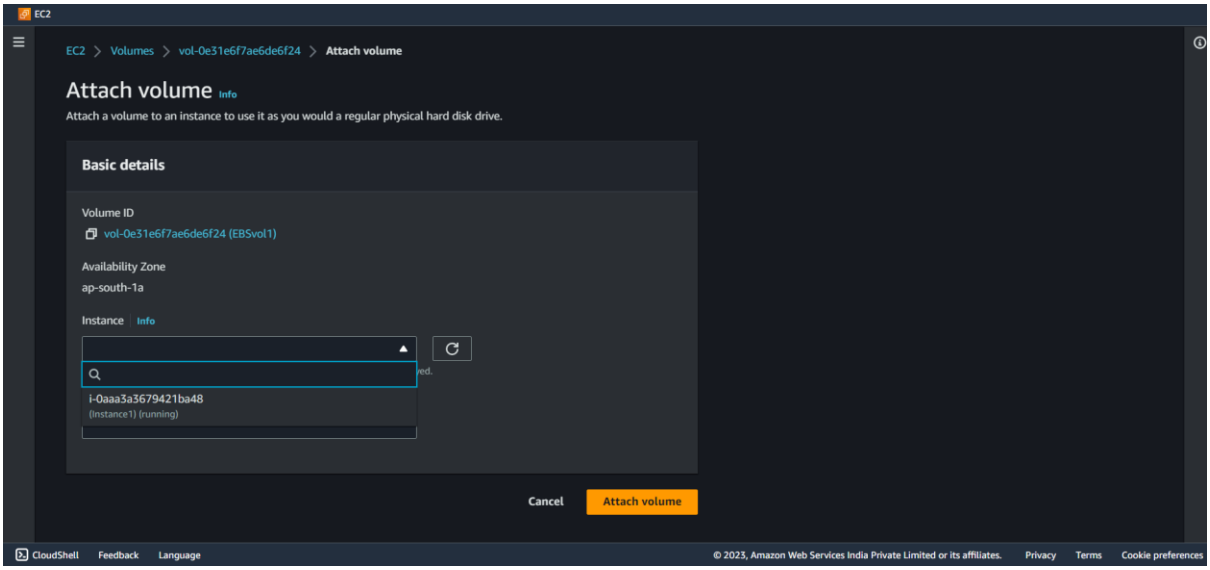


Extra volumes doesn’t have any snapshot id since they are new empty volumes.

3. Attach the new volume to instance1 by selecting the volume and select actions and click on **attach volume.**



4. You will be navigated to attach volume page with respective availability zone you must find the instance **select the instance** and click on **attach volume.**

