

What is Elastic Block Store (EBS)?



Instance



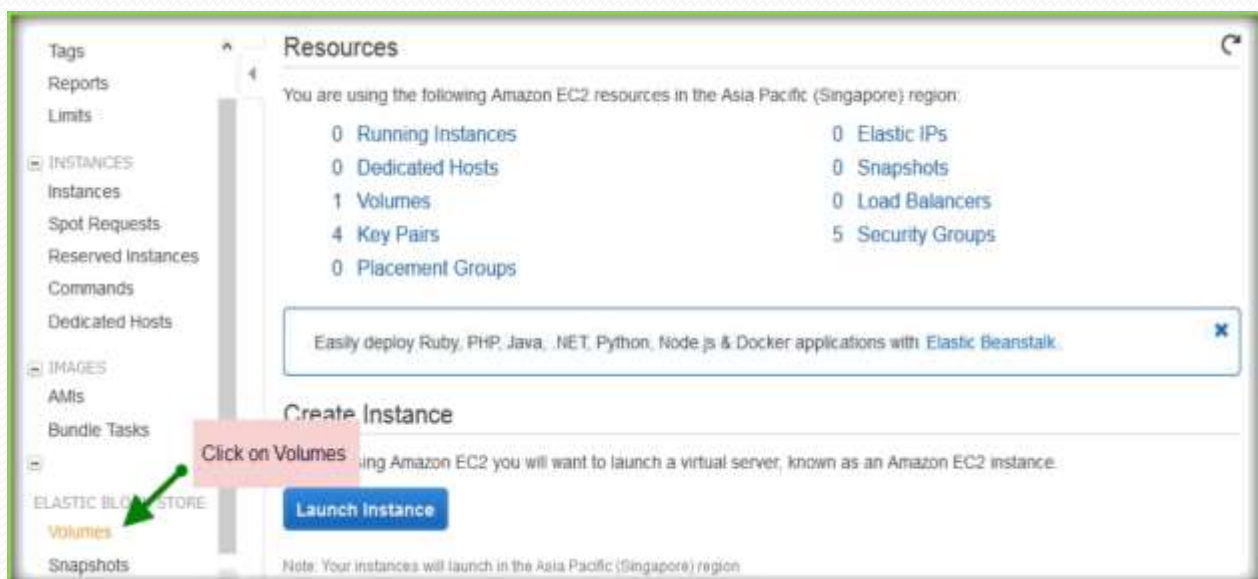
EBS storage

- **EBS storage is allocated in volumes**
 - o A volume is a 'virtual disk' (size: 1gb – 16tb)
 - o Basically, a raw block device
 - o Can be attached to an instance (but only one at a time)
 - o A single instance can access multiple volumes
- **Placed in specific availability zones**
 - o Why is this useful?
 - o Be sure to place it near instances (otherwise can't attach)
- **Replicated across multiple servers**
 - o Data is not lost if a single server fails
 - o Amazon: Annual failure rate is 0.1-0.2%

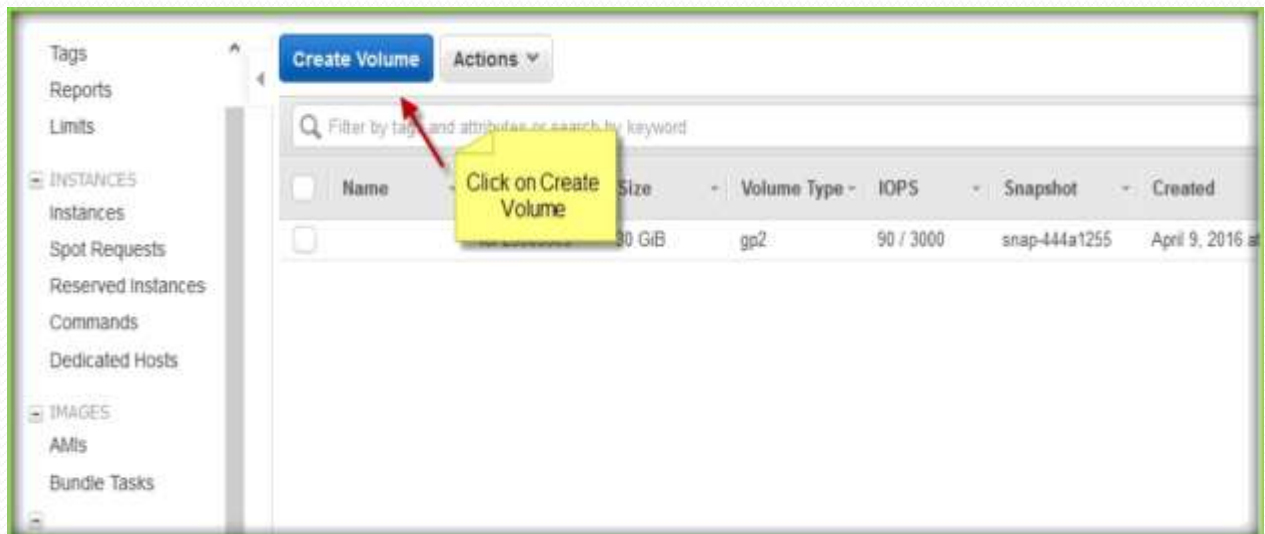
- **EC2 instances can have an EBS volume as their root device ("EBS boot")**
 - o Result: Instance data persists independently from the lifetime of the instance
 - o You can stop and restart the instance, like suspending and resuming a laptop
 - You won't be charged for the instance while it is stopped (only for EBS)
 - o You can enable termination protection for the instance
 - Blocks attempts to terminate the instance (e.g., by accident) until termination protection is disabled again

CREATE EBS VOLUMES

Once you are in the EC2 page, click Volumes under ELASTIC BLOCK STORE on the left pane.

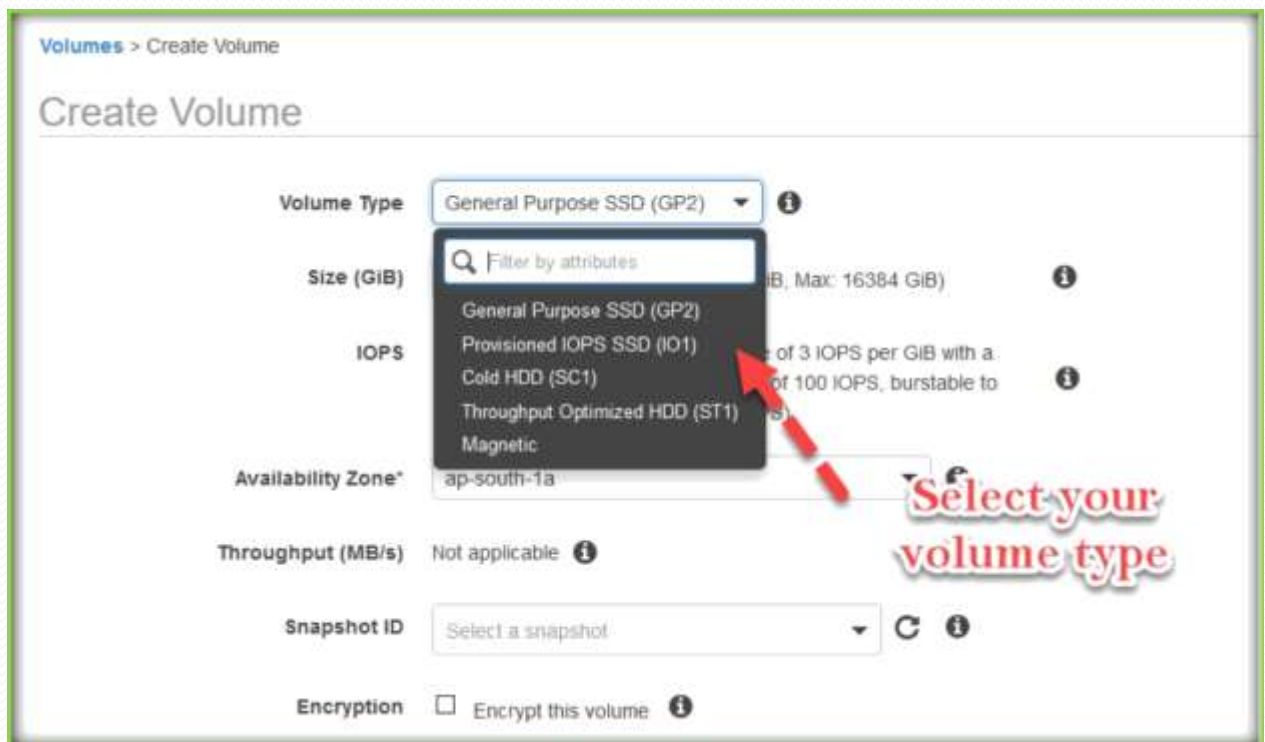


Once you are in the Volumes page, click on Create Volume to create a new volume.



A pop-up window will come and there you need to specify the volume specifications.

Select Volume Type from the drop-down list.



Specify volume size in GBs in Size text field and select availability zone from drop down list in which availability zone you want to create your volume.

The screenshot shows the 'Create Volume' page in the AWS Management Console. The page title is 'Volumes > Create Volume'. The main heading is 'Create Volume'. The form includes the following fields and options:

- Volume Type:** A dropdown menu set to 'General Purpose SSD (GP2)' with an information icon.
- Size (GiB):** A text input field containing '100'. To its right, it says '(Min: 1 GiB, Max: 16384 GiB)' with an information icon.
- IOPS:** A text input field containing '300 / 3000'. To its right, it says '(Baseline of 3 IOPS per GiB, minimum of 100 IOPS, burst up to 3000 IOPS)' with an information icon.
- Availability Zone*:** A dropdown menu showing 'ap-south-1a' with an information icon. A green callout bubble points to this field with the text 'choose availability zone'.
- Throughput (MB/s):** A dropdown menu with a search bar 'Filter by attributes' and two options: 'ap-south-1a' (highlighted) and 'ap-south-1b'.
- Snapshot ID:** A text input field.
- Encryption:** A checkbox labeled 'Encrypt this volume' with an information icon.

Two callout bubbles are present: a red one on the left pointing to the 'Size (GiB)' field with the text 'Specify Volume size', and a green one on the right pointing to the 'Availability Zone*' dropdown with the text 'choose availability zone'.

Specify Snapshot ID if you want your new volume to be copied data from the snapshot, otherwise leave blank.

And select encrypt option if you want to encrypt your newly creating volume, otherwise leave un selected.

Create Volume

Volume Type General Purpose SSD (GP2) ⓘ

Size (GiB) 100 (Min: 1 GiB, Max: 16384 GiB) ⓘ

IOPS 300 / 3000 (Baseline of 3 IOPS per GiB with a minimum of 100 IOPS, burstable to 3000 IOPS) ⓘ

Availability Zone* ap-south-1a ⓘ

Throughput (MiB/s) Not applicable ⓘ

Snapshot ID Select a snapshot ⓘ

Encryption ☐ Encrypt this volume ⓘ

Tags ☐ Create additional tags

select this for volume encryption

Then click on create after specifying the values required.

