

Cloud Computing 2&3 Hands on

Name : Adeagbo M Daniel

Cloud Computing 2&3 Hands On

Prerequisite:

SETUP YOUR BASE INFRASTRUCTURE AS FOLLOWS:

Create a VPC named “awesome_vpc” with the primary CIDR “10.0.0.0/16”

Create an Internet Gateway “awesome_igw” and attach it to the VPC.

Create a Public subnet “awesome_pub_sub1” – “10.0.1.0/24” in US-EAST-1A

Create a Public subnet “awesome_pub_sub2” – “10.0.2.0/24” in US-EAST-1B

Create a Private subnet “awesome_priv_sub1” – “10.0.3.0/24” in US-EAST-1A

Create a Private subnet “awesome_priv_sub2” – “10.0.4.0/24” in US-EAST-1B

The screenshot shows the AWS VPC console interface. At the top, there's a navigation bar with links like Home, Vis, Clc, AW, http:, Go:, CA:, Peo:, Bill, Pla:, Apr, Sig, Cor, Do, Git, and various status indicators. Below the navigation is a search bar and a breadcrumb trail: AWS > Your VPCs. The main area displays a table titled 'Your VPCs (1/2) Info' with one row for 'awesome_vpc'. The table columns include Name, VPC ID, State, Block Public..., IPv4 CIDR, IPv6 CIDR, and DHCP option set. The 'awesome_vpc' row has 'Available' in the state column and '10.0.0.0/16' in the IPv4 CIDR column. Below the table, there are tabs for Details, Resource map, CIDs, Flow logs, Tags, and Integrations. The 'Resource map' tab is selected, showing a diagram with several components: a VPC box labeled 'awesome_vpc', four Subnets (us-east-1a: awesome_pub_sub1, awesome_priv_sub1, awesome_priv_sub2; us-east-1b: awesome_pub_sub2), four Route tables (homework_pr1, rtb-0afab5bd544c21013, homework_Pub, homework_Pri), and one Network connection box labeled 'awesome_igw'. Arrows indicate connections between the subnets and route tables, and between the route tables and the internet gateway.

Homework 1:

Launch an Amazon linux instance in awesome_pub_sub1 subnet as follows:

- AMI: Amazon linux 2
- Specs: t2.micro
- Storage: 8GB
- Attach a Security Group call web-sg allowing SSH traffic to your IP address and HTTP traffic to the outside world.
- Tag the instance our-first-ec2
- KeyPair: awesome-key-east1

Homework 2:

Log into the EC2 (our-first-ec2) created in homework1 using SSH.

Run the command hostnamectl on your ec2 server.SUBMISSION:

Attach a screenshot of the output of the hostnamectl command and share it in your cluster.