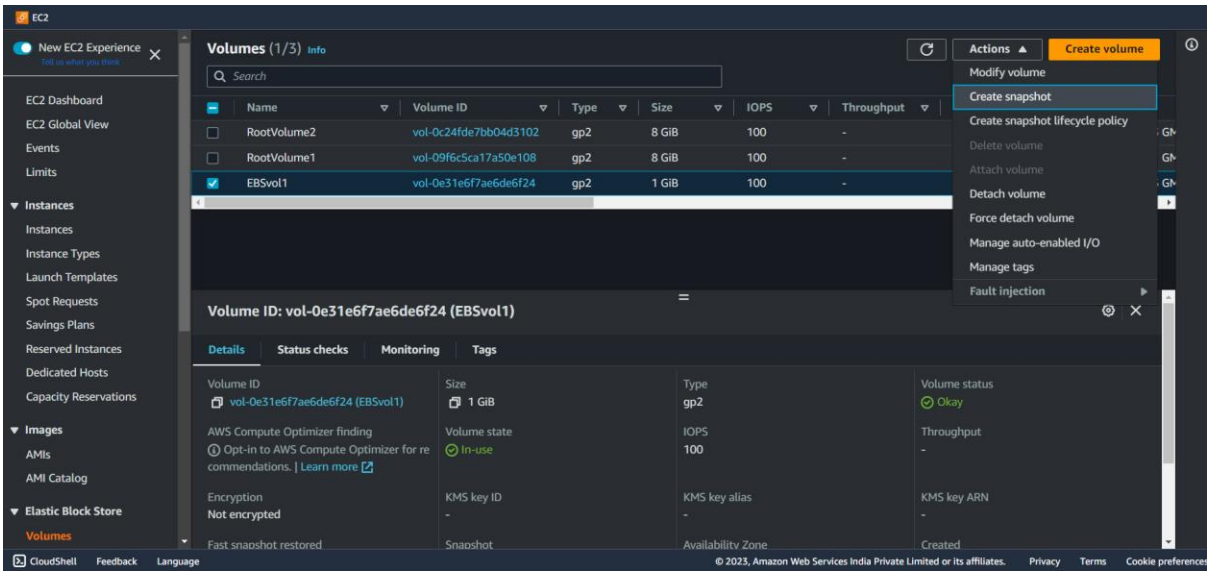


You will find the EBS volume as **in use** in the volumes status.

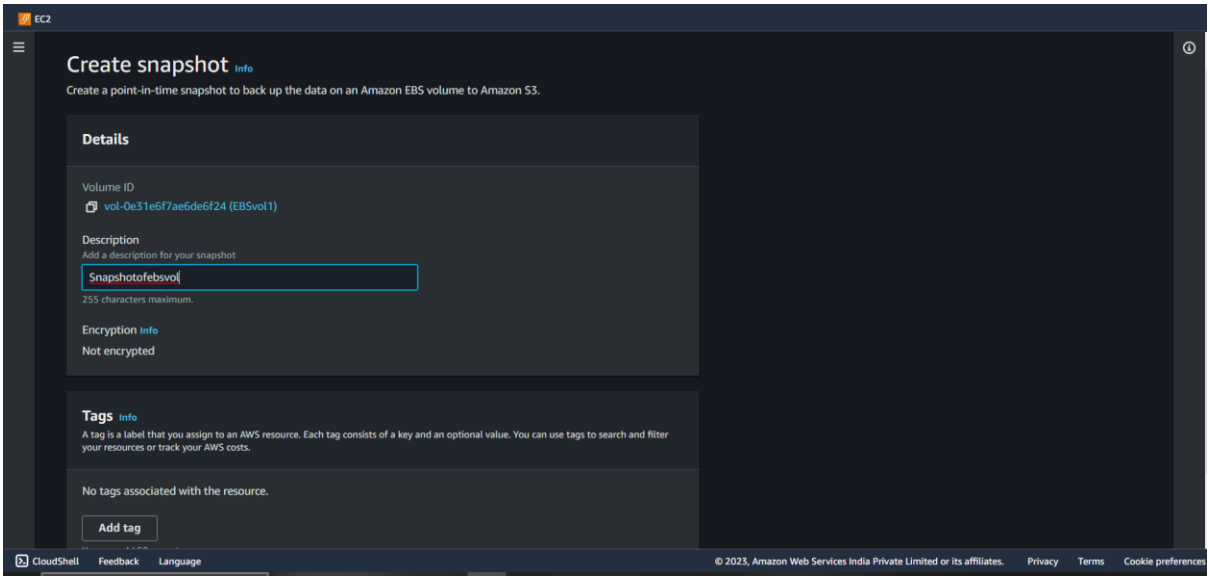
Attaching EBS volume to Instance2 by snapshot

We can't attach a EBS volume of instance of one availability zone to instance of another availability zone since **EBS are AZ specific** hence to transfer the same data we take a snapshot of the volume and create a new volume from the snapshot since **snapshot is Region specific.**

