

# Assignment 04

## Problem 1

1. Select an EBS backed AMI (Linux) from Public. Here I choose a Ubuntu AMI.

Step 1: Choose an Amazon Machine Image (AMI)

An AMI is a template that contains the software configuration (operating system, application server, and applications) required to launch your instance. You can select an AMI provided by AWS, our user community, or the AWS Marketplace; or you can select one of your own AMIs.

Quick Start    My AMIs    AWS Marketplace    Community AMIs

Search community AMIs

ubuntu/images/hvm-ssd/ubuntu-trusty-14.04-amd64-server-20150325 - ami-d05e75b8

Select

Cancel and Exit

Root device type: ebs    Virtualization type: hvm

64-bit

2. Describe the configuration of ami-d05e75b8.

```
hqiu@bos-mpdei> aws ec2 describe-images --image-ids ami-d05e75b8
{
    "Images": [
        {
            "VirtualizationType": "hvm",
            "Name": "ubuntu/images/hvm-ssd/ubuntu-trusty-14.04-amd64-server-20150325",
            "Hypervisor": "xen",
            "SriovNetSupport": "simple",
            "ImageId": "ami-d05e75b8",
            "State": "available",
            "BlockDeviceMappings": [
                {
                    "DeviceName": "/dev/sda1",
                    "Ebs": {
                        "DeleteOnTermination": true,
                        "SnapshotId": "snap-4e3c6d2b",
                        "VolumeSize": 8,
                        "VolumeType": "gp2",
                        "Encrypted": false
                    }
                },
                {
                    "DeviceName": "/dev/sdb",
                    "VirtualName": "ephemeral0"
                },
                {
                    "DeviceName": "/dev/sdc",
                    "VirtualName": "ephemeral1"
                }
            ],
            "Architecture": "x86_64",
            "ImageLocation": "099720109477/ubuntu/images/hvm-ssd/ubuntu-trusty-14.04-amd64-server-20150325",
            "RootDeviceType": "ebs",
            "OwnerId": "099720109477",
            "RootDeviceName": "/dev/sda1",
            "CreationDate": "2015-03-25T23:54:59.000Z",
            "Public": true,
            "ImageType": "machine"
        }
    ]
}
```

```
hqiu@bos-mpdei>> aws ec2 describe-images --image-ids ami-d05e75b8 --output table
```

DescribeImages	
Images	
Architecture	x86_64
CreationDate	2015-03-25T23:54:59.000Z
Hypervisor	xen
ImageId	ami-d05e75b8
ImageLocation	099720109477/ubuntu/images/hvm-ssd/ubuntu-trusty-14.04-amd64-server-20150325
ImageType	machine
Name	ubuntu/images/hvm-ssd/ubuntu-trusty-14.04-amd64-server-20150325
OwnerId	099720109477
Public	True
RootDeviceName	/dev/sdal
RootDeviceType	ebs
SriovNetSupport	simple
State	available
VirtualizationType	hvm
BlockDeviceMappings	
DeviceName	/dev/sdal
VirtualName	
Ebs	
DeleteOnTermination	True
Encrypted	False
SnapshotId	snap-4e3c6d2b
VolumeSize	8
VolumeType	gp2
BlockDeviceMappings	
DeviceName	/dev/sdb
VirtualName	ephemeral0
BlockDeviceMappings	
DeviceName	/dev/sdc
VirtualName	ephemeral1

3. Create two instances from the ami-d05e75b8. Use the option ‘--count’ to create multiple instances at the same time.

```

hqiu@bos-mpdei>> aws ec2 run-instances --image-id ami-d05e75b8 --count 2 --instance-type t2.micro --key-name e
c2hqiui --security-group-ids launch-hqiui
{
    "OwnerId": "217134905396",
    "ReservationId": "r-c678f810",
    "Groups": [],
    "Instances": [
        {
            "Monitoring": {
                "State": "disabled"
            },
            "PublicDnsName": "",
            "RootDeviceType": "ebs",
            "State": {
                "Code": 0,
                "Name": "pending"
            },
            "EbsOptimized": false,
            "LaunchTime": "2015-09-30T16:34:20.000Z",
            "PrivateIpAddress": "172.31.60.19",
            "ProductCodes": [],
            "VpcId": "vpc-dfb48aba",
            "StateTransitionReason": "",
            "InstanceId": "i-0e6776ad",
            "ImageId": "ami-d05e75b8",
            "PrivateDnsName": "ip-172-31-60-19.ec2.internal",
            "KeyName": "ec2hqiui",
            "SecurityGroups": [
                {
                    "GroupName": "launch-hqiui",
                    "GroupId": "sg-adfff3ca"
                }
            ],
            "ClientToken": "",
            "SubnetId": "subnet-abe07780",
            "InstanceType": "t2.micro",
            "Monitoring": {
                "State": "disabled"
            },
            "PublicDnsName": "",
            "RootDeviceType": "ebs",
            "State": {
                "Code": 0,
                "Name": "pending"
            },
            "EbsOptimized": false,
            "LaunchTime": "2015-09-30T16:34:20.000Z",
            "PrivateIpAddress": "172.31.60.20",
            "ProductCodes": [],
            "VpcId": "vpc-dfb48aba",
            "StateTransitionReason": "",
            "InstanceId": "i-766776d5",
            "ImageId": "ami-d05e75b8",
            "PrivateDnsName": "ip-172-31-60-20.ec2.internal",
            "KeyName": "ec2hqiui",
            "SecurityGroups": [
                {
                    "GroupName": "launch-hqiui",
                    "GroupId": "sg-adfff3ca"
                }
            ],
            "ClientToken": "",
            "SubnetId": "subnet-abe07780",
            "InstanceType": "t2.micro",
            "NetworkInterfaces": [
                {
                    "Status": "in-use",
                    "MacAddress": "12:2c:57:8c:2c:cf",
                    "SourceDestCheck": true,
                    "VpcId": "vpc-dfb48aba",
                    "Description": "",
                    "NetworkInterfaceId": "eni-f39e4dd2",
                    "PrivateIpAddresses": [
                        {
                            "PrivateDnsName": "ip-172-31-60-20.ec2.internal",
                            "Primary": true,
                            "PrivateIpAddress": "172.31.60.20"
                        }
                    ]
                }
            ]
        }
    ]
}

```

#### 4. Describe the instances.

```
hqiu@bos-mpdei>> aws ec2 describe-instances --instance-ids i-0e6776ad --output table
```

