

# **Placement Empowerment Program**

## ***Cloud Computing and DevOps Centre***

### **Classic Load Balancer & Auto Scaling in AWS**

Name: Janani E

Department : CSE

## **Introduction:**

In today's PoC, I worked on implementing Classic Load Balancer (CLB) and Auto Scaling in AWS to ensure efficient traffic distribution and automatic resource management.

## What is Load Balancer?

A **Load Balancer** in AWS is a service that automatically distributes incoming traffic across multiple targets (such as EC2 instances, containers, and IP addresses) in different **Availability Zones** to ensure high availability, fault tolerance, and scalability.

## What is Auto Scaling?

**Auto Scaling** in AWS is a feature that automatically adjusts the number of EC2 instances in response to traffic demand. It ensures that the right number of instances are running to handle the load efficiently, reducing costs and improving availability.

## Benefits:

### ✓1. Hands-on Experience with Load Balancing

- Understands how **Classic Load Balancer (CLB)** distributes traffic across multiple EC2 instances.
- Ensures high **availability** and **fault tolerance**.

### ✓2. Improved Understanding of Auto Scaling

- Learns how to **dynamically scale** EC2 instances based on real-time demand.
- Ensures applications run efficiently without manual intervention.

### ✓3. Cost Optimization

- Prevents over-provisioning by **scaling down** instances when demand is low.
- Ensures **cost-efficient** resource management.

### ✓6. Real-World Cloud Deployment Skills

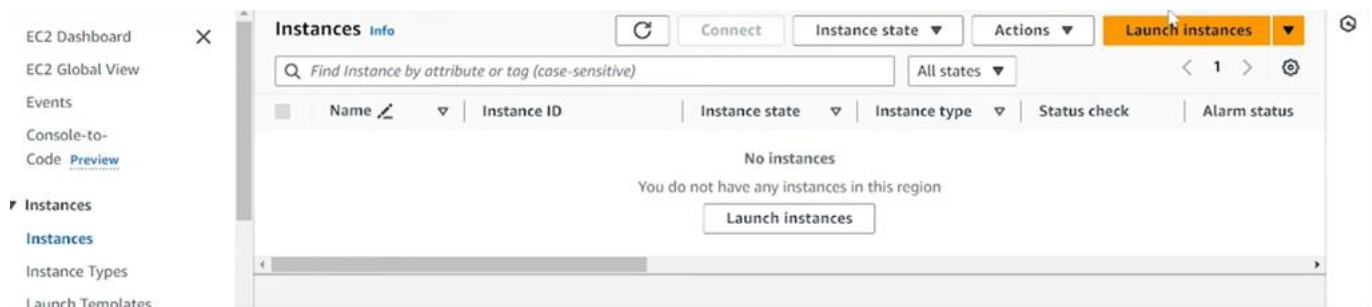
- Builds practical skills useful for **cloud-based applications and DevOps**.
- Prepares for **AWS certification exams** and real-world projects.

## Step-by-Step Overview

# Step1: Log in to AWS Console

1.Go to AWS Management Console.

2. Navigate to EC2.



## Step 2 :Create Two EC2 Instances

1. In the EC2 Dashboard, click Launch Instances.
2. Choose an Amazon Linux 2 or Ubuntu AMI.
3. Select t2.micro (free tier eligible).
4. Configure the instance: • Number of instances: 2 • Keep default settings.
5. Add User Data (optional) to install a web server: • In Advanced Details, under User Data, enter:

## Name and tags [Info](#)

Name

[Add additional tags](#)

## ▼ Application and OS Images (Amazon Machine Image) [Info](#)



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Recents

**Quick Start**



macOS



Ubuntu

ubuntu

Windows

Microsoft

Red Hat

Red Hat



[Browse more AMIs](#)

Including AMIs from  
AWS, Marketplace and  
the Community

### Amazon Machine Image (AMI)

Amazon Linux 2023 AMI

Free tier eligible ▼

ami-00beae93a2d981137 (64-bit (x86), uefi-preferred) / ami-0bfac9aa66a558bd8 (64-bit (Arm), uefi)

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

### Description

Amazon Linux 2023 AMI 2023.4.20240528.0 x86\_64 HVM kernel-6.1

## ▼ Key pair (login) [Info](#)

You can use a key pair to securely connect to your instance. Ensure that you have access to the selected key pair before you launch the instance.

Key pair name - *required*

Select ▲

Q

Proceed without a key pair (Not recommended) Default value

linux  
Type: rsa

 [Create new key pair](#)

Edit

## Auto-assign public IP [Info](#)

Enable

[Additional charges apply](#) when outside of [free tier allowance](#)

