



EC2 and EBS

Trainee Name : Chhavi Sharma

Newers ID : 4023

Mentor Name : Nishith Kulshrestha

College : UPES

1. Create an EC2 instance (Ubuntu 18.04, T3 nano).(instance A)

Ans.

The screenshot shows the 'Step 1: Choose an Amazon Machine Image (AMI)' page. At the top, there are tabs: 1. Choose AMI (which is selected), 2. Choose Instance Type, 3. Configure Instance, 4. Add Storage, 5. Add Tags, 6. Configure Security Group, and 7. Review. On the right, there are two radio button groups: one for '64-bit (x86)' and one for '64-bit (Arm)'. The first section lists 'SUSE Linux Enterprise Server 15 Service Pack 1 (HVM), EBS General Purpose (SSD) Volume Type. Public Cloud, Advanced Systems Management, Web and Scripting, and Legacy modules enabled.' Below it, there are two options for 'Ubuntu Server 18.04 LTS (HVM), SSD Volume Type': one for '64-bit (x86)' and another for '64-bit (Arm)', both marked as 'Free tier eligible'. A 'Select' button is located next to the x86 option. The second section lists 'Ubuntu Server 18.04 LTS (HVM), EBS General Purpose (SSD) Volume Type. Support available from Canonical (http://www.ubuntu.com/cloud/services.)' with similar options for 64-bit (x86) and 64-bit (Arm). Both sections include 'Root device type: ebs', 'Virtualization type: hvm', and 'ENAv Enabled: Yes'.

Step 2: Choose an Instance Type

Currently selected: t2.micro (Variable ECUs, 1 vCPUs, 2.5 GHz, Intel Xeon Family, 1 GiB memory, EBS only)

	Family	Type	vCPUs	Memory (GiB)	Instance Storage (GB)	EBS-Optimized Available	Network Performance	IPv6 Support
<input type="checkbox"/>	General purpose	t2.nano	1	0.5	EBS only	-	Low to Moderate	Yes
<input checked="" type="checkbox"/>	General purpose	t2.micro Free tier eligible	1	1	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	General purpose	t2.small	1	2	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	General purpose	t2.medium	2	4	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	General purpose	t2.large	2	8	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	General purpose	t2.xlarge	4	16	EBS only	-	Moderate	Yes
	General purpose	to.2xlarge	8	32	EBS only	-	High	Yes

[Cancel](#) [Previous](#) [Review and Launch](#) [Next: Configure Instance Details](#)

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Step 3: Configure Instance Details

Configure the instance to suit your requirements. You can launch multiple instances from the same AMI, request Spot instances to take advantage of the lower pricing, assign an access management role to the instance, and more.

The screenshot shows the 'Step 3: Configure Instance Details' page. It includes fields for 'Number of instances' (set to 1), 'Purchasing option' (Request Spot instances), 'Network' (vpc-d38d68b7 | default (default)), 'Subnet' (subnet-06680a5b651f104dc | testpusubnet | us-east-1), 'Auto-assign Public IP' (Enable), 'Placement group' (Add instance to placement group), and 'Capacity Reservation' (Open). Buttons for 'Create new VPC', 'Create new subnet', and 'Create new Capacity Reservation' are also present. At the bottom, there are buttons for 'Cancel', 'Previous', 'Review and Launch', and 'Next: Add Storage'.

Step 3: Configure Instance Details

Configure the instance to suit your requirements. You can launch multiple instances from the same AMI, request Spot instances to take advantage of the lower pricing, assign an access management role to the instance, and more.

Number of instances Launch into Auto Scaling Group [\(i\)](#)

Purchasing option Request Spot instances

Network [\(i\)](#) [Create new VPC](#)

Subnet [\(i\)](#) [Create new subnet](#)
65501 IP Addresses available

Auto-assign Public IP [\(i\)](#)

Placement group Add instance to placement group

Capacity Reservation [\(i\)](#) [Create new Capacity Reservation](#)

[Cancel](#) [Previous](#) [Review and Launch](#) [Next: Add Storage](#)

Step 5: Add Tags

A tag consists of a case-sensitive key-value pair. For example, you could define a tag with key = Name and value = Webserver.

A copy of a tag can be applied to volumes, instances or both.

Tags will be applied to all instances and volumes. [Learn more](#) about tagging your Amazon EC2 resources.

Key	(128 characters maximum)	Value	(256 characters maximum)	Instances (i)	Volumes (i)	X
owner	<input type="text" value="owner"/>	<input type="text" value="Chhavi"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	X
purpose	<input type="text" value="purpose"/>	<input type="text" value="EC2-Assessment-chhavi"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	X

[Add another tag](#) (Up to 50 tags maximum)

Step 6: Configure Security Group

A security group is a set of firewall 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 instance, add rules that allow unrestricted 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.

Assign a security group: Create a new security group
 Select an existing security group

Security group name:

Description:

Type (i)	Protocol (i)	Port Range (i)	Source (i)	Description (i)
SSH	TCP	22	Custom	0.0.0.0/0
e.g. SSH for Admin Desktop X				

[Add Rule](#)

[Cancel](#) [Previous](#) [Review and Launch](#)

Step 7: Review Instance Launch

Please review your instance launch details. You can go back to edit changes for each section. Click **Launch** to assign a key pair to your instance and complete the launch process.

A Improve your instances' security. Your security group, launch-wizard-49, is open to the world.
Your instances may be accessible from any IP address. We recommend that you update your security group rules to allow access from known IP addresses only. You can also open additional ports in your security group to facilitate access to the application or service you're running, e.g., HTTP (80) for web servers. [Edit security groups](#)

A Your instance configuration is not eligible for the free usage tier
To launch an instance that's eligible for the free usage tier, check your AMI selection, instance type, configuration options, or storage devices. Learn more about [free usage tier](#) eligibility and usage restrictions.

[Don't show me this again](#)

AMI Details [Edit AMI](#)

Ubuntu Server 18.04 LTS (HVM), SSD Volume Type - ami-07ebfd5b3428b6f4d
Ubuntu Server 18.04 LTS (HVM).EBS General Purpose (SSD) Volume Type. Support available from Canonical

[Free tier](#) [Edit](#) [Cancel](#) [Previous](#) [Launch](#)

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Launch Status

✓ Your instances are now launching
The following instance launches have been initiated: i-0db72ae1333685026 [View launch log](#)

i Get notified of estimated charges
Create [billing alerts](#) to get an email notification when estimated charges on your AWS bill exceed an amount you define (for example, if you exceed the free usage tier).

How to connect to your instances

New EC2 Experience Tell us what you think [Launch Instance](#) [Connect](#) [Actions](#)

EC2 Dashboard [Events](#) [Tags](#) [Reports](#) [Limits](#)

INSTANCES [Instances](#) [Instance Types](#)

Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status
Chhavi Sharma	i-0db72ae13336850...	t2.micro	us-east-1c	running	Initializing	None

2. Create the AMI of the above instance and launch it. (instance B)

Ans.

Step 1: Select the Instance whose image you want to create . In the actions menu select **create image**.