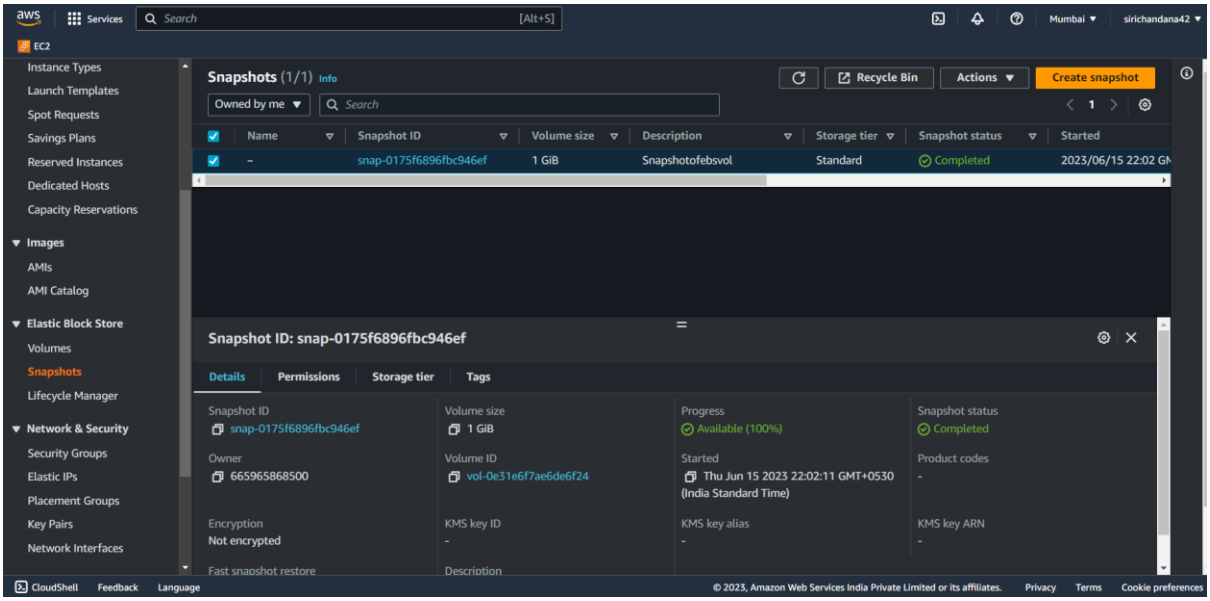
1. Select the EBS volume and click on actions and select on create snapshot



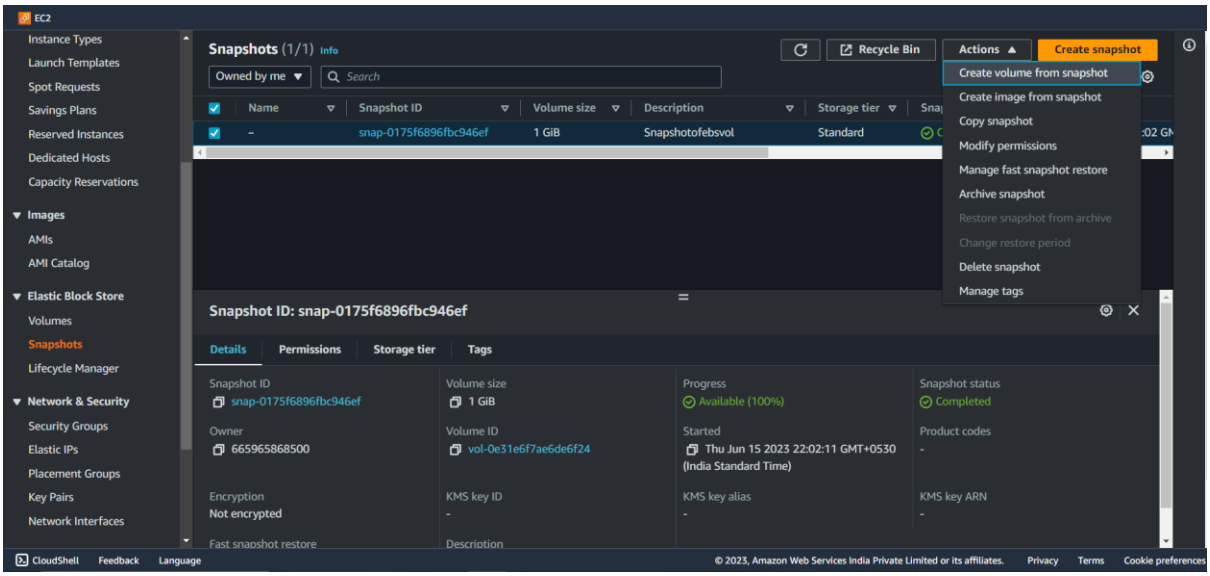
Add the **name** of snapshot and select create snapshot



