



## 1. Describe the use cases each of EBS, S3, EFS Storage Services.

### Use cases of Amazon Elastic Block Storage

It provides the feature of building users SAN in the cloud for the Input and Output intensive applications.

Amazon Elastic Block Storage helps in migrating mid-range, on-premises storage area network (SAN) workloads to the cloud. It Attaches high-performance and high-availability block storage for mission-critical applications.

It runs relational or NoSQL databases.

Amazon Elastic Block Storage helps in deploying and scaling users' choice of databases including the famous SAP HANA, Oracle, Microsoft SQL Server, MySQL, Cassandra, and MongoDB.

It provides the right size of big data analytics engines to the users.

Amazon Elastic Block Storage easily resizes clusters for the big data analytics engines such as Hadoop and Spark and further freely detach and re-attach volumes.

It provides Cost-effective services.

Amazon Elastic Block Storage are cost-effective and ideal for frequent backups. Users can use tools such as AWS Cost Explorer to track the Amazon EBS snapshot usage and spend, and further optimize the storage costs as needed. It helps in saving up to 75% in the Amazon EBS snapshot storage costs by using EBS Snapshots Archive for the long-term retention (over 90 days) of seldom-accessed snapshots.

It provides Security.

Amazon Elastic Block Security offers a simple encryption solution for users of Amazon EBS resources that does not require users to build, maintain, and secure their key management infrastructure. It can be easily configured using the AWS account to enforce encryption of any new EBS volumes and snapshots users create, including snapshots of the on-premises data.

## Use cases of S3

### 1. Backup File System

- Backup is among the most popular use cases for Amazon S3. Storage claims 99.999999999% durability and distribution of three copies of each file between its data centers in different regions. This means crucial backup files you need to store will not be destroyed by human error or even region-level natural disaster.
- With the price of \$0.023 per GB at the first usage tier in the N. Virginia region, you get a reliable and cost-effective offsite solution.

### 2. Infrequent Access, Reduced Redundancy & Archival Storage

- Amazon S3 is divided by Standard, Standard IA Z-IA, RRS, and Glacier. In Standard I/A and Z-IA classes the accessibility of an object is reduced, therefore it poorly suits for files that can be requested by the websites or applications.
- The Reduced Redundancy Storage (RRS) class assumes the higher probability of losing an object, so it's not wise to store crucial data there. Use it for tons of user images or for files that have another copy stored locally instead.
- Amazon Glacier is also described as an Amazon S3 class by AWS, but in fact represents a standalone archival storage for data that is almost never accessed: older backup versions, family archives, etc. Archiving helps users to reduce the overall storage cost and get rid of the outdated files.

### 3. Host Static Website

- Amazon S3 is a silver bullet for site administrators because it's suitable for almost each and every webmaster's need. First of all, it can be used as a hosting service. With the same \$0.0300 price for a hosted GB/Month, it surpasses the hosting market average \$2.75/month, but only to the point where your static website is below 100 GB in total.
- Backup CMS Data
  - ➔ If the thought of losing your blog posts makes you wince, backup is worth taking a look. There are a few plugins that can be integrated into the WordPress system, like BackupBuddy, that can store pages, files, directories, plugins, tables, user accounts and comments in Amazon S3 account on schedule.
- Downloadable Content Storage
  - ➔ Amazon S3 can significantly boost website's performance, with the helping hand from the CloudFront content delivery network. If you're planning to use content distribution on a regular basis, remember that requests to your data are \$0.004/10.000 requests. Because of its price, Amazon S3 is extremely useful for large content distributions.
- Video Stream Source
  - ➔ You can host your streams and live broadcasting using both Amazon S3 and CloudFront. While there are a lot of protocols available for it, most of the users stay on RTMP, which delivers media to the common Adobe Flash Player.

### 4. Create Private Local Repository

- Amazon S3 can be used to create your own private local Git, Yum or Maven repository. This helps in the situation when you want to save some time and avoid complicated scripting. Instead of running multiple servers you just store the master file in the cloud (making S3 bucket a root directory) and push commits through plug-ins like Jgit.

### 5. Improve File Sharing

- Amazon S3 can be also used as a cheap file sharing solution or a network drive and be integrated into your environment. The first use case is similar to Dropbox (which was built on the top of Amazon S3 previously) — you configure ACL policy to allow access to the bucket for some users and upload files to do some teamwork.

## Use cases of EFS

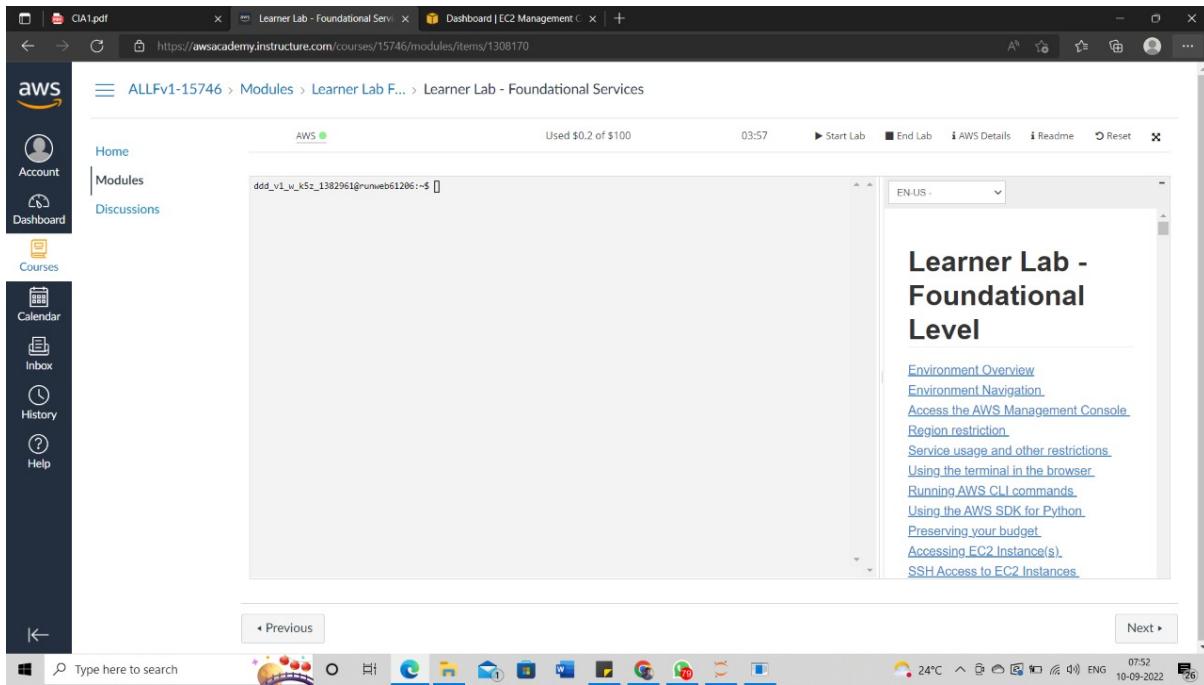
- Web serving and content management
- Enterprise application usage
- Media and entertainment

- Shared and home directories
- Database backups
- Developer and application tools
- Container storage
- Big data analytics
- Other applications where you need to connect a common data source to a single server or multiple servers

**2. Create an Amazon EBS volume. After you create the volume, you will attach the volume to an Amazon EC2 instance, configure the instance to use a virtual disk, create a snapshot and then restore from the snapshot.**

### Launch EC2 Instance for Windows

1. Login to AWS Portal. Go to the Learner Lab program and click on the start lab button. It should show a green signal beside the AWS link.



