Simulating Manual Horizontal and Vertical Scaling in AWS

This runbook provides detailed steps to simulate horizontal and vertical scaling in AWS. We will create an EC2 launch template, an Auto Scaling Group (ASG), and configure **manual scaling.** The process simulates scale out and scale in based on hypothetical load, as well as simulating **vertical scaling** by modifying instance types.

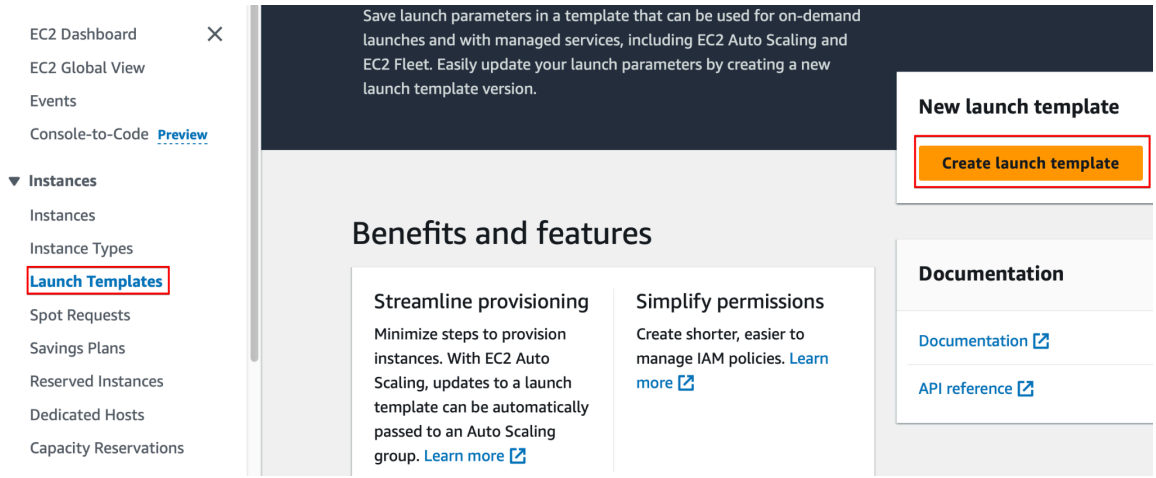
1. Create a Launch Template of an Instance

This step involves creating a launch template which defines the configuration details of the EC2 instances.

The template includes details such as the Amazon Machine Image (AMI), instance type, key pair, security groups, and other parameters required to launch an instance.

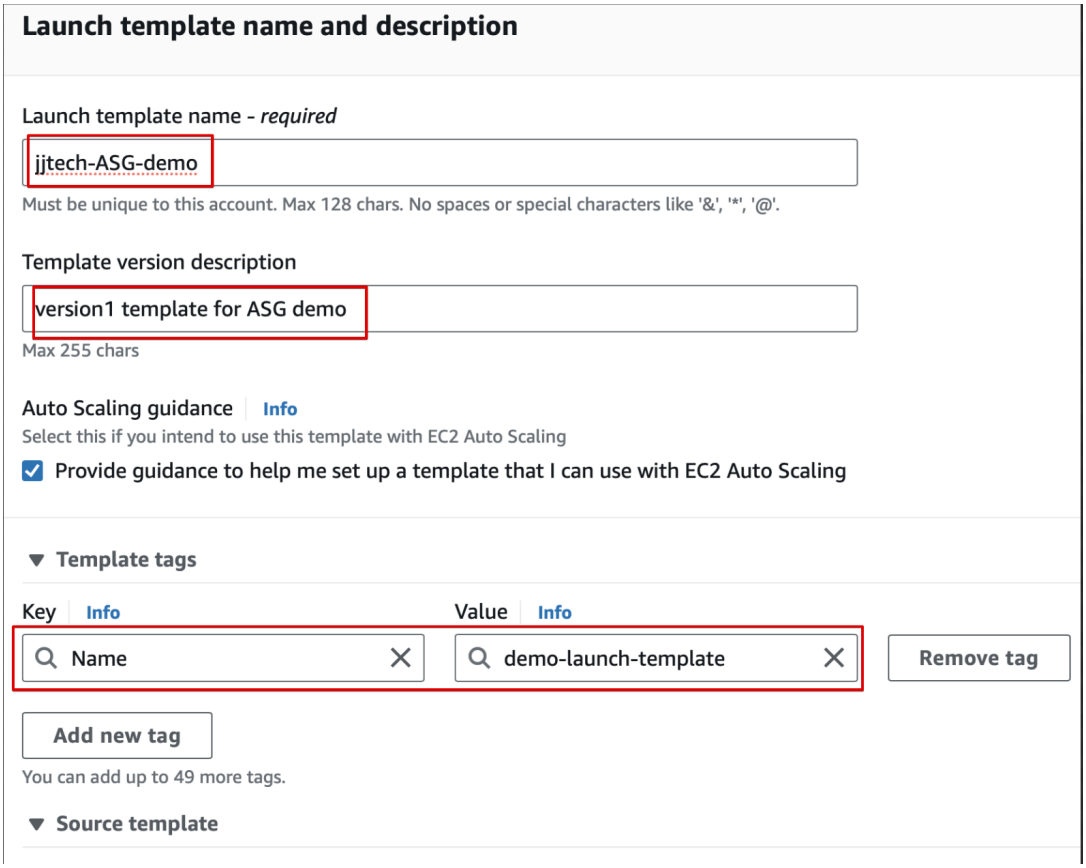
1. Open the Amazon EC2 console.