DescribeInstances	
Reservations	
OwnerId	217134905396
ReservationId	r-c678f810
Instances	
AmiLaunchIndex	0
Architecture	x86_64
ClientToken	
EbsOptimized	False
Hypervisor	xen
ImageId	ami-d05e75b8
InstanceId	i-0e6776ad
InstanceType	t2.micro
KeyName	ec2hqiui
LaunchTime	2015-09-30T16:34:20.000Z
PrivateDnsName	ip-172-31-60-19.ec2.internal
PrivateIpAddress	172.31.60.19
PublicDnsName	ec2-54-175-186-232.compute-1.amazonaws.com
PublicIpAddress	54.175.186.232
RootDeviceName	/dev/sda1
RootDeviceType	ebs
SourceDestCheck	True
StateTransitionReason	
SubnetId	subnet-abe07780
VirtualizationType	hvm
VpcId	vpc-dfb48aba
BlockDeviceMappings	
DeviceName	/dev/sda1
Ebs	
AttachTime	2015-09-30T16:34:24.000Z
DeleteOnTermination	True
Status	attached
VolumeId	vol-ca020927

```
hqiu@bos-mpdei>> aws ec2 describe-instances --instance-ids i-0e6776ad --query 'Reservations[0].Instances[0].PublicIpAddress'  
"54.175.186.232"  
hqiu@bos-mpdei>> aws ec2 describe-instances --instance-ids i-0e6776ad --query 'Reservations[0].Instances[0].PublicDnsName'  
"ec2-54-175-186-232.compute-1.amazonaws.com"  
hqiu@bos-mpdei>> aws ec2 describe-instances --instance-ids i-0e6776ad --query 'Reservations[0].Instances[0].BlockDeviceMappings[0].DeviceName'  
"/dev/sda1"  
hqiu@bos-mpdei>> aws ec2 describe-instances --instance-ids i-0e6776ad --query 'Reservations[0].Instances[0].BlockDeviceMappings[0].Ebs.VolumeId'  
"vol-ca020927"
```

1<sup>st</sup> instance: i-0e6776ad

Public IP Address: 54.175.186.232

Public DNS: ec2-54-175-186-232.compute-1.amazonaws.com

Volume ID: vol-ca020927

Root Device Name: /dev/sda1

DescribeInstances	
Reservations	
OwnerId	217134905396
ReservationId	r-c678f810
Instances	
AmiLaunchIndex	1
Architecture	x86_64
ClientToken	
EbsOptimized	False
Hypervisor	xen
ImageId	ami-d05e75b8
InstanceId	i-766776d5
InstanceType	t2.micro
KeyName	ec2hqiui
LaunchTime	2015-09-30T16:34:20.000Z
PrivateDnsName	ip-172-31-60-20.ec2.internal
PrivateIpAddress	172.31.60.20
PublicDnsName	ec2-54-208-9-245.compute-1.amazonaws.com
PublicIpAddress	54.208.9.245
RootDeviceName	/dev/sda1
RootDeviceType	ebs
SourceDestCheck	True
StateTransitionReason	
SubnetId	subnet-abe07780
VirtualizationType	hvm
VpcId	vpc-dfb48aba
BlockDeviceMappings	
DeviceName	/dev/sda1
Ebs	
AttachTime	2015-09-30T16:34:24.000Z
DeleteOnTermination	True
Status	attached
VolumeId	vol-7b020996

```
hqiu@bos-mpdei>> aws ec2 describe-instances --instance-ids i-766776d5 --query 'Reservations[0].Instances[0].PublicIpAddress'  
"54.208.9.245"  
hqiu@bos-mpdei>> aws ec2 describe-instances --instance-ids i-766776d5 --query 'Reservations[0].Instances[0].PublicDnsName'  
"ec2-54-208-9-245.compute-1.amazonaws.com"  
hqiu@bos-mpdei>> aws ec2 describe-instances --instance-ids i-766776d5 --query 'Reservations[0].Instances[0].BlockDeviceMappings[0].DeviceName'  
"/dev/sda1"  
hqiu@bos-mpdei>> aws ec2 describe-instances --instance-ids i-766776d5 --query 'Reservations[0].Instances[0].BlockDeviceMappings[0].Ebs.VolumeId'  
"vol-7b020996"
```

2<sup>nd</sup> instance: i-766776d5

Public IP Address: 54.208.9.245

Public DNS: ec2-54-208-9-245.compute-1.amazonaws.com

Volume ID: vol-7b020996

Root Device Name: /dev/sda1

## Check from the Amazon Console.

Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status	Public DNS	Public IP
	i-0e6776ad	t2.micro	us-east-1a	running	2/2 checks ...	None	ec2-54-175-186-232.co...	54.175.186.232
<input checked="" type="checkbox"/>	i-766776d5	t2.micro	us-east-1a	running	2/2 checks ...	None	ec2-54-208-9-245.com...	54.208.9.245
<hr/>								
	Instance ID	i-766776d5			Public DNS	ec2-54-208-9-245.compute-1.amazonaws.com		
	Instance state	running			Public IP	54.208.9.245		
	Instance type	t2.micro			Elastic IP	-		
	Private DNS	ip-172-31-60-20.ec2.internal			Availability zone	us-east-1a		
	Private IPs	172.31.60.20			Security groups	launch-hqiu, view rules		
	Secondary private IPs				Scheduled events	No scheduled events		
	VPC ID	vpc-dfb48aba			AMI ID	ubuntu-trusty-14.04-amd64-server-20150325 (ami-d05e75b8)		
	Subnet ID	subnet-abe07780			Platform	-		
	Network interfaces	eth0			IAM role	-		
	Source/dest. check	True			Key pair name	ec2hqiu		
	EBS-optimized	False			Owner	217134905396		
	Root device type	ebs			Launch time	September 30, 2015 at 12:34:20 PM UTC-4 (less than one hour)		
	Root device	/dev/sda1			Termination protection	False		
	Block devices	/dev/sda1			Lifecycle	normal		
					Monitoring	basic		
					Alarm status	None		

- Log into the first instance i-0e6776ad and create a file on the instance. Write the public IP address and public DNS name into that file.

```
hqiu@bos-mpdei:> ssh -i "ec2hqiu.pem" ubuntu@ec2-54-175-186-232.compute-1.amazonaws.com
Welcome to Ubuntu 14.04.2 LTS (GNU/Linux 3.13.0-48-generic x86_64)
```

```
* Documentation: https://help.ubuntu.com/
```

```
System information as of Wed Sep 30 16:46:55 UTC 2015
```

```
System load: 0.05          Processes:         96
Usage of /: 9.8% of 7.74GB  Users logged in:    0
Memory usage: 5%
Swap usage:  0%
```

```
Graph this data and manage this system at:
https://landscape.canonical.com/
```

```
Get cloud support with Ubuntu Advantage Cloud Guest:
http://www.ubuntu.com/business/services/cloud
```

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

```
Last login: Wed Sep 30 16:46:56 2015 from 72.246.0.14
ubuntu@ip-172-31-60-19:~$ ls
ubuntu@ip-172-31-60-19:~$ touch hqiuTestFile.txt
ubuntu@ip-172-31-60-19:~$ vi hqiuTestFile.txt
ubuntu@ip-172-31-60-19:~$ cat hqiuTestFile.txt
This is my first EBS Ubuntu instance.
Public IP Address: 54.175.186.232
Public DNS Name: ec2-54-175-186-232.compute-1.amazonaws.com
```

```
-- By hqiu.
```

- Stop the instance.

```

hqiu@bos-mpdei>> aws ec2 stop-instances --instance-ids i-0e6776ad
{
    "StoppingInstances": [
        {
            "InstanceId": "i-0e6776ad",
            "CurrentState": {
                "Code": 64,
                "Name": "stopping"
            },
            "PreviousState": {
                "Code": 16,
                "Name": "running"
            }
        }
    ]
}

```

	Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status	Public DNS	Public IP
	i-766776d5	i2.micro	us-east-1a	running	2/2 checks ...	None	None	ec2-54-208-9-245.com...	54.208.9.245
<input checked="" type="checkbox"/>	i-0e6776ad	i2.micro	us-east-1a	stopped	None	None	None		

## 7. Detach the volume from the first instance.

From the Amazon Console, select “EBS -> Volumes”, we can see that vol-ca020927 is attached to instance i-0e6776ad on ‘/dev/sda1’.