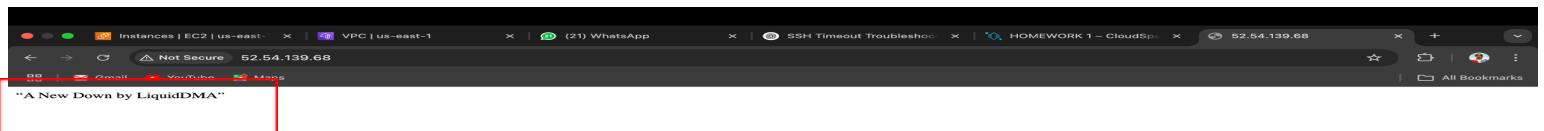
```
Last login: Sun Jun 1 22:39:28 on ttys000
liquidddma@liquids-MacBook-Pro ~ % ls
Desktop      Downloads      Movies       Pictures      yes
Documents    Library       Music        Public       yes.pub
liquidddma@liquids-MacBook-Pro ~ % cd downloads & ls
liquidddma@liquids-MacBook-Pro ~ % ls downloads
ls: downloads: No such file or directory
liquidddma@liquids-MacBook-Pro ~ % ls
Downloads: 3/18/62 17/62/24//3_AWS Course Completion Certificate.pdf
AWS-Interview-Guide.pdf
App
BEATS
Cloud
DAndi.pem
Cloud
DAndi.pem
IMM6825_1_ZG60IHW.pdf
Interview CheatSheet.pdf
MY Photo.pdf
MY Photo.page-0001.jpg
Mama Folder
Manjilinliquid 4
My Doc for PR
My File
My kpair.pem
Simplenote4.66-macOS.dmg
To delete
VPC Hands on.pdf
awesome-key-east1.pem
cert
east-user_credentials.csv
mcp-forms-ben-reg.pdf
s3-user-0023-credentials.csv
s3-user-nu-2024_credentials.csv
liquidddma@liquids-MacBook-Pro ~ % chmod 400 "awesome-key-east1.pem"
liquidddma@liquids-MacBook-Pro ~ % ssh -i "awesome-key-east1.pem" ec2-user@ec2-54-158-24-18.compute-1.amazonaws.com
The authenticity of host 'ec2-54-158-24-18.compute-1.amazonaws.com (54.158.24.18)' can't be established.
ED25519 key fingerprint is SHA256:bygHvh7Uz29gyEzclu8v3eTzqNQLB13Sw/o55ZUE.
This host key is known by the following other names/addresses:
  ./ssh/known_hosts:7: 54.158.24.18
Are you sure you want to continue connecting (yes/no/fingerprint)? yes
Warning: Permanently added 'ec2-54-158-24-18.compute-1.amazonaws.com' (ED25519) to the list of known hosts.
# 
Amazon Linux 2023
https://aws.amazon.com/linux/amazon-linux-2023
[ec2-user@ip-10-0-1-18: ~]$ hostnamectl
Static hostname: ip-10-0-1-18.ec2.internal
Icon name: vm
Chassis: vm [!]
Mac Address: 02:00:0f:99:10:f1
Boot ID: 39a35de3578546ccba6e79a038076e19
Virtualization: xen
Operating System: Amazon Linux 2023.7.2028095.2
CPE OS Name: cpe:/o:amazon:amazon_linux:2023
Kernel: Linux 4.14.134-152.225.amzn2023.x86_64
Architecture: x86_64
Hardware Abstraction Layer Model: HVM domU
Firmware Version: 4.11.amazon
[ec2-user@ip-10-0-1-18: ~]$
```

HOMEWORK 3:

Launch an EC2 Linux instance and connect to it via SSH.

Manually deploy Apache HTTP server on a Linux EC2 instance using the script below.

Display the message “A New Dawn by LiquidDMA” on a webpage.



HOMEWORK 4:

- Work with a cluster member

Create an AMI based on our previous EC2 Apache HTTP Server.

The screenshot shows the AWS EC2 AMIs page. A red box highlights the search bar and the table header. Another red box highlights the 'AMI ID' and 'AMI name' fields in the table row for the 'homework4-apache-ami' AMI. The table includes columns for Name, AMI ID, Source, Owner, Visibility, Status, and Creation date. The AMI ID is 'ami-0b223d26485c3c574' and the AMI name is 'homework4-apache-ami'. The status is 'Available' and the creation date is '2025/06/04 02:24:00'. The page also shows other sections like Instances, Images, and Network & Security.

Share the AMI with one member of your cluster.

The screenshot shows the AWS EC2 AMIs page. A red box highlights the search bar and the table header. Another red box highlights the 'AMI ID' and 'AMI name' fields in the table row for the 'homework4-apache-ami' AMI. The table includes columns for Name, AMI ID, Source, Owner, Visibility, and so on. The AMI ID is 'ami-0b223d26485c3c574' and the AMI name is 'homework4-apache-ami'. The status is 'Available' and the creation date is '2025/06/04 04:54:15.000Z'. The page also shows other sections like Instances, Images, and Network & Security. A user profile icon 'AdeagboTechie' is visible in the top right corner.

Launch an EC2 instance using the AMI created in the previous step.