2. In the left navigation pane, choose 'Launch Templates'.

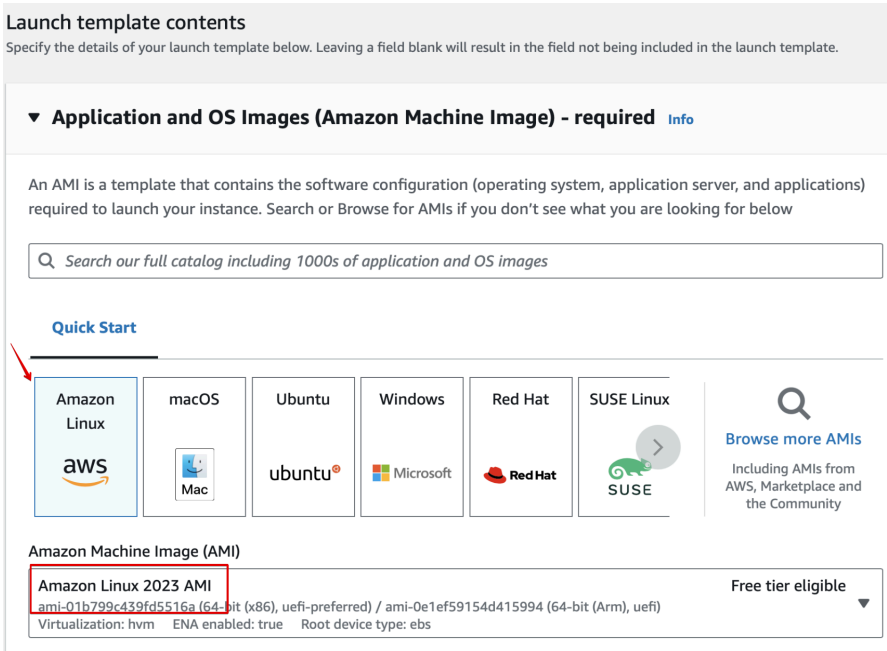


3. Choose 'Create launch template'.

4. Provide a name and description and tag(optional) for the launch template.



5. In the 'Launch template contents' section, specify the AMI, instance type, key pair, security group, and other configurations.



Instance type Info | Get advice

Instance type

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: 0.0716 USD per Hour
On-Demand Linux base pricing: 0.0116 USD per Hour

Additional costs apply for AMIs with pre-installed software

Key pair (login) Info

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

Key pair name

ASG-lauchTemplate

Network settings Info

Subnet Info

Don't include in launch template

When you specify a subnet, a network interface is automatically added to your template.

Firewall (security groups) Info

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

○ Select existing security group ◉ Create security group

Security group name - *required*

asg-template-sg

This security group will be added to all network interfaces. The name can't be edited after the security gr
characters. Valid characters: a-z, A-Z, 0-9, spaces, and ._-:/()#,@[]+=&;{}!$*

Description - *required* Info

Sg for instances launch using the ASG

VPC Info

vpc-d0c9adad (default)
172.31.0.0/16

Inbound Security Group Rules

No security group rules are currently included in this template. Add a new rule to include

