LAMBTON COLLEGE

A Report on
[Lab 4,5,6 on AWS Cloud Foundations]

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ON L4Z 3E9

A Group assignment with screenshots of Lab 4, 5, and 6

on Aws academy

Big Data Analytics DSMM

Under the supervision
of
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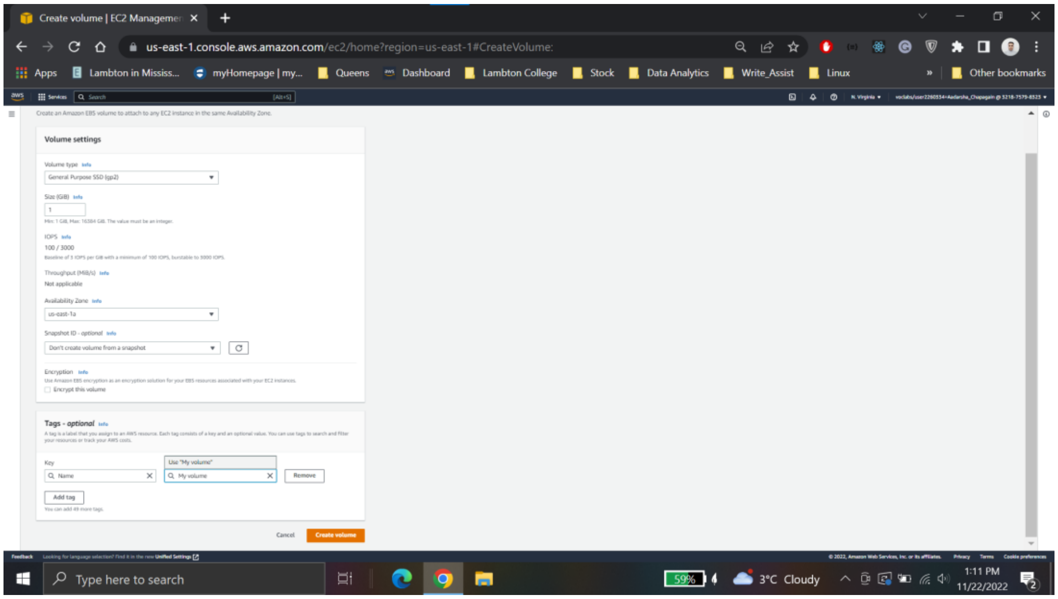
Lab4: Working With EBS

Create Volume



Create an Amazon EBS volume to attach to any EC2 instance in the same Availability Zone.

Volume settings

Volume type: General Purpose SSD (gp2)

Size (GiB): 1

Min: 1 GiB, Max: 16384 GiB. The value must be an integer.

IOPS: 100 / 3000

Baseline of 3 IOPS per GiB with a minimum of 100 IOPS, burstable to 3000 IOPS.

Throughput (MiB/s): Not applicable

Availability Zone: us-east-1a

Snapshot ID - optional: Don't create volume from a snapshot

Encryption

Use Amazon EBS encryption as an encryption solution for your EBS resources associated with your EC2 instances.

□ Encrypt this volume

Tags - optional

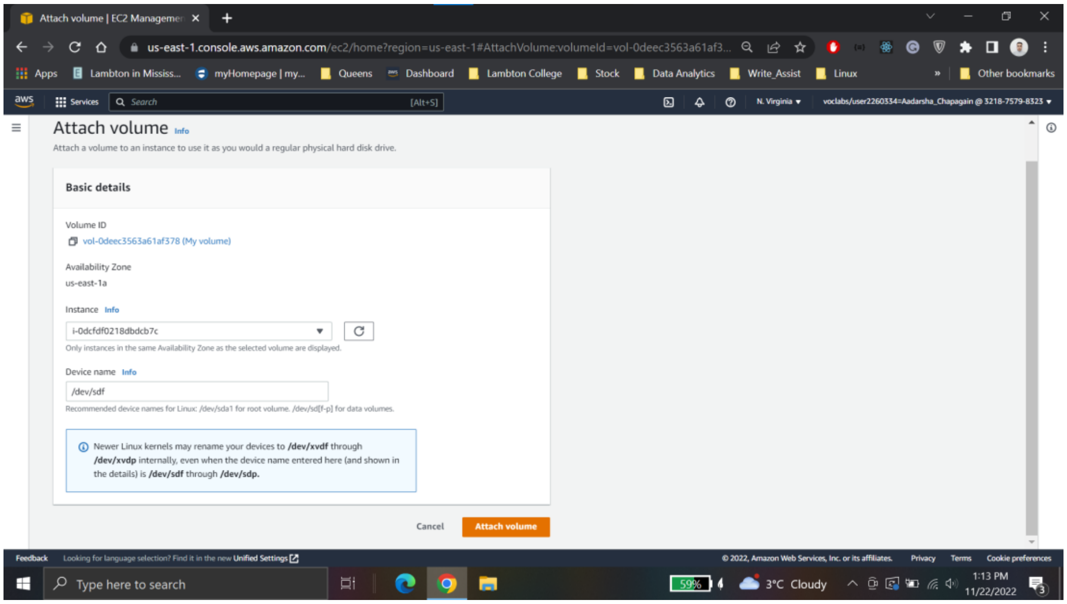
A tag is a label that you assign to an AWS resource. Each tag consists of a key and an optional value. You can use tags to search and filter your resources or track your AWS costs.

Key: Name

Value: My volume

You can add 49 more tags.

Attach Volume



Attach volume

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

Basic details

Volume ID: vol-0deec3563a61af378 (My volume)

Availability Zone: us-east-1a

Instance: i-0dcfdf0218dbdcb7c

Only instances in the same Availability Zone as the selected volume are displayed.

Device name: /dev/sdf

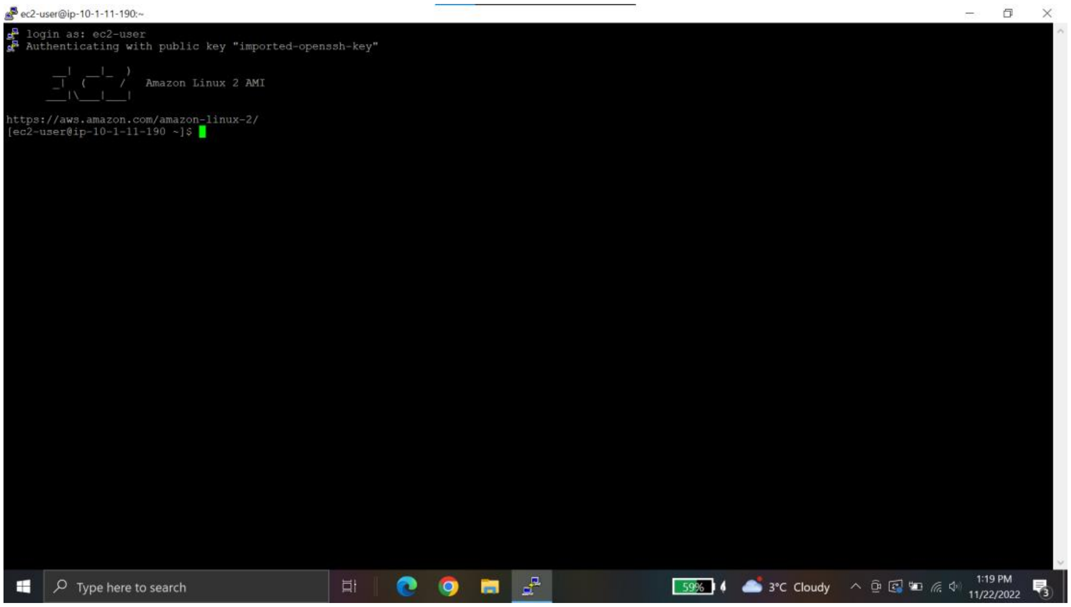
Recommended device names for Linux: /dev/sda1 for root volume. /dev/sd[f-p] for data volumes.

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.**

Attach volume | EC2 Managemen
us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#AttachVolume:volumeId=vol-0deec3563a61af3...
Apps
Lambton in Mississ...
myHomepage | my...
Queens
Dashboard
Lambton College
Stock
Data Analytics
Write_Assist
Linux
Other bookmarks
Services
Search
[Alt+S]
N. Virginia
voclabs/user2260334=Aadarsha_Chapagain @ 3218-7579-8323
Info
Cancel
Attach volume
Feedback
Looking for language selection? Find it in the new Unified Settings
© 2022, Amazon Web Services, Inc. or its affiliates.
Privacy
Terms
Cookie preferences
Type here to search
3°C Cloudy
1:13 PM
11/22/2022

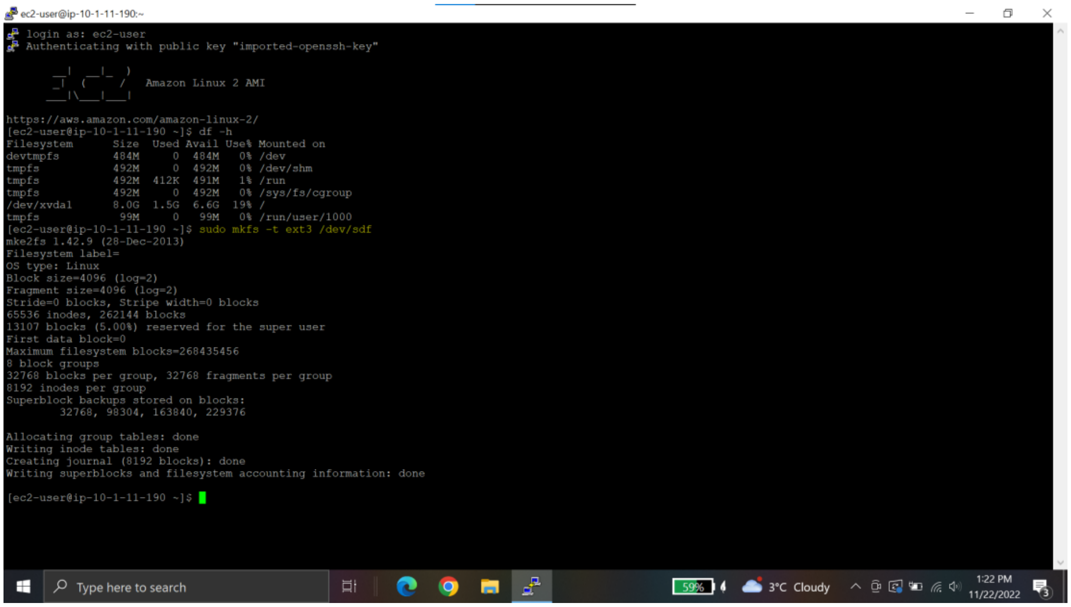
Login using Putty client

At first the .ppk was downloaded and using same key in putty ssh connection was established.



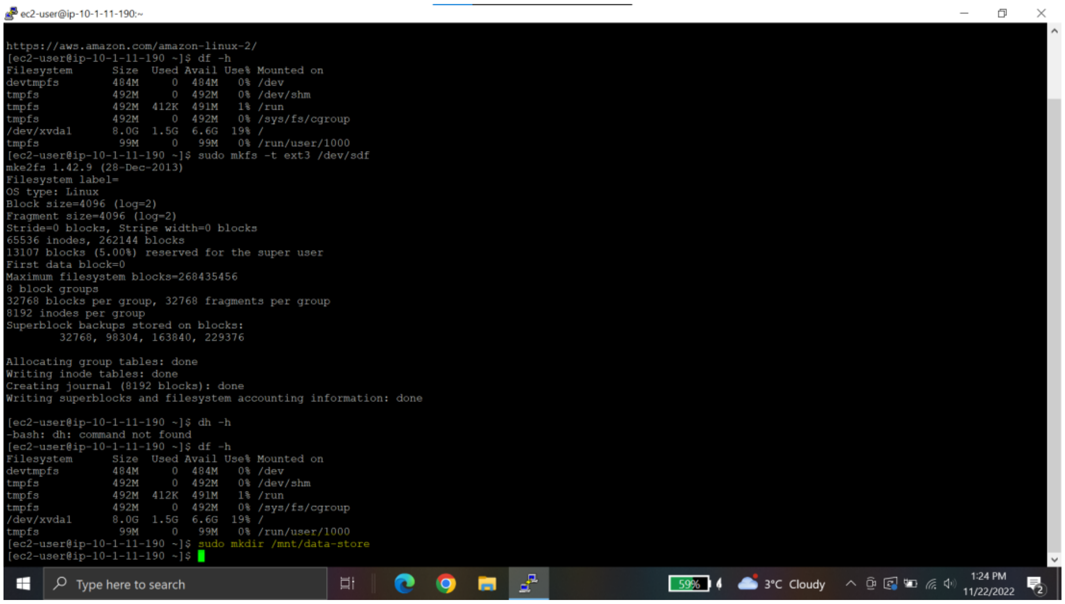
```
login as: ec2-user
Authenticating with public key "imported-openssh-key"

       __|  __|_  )
       _|  (     /   Amazon Linux 2 AMI
      ___|\___|___|

https://aws.amazon.com/amazon-linux-2/
[ec2-user@ip-10-1-11-190 ~]$
```