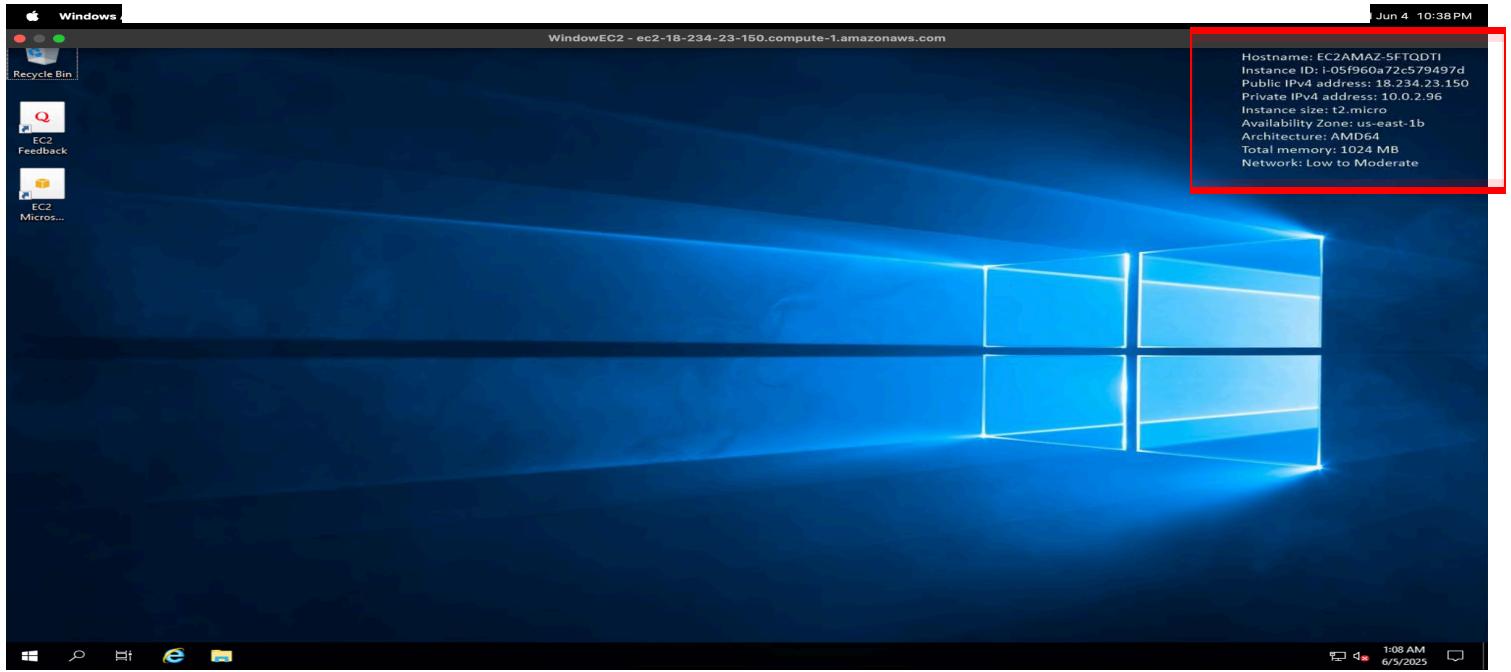
The screenshot shows the AWS EC2 Instances page. On the left, there's a sidebar with navigation links like EC2, Dashboard, EC2 Global View, Events, Instances, Images, Elastic Block Store, Network & Security, and Load Balancing. The main area displays a table of instances. One instance, 'Awesme2' (ID: i-075c29034da88f114), is selected and shown in detail on the right. The 'Actions' dropdown menu at the top right of the table has 'Launch instances' highlighted with a red box. Other options in the Actions menu include Connect, Instance state, and Launch instances.

HOMEWORK 5:

- Launch a windows server 2019 EC2 instance and connect to it using a RDP client of your choice.

This screenshot shows the AWS EC2 Instances page again. The sidebar and instance table are similar to the previous one. The 'AMIs' section in the sidebar is expanded, showing the AMI ID 'ami-0a56bf349fb3bb8' and the AMI name 'Windows_Server-2019-English-Full-Base-2025.05.15'. A red box highlights this AMI location. The 'Actions' dropdown menu is open, showing options like Connect, Instance state, and Launch instances. The 'Launch instances' option is also highlighted with a red box.

