

Name : Mohammad Faraz M Khan

Enrollment No. : A70405219039

Course : B.Tech (CSE) Sem-7

Subject : Cloud Computing Lab

Experiment : 6

Problem Statement

1. Attach EBS volume to the instance
2. Remove EBS volume from the instance
3. Create a Load balancer
4. Create Auto Scaling of instance

Results :

1. Attach EBS volume to the instance

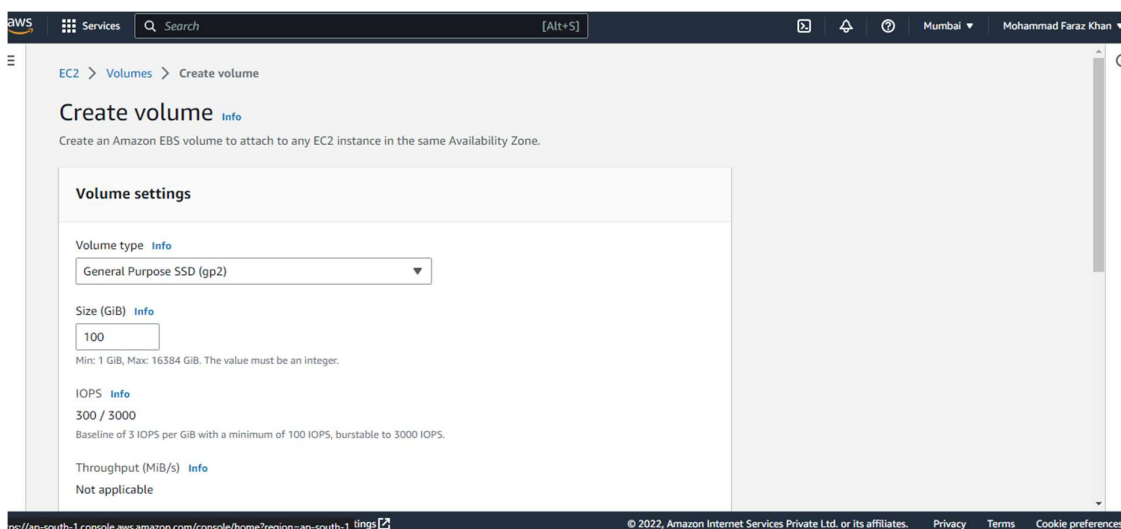
THEORY

You may attach a robust, block-level storage device called an Amazon EBS volume to your instances. You may utilise a volume as you would a physical hard disc after attaching it to an instance. EBS volumes can be changed. You may dynamically adjust the volume type, provisioned IOPS capacity, and size for current-generation volumes that are associated to current generation instance types.

For data that needs frequent changes, such as the system drive for an instance or storage for a database application, you may utilise EBS volumes as main storage. They can also be used for applications with high throughput requirements that run continuous disc scans. EBS volumes survive independently of an EC2 instance's active life.

A single instance can have many EBS volumes attached. There must be a shared Availability Zone between the volume and the instance. You may use Multi-Attach to simultaneously mount a volume to several instances, depending on the volume and instance types.

Creating EBS Volume



The screenshot displays the AWS Management Console interface for creating an EBS volume. The breadcrumb navigation shows 'EC2 > Volumes > Create volume'. The main heading is 'Create volume' with an 'Info' link. Below this, a sub-header reads 'Create an Amazon EBS volume to attach to any EC2 instance in the same Availability Zone.' The 'Volume settings' section contains the following fields and information:

- Volume type:** A dropdown menu currently showing 'General Purpose SSD (gp2)'.
- Size (GiB):** A text input field containing the value '100'. Below the field, it states 'Min: 1 GiB, Max: 16384 GiB. The value must be an integer.'
- IOPS:** A section showing '300 / 3000' and a note: 'Baseline of 3 IOPS per GiB with a minimum of 100 IOPS, burstable to 3000 IOPS.'
- Throughput (MiB/s):** A section showing 'Not applicable'.

The footer of the console shows the URL 'ps://ap-south-1.console.aws.amazon.com/console/home?region=ap-south-1 tings', the copyright notice '© 2022, Amazon Internet Services Private Ltd. or its affiliates.', and links for 'Privacy', 'Terms', and 'Cookie preferences'.

Volumes | EC2 Management Console

ap-south-1.console.aws.amazon.com/ec2/home?region=ap-south-1#Volumes:

Services Search [Alt+S]

New EC2 Experience Tell us what you think

EC2 Dashboard
EC2 Global View
Events
Tags
Limits

Instances
Instances New
Instance Types
Launch Templates
Spot Requests
Savings Plans
Reserved Instances New
Dedicated Hosts
Capacity Reservations

Images

You can now create Amazon Data Lifecycle Manager policies to automate snapshot management directly from this screen. Select the volumes to back up, and then choose **Actions**, **Create snapshot lifecycle policy**. For more information, see the [Knowledge Center article](#).

Volumes (5)

Search

	Name	Volume ID	Type	Size	IOPS	Throughput	Snapshot	Created
<input type="checkbox"/>	-	vol-09487715e9d047643	gp2	8 GiB	100	-	snap-08ca0f1...	2022/11/09 13
<input type="checkbox"/>	-	vol-051d36cbc2745a3a0	gp2	1 GiB	100	-	-	2022/11/21 15
<input type="checkbox"/>	-	vol-0b2b623debbd30b5f	gp2	8 GiB	100	-	snap-0f0f2d1...	2022/11/28 15
<input type="checkbox"/>	-	vol-00e34985863844320	gp2	10 GiB	100	-	-	2022/11/21 14
<input type="checkbox"/>	-	vol-06e4b9bd5d721579c	gp2	8 GiB	100	-	snap-0f0f2d1...	2022/11/21 15

Select a volume above

Feedback Looking for language selection? Find it in the new Unified Settings

© 2022, Amazon Internet Services Private Ltd. or its affiliates. Privacy Terms Cookie preferences

Attaching the EC2 Instance to the EBS Volume

Volumes | EC2 Management Console

ap-south-1.console.aws.amazon.com/ec2/home?region=ap-south-1#Volumes:

Services Search [Alt+S]

New EC2 Experience Tell us what you think

EC2 Dashboard
EC2 Global View
Events
Tags
Limits

Instances
Instances New
Instance Types
Launch Templates
Spot Requests
Savings Plans
Reserved Instances New
Dedicated Hosts
Capacity Reservations

Images

You can now create Amazon Data Lifecycle Manager policies to automate snapshot management directly from this screen. Select the volumes to back up, and then choose **Actions**, **Create snapshot lifecycle policy**. For more information, see the [Knowledge Center article](#).