6. Leave other settings (e.g storage) as default.

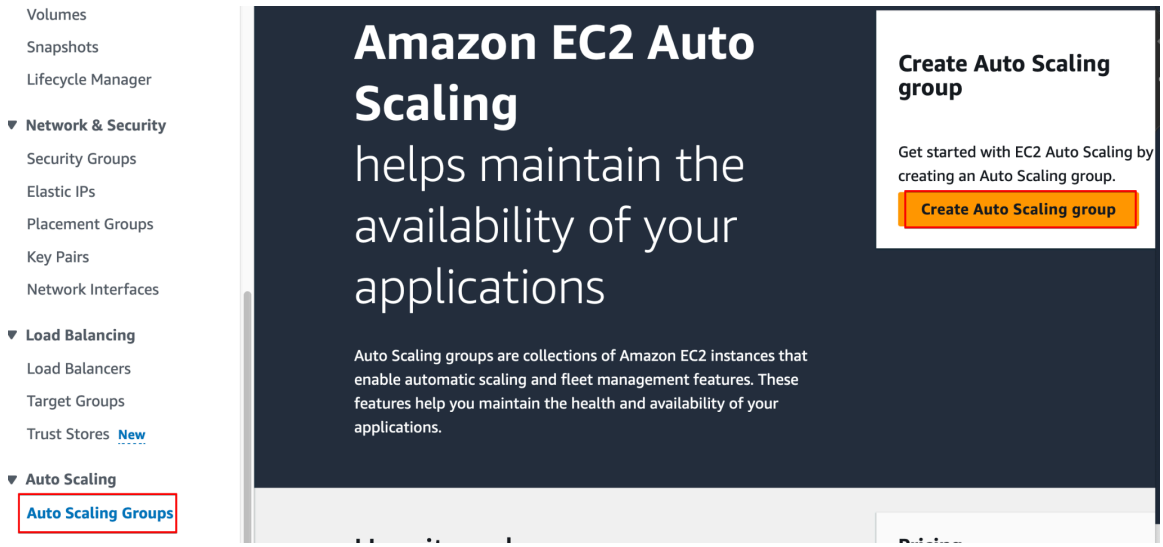
Review the settings and choose '**Create launch template**'.

2. Create an Auto Scaling Group

This step involves creating an Auto Scaling Group (ASG) using the launch template. The ASG ensures that the number of instances scales automatically based on the defined policies and rules.

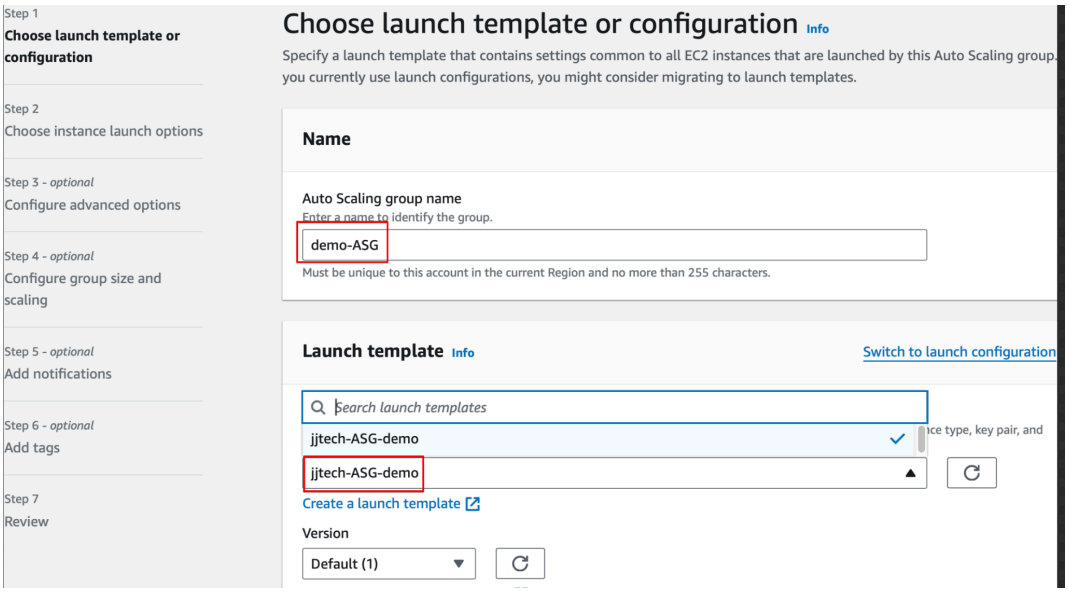
1. Open the Amazon EC2 console.