Create an ext3 file system on the new volume



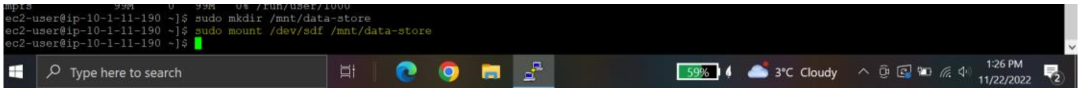
```
login as: ec2-user
Authenticating with public key "imported-openssh-key"

       __|  __|_  )
       _|  (     /   Amazon Linux 2 AMI
      ___|\___|___|

https://aws.amazon.com/amazon-linux-2/
[ec2-user@ip-10-1-11-190 ~]$ df -h
Filesystem      Size  Used Avail Use% Mounted on
devtmpfs        484M     0  484M   0% /dev
tmpfs           492M     0  492M   0% /dev/shm
tmpfs           492M  412K  491M   1% /run
tmpfs           492M     0  492M   0% /sys/fs/cgroup
/dev/xvda1      8.0G  1.5G  6.6G  19% /
tmpfs            99M     0   99M   0% /run/user/1000
[ec2-user@ip-10-1-11-190 ~]$ sudo mkfs -t ext3 /dev/sdf
mke2fs 1.42.9 (28-Dec-2013)
Filesystem label=
OS type: Linux
Block size=4096 (log=2)
Fragment size=4096 (log=2)
Stride=0 blocks, Stripe width=0 blocks
65536 inodes, 262144 blocks
13107 blocks (5.00%) reserved for the super user
First data block=0
Maximum filesystem blocks=268435456
8 block groups
32768 blocks per group, 32768 fragments per group
8192 inodes per group
Superblock backups stored on blocks:
        32768, 98304, 163840, 229376

Allocating group tables: done
Writing inode tables: done
Creating journal (8192 blocks): done
Writing superblocks and filesystem accounting information: done

[ec2-user@ip-10-1-11-190 ~]$
```

Create a directory for mounting the new storage volume:



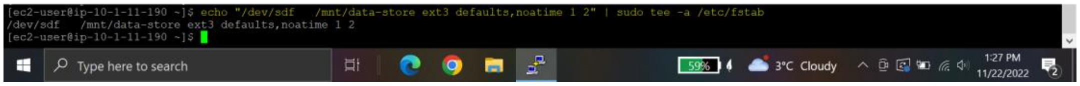
```
https://aws.amazon.com/amazon-linux-2/
[ec2-user@ip-10-1-11-190 ~]$ df -h
Filesystem      Size  Used Avail Use% Mounted on
devtmpfs        484M     0  484M   0% /dev
tmpfs           492M     0  492M   0% /dev/shm
tmpfs           492M  412K  491M   1% /run
tmpfs           492M     0  492M   0% /sys/fs/cgroup
/dev/xvda1      8.0G  1.5G  6.6G  19% /
tmpfs            99M     0   99M   0% /run/user/1000
[ec2-user@ip-10-1-11-190 ~]$ sudo mkfs -t ext3 /dev/sdf
mke2fs 1.42.9 (28-Dec-2013)
Filesystem label=
OS type: Linux
Block size=4096 (log=2)
Fragment size=4096 (log=2)
Stride=0 blocks, Stripe width=0 blocks
65536 inodes, 262144 blocks
13107 blocks (5.00%) reserved for the super user
First data block=0
Maximum filesystem blocks=268435456
8 block groups
32768 blocks per group, 32768 fragments per group
8192 inodes per group
Superblock backups stored on blocks:
        32768, 98304, 163840, 229376

Allocating group tables: done
Writing inode tables: done
Creating journal (8192 blocks): done
Writing superblocks and filesystem accounting information: done

[ec2-user@ip-10-1-11-190 ~]$ dh -h
-bash: dh: command not found
[ec2-user@ip-10-1-11-190 ~]$ df -h
Filesystem      Size  Used Avail Use% Mounted on
devtmpfs        484M     0  484M   0% /dev
tmpfs           492M     0  492M   0% /dev/shm
tmpfs           492M  412K  491M   1% /run
tmpfs           492M     0  492M   0% /sys/fs/cgroup
/dev/xvda1      8.0G  1.5G  6.6G  19% /
tmpfs            99M     0   99M   0% /run/user/1000
[ec2-user@ip-10-1-11-190 ~]$ sudo mkdir /mnt/data-store
[ec2-user@ip-10-1-11-190 ~]$ 
```

Mount the new volume:



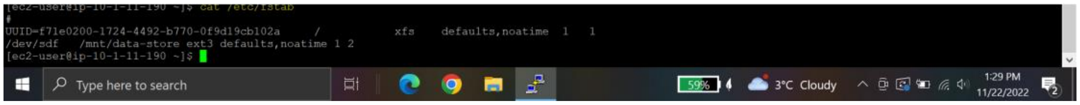
```
mpfs            99M     0   99M   0% /run/user/1000
ec2-user@ip-10-1-11-190 ~]$ sudo mkdir /mnt/data-store
ec2-user@ip-10-1-11-190 ~]$ sudo mount /dev/sdf /mnt/data-store
ec2-user@ip-10-1-11-190 ~]$ 
```

To configure the Linux instance to mount this volume whenever the instance is started, add a line to */etc/fstab*.



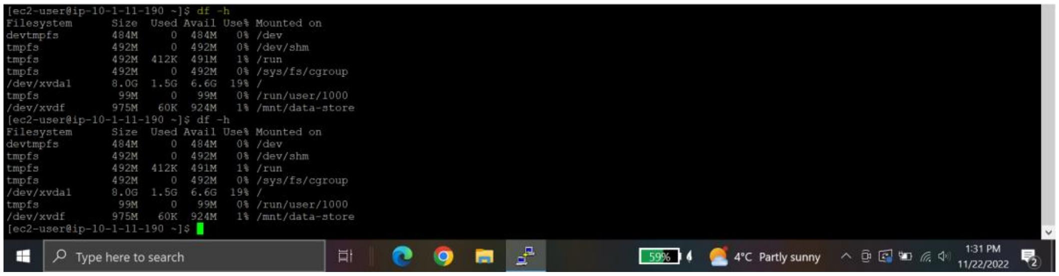
```
[ec2-user@ip-10-1-11-190 ~]$ echo "/dev/sdf   /mnt/data-store ext3 defaults,noatime 1 2" | sudo tee -a /etc/fstab
/dev/sdf   /mnt/data-store ext3 defaults,noatime 1 2
[ec2-user@ip-10-1-11-190 ~]$ 
```

View the configuration file to see the setting on the last line



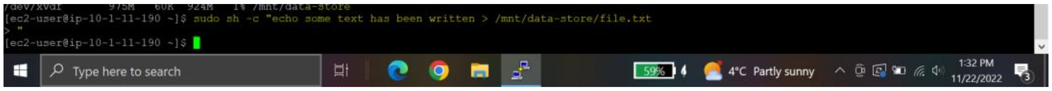
```
[ec2-user@ip-10-1-11-190 ~]$ cat /etc/fstab
#
UUID=f71e0200-1724-4492-b770-0f9d19cb102a     /           xfs    defaults,noatime  1   1
/dev/sdf   /mnt/data-store ext3 defaults,noatime 1 2
[ec2-user@ip-10-1-11-190 ~]$ 
```

View the available storage again



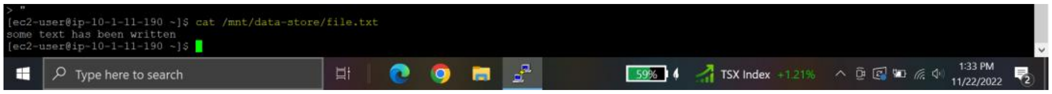
```
[ec2-user@ip-10-1-11-190 ~]$ df -h
Filesystem      Size  Used Avail Use% Mounted on
devtmpfs        484M     0  484M   0% /dev
tmpfs           492M     0  492M   0% /dev/shm
tmpfs           492M  412K  491M   1% /run
tmpfs           492M     0  492M   0% /sys/fs/cgroup
/dev/xvda1      8.0G  1.5G  6.6G  19% /
tmpfs            99M     0   99M   0% /run/user/1000
/dev/xvdf       975M   60K  924M   1% /mnt/data-store
[ec2-user@ip-10-1-11-190 ~]$ df -h
Filesystem      Size  Used Avail Use% Mounted on
devtmpfs        484M     0  484M   0% /dev
tmpfs           492M     0  492M   0% /dev/shm
tmpfs           492M  412K  491M   1% /run
tmpfs           492M     0  492M   0% /sys/fs/cgroup
/dev/xvda1      8.0G  1.5G  6.6G  19% /
tmpfs            99M     0   99M   0% /run/user/1000
/dev/xvdf       975M   60K  924M   1% /mnt/data-store
[ec2-user@ip-10-1-11-190 ~]$ 
```

On mounted volume, create a file and add some text to it.



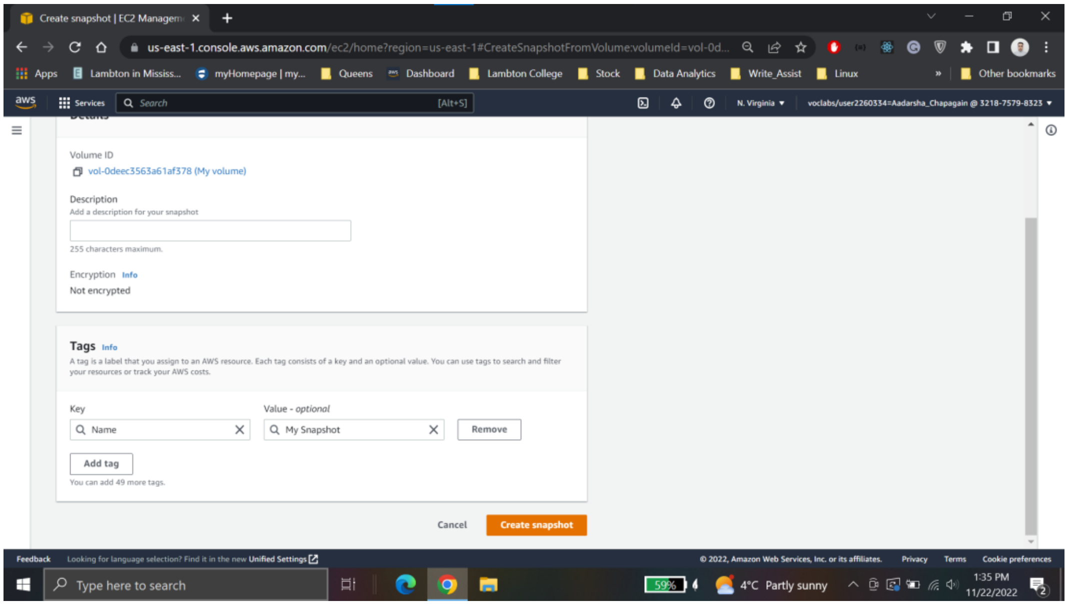
```
/dev/xvdf        975M   60K  924M   1% /mnt/data-store
[ec2-user@ip-10-1-11-190 ~]$ sudo sh -c "echo some text has been written > /mnt/data-store/file.txt
> "
[ec2-user@ip-10-1-11-190 ~]$
```

Verify that the text has been written to your volume



```
> "
[ec2-user@ip-10-1-11-190 ~]$ cat /mnt/data-store/file.txt
some text has been written
[ec2-user@ip-10-1-11-190 ~]$
```

Create Snapshot



Create snapshot | EC2 Managem
us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#CreateSnapshotFromVolume:volumeId=vol-0d...
Apps
Lambton in Mississ...
myHomepage | my...
Queens
Dashboard
Lambton College
Stock
Data Analytics
Write_Assist
Linux
Other bookmarks
aws
Services
Search
[Alt+S]
N. Virginia
voclabs/user2260334=Aadarsha_Chapagain @ 3218-7579-8323

Volume ID
vol-0deec3563a61af378 (My volume)

Description
Add a description for your snapshot

255 characters maximum.