Volume Type General Purpose SSD (GP2) ⓘ

Size (GiB) 100 (Min: 1 GiB, Max: 16384 GiB) ⓘ

IOPS 300 / 3000 (Baseline of 3 IOPS per GiB with a minimum of 100 IOPS, burstable to 3000 IOPS) ⓘ

Availability Zone* ap-south-1a ⓘ

Throughput (MiB/s) Not applicable ⓘ

Snapshot ID Select a snapshot ⓘ

Encryption ☐ Encrypt this volume ⓘ

Tags ☐ Create additional tags

Click on Create Volume

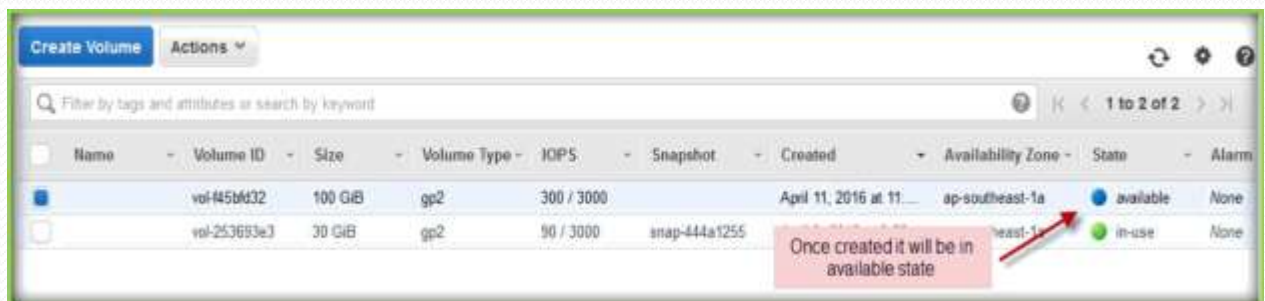
* Required

Cancel Create Volume

Your volume will start creating.

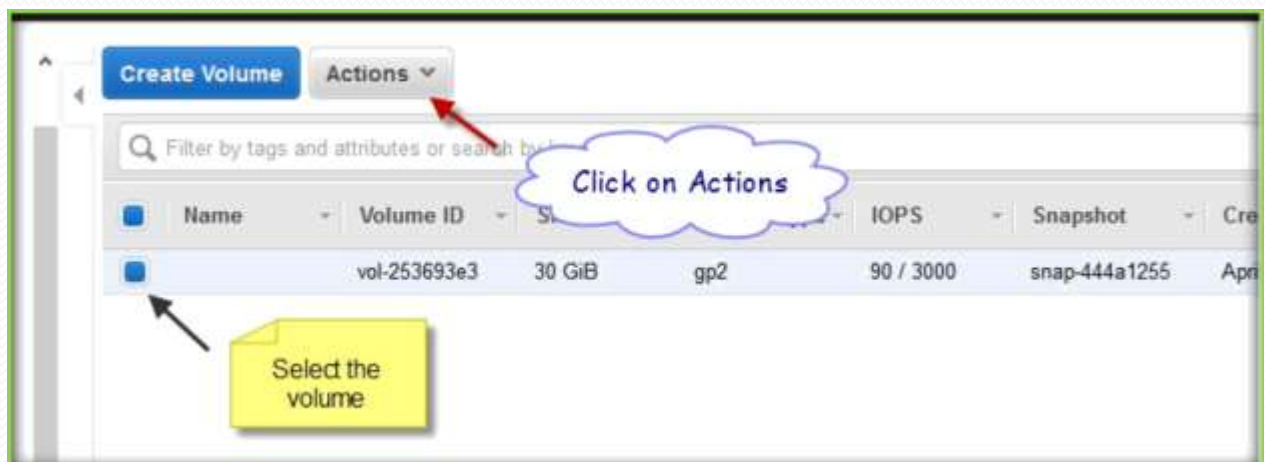


Once created it will be available state under volumes section.

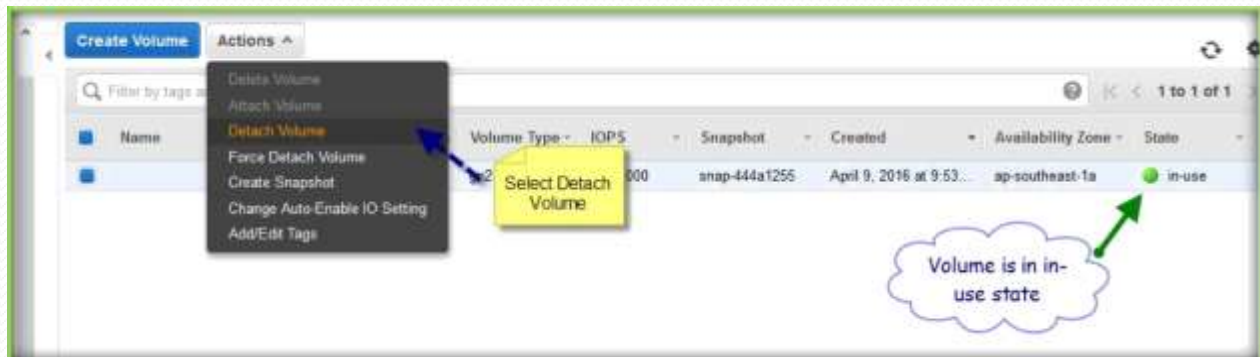


DELETE EBS VOLUME

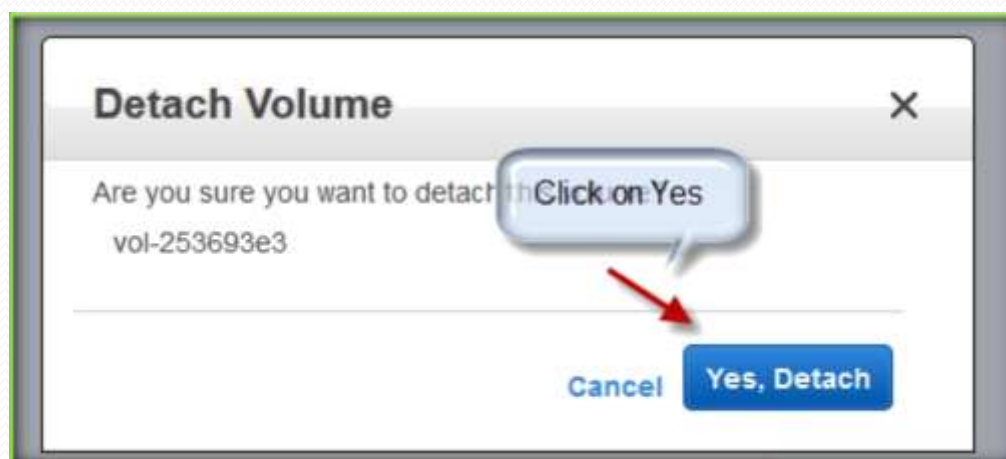
Once you logged in to AWS, go to EC2 section then go to Volumes section. Click the volume which you want to delete and click on actions.



From the Actions menu select Detach Volume as you can see volume state is in **in-use** and those Delete volume option is unselectable.



Click on Yes, detach to detach volume from instance.



Select Volume which you want to delete then click on actions and select Delete Volume from the list.



A pop-up window will come for confirmation, then click on Yes, delete to delete.



Volume will delete, and the State will change to deleting.



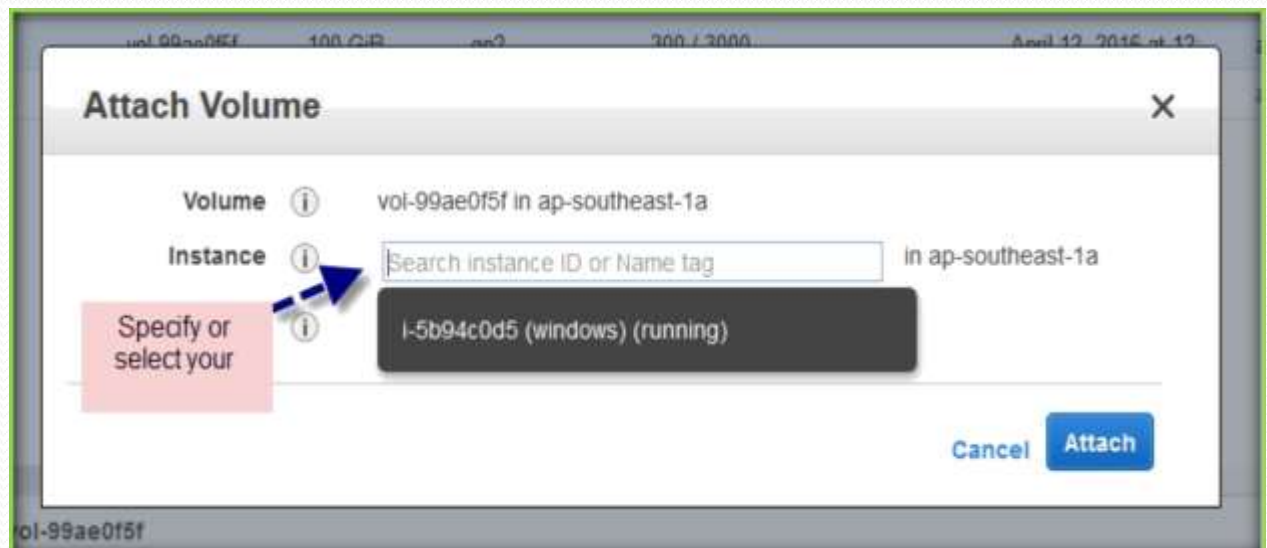
ATTACHING AND MOUNTING VOLUMES TO WINDOWS INSTANCES

Go to volumes section and create a volume, make sure you select the availability zone same as your instance is residing.

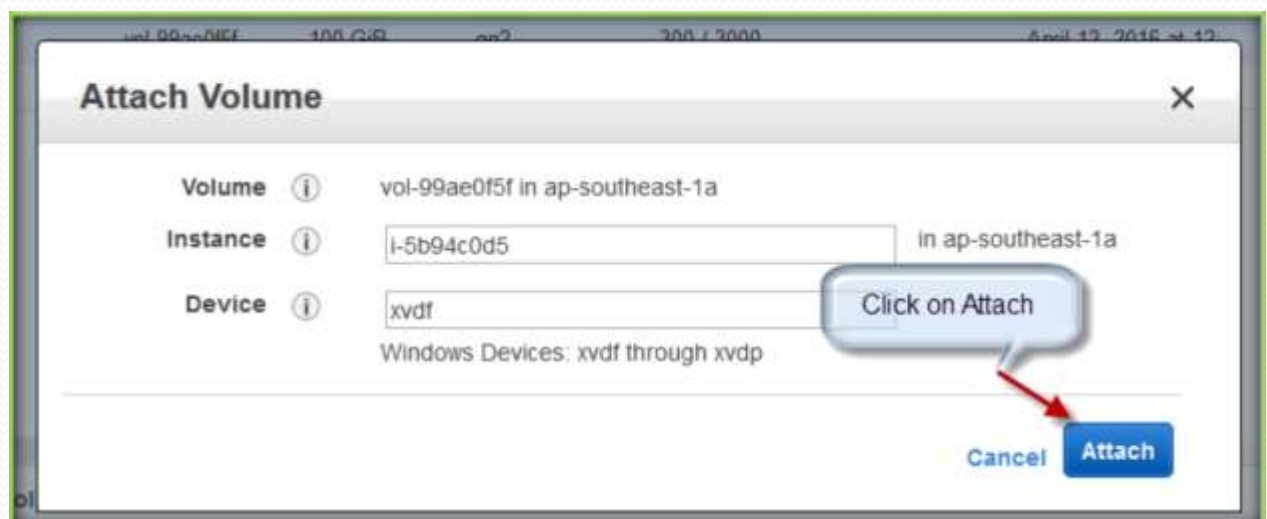
Once created select the Volume and click on actions and select Attach Volume.