Connect to it using a RDP client of your choice.



HOMEWORK 6: USER DATA

Automate your HTTP server creation using EC2 user-data.

Make sure to attach an SSM role at launch that will allow you to login into the instance within your browser.

The screenshot shows the AWS EC2 Instances page. On the left, there's a sidebar with navigation links for EC2, Instances, Images, Elastic Block Store, Network & Security, and Load Balancing. The main content area displays a table of instances. One instance, "EC2SSM" (ID: i-0bedf646497a59ad8), is selected and highlighted with a blue border. Below the table, there's a detailed view for this specific instance. The "IAM Role" field is highlighted with a red box. At the bottom, there's a section titled "Instance details" with a link to "Info".

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS	Public IPv4 IP	Elastic IP
WindowEC2	i-05f960a72c579497d	Stopped	t2.micro	-	View alarms +	us-east-1b	-	-	-
Windows_EC2	i-01ea1f2d2acc6167	Terminated	t3.micro	-	View alarms +	us-east-1b	-	-	-
EC2SSM	i-0bedf646497a59ad8	Running	t2.micro	2/2 checks passed	View alarms +	us-east-1b	ec2-3-81-6-212.compute-1.amazonaws.com	3.81.6.212	-
Windows_EC2	i-0cdb1d4ac5ff5157d	Terminated	t3.micro	-	View alarms +	us-east-1b	-	-	-

i-0bedf646497a59ad8 (EC2SSM)

[Details](#) [Status and alarms](#) [Monitoring](#) [Security](#) [Networking](#) [Storage](#) [Tags](#)

Instance summary [Info](#)

Instance ID: [i-0bedf646497a59ad8](#)

IPv6 address: -

Hostname type: IP name: ip-10-0-2-68.ec2.internal

Answer private resource DNS name: -

Auto-assigned IP address: [3.81.6.212 \[Public IP\]](#)

IAM Role: [EC2SSMRole](#)

IMDv2 Required

Operator: -

Instance details [Info](#)

Public IPv4 address: [3.81.6.212 \[open address\]](#)

Instance state: [Running](#)

Private IP DNS name (IPv4 only): [ip-10-0-2-68.ec2.internal](#)

Instance type: t2.micro

VPC ID: [vpc-0ddcd1a128c73b3708 \(awesome_vpc\)](#)

Subnet ID: [subnet-04fd140cda1622b08 \(awesome_pub_sub2\)](#)

Instance ARN: [arn:aws:ec2:us-east-1:867468445868:instance/i-0bedf646497a59ad8](#)

Private IPv4 addresses: [10.0.2.68](#)

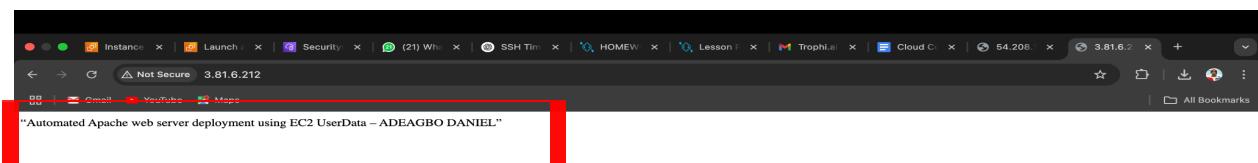
Public DNS: [ec2-3-81-6-212.compute-1.amazonaws.com \[open address\]](#)

Elastic IP addresses: -

AWS Compute Optimizer finding: [Opt-in to AWS Compute Optimizer for recommendations.](#) | Learn more

Auto Scaling Group name: -

Managed: false



HOMEWORK 7: AWS CLI

Launch a linux EC2 instance using AWS CLI and Tag it with “my-ec2-created-through-CLI”. Be carefull with Name tag