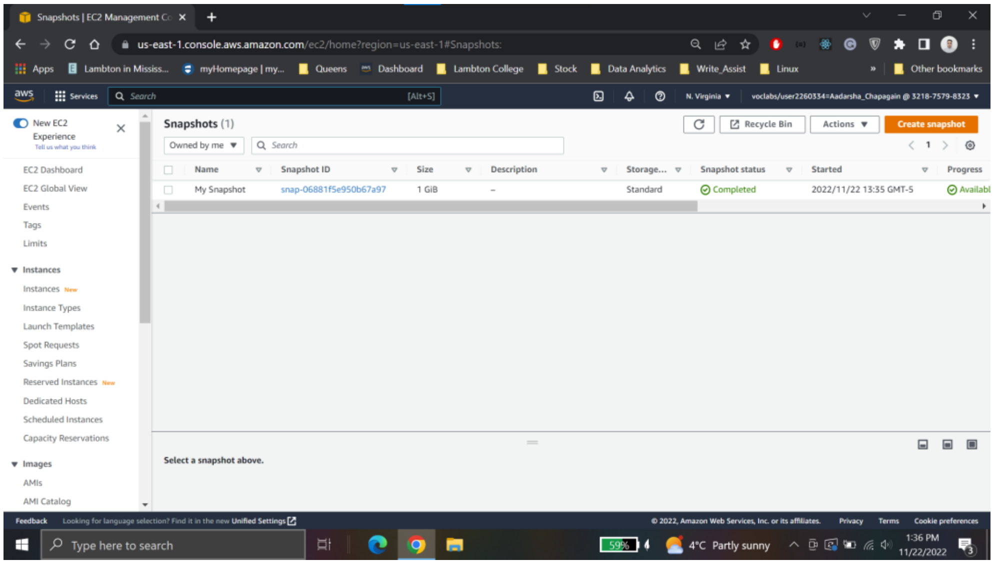
Encryption Info
Not encrypted

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

Key	Value - *optional*
Name	My Snapshot

Remove
Add tag
You can add 49 more tags.
Cancel
Create snapshot
Feedback
Looking for language selection? Find it in the new Unified Settings
© 2022, Amazon Web Services, Inc. or its affiliates.
Privacy
Terms
Cookie preferences
Type here to search
59%
4°C Partly sunny
1:35 PM
11/22/2022

Snapshot created



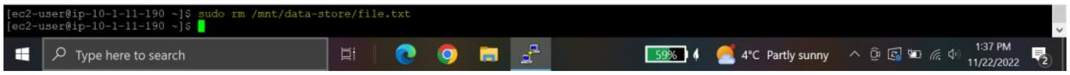
Snapshots (1)

Name	Snapshot ID	Size	Description	Storage...	Snapshot status	Started	Progress
My Snapshot	snap-06881f5e950b67a97	1 GiB	–	Standard	Completed	2022/11/22 13:35 GMT-5	Availabl

Select a snapshot above.

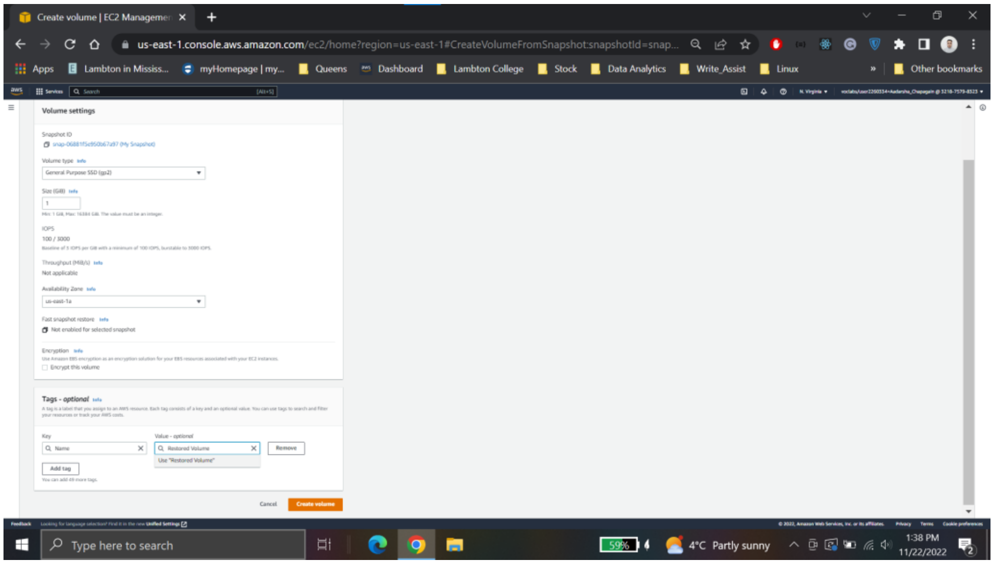
Feedback
Looking for language selection? Find it in the new Unified Settings
© 2022, Amazon Web Services, Inc. or its affiliates.
Privacy
Terms
Cookie preferences
Type here to search
59%
4°C Partly sunny
1:36 PM
11/22/2022

Delete created file



```
[ec2-user@ip-10-1-11-190 ~]$ sudo rm /mnt/data-store/file.txt
[ec2-user@ip-10-1-11-190 ~]$
```

Create volume from stored snapshot



Create volume | EC2 Management

us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#CreateVolumeFromSnapshot:snapshotId=snap...

Volume settings

Snapshot ID
snap-06881f5e950b67a97 (My Snapshot)

Volume type: General Purpose SSD (gp2)

Size (GiB): 1
Min: 1 GiB, Max: 16384 GiB. The value must be an integer.

IOPS
100 / 3000
Baseline of 3 IOPS per GiB with a minimum of 100 IOPS, burstable to 3000 IOPS.

Throughput (MiB/s)
Not applicable

Availability Zone: us-east-1a

Fast snapshot restore
Not enabled for selected snapshot

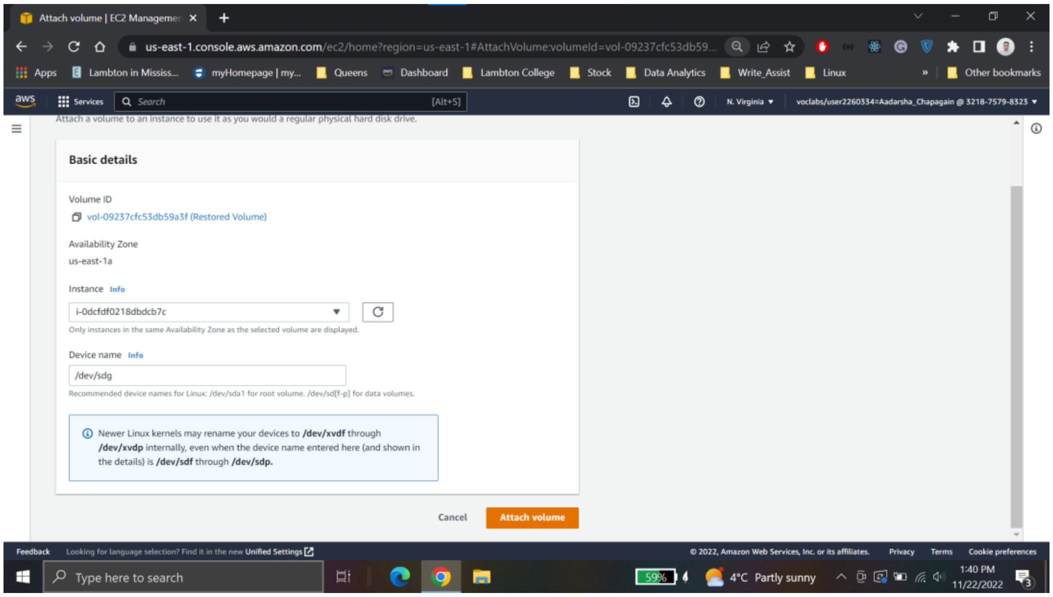
Encryption
Use Amazon EBS encryption as an encryption solution for your EBS resources associated with your EC2 instances.
□ Encrypt this volume

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

Key: Name
Value - *optional*: Restored Volume
Use "Restored Volume"

You can add 49 more tags.

Attach the volume to instance



Attach volume | EC2 Management

us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#AttachVolume:volumeId=vol-09237cfc53db59...

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

Basic details

Volume ID
vol-09237cfc53db59a3f (Restored Volume)

Availability Zone
us-east-1a

Instance: i-0dcfdf0218dbdcb7c
Only instances in the same Availability Zone as the selected volume are displayed.

Device name: /dev/sdg
Recommended device names for Linux: /dev/sda1 for root volume. /dev/sd[f-p] for data volumes.

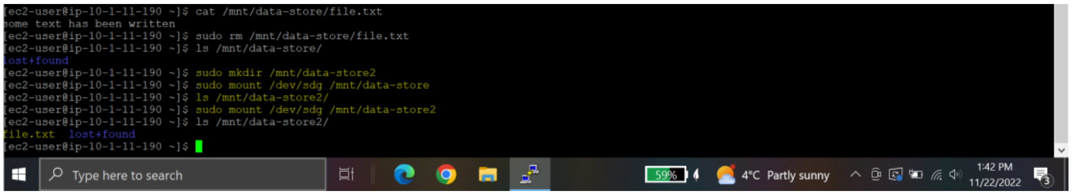
Newer Linux kernels may rename your devices to **/dev/xvdf** through **/dev/xvdp** internally, even when the device name entered here (and shown in the details) is **/dev/sdf** through **/dev/sdp.**

Create a directory for mounting the new storage volume:

sudo mkdir /mnt/data-store2

Mount the new volume:

sudo mount /dev/sdg /mnt/data-store2



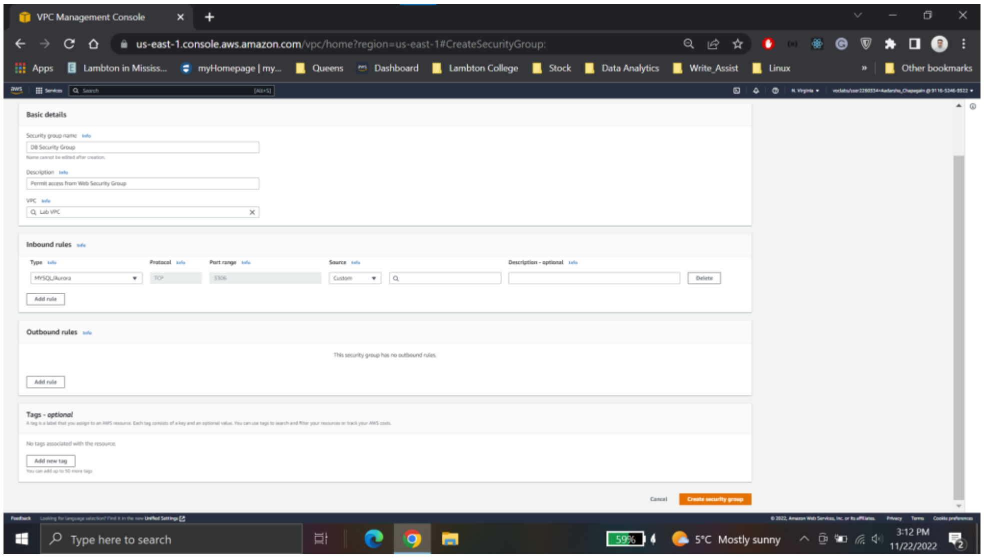
```
[ec2-user@ip-10-1-11-190 ~]$ cat /mnt/data-store/file.txt
some text has been written
[ec2-user@ip-10-1-11-190 ~]$ sudo rm /mnt/data-store/file.txt
[ec2-user@ip-10-1-11-190 ~]$ ls /mnt/data-store/
lost+found
[ec2-user@ip-10-1-11-190 ~]$ sudo mkdir /mnt/data-store2
[ec2-user@ip-10-1-11-190 ~]$ sudo mount /dev/sdg /mnt/data-store
[ec2-user@ip-10-1-11-190 ~]$ ls /mnt/data-store2/
[ec2-user@ip-10-1-11-190 ~]$ sudo mount /dev/sdg /mnt/data-store2
[ec2-user@ip-10-1-11-190 ~]$ ls /mnt/data-store2/
file.txt  lost+found
[ec2-user@ip-10-1-11-190 ~]$ 
```

Conclusions for Lab4

- Created an Amazon EBS volume
- Attached the volume to an EC2 instance
- Created a file system on the volume
- Added a file to volume
- Created a snapshot of your volume
- Created a new volume from the snapshot
- Attached and mounted the new volume to your EC2 instance
- Verified that the file created earlier was on the newly created volume

Lab 5: Build Your DB Server and Interact With Your DB Using an App

Create a security group



VPC Management Console

us-east-1.console.aws.amazon.com/vpc/home?region=us-east-1#CreateSecurityGroup:

Basic details

Security group name: DB Security Group

Name cannot be edited after creation.

Description: Permit access from Web Security Group

VPC: Lab VPC

Inbound rules

Type	Protocol	Port range	Source		Description - optional
MYSQL/Aurora	TCP	3306	Custom		

Outbound rules

This security group has no outbound rules.