Volumes (1/5)

Search

	Name	Volume ID	Type	Size	IOPS
<input type="checkbox"/>	-	vol-09487715e9d047643	gp2	8 GiB	100
<input checked="" type="checkbox"/>	-	vol-051d36cbc2745a3a0	gp2	1 GiB	100
<input type="checkbox"/>	-	vol-0b2b623debbd30b5f	gp2	8 GiB	100
<input type="checkbox"/>	-	vol-00e34985863844320	gp2	10 GiB	100
<input type="checkbox"/>	-	vol-06e4b9bd5d721579c	gp2	8 GiB	100

Actions

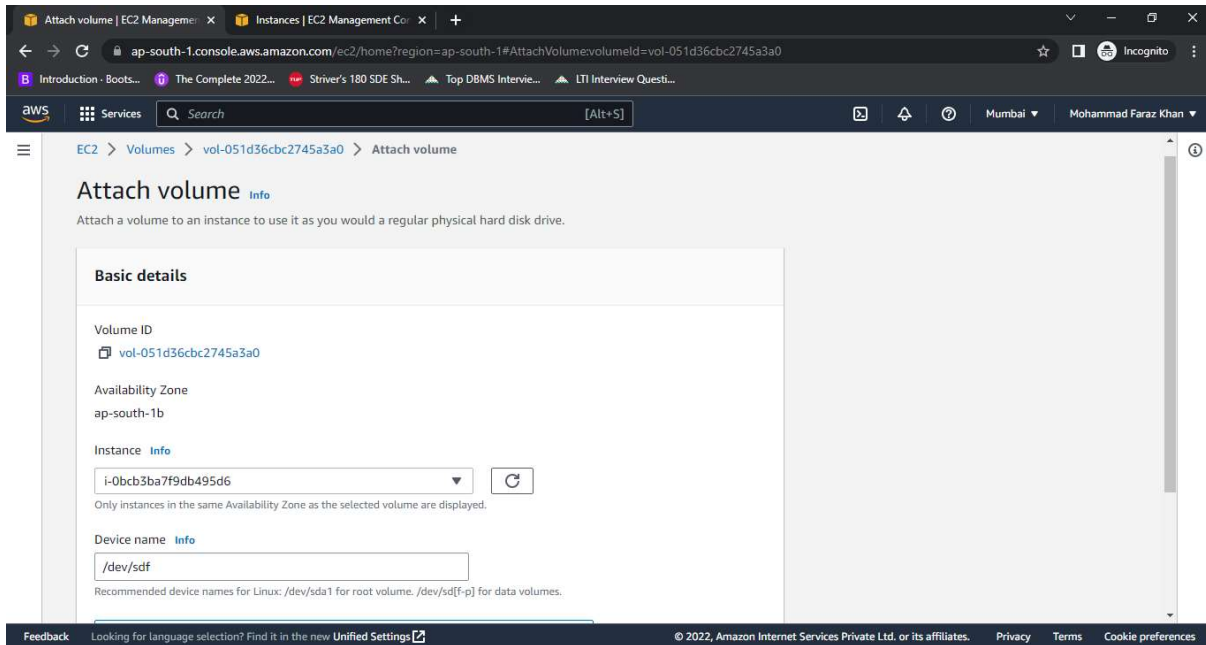
- Modify volume
- Create snapshot
- Create snapshot lifecycle policy
- Delete volume
- Attach volume
- Detach volume
- Force detach volume
- Manage auto-enabled I/O
- Manage tags