New EC2 Experience
Tell us what you think

EC2 Dashboard [New](#)

Events

Tags

Reports

Limits

INSTANCES

Instances

Instance Types

Launch Templates [New](#)

Spot Requests

Savings Plans

Launch Instance Connect Actions

search : chhavi Add filter

Name Instance ID

Chhavi Sharma i-0db72ae1333685026

Connect Get Windows Password Create Template From Instance Launch More Like This

Instance State Instance Settings

Image Create Image Networking Bundle Instance (instance store AMI)

CloudWatch Monitoring

1 to 1 of 1

Availability Zone Instance State Status Checks Alarm Status

i-0db72ae1333685026 running Initializing None

Instance: i-0db72ae1333685026 (Chhavi Sharma) Public DNS: ec2-184-72-101-218.compute-1.amazonaws.com

Step 2: Specify the image name and description.

Create Image

Instance ID: i-0db72ae1333685026

Image name: AMI of Instance A

Image description: AMI for launching B

No reboot:

Instance Volumes

Volume Type	Device	Snapshot	Size (GiB)	Volume Type	IOPS	Throughput (MB/s)	Delete on Termination	Encrypted
Root	/dev/sda1	snap-0e078112eedeecd9db	8	General Purpose S3	100 / 3000	N/A	<input checked="" type="checkbox"/>	Not Encrypted

Add New Volume

Total size of EBS Volumes: 8 GiB

When you create an EBS image, an EBS snapshot will also be created for each of the above volumes.

Cancel Create Image

Image created

Create Image

Create Image request received.
View pending image ami-02629b1f1fdced6b

Any snapshots backing your new EBS image can be managed on the [snapshots screen](#) after successful image creation.

Close

New EC2 Experience
Tell us what you think

Launch Actions

Owned by me search : Chhavi Add filter

Name	AMI Name	AMI ID	Source	Owner	Visibility	Status
Chhavi Shar...	AMI of Instance A	ami-02629b1f1fcfdced6b	187632318301/...	187632318301	Private	available

Image: ami-02629b1f1fcfdced6b

Details Permissions Tags

Edit

AMI ID	ami-02629b1f1fcfdced6b	AMI Name	AMI of Instance A
Owner	187632318301	Source	187632318301/AMI of Instance A
Status	available	State Reason	-
Creation date	February 20, 2020 at 1:39:40 PM UTC+5:30	Platform	Other Linux
Architecture	x86_64	Image Type	machine
Virtualization Type		Description	All for launching D

Step 3: Now select the ami from which you want to create an image. Click on launch and follow the instance creation steps.

New EC2 Experience
Tell us what you think

Launch Actions

Owned by me Add filter

- Launch
- Spot Request
- Deregister
- Register New AMI
- Copy AMI
- Modify Image Permissions
- Add/Edit Tags
- Modify Boot Volume Setting

Image: ami-02629b1f1fcfdced6b

Details Permissions Tags

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 types Current generation Show/Hide Columns

Currently selected: t2.micro (Variable ECUs, 1 vCPUs, 2.5 GHz, Intel Xeon Family, 1 GiB memory, EBS only)

	Family	Type	vCPUs	Memory (GiB)	Instance Storage (GB)	EBS-Optimized Available	Network Performance	IPv6 Support
<input type="checkbox"/>	General purpose	t2.nano	1	0.5	EBS only	-	Low to Moderate	Yes
<input checked="" type="checkbox"/>	General purpose	t2.micro <small>Free tier eligible</small>	1	1	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	General purpose	t2.small	1	2	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	General purpose	t2.medium	2	4	EBS only	-	Low to Moderate	Yes

Cancel **Previous** **Review and Launch** **Next: Configure Instance Details**

Step 3: Configure Instance Details

Configure the instance to suit your requirements. You can launch multiple instances from the same AMI, request Spot instances to take advantage of the lower pricing, assign an access management role to the instance, and more.

Number of instances	<input type="text" value="1"/>	Launch into Auto Scaling Group
Purchasing option	<input type="checkbox"/> Request Spot instances	
Network	vpc-d38d68b7 default (default)	<input type="button" value="Create new VPC"/>
Subnet	subnet-06680a5b651f104dc testpusubnet us-east-1 65495 IP Addresses available	<input type="button" value="Create new subnet"/>
Auto-assign Public IP	Enable	
Placement group	<input type="checkbox"/> Add instance to placement group	
Capacity Reservation	<input type="button" value="Open"/>	<input type="button" value="Create new Capacity Reservation"/>

[Cancel](#) [Previous](#) [Review and Launch](#) [Next: Add Storage](#)

Step 4: Add Storage

Your instance will be launched with the following storage device settings. You can attach additional EBS volumes and instance store volumes to your instance, or edit the settings of the root volume. You can also attach additional EBS volumes after launching an instance, but not instance store volumes. [Learn more](#) about storage options in Amazon EC2.

Volume Type	Device	Snapshot	Size (GiB)	Volume Type	IOPS	Throughput (MB/s)	Delete on Termination	Encryption
Root	/dev/sda1	snap-0fce864b3feeeded2d	8	General Purpose S	100 / 3000	N/A	<input checked="" type="checkbox"/>	Not Encrypted

[Add New Volume](#)

Free tier eligible customers can get up to 30 GB of EBS General Purpose (SSD) or Magnetic storage. [Learn more](#) about free usage tier eligibility and usage restrictions.

[Cancel](#) [Previous](#) [Review and Launch](#) [Next: Add Tags](#)

Step 5: Add Tags

A tag consists of a case-sensitive key-value pair. For example, you could define a tag with key = Name and value = Webserver.

A copy of a tag can be applied to volumes, instances or both.

Tags will be applied to all instances and volumes. [Learn more](#) about tagging your Amazon EC2 resources.

Key	(128 characters maximum)	Value	(256 characters maximum)	Instances	Volumes	X
owner	<input type="text" value="Chhavi"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	X
purpose	<input type="text" value="EC2-Assessment-chhavi"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	X
Name	<input type="text" value="Instance B"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	X

[Add another tag](#) (Up to 50 tags maximum)

[Cancel](#) [Previous](#) [Review and Launch](#) [Next: Configure Security Group](#)

Step 6: Configure Security Group

A security group is a set of firewall 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 instance, add rules that allow unrestricted 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.

Assign a security group: Create a new security group

Select an existing security group

Security group name:

launch-wizard-52

Description:

launch-wizard-52 created 2020-02-20T13:46:15.607+05:30

Type	Protocol	Port Range	Source	Description
SSH	TCP	22	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

Cancel

Previous

Review and Launch

Feedback English (US)

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Step 7: Review Instance Launch

Please review your instance launch details. You can go back to edit changes for each section. Click **Launch** to assign a key pair to your instance and complete the launch process.



⚠ Improve your instances' security. Your security group, launch-wizard-52, is open to the world.

Your instances may be accessible from any IP address. We recommend that you update your security group rules to allow access from known IP addresses only.