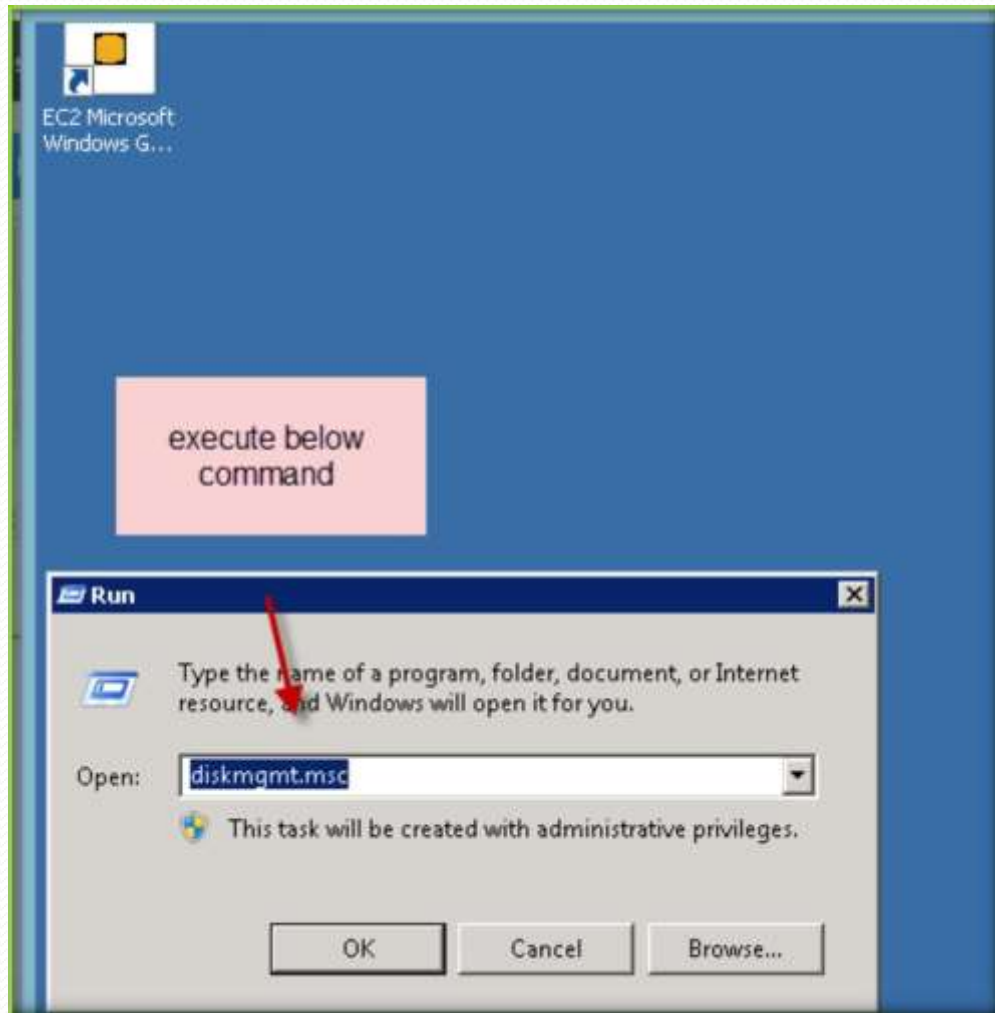
In the next page Select or search in the Instance text field and select your instance.



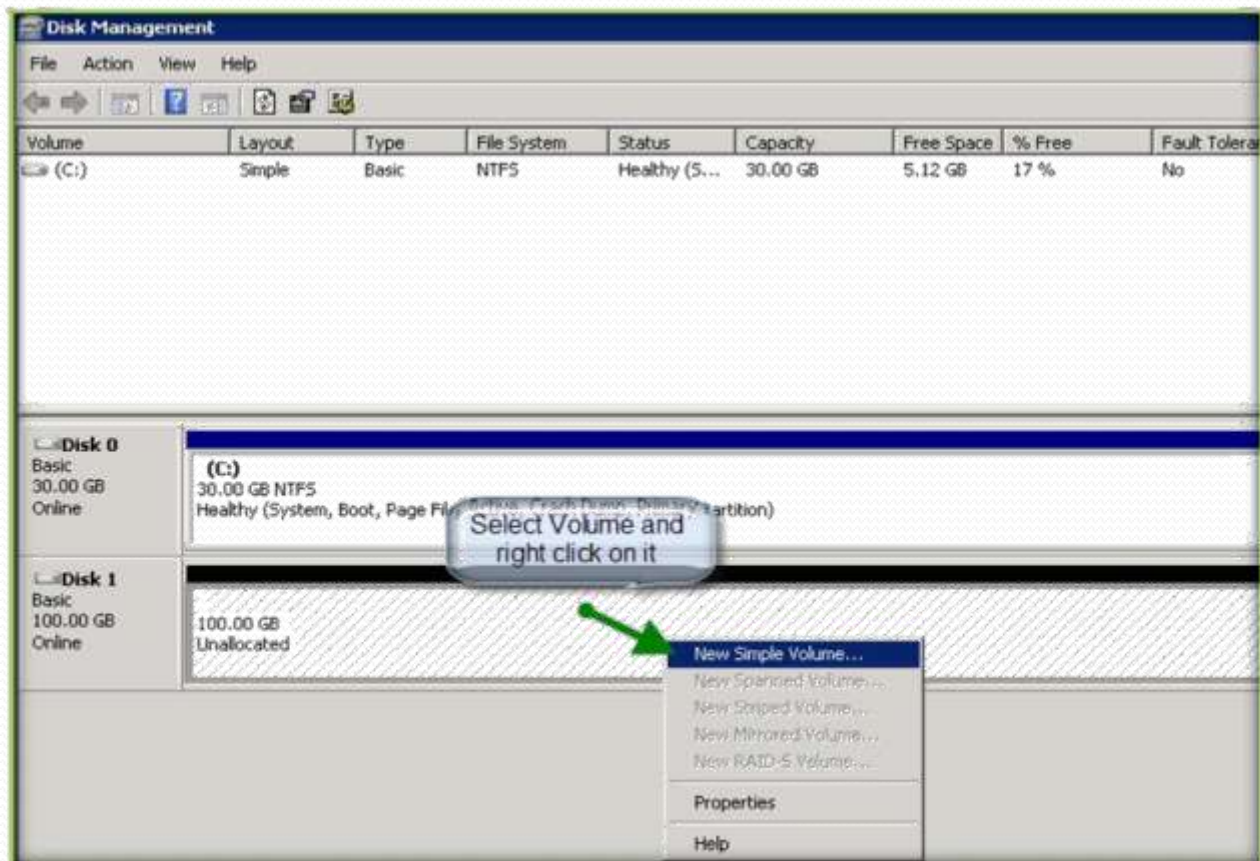
Then click on Attach button.



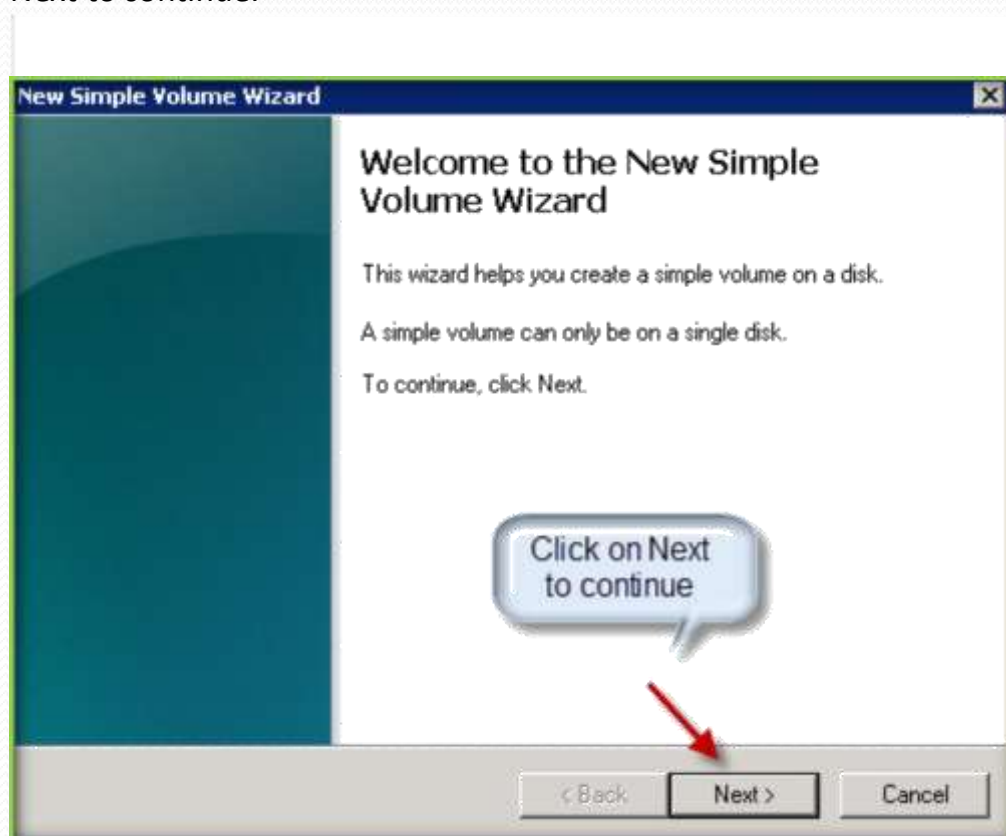
Then go and login to your instance, after logged in open Run and execute diskmgmt.msc command to open storage volumes attached to instance.