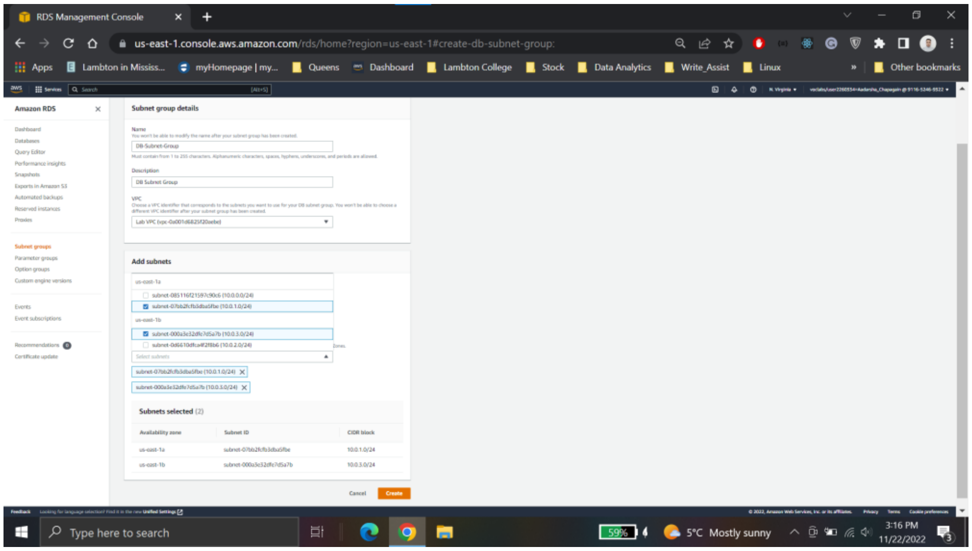
Tags - optional

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

No tags associated with the resource.

You can add up to 50 more tags

Create Db Subnet Group



RDS Management Console

us-east-1.console.aws.amazon.com/rds/home?region=us-east-1#create-db-subnet-group:

Subnet group details

Name: DB-Subnet-Group

You won't be able to modify the name after your subnet group has been created.

Must contain from 1 to 255 characters. Alphanumeric characters, spaces, hyphens, underscores, and periods are allowed.

Description: DB Subnet Group

VPC: Lab VPC (vpc-0a001d6825f20aebe)

Choose a VPC identifier that corresponds to the subnets you want to use for your DB subnet group. You won't be able to choose a different VPC identifier after your subnet group has been created.

Add subnets

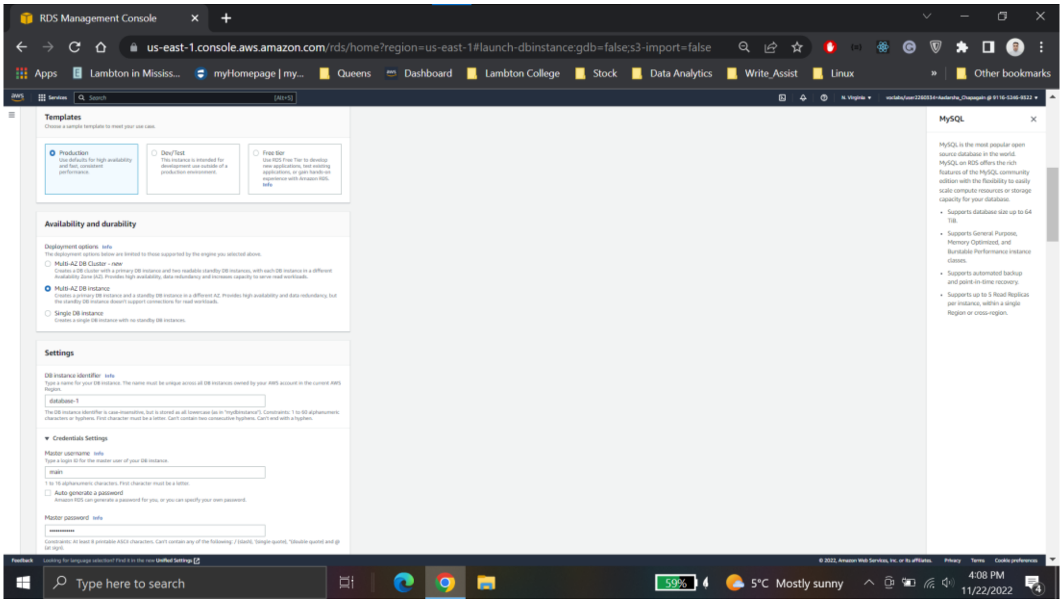
us-east-1a
- □ subnet-085116f21597c90c6 (10.0.0.0/24)
- ☑ subnet-07bb2fcfb3dba5fbe (10.0.1.0/24)

us-east-1b
- ☑ subnet-000a3e32dfe7d5a7b (10.0.3.0/24)
- □ subnet-0d6610dfca4f2f8b6 (10.0.2.0/24)

Subnets selected (2)

Availability zone	Subnet ID	CIDR block
us-east-1a	subnet-07bb2fcfb3dba5fbe	10.0.1.0/24
us-east-1b	subnet-000a3e32dfe7d5a7b	10.0.3.0/24

Create Database


RDS Management Console
us-east-1.console.aws.amazon.com/rds/home?region=us-east-1#launch-dbinstance:gdb=false;s3-import=false
Apps
Lambton in Mississ...
myHomepage | my...
Queens
Dashboard
Lambton College
Stock
Data Analytics
Write_Assist
Linux
Other bookmarks
Services
Search
[Alt+S]
N. Virginia
voclabs/user2260334=Aadarsha_Chapagain @ 9116-5246-9322
Feedback
Looking for language selection? Find it in the new Unified Settings
© 2022, Amazon Web Services, Inc. or its affiliates.
Privacy
Terms
Cookie preferences
Type here to search
59%
5°C Mostly sunny
4:08 PM
11/22/2022

Templates

Choose a sample template to meet your use case.

● Production
Use defaults for high availability and fast, consistent performance.

○ Dev/Test
This instance is intended for development use outside of a production environment.

○ Free tier
Use RDS Free Tier to develop new applications, test existing applications, or gain hands-on experience with Amazon RDS. Info

Availability and durability

Deployment options Info
The deployment options below are limited to those supported by the engine you selected above.

○ Multi-AZ DB Cluster - new
Creates a DB cluster with a primary DB instance and two readable standby DB instances, with each DB instance in a different Availability Zone (AZ). Provides high availability, data redundancy and increases capacity to serve read workloads.

● Multi-AZ DB instance
Creates a primary DB instance and a standby DB instance in a different AZ. Provides high availability and data redundancy, but the standby DB instance doesn't support connections for read workloads.

○ Single DB instance
Creates a single DB instance with no standby DB instances.

Settings

DB instance identifier Info
Type a name for your DB instance. The name must be unique across all DB instances owned by your AWS account in the current AWS Region.

database-1

The DB instance identifier is case-insensitive, but is stored as all lowercase (as in "mydbinstance"). Constraints: 1 to 60 alphanumeric characters or hyphens. First character must be a letter. Can't contain two consecutive hyphens. Can't end with a hyphen.

▼ Credentials Settings

Master username Info
Type a login ID for the master user of your DB instance.

main

1 to 16 alphanumeric characters. First character must be a letter.

□ Auto generate a password
Amazon RDS can generate a password for you, or you can specify your own password.

Master password Info

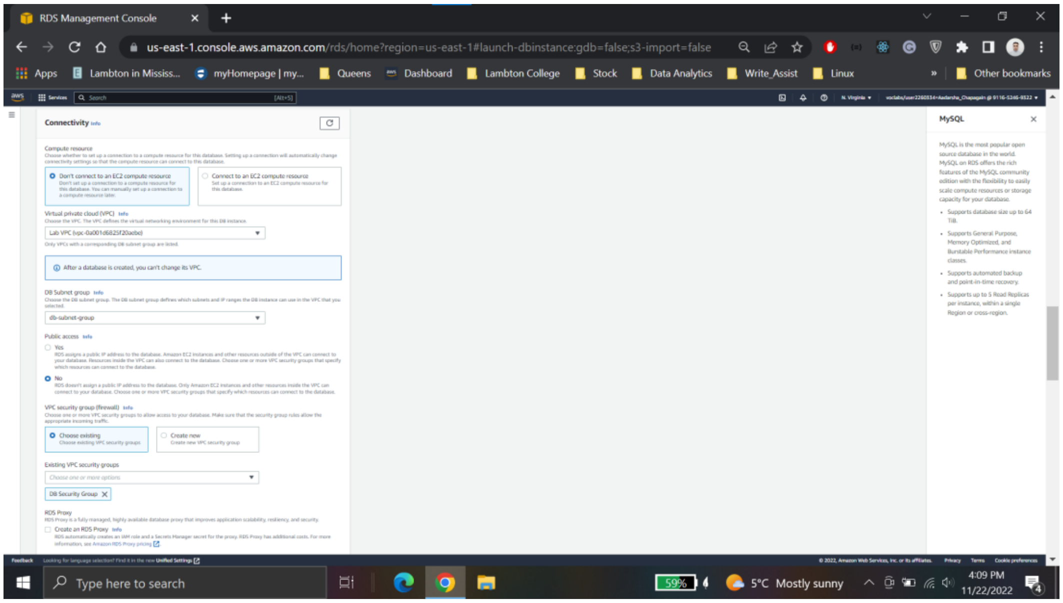
•••••••••••••

Constraints: At least 8 printable ASCII characters. Can't contain any of the following: / (slash), '(single quote), "(double quote) and @ (at sign).

MySQL

MySQL is the most popular open source database in the world. MySQL on RDS offers the rich features of the MySQL community edition with the flexibility to easily scale compute resources or storage capacity for your database.

- Supports database size up to 64 TiB.
- Supports General Purpose, Memory Optimized, and Burstable Performance instance classes.
- Supports automated backup and point-in-time recovery.
- Supports up to 5 Read Replicas per instance, within a single Region or cross-region.


RDS Management Console
us-east-1.console.aws.amazon.com/rds/home?region=us-east-1#launch-dbinstance:gdb=false;s3-import=false
Apps
Lambton in Mississ...
myHomepage | my...
Queens
Dashboard
Lambton College
Stock
Data Analytics
Write_Assist
Linux
Other bookmarks
Services
Search
[Alt+S]
N. Virginia
voclabs/user2260334=Aadarsha_Chapagain @ 9116-5246-9322
Feedback
Looking for language selection? Find it in the new Unified Settings
© 2022, Amazon Web Services, Inc. or its affiliates.
Privacy
Terms
Cookie preferences
Type here to search
59%
5°C Mostly sunny
4:09 PM
11/22/2022

Connectivity Info

Compute resource
Choose whether to set up a connection to a compute resource for this database. Setting up a connection will automatically change connectivity settings so that the compute resource can connect to this database.

● Don't connect to an EC2 compute resource
Don't set up a connection to a compute resource for this database. You can manually set up a connection to a compute resource later.

○ Connect to an EC2 compute resource
Set up a connection to an EC2 compute resource for this database.

Virtual private cloud (VPC) Info
Choose the VPC. The VPC defines the virtual networking environment for this DB instance.

Lab VPC (vpc-0a001d6825f20aebe) ▼

Only VPCs with a corresponding DB subnet group are listed.

ⓘ After a database is created, you can't change its VPC.

DB Subnet group Info
Choose the DB subnet group. The DB subnet group defines which subnets and IP ranges the DB instance can use in the VPC that you selected.

db-subnet-group ▼

Public access Info

○ Yes
RDS assigns a public IP address to the database. Amazon EC2 instances and other resources outside of the VPC can connect to your database. Resources inside the VPC can also connect to the database. Choose one or more VPC security groups that specify which resources can connect to the database.

● No
RDS doesn't assign a public IP address to the database. Only Amazon EC2 instances and other resources inside the VPC can connect to your database. Choose one or more VPC security groups that specify which resources can connect to the database.

VPC security group (firewall) Info
Choose one or more VPC security groups to allow access to your database. Make sure that the security group rules allow the appropriate incoming traffic.

● Choose existing
Choose existing VPC security groups

○ Create new
Create new VPC security group

Existing VPC security groups

Choose one or more options ▼

DB Security Group ✕

RDS Proxy
RDS Proxy is a fully managed, highly available database proxy that improves application scalability, resiliency, and security.

□ Create an RDS Proxy Info
RDS automatically creates an IAM role and a Secrets Manager secret for the proxy. RDS Proxy has additional costs. For more information, see Amazon RDS Proxy pricing.