You can also open additional ports in your security group to facilitate access to the application or service you're running, e.g., HTTP (80) for web servers. [Edit security groups](#)

AMI Details

Edit AMI



AMI of Instance A - ami-02629b1f1fcdecd6b

AMI for launching B

Root Device Type: ebs Virtualization type: hvm

Instance Type

Edit instance type

Instance Type	ECUs	vCPUs	Memory (GiB)	Instance Storage (GB)	EBS-Optimized Available	Network Performance

Cancel

Previous

Launch

Feedback English (US)

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New EC2 Experience

Tell us what you think

Launch Instance

Connect

Actions



Reserved Instances

Dedicated Hosts [New](#)

Scheduled Instances

Capacity Reservations

IMAGES

AMIs

Bundle Tasks

ELASTIC BLOCK STORE

Volumes

Snapshots

Lifecycle Manager

Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status
Instance B	i-05b11abe787e5b596	t2.micro	us-east-1c	running	Initializing	None
Instance A	i-0db72ae13336850...	t2.micro	us-east-1c	running	2/2 checks ...	None

Instance: i-05b11abe787e5b596 (Instance B) Public DNS: ec2-18-204-222-129.compute-1.amazonaws.com

3. Attach EBS (8 GB) on that running instance.

Ans.

Step 1: Create an EBS volume.

The screenshot shows the AWS EC2 Volumes page. On the left, there's a navigation sidebar with 'New EC2 Experience' and sections for 'Capacity Reservations', 'IMAGES' (AMIs, Bundle Tasks), and 'ELASTIC BLOCK STORE' (Volumes, Snapshots, Lifecycle Manager). The 'Volumes' section is currently selected. The main area displays a table of existing volumes:

Name	Volume ID	Size	Volume Type	IOPS	Snapshot	Created	Availability Zone
Instance B	vol-0ec5606...	8 GiB	gp2	100	snap-0fce864b...	February 20, 2020 ...	us-east-1c
	vol-0cc96abc...	8 GiB	gp2	100	snap-0e07811...	February 20, 2020 ...	us-east-1c

Specify the size of the volume and the AZ. Make sure to select the same AZ as the instance that you want to attach the EBS to.

The screenshot shows the 'Create Volume' wizard. It has several fields:

- Volume Type:** General Purpose SSD (gp2)
- Size (GiB):** 8 (Min: 1 GiB, Max: 16384 GiB)
- IOPS:** 100 / 3000 (Baseline of 3 IOPS per GiB with a minimum of 100 IOPS, burstable to 3000 IOPS)
- Availability Zone***: us-east-1c
- Throughput (MB/s):** Not applicable
- Snapshot ID:** Select a snapshot
- Encryption:** Encrypt this volume (checkbox)

The screenshot shows the AWS EC2 Volumes page again. The 'Volumes' section is selected. A new volume named 'Chhavi' has been added to the list:

Name	Volume ID	Size	Volume Type	IOPS	Snapshot	Created	Availability Zone
Chhavi	vol-008ad62f245ec51d6	8 GiB	gp2	100		February 20, 2020 ...	us-east-1c
Instance B	vol-0ec5606...	8 GiB	gp2	100	snap-0fce864b...	February 20, 2020 ...	us-east-1c
Instance A	vol-0cc96abc...	8 GiB	gp2	100	snap-0e07811...	February 20, 2020 ...	us-east-1c

Below the table, a message says 'Volumes: vol-008ad62f245ec51d6 (Chhavi)' with three small icons next to it. At the bottom, there are tabs for 'Description', 'Status Checks', 'Monitoring', and 'Tags'.

Step 2: Select the EBS and select Attach Volume option from the actions menu.

The screenshot shows the AWS EC2 Volumes page. On the left, there's a sidebar with navigation links like New EC2 Experience, Capacity Reservations, IMAGES, AMIs, Bundle Tasks, ELASTIC BLOCK STORE, Volumes, Snapshots, Lifecycle Manager, NETWORK & SECURITY, Security Groups, Elastic IPs, Placement Groups, and Key Pairs. The main area displays a table of volumes. A context menu is open over a row labeled 'Chhavi' under the 'Name' column. The menu options are: Modify Volume, Create Snapshot, Delete Volume, **Attach Volume**, Detach Volume, Force Detach Volume, Change Auto-Enable IO Setting, and Add/Edit Tags. The table has columns for Name, Volume Type, IOPS, Snapshot, Created, and Availability Zone. One row is selected, showing details like vol-008ad62f245ec51d6, gp2, 100, snap-0fce864b..., February 20, 2020, us-east-1c.

Step 3: Specify the instance ID and Device.

The screenshot shows the 'Attach Volume' dialog box. It has fields for Volume (vol-008ad62f245ec51d6), Instance (i-0db72ae1333685026), and Device (/dev/sdf). A note at the bottom says: 'Note: Newer Linux kernels may rename your devices to /dev/xvdf through /dev/xvdp internally, even when the device name entered here (and shown in the details) is /dev/sdf through /dev/sdp.' There are 'Cancel' and 'Attach' buttons at the bottom.

The screenshot shows the AWS EC2 Volumes page again. The table now includes a new row for 'Chhavi-EBS' with the volume ID vol-008ad62f245ec51d6. The 'Attachment information' section for this volume shows it is 'in-use' on instance i-0db72ae1333685026, specifically at device /dev/sdf (attached). Other details shown include Volume type gp2, Product codes -, IOPS 100, Encryption Not Encrypted, KMS Key ID, KMS Key Aliases, KMS Key ARN, and Multi-Attach Enabled No.

4. Stop, Start, Restart that EBS (EBS must be auto-attached).

Ans.

For this we need to make an entry of the mounted EBS in the /etc/fstab file.

```
chhavi@chhavi:~$ sudo ssh -i /home/chhavi/Downloads/chhavi-ec2-assessment.pem ubuntu@184.72.101.218
Welcome to Ubuntu 18.04.3 LTS (GNU/Linux 4.15.0-1057-aws x86_64)

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

 System information as of Thu Feb 20 08:38:51 UTC 2020

 System load:  0.0          Processes:           86
 Usage of /:   13.6% of 7.69GB  Users logged in:    0
 Memory usage: 14%          IP address for eth0: 172.31.247.124
 Swap usage:   0%

0 packages can be updated.
0 updates are security updates.
```

```
ubuntu@ip-172-31-247-124:~$ lsblk
NAME   MAJ:MIN RM  SIZE RO TYPE MOUNTPOINT
loop0    7:0      0  18M  1 loop /snap/amazon-ssm-agent/1480
loop1    7:1      0 89.1M  1 loop /snap/core/8268
xvda    202:0     0   8G  0 disk 
└─xvda1  202:1     0   8G  0 part /
xvdf    202:80    0   8G  0 disk
ubuntu@ip-172-31-247-124:~$
```

```
ubuntu@ip-172-31-247-124:~$ sudo file -s /dev/xvdf
/dev/xvdf: data
ubuntu@ip-172-31-247-124:~$
```

```
ubuntu@ip-172-31-247-124:~$ sudo mkfs.ext4 /dev/xvdf
mke2fs 1.44.1 (24-Mar-2018)
Creating filesystem with 2097152 4k blocks and 524288 inodes
Filesystem UUID: 3bc2f33f-9900-4261-bfaa-6925d4dde3bd
Superblock backups stored on blocks:
            32768, 98304, 163840, 229376, 294912, 819200, 884736, 1605632
```

```
Allocating group tables: done
Writing inode tables: done
Creating journal (16384 blocks): done
Writing superblocks and filesystem accounting information: done
```

```
ubuntu@ip-172-31-247-124:~$
```

```
ubuntu@ip-172-31-247-124:~$ sudo mount /dev/xvdf /mnt/external-ebs/
ubuntu@ip-172-31-247-124:~$
```