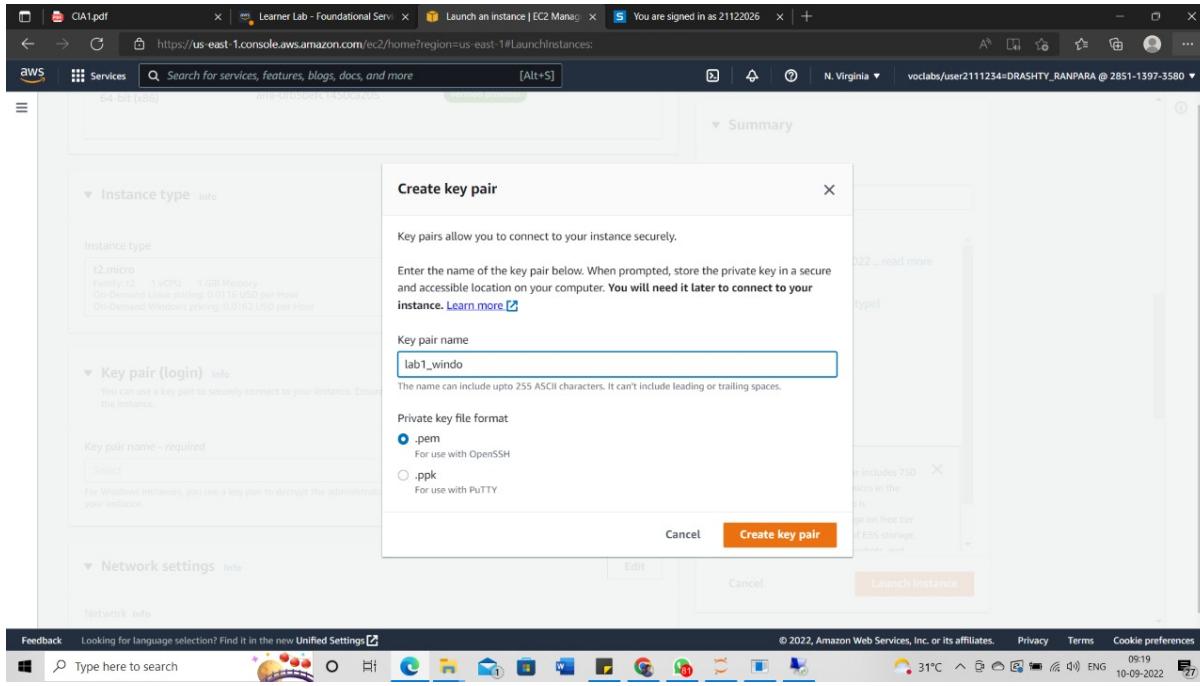
2. Navigate to EC2 Dashboard and click on Launch Instance.

The screenshot shows the AWS EC2 Dashboard. On the left, there's a sidebar with options like EC2 Global View, Events, Tags, Limits, Instances (with sub-options like Instances, Instance Types, Launch Templates, Spot Requests, Savings Plans, Reserved Instances, Dedicated Hosts, Scheduled Instances, Capacity Reservations), and Feedback. The main area has a section titled 'Resources' with tables for Instances (running), Dedicated Hosts, Elastic IPs, Instances, Key pairs, Load balancers, Placement groups, Security groups, Snapshots, and Volumes. To the right, there's a 'Account attributes' panel listing Supported platforms (VPC), Default VPC (vpc-02d3013f96067cce7), Settings, EBS encryption, Zones, EC2 Serial Console, Default credit specification, and Console experiments. At the bottom, there's an 'Explore AWS' section with a promotion for T4g instances.

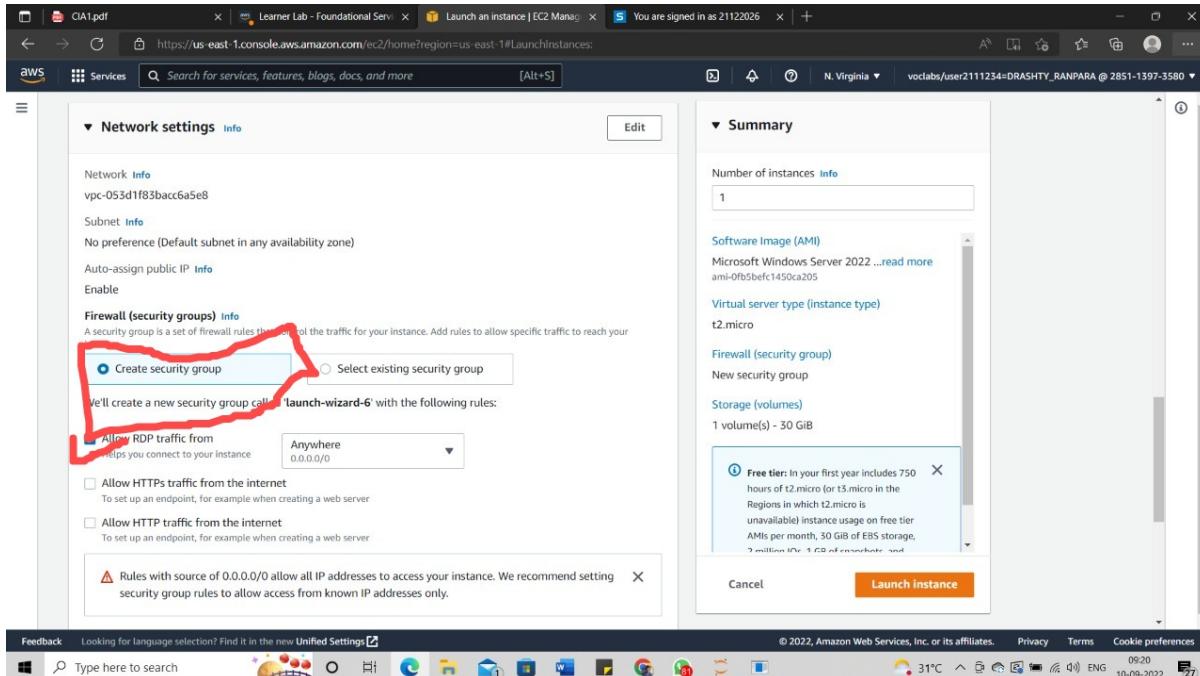
- Provide with Name and tags - for instance, lab1. Furthermore, select the necessary operating system based on your requirement. In our case, we go for **Windows** and opt for **free tier eligibility**.

The screenshot shows the 'Launch an instance' wizard. It starts with a summary step where you can enter the number of instances (1). Then it moves to the 'Instance type' step, where 't2.micro' is selected. Below it, there's a note about free tier eligibility for Windows Server 2022. The next step is 'Key pair (login)', which asks for a key pair name (e.g., 'Select'). A note says that for Windows instances, you use a key pair to decrypt the administrator password. Finally, it reaches the 'Network settings' step. At the bottom, there's a 'Launch Instance' button.

- Select the necessary **instance type** and click on **Create new key pair**. From the dialogue box that appeared, give the **Key pair name** and under the **Key pair type** select **RSA** furthermore, under the **Private key file format** select **.ppk**(for Linux). Finally, click on **Create key pair** button.



5. After creating key pair under Network Settings select the radio button and **Create security group**. If you already have an existing security group kindly go for that option. Next, select the checkbox **Allow RDP traffic from**.



6. According to your requirements go for **Configure storage**. Here I opt for default storage which is already given. After that, click on the **Launch instance** button.

The screenshot shows the AWS Lambda console with a success message: "Successfully initiated launch of instance (i-06b1d2c18a4e7b777)". Below this, there's a "Launch log" link. A "Next Steps" section follows, containing links for "Get notified of estimated charges", "How to connect to your instance", and "View more resources to get you started". At the bottom right is a "View all instances" button.

The screenshot shows the AWS Lambda console configuration interface. It includes sections for "Allow HTTP traffic from the internet", "Configure storage" (with a note about free tier storage), and "Advanced details". A modal window titled "Summary" is open, showing "Number of instances" set to 1. In the bottom right corner of this modal, there is a red box around the "Launch instance" button.

7. A **Success** message will be popped once you launch the instance.

8. Furthermore, click on **Get Password**.

The screenshot shows the AWS Management Console with the URL <https://us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#GetWindowsPasswordInstanceId=0157cdfb120398423;previousPlace=ConnectToInstance>. The page title is "Get Windows password". It instructs the user to retrieve and decrypt the initial Windows administrator password for the instance. A box highlights the "Key pair associated with this instance" as "lab1\_window". Below it, a "Browse" button is shown, and a file named "lab1\_window.pem" (1.678KB) is selected. A note says "Or copy and paste the contents of the key pair below:" followed by a large text area containing the RSA PRIVATE KEY content.