2. In the left navigation pane, choose 'Auto Scaling Groups'.



3. Choose 'Create Auto Scaling group'.

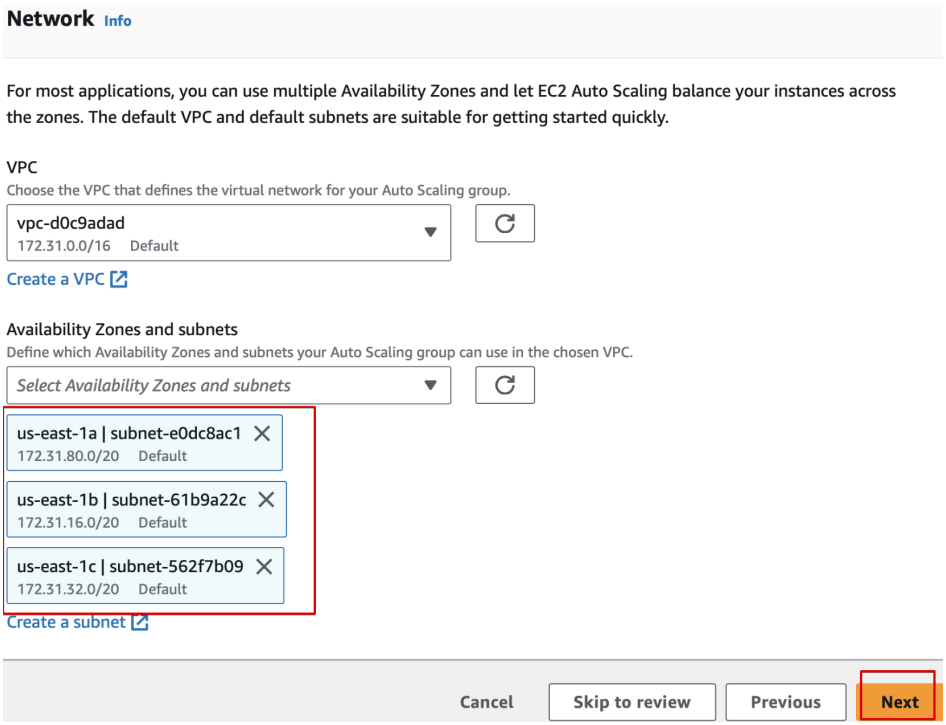
4. Select the launch template created in the previous step and click on **Next**



In the *Choose instance launch options* section,

5. For instance type requirements, leave as default

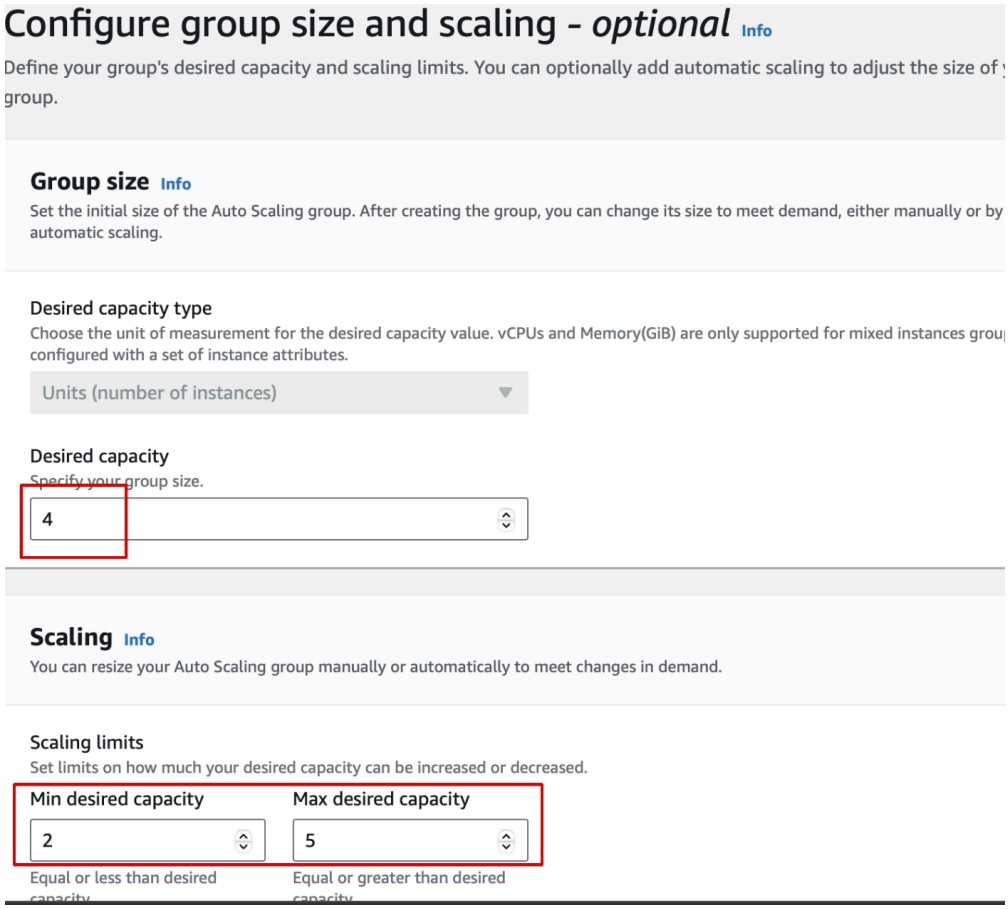
6. Configure the VPC and subnets for the Auto Scaling group. Select subnets in different AZs in order to enable the ASG to launch instances in that AZ