	Name	Volume ID	Size	Volume Type	IOPS	Snapshot	Created	Availability Zone	State	Alarm Status
	vol-b020996	8 GiB	gp2	24 / 3000	snap-4e3c6d2b	September 30, 201...	us-east-1a	in-use	None	None
<input checked="" type="checkbox"/>	vol-ca020927	8 GiB	gp2	24 / 3000	snap-4e3c6d2b	September 30, 201...	us-east-1a	in-use	None	None

Volumes: vol-ca020927	
<a href="#">Description</a> <a href="#">Status Checks</a> <a href="#">Monitoring</a> <a href="#">Tags</a>	
Volume ID	vol-ca020927
Size	8 GiB
Created	September 30, 2015 at 12:34:24 PM UTC-4
State	in-use
Attachment information	i-0e6776ad:/dev/sda1 (attached)
Volume type	gp2
Alarm status	None
Snapshot	snap-4e3c6d2b
Availability Zone	us-east-1a
Encrypted	Not Encrypted
KMS Key ID	
KMS Key Aliases	

Volumes: vol-ca020927	
<a href="#">Description</a> <a href="#">Status Checks</a> <a href="#">Monitoring</a> <a href="#">Tags</a>	
Volume ID	vol-ca020927
Size	8 GiB
Created	September 30, 2015 at 12:34:24 PM UTC-4
State	in-use
Attachment information	i-0e6776ad:/dev/sda1 (attached)
Volume type	gp2
Product codes	-
IOPS	24 / 3000

Same to the second volume. We can see that vol-7b020996 is attached to instance i-766776d5 on '/dev/sda1'.

	Name	Volume ID	Size	Volume Type	IOPS	Snapshot	Created	Availability Zone	State	Alarm Status
<input type="checkbox"/>	vol-7b020996	8 GiB	gp2	24 / 3000	snap-4e3c6d2b	September 30, 201...	us-east-1a	<span>● in-use</span>	None	
<input type="checkbox"/>	vol-ca020927	8 GiB	gp2	24 / 3000	snap-4e3c6d2b	September 30, 201...	us-east-1a	<span>● in-use</span>	None	

Volumes: vol-7b020996	
<a href="#">Description</a> <span><a href="#">Status Checks</a></span> <span><a href="#">Monitoring</a></span> <span><a href="#">Tags</a></span>	
Volume ID	vol-7b020996
Size	8 GiB
Created	September 30, 2015 at 12:34:24 PM UTC-4
State	in-use
Attachment information	i-766776d5:/dev/sda1 (attached)
Volume type	gp2
Alarm status	None
Snapshot	<a href="#">snap-4e3c6d2b</a>
Availability Zone	us-east-1a
Encrypted	Not Encrypted
KMS Key ID	
KMS Key Aliases	

Detach the volume vol-ca020927 from the first instance.

```
hqiu@bos-mpdei>> aws ec2 detach-volume --volume-id vol-ca020927
{
    "AttachTime": "2015-09-30T16:34:24.000Z",
    "InstanceId": "i-0e6776ad",
    "VolumeId": "vol-ca020927",
    "State": "detaching",
    "Device": "/dev/sda1"
}
```

Check from the AWS console, the volume becomes available now. It isn't attached to any instances.

<input type="checkbox"/>	vol-7b020996	8 GiB	gp2	24 / 3000	snap-4e3c6d2b	September 30, 201...	us-east-1a	<span>● in-use</span>	None
<input type="checkbox"/>	vol-ca020927	8 GiB	gp2	24 / 3000	snap-4e3c6d2b	September 30, 201...	us-east-1a	<span>● available</span>	None

Volumes: vol-ca020927	
<a href="#">Description</a> <span><a href="#">Status Checks</a></span> <span><a href="#">Monitoring</a></span> <span><a href="#">Tags</a></span>	
Volume ID	vol-ca020927
Size	8 GiB
Created	September 30, 2015 at 12:34:24 PM UTC-4
State	available
Attachment information	
Alarm status	None
Snapshot	<a href="#">snap-4e3c6d2b</a>
Availability Zone	us-east-1a
Encrypted	Not Encrypted
KMS Key ID	

8. Create a snapshot of the volume.

```

hqiu@bos-mpdei>> aws ec2 create-snapshot --volume-id vol-ca020927 --description "This is my root volume snapshot for the ubuntu instance."
{
    "Description": "This is my root volume snapshot for the ubuntu instance.",
    "Encrypted": false,
    "VolumeId": "vol-ca020927",
    "State": "pending",
    "VolumeSize": 8,
    "Progress": "",
    "StartTime": "2015-09-30T16:57:28.000Z",
    "SnapshotId": "snap-8eec6efa",
    "OwnerId": "217134905396"
}

```

Check from “EBS->Snapshots”.

Owned By Me	Name	Snapshot ID	Size	Description	Status	Started
		snap-8eec6efa	8 GiB	This is my root volume snapshot for the ubuntu instance.	completed	September 30, 2015 at 12:57:2

**Snapshot: snap-8eec6efa**

Description	Permissions	Tags
<b>Snapshot ID</b> snap-8eec6efa <b>Status</b> completed <b>Volume</b> vol-ca020927 <b>Started</b> September 30, 2015 at 12:57:28 PM UTC-4 <b>Owner</b> 217134905396 <b>Product codes</b> -	<b>Progress</b> 100% <b>Capacity</b> 8 GiB <b>Encrypted</b> Not Encrypted <b>KMS Key ID</b> <b>KMS Key Aliases</b> <b>KMS Key ARN</b>	

## 9. Attach the volume to the other instance i-766776d5.

```

hqiu@bos-mpdei>> aws ec2 attach-volume --volume-id vol-ca020927 --instance-id i-766776d5 --device /dev/sdf
{
    "AttachTime": "2015-09-30T17:01:13.111Z",
    "InstanceId": "i-766776d5",
    "VolumeId": "vol-ca020927",
    "State": "attaching",
    "Device": "/dev/sdf"
}

```

Check from the AWS Console. We can see that volume vol-ca020927 is attached to instance i-766776d5 now.

	Name	Volume ID	Size	Volume Type	IOPS
<input type="checkbox"/>		vol-7b020996	8 GiB	gp2	24 / 3000
<input checked="" type="checkbox"/>		vol-ca020927	8 GiB	gp2	24 / 3000

Volumes: vol-ca020927

Description	Status Checks	Monitoring	Tags
<b>Volume ID</b>	vol-ca020927		
<b>Size</b>	8 GiB		
<b>Created</b>	September 30, 2015 at 12:34:24 PM UTC-4		
<b>State</b>	in-use		
<b>Attachment information</b>	i-766776d5:/dev/sdf (attached)		
<b>Volume type</b>	gp2		
<b>Product codes</b>	-		
<b>IOPS</b>	24 / 3000		

Volumes: vol-7b020996

Description	Status Checks	Monitoring	Tags
<b>Volume ID</b>	vol-7b020996		
<b>Size</b>	8 GiB		
<b>Created</b>	September 30, 2015 at 12:34:24 PM UTC-4		
<b>State</b>	in-use		
<b>Attachment information</b>	i-766776d5:/dev/sda1 (attached)		
<b>Volume type</b>	gp2		
<b>Product codes</b>	-		
<b>IOPS</b>	24 / 3000		

Now the instance i-766776d5 has two volumes attached now.