MySQL

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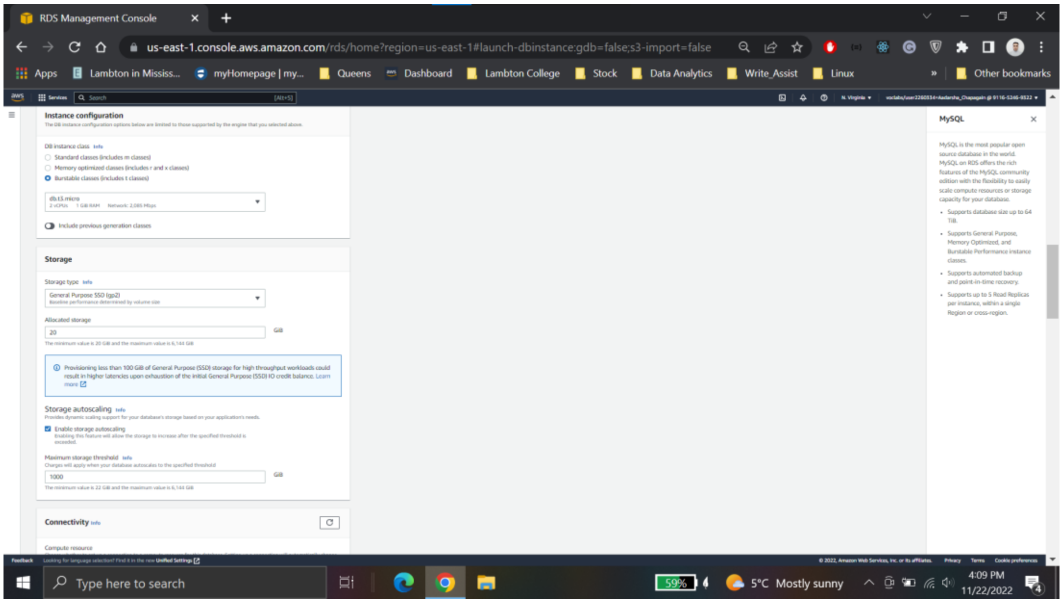
RDS Management Console
us-east-1.console.aws.amazon.com/rds/home?region=us-east-1#launch-dbinstance:gdb=false;s3-import=false
Apps
Lambton in Mississ...
myHomepage | my...
Queens
Dashboard
Lambton College
Stock
Data Analytics
Write_Assist
Linux
Other bookmarks
Services
Search
[Alt+S]
N. Virginia
voclabs/user2260334=Aadarsha_Chapagain @ 9116-5246-9322
Feedback
Looking for language selection? Find it in the new Unified Settings
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Privacy
Terms
Cookie preferences
Type here to search
59%
5°C Mostly sunny
4:09 PM
11/22/2022

Instance configuration

The DB instance configuration options below are limited to those supported by the engine that you selected above.

DB instance class Info

○ Standard classes (includes m classes)
○ Memory optimized classes (includes r and x classes)
● Burstable classes (includes t classes)

db.t3.micro
2 vCPUs 1 GiB RAM Network: 2,085 Mbps

Include previous generation classes

Storage

Storage type Info

General Purpose SSD (gp2)
Baseline performance determined by volume size

Allocated storage

20 GiB

The minimum value is 20 GiB and the maximum value is 6,144 GiB

Provisioning less than 100 GiB of General Purpose (SSD) storage for high throughput workloads could result in higher latencies upon exhaustion of the initial General Purpose (SSD) IO credit balance. Learn more

Storage autoscaling Info

Provides dynamic scaling support for your database's storage based on your application's needs.

☑ Enable storage autoscaling
Enabling this feature will allow the storage to increase after the specified threshold is exceeded.

Maximum storage threshold Info

Charges will apply when your database autoscales to the specified threshold

1000 GiB

The minimum value is 22 GiB and the maximum value is 6,144 GiB

Connectivity Info

Compute resource

MySQL

MySQL is the most popular open source database in the world. MySQL on RDS offers the rich features of the MySQL community edition with the flexibility to easily scale compute resources or storage capacity for your database.

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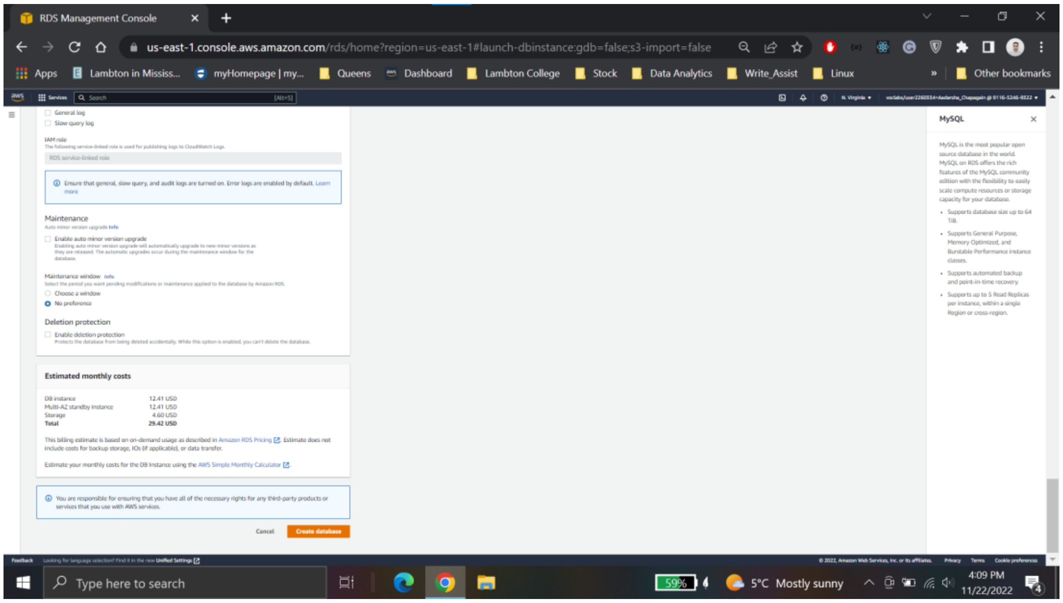
RDS Management Console
us-east-1.console.aws.amazon.com/rds/home?region=us-east-1#launch-dbinstance:gdb=false;s3-import=false
Apps
Lambton in Mississ...
myHomepage | my...
Queens
Dashboard
Lambton College
Stock
Data Analytics
Write_Assist
Linux
Other bookmarks
Services
Search
[Alt+S]
N. Virginia
voclabs/user2260334=Aadarsha_Chapagain @ 9116-5246-9322
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□ General log
□ Slow query log

IAM role

The following service-linked role is used for publishing logs to CloudWatch Logs.

RDS service-linked role

Ensure that general, slow query, and audit logs are turned on. Error logs are enabled by default. Learn more

Maintenance

Auto minor version upgrade Info

□ Enable auto minor version upgrade
Enabling auto minor version upgrade will automatically upgrade to new minor versions as they are released. The automatic upgrades occur during the maintenance window for the database.

Maintenance window Info

Select the period you want pending modifications or maintenance applied to the database by Amazon RDS.

○ Choose a window
● No preference

Deletion protection

□ Enable deletion protection
Protects the database from being deleted accidentally. While this option is enabled, you can't delete the database.

Estimated monthly costs

DB instance	12.41 USD
Multi-AZ standby instance	12.41 USD
Storage	4.60 USD
Total	**29.42 USD**

This billing estimate is based on on-demand usage as described in Amazon RDS Pricing. Estimate does not include costs for backup storage, IOs (if applicable), or data transfer.

Estimate your monthly costs for the DB Instance using the AWS Simple Monthly Calculator.

You are responsible for ensuring that you have all of the necessary rights for any third-party products or services that you use with AWS services.

Cancel Create database

MySQL

MySQL is the most popular open source database in the world. MySQL on RDS offers the rich features of the MySQL community edition with the flexibility to easily scale compute resources or storage capacity for your database.

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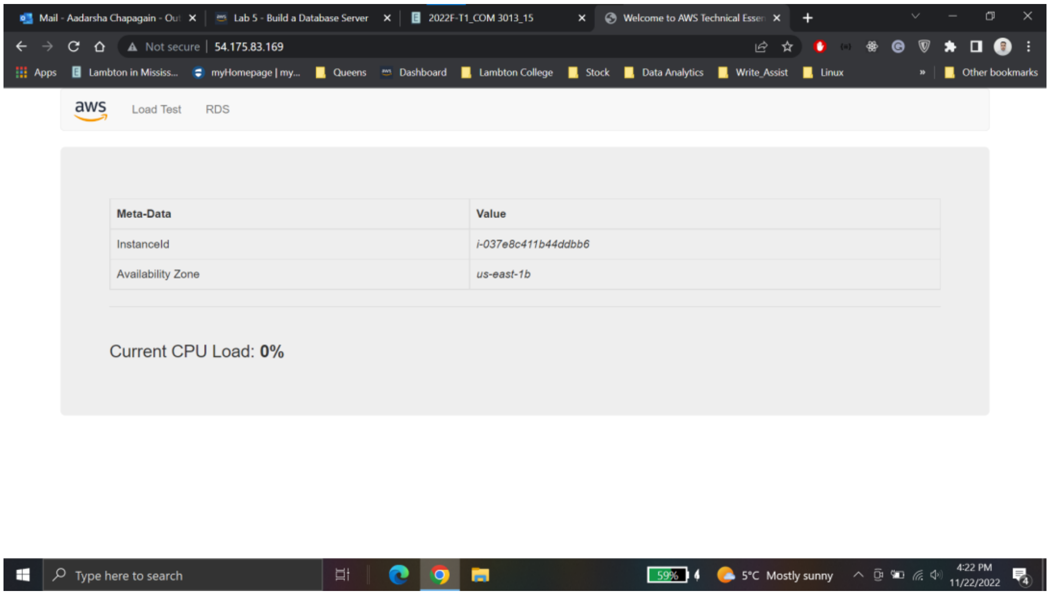
- Supports General Purpose, Memory Optimized, and Burstable Performance instance classes.
- Supports automated backup and point-in-time recovery.
- Supports up to 5 Read Replicas per instance, within a single Region or cross-region.

database-1.c9kgzdoxiquz.us-east-1.rds.amazonaws.com

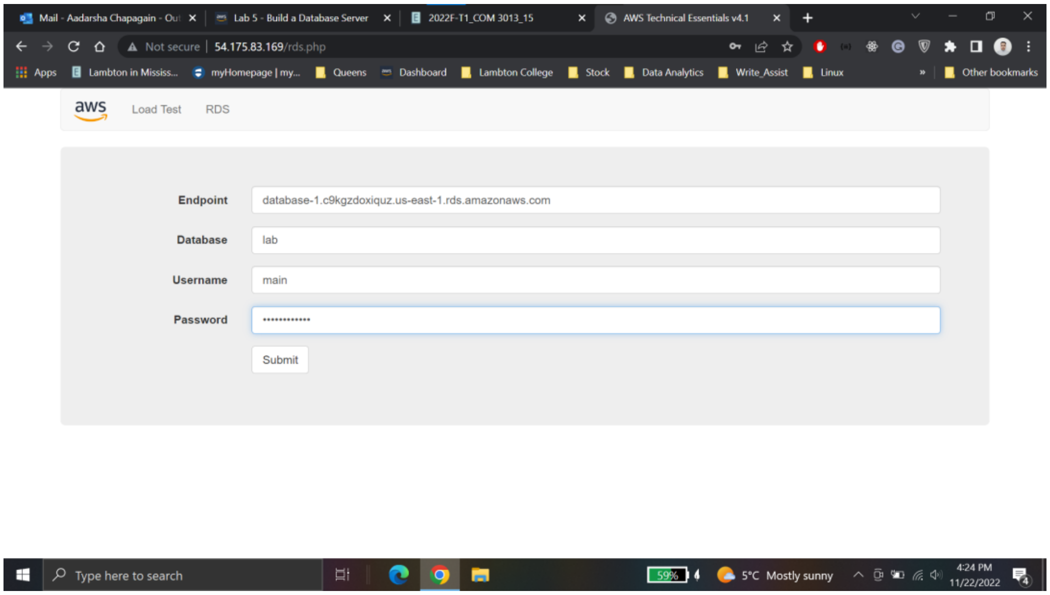
Web server Ip address



Meta-Data	Value
InstanceId	*i-037e8c411b44ddbb6*
Availability Zone	*us-east-1b*

Current CPU Load: **0%**

Web application to interact with database.