Volume ID: vol-051d36cbc2745a3a0

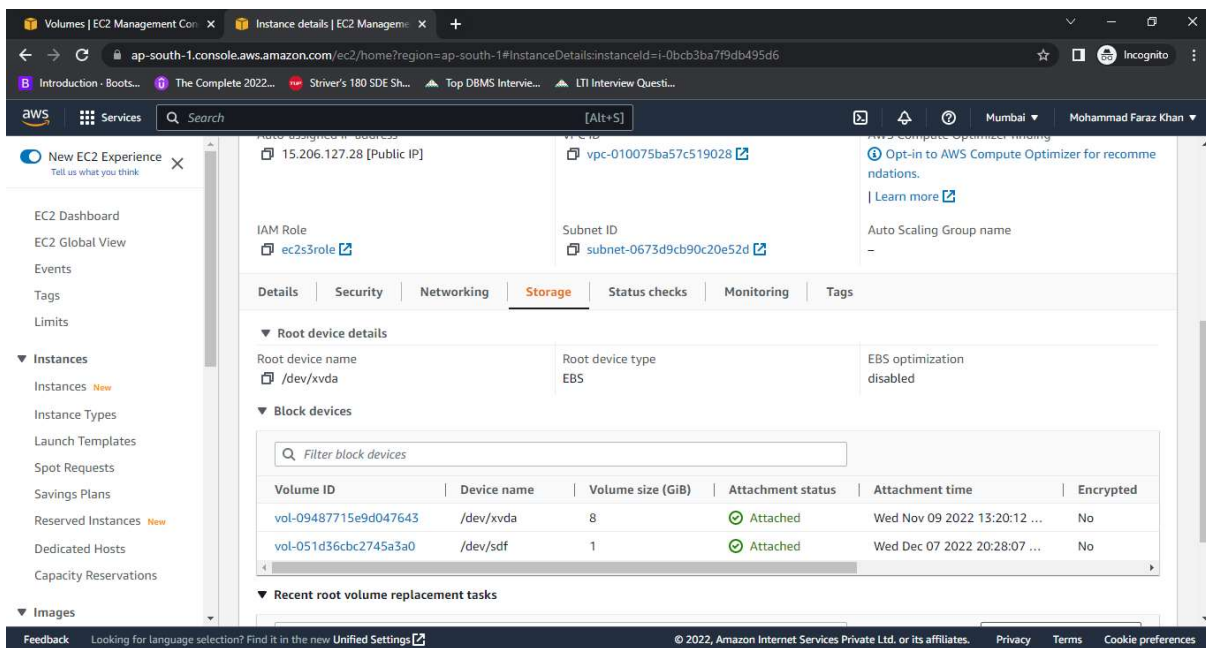
Details Status checks Monitoring Tags

Feedback Looking for language selection? Find it in the new Unified Settings

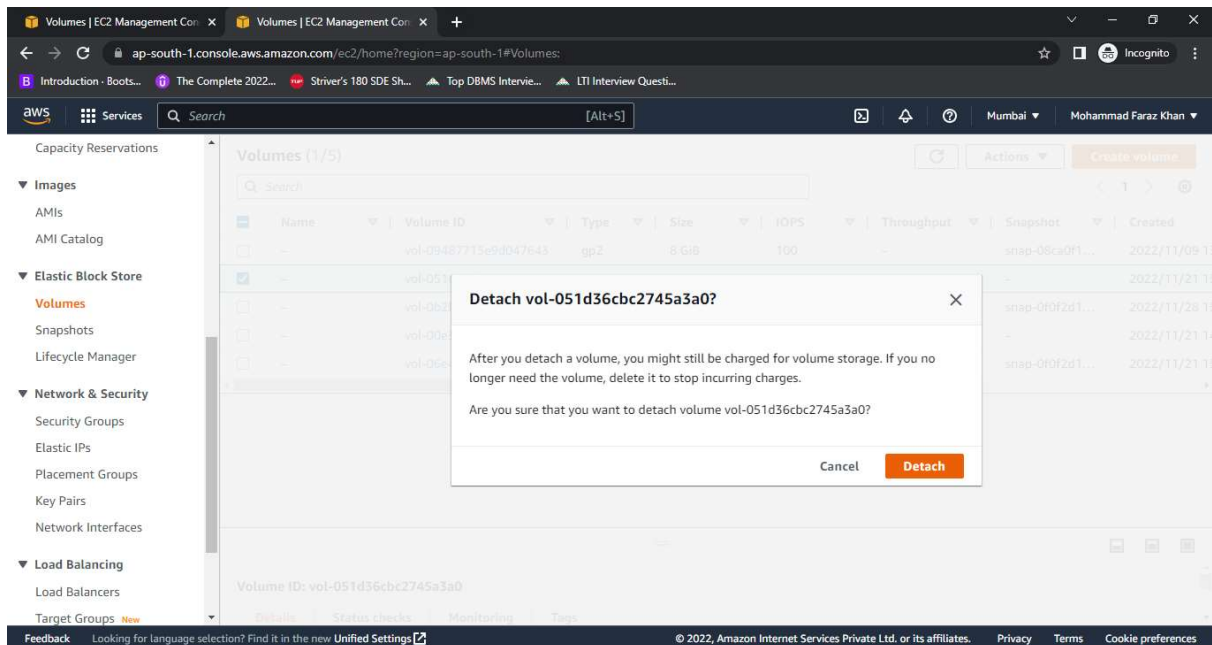
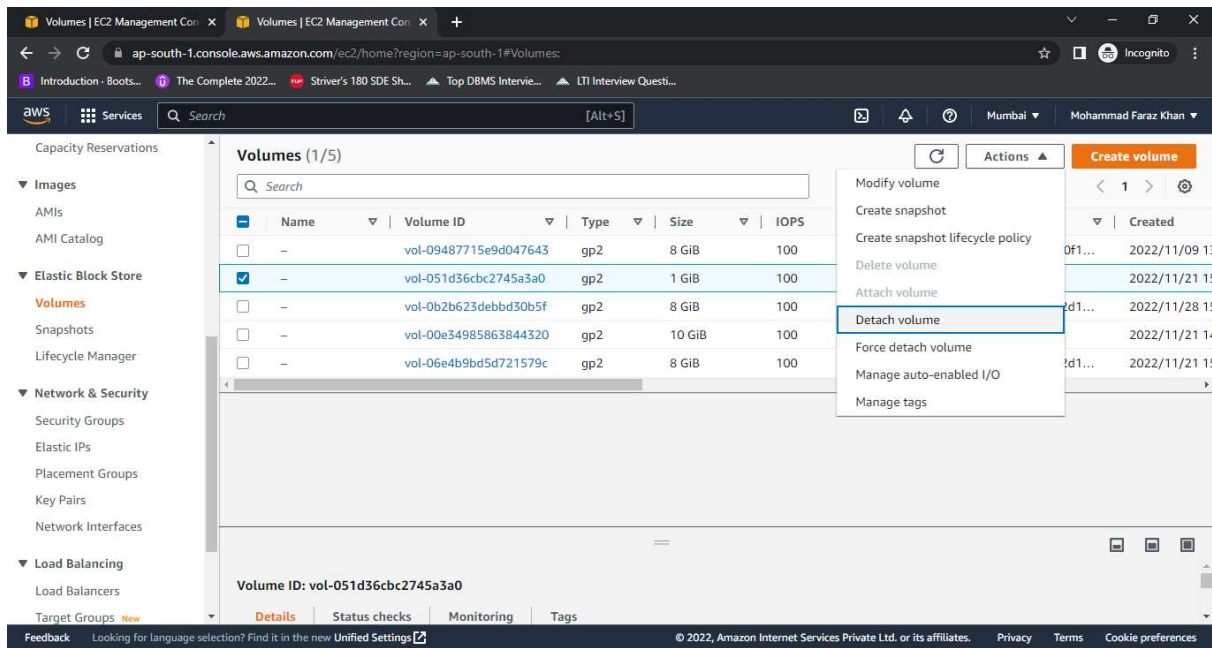
© 2022, Amazon Internet Services Private Ltd. or its affiliates. Privacy Terms Cookie preferences



- Successfully Attached



2. Detach EBS volume from the instance



• Successfully Detached

Browser tabs: Volumes | EC2 Management Console, Instance details | EC2 Management Console. Address bar: ap-south-1.console.aws.amazon.com/ec2/home?region=ap-south-1#InstanceDetails:instanceId=i-0bcb3ba7f9db495d6. Search bar: [Alt+S].