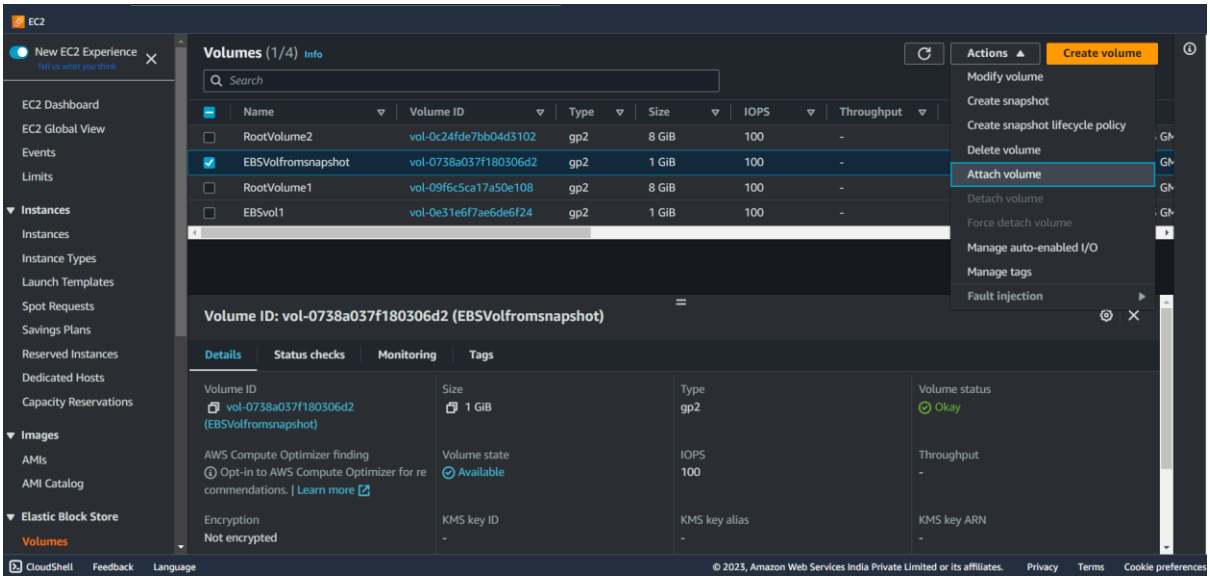
2. Now navigate to snapshots in EBS section you can find the snapshot now **create a new volume** from the existing snapshot.