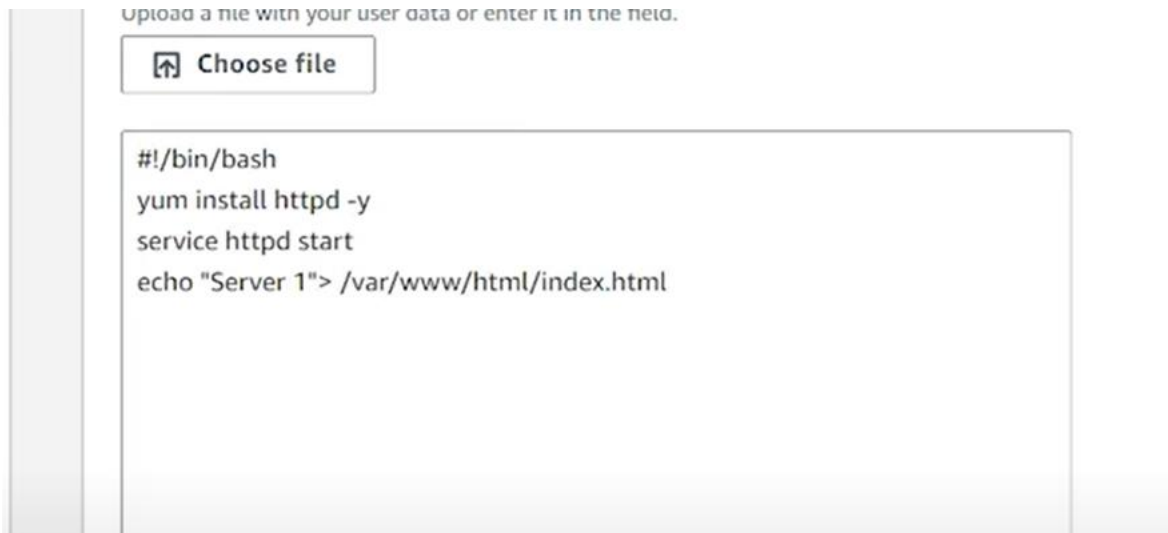
## Firewall (security groups) [Info](#)

A security group is a set of firewall rules that control the traffic for your instance. Add rules to allow specific traffic to reach your instance.

☐ Create security group

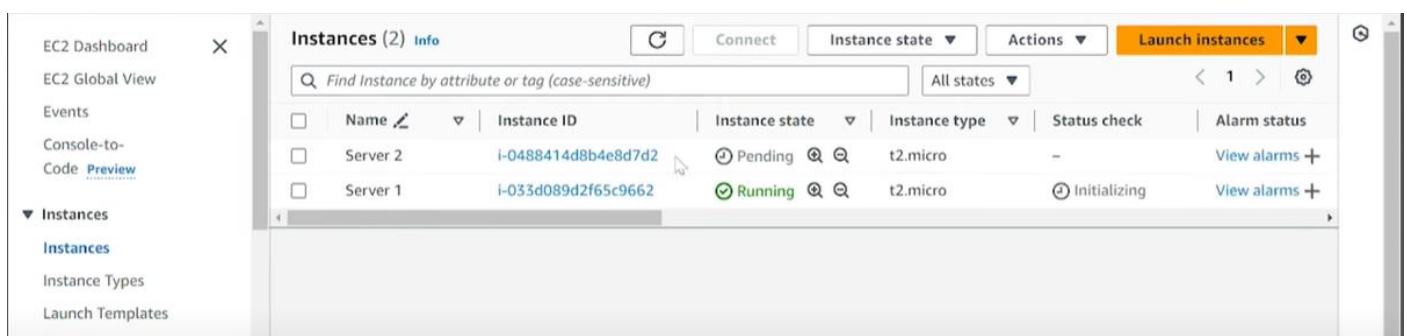
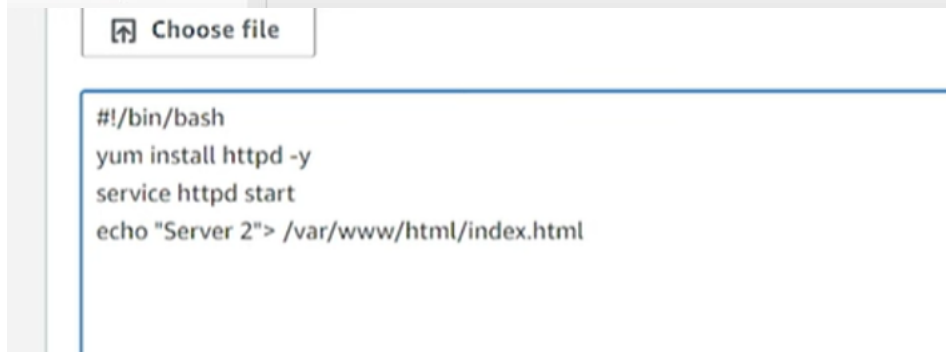
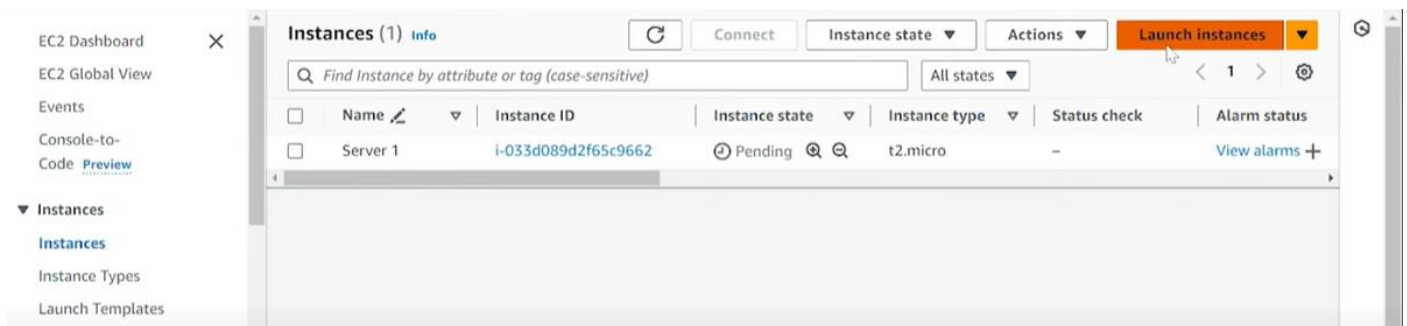
☒ Select existing security group