## 9. Navigate to Elastic Block Store → Volumes. Click on create volume.

The screenshot shows the AWS Management Console with the URL <https://us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#Volumes>. The left sidebar shows navigation links for Spot Requests, Savings Plans, Reserved Instances, Dedicated Hosts, Scheduled Instances, Capacity Reservations, Images, AMIs, AMI Catalog, Elastic Block Store (with 'Volumes' selected), Network & Security, Load Balancing, and Auto Scaling. The main pane displays a table titled "Volumes (3)" with columns: Name, Volume ID, Type, Size, IOPS, Throughput, Snapshot, Created, Availability Zone, and Actions. Three volumes are listed: vol-01115fba66gef0fd10 (gp2, 30 GiB, 100 IOPS, 125 Throughput, snap-0426aae..., 2022/10/13 11:11:20 GMT+5:30, us-east-1a), vol-0bdcb1b15ed550f01f (gp3, 100 GiB, 3000 IOPS, - Throughput, - Snapshot, 2022/10/13 11:26 GMT+5:30, us-east-1a), and vol-08472b46b197ba6e5 (gp2, 30 GiB, 100 IOPS, - Throughput, snap-0426aae..., 2022/10/13 15:20 GMT+5:30, us-east-1a). A "Create volume" button is visible at the top right of the table.

## 10. Change Volume Type and other variables according to your needs and click on create volume.

The screenshot shows the AWS Cloud9 IDE interface. The left sidebar contains navigation links for Spot Requests, Savings Plans, Reserved Instances, Dedicated Hosts, Scheduled Instances, Capacity Reservations, Images, AMIs, Elastic Block Store (Volumes, Snapshots, Lifecycle Manager), Network & Security (Security Groups, Elastic IPs, Placement Groups, Key Pairs, Network Interfaces), Load Balancing (Load Balancers, Target Groups), and Auto Scaling.

The main content area displays a table titled "Volumes (3)" with the following data:

Name	Volume ID	Type	Size	IOPS	Throughput	Snapshot	Created	Availability Zone
-	vol-01115f8a66efdf10	gp2	30 GiB	100	-	snap-0426ae...	2022/10/13 11:21 GMT+5...	us-east-1a
-	vol-0bdc1b15ed550f01f	gp3	100 GiB	3000	125	-	2022/10/13 11:26 GMT+5...	us-east-1a
-	vol-08472b46b197ba6e5	gp2	30 GiB	100	-	snap-0426ae...	2022/10/13 15:20 GMT+5...	us-east-1a

A message at the bottom of the table says "Select a volume above".

The status bar at the bottom indicates "Feedback Looking for language selection? Find it in the new Unified Settings" and shows the date and time as "13-10-2022 15:21".

**Second Screenshot:**

The second screenshot shows the same AWS Cloud9 IDE interface after a volume has been created. A green banner at the top reads "Successfully created volume vol-06753ac7dd51b310b." The main content area now shows a table titled "Volumes (4)" with the following data:

Name	Volume ID	Type	Size	IOPS	Throughput	Snapshot	Created	Availability Zone
-	vol-01115f8a66efdf10	gp2	30 GiB	100	-	snap-0426ae...	2022/10/13 11:21 GMT+5...	us-east-1a
-	vol-0bdc1b15ed550f01f	gp3	100 GiB	3000	125	-	2022/10/13 11:26 GMT+5...	us-east-1a
-	vol-08472b46b197ba6e5	gp2	30 GiB	100	-	snap-0426ae...	2022/10/13 15:20 GMT+5...	us-east-1a
-	vol-06753ac7dd51b310b	gp3	100 GiB	3000	125	-	2022/10/13 15:34 GMT+5...	us-east-1a

A message at the bottom of the table says "Select a volume above".

The status bar at the bottom indicates "Feedback Looking for language selection? Find it in the new Unified Settings" and shows the date and time as "13-10-2022 15:34".

11. Select the checkbox of the newly created volume. Furthermore, go to the Actions tab and click **Attach volume**.

Volumes (1/4)

Name	Volume ID	Type	Size	IOPS	Throughput	Snapshot
vol-01115f8a66efdf10	gp2	30 GiB	100	-	-	snap-0426aee...
vol-0bdc1b15ed50f01f	gp3	100 GiB	3000	125	-	
vol-08472b46b197ba6e5	gp2	30 GiB	100	-	-	snap-0426aee...
vol-06753ac7dd51b310b	gp3	100 GiB	3000	125	-	

**Actions ▾**

- Modify volume
- Create snapshot
- Create snapshot lifecycle policy
- Delete volume
- Attach volume
- Detach volume
- Force detach volume
- Manage auto-enabled I/O
- Manage tags

Volume ID: vol-06753ac7dd51b310b

Details Status checks Monitoring Tags

12. Select your previously created instance to be allocated to the particular volume and click on **Attach volume** button.

Attach volume Info

Attach a volume to an instance to use it as you would a regular physical hard disk drive.

**Basic details**

Volume ID  
vol-06753ac7dd51b310b

Availability Zone  
us-east-1a

Instance Info  
i-01000d67e49feaff0

Device name Info  
xvdf

Recommended device names for Windows: /dev/sda1 for root volume, xvdf[1-p] for data volumes.

Cancel **Attach volume**

13. Cross check whether the volume is attached to instance or not under the **Attached instances** tab.

The screenshot shows the AWS EC2 Volumes page. The left sidebar includes options like EC2 Dashboard, Global View, Events, Tags, Limits, Instances (selected), Instance Types, Launch Templates, Spot Requests, Savings Plans, Reserved Instances, Dedicated Hosts, Scheduled Instances, Capacity Reservations, Images, AMIs, and Elastic Block Store (Volumes selected). The main content area displays a table of volumes:

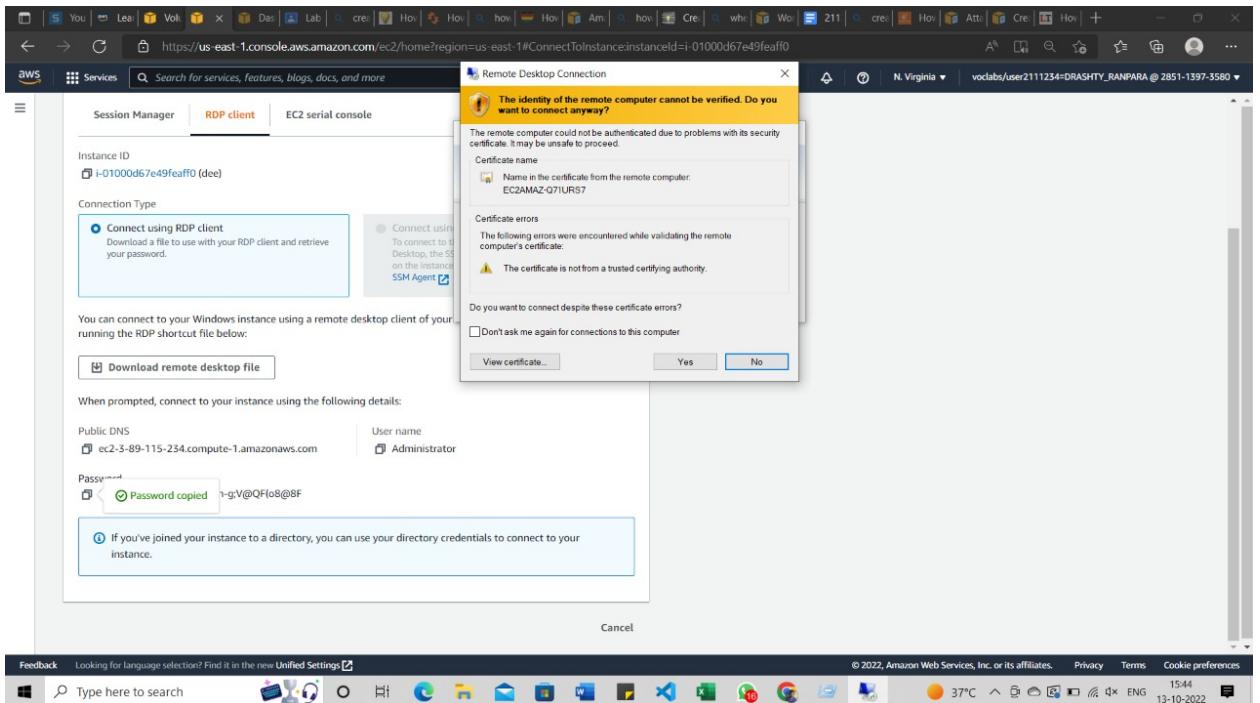
Availability Zone	Volume state	Alarm status	Attached Instances	Volume state	Encryption	KMS key ID	KMS key alias	Multi-Att...
us-east-1a	In-use	No alarms	i-0098471b46c2a6028 (lab...)	Okay	Not encrypted	-	-	No
us-east-1a	In-use	No alarms	i-0098471b46c2a6028 (lab...)	Okay	Not encrypted	-	-	No
us-east-1a	In-use	No alarms	i-01000d67e49feaff0 (dee...)	Okay	Not encrypted	-	-	No
us-east-1a	In-use	No alarms	i-01000d67e49feaff0 (dee...)	Insufficient data	Not encrypted	-	-	No