/etc/fstab

```
LABEL=cloudimg-rootfs   /      ext4    defaults,discard      0 0
/dev/xvdf     /mnt/external-ebs  ext4    defaults      0 0
```

```
~
```

```
ubuntu@ip-172-31-247-124:/mnt/external-ebs$ sudo vim /etc/fstab
```

```
ubuntu@ip-172-31-247-124:/mnt/external-ebs$ sudo mount -a
```

```
ubuntu@ip-172-31-247-124:/mnt/external-ebs$ sudo findmnt --verify
```

```
/ [W] recommended root FS passno is 1 (current is 0)
```

```
0 parse errors, 0 errors, 1 warning
```

```
ubuntu@ip-172-31-247-124:/mnt/external-ebs$
```

Now start stop instance

Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status
Instance B	i-05b11abe787e5b596	t2.micro	us-east-1c	running	2/2 checks ...	None
Instance A	i-0db72ae13336850...	t2.micro	us-east-1c	stopping	None	

```
ubuntu@ip-172-31-247-124:~$ df -h
```

Filesystem	Size	Used	Avail	Use%	Mounted on
udev	481M	0	481M	0%	/dev
tmpfs	99M	752K	98M	1%	/run
/dev/xvda1	7.7G	1.3G	6.5G	16%	/
tmpfs	492M	0	492M	0%	/dev/shm
tmpfs	5.0M	0	5.0M	0%	/run/lock
tmpfs	492M	0	492M	0%	/sys/fs/cgroup
/dev/loop0	18M	18M	0	100%	/snap/amazon-ssm-agent/1480
/dev/loop1	90M	90M	0	100%	/snap/core/8268
/dev/xvdf	7.9G	36M	7.4G	1%	/mnt/external-ebs
tmpfs	99M	0	99M	0%	/run/user/1000

```
ubuntu@ip-172-31-247-124:~$
```

```

chhavi@chhavi:~$ sudo ssh -i /home/chhavi/Downloads/chhavi-ec2-assessment.pem ubuntu@18.205.189.18
The authenticity of host '18.205.189.18 (18.205.189.18)' can't be established.
ECDSA key fingerprint is SHA256:IJaFuecLWcOsB9qIVk30GKfGreIzJJHybBEwmiamZR8.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '18.205.189.18' (ECDSA) to the list of known hosts.
Welcome to Ubuntu 18.04.3 LTS (GNU/Linux 4.15.0-1057-aws x86_64)

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

System information as of Thu Feb 20 09:56:56 UTC 2020

System load:  0.05          Processes:      92
Usage of /:   15.7% of 7.69GB  Users logged in:  0
Memory usage: 14%           IP address for eth0: 172.31.247.124
Swap usage:   0%

53 packages can be updated.

```

5. Make some mistake in fstab file, stop and start the instance, then troubleshoot it.

Ans.

Wrong entry in fstab

```

LABEL=cloudimg-rootfs  /          ext4  defaults,discard      0 0
/dev/xvdf      /mnt/external-ebs/  //ext4  defaults      0 0

```

Now start stop instance

Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status
Instance B	i-05b11abe787e5b596	t2.micro	us-east-1c	green running	2/2 checks ...	None
Instance A	i-0db72ae13336850...	t2.micro	us-east-1c	yellow stopping	None	

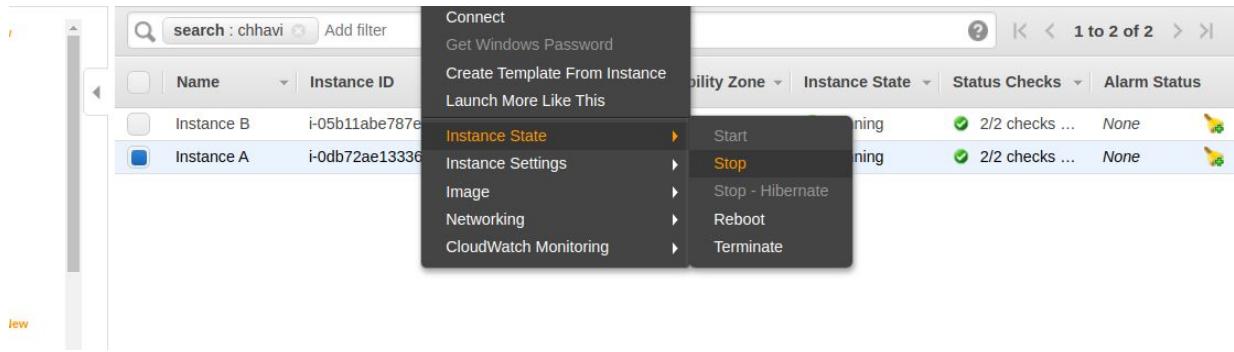
Connection refused.

```

chhavi@chhavi:~$ sudo ssh -i /home/chhavi/Downloads/chhavi-ec2-assessment.pem  ubuntu@52.87.191.218
ssh: connect to host 52.87.191.218 port 22: Connection refused
chhavi@chhavi:~$ 

```

Step 1. Stop the instance



Step 2. Detach root vol of instance a

This screenshot shows the AWS EBS console. The left sidebar includes 'Dedicated Hosts', 'Scheduled Instances', 'Capacity Reservations', 'IMAGES', 'AMIs', 'Bundle Tasks', 'ELASTIC BLOCK STORE' (selected), 'Volumes' (selected), 'Snapshots', 'Lifecycle Manager', 'NETWORK & SECURITY', 'Security Groups', and 'Elastic IPs'. The main area lists volumes: 'Chhavi-EBS' (gp2, 100 IOPS, created Feb 20, 2020, availability zone us-east-1c), 'Instance B' (gp2, 100 IOPS, created Feb 20, 2020, availability zone us-east-1c), and 'Instance A' (gp2, 100 IOPS, created Feb 20, 2020, availability zone us-east-1c). A context menu is open over 'Chhavi-EBS', with options: 'Modify Volume', 'Create Snapshot', 'Delete Volume', 'Attach Volume', 'Detach Volume' (highlighted), 'Force Detach Volume', 'Change Auto-Enable IO Setting', and 'Add/Edit Tags'. Below the table, a detailed view of the 'vol-008ad62f245ec51d6' volume is shown, including its description, status checks, monitoring, and tags. The volume ID is vol-008ad62f245ec51d6, size is 8 GiB, and it was created on February 20, 2020 at 10:45 AM. It has an alarm status of 'None', a snapshot of 'snap-0fce864b...', and is located in the 'us-east-1c' availability zone.

Step 3. Create a new maintenance instance

This screenshot shows the AWS Lambda console. The left sidebar is identical to the previous one. The main area displays a table of instances. A context menu is open over 'Maintenance...' (with ID i-0d2c4e33edb528387). The menu options are the same as in Step 2, with 'Stop' highlighted. The table shows three instances: 'Instance B' (running, 2/2 checks passing, availability zone us-east-1c), 'Maintenance...' (initializing, 0/0 checks passing, availability zone us-east-1c), and 'Instance A' (stopped, 0/0 checks passing, availability zone us-east-1c).