Common security groups [Info](#)



## Step 3 :

For **server 2**, follow the same steps, but modify the **User Data script** to display a different message.



# Step 4 :

Select Load Balancer Type

1. Choose "**Classic Load Balancer.**"
2. Click "**Create.**"

Configure Load Balancer Settings

1. **Name:** Enter a unique name (e.g., MyClassicLB).
2. **Scheme:** Select **Internet-facing** (for public access) or **Internal** (for private use).
3. **Listener Configuration:**
  - **Protocol:** HTTP
  - **Port:** 80 (default for web traffic)
4. **VPC & Availability Zones:**
  - Choose a **VPC** where your EC2 instances are running.
  - Select at least **two Availability Zones** for high availability.

The image shows two screenshots from the AWS Management Console. The top screenshot displays the 'Load balancers' page under the 'EC2' section. It includes a sidebar with 'Network & Security' and 'Load Balancing' categories. The main content area shows a table with columns for Name, DNS name, State, VPC ID, and Availability Zones. A 'Create load balancer' button is visible. The bottom screenshot shows the 'Classic Load Balancer - previous generation' configuration page. It features a diagram of a Classic Load Balancer (CLB) with listeners for HTTP, HTTPS, TCP, and SSL, each connected to an EC2 instance. A 'Create' button is also present.

**Load balancer name**  
Name must be unique within your AWS account and can't be changed after the load balancer is created.

My-LB

A maximum of 32 alphanumeric characters including hyphens are allowed, but the name must not begin or end with a hyphen.

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**Network mapping** [Info](#)  
The load balancer routes traffic to targets in the selected subnets, and in accordance with your network settings.

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**VPC** [Info](#)  
Select the virtual private cloud (VPC) for your targets or you can [create a new VPC](#). Only VPCs with an internet gateway are available for selection. The selected VPC cannot be changed after the load balancer is created. When selecting a VPC for your load balancer, ensure each subnet has a CIDR block with at least a /27 bitmask and at least 8 free IP addresses. [Learn more](#)

vpc-08fbbc6bfc39aee69  
IPv4 VPC CIDR: 172.31.0.0/16

---

**Security groups** [Info](#)  
A security group is a set of firewall rules that control the traffic to your load balancer. Select an existing security group, or you can [create a new security group](#).

Security groups

Select up to 5 security groups

Q |

☒ All-TCP  
sg-0e0254f8299fac3b9 VPC: vpc-08fbbc6bfc39aee69

☐ default

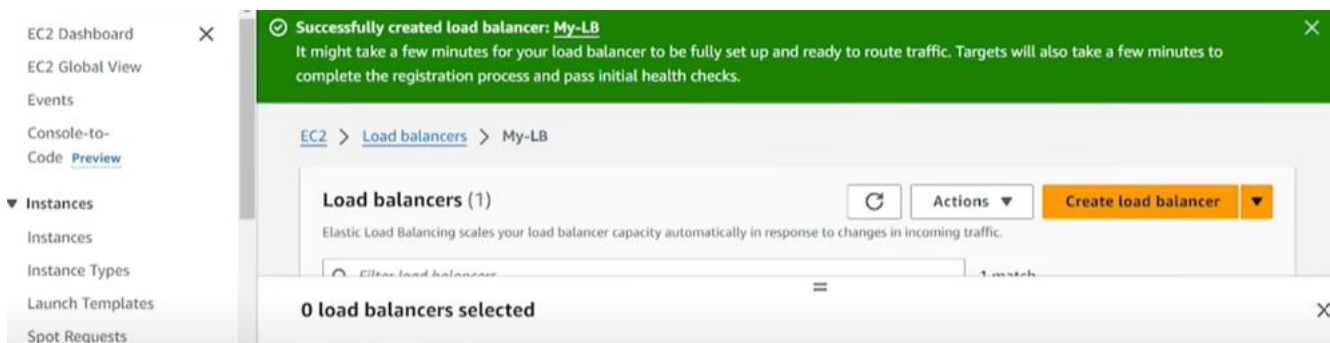
## Step 5 :

Copy the **DNS Name** of your Load Balancer.