Select a volume above

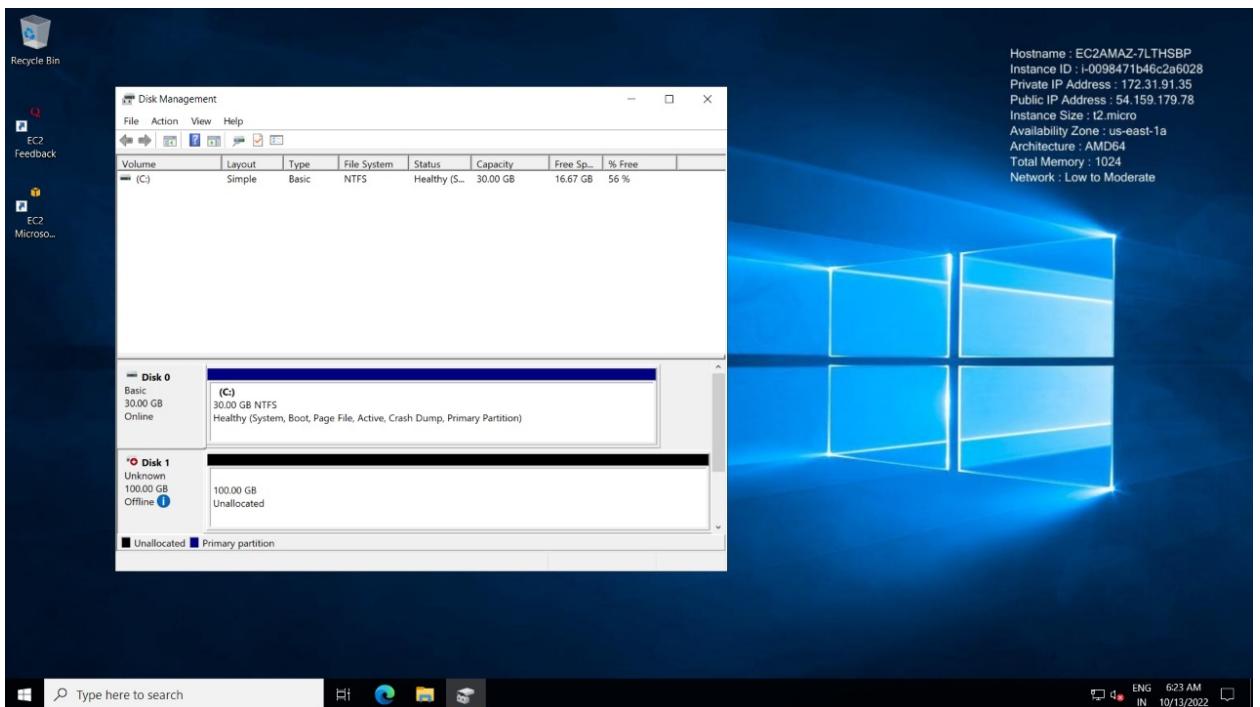
## 14. Connect your instance with RDP client.

The screenshot shows the AWS EC2 ConnectToInstance page for instance i-01000d67e49feaff0. The left sidebar shows EC2 > Instances > i-01000d67e49feaff0 > Connect to instance. The main content area has tabs for Session Manager, RDP client (selected), and EC2 serial console. The RDP client tab shows:

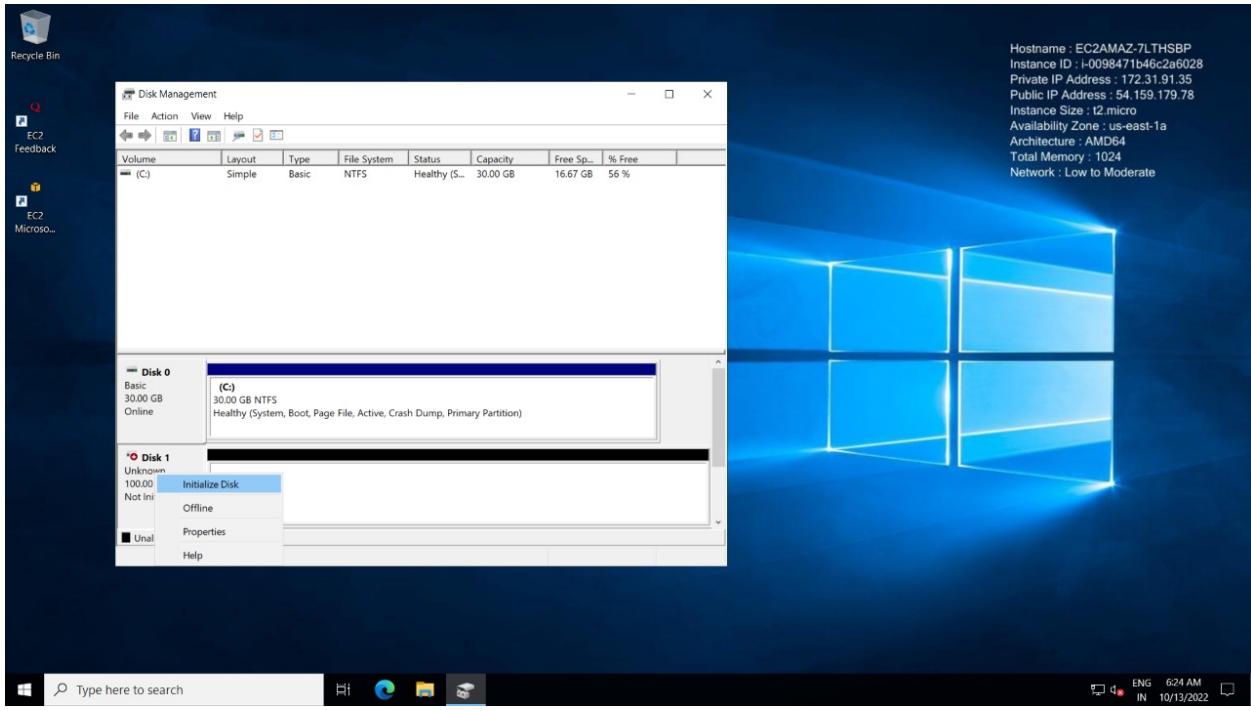
- Connect to instance** (Info): Connect to your instance i-01000d67e49feaff0 (dee) using any of these options.
- Session Manager**, **RDP client** (selected), **EC2 serial console**
- Instance ID**: i-01000d67e49feaff0 (dee)
- Connection Type**:
  - Connect using RDP client** (selected): Download a file to use with your RDP client and retrieve your password.
  - Connect using Fleet Manager**: To connect to the instance using Fleet Manager Remote Desktop, the SSM Agent must be installed and running on the instance. For more information, see [Working with SSM Agent](#).
- You can connect to your Windows instance using a remote desktop client of your choice, and by downloading and running the RDP shortcut file below:**
- Download remote desktop file**
- When prompted, connect to your instance using the following details:**
  - Public DNS**: ~1.amazonaws.com (Public DNS copied)
  - User name**: Administrator
  - Password**: Get password
- If you've joined your instance to a directory, you can use your directory credentials to connect to your instance**