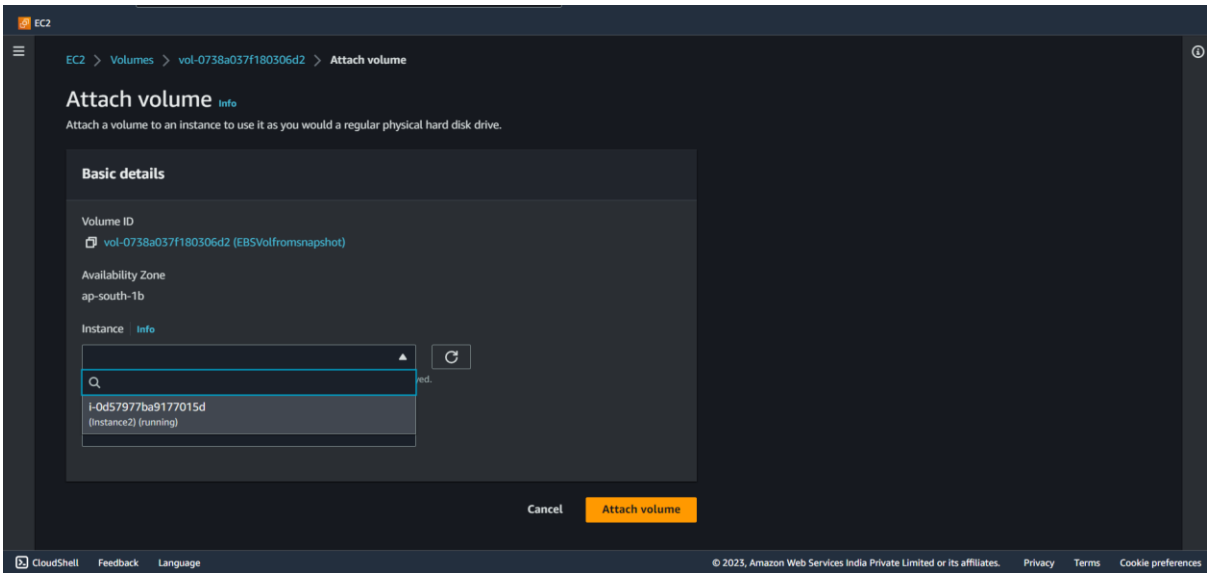


3. Now select the snapshot and click on actions you can find create new volume from snapshot option click on it



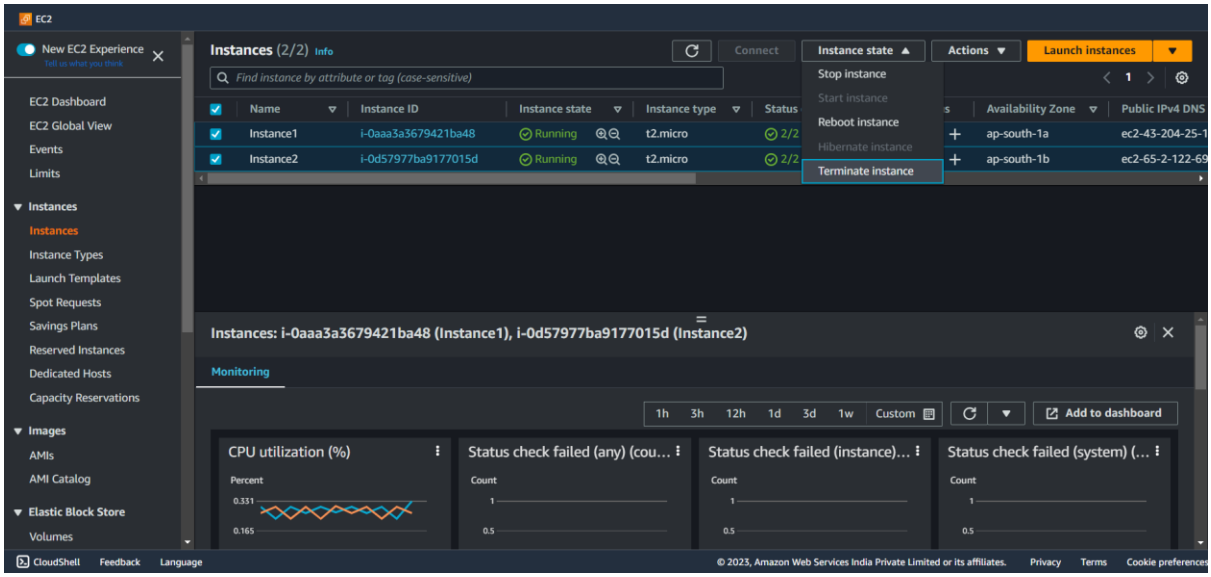
4. Now attach this volume to the instance in ap-south-1b availability zone