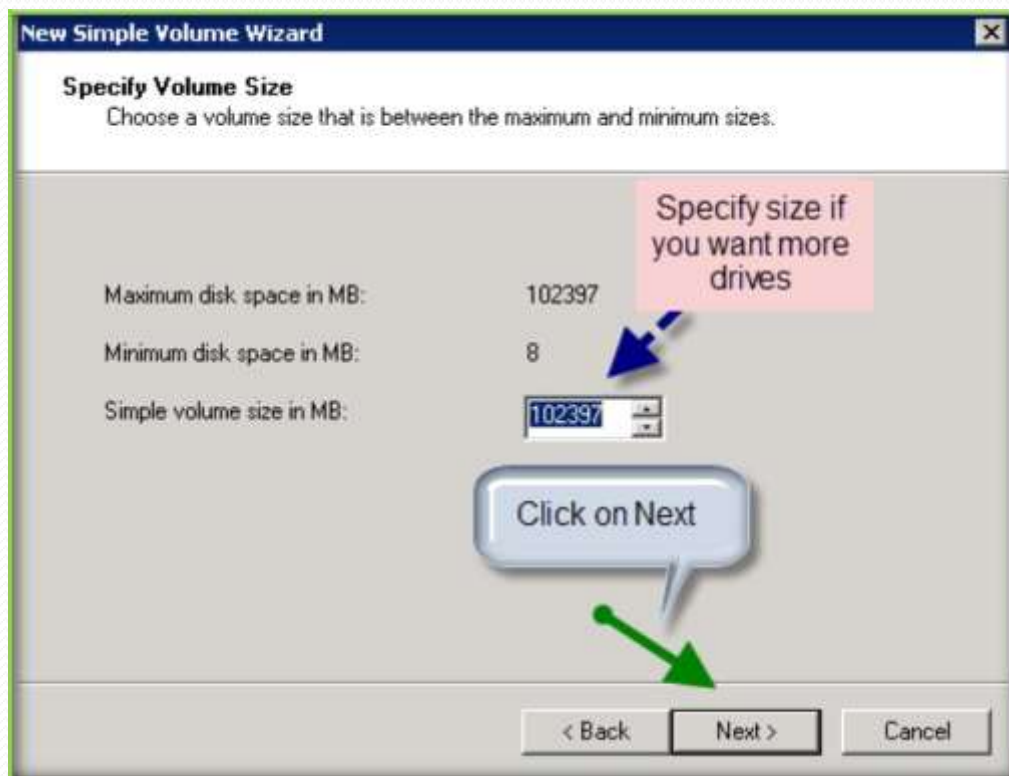
Then in the disk management screen select the volume which we have created and do a right click on the volume.



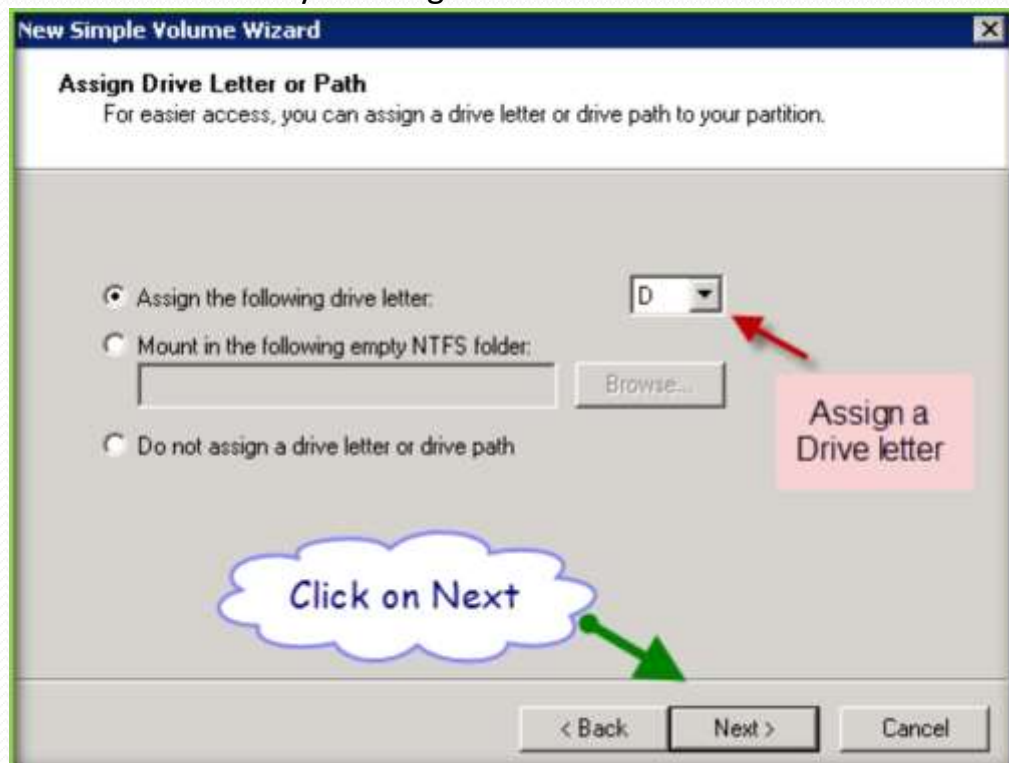
Click on Next to continue.



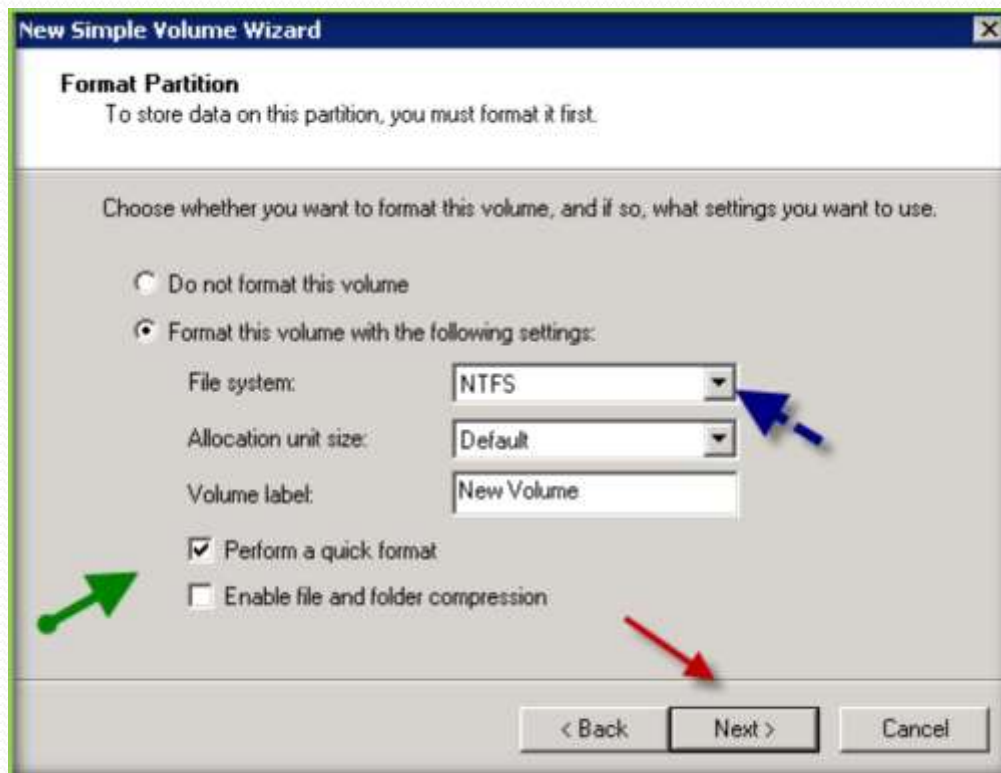
In the following screen specify size if you want to create more drives or leave as full size and click on Next.



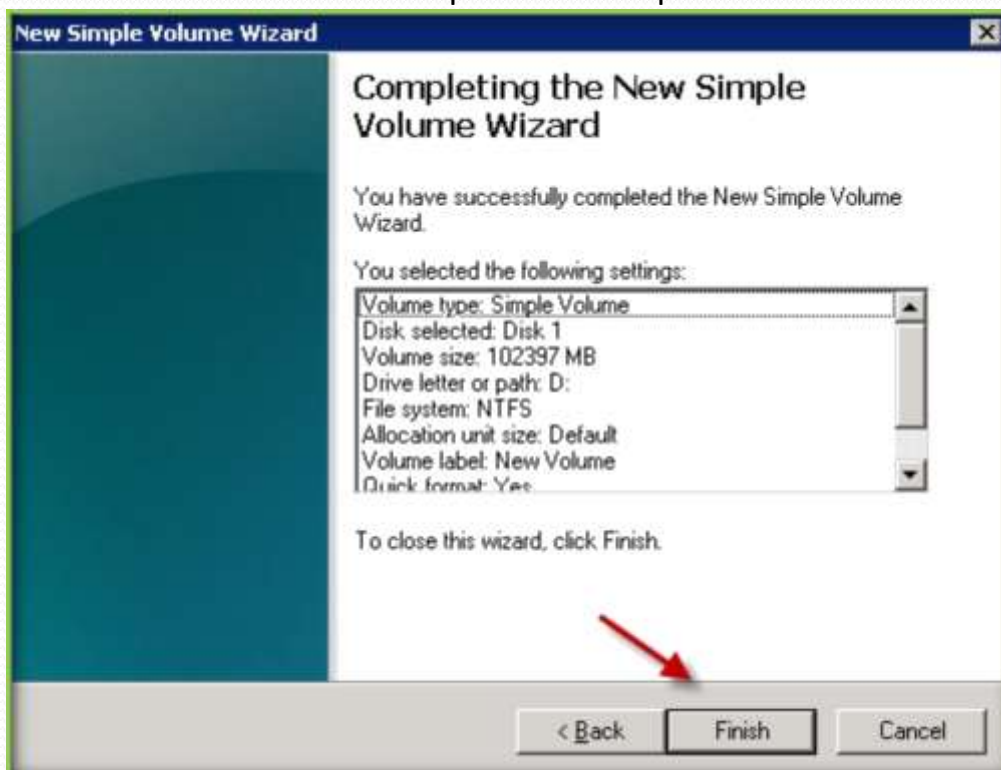
Specify a drive for the newly creating volume and click on Next.



In the screen go with default selections and click on Next.



On the next screen click finish to complete the setup.



After formatting it will show as Healthy, then close disk management console.

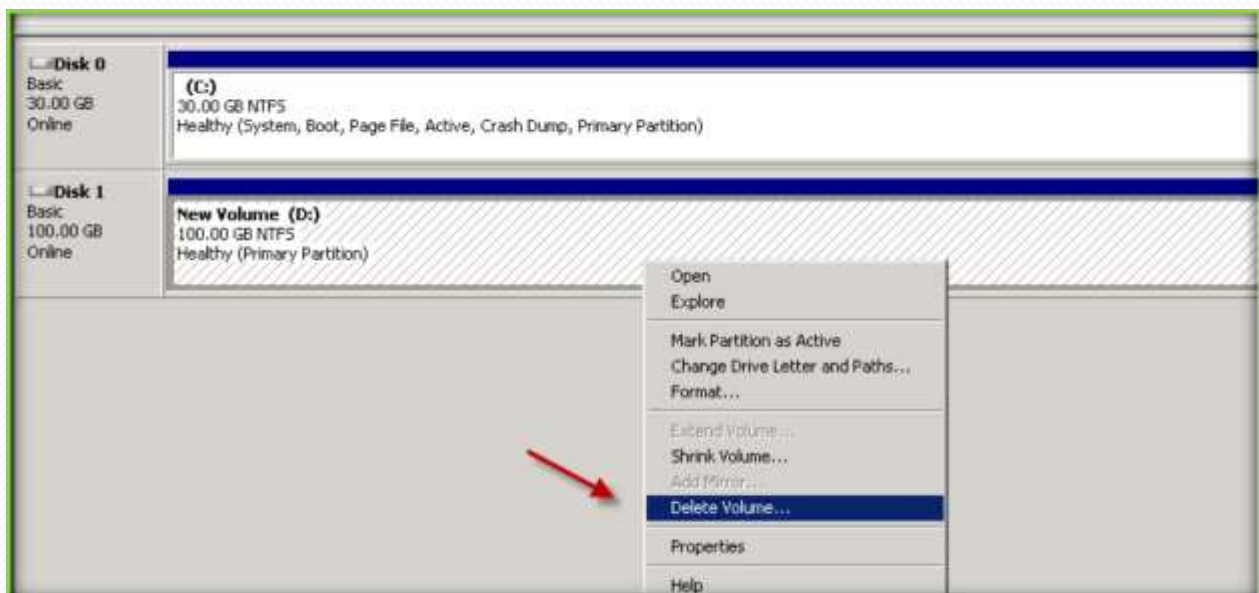


Open My Computer to see the newly formatted volume.