In the *Configure Advanced Options* section, leave everything as default

In *Configure the group size and scaling* section,

7. Set the minimum capacity to **2**, desired capacity to **4**, and maximum capacity to **6**



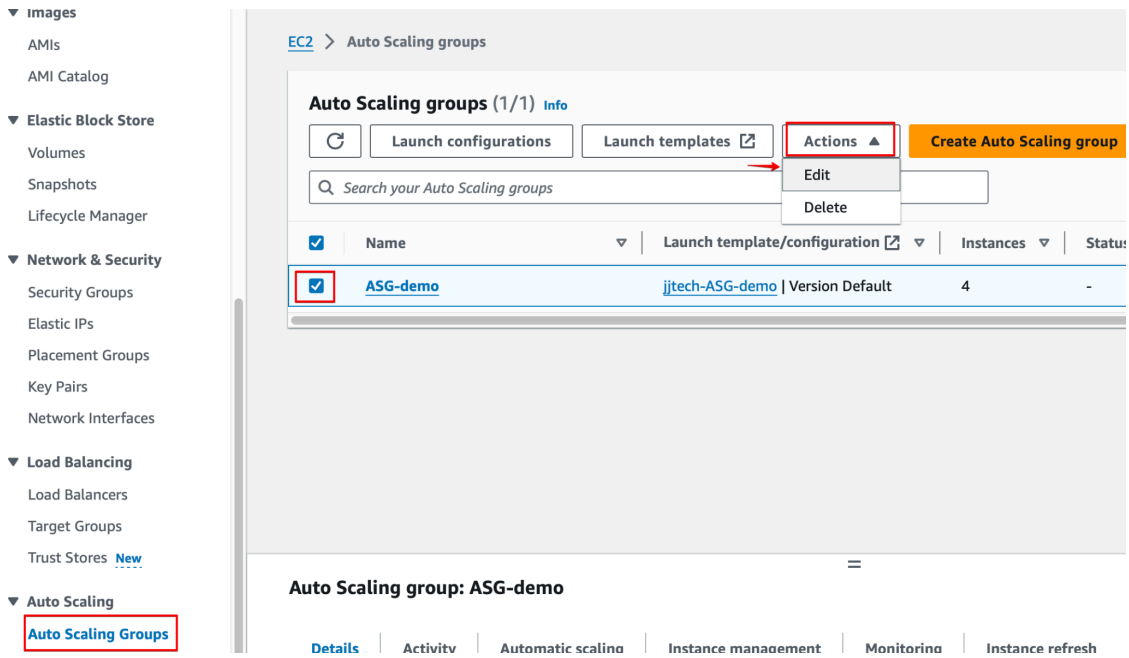
8. Leave other settings as default, scroll down and click on **Skip to review**