Left sidebar: New EC2 Experience, EC2 Dashboard, EC2 Global View, Events, Tags, Limits, Instances (selected), Instance Types, Launch Templates, Spot Requests, Savings Plans, Reserved Instances, Dedicated Hosts, Capacity Reservations, Images.

Main content area: Storage tab selected. Sub-tabs: Details, Security, Networking, Storage, Status checks, Monitoring, Tags.

▼ Root device details

Root device name /dev/xvda	Root device type EBS	EBS optimization disabled
-------------------------------	-------------------------	------------------------------

▼ Block devices

Filter block devices

Volume ID	Device name	Volume size (GiB)	Attachment status	Attachment time	Encrypted
vol-09487715e9d047643	/dev/xvda	8	Attached	Wed Nov 09 2022 13:20:12 ...	No

▼ Recent root volume replacement tasks

Filter tasks

Replace root volume

Task ID	Task state	Start time	Completion time	Tags
No recent replace root volume tasks				

Footer: Feedback, Looking for language selection? Find it in the new Unified Settings, © 2022, Amazon Internet Services Private Ltd. or its affiliates, Privacy, Terms, Cookie preferences.

3. Create a Load balancer

THEORY

- Your incoming traffic is automatically split across several targets, including EC2 instances, containers, and IP addresses in one or more Availability Zones, thanks to elastic load balancing. It keeps track of the wellbeing of the registered targets, only sending traffic to those that are in good shape. Elastic load balancing automatically adjusts the capacity of your load balancer in response to variations in incoming traffic.

Benefits of Load Balancer

- Workloads are divided up across various computing resources, such virtual servers, via a load balancer. Your applications' availability and fault tolerance will be improved by using a load balancer.
- Without affecting the overall flow of requests to your apps, you may add and subtract computing resources from your load balancer as your needs change.
- To ensure that the load balancer only sends requests to the healthy compute resources, you may implement health checks, which keep an eye on their condition. Additionally, you may delegate encryption and decryption tasks to your load balancer, freeing up your computational resources to concentrate on their primary tasks.
- To start with, before creating the Load Balancer we will have to create a security group

Creating the Security Group

EC2 > Security Groups > Create security group

Create security group [Info](#)

A security group acts as a virtual firewall for your instance to control inbound and outbound traffic. To create a new security group, complete the fields below.

Basic details

Security group name [Info](#)

Name cannot be edited after creation.

Description [Info](#)

VPC [Info](#)

Inbound rules [Info](#)

Feedback Looking for language selection? Find it in the new [Unified Settings](#)

© 2022, Amazon Internet Services Private Ltd. or its affiliates. [Privacy](#) [Terms](#) [Cookie preferences](#)

EC2 > Security Groups > Create security group

Create security group [Info](#)

A security group acts as a virtual firewall for your instance to control inbound and outbound traffic. To create a new security group, complete the fields below.

Basic details

Security group name [Info](#)

Name cannot be edited after creation.

Description [Info](#)

VPC [Info](#)

Inbound rules [Info](#)

Outbound rules [Info](#)

Type Info	Protocol Info	Port range Info	Destination Info	Description - optional Info
HTTP	TCP	80	Anywh... 0.0.0.0/0	

[Add rule](#)

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.

[Add new tag](#)

You can add up to 50 more tags.

Cancel [Create security group](#)

Feedback Looking for language selection? Find it in the new [Unified Settings](#)

© 2022, Amazon Internet Services Private Ltd. or its affiliates. [Privacy](#) [Terms](#) [Cookie preferences](#)

Creating a Load Balancer

Instance Types

Launch Templates

Spot Requests

Savings Plans

Reserved Instances New

Dedicated Hosts

Capacity Reservations

▼ Images

AMIs

AMI Catalog

▼ Elastic Block Store

Volumes

Snapshots

Lifecycle Manager

▼ Network & Security

Security Groups

Elastic IPs

Placement Groups

Key Pairs

Network Interfaces

▼ Load Balancing

Load Balancers

Target Groups New

Create Load Balancer

Actions ▼

Filter by tags and attributes or search by keyword

<< None found >>

Name	DNS name	State	VPC ID	Availability Zones	Type
You do not have any load balancers in this region.					

Select a load balancer

Feedback

Looking for language selection? Find it in the new Unified Settings

© 2022, Amazon Internet Services Private Ltd. or its affiliates.

Privacy

Terms

Cookie preferences

Volumes | EC2 Management Co

Load balancers | EC2 Manage

ap-south-1.console.aws.amazon.com/ec2/home?region=ap-south-1#SelectCreateELBWizard

Incognito

Introduction - Boots...

The Complete 2022...

Striver's 180 SDE Sh...

Top DBMS Intervie...

LTI Interview Quest...

Services

Search

[Alt+S]

Mumbai

Mohammad Faraz Khan

EC2 > Load balancers > Select load balancer type

Select load balancer type

A complete feature-by-feature comparison along with detailed highlights is also available. [Learn more](#)

Load balancer types

Application Load Balancer [Info](#)

Network Load Balancer [Info](#)

Gateway Load Balancer [Info](#)