Step 4. Attach root volume of instance A to maintenance instance.

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Create Volume Actions ▾

Name	Volume ID	Size	Volume Type	IOPS	Snapshot	Created	Availability Zone
Maintenance...	vol-03e2555...	8 GiB	gp2	100	snap-0e07811...	February 20, 2020 ...	us-east-1c
Chhavi-EBS	vol-008ad62f...	8 GiB	gp2	100		February 20, 2020 ...	us-east-1c
Instance B	vol-0ec5606...	8 GiB	gp2	100	snap-0fce864b...	February 20, 2020 ...	us-east-1c
Instance A	vol-0cc96abc...	8 GiB	gp2	100	snap-0e07811...	February 20, 2020 ...	us-east-1c

Size: 8 GiB Snapshot: snap-0e078112eedeec9db
 Created: February 20, 2020 at 1:34:47 PM UTC+5:30 Availability Zone: us-east-1c
 State: in-use Encryption: Not Encrypted
 Attachment information: i-0d2c4e33edb528387 (Maintenance Instance):/dev/sdf (attaching)
 Volume type: gp2 KMS Key Aliases:
 Product codes: - KMS Key ARN:
 IOPS: 100 Multi-Attach Enabled: No

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Step 5. ssh into maintenance instance

```
chhavi@chhavi:~$ sudo ssh -i /home/chhavi/Downloads/chhavi-ec2-assessment.pem ubuntu@54.144.234.38
[sudo] password for chhavi:
Welcome to Ubuntu 18.04.3 LTS (GNU/Linux 4.15.0-1057-aws x86_64)

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

 System information as of Thu Feb 20 11:46:31 UTC 2020

 System load:  0.11              Processes:      90
 Usage of /:   13.8% of 7.69GB   Users logged in:  0
 Memory usage: 15%               IP address for eth0: 172.31.98.54
 Swap usage:   0%

 0 packages can be updated.
 0 updates are security updates.

Last login: Thu Feb 20 11:06:10 2020 from 182.71.160.186
ubuntu@ip-172-31-98-54:~$
```

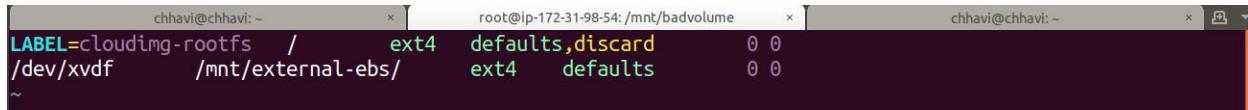
Step 6. Lsblk

```
root@ip-172-31-98-54:/home/ubuntu# lsblk
NAME   MAJ:MIN RM  SIZE RO TYPE MOUNTPOINT
loop0    7:0    0  18M  1 loop /snap/amazon-ssm-agent/1480
loop1    7:1    0 89.1M  1 loop /snap/core/8268
xvda   202:0    0   8G  0 disk 
└─xvda1 202:1    0   8G  0 part /
xvdf   202:80   0   8G  0 disk 
└─xvdf1 202:81   0   8G  0 part
```

Step 7. Mount xvdf

```
root@ip-172-31-98-54:/home/ubuntu# cd /mnt
root@ip-172-31-98-54:/mnt# rm -rf badvolume/
root@ip-172-31-98-54:/mnt# mkdir /mnt/badvolume
root@ip-172-31-98-54:/mnt# mount /dev/xvdf1 /mnt/badvolume/
```

Step 8. Correct the etc/fstab in /mnt/badvolume



```
chhavi@chhavi:~          root@ip-172-31-98-54:/mnt/badvolume      chhavi@chhavi:~
LABEL=cloudimg-rootfs   /      ext4    defaults,discard    0 0
/dev/xvdf      /mnt/external-ebs/  ext4    defaults        0 0
~
```

Step 9.check the entry

```
root@ip-172-31-98-54:/mnt/badvolume# mount -a
root@ip-172-31-98-54:/mnt/badvolume#
```

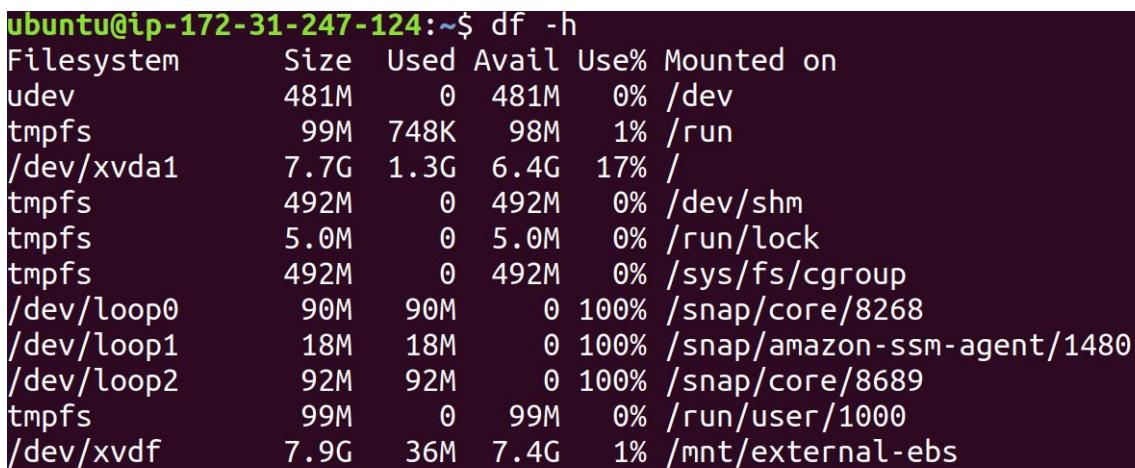
Step 10.Unmount the disk

```
root@ip-172-31-98-54:~# sudo umount /mnt/badvolume/
root@ip-172-31-98-54:~#
```

Step 11. Detach the volume from maintenance instance and attach back to instance A.

Step 12. Ssh into instance A. Now we can enter into instance A successfully.