## 10. Map the volume to a directory on the second instance i766776d5.

```
hqiu@bos-mpdei>> ssh -i "ec2hqiupem" ubuntu@ec2-54-208-9-245.compute-1.amazonaws.com
Welcome to Ubuntu 14.04.2 LTS (GNU/Linux 3.13.0-48-generic x86_64)

 * Documentation:  https://help.ubuntu.com/

 System information as of Wed Sep 30 16:47:40 UTC 2015

 System load:  0.0          Processes:      96
 Usage of /:   9.8% of 7.74GB  Users logged in:    0
 Memory usage: 5%           IP address for eth0: 172.31.60.20
 Swap usage:   0%

 Graph this data and manage this system at:
 https://landscape.canonical.com/

 Get cloud support with Ubuntu Advantage Cloud Guest:
 http://www.ubuntu.com/business/services/cloud

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

We can check the volume using ‘lsblk’. The volume vol-ca020927 is attached to ‘/dev/xvdf1’. It already has file system installed.

```
ubuntu@ip-172-31-60-20:~$ lsblk
NAME   MAJ:MIN RM SIZE RO TYPE MOUNTPOINT
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
ubuntu@ip-172-31-60-20:~$ sudo file -s /dev/xvda1
/dev/xvda1: Linux rev 1.0 ext4 filesystem data, UUID=d4f2aaafc-946a-4514-930d-4c45e676f198, volume name "cloudimage-rootfs" (needs journal recovery) (extents) (large files) (huge files)
ubuntu@ip-172-31-60-20:~$ sudo file -s /dev/xvdf1
/dev/xvdf1: Linux rev 1.0 ext4 filesystem data, UUID=d4f2aaafc-946a-4514-930d-4c45e676f198, volume name "cloudimage-rootfs" (extents) (large files) (huge files)
```

We can also find the new attached volumes by describing the instance.

BlockDeviceMappings	
DeviceName	/dev/sda1
Ebs	
AttachTime	2015-09-30T16:34:24.000Z
DeleteOnTermination	True
Status	attached
VolumeId	vol-7b020996
BlockDeviceMappings	
DeviceName	/dev/sdf
Ebs	
AttachTime	2015-09-30T17:01:13.000Z
DeleteOnTermination	False
Status	attached
VolumeId	vol-ca020927

```

hqiu@bos-mpdei>> aws ec2 describe-instances --instance-ids i-766776d5 --query 'Reservations[0].Instances[0].BlockDeviceMappings[0].Ebs.VolumeId'
"vol-7b020996"
hqiu@bos-mpdei>> aws ec2 describe-instances --instance-ids i-766776d5 --query 'Reservations[0].Instances[0].BlockDeviceMappings[1].Ebs.VolumeId'
"vol-ca020927"
    "BlockDeviceMappings": [
        {
            "DeviceName": "/dev/sda1",
            "Ebs": {
                "Status": "attached",
                "DeleteOnTermination": true,
                "VolumeId": "vol-7b020996",
                "AttachTime": "2015-09-30T16:34:24.000Z"
            }
        },
        {
            "DeviceName": "/dev/sdf",
            "Ebs": {
                "Status": "attached",
                "DeleteOnTermination": false,
                "VolumeId": "vol-ca020927",
                "AttachTime": "2015-09-30T17:01:13.000Z"
            }
        }
    ],

```

	Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status	Public DNS	Public IP
<input checked="" type="checkbox"/>		i-766776d5	i2.micro	us-east-1a	<span>green</span> running	<span>green</span> 2/2 checks ...	<span>green</span> None	ec2-54-208-9-245.com...	54.208.9.245
<input type="checkbox"/>		i-0e6776ad	i2.micro	us-east-1a	<span>red</span> stopped	<span>red</span> None	<span>red</span> None		

Network interfaces	eth0	IAM role	-
Source/dest. check	True	Key pair name	ec2hqiu
EBS-optimized	False	Owner	217134905396
Root device type	ebs	Launch time	September 30, 2015 at 12:34:20 PM UTC-4 (less than one hour)
Root device	/dev/sda1	Termination protection	False
Block devices	/dev/sda1 /dev/sdf	Lifecycle	normal
		Monitoring	basic

Create the new directory and mount the new volume.

```

ubuntu@ip-172-31-60-20:~$ df -h
Filesystem      Size  Used Avail Use% Mounted on
/dev/xvda1     7.8G  780M  6.6G  11% /
none            4.0K   0    4.0K   0% /sys/fs/cgroup
udev            492M  12K  492M   1% /dev
tmpfs           100M  332K  99M   1% /run
none            5.0M   0    5.0M   0% /run/lock
none            497M   0   497M   0% /run/shm
none            100M   0   100M   0% /run/user
ubuntu@ip-172-31-60-20:~$ 
ubuntu@ip-172-31-60-20:~$ sudo mkdir /mnt/foreign/
ubuntu@ip-172-31-60-20:~$ sudo mount /dev/xvd1 /mnt/foreign/
ubuntu@ip-172-31-60-20:~$ 
ubuntu@ip-172-31-60-20:~$ df -h
Filesystem      Size  Used Avail Use% Mounted on
/dev/xvda1     7.8G  780M  6.6G  11% /
none            4.0K   0    4.0K   0% /sys/fs/cgroup
udev            492M  12K  492M   1% /dev
tmpfs           100M  332K  99M   1% /run
none            5.0M   0    5.0M   0% /run/lock
none            497M   0   497M   0% /run/shm
none            100M   0   100M   0% /run/user
/dev/xvd1       7.8G  780M  6.6G  11% /mnt/foreign

```

We can see that the new volume ‘/dev/xvdf1’ is mounted to ‘/mnt/foreign’.

11. Verify that from the second instance, we can see the file we’ve added in the original instance.

```
ubuntu@ip-172-31-60-20:~$ sudo find / -name hqiuTestFile.txt -print
/mnt/foreign/home/ubuntu/hqiuTestFile.txt
ubuntu@ip-172-31-60-20:~$ cat /mnt/foreign/home/ubuntu/hqiuTestFile.txt
This is my first EBS Ubuntu instance.
Public IP Address: 54.175.186.232
Public DNS Name: ec2-54-175-186-232.compute-1.amazonaws.com

-- By hqiu.
```

12. Change the file. Add the DNS name of the current host to it.

```
ubuntu@ip-172-31-60-20:~$ vi /mnt/foreign/home/ubuntu/hqiuTestFile.txt
ubuntu@ip-172-31-60-20:~$ cat /mnt/foreign/home/ubuntu/hqiuTestFile.txt
This is my first EBS Ubuntu instance.
Public IP Address: 54.175.186.232
Public DNS Name: ec2-54-175-186-232.compute-1.amazonaws.com

This is my second EBS Ubuntu instance.
Public IP Address: 54.208.9.245
Public DNS Name: ec2-54-208-9-245.compute-1.amazonaws.com

-- By hqiu.
```

13. Detach the volume from the active instance. Do it through the AWS Console GUI. ‘umount’ the disk first.