Name	Instance ID	Instance State	Instance Type	Status Check	Alarm Status	Availability Zone	Public IPv4 DNS	Public IPv4 Address	Elastic IP
my-ec2-create...	i-0132e28ef93a51dbd	Terminated	t2.micro	-	View alarms	us-east-1a	-	-	-
my-ec2-create...	i-0e8787ad62365980d	Running	t2.micro	2/2 checks passed	View alarms	us-east-1a	ec2-52-87-250-24.compute-1.amazonaws.com	52.87.250.24	-

i-0e8787ad62365980d (my-ec2-created-through-CLI)

Details **Status and alarms** **Monitoring** **Security** **Networking** **Storage** **Tags**

Instance summary

Public IPv4 address: 52.87.250.24 | [open address](#)

Private IPv4 addresses: 192.148.64.194

Public DNS: ec2-52-87-250-24.compute-1.amazonaws.com | [open address](#)

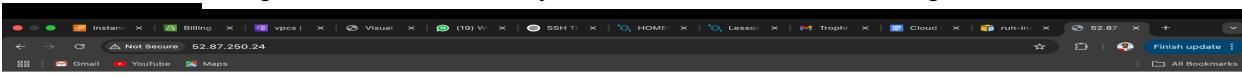
Elastic IP addresses: -

AWS Compute Optimizer finding: Opt-in to AWS Compute Optimizer for recommendations. | Learn more

Auto Scaling Group name: -

Managed: false

Using AWS CLI, Automate your HTTP server creation using EC2 user-data.



Post a screenshot of the CLI commands for launching and terminating the EC2 instance. Attach your screenshot(s) to a Word or pdf document.

```

My Doc For PR
My Files
SSM.pem
Tc.pdf
VPC Hand on.pdf
WindowEc2.rdp
awskey.pem
core.pr
east-user_credentials.csv
mcpr-formatted-credentials.csv
s3_user_nov_2024_credentials.csv
s3_user_nov_2024_credentials.csv
windowkey.pem
liquiddma@Liquids-MBP:~$ aws ec2 run-instances \
--image-id ami-02457590d33d576c3 \
--instance-type t2.micro \
--subnet-id subnet-01a1743b6d1747c38 \
--security-group-ids sg-0a028c1906681f2b3e \
--associate-public-ip-address \
--key-name consolekey \
--user-data file://user-data.sh \
--tag-specifications ResourceType=instance,Tags=[{"Key=Name,Value=my-ec2-created-through-CLI"}]
{
  "ReservationId": "r-07b58bd93bb306e8",
  "OwnerId": "867468445868",
  "OrderReference": null,
  "Instances": [
    {
      "Architecture": "x86_64",
      "BlockDeviceMappings": [],
      "ClientToken": "558af182-ec6e-49a3-as6b-f157f330bce4",
      "EbsOptimized": false,
      "EnhancedNetworking": true,
      "Hypervisor": "xen",
      "NetworkInterfaces": [
        {
          "Attachment": {
            "AttachTime": "2025-06-06T12:57:20+00:00",
            "DeleteOnTermination": true,
            "DeviceIndex": 0,
            "Status": "attaching",
            "NetworkCardIndex": 0
          },
          "Description": ""
        }
      ],
      "Description": ""
    }
  ]
}
liquiddma@Liquids-MBP:~$ ssh -i ~/Downloads/Consolekey.pem ec2-user@ec2-34-207-244-156.compute-1.amazonaws.com
ssh -i ~/Downloads/Consolekey.pem ec2-user@ec2-32-87-250-24.compute-1.amazonaws.com

[[Bash: connect to host ec2-34-207-244-156.compute-1.amazonaws.com port 22: Operation timed out
liquiddma@Liquids-MBP:~$ ssh -i ~/Downloads/Consolekey.pem ec2-user@ec2-32-87-250-24.compute-1.amazonaws.com
The authenticity of host 'ec2-32-87-250-24.compute-1.amazonaws.com (52.67.250.24)' can't be established.
ED25519 key fingerprint is SHA256:81GqN0BoNEYD9FTBFjPWrAU/HN13ENquDGuxNb+0Ek.
This key is not known by any other names.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'ec2-32-87-250-24.compute-1.amazonaws.com' (ED25519) to the list of known hosts.

# Amazon Linux 2023
# https://aws.amazon.com/linux/amazon-linux-2023

Last login: Fri Jun 6 10:25:11 on ttys000
liquiddma@Liquids-MBP ~% aws configure
AWS Access Key ID [*****xBa6]: 
AWS Secret Access Key [*****xBa6]: 
Default region name [us-east-1]: 
Default output format [json]: 
liquiddma@Liquids-MBP ~% aws ec2 describe-instances \
--query "Reservations[0].Instances[0].State.Name, Tags[?Key=='Name'][0].Value" \
--output table
|             DescribeInstances             |
|-----+-----+-----+-----+-----+-----|
| i-05f960a72cb79497d | stopped | windowEc2 |
| i-0bedf6466497a99db | stopped | EC2SM      |
| i-01322e28ef92a51bd | terminated | my-ec2-created-through-CLI |
| i-0d46a09182ac9715ea | stopped | my-ec2-created-through-CLI |
| i-001da8b47be88b2a9 | terminated | my-ec2-created-through-CLI |
liquiddma@Liquids-MBP ~% aws ec2 terminate-instances --instance-ids i-0e8787ad62365980d
{
  "TerminatingInstances": [
    {
      "InstanceId": "i-0e8787ad62365980d",
      "CurrentState": {
        "Code": 32,
        "Name": "shutting-down"
      },
      "PreviousState": {
        "Code": 16,
        "Name": "running"
      }
    }
  ]
}
liquiddma@Liquids-MBP ~% aws ec2 describe-instances --instance-ids i-0e8787ad62365980d --query "Reservations[0].Instances[0].State.Name"
[ "terminated" ]
liquiddma@Liquids-MBP ~% 