9. Review the settings and choose **'Create Auto Scaling group**'.

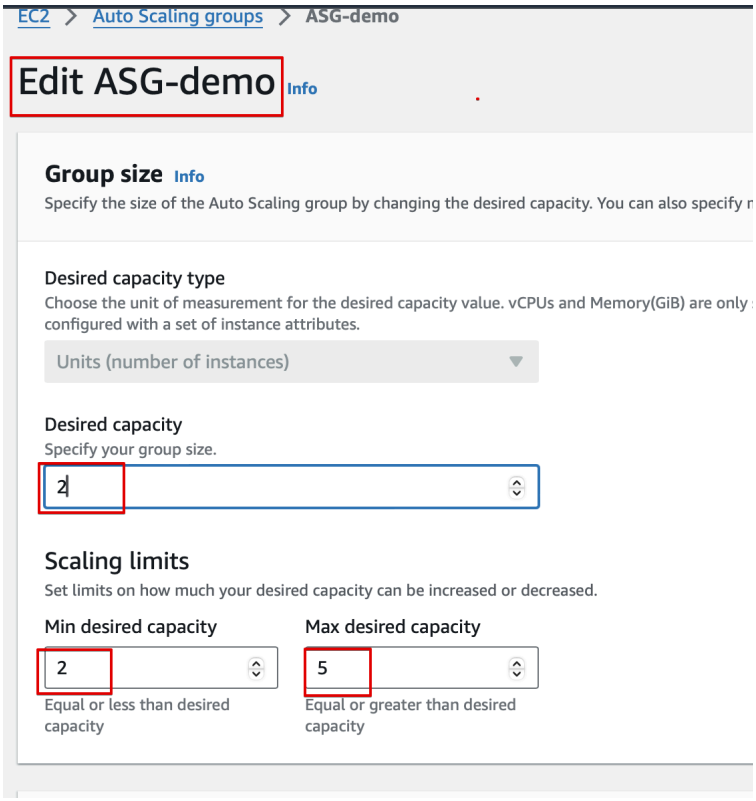
3. Manual Scaling

Manual scaling allows you to manually adjust the desired capacity of the Auto Scaling group. This step demonstrates how to change the desired capacity to simulate scaling events.

1. Open the Amazon EC2 console.
2. In the left navigation pane, choose 'Auto Scaling Groups'.
3. Select the Auto Scaling group created earlier.
4. Choose 'Edit'.



5. Change the desired capacity to the desired value (e.g., 2).



6. Scroll down and click on **Update** to save the changes. Observe the scaling activity.

Vertical Scaling Simulation

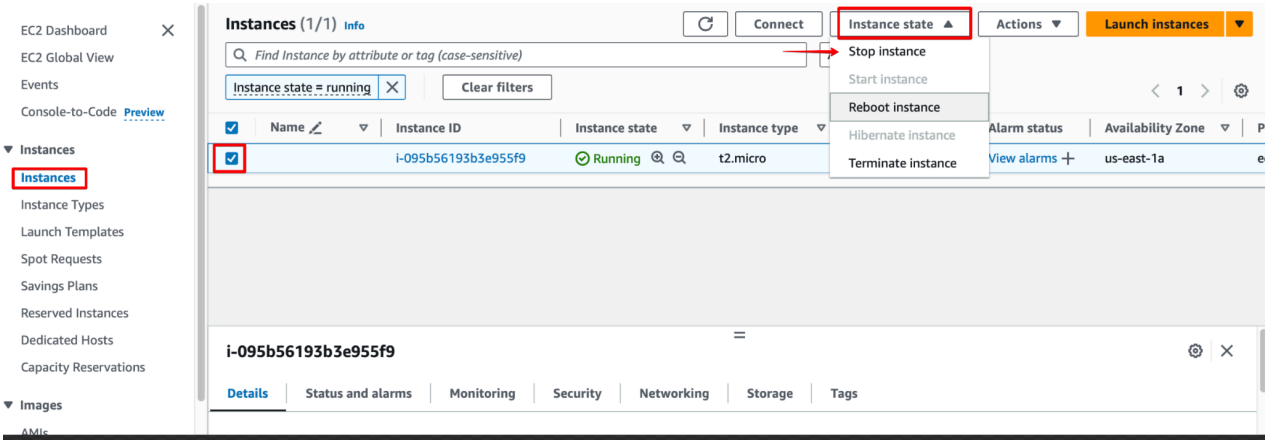
Vertical scaling involves changing the instance type to a larger or smaller instance to increase or decrease the resources (CPU, memory) available to the application. This simulation will demonstrate how to modify the instance type directly on an existing EC2 instance.

Prerequisites:

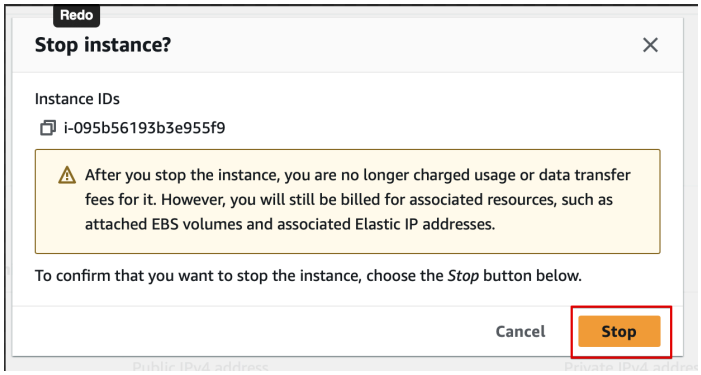
- Existing EC2 instance running.