Feedback

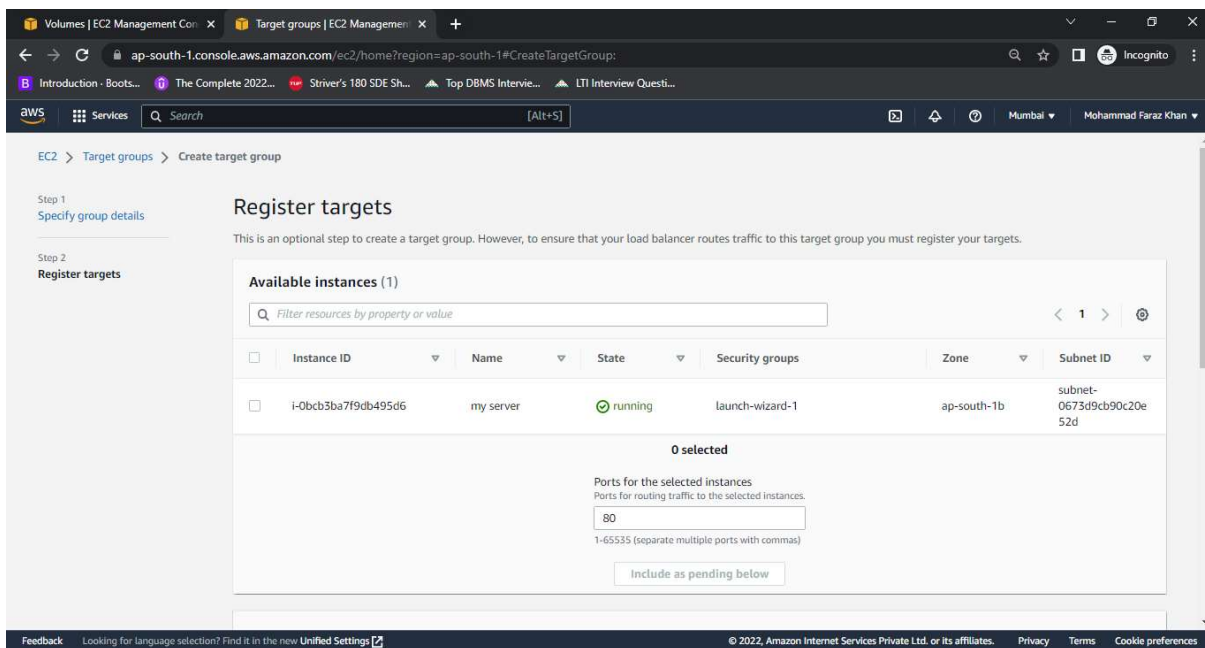
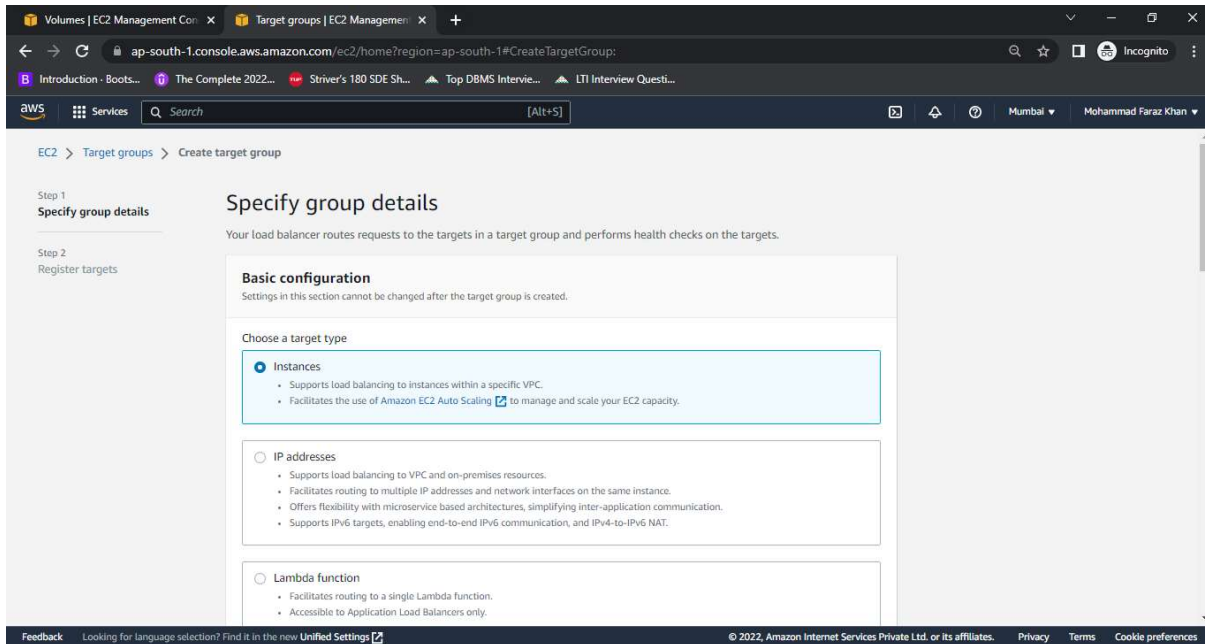
Looking for language selection? Find it in the new Unified Settings

© 2022, Amazon Internet Services Private Ltd. or its affiliates.

Privacy

Terms

Cookie preferences



- Attaching the security group, created earlier, to the load balancer

Security groups [Info](#)
A security group is a set of firewall rules that control the traffic to your load balancer.

Security groups
Select up to 5 security groups

[Create new security group](#) [↗](#)

security_group sg-0c689b22853525d5e
VPC: vpc-0676e8a3fb243fbce

Listeners and routing [Info](#)
A listener is a process that checks for connection requests using the port and protocol you configure. The rules that you define for a listener determine how the load balancer routes requests to its registered targets.

▼ Listener HTTP:80

Protocol Port Default action [Info](#)
HTTP : 80 Forward to target1 HTTP
1-65535 Target type: Instance, IPv4
[Create target group](#) [↗](#)

Listener tags - *optional*
Consider adding tags to your listener. Tags enable you to categorize your AWS resources so you can more easily manage them.

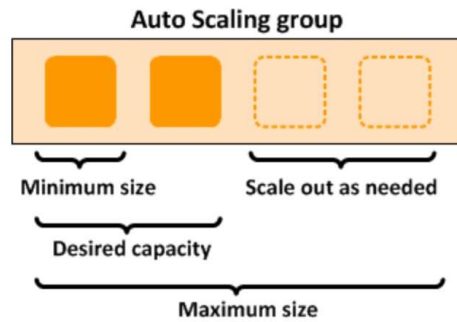
Feedback Looking for language selection? Find it in the new Unified Settings [↗](#) © 2022, Amazon Internet Services Private Ltd. or its affiliates. Privacy Terms Cookie preferences

4. Create Auto Scaling of instance

THEORY

- You can make sure that you have the appropriate number of Amazon EC2 instances available to handle the load for your application by using Amazon EC2 Auto Scaling. Auto Scaling groups are assemblages of EC2 instances that you build. Each Auto Scaling group has a minimum number of instances that can be specified, and Amazon EC2 Auto Scaling makes sure that your group never falls below this amount. Each Auto Scaling group has a maximum number of instances that can be specified, and Amazon EC2 Auto Scaling makes sure that your group never exceeds this amount. Amazon EC2 Auto Scaling makes sure that your group has the number of instances you select when you create the group or at any other time afterward if you specify the appropriate capacity. As the demand for your application rises or falls, Amazon EC2 Auto Scaling can launch or terminate instances provided scaling policies are specified.
- For instance, the next Auto Scaling group has a minimum instance size of one, a targeted instance capacity of two, and a maximum instance size of four. Within your minimum and maximum number of instances, the scaling policies

you design change the number of instances according to the parameters you set.