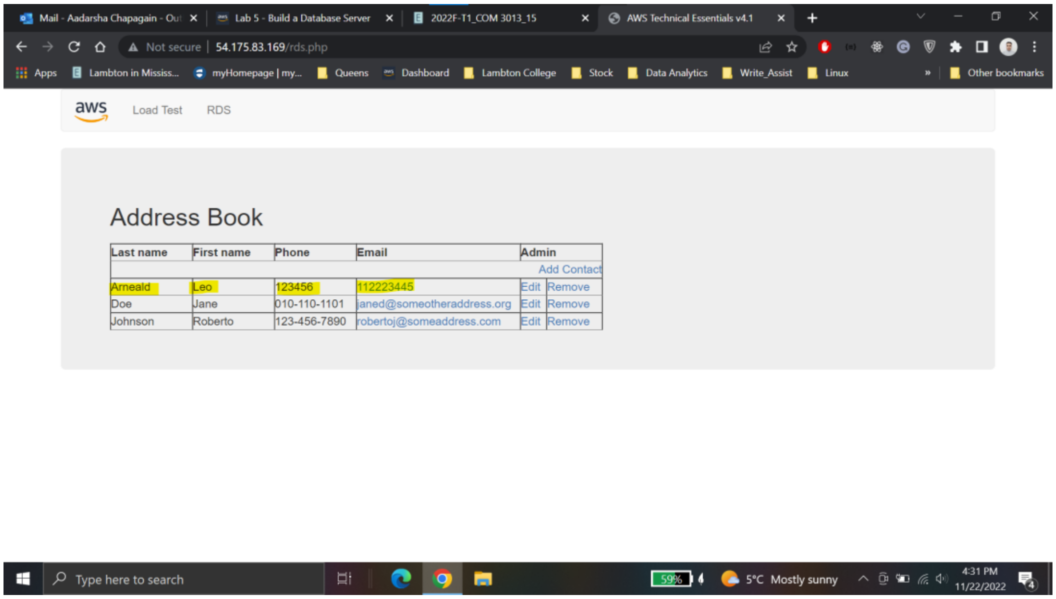
Endpoint database-1.c9kgzdoxiquz.us-east-1.rds.amazonaws.com

Database lab

Username main

Password ••••••••••••

Created the record to test the connection



Address Book

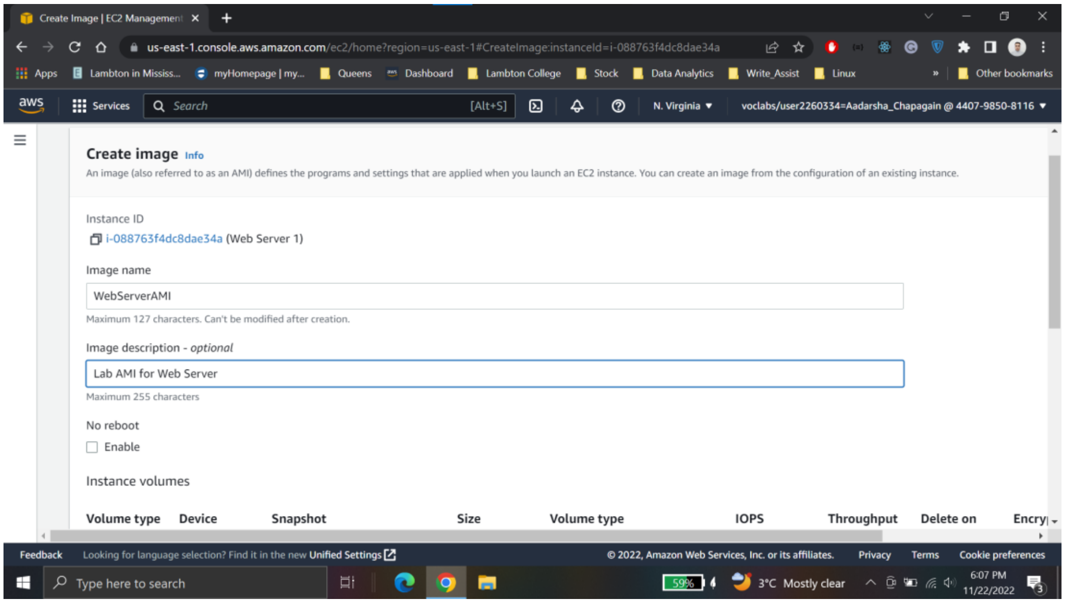
Last name	First name	Phone	Email	Admin
				Add Contact
Arneald	Leo	123456	112223445	Edit Remove
Doe	Jane	010-110-1101	janed@someotheraddress.org	Edit Remove
Johnson	Roberto	123-456-7890	robertoj@someaddress.com	Edit Remove

Lab 5 Conclusion

- Launched an Amazon RDS DB instance with high availability.
- Configured the DB instance to permit connections from your web server.
- Opened a web application and interact with your database

Lab 6: Scale and Load Balance Your Architecture

Task 1: Create an AMI for Auto Scaling



Create image Info

An image (also referred to as an AMI) defines the programs and settings that are applied when you launch an EC2 instance. You can create an image from the configuration of an existing instance.

Instance ID
i-088763f4dc8dae34a (Web Server 1)

Image name
WebServerAMI
Maximum 127 characters. Can't be modified after creation.

Image description - *optional*
Lab AMI for Web Server
Maximum 255 characters

No reboot
□ Enable

Instance volumes

Volume type	Device	Snapshot	Size	Volume type	IOPS	Throughput	Delete on	Encry

Create Image | EC2 Management
us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#CreateImage:instanceId=i-088763f4dc8dae34a
Apps
Lambton in Mississ...
myHomepage | my...
Queens
Dashboard
Lambton College
Stock
Data Analytics
Write_Assist
Linux
Other bookmarks
Services
Search
[Alt+S]
N. Virginia
voclabs/user2260334=Aadarsha_Chapagain @ 4407-9850-8116
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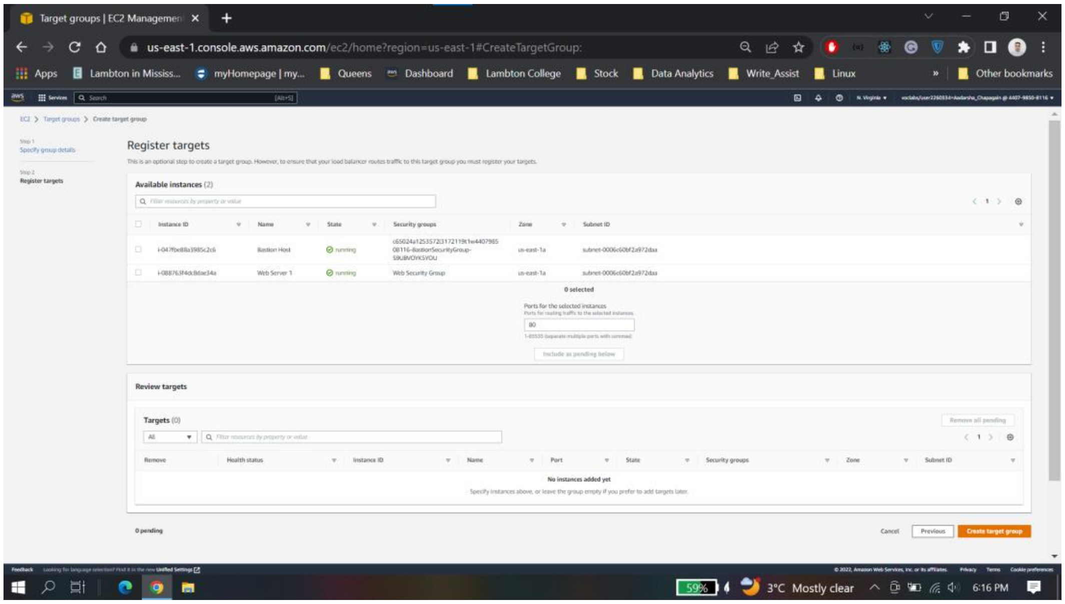
Cookie preferences
Type here to search
59%
3°C Mostly clear
6:07 PM
11/22/2022

Task 2: Create a Load Balancer

Create a target group



EC2 > Target groups > Create target group

Step 1
Specify group details

Step 2
Register targets

Register targets

This is an optional step to create a target group. However, to ensure that your load balancer routes traffic to this target group you must register your targets.

Available instances (2)

	Instance ID	Name	State	Security groups	Zone	Subnet ID
□	i-047fbe88a3985c2c6	Bastion Host	running	c65024a1253572l3172119t1w4407985 08116-BastionSecurityGroup-S9UBVOYKSYOU	us-east-1a	subnet-0006c60bf2a972daa
□	i-088763f4dc8dae34a	Web Server 1	running	Web Security Group	us-east-1a	subnet-0006c60bf2a972daa

0 selected

Ports for the selected instances
Ports for routing traffic to the selected instances.
80
1-65535 (separate multiple ports with commas)

Include as pending below

Review targets

Targets (0)

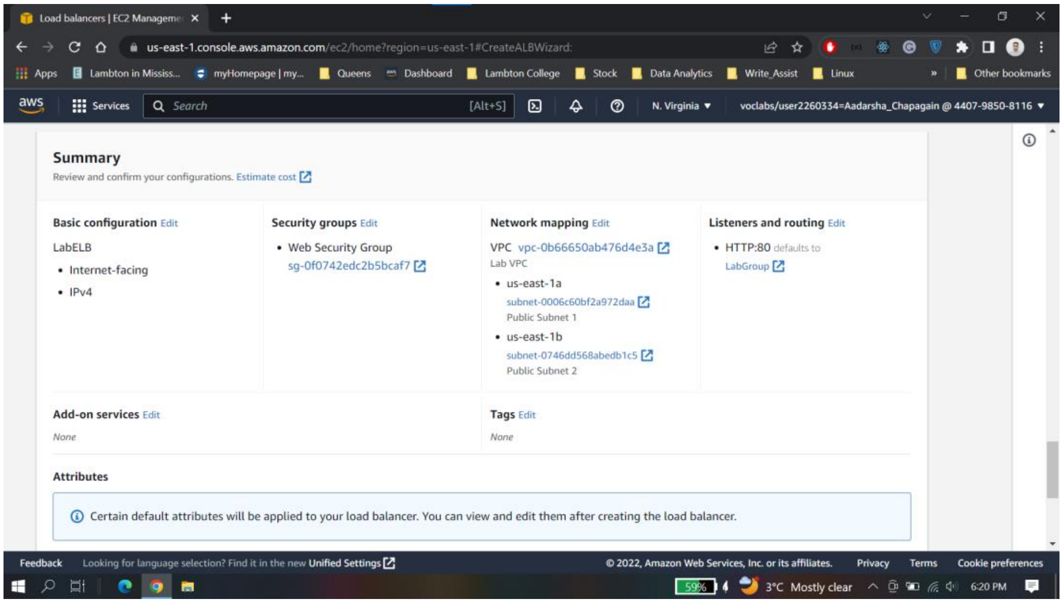
All

Remove	Health status	Instance ID	Name	Port	State	Security groups	Zone	Subnet ID

No instances added yet
Specify instances above, or leave the group empty if you prefer to add targets later.

0 pending

Create Load Balancer


Load balancers | EC2 Manageme
us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#CreateALBWizard:
Apps
Lambton in Mississ...
myHomepage | my...
Queens
Dashboard
Lambton College
Stock
Data Analytics
Write_Assist
Linux
Other bookmarks
aws
Services
Search
[Alt+S]
N. Virginia
voclabs/user2260334=Aadarsha_Chapagain @ 4407-9850-8116
Feedback
Looking for language selection? Find it in the new Unified Settings
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59%
3°C Mostly clear
6:20 PM

Summary

Review and confirm your configurations. Estimate cost

Basic configuration Edit

LabELB

- Internet-facing
- IPv4

Security groups Edit

- Web Security Group
  sg-0f0742edc2b5bcaf7

Network mapping Edit

VPC vpc-0b66650ab476d4e3a
Lab VPC

- us-east-1a
  subnet-0006c60bf2a972daa
  Public Subnet 1
- us-east-1b
  subnet-0746dd568abedb1c5
  Public Subnet 2

Listeners and routing Edit

- HTTP:80 defaults to
  LabGroup

Add-on services Edit

None

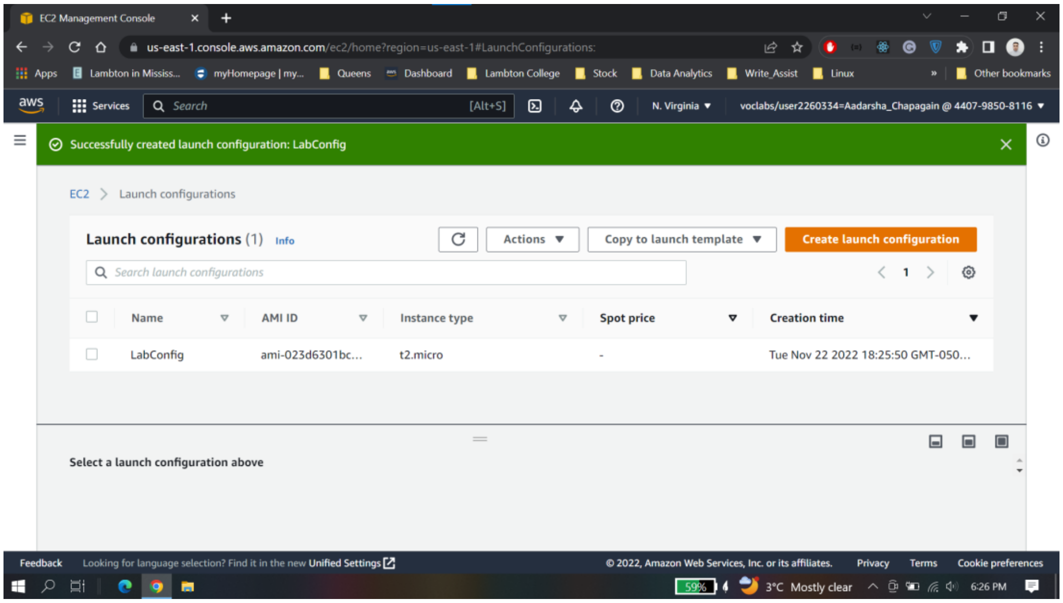
Tags Edit

None

Attributes

Certain default attributes will be applied to your load balancer. You can view and edit them after creating the load balancer.