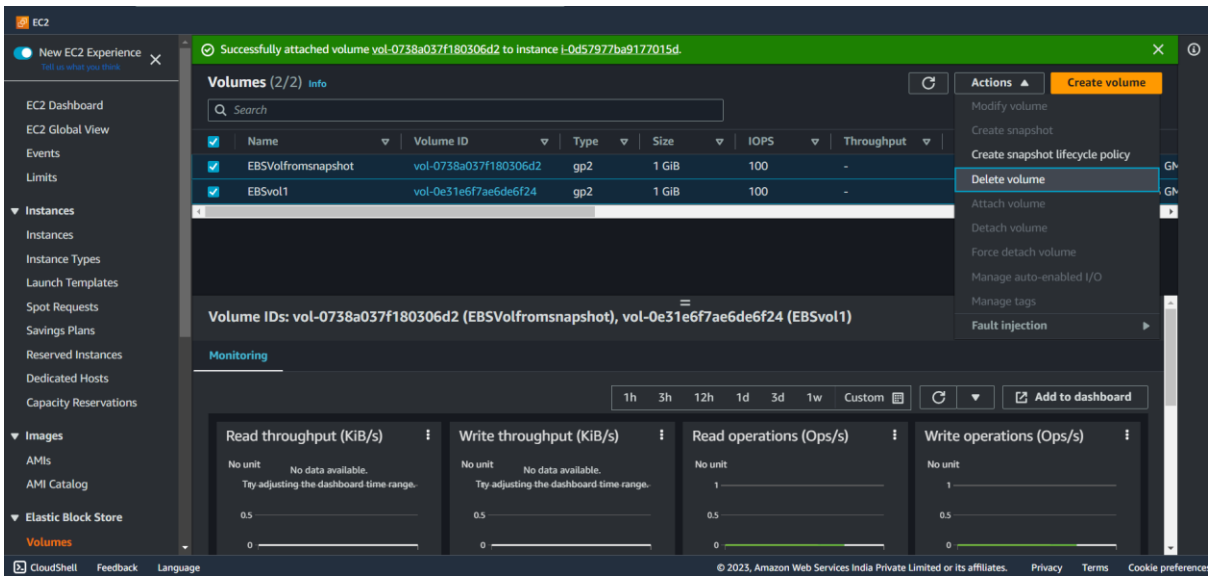


Cleaning up workspace

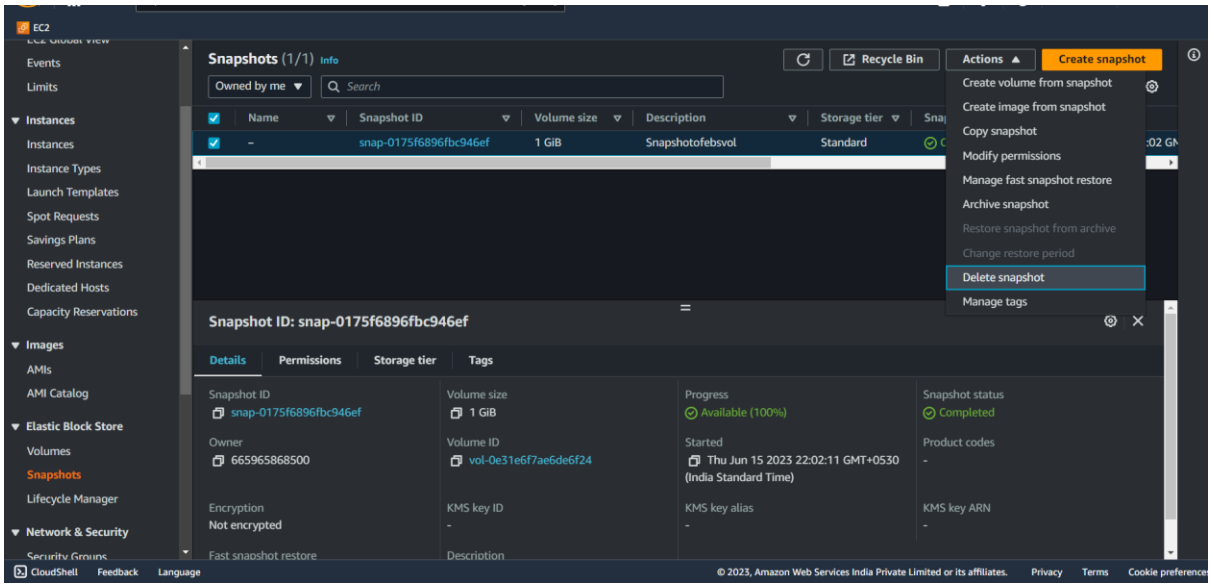
1. When you no longer need an instance you can **terminate the instance** by selecting the instances and click on instance state and then click terminate instance



2. When you terminate an instance with DOT on the root volumes will be deleted but but **EBS volumes** stay so we have to **delete** them



3. You must also **delete the snapshot** or else charges will be applied after 24hrs



Make sure your EC2 dashboard is clear with no running resources