```
ubuntu@ip-172-31-60-20:~$ sudo umount -d /dev/xvdf1
ubuntu@ip-172-31-60-20:~$ df -h
Filesystem      Size  Used Avail Use% Mounted on
/dev/xvda1     7.8G  780M  6.6G  11% /
none            4.0K    0   4.0K   0% /sys/fs/cgroup
udev           492M   12K  492M   1% /dev
tmpfs          100M  332K   99M   1% /run
none            5.0M    0   5.0M   0% /run/lock
none            497M    0   497M   0% /run/shm
none           100M    0  100M   0% /run/user
```

```

hqiu@bos-mpdei>> aws ec2 stop-instances --instance-ids i-766776d5
{
    "StoppingInstances": [
        {
            "InstanceId": "i-766776d5",
            "CurrentState": {
                "Code": 64,
                "Name": "stopping"
            },
            "PreviousState": {
                "Code": 16,
                "Name": "running"
            }
        }
    ]
}

```

**Create Volume**

**Actions ▾**

Filter by tags

	Name	Volume Type	IOPS	Snapshots
<input type="checkbox"/>		gp2	24 / 3000	sna
<input checked="" type="checkbox"/>		gp2	24 / 3000	sna

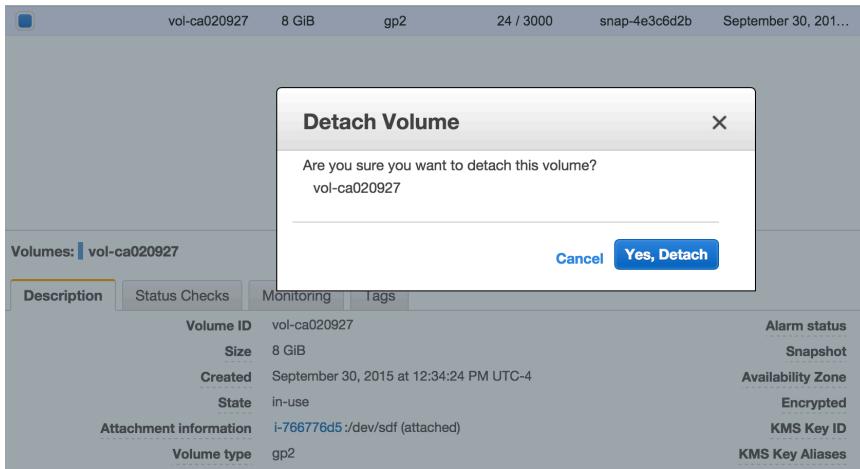
**Actions ▾**

- Delete Volume
- Attach Volume
- Detach Volume**
- Force Detach Volume
- Create Snapshot
- Change Auto-Enable IO Setting
- Add/Edit Tags

Volumes: vol-ca020927

Description Status Checks Monitoring Tags

Volume ID	vol-ca020927
Size	8 GiB
Created	September 30, 2015 at 12:34:24 PM UTC-4
State	in-use
Attachment information	i-766776d5:/dev/sdf (attached)
Volume type	gp2
Product codes	-
IOPS	24 / 3000



After detaching the volume, vol-ca020927 becomes available again.

	Name	Volume ID	Size	Volume Type	IOPS	Snapshot	Created	Availability Zone	State	Alarm S
<input type="checkbox"/>	vol-7b020996	8 GiB	gp2	24 / 3000	snap-4e3c6d2b	September 30, 201...	us-east-1a	<span style="color: green;">●</span> in-use	<span style="color: green;">●</span>	None
<input checked="" type="checkbox"/>	vol-ca020927	8 GiB	gp2	24 / 3000	snap-4e3c6d2b	September 30, 201...	us-east-1a	<span style="color: blue;">●</span> available	<span style="color: blue;">●</span>	None

	Name	Volume ID	Size	Volume Type	IOPS	Snapshot	Created	Availability Zone	State	Alarm S
<input type="checkbox"/>	vol-7b020996	8 GiB	gp2	24 / 3000	snap-4e3c6d2b	September 30, 201...	us-east-1a	<span style="color: green;">●</span> in-use	<span style="color: green;">●</span>	None
<input checked="" type="checkbox"/>	vol-ca020927	8 GiB	gp2	24 / 3000	snap-4e3c6d2b	September 30, 201...	us-east-1a	<span style="color: blue;">●</span> available	<span style="color: blue;">●</span>	None

i-766776d5 has only one volume attached now.

	Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status	Public DNS	Public IP
<input type="checkbox"/>	i-0e6776ad	t2.micro	us-east-1a	<span style="color: red;">●</span> stopped		None			
<input checked="" type="checkbox"/>	i-766776d5	t2.micro	us-east-1a	<span style="color: red;">●</span> stopped		None			

Network interfaces	eth0	IAM role	-
Source/dest. check	True	Key pair name	ec2hqi
EBS-optimized	False	Owner	217134905396
Root device type	ebs	Launch time	September 30, 2015 at 1:59:26 PM UTC-4 (less than one hour)
Root device	/dev/sda1	Termination protection	False
Block devices	/dev/sda1	Lifecycle	normal
		Monitoring	basic
		Alarm status	None
		Kernel ID	-

14. Attach the volume back to the original instance. Use the original device name '/dev/sda1'.

The screenshot shows the AWS Lambda console interface. At the top, there's a navigation bar with 'Create Function' and 'Actions' tabs. Below the navigation bar, there's a search bar labeled 'Filter by tags' and a table header with columns 'Name', 'Volume Type', and 'IOPS'. Two volumes are listed: one gp2 volume with 24 IOPS and another gp2 volume with 24 IOPS. A context menu is open over the second volume, showing options like 'Delete Volume', 'Attach Volume' (which is highlighted in orange), 'Detach Volume', 'Force Detach Volume', 'Create Snapshot', 'Change Auto-Enable IO Setting', and 'Add/Edit Tags'. Below this, the 'Volumes' section is shown with a table of volumes. The volume 'vol-ca020927' is selected. Its details are displayed in a modal window titled 'Attach Volume'. The 'Volume' field shows 'vol-ca020927 in us-east-1a'. The 'Instance' field shows 'i-0e6776ad in us-east-1a'. The 'Device' field shows '/dev/sda1'. A note in the modal states: 'Note: Newer Linux kernels may rename your devices to /dev/xvdf through /dev/xvd 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 of the modal. The status bar at the bottom indicates 'State: available' and 'Encrypted: Not Encrypted'.

Name	Volume Type	IOPS
gp2	24 / 3000	
gp2	24 / 3000	

**Volumes:** vol-ca020927

Description	Status Checks	Monitoring	Tags
Volume ID: vol-ca020927			
Size: 8 GiB			
Created: September 30, 2015 at 12:34:24 PM UTC-4			
State: available			

Name	Volume ID	Size	Volume Type	IOPS	Snapshot	Created	Availability Zone	State	Alarm Status
vol-7b020996	8 GiB	gp2	24 / 3000	snap-4e3c6d2b	September 30, 2015	us-east-1a	<span style="color: green;">●</span> in-use	None	<span style="color: yellow;">⚠️</span>
<b>vol-ca020927</b>	8 GiB	gp2	24 / 3000	snap-4e3c6d2b	September 30, 2015	us-east-1a	<span style="color: blue;">●</span> available	None	<span style="color: yellow;">⚠️</span>

**Attach Volume**

Volume: vol-ca020927 in us-east-1a

Instance: i-0e6776ad in us-east-1a

Device: /dev/sda1  
Linux Devices: /dev/sdf through /dev/sdp

Note: Newer Linux kernels may rename your devices to /dev/xvdf through /dev/xvd internally, even when the device name entered here (and shown in the details) is /dev/sdf through /dev/sdp.

Cancel Attach

Vol-ca020927 is attached back to i-0e6776ad again.

vol-ca020927 8 GiB gp2 24 / 3000 snap-4e3c6d2b September 30, 201... us-east-1a in-use

---

Volumes: vol-ca020927

Description Status Checks Monitoring Tags

Volume ID	vol-ca020927	Alarm status	None
Size	8 GiB	Snapshot	snap-4e3c6d2b
Created	September 30, 2015 at 12:34:24 PM UTC-4	Availability Zone	us-east-1a
State	in-use	Encrypted	Not Encrypted
Attachment information	i-0e6776ad :/dev/sda1 (attached)	KMS Key ID	
Volume type	gp2	KMS Key Aliases	

---

Name	Instance ID	Instance Type	Availability Zone	Instance State
vol-ca020927	i-0e6776ad	t2.micro	us-east-1a	stopped
	i-766776d5	t2.micro	us-east-1a	stopped

---

Private DNS ip-172-31-60-19.ec2.internal  
Private IPs 172.31.60.19

Secondary private IPs  
VPC ID vpc-dfb48aba

Subnet ID subnet-abe07780  
Network interfaces eth0  
Source/dest. check True

EBS-optimized False

Root device type ebs  
Root device /dev/sda1  
Block devices /dev/sda1

15. Start the original instance.

The screenshot shows the AWS EC2 Instances page. A context menu is open over the first instance (i-0e6776ad). The 'Actions' menu is expanded, and the 'Start' option is highlighted. The instance details below show it is currently running.

Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status	Public DNS	Public IP
i-0e6776ad	i-0e6776ad	t2.micro	us-east-1a	running	2/2 checks ...	None	ec2-52-23-160-100.co...	52.23.160.100
i-766776d5	i-766776d5	t2.micro	us-east-1a	stopped		None		

Below the table, detailed instance information is shown:

Private DNS	ip-172-31-60-19.ec2.internal	Availability zone	us-east-1a
Private IPs	172.31.60.19	Security groups	launch-hqiu . view rules
Secondary private IPs		Scheduled events	-
VPC ID	vpc-dfb48aba	AMI ID	ubuntu-trusty-14.04-amd64-(ami-d05e75b8)

16. Verify that we can see modifications made while the volume was attached to the other instance.