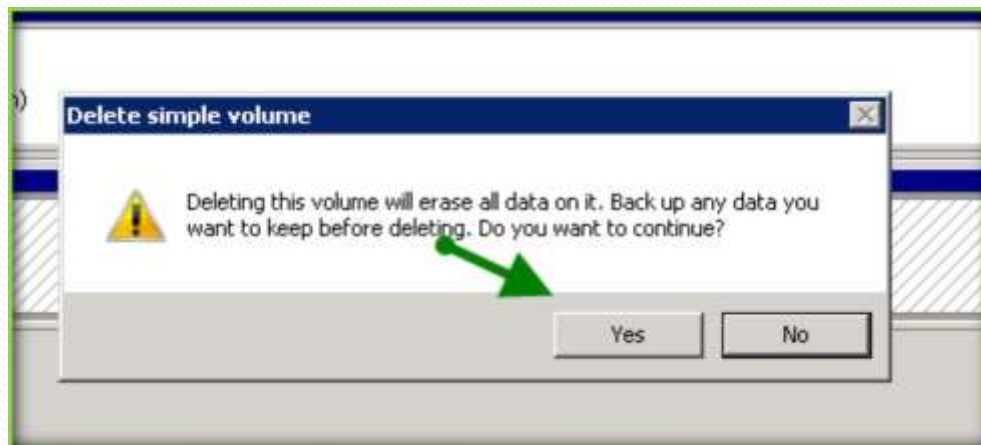


To unmount the Volume, once again open run and execute diskmgmt.msc to disk management console.

Then select your volume and right click on it and select Delete Volume.



Click yes to confirm.



Then go to Volumes section on the EC2 page on AWS console.
Select the volume and go to Actions click on Detach Volume.



Click on Yes, detach to confirming detaching from the Instance.



ATTACHING AND MOUNTING VOLUMES TO LINUX INSTANCES

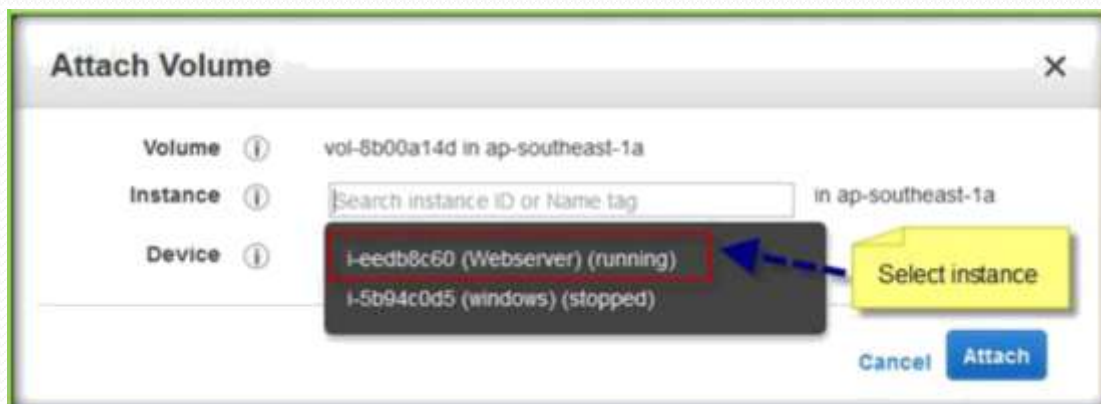
Once you logged in to AWS, go Volumes section under EC2.

Then create a volume as depicted above.

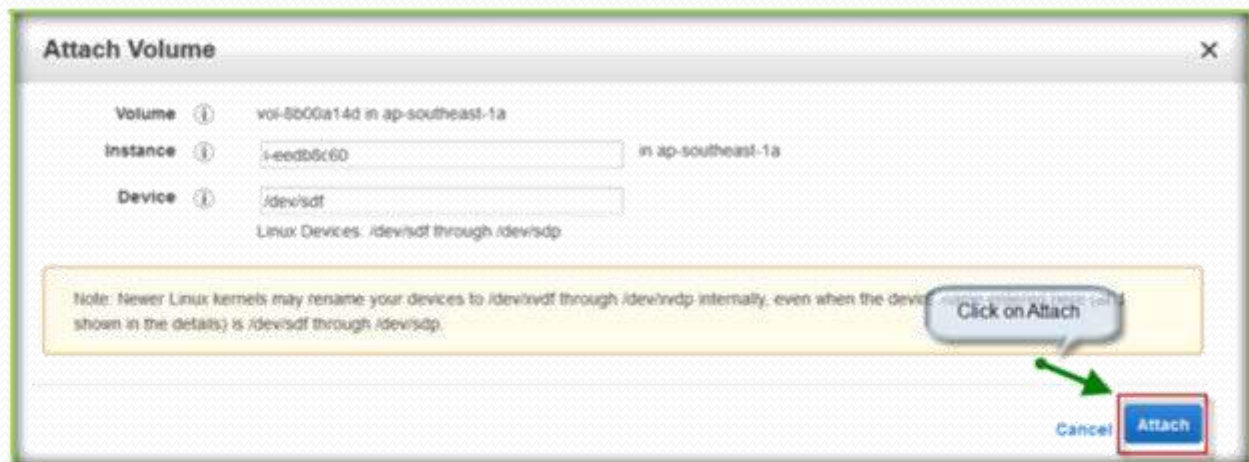
Once created select the volume and click Actions and choose Attach Volume.



Select instance from the Instance text field or specify Instance id.



Then click on Attach to attach volume to selected instance.



Then go and login to Linux and execute the below commands to format and mount to your instance.

Create the partition for newly attached volume.

```
[root@ip-172-31-25-51 ~]# fdisk /dev/xvdf
Welcome to fdisk (util-linux 2.23.2).
```

Changes will remain in memory only, until you decide to write them.

Be careful before using the write command.

Device does not contain a recognized partition table

Building a new DOS disklabel with disk identifier 0x7ee209a3.

Command (m for help): n

Partition type:

p primary (0 primary, 0 extended, 4
free) e extended

Select (default p):

Using default response p

Partition number (1-4, default 1):

First sector (2048-209715199, default 2048):

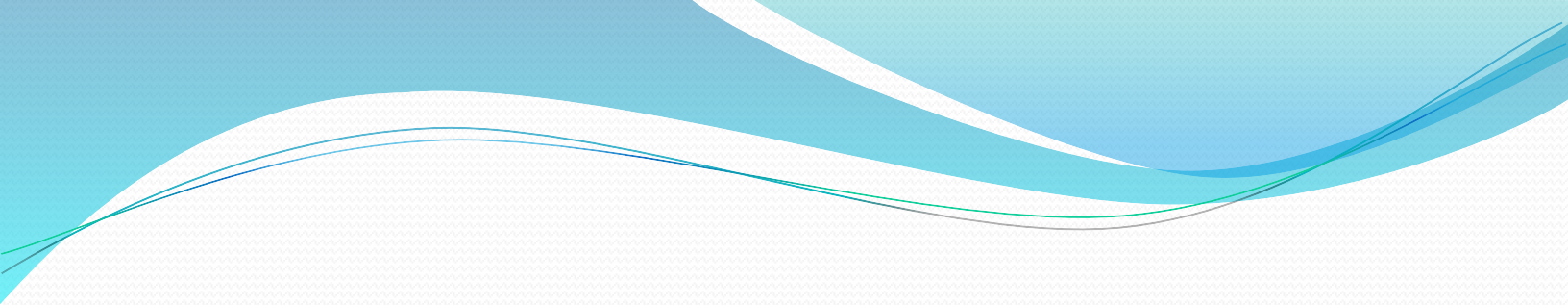
Using default value 2048

Last sector, +sectors or +size{K,M,G} (2048-209715199, default 209715199):

Using default value 209715199

Partition 1 of type Linux and of size 100 GiB is set

Command (m for help): p



Disk /dev/xvdf: 107.4 GB, 107374182400 bytes, 209715200 sectors
Units = sectors of 1 * 512 = 512 bytes

Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk label type: dos
Disk identifier: 0x7ee209a3

Device	Boot	Start	End	Blocks	Id	System
/dev/xvdf1		209715199	104856576	83	Linux	

Command (m for help): w
The partition table has been altered!

Calling ioctl() to re-read partition table.
Syncing disks.

Formatting newly created partition.

```
[root@ip-172-31-25-51 ~]# mkfs.ext4 /dev/xvdf1
mke2fs 1.42.12 (29-Aug-2014)
Creating filesystem with 26214144 4k blocks and 6553600
inodes Filesystem UUID: 6459b7c0-440f-4fc0-9422-94de2ee5dc34
Superblock backups stored on blocks:
    32768, 98304, 16384, 4096000, 7962624, 11239424, 20480000, 23887872
```

```
Allocating group tables: done
Writing inode tables: done
Creating journal (32768 blocks): done
Writing superblocks and filesystem accounting information: done
```

Once formatted, we are now mounting to a directory.

```
~]# mount /dev/xvdf1 /mnt/
[root@ip-172-31-25-51 ~]# df -h
```

Filesystem	Size	Used	Avail	Use%	Mounted on
/dev/xvda1	7.8G	1.1G	6.6G	15%	/
devtmpfs	490M	64K	490M	1%	/dev
tmpfs	498M	0	498M	0%	/dev/shm