Task 3: Create a Launch Configuration and an Auto Scaling Group


EC2 Management Console
us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#LaunchConfigurations:
Apps
Lambton in Mississ...
myHomepage | my...
Queens
Dashboard
Lambton College
Stock
Data Analytics
Write_Assist
Linux
Other bookmarks
aws
Services
Search
[Alt+S]
N. Virginia
voclabs/user2260334=Aadarsha_Chapagain @ 4407-9850-8116
Actions
Copy to launch template
Create launch configuration
Search launch configurations
1
Feedback
Looking for language selection? Find it in the new Unified Settings
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59%
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6:26 PM

Successfully created launch configuration: LabConfig

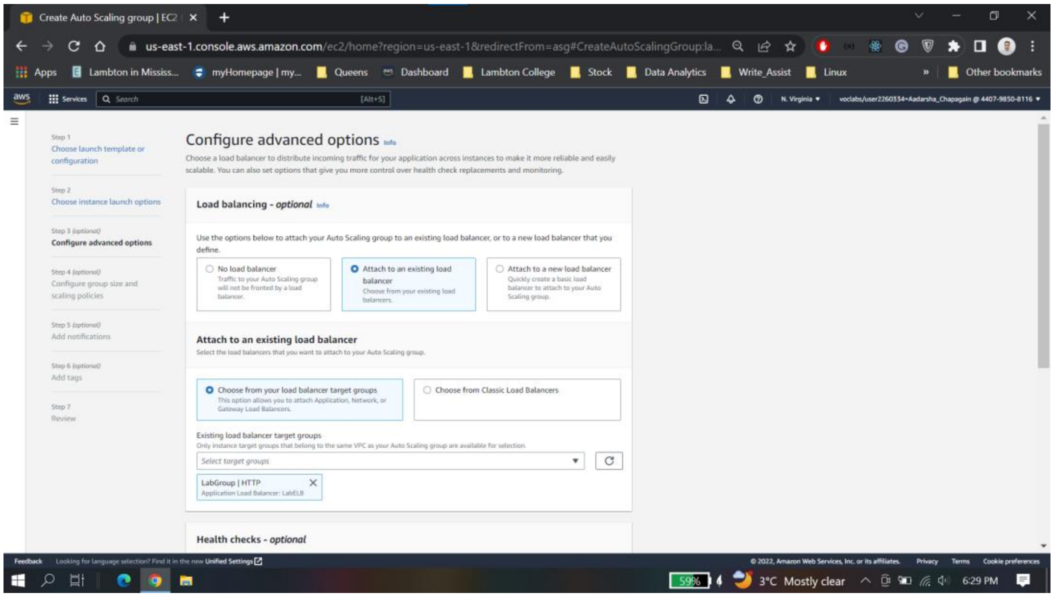
EC2 > Launch configurations

Launch configurations (1) Info

□	Name	AMI ID	Instance type	Spot price	Creation time
□	LabConfig	ami-023d6301bc...	t2.micro	-	Tue Nov 22 2022 18:25:50 GMT-050...

Select a launch configuration above

Creta Auto scaling group


Create Auto Scaling group | EC2
us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1&redirectFrom=asg#CreateAutoScalingGroup:la...
Apps
Lambton in Mississ...
myHomepage | my...
Queens
Dashboard
Lambton College
Stock
Data Analytics
Write_Assist
Linux
Other bookmarks
Services
Search
[Alt+S]
N. Virginia
voclabs/user2260334=Aadarsha_Chapagain @ 4407-9850-8116
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59%
3°C Mostly clear
6:29 PM

Step 1
Choose launch template or configuration

Step 2
Choose instance launch options

Step 3 *(optional)*
Configure advanced options

Step 4 *(optional)*
Configure group size and scaling policies

Step 5 *(optional)*
Add notifications

Step 6 *(optional)*
Add tags

Step 7
Review

Configure advanced options Info

Choose a load balancer to distribute incoming traffic for your application across instances to make it more reliable and easily scalable. You can also set options that give you more control over health check replacements and monitoring.

Load balancing - *optional* Info

Use the options below to attach your Auto Scaling group to an existing load balancer, or to a new load balancer that you define.

○ No load balancer
Traffic to your Auto Scaling group will not be fronted by a load balancer.

● Attach to an existing load balancer
Choose from your existing load balancers.

○ Attach to a new load balancer
Quickly create a basic load balancer to attach to your Auto Scaling group.

Attach to an existing load balancer
Select the load balancers that you want to attach to your Auto Scaling group.

● Choose from your load balancer target groups
This option allows you to attach Application, Network, or Gateway Load Balancers.

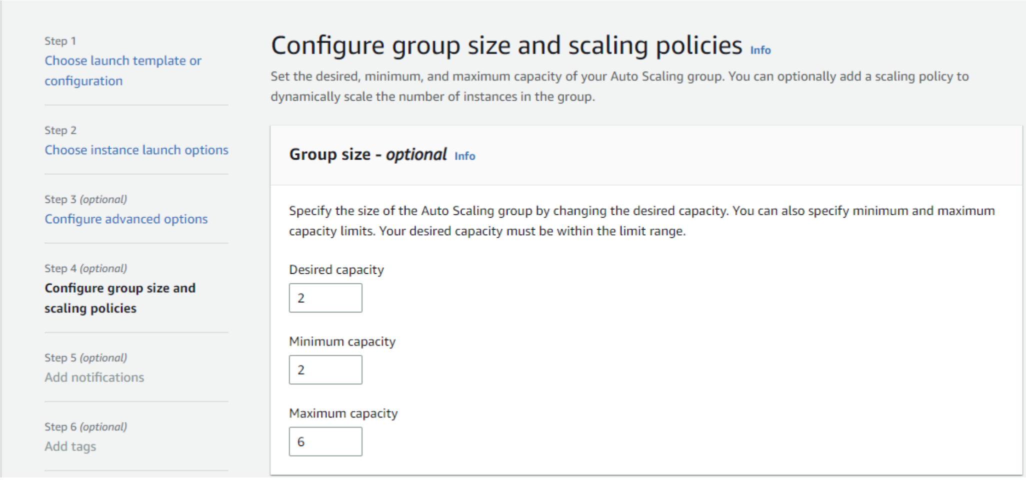
○ Choose from Classic Load Balancers

Existing load balancer target groups
Only instance target groups that belong to the same VPC as your Auto Scaling group are available for selection.

Select target groups

LabGroup | HTTP
Application Load Balancer: LabELB

Health checks - *optional*



Step 1
Choose launch template or configuration

Step 2
Choose instance launch options

Step 3 *(optional)*
Configure advanced options

Step 4 *(optional)*
Configure group size and scaling policies

Step 5 *(optional)*
Add notifications

Step 6 *(optional)*
Add tags

Configure group size and scaling policies Info

Set the desired, minimum, and maximum capacity of your Auto Scaling group. You can optionally add a scaling policy to dynamically scale the number of instances in the group.

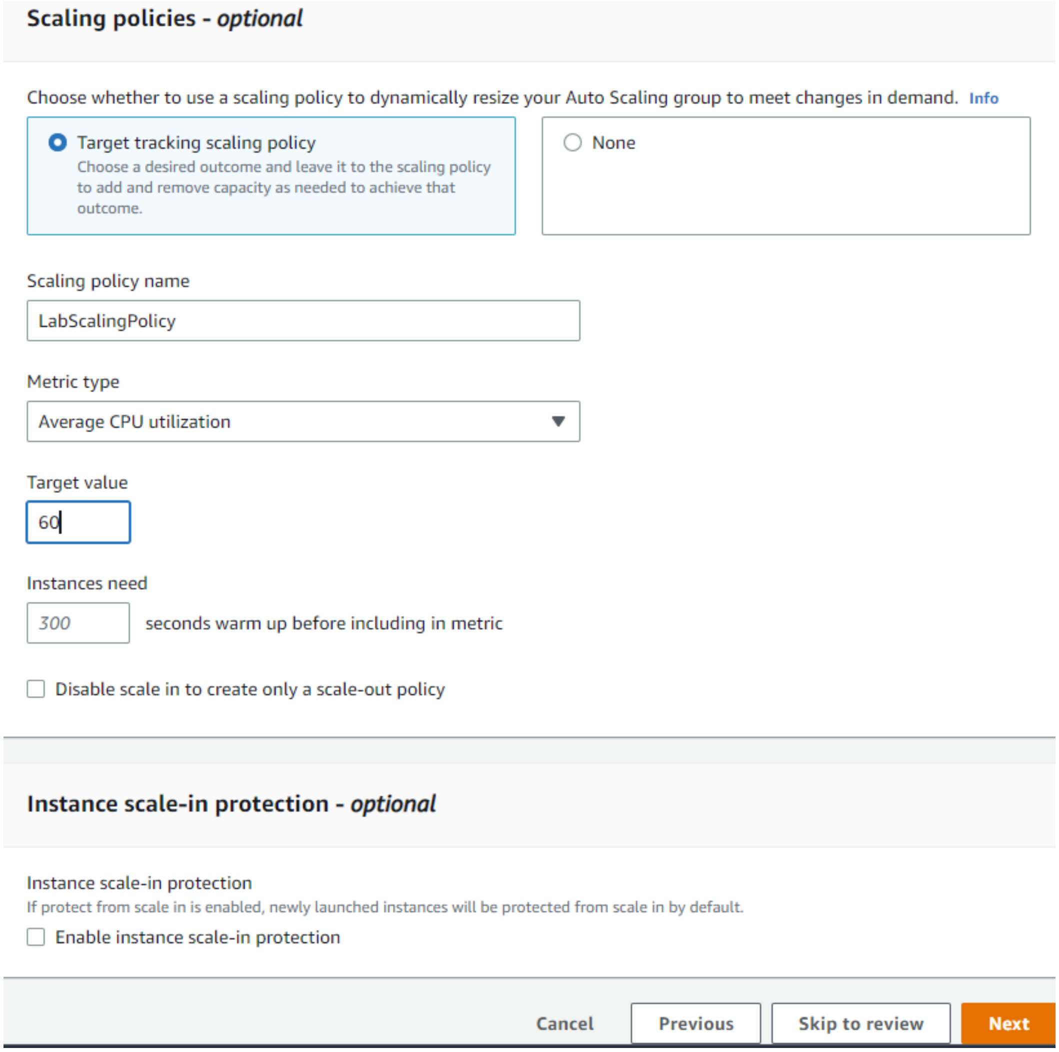
Group size - *optional* Info

Specify the size of the Auto Scaling group by changing the desired capacity. You can also specify minimum and maximum capacity limits. Your desired capacity must be within the limit range.

Desired capacity
2

Minimum capacity
2

Maximum capacity
6



Scaling policies - *optional*

Choose whether to use a scaling policy to dynamically resize your Auto Scaling group to meet changes in demand. Info

● Target tracking scaling policy
Choose a desired outcome and leave it to the scaling policy to add and remove capacity as needed to achieve that outcome.

○ None

Scaling policy name
LabScalingPolicy

Metric type
Average CPU utilization ▼

Target value
60

Instances need
300 seconds warm up before including in metric

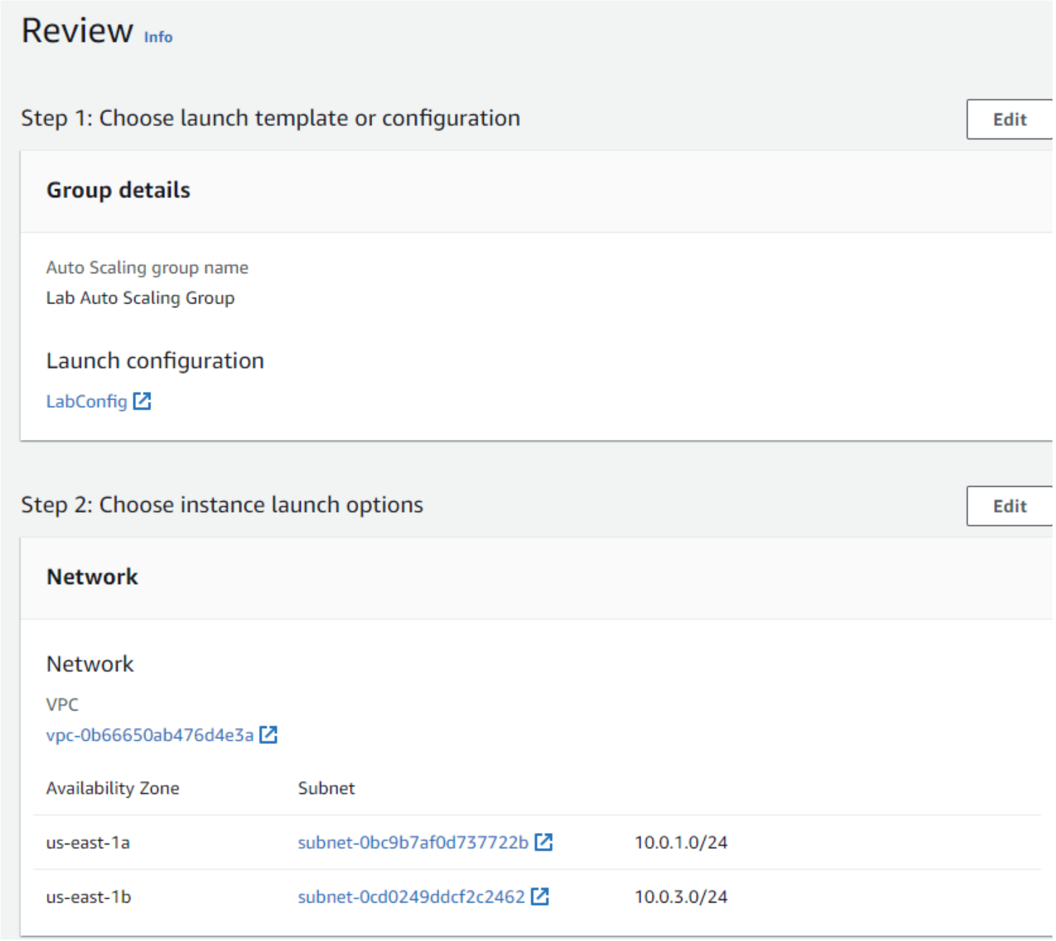
□ Disable scale in to create only a scale-out policy

Instance scale-in protection - *optional*

Instance scale-in protection
If protect from scale in is enabled, newly launched instances will be protected from scale in by default.