```
hqiu@bos-mpdei>> ssh -i "ec2hqiu.pem" ubuntu@ec2-52-23-160-100.compute-1.amazonaws.com
The authenticity of host 'ec2-52-23-160-100.compute-1.amazonaws.com (52.23.160.100)' can't be established.
RSA key fingerprint is a3:a9:c3:5a:07:1f:f3:89:94:c7:a6:7c:fc:df:4a:4e.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added 'ec2-52-23-160-100.compute-1.amazonaws.com,52.23.160.100' (RSA) to the list of known hosts.
Welcome to Ubuntu 14.04.2 LTS (GNU/Linux 3.13.0-48-generic x86_64)

 * Documentation:  https://help.ubuntu.com/

 System information as of Wed Sep 30 18:14:34 UTC 2015

 System load: 0.0          Memory usage: 5%    Processes:      80
 Usage of /:  9.8% of 7.74GB   Swap usage:  0%    Users logged in: 0

 Graph this data and manage this system at:
  https://landscape.canonical.com/

 Get cloud support with Ubuntu Advantage Cloud Guest:
  http://www.ubuntu.com/business/services/cloud

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

```

ubuntu@ip-172-31-60-19:~$ lsblk
NAME   MAJ:MIN RM SIZE RO TYPE MOUNTPOINT
xvda   202:0    0   8G  0 disk
└─xvda1 202:1    0   8G  0 part /
ubuntu@ip-172-31-60-19:~$ df -h
Filesystem      Size  Used Avail Use% Mounted on
/dev/xvda1     7.8G  780M  6.6G  11% /
none            4.0K   0  4.0K  0% /sys/fs/cgroup
udev            492M  12K  492M  1% /dev
tmpfs           100M  324K  99M  1% /run
none            5.0M   0  5.0M  0% /run/lock
none            497M   0  497M  0% /run/shm
none            100M   0  100M  0% /run/user
ubuntu@ip-172-31-60-19:~$ sudo find / -name hqiuTestFile.txt -print
/home/ubuntu/hqiuTestFile.txt
ubuntu@ip-172-31-60-19:~$ cat /home/ubuntu/hqiuTestFile.txt
This is my first EBS Ubuntu instance.
Public IP Address: 54.175.186.232
Public DNS Name: ec2-54-175-186-232.compute-1.amazonaws.com

This is my second EBS Ubuntu instance.
Public IP Address: 54.208.9.245
Public DNS Name: ec2-54-208-9-245.compute-1.amazonaws.com

-- By hqiu.

```

We can see the modified content here.

## 17. Terminate the instance.

```

hqiu@bos-mpdei>> aws ec2 terminate-instances --instance-ids i-0e6776ad
{
  "TerminatingInstances": [
    {
      "InstanceId": "i-0e6776ad",
      "CurrentState": {
        "Code": 48,
        "Name": "terminated"
      },
      "PreviousState": {
        "Code": 80,
        "Name": "stopped"
      }
    }
  ]
}
hqiu@bos-mpdei>> aws ec2 terminate-instances --instance-ids i-766776d5
{
  "TerminatingInstances": [
    {
      "InstanceId": "i-766776d5",
      "CurrentState": {
        "Code": 48,
        "Name": "terminated"
      },
      "PreviousState": {
        "Code": 80,
        "Name": "stopped"
      }
    }
  ]
}