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

Choose launch template or configuration [Info](#)

Specify a launch template that contains settings common to all EC2 instances that are launched by this Auto Scaling group. If you currently use launch configurations, you might consider migrating to launch templates.

Name

Auto Scaling group name

Enter a name to identify the group.

Must be unique to this account in the current Region and no more than 255 characters.

Launch template [Info](#)

[Switch to launch configuration](#)

Launch template

Choose a launch template that contains the instance-level settings, such as the Amazon Machine Image (AMI), instance type, key pair, and security groups.

↻

[Create a launch template](#)

Cancel

Next

Feedback

Looking for language selection? Find it in the new [Unified Settings](#)

© 2022, Amazon Internet Services Private Ltd. or its affiliates.

[Privacy](#)

[Terms](#)

[Cookie preferences](#)

- Creating a Template

Create launch template | EC2 M... x +

ap-south-1.console.aws.amazon.com/ec2/home?region=ap-south-1#CreateTemplate:

Introduction - Boots... The Complete 2022... Striver's 180 SDE Sh... Top DBMS Intervie... LTI Interview Quest...

aws Services Search [Alt+S]

Mumbai Mohammad Faraz Khan

Create launch template

Creating a launch template allows you to create a saved instance configuration that can be reused, shared and launched at a later time. Templates can have multiple versions.

Launch template name and description

Launch template name - *required*

Template-1

Must be unique to this account. Max 128 chars. No spaces or special characters like '!', '"', '@'.

Template version description

N/A

Max 255 chars

Auto Scaling guidance [Info](#)

Select this if you intend to use this template with EC2 Auto Scaling

☒ Provide guidance to help me set up a template that I can use with EC2 Auto Scaling

Template tags

Source template

Summary

Software Image (AMI)

-

Virtual server type (instance type)

-

Firewall (security group)

-

Storage (volumes)

-

Free tier: In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which t2.micro is unavailable) instance usage on free tier AMIs per month, 30 GiB of EBS storage, 2 million I/Os, 1 GB of snapshots, and 100 GB of bandwidth to the internet.

Cancel Create launch template

Feedback Looking for language selection? Find it in the new [Unified Settings](#)

© 2022, Amazon Internet Services Private Ltd. or its affiliates. Privacy Terms Cookie preferences

Create launch template | EC2 M... x +

ap-south-1.console.aws.amazon.com/ec2/home?region=ap-south-1#CreateTemplate:

Introduction - Boots... The Complete 2022... Striver's 180 SDE Sh... Top DBMS Intervie... LTI Interview Quest...

aws Services Search [Alt+S]

Mumbai Mohammad Faraz Khan

Search our full catalog including 1000s of application and OS images

Recents Quick Start

Amazon Linux macOS Ubuntu Windows Red Hat

Amazon Machine Image (AMI)

Amazon Linux 2 AMI (HVM) - Kernel 5.10, SSD Volume Type

ami-074dc0a6f6c764218 (64-bit (x86)) / ami-019774e5cafd1685 (64-bit (Arm))

Virtualization: hvm ENA enabled: true Root device type: ebs

Free tier eligible

Description

Amazon Linux 2 Kernel 5.10 AMI 2.0.20221103.3 x86_64 HVM gp2

Architecture

64-bit (x86)

AMI ID

ami-074dc0a6f6c764218

Verified provider

Summary

Software Image (AMI)

Amazon Linux 2 Kernel 5.10 AMI...[read more](#)

ami-074dc0a6f6c764218

Virtual server type (instance type)

-

Firewall (security group)

-

Storage (volumes)