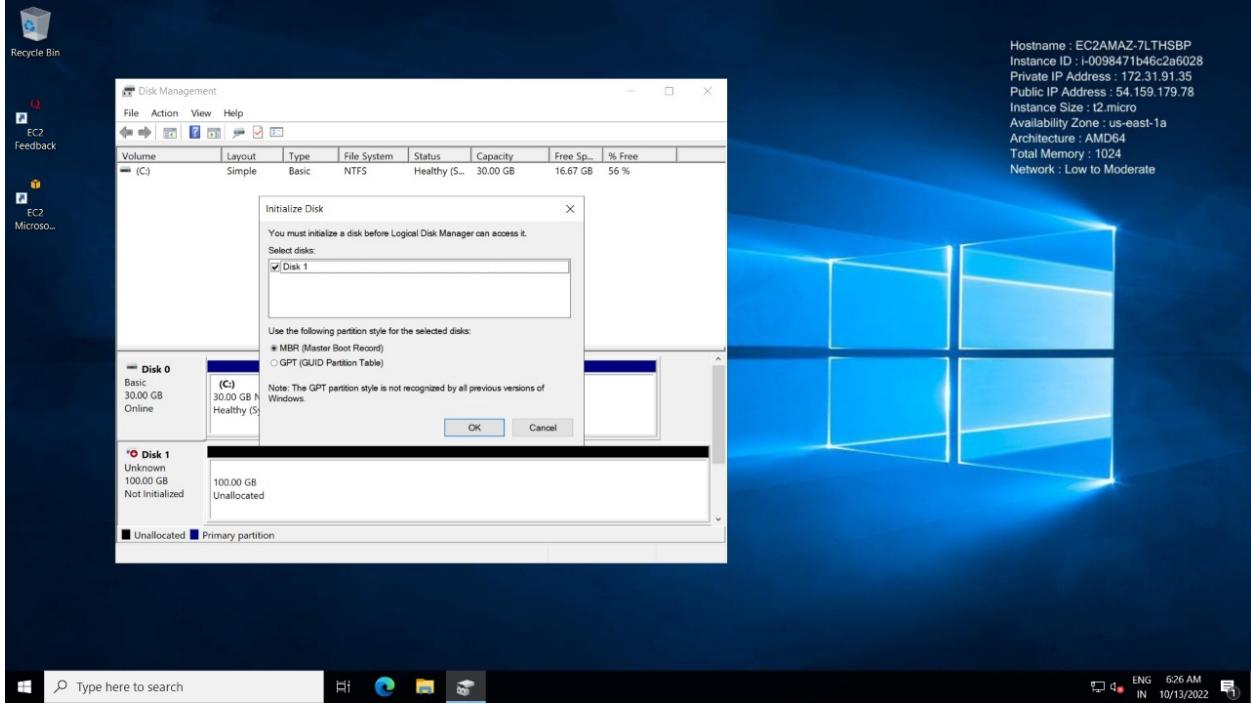
## 15. In your instance open Disk Management.



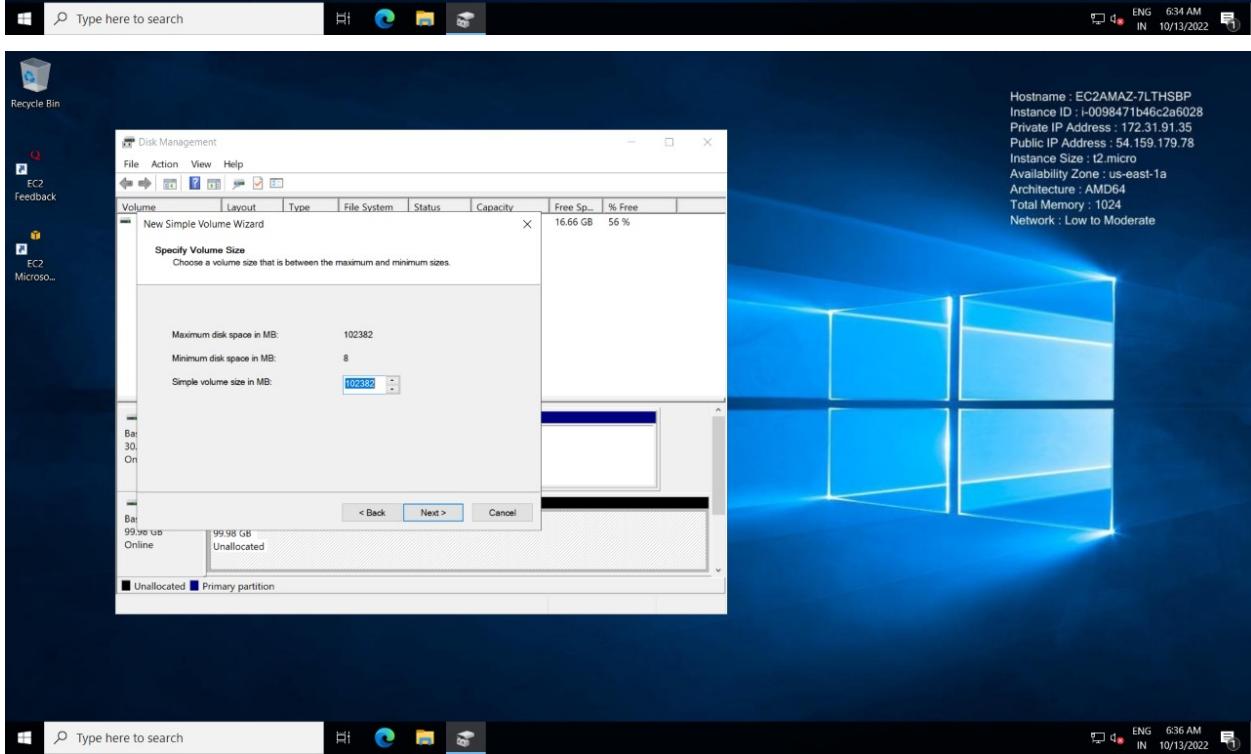
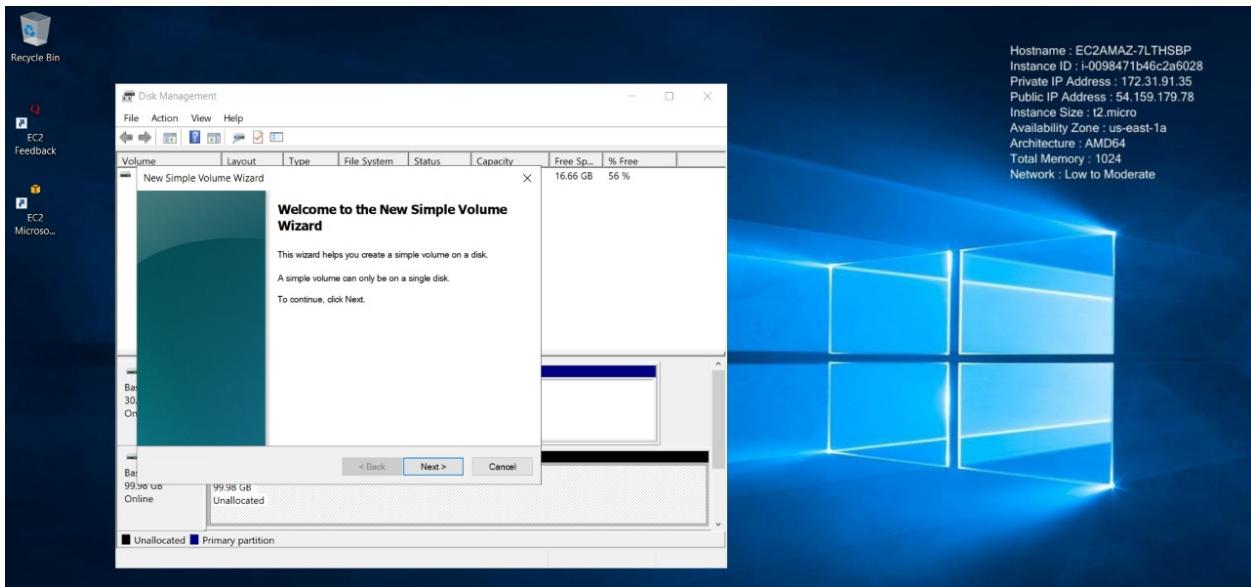
## 16. Right click on Disk 1 click online option. Next, again right click on Disk 1 and select Initialize Disk.