/dev/xvdf1 99G 60M 94G 1% /mnt

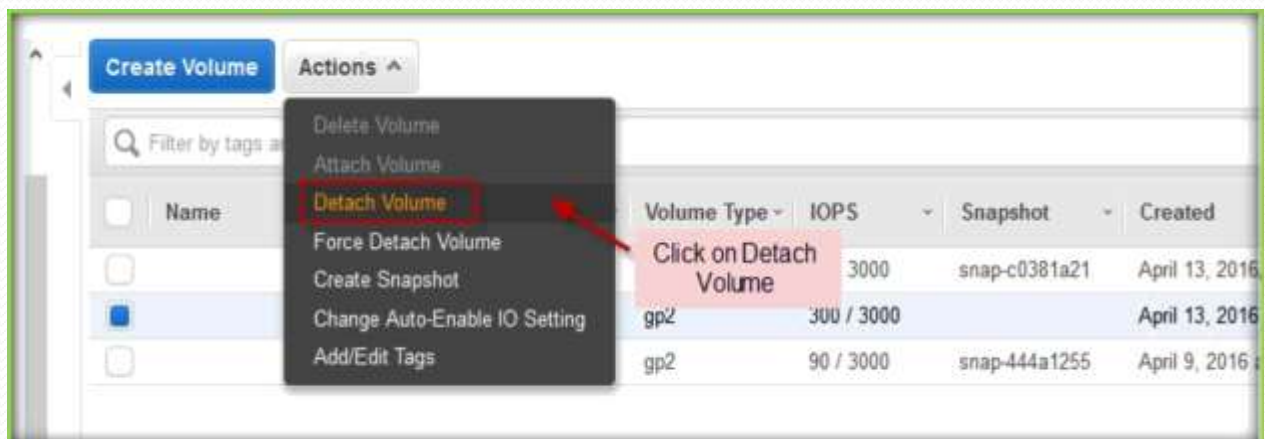
To unmount from the instance, follow below process.

```
[root@ip-172-31-25-51 ~]# umount /mnt/

[root@ip-172-31-25-51 ~]# df -h
```

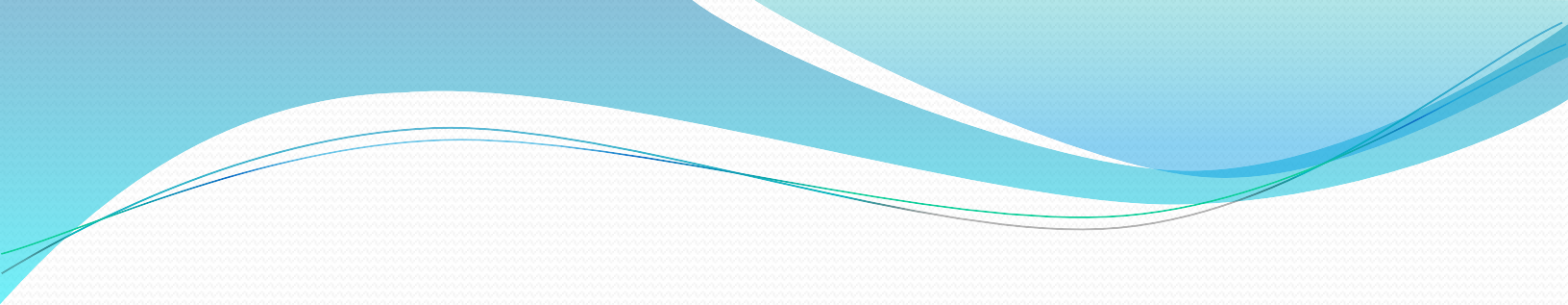
Filesystem	Size	Used	Avail	Use%	Mounted on
/dev/xvda1	7.8G	1.1G	6.6G	15%	/
devtmpfs	490M	64K	490M	1%	/dev
tmpfs	498M	0	498M	0%	/dev/shm

After unmounting, go to Volumes section, select the volume and click on Actions. Under the Actions, click on Detach Volume.



Click on Yes, detach to detach volume.





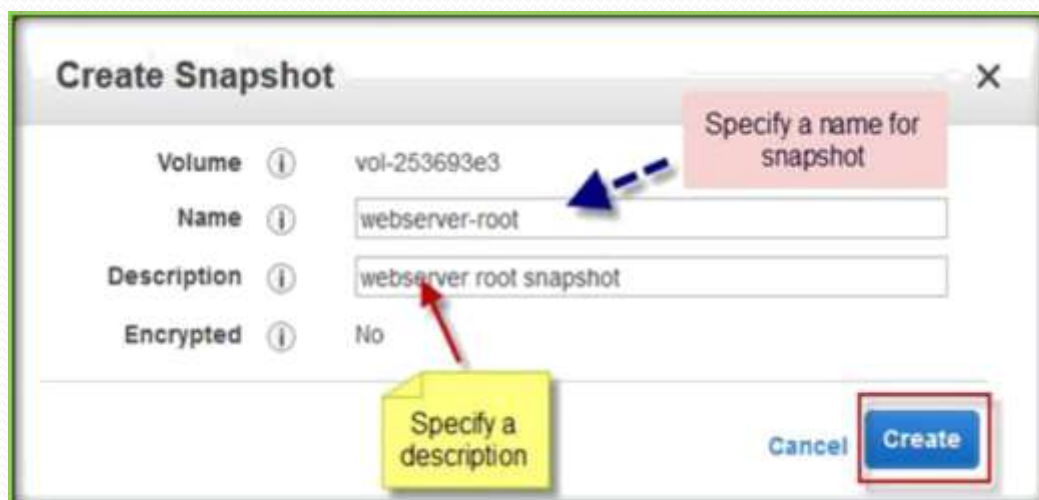
Once Volume detached, you can select and delete the volume.

CREATING AND DELETING SNAPSHOTS

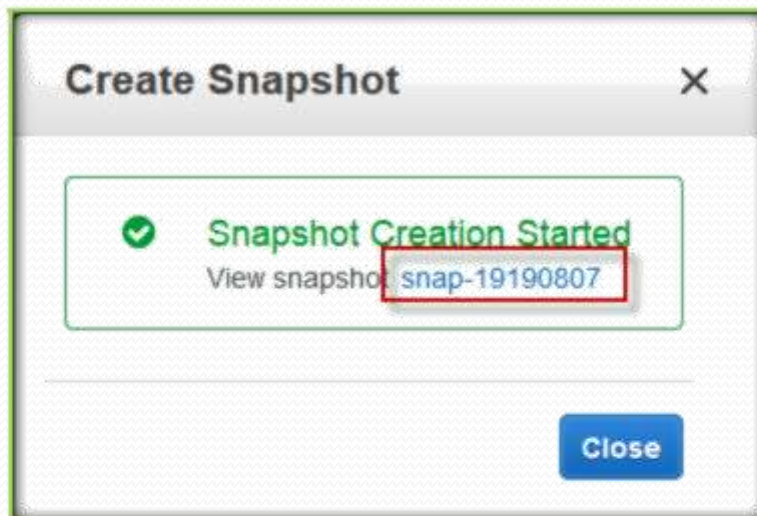
Go to Volumes section under EC2 on AWS console.
Select the volume which you want to take a snapshot and click on Actions.
Under Actions menu, select Create Snapshot.



In the next page specify name for snapshot and add description, click on Create button to create.



A confirmation box will pop up with Snapshot id.

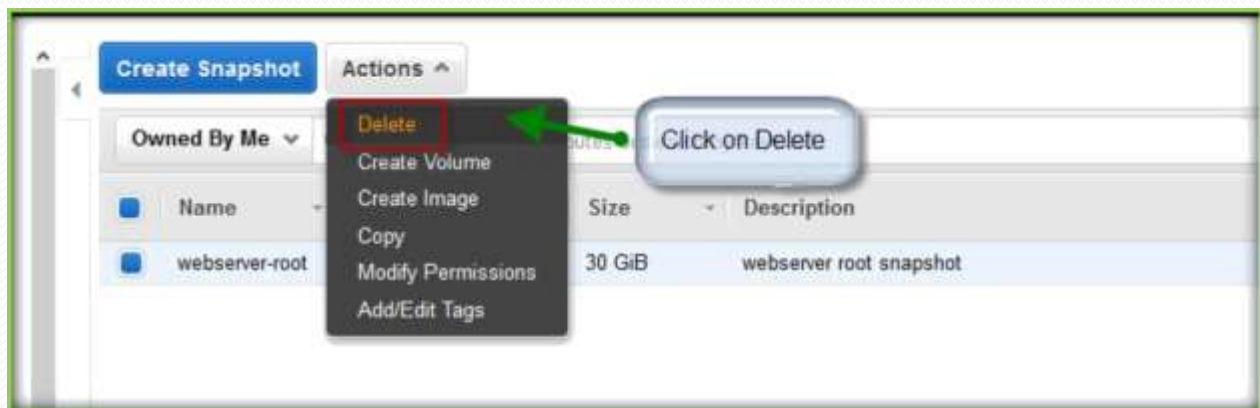


Click on the snapshot id to go the snapshot section or go to Snapshots under ELASTIC BLOCK STORE on EC2 left pane. You will find your snapshot which is created.

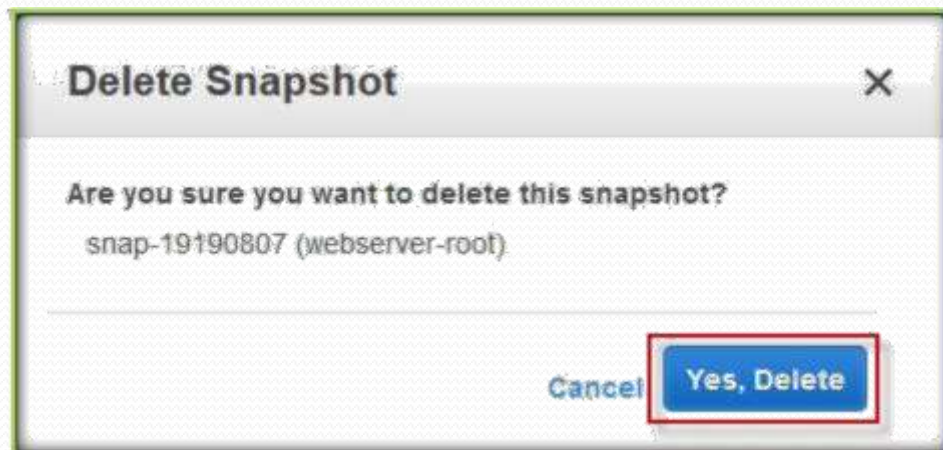
DELETING SNAPSHOTS

Go to Snapshots section under EC2 page, then select your snapshot which you want to delete.

Click on Actions, select Delete to delete the snapshot.



A confirmation dialog popup will show, click on Yes, delete to delete the snapshot.



CREATING VOLUMES FROM SNAPSHOTS

Go to Snapshots section under EC2 page.
Select the snapshot and click on Actions, then select Create Volume to create a new volume.



In the next page, select the Volume Type from the drop-down list.

Create Volume

Snapshot ID ⓘ snap-19190807 (webserver-root)

Volume Type ⓘ **General Purpose SSD (GP2)**

Size (GiB) ⓘ GiB

IOPS ⓘ 300 / 3000 (Baseline of 3 IOPS per GiB)

Availability Zone ⓘ ap-southeast-1a

Encryption ⓘ Not Encrypted

Cancel Create

Specify size in size text field, select availability zone from drop down list. Then click on create button to create a volume.

Create Volume

Snapshot ID ⓘ snap-19190807 (webserver-root)

Volume Type ⓘ General Purpose SSD (GP2)

Size (GiB) ⓘ **100** (Min: 1 GiB, Max: 16384 GiB)

IOPS ⓘ 300 / 3000 (Baseline of 3 IOPS per GiB)

Availability Zone ⓘ **ap-southeast-1a**

Encryption ⓘ

Cancel Create

A confirmation pops up with volume id will show, click on volume id to go to the volume.