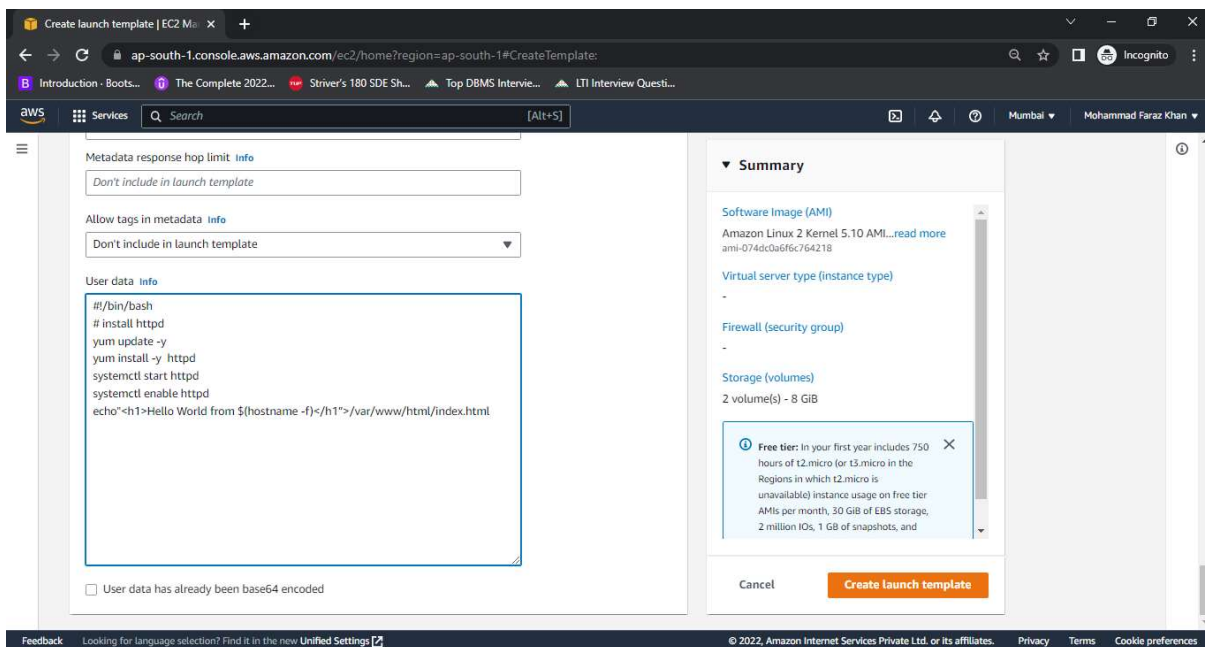
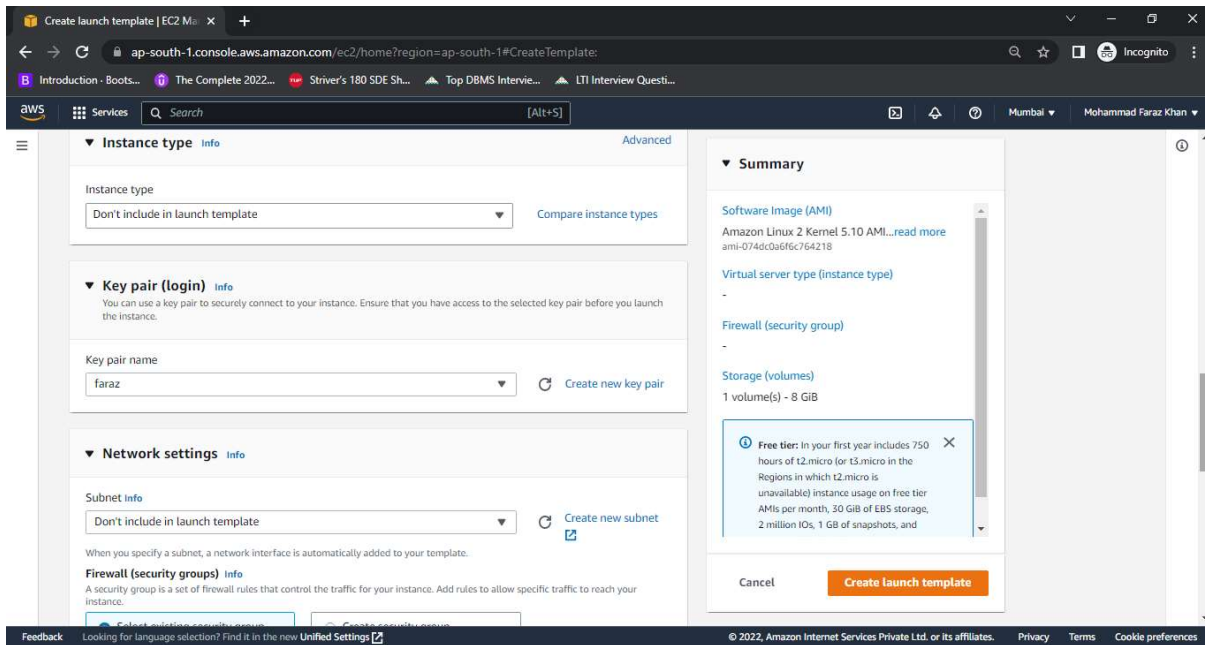
1 volume(s) - 8 GiB

Free tier: In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which t2.micro is unavailable) instance usage on free tier AMIs per month, 30 GiB of EBS storage, 2 million I/Os, 1 GB of snapshots, and 100 GB of bandwidth to the internet.

Cancel Create launch template

Feedback Looking for language selection? Find it in the new [Unified Settings](#)

© 2022, Amazon Internet Services Private Ltd. or its affiliates. Privacy Terms Cookie preferences