Step 13. Here correct the entry in the fstab file.



```
ubuntu@ip-172-31-247-124:~$ df -h
Filesystem      Size  Used Avail Use% Mounted on
udev            481M    0  481M   0% /dev
tmpfs           99M  748K  98M   1% /run
/dev/xvda1      7.7G  1.3G  6.4G  17% /
tmpfs           492M    0  492M   0% /dev/shm
tmpfs           5.0M    0  5.0M   0% /run/lock
tmpfs           492M    0  492M   0% /sys/fs/cgroup
/dev/loop0       90M   90M    0 100% /snap/core/8268
/dev/loop1       18M   18M    0 100% /snap/amazon-ssm-agent/1480
/dev/loop2       92M   92M    0 100% /snap/core/8689
tmpfs           99M    0  99M   0% /run/user/1000
/dev/xvdf       7.9G  36M  7.4G   1% /mnt/external-ebs
ubuntu@ip-172-31-247-124:~$ exit
logout
Connection to 54.225.54.92 closed.
chhavi@chhavi:~$
```

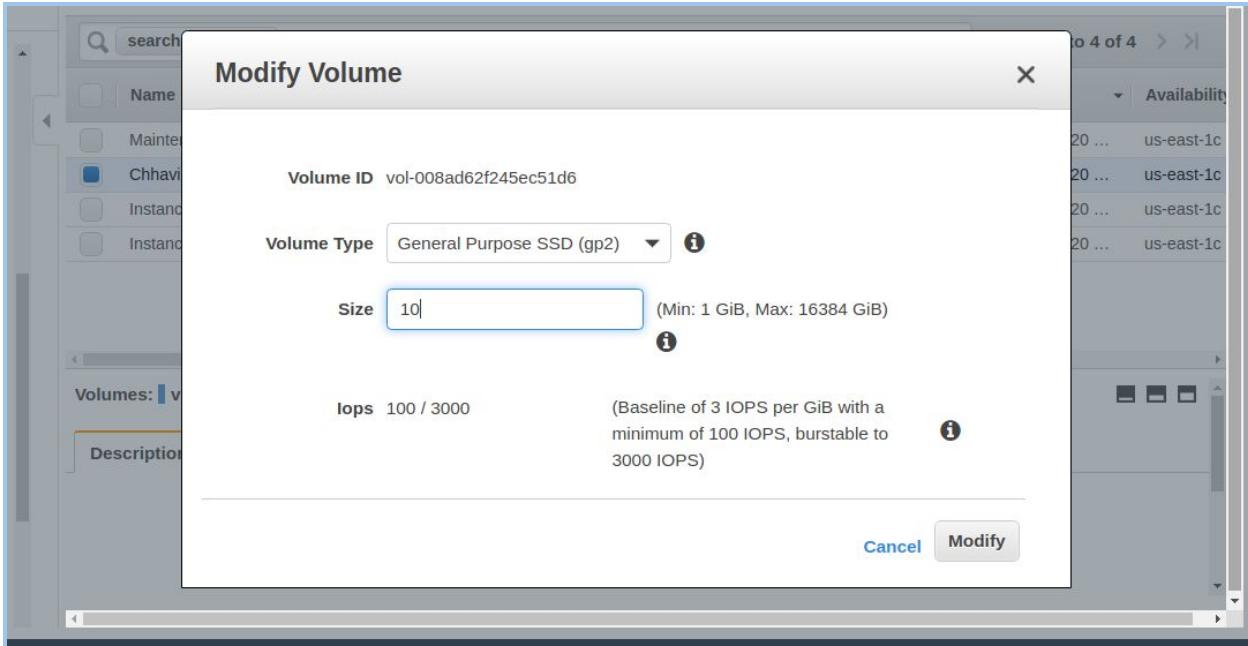
Step 14. Stop/Start Instance.SSH into Instance .You can ssh successfully.

The screenshot shows the AWS EC2 Instances page. On the left, there's a sidebar with various navigation links like EC2 Dashboard, Events, Tags, Reports, Limits, and a section for Instances. Under Instances, there are links for Instance Types, Launch Templates, Spot Requests, Savings Plans, Reserved Instances, Dedicated Hosts, Scheduled Instances, and Capacity Reservations. The main content area displays a table of instances. One instance, 'Instance A' (i-0db72ae1333685026), is selected and highlighted with a blue border. Below the table, there's a detailed view for 'Instance A'. At the top of this view, there are tabs for Description, Status Checks, Monitoring, and Tags. The Description tab is active, showing details such as Instance ID (i-0db72ae1333685026), Public DNS (ec2-54-225-54-92.compute-1.amazonaws.com), Instance state (running), Instance type (t2.micro), and a note about finding the instance. The Monitoring tab shows CloudWatch Monitoring status. The Status Checks tab shows 2/2 checks passing. The Monitoring tab shows no data. At the bottom of the instance view, there are buttons for Feedback, English (US), and links to Privacy Policy and Terms of Use.

```
Last login: Thu Feb 20 12:09:53 2020 from 61.12.91.218
ubuntu@ip-172-31-247-124:~$ df -h
Filesystem      Size  Used Avail Use% Mounted on
udev            481M    0  481M   0% /dev
tmpfs           99M  752K  98M   1% /run
/dev/xvda1      7.7G  1.3G  6.4G  17% /
tmpfs           492M    0  492M   0% /dev/shm
tmpfs           5.0M    0  5.0M   0% /run/lock
tmpfs           492M    0  492M   0% /sys/fs/cgroup
/dev/loop0       18M    0  18M  100% /snap/amazon-ssm-agent/1480
/dev/loop1       90M    0  90M  100% /snap/core/8268
/dev/loop2       92M    0  92M  100% /snap/core/8689
/dev/xvdf       7.9G  36M  7.4G   1% /mnt/external-ebs
tmpfs           99M    0  99M   0% /run/user/1000
ubuntu@ip-172-31-247-124:~$
```

6. Resize the EBS from 8 to 10GB.

Ans.



7. SSH from one instance A to instance B.

Ans.

Step 1: Ssh into instance A and Generate a public private rsa key pair.

```
ubuntu@ip-172-31-247-124:~$ ssh-keygen
Generating public/private rsa key pair.
Enter file in which to save the key (/home/ubuntu/.ssh/id_rsa):
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /home/ubuntu/.ssh/id_rsa.
Your public key has been saved in /home/ubuntu/.ssh/id_rsa.pub.
The key fingerprint is:
SHA256:0YpIIY2CyAR48GGJRmudxJBj4pUfYzyx5dDZcPf780s ubuntu@ip-172-31-247-124
The key's randomart image is:
+---[RSA 2048]---+
|@*B+ooo+. . |
|BOB*oB=o.o. . |
|==+o+.+. . . |
|... o . o . . |
| . . S . . . |
| . . . . . . . |
| . . . E . . . |
| . . . . o . . |
+---[SHA256]---+
ubuntu@ip-172-31-247-124:~$
```

Step 2: cd into .ssh/ and copy the rsa public key generated.

```
ubuntu@ip-172-31-247-124:~$ cd .ssh/
ubuntu@ip-172-31-247-124:~/ssh$ ls
authorized_keys  id_rsa  id_rsa.pub
ubuntu@ip-172-31-247-124:~/ssh$ cat id_rsa.pub
ssh-rsa AAAAB3NzaC1yc2EAAAQABAAQD1G+B16+4cmhm7vl7q2CMFW9Z3hkntUHspAZuCcDSo1tnPtc7Dkq6ZQfnD4qXYyduBmWd
ExV0SML1tk4vbeMnUQuV0LWUcXDC8EDnNoHw9hINPq+1QMD7v+jh1i5yyZ5cJkWYzBL0DLJr5zIq3XqvQsgwTAc3/fUkR9mWEU8KLL2r
MSpDk/xAO2GYiR7d6UD4B/QuGcgSg1GBYg9JFGqczYudYxKCqF975vu4qvgLemCaI05VXZ+UXlifz1jELaEM1BAkSpMdntL5hYFF2jg3Kd
ifHv41623CSm1/LogM+iGCJ8I1VILk/iURcmVB5E5Kqx4EZ0+gzFEYKgbFn  ubuntu@ip-172-31-247-124
ubuntu@ip-172-31-247-124:~/ssh$
```