Create Volume

✓ **Volume Successfully Created**

View volume **vol-b654f470**

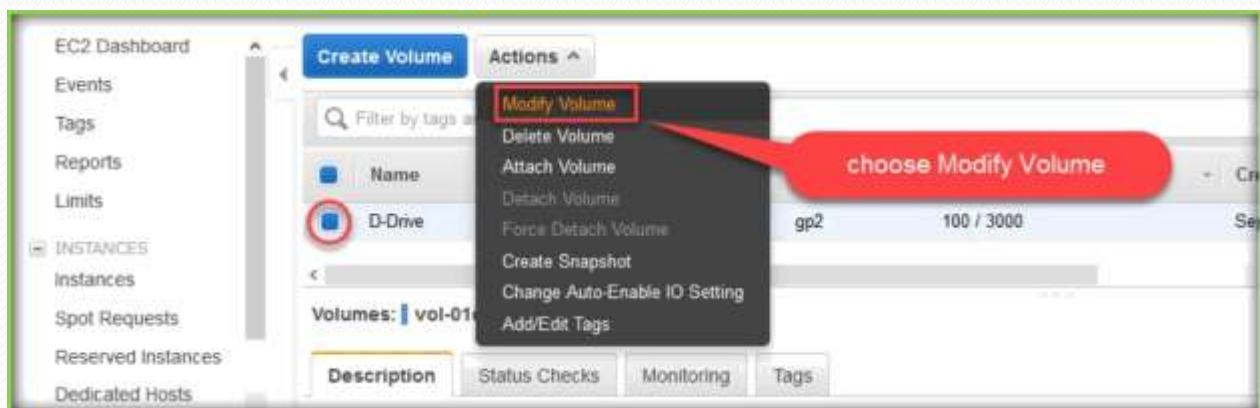
Close

After creation volume, you can attach to other instances.

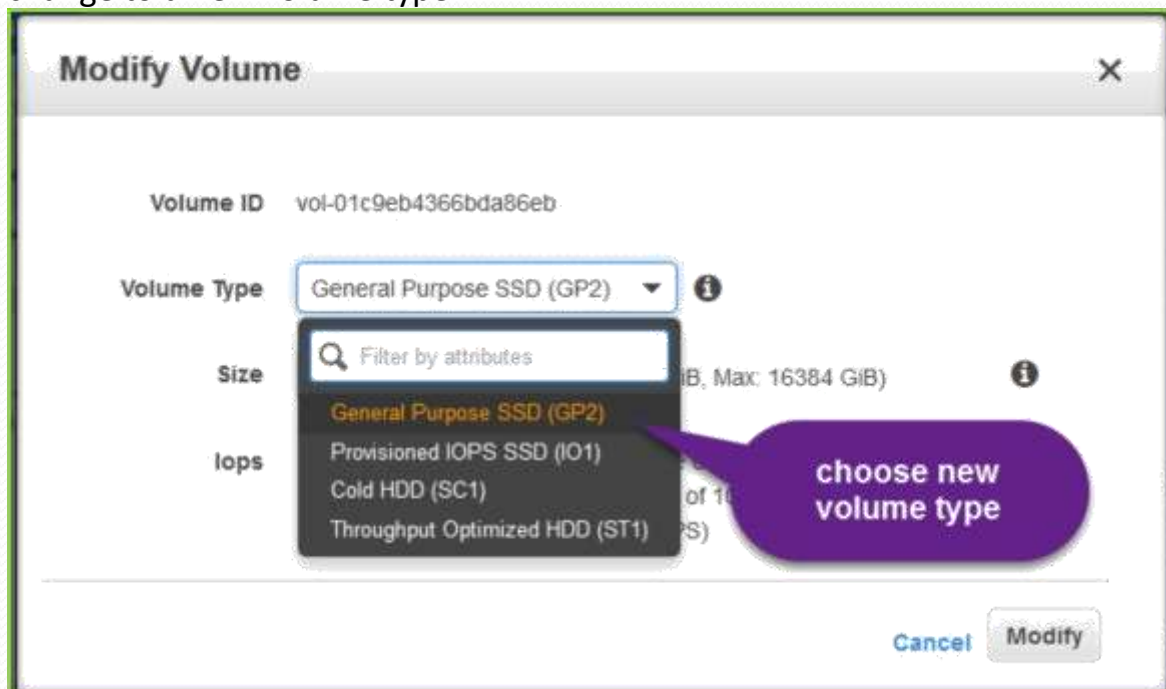
MODIFY VOLUMES

Amazon EBS volume is attached to an EC2 instance type, can increase its size, change its volume type, or (for an io1 volume) adjust its IOPS performance, all without detaching it. You can apply these changes to detached volumes as well.

Go to volumes, choose the volume which you want to modify, then select and go to Actions tab then choose modify volume.



On the modify volume dialog box, choose a different volume type if you want to change to a new volume type.



Specify the new size and IOPS if it is Provisioned IOPS volume.

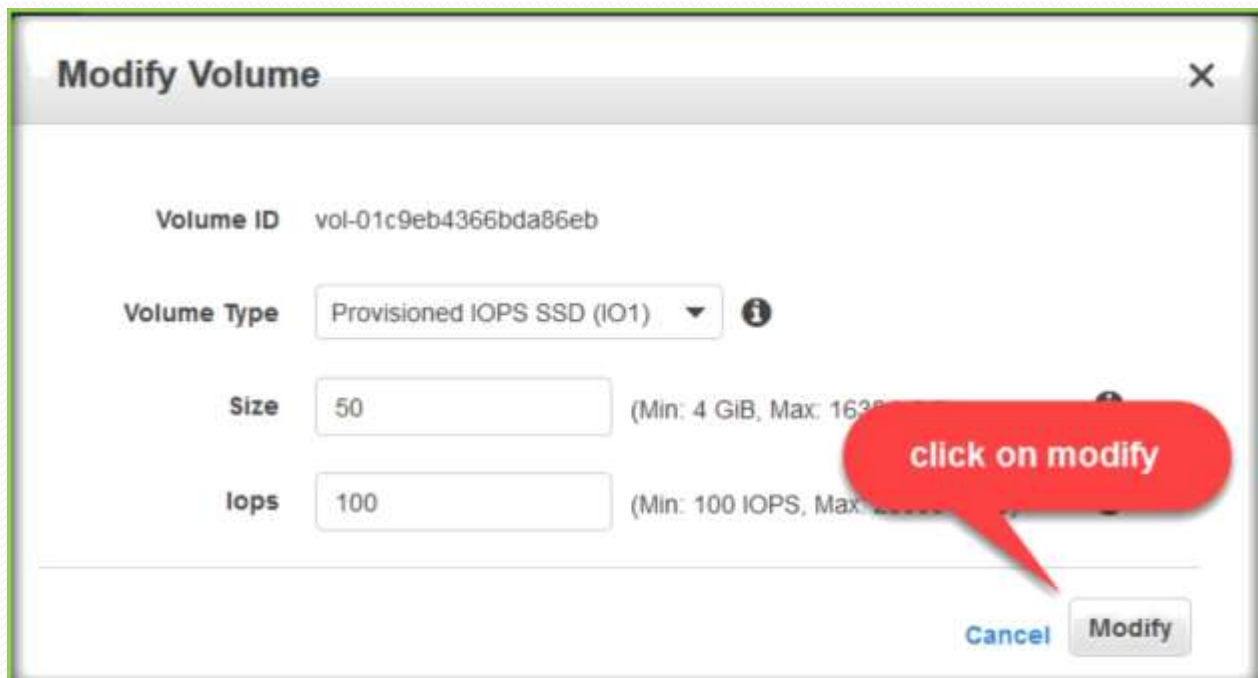


The screenshot shows the 'Modify Volume' dialog box. The 'Volume ID' is 'vol-01c9eb4366bda86eb'. The 'Volume Type' is 'Provisioned IOPS SSD (IO1)'. The 'Size' field is set to '50' and has a red callout bubble pointing to it with the text 'Specify the new size'. The 'IOPS' field is set to '100' with a note '(Min: 100 IOPS, Max: 20000 IOPS)'. At the bottom right are 'Cancel' and 'Modify' buttons.

Volume ID	vol-01c9eb4366bda86eb		
Volume Type	Provisioned IOPS SSD (IO1) ⓘ		
Size	50		Specify the new size
IOPS	100	(Min: 100 IOPS, Max: 20000 IOPS) ⓘ	

Cancel Modify

Then click on modify.



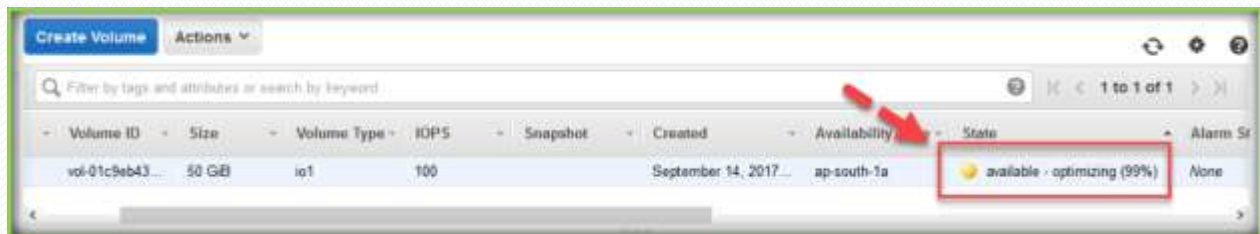
The screenshot shows the 'Modify Volume' dialog box. The 'Volume ID' is 'vol-01c9eb4366bda86eb'. The 'Volume Type' is 'Provisioned IOPS SSD (IO1)'. The 'Size' field is set to '50' with a note '(Min: 4 GiB, Max: 16384 GiB)'. The 'IOPS' field is set to '100' with a note '(Min: 100 IOPS, Max: 20000 IOPS)'. A red callout bubble points to the 'Modify' button with the text 'click on modify'. At the bottom right are 'Cancel' and 'Modify' buttons.

Volume ID	vol-01c9eb4366bda86eb		
Volume Type	Provisioned IOPS SSD (IO1) ⓘ		
Size	50	(Min: 4 GiB, Max: 16384 GiB) ⓘ	
IOPS	100	(Min: 100 IOPS, Max: 20000 IOPS) ⓘ	

click on modify

Cancel Modify

You can view the volume state about the modification.



Once done state will show completed.