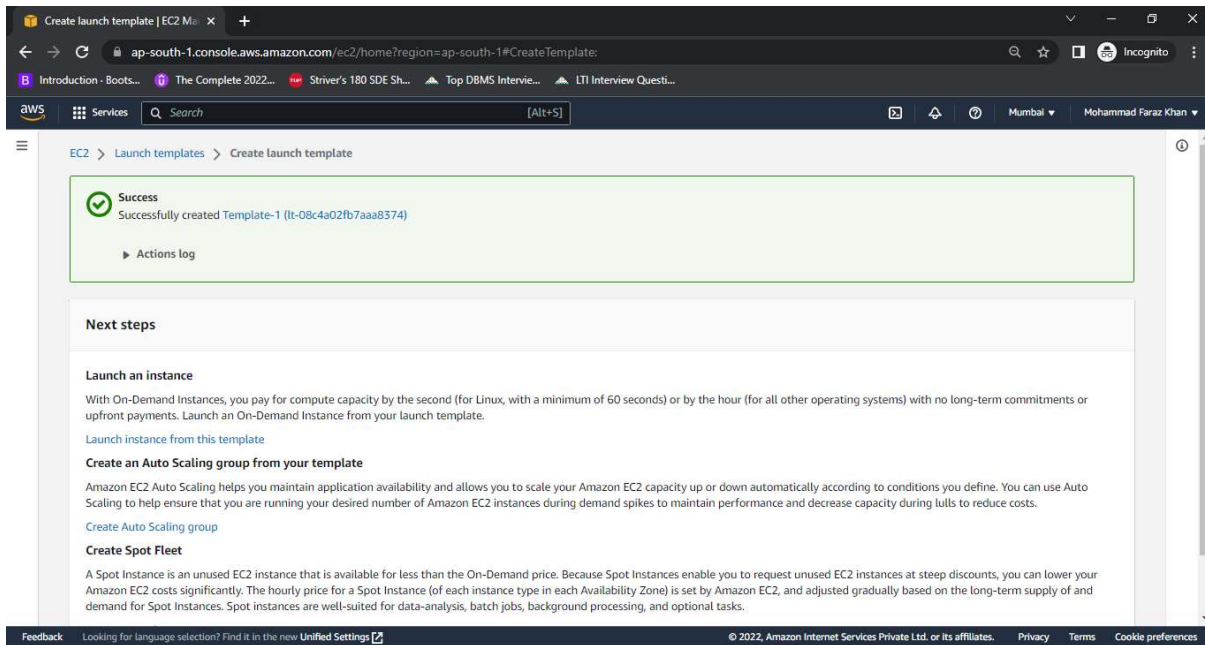


In the user data section, as shown above, insert the following code

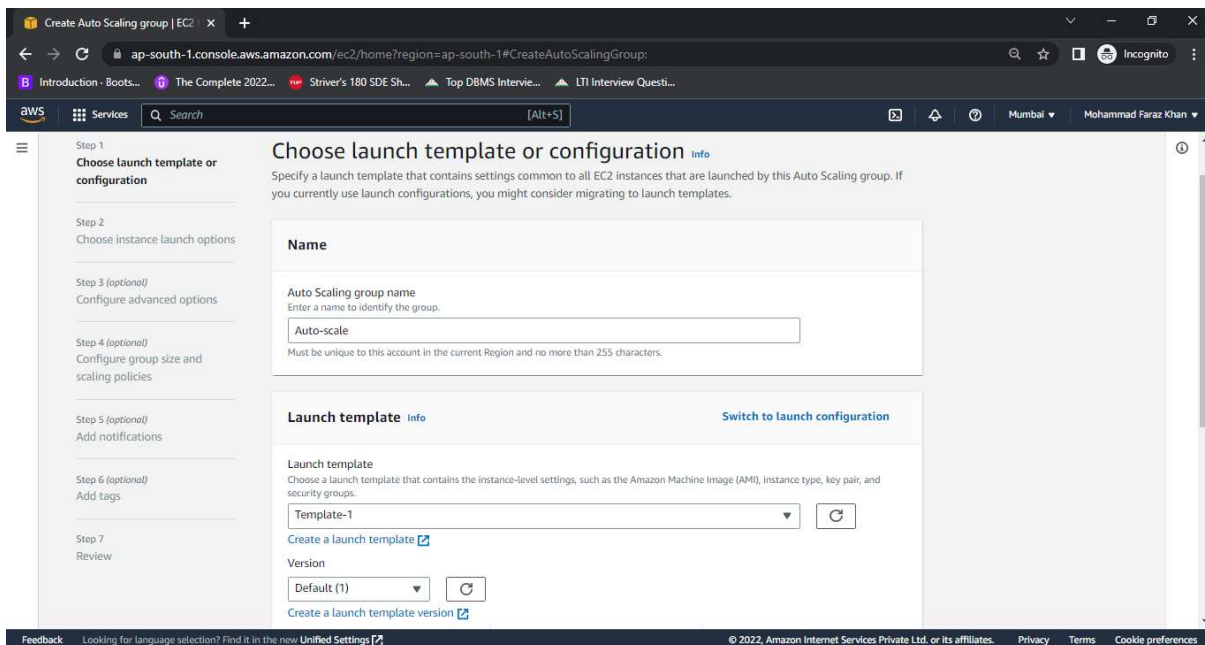
```
#!/bin/bash
# install httpd yum
update -y yum install
-y httpd systemctl
start httpd systemctl
enable httpd
```

```
echo"<h1>Hello World from $(hostname -f)</h1>">/var/www/html/index.html
```

Template successfully created



Attaching the created template



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

Network Info

For most applications, you can use multiple Availability Zones and let EC2 Auto Scaling balance your instances across the zones. The default VPC and default subnets are suitable for getting started quickly.

VPC
Choose the VPC that defines the virtual network for your Auto Scaling group.

vpc-0676e8a3fb243fbce

172.31.0.0/16

Default

Create a VPC

Availability Zones and subnets
Define which Availability Zones and subnets your Auto Scaling group can use in the chosen VPC.

Select Availability Zones and subnets

ap-south-1a | subnet-0aaf5fe8c27ac453

172.31.32.0/20

Default

ap-south-1b | subnet-01b38759be435444e

172.31.0.0/20

Default

ap-south-1c | subnet-09c44b08d2fab3b42

172.31.16.0/20

Default

172.31.16.0/20

Default

Create a subnet

Instance type requirements Info

You can keep the same instance attributes or instance type from your launch template, or you can choose to override the launch template by specifying different instance attributes or manually adding instance types.

Reset to launch template

Feedback

Looking for language selection? Find it in the new Unified Settings

© 2022, Amazon Internet Services Private Ltd. or its affiliates.

Privacy

Terms

Cookie preferences

Create Auto Scaling group | EC2

ap-south-1.console.aws.amazon.com/ec2/home?region=ap-south-1#CreateAutoScalingGroup:

Introduction - Boot... The Complete 2022... Striver's 180 SDE Sh... Top DBMS Intervie... LTI Interview Quest...

Services Search [Alt+S]

Mumbai Mohammad Faraz Khan

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

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

mygroup | HTTP

Application Load Balancer: MySample

Health checks - optional

Health check type Info

Feedback

Looking for language selection? Find it in the new Unified Settings

© 2022, Amazon Internet Services Private Ltd. or its affiliates.

Privacy

Terms

Cookie preferences

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

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 type

Choose the unit of measurement for the desired capacity value. By default, the desired capacity is measured in number of instances (units).

Units

Desired capacity

2

Minimum capacity

1

Maximum capacity

3

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

Feedback

Looking for language selection? Find it in the new Unified Settings

© 2022, Amazon Internet Services Private Ltd. or its affiliates.

Privacy

Terms

Cookie preferences

EC2 Dashboard

EC2 Global View

Events

Tags

Limits

Instances

Instances New

Instance Types

Launch Templates

Spot Requests

Savings Plans

Reserved Instances New

<input type="checkbox"/>	Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IP
<input type="checkbox"/>	LabInstance	i-0340fd48397121d68	Running	t2.micro	2/2 checks passed	No alarms	ap-south-1a	ec2-
<input type="checkbox"/>	2nd-Instance	i-0b392c2425dc9fb83	Running	t2.micro	2/2 checks passed	No alarms	ap-south-1a	ec2-
<input type="checkbox"/>	-	i-007b6d94dc4eb0b69	Running	t2.micro	Initializing	No alarms	ap-south-1a	ec2-
<input type="checkbox"/>	-	i-0ae072a886d6047f0	Running	t2.micro	Initializing	No alarms	ap-south-1b	ec2-

Select an instance

17 of 17