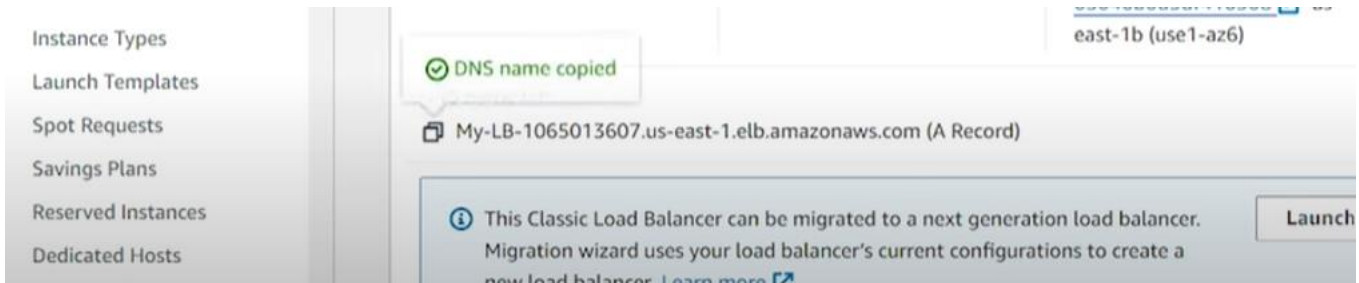
- Open a web browser and paste the DNS link in the address bar.
- For example, <http://myclassiclb-1234567890.us-west-2.elb.amazonaws.com>.

Verify the Web Server Output

- **If the Load Balancer is correctly configured**, the browser should show the **web page** from one of the EC2 instances (e.g., **Server 1** or **Server 2**).
- **Refresh the page** multiple times. You should see the page alternate between **Server 1** and **Server 2** (depending on the load balancing).







## Step 6 :

### Create Launch Template

1. In the **Launch Templates** section, click **Create launch template**.
2. Fill in the following information:
  - **Template Name:** My-Template.
  - **Template Version Description:** My-Template.
  - **AMI ID:** Choose the **Amazon Linux 2** or **Ubuntu** AMI you selected for Server 1 and Server 2.
  - **Instance Type:** t2.micro (or any other type that fits your needs).
  - **Key Pair:** Select an existing key pair or create a new one for SSH access.
  - **Network:** Select the **VPC** you are using (ensure both EC2 instances are in the same VPC).
  - **Subnet:** Choose a subnet or use the default.
  - **Security Group:** Select the security group that allows HTTP (port 80) and HTTPS (port 443).
  - **IAM Role (Optional):** Select if needed.

EC2 Dashboard

EC2 Global View

Events

Console-to-Code [Preview](#)

▼ Instances

Instances

Instance Types

**Launch Templates**

Spot Requests

Savings Plans

Reserved Instances

Dedicated Hosts

Capacity Reservations

# launches

Use launch templates to automate instance launches, simplify permission policies, and enforce best practices across your organization. Save launch parameters in a template that can be used for on-demand launches and with managed services, including EC2 Auto Scaling and EC2 Fleet. Easily update your launch parameters by creating a new launch template version.

**New launch template**

Create launch template

## Benefits and features

Streamline provisioning  
Minimize steps to provision

Simplify permissions  
Create shorter, easier to

**Documentation**

[Documentation](#)

### Launch template name and description

Launch template name - *required*

My-Template

Must be unique to this account. Max 128 chars. No spaces or special characters like '&', '\*', '@'.

Template version description

A prod webserver for MyApp

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

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

**Recents** Quick Start

☒ Don't include in launch template

☐ Recently launched

☐ Currently in use

**Browse more AMIs**

Including AMIs from AWS, Marketplace and the Community

## Step 7 :

### Creating AMI for Server 1

1. **Log in to AWS Console** and navigate to **EC2**.
2. In the **Instances** section, select **Server 1**.
3. Click on **Actions** → **Image and templates** → **Create image**.
  - Provide a **name** for the image (e.g., Server1-AMI).

- Optionally, add a description.
  - Select **No Reboot** if you do not want to reboot the instance.
4. Click **Create Image** and wait for the image creation to complete.
  5. Once ready, the **AMI** will be available in the **AMIs** section under **Images**.

## Or Creating AMI for Server 2

1. Select **Server 2** in the **Instances** section.
2. Repeat the same steps:
  - Click **Actions** → **Image and templates** → **Create image**.
  - Name the image (e.g., Server2-AMI).
3. Click **Create Image** and wait for the process to complete.
4. **Server 2's AMI** will appear in the **AMIs** section once ready.