Steps to Simulate Vertical Scaling:

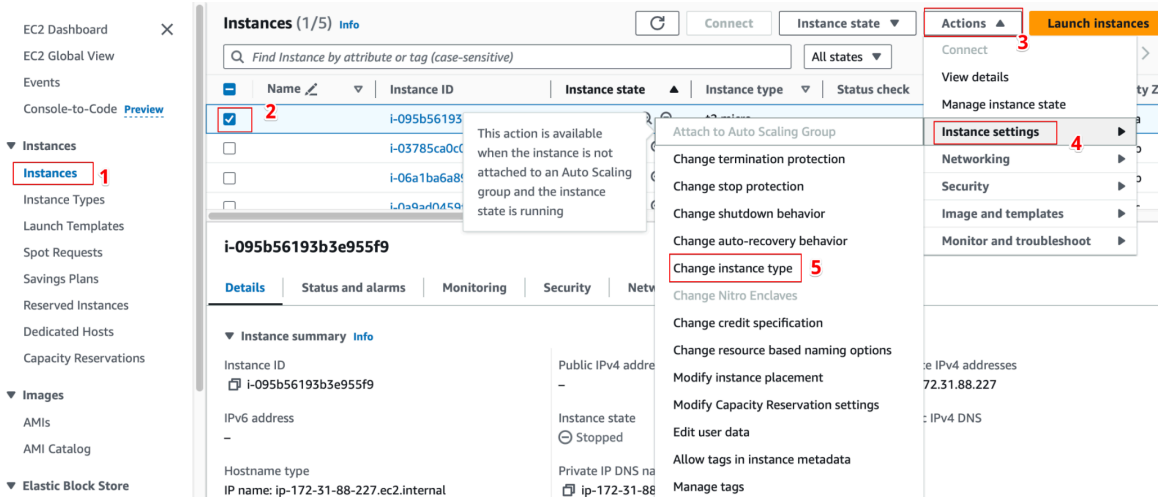
1. **Open the Amazon EC2 Console**
    - Navigate to the Amazon EC2 console.
2. **Stop the Instance**
    - In the left navigation pane, choose 'Instances'.
    - Select the instance you want to scale vertically.
    - Choose 'Instance State' > 'Stop Instance'.



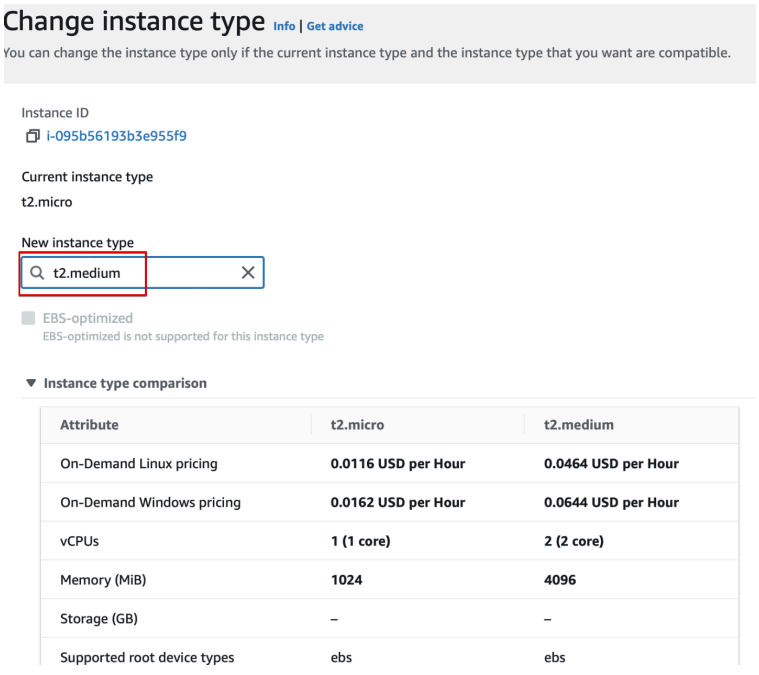
- Confirm the action to stop the instance.