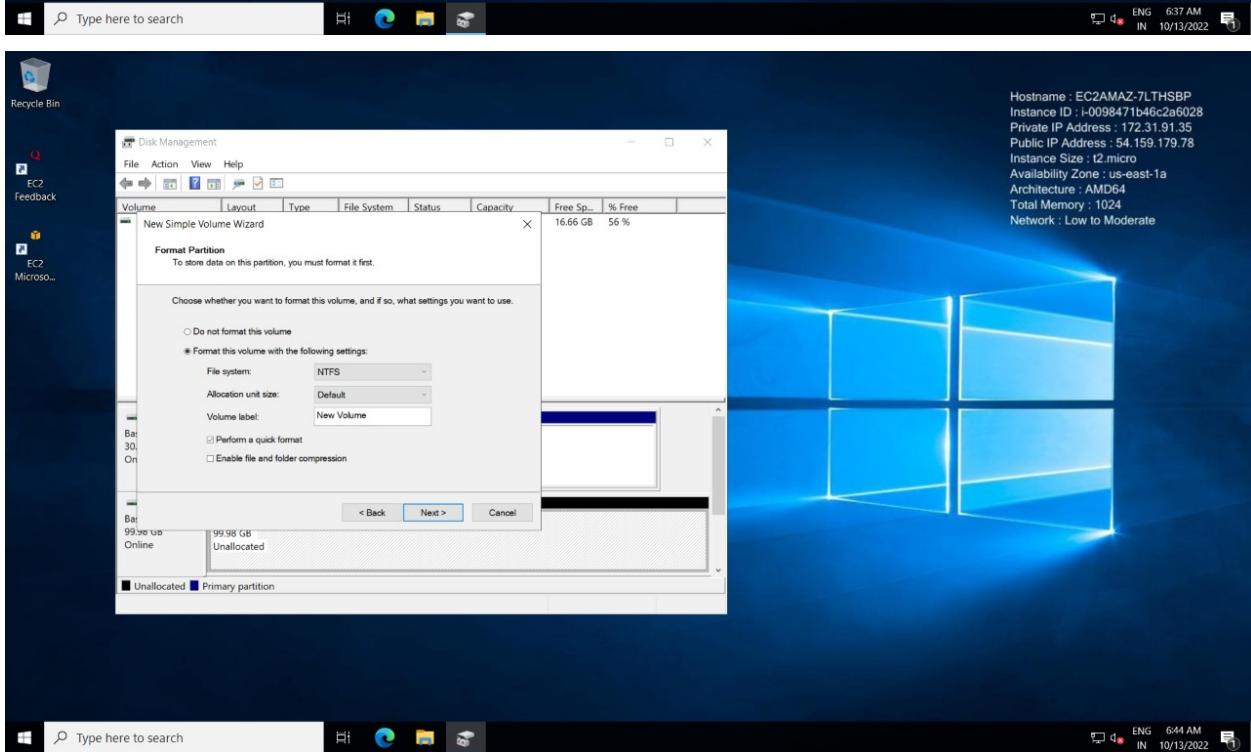
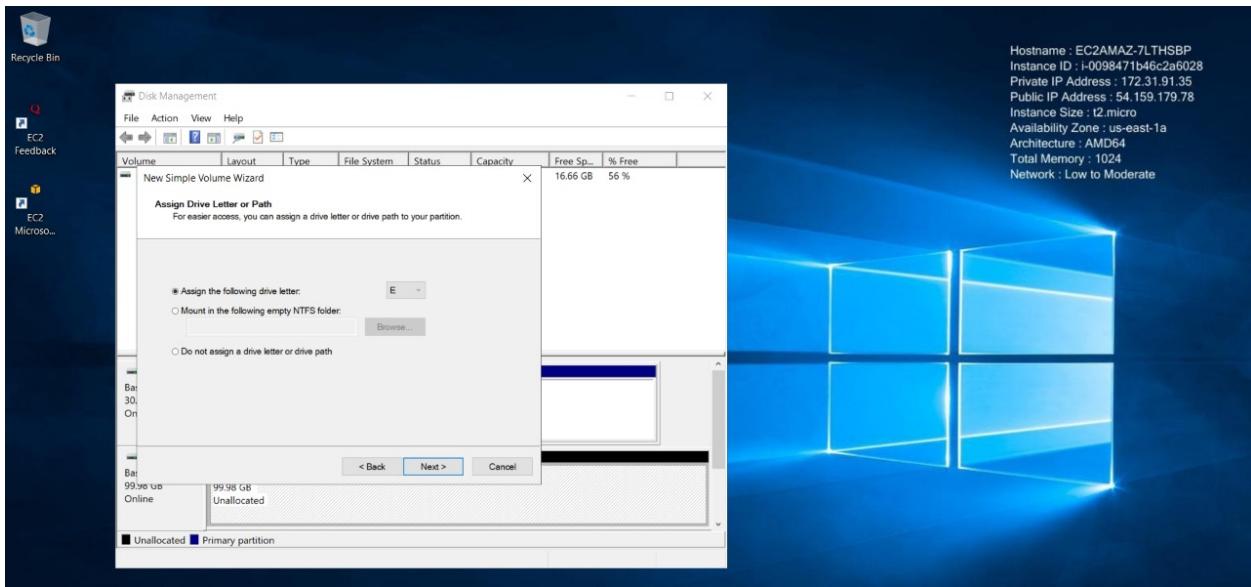
17. In the Initialize Disk window choose the GPT radio button → OK.

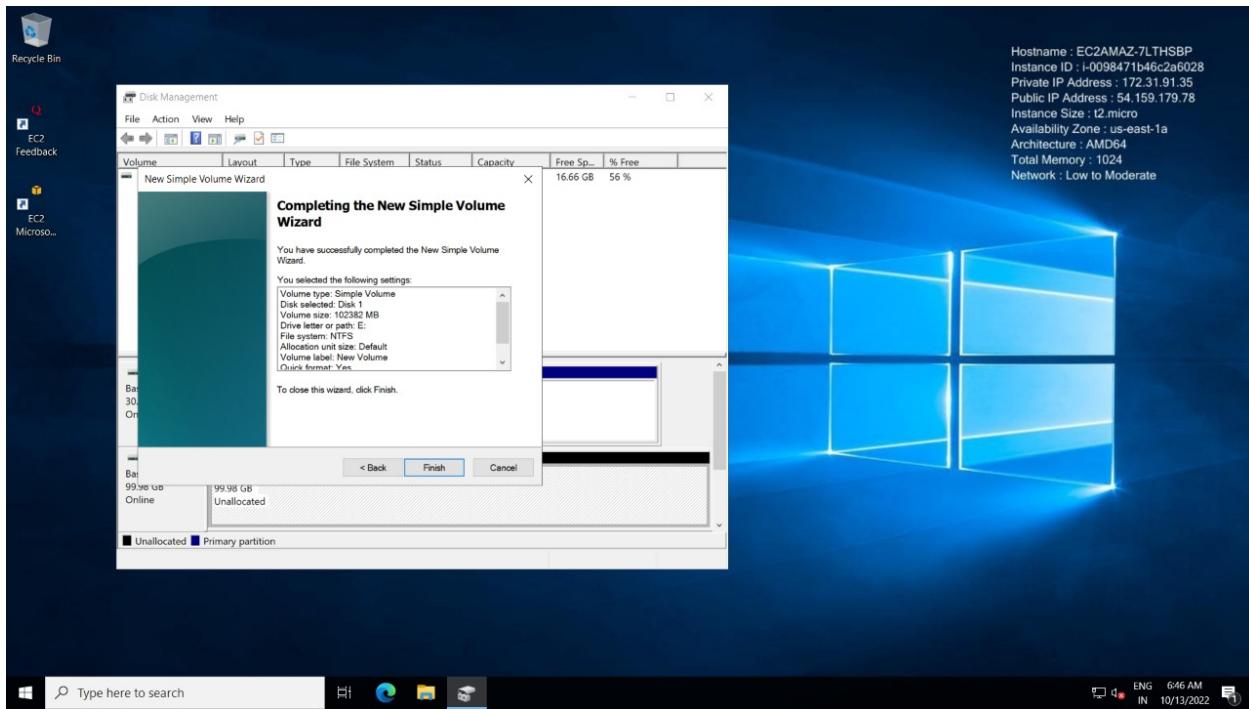


18. Right click on unallocated and select New Simple Volume and this will direct you to the Wizard screen and allocate space according to your requirements click on Next.