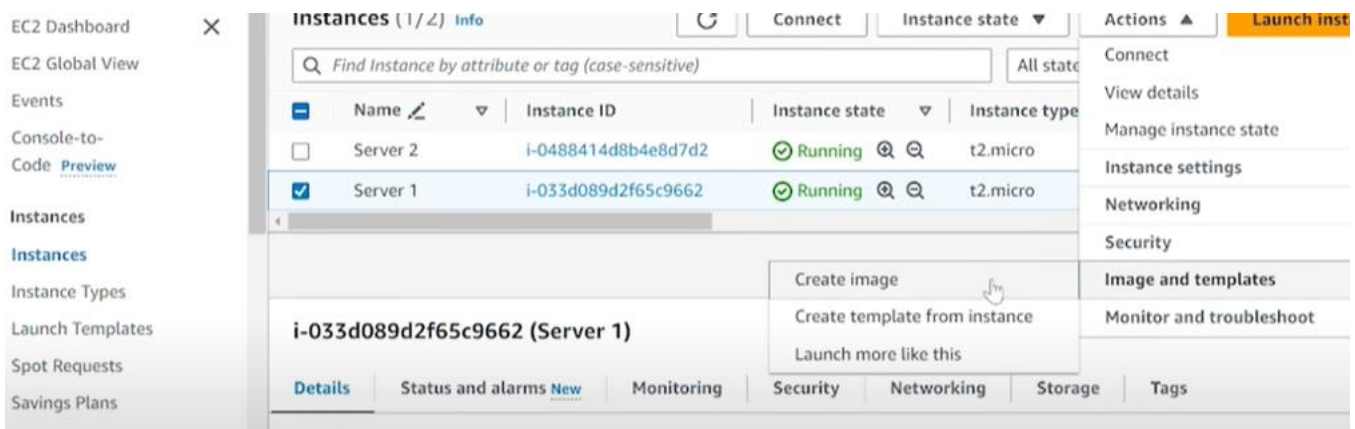


Image name

My-AMI

Maximum 127 characters. Can't be modified after creation.

Image description - optional

My-AMI

Maximum 255 characters

No reboot

☐ Enable

**i** During the image creation process, Amazon EC2 creates a snapshot of each of the above volumes.

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.

☒ Tag image and snapshots together  
Tag the image and the snapshots with the same tag.

☐ Tag image and snapshots separately  
Tag the image and the snapshots with different tags.

Key

Q Name

Use "Name"

Add new tag

You can add up to 49 more tags.

Value - optional

Q Enter value

## Step 9 :

Create Launch Template follows Step 6 as a continue. Name : Server 3

The screenshot displays the AWS Management Console interface. At the top, a green notification bar states: "Currently creating AMI ami-05232c4fb134e8a8b from instance i-033d089d2f65c9662. Check that the AMI status is 'Available' before deleting the instance or carrying out other actions related to this AMI." Below this, the "Instances (2)" section shows a table with two running instances: "Server 2" (ID: i-0488414d8b4e8d7d2) and "Server 1" (ID: i-033d089d2f65c9662), both using the "t2.micro" instance type. A "Select an instance" dropdown is visible below the table. The bottom portion of the image shows the "Instance type" selection dropdown menu, which is open, displaying a search bar and a list of instance types. The "t2.micro" instance type is highlighted, showing its specifications: "Family: t2", "1 vCPU", "1 GiB Memory", and "Current generation: true". It also indicates "Free tier eligible" and lists pricing for various operating systems: "On-Demand SUSE base pricing: 0.0058 USD per Hour", "On-Demand Windows base pricing: 0.0081 USD per Hour", "On-Demand Windows base pricing: 0.0162 USD per Hour", "On-Demand SUSE base pricing: 0.0116 USD per Hour", and "On-Demand RHEL base pricing: 0.0116 USD per Hour". To the right of the dropdown, there is a toggle for "All generations" and a link to "Compare instance types".

EC2 Dashboard  
EC2 Global View  
Events  
Console-to-Code [Preview](#)

▼ Instances  
Instances  
Instance Types  
Launch Templates  
Spot Requests

Currently creating AMI ami-05232c4fb134e8a8b from instance i-033d089d2f65c9662. Check that the AMI status is 'Available' before deleting the instance or carrying out other actions related to this AMI.

Instances (2) Info

Find Instance by attribute or tag (case-sensitive) All states

	Name	Instance ID	Instance state	Instance type	Status check	Alarm status
<input type="checkbox"/>	Server 2	i-0488414d8b4e8d7d2	Running	t2.micro	2/2 checks passed	<a href="#">View alarms</a>
<input type="checkbox"/>	Server 1	i-033d089d2f65c9662	Running	t2.micro	2/2 checks passed	<a href="#">View alarms</a>

Select an instance

▼ Instance type Info | [Get advice](#) [Advanced](#)

Instance type

Don't include in launch template

Q |

On-Demand SUSE base pricing: 0.0058 USD per Hour  
On-Demand Windows base pricing: 0.0081 USD per Hour