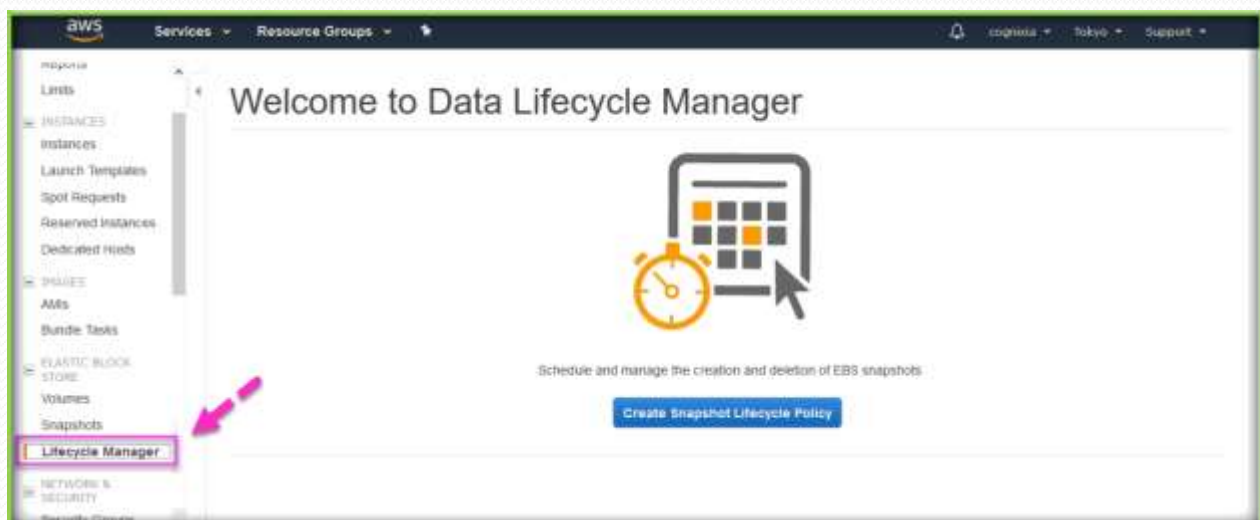


Then we must go to the respective operating system and extend the volume sizes to view the new size in the operating systems.

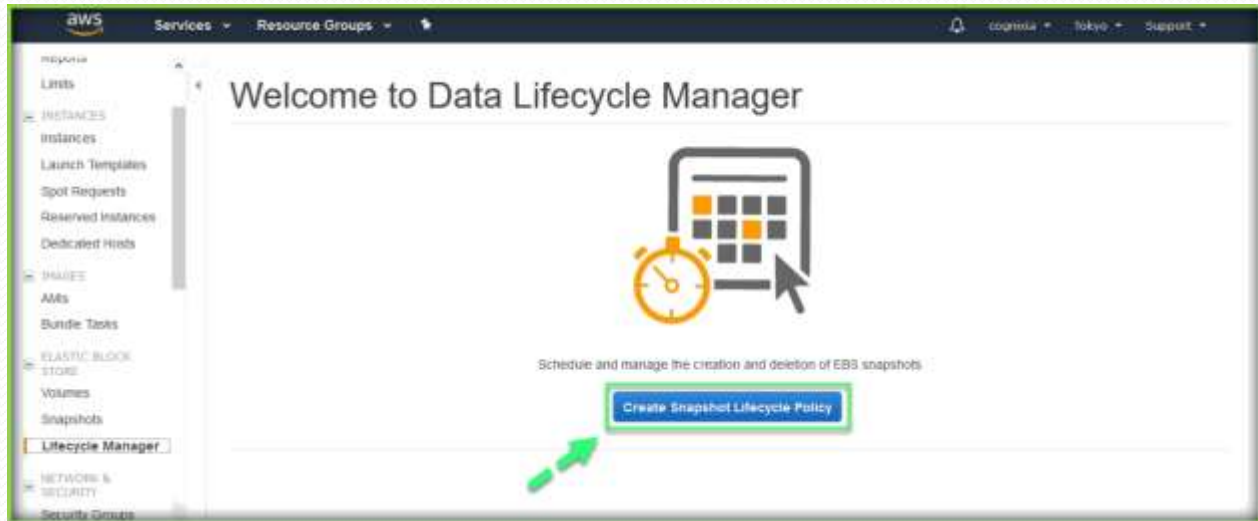
Creating and Using a Lifecycle Policy

Lifecycle Manager uses lifecycle policies to figure out when to run, which volumes to snapshot, and how long to keep the snapshots around.

I access the Lifecycle Manager from the Elastic Block Store section of the menu



Then I click Create Snapshot Lifecycle Policy to proceed:



Then I create my first policy

[Services](#)[Resource Groups](#)

Jeff Barr

N. Virginia

[Support](#)[Policies](#) > Create Snapshot Lifecycle Policy

Create Snapshot Lifecycle Policy

Data Lifecycle Manager for EBS Snapshots will help you automate the creation and deletion of EBS snapshots based on a schedule. Volumes are targeted by tags.

Description* Backup Policy for Developer Volumes ⓘ

Target volumes with tags This policy will be applied to volumes with **any** of the following tags. ⓘ
You cannot use tags that are in use by another enabled or disabled lifecycle policy.

department dev ⓘ

Schedule name* Default Schedule ⓘ

Create snapshots every 24 Hours ⓘ

Snapshot creation start time 00:15 UTC

A snapshot will be taken within one hour from the start time.

Retention rule Number of snapshots that will be retained. ⓘ

+ 14

Rule summary Every 24 hours a snapshot will be created starting at 00:15 UTC.
A maximum of 14 snapshots will be retained of a target volume.
The oldest snapshot retained will be approximately 2 weeks old.

Tag created snapshots Any snapshot created with this policy will automatically be tagged with the policy ID and schedule name. You can add additional tags below.

Key	Value
(127 characters maximum)	(255 characters maximum)

This resource currently has no tags.

Choose the Add tag button or click to add a Name tag.

Add Tag 50 remaining (up to 50 tags maximum)

IAM role This policy needs to be associated with an IAM role that has snapshot create and delete permissions. If you are unsure what IAM role to use, select the AWS Default role.

☒ Default role

If EBS Default role is not present, one will be automatically created with all required permissions. View Details

☐ Choose another role

Policy status after creation* ☒ Enable policy
☐ Disable policy

[Cancel](#)[Create Policy](#)

I use tags to specify the volumes that the policy applies to. If I specify multiple tags, then the policy applies to volumes that have any of the tags

The screenshot shows the 'Target volumes with tags' section of the AWS Data Lifecycle Manager console. It includes a text box for 'department' with a dropdown arrow and a refresh icon. Below this is a table with 'Schedule Name' and 'Default Schedule'. The 'Create snapshots every' dropdown is set to '12'. The 'Snapshot creation start time' is set to '09 : 00' UTC. A dropdown menu is open, showing 'Tag value' options: 'dev', 'factory', and 'marketing'.

I can create snapshots at 12- or 24-hour intervals, and I can specify the desired snapshot time. Snapshot creation will start no more than an hour after this time, with completion based on the size of the volume and the degree of change since the last snapshot.

I can use the built-in default IAM role or I can create one of my own. If I use my own role, I need to enable the EC2 snapshot operations and all the DLM (Data Lifecycle Manager) operations.

Newly created snapshots will be tagged with the `aws:dlm:lifecycle-policy-id` and `aws:dlm:lifecycle-schedule-name` automatically; I can also specify up to 50 additional key/value pairs for each policy

The screenshot shows the 'Tag created snapshots' section of the AWS Data Lifecycle Manager console. It includes a text box for 'department' and a 'Value' dropdown menu. Below this is a table with 'Key' and 'Value' columns. The 'Key' column has a value of 'department' and the 'Value' column has a value of 'factory'. There is a button labeled 'Add Tag' and a counter showing '49 remaining (Up to 50 tags maximum)'.

I can see all my policies at a glance

Create Snapshot Lifecycle Policy

Actions

Filter by attributes or search by keyword

<< 1 to 2 of 2 >>

<input type="checkbox"/>	Policy ID	Description	State
<input checked="" type="checkbox"/>	policy-0b2581d5675dc6...	Backup Policy for Factory Volumes	ENABLED
<input type="checkbox"/>	policy-0d4812fb658db8b	Backup Policy for Developer Volumes	ENABLED

Policy: policy-0b2581d5675dc6403

Details

Policy ID

policy-0b2581d5675dc6403

Date created

Wed Jul 11 17:11:12 GMT-700
2018

Date modified

Wed Jul 11 17:12:35 GMT-700
2018

Target volumes with these tags

department factory

Rule summary

Every 12 hours a snapshot will be created starting at 00:30 UTC. A maximum of 14 snapshots will be retained of a target volume. The oldest snapshot retained will be approximately 7 days old.

Description

Backup Policy for Factory Volumes

Policy state

ENABLED

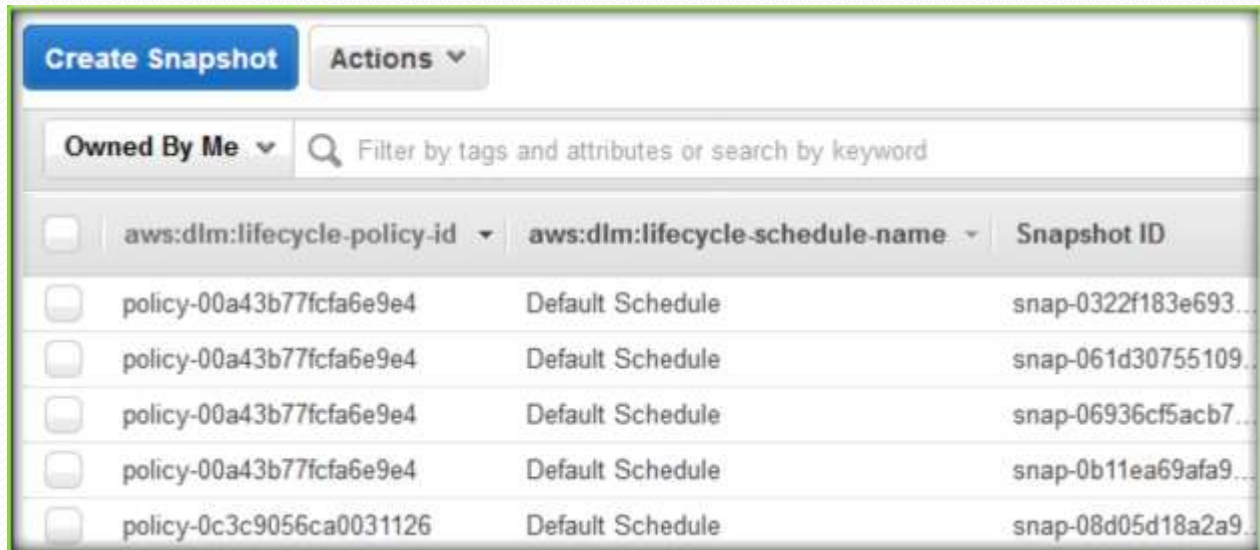
Schedule name

Factory Volume Schedule

Tags added to snapshots

department factory

I took a short break and came back to find that the first set of snapshots had been created, as expected (I configured the console to show the two tags created on the snapshots)



<div>Create Snapshot Actions</div>			
Owned By Me <input type="text" value="Filter by tags and attributes or search by keyword"/>			
<input type="checkbox"/>	aws:dlm:lifecycle-policy-id	aws:dlm:lifecycle-schedule-name	Snapshot ID
<input type="checkbox"/>	policy-00a43b77fca6e9e4	Default Schedule	snap-0322f183e693...
<input type="checkbox"/>	policy-00a43b77fca6e9e4	Default Schedule	snap-061d30755109...
<input type="checkbox"/>	policy-00a43b77fca6e9e4	Default Schedule	snap-06936cf5acb7...
<input type="checkbox"/>	policy-00a43b77fca6e9e4	Default Schedule	snap-0b11ea69afa9...
<input type="checkbox"/>	policy-0c3c9056ca0031126	Default Schedule	snap-08d05d18a2a9...