Step 3: Now ssh into Instance B and cd into .ssh/ folder. Now modify the authorized_keys file and paste the rsa public key in it. Exit.

```
chhavi@chhavi:~$ sudo ssh -i /home/chhavi/Downloads/chhavi-ec2-assessment.pem ubuntu@107.23.199.3
[sudo] password for chhavi:
Welcome to Ubuntu 18.04.3 LTS (GNU/Linux 4.15.0-1057-aws x86_64)

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

System information as of Fri Feb 21 10:15:53 UTC 2020

System load: 0.0          Processes:      89
Usage of /: 20.6% of 7.69GB Users logged in: 0
Memory usage: 21%          IP address for eth0: 172.31.149.230
Swap usage: 0%

* Multipass 1.0 is out! Get Ubuntu VMs on demand on your Linux, Windows or
Mac. Supports cloud-init for fast local/cloud device simulation.

System restart required
Last login: Fri Feb 21 07:17:57 2020 from 182.71.160.186
ubuntu@ip-172-31-149-230:~$ cd .ssh
ubuntu@ip-172-31-149-230:~/ssh$ ls
authorized_keys
ubuntu@ip-172-31-149-230:~/ssh$ sudo vim authorized_keys
ubuntu@ip-172-31-149-230:~/ssh$
ubuntu@ip-172-31-149-230:~/ssh$ exit
logout
Connection to 107.23.199.3 closed.
```

Step 4: Now in instance A try to ssh into instance B.

You can successfully ssh.

```
ubuntu@ip-172-31-247-124:~$ ssh ubuntu@ip-172-31-149-230
The authenticity of host 'ip-172-31-149-230 (172.31.149.230)' can't be established.
ECDSA key fingerprint is SHA256:vwB36MskS1Uv6Iw9EA8x0aEu9x6udcBYLaGpTRbH0zM.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added 'ip-172-31-149-230,172.31.149.230' (ECDSA) to the list of known hosts.
Welcome to Ubuntu 18.04.3 LTS (GNU/Linux 4.15.0-1057-aws x86_64)
```

8. Copy the EBS in different regions(oregon).

Ans.

//PERMISSION NOT GIVEN

9. Detach the root EBS, create its snapshot, then create the AMI and run it as instance such that nginx should be pre installed at the boot time of instance.

Ans.

Step 1:Stop instance A and detach the root EBS.

The screenshot shows the AWS CloudWatch Metrics Insights search results page. The search query is:

```
MetricsFilter @version=2 @timestamp >= 2020-02-20T00:00:00Z & @version=2 @timestamp <= 2020-02-20T23:59:59Z & @version=2 @logEventId=i-0db72ae1333685026 /aws/ec2/instance/events
```

The results table lists three metrics:

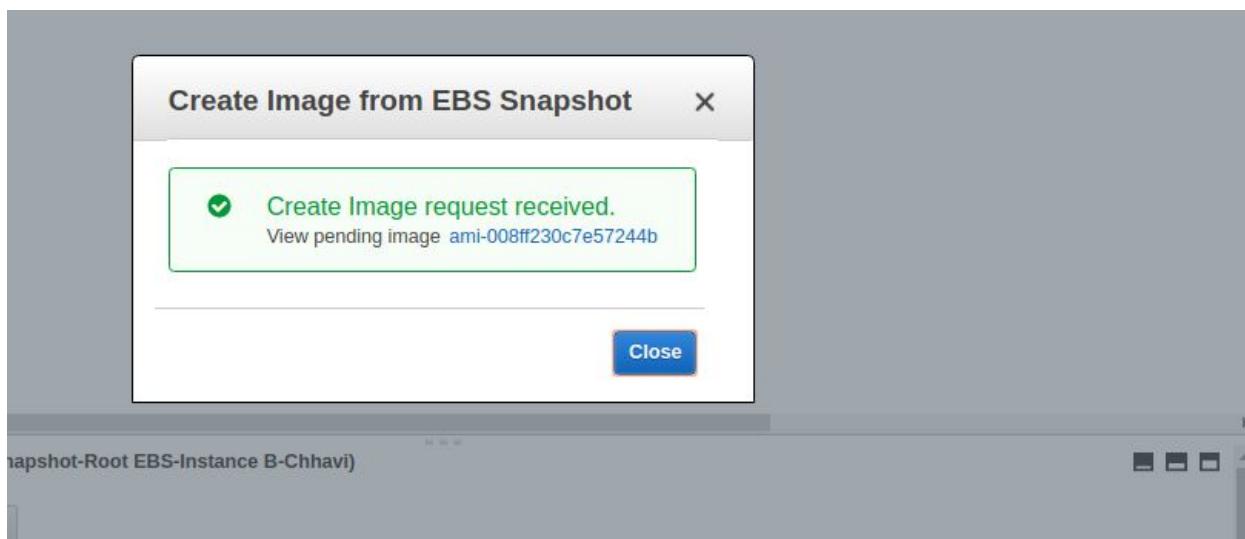
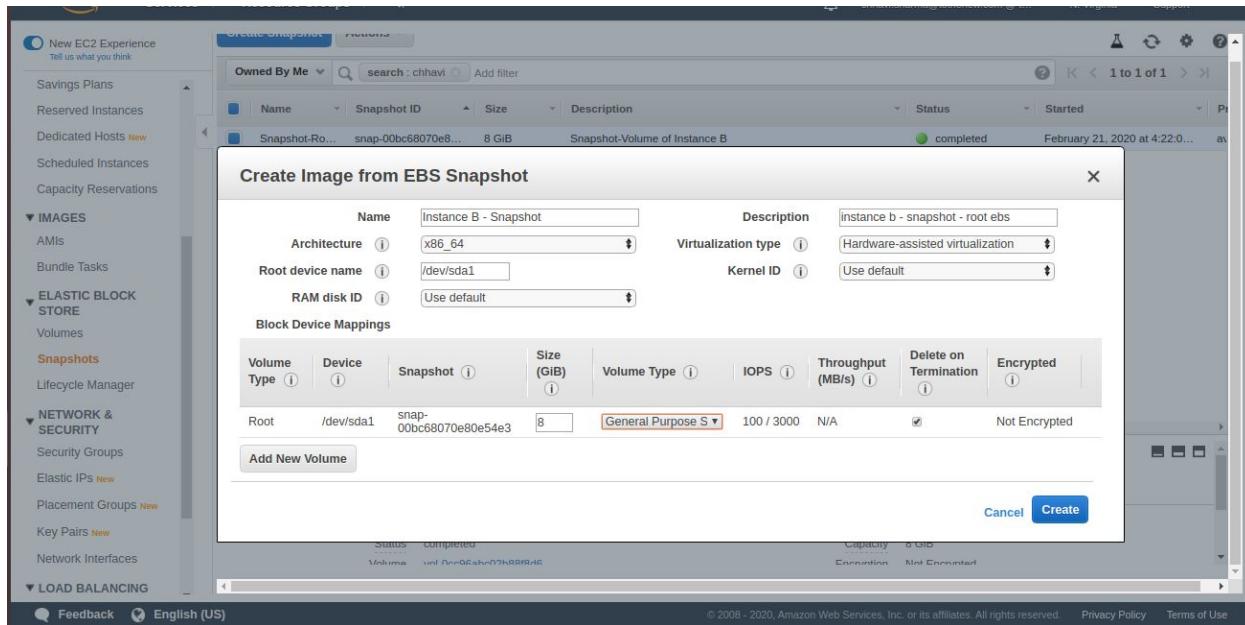
Series	Value	Timestamp
aws.ec2.instance.events	1	2020-02-20T23:59:59Z
aws.ec2.instance.events	1	2020-02-20T23:59:59Z

Step 2: Create a snapshot of the root EBS detached.