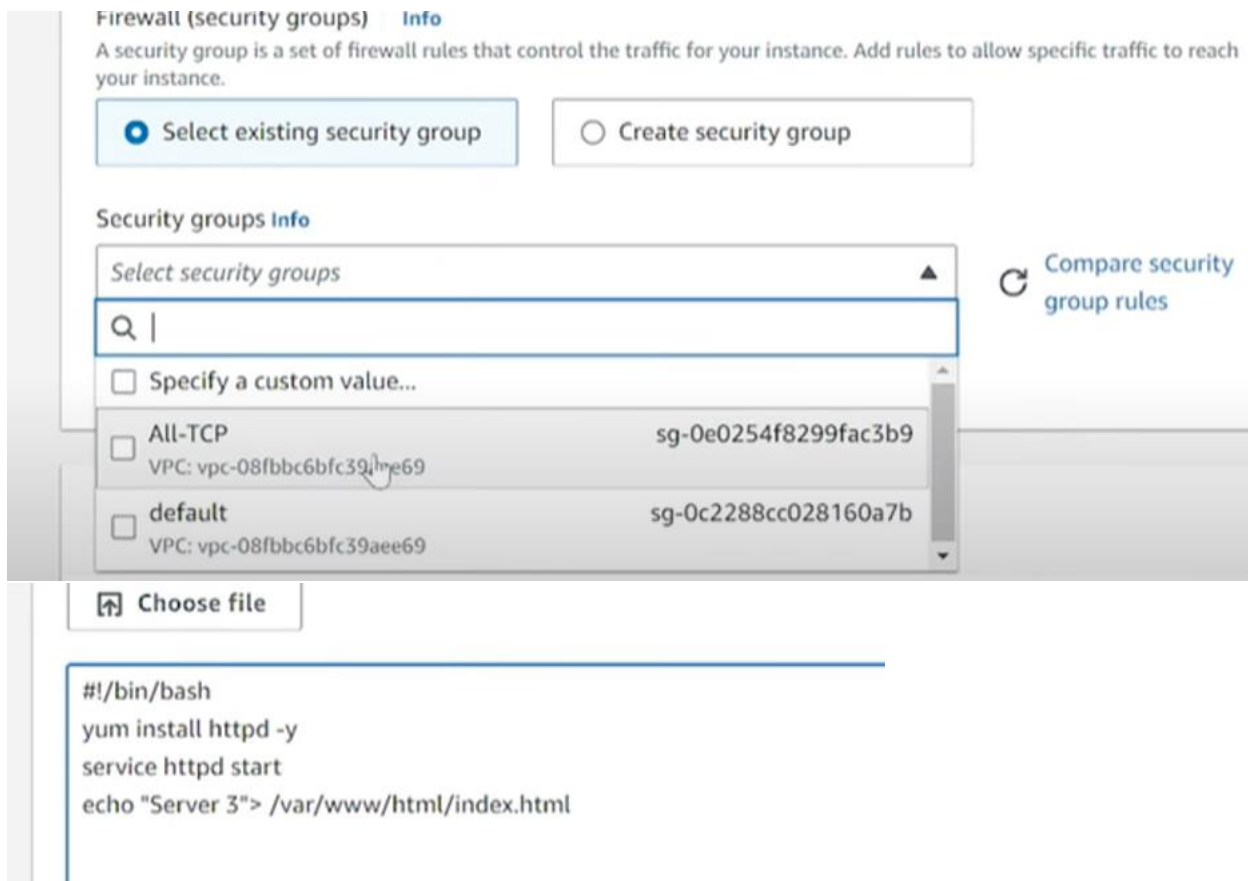
t2.micro Free tier eligible

Family: t2 1 vCPU 1 GiB Memory Current generation: true  
On-Demand Windows base pricing: 0.0162 USD per Hour  
On-Demand SUSE base pricing: 0.0116 USD per Hour  
On-Demand RHEL base pricing: 0.0116 USD per Hour

All generations

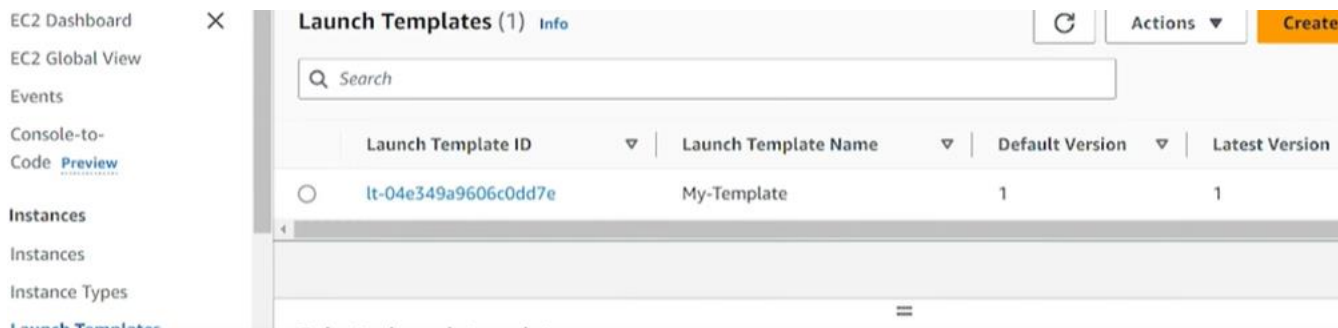
[Compare instance types](#)