3. **Change the Instance Type**
    - After the instance is stopped, select the instance again.
    - Choose 'Actions' > 'Instance Settings' > 'Change Instance Type'.

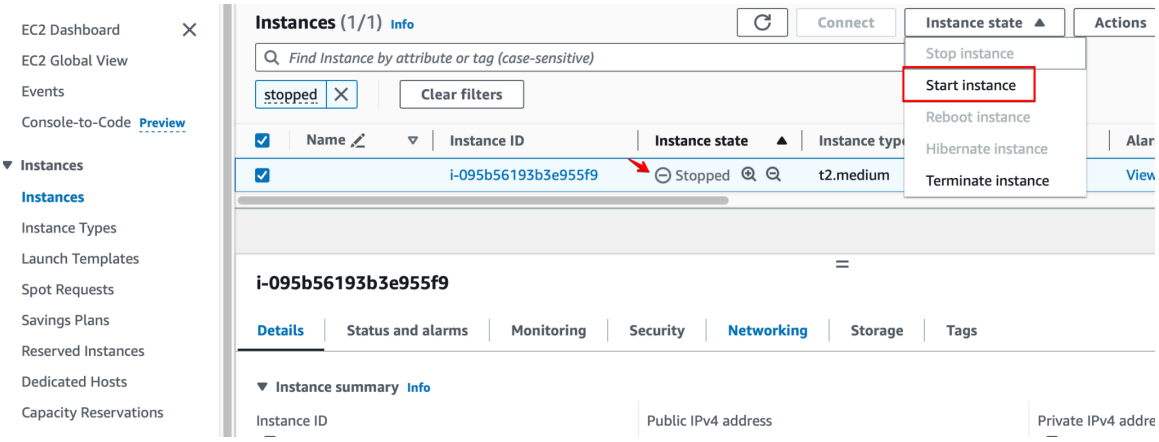


    - In the 'Change Instance Type' dialog box, select the new instance type you want to use (e.g., change from **t2.micro** to **t2.medium**).

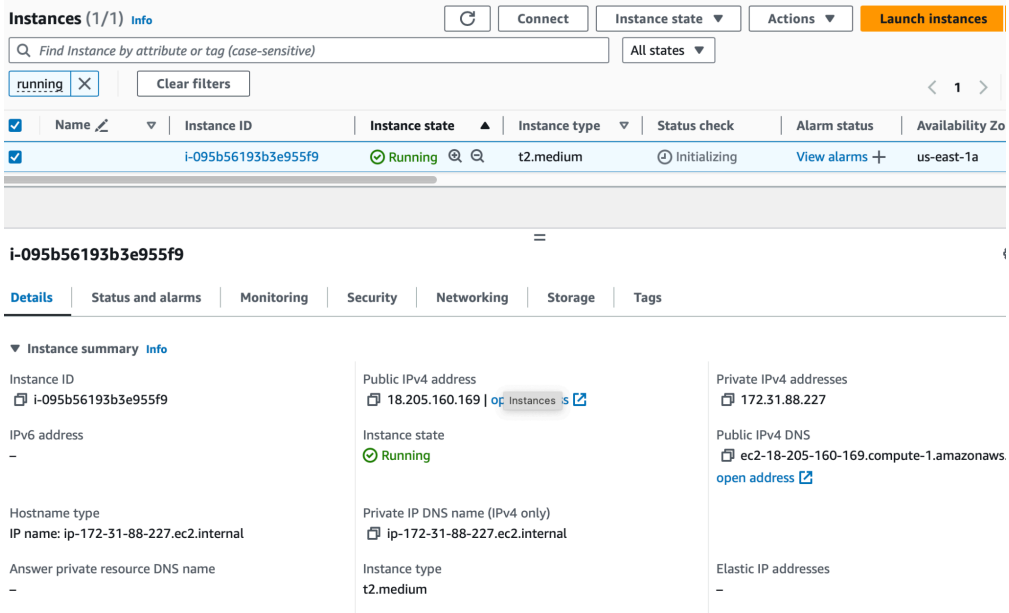


    - Choose '**Apply**'.

4. **Start the Instance**
    - With the instance still selected, choose 'Instance State' > 'Start Instance'.
    - Confirm the action to start the instance.



    - Wait for the instance to enter the 'running' state.
5. **Verify the Changes**
    - Select the instance to view its details.
    - Verify that the 'Instance Type' has been updated to the new instance type.



    - Ensure that the instance is running and operating as expected.