```

## Problem 2

1. Create the instance from the select AMI ami-6b726502.

```
hqiu@bos-mpdei>> aws ec2 describe-images --image-ids ami-6b726502
{
  "Images": [
    {
      "VirtualizationType": "paravirtual",
      "Name": "amzn-ami-pv-2014.03.0.x86_64-s3",
      "Hypervisor": "xen",
      "ImageOwnerAlias": "amazon",
      "ImageId": "ami-6b726502",
      "RootDeviceType": "instance-store",
      "State": "available",
      "BlockDeviceMappings": [],
      "Architecture": "x86_64",
      "ImageLocation": "amzn-ami-us-east-1/amzn-ami-pv-2014.03.0.x86_64.manifest.xml",
      "KernelId": "aki-919dcaf8",
      "OwnerId": "137112412989",
      "CreationDate": "2014-03-25T06:35:32.000Z",
      "Public": true,
      "ImageType": "machine",
      "Description": "Amazon Linux AMI x86_64 PV S3"
    }
  ]
}
```

```
hqiu@bos-mpdei:> aws ec2 run-instances --image-id ami-6b726502 --count 1 --instance-type m1.small --key-name ec2hqiui --security-group-ids launch-hqiui
{
    "OwnerId": "217134905396",
    "ReservationId": "r-00ac38d6",
    "Groups": [],
    "Instances": [
        {
            "Monitoring": {
                "State": "disabled"
            },
            "PublicDnsName": "",
            "KernelId": "aki-919dcf8",
            "State": {
                "Code": 0,
                "Name": "pending"
            },
            "EbsOptimized": false,
            "LaunchTime": "2015-10-02T14:22:18.000Z",
            "PrivateIpAddress": "172.31.58.95",
            "ProductCodes": [],
            "VpcId": "vpc-dfb48aba",
            "StateTransitionReason": "",
            "InstanceId": "i-cc8a6b6e",
            "ImageId": "ami-6b726502",
            "PrivateDnsName": "ip-172-31-58-95.ec2.internal",
            "KeyName": "ec2hqiui",
            "SecurityGroups": [
                {
                    "GroupName": "launch-hqiui",
                    "GroupId": "sg-adfff3ca"
                }
            ],
            "ClientToken": "",
            "SubnetId": "subnet-abe07780",
            "InstanceType": "m1.small",
            "NetworkInterfaces": [
                {
                    "Status": "in-use",
                    "MacAddress": "12:73:a1:fb:f0:33",
                    "SourceDestCheck": true,
                    "VpcId": "vpc-dfb48aba",
                    "Description": "",
                    "NetworkInterfaceId": "eni-089d3929",
                    "Primary": true
                }
            ]
        }
    ]
}
```

## 2. Describe the instance.

```
hqiu@bos-mpdei>> aws ec2 describe-instances --instance-ids i-cc8a6b6e --output table
```

DescribeInstances	
Reservations	
OwnerId	217134905396
ReservationId	r-00ac38d6
Instances	
AmiLaunchIndex	0
Architecture	x86_64
ClientToken	
EbsOptimized	False
Hypervisor	xen
ImageId	ami-6b726502
InstanceId	i-cc8a6b6e
InstanceType	m1.small
KernelId	aki-919dcf8
KeyName	ec2hqiu
LaunchTime	2015-10-02T14:22:18.000Z
PrivateDnsName	ip-172-31-58-95.ec2.internal
PrivateIpAddress	172.31.58.95
PublicDnsName	ec2-52-23-240-108.compute-1.amazonaws.com
PublicIpAddress	52.23.240.108
RootDeviceType	instance-store
SourceDestCheck	True
StateTransitionReason	
SubnetId	subnet-abe07780
VirtualizationType	paravirtual
VpcId	vpc-dfb48aba

Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status	Public DNS	Public IP
	i-cc8a6b6e	m1.small	us-east-1a	running	2/2 checks ...	None	ec2-52-23-240-108.co...	52.23.240.108
Instance: i-cc8a6b6e Public DNS: ec2-52-23-240-108.compute-1.amazonaws.com								
<a href="#">Description</a> <a href="#">Status Checks</a> <a href="#">Monitoring</a> <a href="#">Tags</a>								
Instance ID	i-cc8a6b6e	Public DNS	ec2-52-23-240-108.compute-1.amazonaws.com					
Instance state	running	Public IP	52.23.240.108					
Instance type	m1.small	Elastic IP	-					
Private DNS	ip-172-31-58-95.ec2.internal	Availability zone	us-east-1a					
Private IPs	172.31.58.95	Security groups	launch-hqiu, view rules					
Secondary private IPs		Scheduled events	No scheduled events					
VPC ID	vpc-dfb48aba	AMI ID	amzn-ami-pv-2014.03.0.x86_64.manifest.xml (ami-6b726502)					

```
hqiu@bos-mpdei>> aws ec2 describe-instances --instance-ids i-cc8a6b6e --query 'Reservations[0].Instances[0].PublicIpAddress'
"52.23.240.108"
hqiu@bos-mpdei>> aws ec2 describe-instances --instance-ids i-cc8a6b6e --query 'Reservations[0].Instances[0].PublicDnsName'
"ec2-52-23-240-108.compute-1.amazonaws.com"
```

## 3. Login to the instance as “ec2-user”. Create new “ec2test” group and “ec2test” user. Add the new user to the group.

```

hqiu@bos-mpdei>> ssh -i "ec2hqiui.pem" ec2-user@ec2-52-23-240-108.compute-1.amazonaws.com
Last login: Fri Oct  2 14:25:56 2015 from 72.246.0.14
      _\ _|_ )
      _\ (   /  Amazon Linux AMI
      ___\_\_|_|
https://aws.amazon.com/amazon-linux-ami/2014.03-release-notes/
38 package(s) needed for security, out of 203 available
Run "sudo yum update" to apply all updates.
Amazon Linux version 2015.09 is available.
[ec2-user@ip-172-31-58-95 ~]$
[ec2-user@ip-172-31-58-95 ~]$ sudo groupadd ec2test
[ec2-user@ip-172-31-58-95 ~]$ sudo useradd -c "Test user" -d /home/ec2test -m -s /bin/bash -g ec2test ec2test
[ec2-user@ip-172-31-58-95 ~]$ cat /etc/passwd | grep ec2test
ec2test:x:501:Test user:/home/ec2test:/bin/bash

```

4. Make new user “ec2test” sudo user. “visudo” will help check the syntax of “/etc/sudoers” before we exit.

```
[ec2-user@ip-172-31-58-95 ~]$ sudo visudo
```

Add a line after ‘allows people to run all commands without a password’.

```

## Allows people in group wheel to run all commands
# %wheel      ALL=(ALL)      ALL

## Same thing without a password
# %wheel      ALL=(ALL)      NOPASSWD: ALL
ec2test      ALL=(ALL)      NOPASSWD: ALL

```

5. Create the directory “.ssh” for “ec2test” user. Set the right owner, group and permission.

```

[ec2-user@ip-172-31-58-95 ~]$ sudo mkdir /home/ec2test/.ssh
[ec2-user@ip-172-31-58-95 ~]$ sudo ls -la /home/ec2test/.ssh
total 8
drwxr-xr-x 2 root      root      4096 Oct  2 14:28 .
drwx----- 3 ec2test    ec2test   4096 Oct  2 14:28 ..
[ec2-user@ip-172-31-58-95 ~]$ sudo chgrp ec2test /home/ec2test/.ssh
[ec2-user@ip-172-31-58-95 ~]$ sudo chown ec2test /home/ec2test/.ssh
[ec2-user@ip-172-31-58-95 ~]$ sudo ls -la /home/ec2test/.ssh
total 8
drwxr-xr-x 2 ec2test    ec2test   4096 Oct  2 14:28 .
drwx----- 3 ec2test    ec2test   4096 Oct  2 14:28 ..

[ec2-user@ip-172-31-58-95 ~]$ sudo chmod 700 /home/ec2test/.ssh
[ec2-user@ip-172-31-58-95 ~]$ sudo ls -la /home/ec2test/.ssh
total 8
drwx----- 2 ec2test    ec2test   4096 Oct  2 14:28 .
drwx----- 3 ec2test    ec2test   4096 Oct  2 14:28 ..