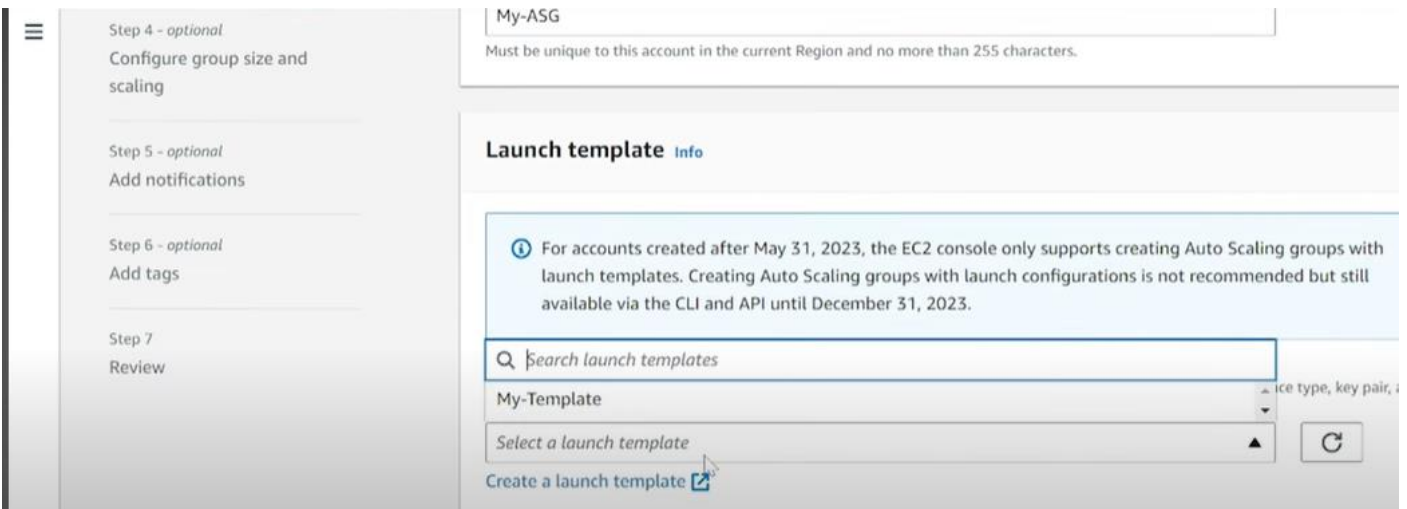
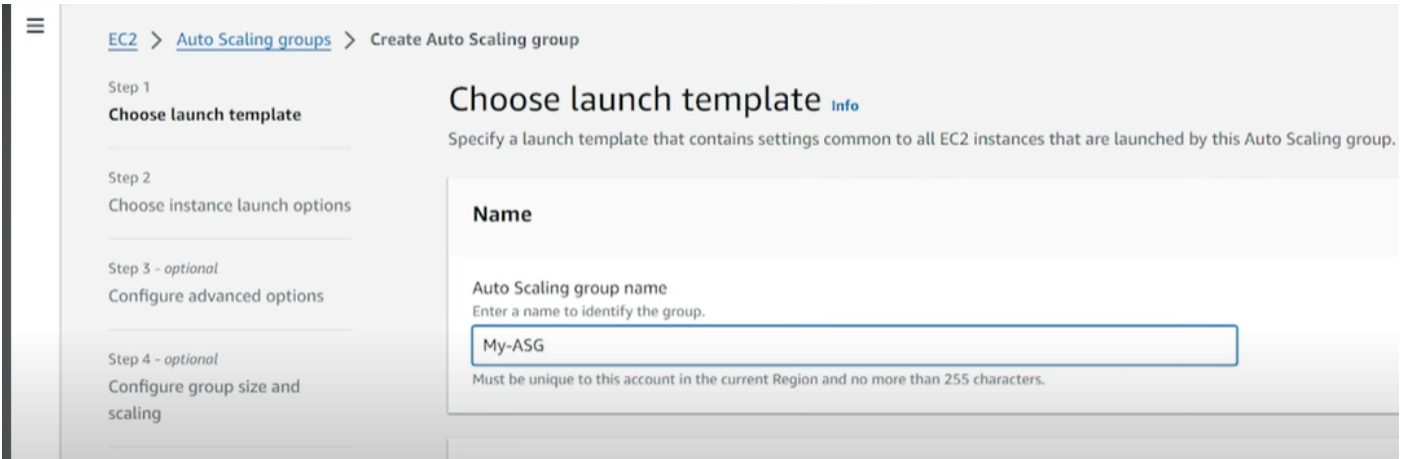
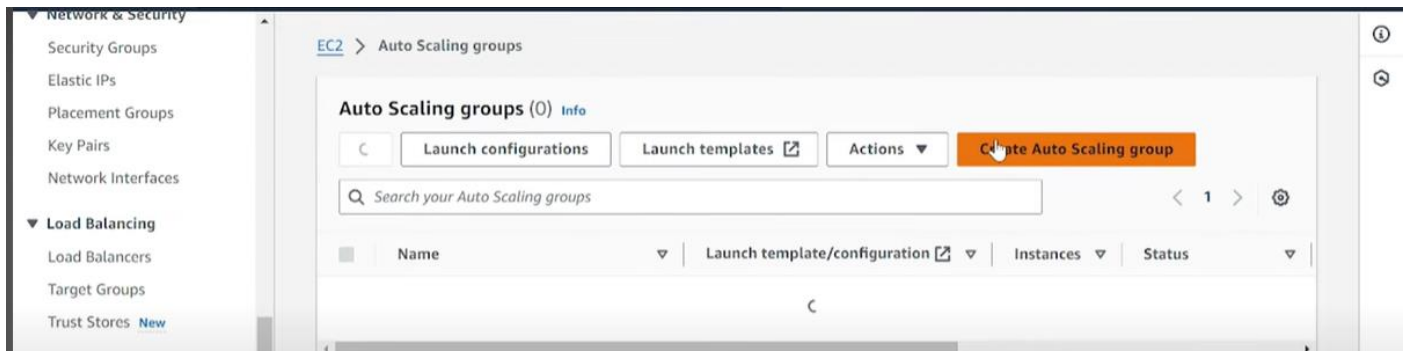
Access to the selected key