```

HOMWORK 8: EBS & SNAPSHOT

1- Launch a linux EC2 instance using AWS CLI and Tag it with “my-ec2-created-through-CLI”. Be carefull with Name tag

2- Take a snapshot of the Root Volume

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

```
/aws/ec2/instance-state-change AND @timestamp > 2023-06-01T00:00:00Z AND @timestamp < 2023-06-02T00:00:00Z
```

The results table displays the following data:

Instance ID	Name	Instance State	Instance Type	Alarm Status	Availability Zone	Public IPv4 DNS	Public IPv4 IP
i-05f960a72c579497d	WindowEC2	Stopped	t2.micro	-	us-east-1b	-	-
i-08edf646497a59ad8	EC2SSM	Stopped	t2.micro	-	us-east-1a	-	-
i-0e95274ae26edf143	Console	Stopped	t2.micro	-	us-east-1a	-	-
i-0ff6927153d9dbbf	my-ec2-create...	Running	t2.micro	2/2 checks passed	us-east-1a	ec2-3-84-243-50.comp...	3.84.243.50
i-d46c01826c9715a4	awsome_ec2	Stopped	t2.micro	-	us-east-1a	-	-

Create a new Volume (with Name tag “**your_first_name**”, size 50 GB) in the same Availability Zone (AZ) as the EC2 instance. Take screenshot

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

```
/aws/ec2/volume-size AND @timestamp > 2023-06-01T00:00:00Z AND @timestamp < 2023-06-02T00:00:00Z
```

The results table displays the following data:

Volume ID	Type	Size (GB)	IOPS	Throughput	Snapshot ID	Created	Availability Zone	Volume state	Alarm state
vol-04c512e359bbf873f	gp2	50	100	-	snap-061e06a...	2025/06/04 22:31 GMT-2:30	us-east-1b	In-use	No alarm
vol-0153333d8bbcced84	gp3	8	3000	125	snap-02a7d2...	2025/06/05 19:20 GMT-2:30	us-east-1a	In-use	No alarm
vol-0f0e4c7f83646c382	gp3	8	3000	125	snap-02a7d2...	2025/06/03 00:13 GMT-2:30	us-east-1a	In-use	No alarm
Daniel	gp3	50	3000	125	-	-	us-east-1a	Available	No alarm
vol-08698cbabdf867b55	gp3	8	3000	125	snap-02a7d2...	2025/06/05 15:39 GMT-2:30	us-east-1a	In-use	No alarm
vol-01998bb32d04ff974	gp3	8	3000	125	snap-02a7d2...	2025/06/06 15:33 GMT-2:30	us-east-1a	In-use	No alarm
vol-0c71a451218b3db2c	gp3	8	3000	125	snap-02a7d2...	2025/06/04 23:11 GMT-2:30	us-east-1b	In-use	No alarm

Attach the new volume to the EC2 created in step 1. Take a screenshot showing both Volumes in the console.

The screenshot shows the AWS CloudWatch Metrics Insights interface. A query is being run against the 'CloudWatch Metrics' dataset. The query is:

```
aws [options] <command> <subcommand> [<subcommand> ...] [parameters]
To see help text, you can run:
aws help
aws <command> help
aws <command> <subcommand> help
Unknown options:
zsh: command not found: --instance-type
zsh: command not found: --user-data
liquiddma@liquids-MBP:~$ aws ec2 run-instances \
--image-id ami-02457598d3d3f76c3 \
--instance-type t2.micro \
--instance-ids i-0ff6927153d9dbbf \
--security-group-ids sg-aab28c198681f2b3e \
--associate-public-ip-address \
--key-name Consolekey \
--tag-specifications 'ResourceType=instance,Tags=[{Key=Name,Value=my-ec2-created-through-CLI}]'

{
  "ReservationId": "r-0b76ddb7563cee834",
  "OwnerId": "867468445868",
  "Groups": [],
  "Instances": [
    {
      "Architecture": "x86_64",
      "BlockDeviceMappings": [],
      "ClientToken": "a384ee99-f67a-4b5c-afde-049f8173f09e",
      "EbsOptimized": false,
      "EnaSupport": true,
      "Hypervisor": "xen",
      "NetworkInterfaces": [
        {
          "Attachment": {
            "AttachTime": "2025-06-06T18:03:48+00:00",
            "DeleteOnTermination": true,
            "DeviceIndex": 0,
            "Status": "attaching",
            "NetworkCardIndex": 0
          },
          "Description": ""
        }
      ],
      "RootDeviceType": "EBS"
    }
  ]
}
liquiddma@liquids-MBP:~$ ssh -i ~/Downloads/Consolekey.pem ec2-user@ec2-3-84-243-50.compute-1.amazonaws.com
The authenticity of host 'ec2-3-84-243-50.compute-1.amazonaws.com (3.84.243.50)' can't be established.
ED25519 key fingerprint is SHA256:mtlhrp3tmemCsdJJqUqb1kD8irkJtxx+cuonubel0pE.
This key is not known by any other names.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'ec2-3-84-243-50.compute-1.amazonaws.com' (ED25519) to the list of known hosts.
[ec2-user@ip-192-148-82-206 ~]$ lsblk
NAME   MAJ:MIN RM  SIZE RO TYPE MOUNTPOINT
xvda   202:0    0   8G  0 disk
└─xvda1 202:1    0   8G  0 part /
└─xvda12 259:0    0   1M  0 part
└─xvda12p1 259:1    0   1M  0 part /boot/efi
xvdb   202:16   0   500 0 disk
[ec2-user@ip-192-148-82-206 ~]$
```

login to the EC2 instance and run the command “**lsblk**”. Take a screenshot showing both Volumes size

```
[ec2-user@ip-192-148-82-206 ~]$ lsblk
NAME   MAJ:MIN RM  SIZE RO TYPE MOUNTPOINT
xvda   202:0    0   8G  0 disk
└─xvda1 202:1    0   8G  0 part /
└─xvda12 259:0    0   1M  0 part
└─xvda12p1 259:1    0   1M  0 part /boot/efi
xvdb   202:16   0   500 0 disk
[ec2-user@ip-192-148-82-206 ~]$
```