□ Enable instance scale-in protection

Review the configurations



Review

Step 1: Choose launch template or configuration

Group details

Auto Scaling group name
Lab Auto Scaling Group

Launch configuration
LabConfig

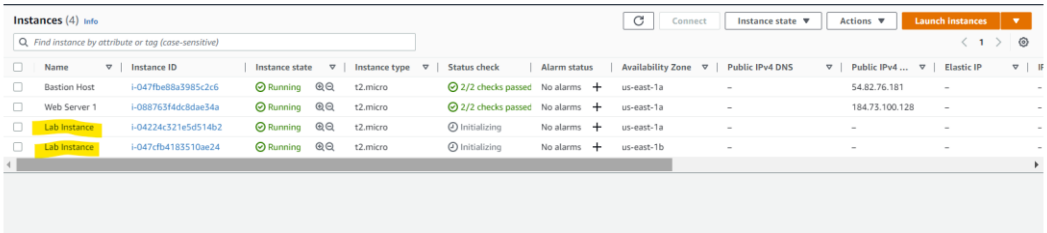
Step 2: Choose instance launch options

Network

Network
VPC
vpc-0b66650ab476d4e3a

Availability Zone	Subnet	
us-east-1a	subnet-0bc9b7af0d737722b	10.0.1.0/24
us-east-1b	subnet-0cd0249ddcf2c2462	10.0.3.0/24

Newly launched two instances

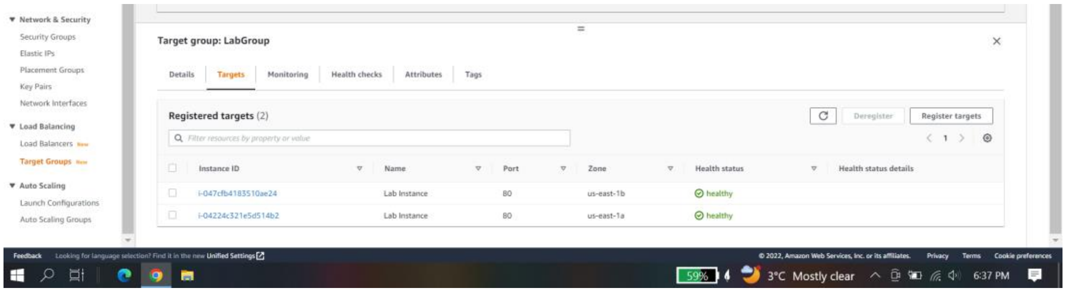


Instances (4)

□	Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS	Public IPv4 ...	Elastic IP	IP
□	Bastion Host	i-047fbe88a3985c2c6	Running	t2.micro	2/2 checks passed	No alarms +	us-east-1a	–	54.82.76.181	–	–
□	Web Server 1	i-088763f4dc8dae34a	Running	t2.micro	2/2 checks passed	No alarms +	us-east-1a	–	184.73.100.128	–	–
□	Lab Instance	i-04224c321e5d514b2	Running	t2.micro	Initializing	No alarms +	us-east-1a	–	–	–	–
□	Lab Instance	i-047cfb4183510ae24	Running	t2.micro	Initializing	No alarms +	us-east-1b	–	–	–	–

Task 4: Verify that Load Balancing is Working

Healthy indicates that an instance has passed the Load Balancer's health check. This means that the Load Balancer will send traffic to the instance

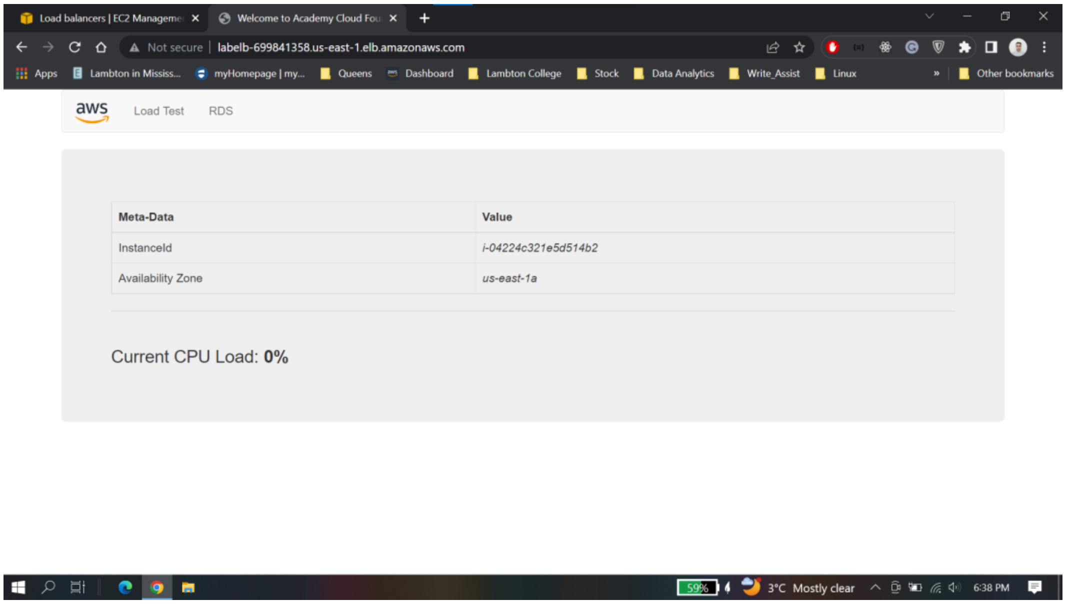


Target group: LabGroup

Registered targets (2)

Instance ID	Name	Port	Zone	Health status	Health status details
i-047cfb4183510ae24	Lab Instance	80	us-east-1b	healthy	
i-04224c321e5d514b2	Lab Instance	80	us-east-1a	healthy	

Test Load balancer



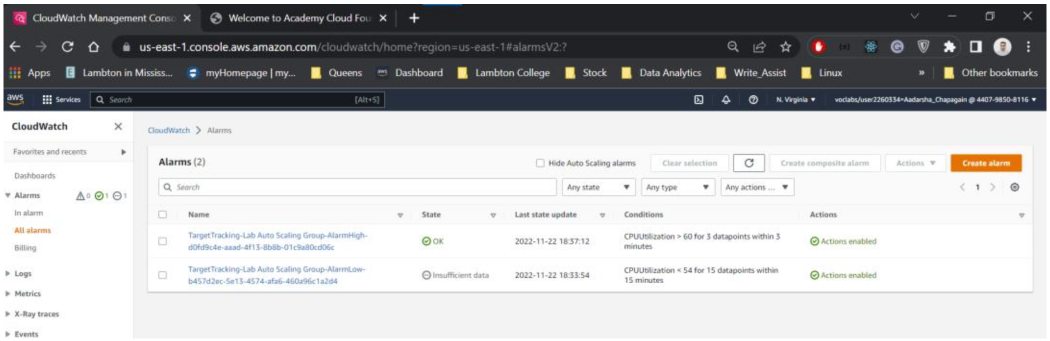
Meta-Data	Value
InstanceId	*i-04224c321e5d514b2*
Availability Zone	*us-east-1a*

Current CPU Load: **0%**

This indicates that the Load Balancer received the request, sent it to one of the EC2 instances, then passed back the result.

Task 5: Test Auto Scaling

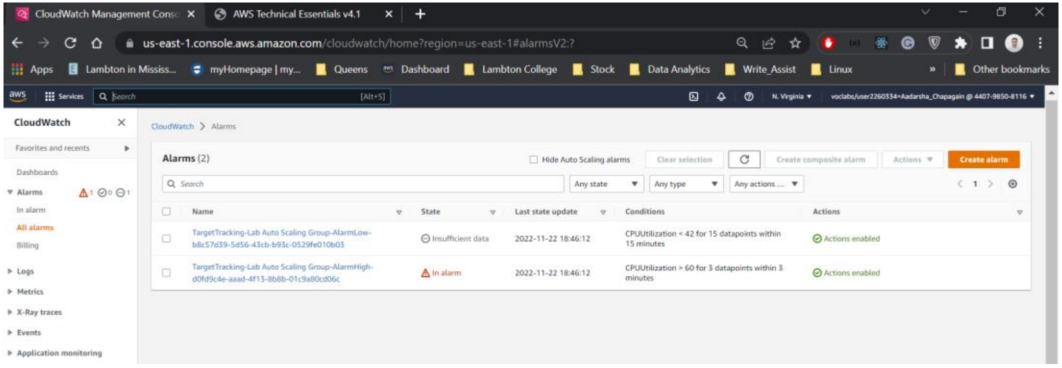
Two alarms under cloudwatch



Alarms (2)

Name	State	Last state update	Conditions	Actions
TargetTracking-Lab Auto Scaling Group-AlarmHigh-d0fd9c4e-aaad-4f13-8b8b-01c9a80cd06c	OK	2022-11-22 18:37:12	CPUUtilization > 60 for 3 datapoints within 3 minutes	Actions enabled
TargetTracking-Lab Auto Scaling Group-AlarmLow-b457d2ec-5e13-4574-afa6-460a96c1a2d4	Insufficient data	2022-11-22 18:33:54	CPUUtilization < 54 for 15 datapoints within 15 minutes	Actions enabled

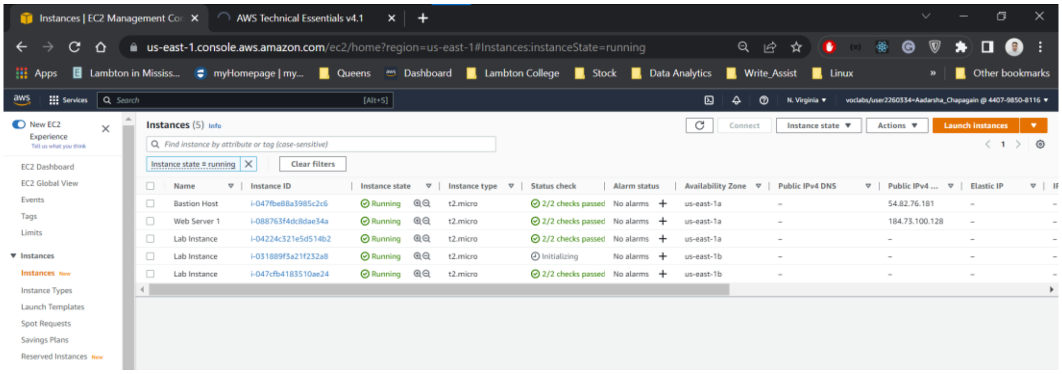
After Performing load test Here Alarm high is in "**In Alarm** " state



Alarms (2)

Name	State	Last state update	Conditions	Actions
TargetTracking-Lab Auto Scaling Group-AlarmLow-b8c57d39-5d56-43cb-b93c-0529fe010b03	Insufficient data	2022-11-22 18:46:12	CPUUtilization < 42 for 15 datapoints within 15 minutes	Actions enabled
TargetTracking-Lab Auto Scaling Group-AlarmHigh-d0fd9c4e-aaad-4f13-8b8b-01c9a80cd06c	In alarm	2022-11-22 18:46:12	CPUUtilization > 60 for 3 datapoints within 3 minutes	Actions enabled

Number of lab instances has increased as well from 2 to 3 instances to handle the load



Instances (5)

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS	Public IPv4 ...	Elastic IP
Bastion Host	i-047fbe88a3985c2c6	Running	t2.micro	2/2 checks passed	No alarms	us-east-1a	–	54.82.76.181	–
Web Server 1	i-088763f4dc8dae34a	Running	t2.micro	2/2 checks passed	No alarms	us-east-1a	–	184.73.100.128	–
Lab Instance	i-04224c321e5d514b2	Running	t2.micro	2/2 checks passed	No alarms	us-east-1a	–	–	–
Lab Instance	i-031889f3a21f232a8	Running	t2.micro	Initializing	No alarms	us-east-1b	–	–	–
Lab Instance	i-047cfb4183510ae24	Running	t2.micro	2/2 checks passed	No alarms	us-east-1b	–	–	–

Lab 6 Conclusion

- Created an Amazon Machine Image (AMI) from a running instance.
- Created a load balancer.
- Created a launch configuration and an Auto Scaling group.
- Automatically scale new instances within a private subnet
- Created Amazon CloudWatch alarms and monitor performance of your infrastructure.