```

6. Change to the “root” user. Go to “.ssh” directory of “ec2test” user and generate key pair. Push public key to file ‘authorized\_keys’.

```
[ec2-user@ip-172-31-58-95 ~]$ sudo -i
[root@ip-172-31-58-95 ~]# cd /home/ec2test/.ssh/
[root@ip-172-31-58-95 .ssh]# ls -lart
total 8
drwx----- 3 ec2test ec2test 4096 Oct  2 14:28 ..
drwx----- 2 ec2test ec2test 4096 Oct  2 14:28 .
[root@ip-172-31-58-95 .ssh]# ssh-keygen -f ec2testKey -C 'Private key user ec2test' -N "" -t rsa
Generating public/private rsa key pair.
Your identification has been saved in ec2testKey.
Your public key has been saved in ec2testKey.pub.
The key fingerprint is:
63:4d:02:21:ca:88:46:ab:7c:e4:4f:2b:67:a0:38:65 Private key user ec2test
The key's randomart image is:
+---[ RSA 2048]---+
| . . o. |
|oo... . . |
|ooo. . . |
|+ o + |
|..E+ . S . |
|.oo + . . |
|o. . = |
| . + |
| |
+-----+
[root@ip-172-31-58-95 .ssh]# cat ec2testKey.pub >> authorized_keys
[root@ip-172-31-58-95 .ssh]# chmod 600 authorized_keys
[root@ip-172-31-58-95 .ssh]# chgrp ec2test authorized_keys
[root@ip-172-31-58-95 .ssh]# chown ec2test authorized_keys
```

## 7. Copy keys back to my local desktop. Set the right permission.

```
[root@ip-172-31-58-95 .ssh]# mv ec2testKey* /mnt
[root@ip-172-31-58-95 .ssh]# ls -lart /mnt/
total 16
dr-xr-xr-x 25 root root 4096 Oct  2 14:24 ..
-rw-r--r--  1 root root  406 Oct  2 14:38 ec2testKey.pub
-rw-------  1 root root 1679 Oct  2 14:38 ec2testKey
drwxr-xr-x  2 root root 4096 Oct  2 14:40 .

[root@ip-172-31-58-95 mnt]# cd /mnt
[root@ip-172-31-58-95 mnt]# sudo chmod a+r ec2testKey

hqiu@bos-mpdei>> scp -i ec2hqiup.pem ec2-user@ec2-52-23-240-108.compute-1.amazonaws.com:/mnt/ec2testKey* .
ec2testKey                                         100% 1679      1.6KB/s  00:00
ec2testKey.pub                                     100%  406      0.4KB/s  00:00

hqiu@bos-mpdei>> ls -lar ec2testKey*
-rw-r--r--  1 hqiu  600   406 Oct  2 10:43 ec2testKey.pub
-rw-r--r--  1 hqiu  600  1679 Oct  2 10:43 ec2testKey
hqiu@bos-mpdei>> sudo chmod 400 ec2testKey
Password:
hqiu@bos-mpdei>> ls -lar ec2testKey*
-rw-r--r--  1 hqiu  600   406 Oct  2 10:43 ec2testKey.pub
-r-----  1 hqiu  600  1679 Oct  2 10:43 ec2testKey
```

## 8. Connect to my instance as user “ec2test”. Create a text file on the instance and check permissions of the text file.

```

hqiu@bos-mpdei>> ssh -i ec2testKey ec2test@ec2-52-23-240-108.compute-1.amazonaws.com
 _|_ _|_
_| ( / Amazon Linux AMI
__|\_\_|_|
https://aws.amazon.com/amazon-linux-ami/2014.03-release-notes/
38 package(s) needed for security, out of 203 available
Run "sudo yum update" to apply all updates.
Amazon Linux version 2015.09 is available.
[ec2test@ip-172-31-58-95 ~]$
[ec2test@ip-172-31-58-95 ~]$ pwd
/home/ec2test
[ec2test@ip-172-31-58-95 ~]$
[ec2test@ip-172-31-58-95 ~]$ touch hqiuTestFile.txt
[ec2test@ip-172-31-58-95 ~]$ ls -lart hqiuTestFile.txt
-rw-rw-r-- 1 ec2test ec2test 0 Oct  2 14:48 hqiuTestFile.txt

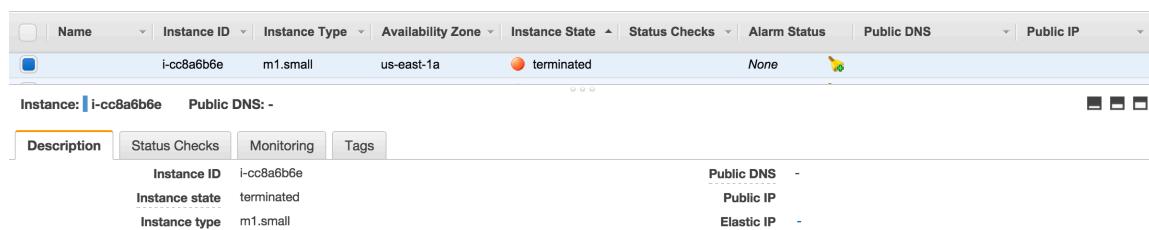
```

The file has “read” and “write’ permission for user “ec2test” and group “ec2test”.

## 9. Terminate the instance.

```

hqiu@bos-mpdei>> aws ec2 terminate-instances --instance-ids i-cc8a6b6e
{
    "TerminatingInstances": [
        {
            "InstanceId": "i-cc8a6b6e",
            "CurrentState": {
                "Code": 32,
                "Name": "shutting-down"
            },
            "PreviousState": {
                "Code": 16,
                "Name": "running"
            }
        }
    ]
}
-
```



## Problem 3

### 1. Delete the volumes and snapshot.



Create Snapshot Actions

Owned By Me Filter by tags and attributes or search by keyword

Name	Snapshot ID	Size	Description	Status	Started
snap-8eec6efa	8 GiB	This is my root volume snapshot for the ubuntu instance.	completed	September 30, 2015 at 12:57:2	

**Snapshot: snap-8eec6efa**

Description Permissions Tags

Snapshot ID	snap-8eec6efa	Progress	100%
Status	completed	Capacity	8 GiB
Volume	vol-ca020927	Encrypted	Not Encrypted
Started	September 30, 2015 at 12:57:28 PM UTC-4	KMS Key ID	
Owner	217134905396	KMS Key Aliases	
Product codes	-	KMS Key ARN	
Description	This is my root volume snapshot for the ubuntu instance.		

Delete using AWS CLI tools.

```
hqiu@bos-mpdei>> aws ec2 delete-snapshot --snapshot-id snap-8eec6efa
```

Create Snapshot Actions

Owned By Me Filter by tags and attributes or search by keyword

You do not have any snapshots in this region.  
Click the Create Snapshot button to create your first snapshot.

**Create Snapshot**

```
hqiu@bos-mpdei>> aws ec2 delete-volume --volume-id vol-ca020927
```

Create Volume Actions

Filter by tags and attributes or search by keyword

You do not have any EBS volumes in this region.  
Click the Create Volume button to create your first volume.

**Create Volume**