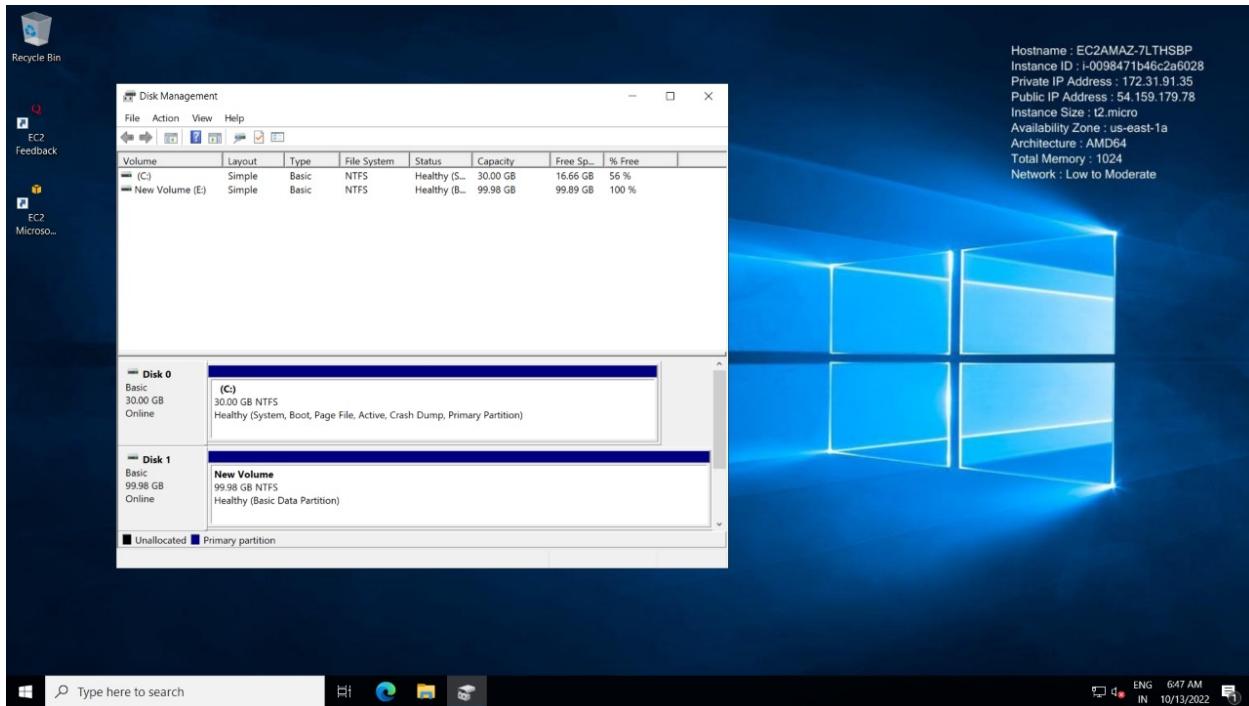


19. Select your disk name and click **next** and **finish**.





20. To confirm the volume addition in the instance environment. Go to file manager and check the Drive 1 i.e. C Drive partition which is now allocated.



21. Navigate to the Volumes and select the volume for which you want to make a snapshot. Go to Actions tab and select Create snapshot.

Volumes (1/4)

Name	Volume ID	Type	Size	IOPS	Throughput	Snapshot
vol-01115f8a66efdf10	gp2	30 GiB	100	-	-	snap-0426aee...
<b>vol-0bdc1b15ed550f01f</b>	<b>gp3</b>	<b>100 GiB</b>	<b>3000</b>	<b>125</b>	<b>-</b>	<b>snap-0426aee...</b>
vol-08472b46b197ba6e5	gp2	30 GiB	100	-	-	snap-0426aee...
vol-06753ac7dd51b310b	gp3	100 GiB	3000	125	-	-

Volume ID: vol-0bdc1b15ed550f01f

Details Status checks Monitoring Tags

22. During creation of the snapshot give the description and click create snapshot button.

Create snapshot info

Create a point-in-time snapshot to back up the data on an Amazon EBS volume to Amazon S3.

Details

Volume ID  
vol-06753ac7dd51b310b

Description  
Add a description for your snapshot

Encryption Info  
Not encrypted

Tags Info

A tag is a label that you assign to an AWS resource. Each tag consists of a key and an optional value. You can use tags to search and filter your resources or track your AWS costs.

Key	Value - optional
dee	Enter value
Remove	

Add tag

You can add 49 more tags.

Create snapshot

23. Under the snapshots see whether it is created or not.

Snapshots (2)

Name	Snapshot ID	Size	Description	Storage...	Snapshot status	Started	Progress
—	snap-0598c8df1562f5468	100 GiB	—	Standard	Completed	2022/10/13 16:46 GMT+5:30	Available (100%)
—	snap-0185d6f0e0fa5ec03	100 GiB	—	Standard	Completed	2022/10/13 16:17 GMT+5:30	Available (100%)

Select a snapshot above.

24. Now Detach the volume from which you created the snapshot.

Volumes (1/4)

Throughput	Snapshot	Created	Availability Zone	Volume state	Alarm status	Attached instances	Volume sta...
125	snap-0426aae...	2022/10/13 11:21 GMT+5:30	us-east-1a	In-use	No alarms	i-0098471b4622a6028 (det...	Okay
125	snap-0185d6f...	2022/10/13 15:20 GMT+5:30	us-east-1a	In-use	No alarms	i-01000d7e49ffea70 (det...	Okay

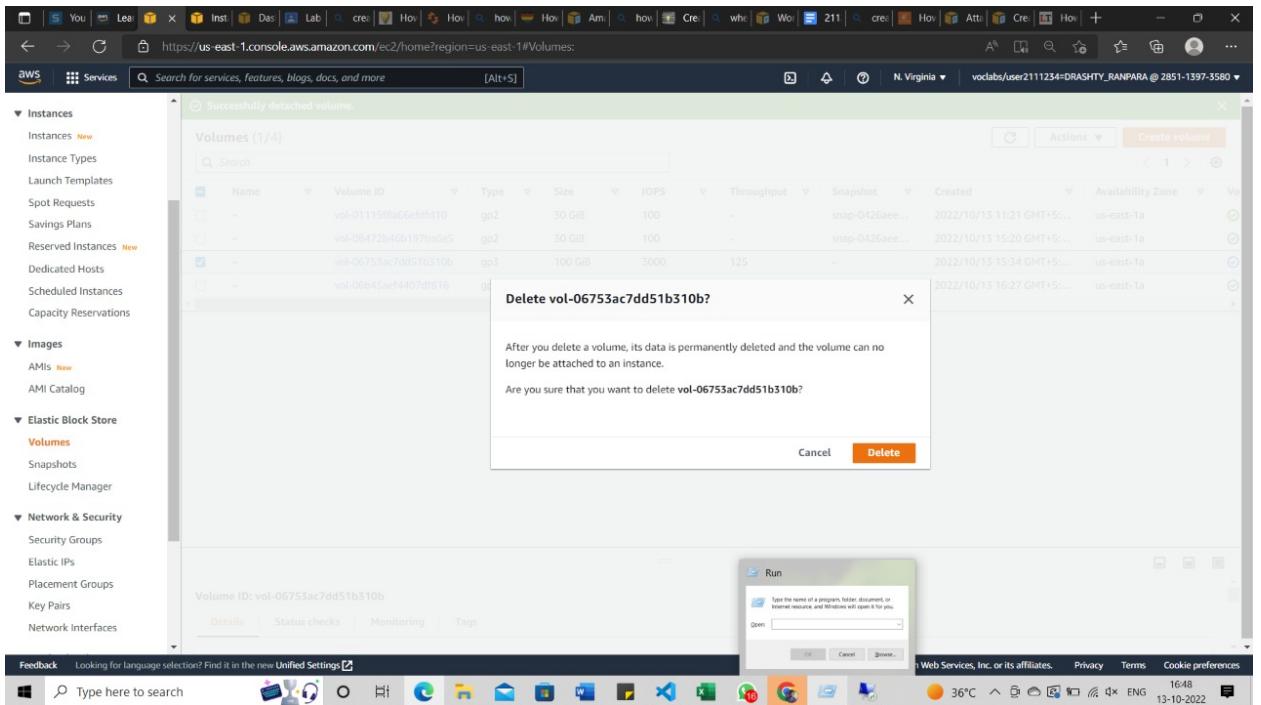
Detach vol-06753ac7dd51b310b?

After you detach a volume, you might still be charged for volume storage. If you no longer need the volume, delete it to stop incurring charges.