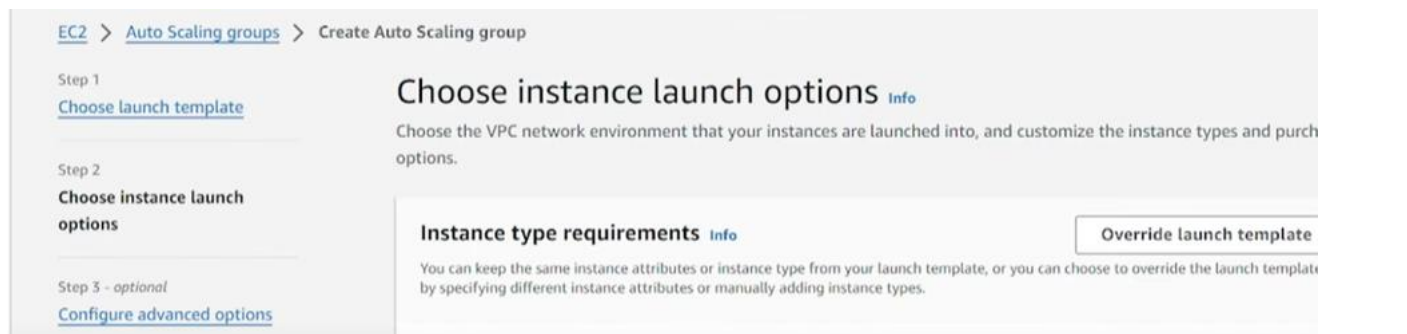
Step 9 :

Create AutoScaling Groups.





Click next..





Step 7  
[Review](#)

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

☒ Choose from Classic Load Balancers

Classic Load Balancers

Select Classic Load Balancers

MY-LB  
Classic Load Balancer

Step 3 - optional  
Configure advanced options

Step 4 - optional  
[Configure group size and scaling](#)

Step 5 - optional  
[Add notifications](#)

Load balancing [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.

Health checks increase availability by replacing unhealthy instances. When you use multiple health checks, all are evaluated, and if one fails, instance replacement occurs.

EC2 health checks  
*Always enabled*

Additional health check types - optional [Info](#)

☒ Turn on Elastic Load Balancing health checks **Recommended**  
Elastic Load Balancing monitors whether instances are available to handle requests. When it reports an unhealthy instance, EC Scaling can replace it on its next periodic check.

*EC2 Auto Scaling will start to detect and act on health checks performed by Elastic Load Balancing. To avoid unexpected terminations, first verify the settings of these health checks in the [Load Balancer console](#).*

Click Next...

[Configure advanced options](#)

Step 4 - optional  
**Configure group size and scaling**

Step 5 - optional  
[Add notifications](#)

Step 6 - optional  
[Add tags](#)

Step 7  
[Review](#)

**Desired capacity type**  
Choose the unit of measurement for the desired capacity value. vCPUs and Memory(GiB) are only supported for mixed instance configured with a set of instance attributes.

Units (number of instances) ▼

**Desired capacity**  
Specify your group size.

2

**Scaling Info**  
You can resize your Auto Scaling group manually or automatically to meet changes in demand.

**Scaling limits**  
Set limits on how much your desired capacity can be increased or decreased.

Min desired capacity      Max desired capacity

After this step all are default and click next..

EC2 > [Auto Scaling groups](#) > Create Auto Scaling group

Step 1  
[Choose launch template](#)

Step 2  
[Choose instance launch options](#)

Step 3 - optional  
[Configure advanced options](#)

Step 4 - optional  
[Configure group size and scaling](#)

**Add notifications - optional Info**  
Send notifications to SNS topics whenever Amazon EC2 Auto Scaling launches or terminates the EC2 instances in your Auto Scaling group.

Add notification

Cancel      Skip to review      Previous      **Next**

click Next and click Create auto scaling Groups.

EC2 > [Auto Scaling groups](#)

**Auto Scaling groups (1) Info**      Refresh      Launch configurations      Launch templates      Actions      **Create Auto Scaling group**

Search your Auto Scaling groups

<input type="checkbox"/>	Name	Launch template/configuration	Instances	Status	Desired capacity	Min instances
<input type="checkbox"/>	<a href="#">My-ASG</a>	<a href="#">My-Template</a>   Version Default	0	Updating capacity...	2	1

Step 10:

Go to EC2 instance there will running another 2 servers with the name of SERVER 3 which we given in the Launch Template.