The screenshot shows the AWS Lambda function configuration page for the function "lambda-ec2-ami". The configuration tab is selected, showing the following details:

- Runtime: Python 3.8
- Memory: 128 MB
- Timeout: 15 seconds
- Environment Variables:
 - EC2_INSTANCE_ID: i-0db72ae1333685026
 - EC2_INSTANCE_TYPE: t2.micro
 - EC2_AMI_NAME: Amazon Linux 2 AMI - 2020.02.20
 - EC2_AMI_ID: ami-0e07811...
 - EC2_AMI_REGION: us-east-1
 - EC2_AMI_VPC_ID: vpc-00bc68070e80e54e3
 - EC2_AMI_AVAILABILITY_ZONES: us-east-1c
 - EC2_AMI_BLOCK_DEVICE: /dev/sda1
 - EC2_AMI_ROOT_BLOCK_DEVICE: /dev/sda1
 - EC2_AMI_ROOT_BLOCK_SIZE: 8 GiB
 - EC2_AMI_ROOT_BLOCK_TYPE: gp2
 - EC2_AMI_ROOT_BLOCK_IOPS: 100
 - EC2_AMI_ROOT_BLOCK_ENCRYPTED: No
 - EC2_AMI_ROOT_BLOCK_KMS_KEY_ID: Not Encrypted
 - EC2_AMI_ROOT_BLOCK_KMS_KEY_ALIAS: Not Encrypted
 - EC2_AMI_ROOT_BLOCK_KMS_KEY_ARN: Not Encrypted
 - EC2_AMI_ROOT_BLOCK_MULTI_ATTACH_ENABLED: No
- Role: arn:aws:iam::aws:lambda:ExecutionRole-lambda-ec2-ami
- Code: /var/task
- Deployment Package: zip
- Environment: /var/lang/bin/python3.8
- Tracing: Off
- Logs: CloudWatch Logs
- Code signing: Off
- Layer version: 1 (lambda-ec2-ami-layer)

Step 3: Create an image from this snapshot.



Step 4: Launch an instance from the created AMI and write the user data.

Step 3: Configure Instance Details

▼ Network interfaces ⓘ

Device	Network Interface	Subnet	Primary IP	Secondary IP addresses	IPv6 IPs
eth0	New network interface ▾	subnet-06680a5b ▾	Auto-assign	Add IP	Add IP

[Add Device](#)

▼ Advanced Details

User data ⓘ As text As file Input is already base64 encoded

```
#!/bin/bash
sudo apt-get update -y
sudo apt-get install nginx -y
```

[Cancel](#) [Previous](#) [Review and Launch](#) [Next: A](#)

[Feedback](#) [English \(US\)](#)

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Step 7: Review Instance Launch

▼ AMI Details [Edit AMI](#)

Instance B - Snapshot - ami-008ff230c7e57244b
 EBS-SNAPSHOT
Root Device Type: ebs Virtualization type: hvm

▼ Instance Type [Edit instance type](#)

Instance Type	ECUs	vCPUs	Memory (GiB)	Instance Storage (GB)	EBS-Optimized Available	Network Performance
t2.micro	Variable	1	1	EBS only	-	Low to Moderate

▼ Security Groups [Edit security groups](#)

Security group name	Description
launch-wizard-126	launched-wizard-126 created 2020-02-21T17:01:39.716+05:30

[Cancel](#) [Previous](#) [Launch](#)

Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status
Instance B	i-05b11abe787e5b596	t2.micro	us-east-1c	stopped	None	
Maintenance...	i-0d2c4e33edb528387	t2.micro	us-east-1c	stopped	None	
Instance A	i-0db72ae13336850...	t2.micro	us-east-1c	stopped	None	
Snapshot-EBS	i-0ff58b890586146dc	t2.micro	us-east-1c	running	Initializing	None

Instance: i-0ff58b890586146dc (Snapshot-EBS) Public DNS: ec2-18-205-150-74.compute-1.amazonaws.com

Description Status Checks Monitoring Tags

Instance ID	i-0ff58b890586146dc	Public DNS (IPv4)	ec2-18-205-150-74.compute-1.amazonaws.com
Instance state	running	IPv4 Public IP	18.205.150.74
Instance type	t2.micro	IPv6 IPs	-
Finding	You may not have permission	Elastic IPs	

```
chhavi@chhavi:~$ sudo ssh -i /home/chhavi/Downloads/chhavi-ec2-assessment.pem ubuntu@3.95.17.109
```

```
The authenticity of host '3.95.17.109 (3.95.17.109)' can't be established.  
ECDSA key fingerprint is SHA256:o2zTNEgyGUcgsPP4NuwxazTwke/0A0oBH9Vc/xAPtB8.  
Are you sure you want to continue connecting (yes/no)? yes  
Warning: Permanently added '3.95.17.109' (ECDSA) to the list of known hosts.  
Welcome to Ubuntu 18.04.3 LTS (GNU/Linux 4.15.0-1057-aws x86_64)
```

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

```
System information as of Fri Feb 21 12:12:16 UTC 2020
```

```
System load: 0.74 Processes: 91  
Usage of /: 15.9% of 7.69GB Users logged in: 0  
Memory usage: 16% IP address for eth0: 172.31.35.68  
Swap usage: 0%
```

```
53 packages can be updated.
```

```
31 updates are security updates.
```

```
Last login: Fri Feb 21 12:01:08 2020 from 61.12.91.218  
To run a command as administrator (user "root"), use "sudo <command>".
```

Check if Nginx is running .

```
ubuntu@ip-172-31-35-68:~$ sudo service nginx status  
● nginx.service - A high performance web server and a reverse proxy server  
  Loaded: loaded (/lib/systemd/system/nginx.service; enabled; vendor preset: enabled)  
  Active: active (running) since Fri 2020-02-21 12:11:57 UTC; 50s ago  
    Docs: man:nginx(8)  
 Main PID: 1879 (nginx)  
   Tasks: 2 (limit: 1152)  
  CGroup: /system.slice/nginx.service  
          └─1879 nginx: master process /usr/sbin/nginx -g daemon on; master_process on;  
             ├─1881 nginx: worker process
```

```
Feb 21 12:11:56 ip-172-31-35-68 systemd[1]: Starting A high performance web server and a reverse proxy serv  
Feb 21 12:11:57 ip-172-31-35-68 systemd[1]: nginx.service: Failed to parse PID from file /run/nginx.pid: In  
Feb 21 12:11:57 ip-172-31-35-68 systemd[1]: Started A high performance web server and a reverse proxy serve  
lines 1-13/13 (END)
```