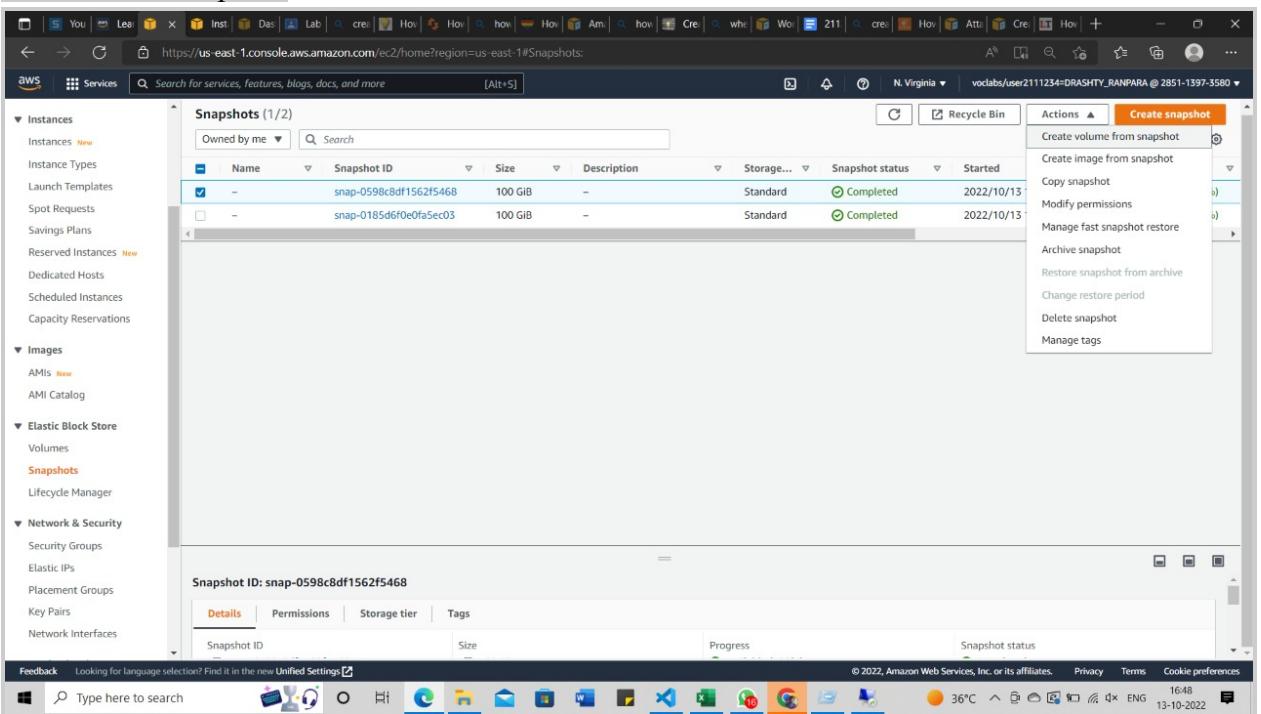
Are you sure that you want to detach volume vol-06753ac7dd51b310b?

Cancel Detach

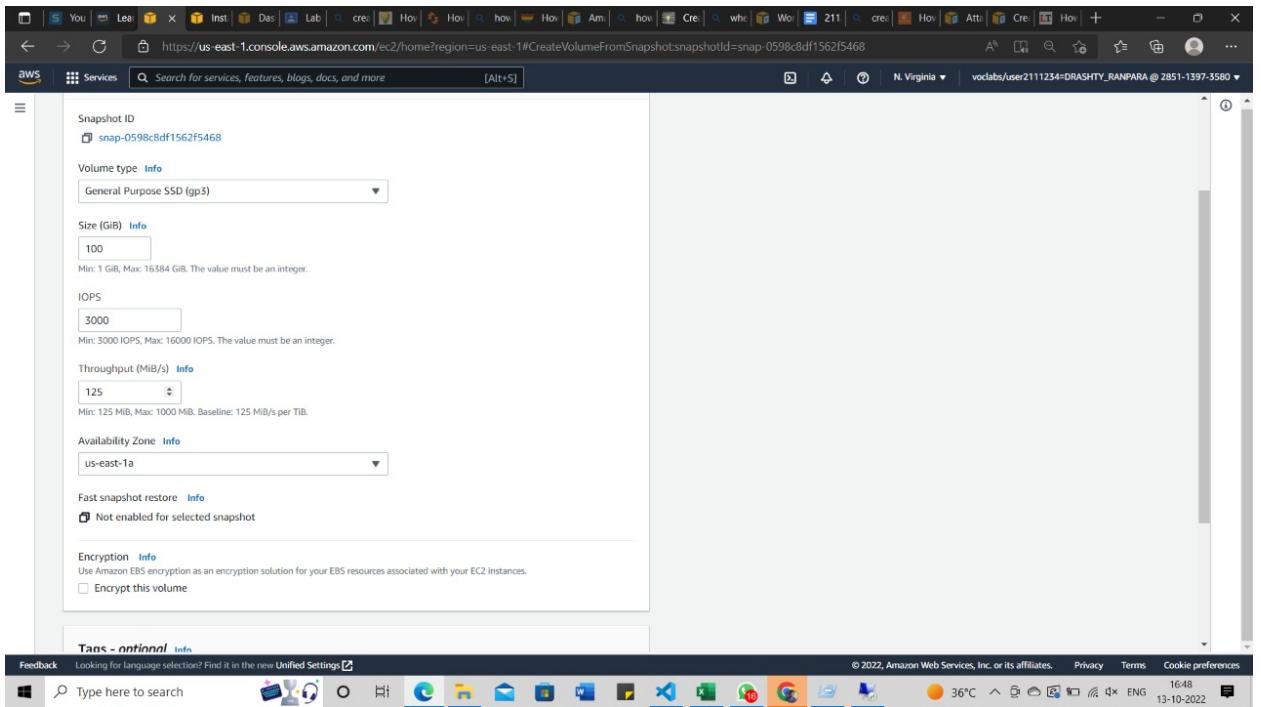
25. Then Delete the volume from Actions tab → Delete Volume which you created the snapshot.



26. Navigate again to Snapshots tab from left pane and from Actions tab → Create volume from snapshot

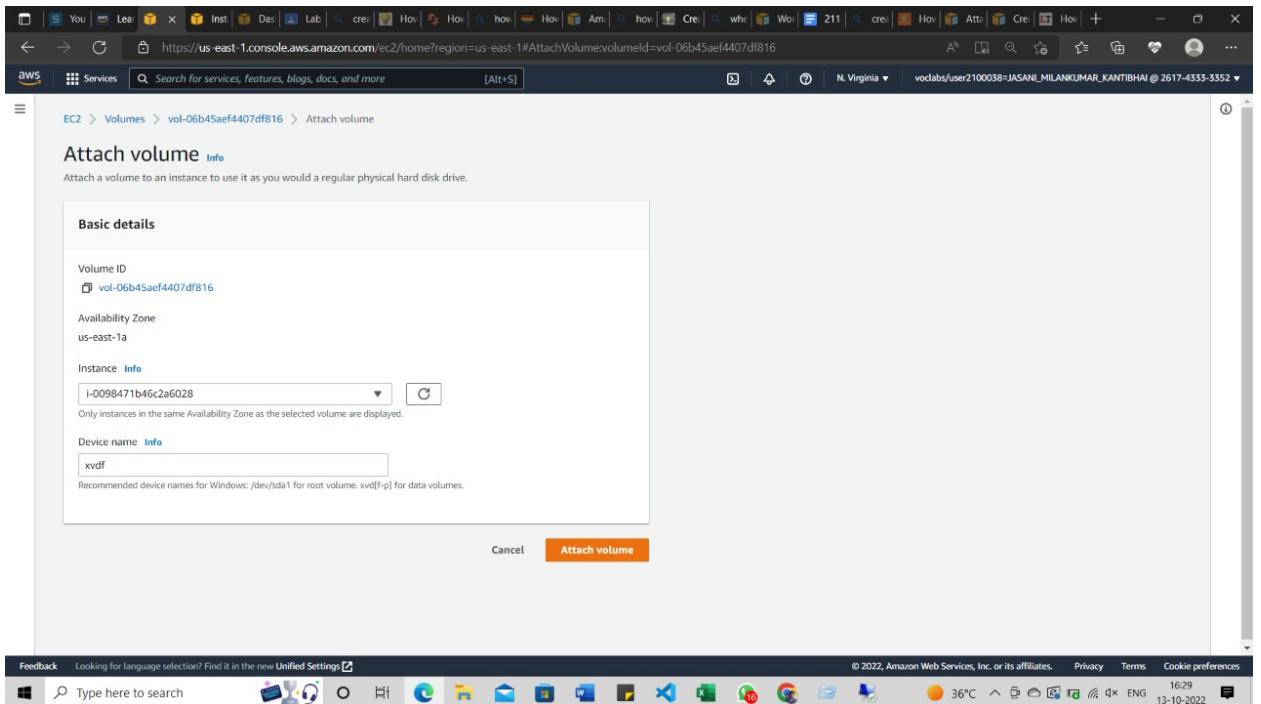


27. Now you can see the volume is created/ restored from the snapshot which was created earlier.



### **3. Attach an Instance store volume to the existing EC2 instance.**

28. The newly created volume can be visible in the **Volumes** section now. Now, tick the newly created volume and from **Actions** tab → **Attach volume**. Eventually, attach the Instance stored volume from EC2 instance.



29. That's all! Enjoy around the other new technologies of the cloud :)

