

# LAB 03: AUTO SCALING AN APP ON AMAZON WEB SERVICES

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## TASK 1: ADD AUTO SCALING TO YOUR APPLICATION

In this task you will create an Auto Scaling Group with a scaling policy that automatically launches new instances when the CPU utilization exceeds 30% and terminates instances when CPU utilization falls below 10%.

1. Open the EC2 console. Create a new Launch Configuration based on the AMI you created earlier. Provide the following answers (leave any field not mentioned at its default value):
  - Choose AMI
    - Click on **My AMIs** and choose the AMI created earlier
  - Choose Instance Type
    - Leave at default values
  - Configure detail
    - Name: *yourlastname*-Drupal-Autoscale
  - Configure Security Group
    - Specify the existing security group for Drupal instances

Copy Launch Configuration from zerbib-Drupal-Autoscale

Review the details of your launch configuration. You can go back to edit the details of each section before you finish.

⚠️ Improve security of instances launched using your launch configuration, zerbib-Drupal-AutoscaleCopy. Your security group, Security\_Group\_NV\_1, is open to the world.

Your instances may be accessible from any IP address. We recommend that you update your security group rules to allow access from known IP addresses only. You can also open additional ports in your security group to facilitate access to the application or service you're running, e.g., HTTP (80) for web servers. [Edit security groups](#)

AMI Details

zerbib-Drupal - ami-00c8c14d9f8de4287  
Drupal connected to RDS database  
Root device type: ebs    Virtualization Type: hvm

Edit AMI

Instance Type

Instance Type	ECUs	vCPUs	Memory GB	Instance Storage (GiB)	EBS-Optimized Available	Network Performance
t2.micro	Variable	1	1	EBS only	-	Low to Moderate

Edit instance type

Launch configuration details

Name

zerbib-Drupal-AutoscaleCopy

Purchasing option

On demand

EBS Optimized

No

Monitoring

No

IAM role

None

Tenancy

Shared tenancy (multi-tenant hardware)

Kernel ID

Use default

RAM Disk ID

Use default

User data

Edit details

Security Group ID	Name	Description
sg-056648eafe863e321	Security_Group_NV_1	default security group for web server

All selected security groups inbound rules

Type	Protocol	Port Range	Source
HTTP	TCP	80	0.0.0.0/0
SSH	TCP	22	0.0.0.0/0
HTTPS	TCP	443	0.0.0.0/0
All ICMP	All	N/A	0.0.0.0/0

Edit

2. Create a new Auto Scaling Group.

- Create from existing launch configuration
  - Select the launch configuration you just created

## Create Auto Scaling Group

[Cancel and Exit](#)

Complete this wizard to create your Auto Scaling group. First, choose either a launch configuration or a launch template to specify the parameters that your Auto Scaling group uses to launch instances.

### ☒ Launch Configuration

You can continue to use your launch configurations if they support the Amazon EC2 features you need. [Learn more](#)

[Create a new launch configuration](#)

### ☐ Launch Template New

Launch templates give you the option of launching one type of instance, or a combination of instance types and purchase options. Launch templates include the latest Amazon EC2 features and can be updated and versioned. [Learn more](#)

[Create new launch template](#)

Filter launch configurations...					<< 1 to 1 of 1 Launch Configurations >>	
Name	AMI ID	Instance Type	Spot Price	Security Groups		
<input checked="" type="checkbox"/> zerbib-Drupal-Autoscale	ami-00cbc14d9f8de4287	t2.micro		sg-056648eafe863e321		

[Cancel](#)[Next Step](#)

- Configure Auto Scaling group details
  - Group name: *yourlastname*-Drupal-Autoscale
  - Group size: Start with **1** instance
  - Subnet: select one of the available subnets

## Create Auto Scaling Group

[Cancel and Exit](#)

Group name ⓘ  
zerbib-Drupal-Autoscale

Launch Configuration ⓘ  
zerbib-Drupal-Autoscale

Group size ⓘ  
Start with  instances

Network ⓘ  
vpc-173a096d (172.31.0.0/16) (default) [Create new VPC](#)

Subnet ⓘ  
subnet-c507decb(172.31.64.0/20) | Default in us-east-1f [Create new subnet](#)

Each instance in this Auto Scaling group will be assigned a public IP address. ⓘ

### ▶ Advanced Details

- Configure scaling policies
  - Use scaling policies to adjust the capacity of this group
  - Scale between **1** and **3** instances.
  - In the **Scale Group Size** box click on **Scale the Auto Scaling group using step or simple scaling policies**.

- Increase group size: Add new alarm:
  - Send a notification: uncheck
  - Whenever **Average** of **CPU Utilization** is **>= 30** Percent Take the action: **Add 1 Instance**  
Create a simple scaling policy. And then wait **30** seconds before allowing another scaling activity.
- Decrease group size: Same as before with **CPU Utilization** is **<= 10** Percent.

### Create Auto Scaling Group

Scale between  and  instances. These will be the minimum and maximum size of your group.

#### Increase Group Size

Name:

Execute policy when: [awsec2-zerbib-Drupal-Autoscale-CPU-Utilization](#) [Edit](#) [Remove](#)  
breaches the alarm threshold: CPUUtilization >= 30 for 300 seconds  
for the metric dimensions AutoScalingGroupName = zerbib-Drupal-Autoscale

Take the action:

And then wait:  seconds before allowing another scaling activity

[Create a scaling policy with steps](#) ⓘ

#### Decrease Group Size

Name:

Execute policy when: [awsec2-zerbib-Drupal-Autoscale-High-CPU-Utilization](#) [Edit](#) [Remove](#)  
breaches the alarm threshold: CPUUtilization <= 10 for 300 seconds  
for the metric dimensions AutoScalingGroupName = zerbib-Drupal-Autoscale

Take the action:

And then wait:  seconds before allowing another scaling activity

[Create a scaling policy with steps](#) ⓘ

[Scale the Auto Scaling group using a target tracking scaling policy](#) ⓘ

Observe how the Auto Scaling group launches the first instance.

We forgot to take a screenshot of this step, but from the screenshot below, you can see that the instance terminated (the second from the top) was the instance created by the auto-scale group.

3. Manually terminate the instance in the Auto Scaling Group. Observe how the Auto Scaling Group automatically replaces it.

After terminating the instance, as stated in the screenshot below, we can see that the instance is replaced by the auto-scale group

4. Connect the Auto Scaling group to the load balancer. Navigate to **Auto Scaling > Auto Scaling Groups**. Select the group. On the **Details** tab, click **Edit**. In the field **Load Balancers**, select your load balancer. Click **Save**.
5. Trigger a scaling action by simulating heavy load. Try to create heavy load with JMeter to trigger a scaling action. If it fails, you can also launch a resource-heavy application on the instance.
  - Log into the instance of the Auto Scaling group.
  - Install package `sysbench`: `sudo apt install sysbench`.
  - Run `sysbench` in a loop: `while true; do sysbench --test=cpu run; done`
6. Bring up two console tabs in your browser.

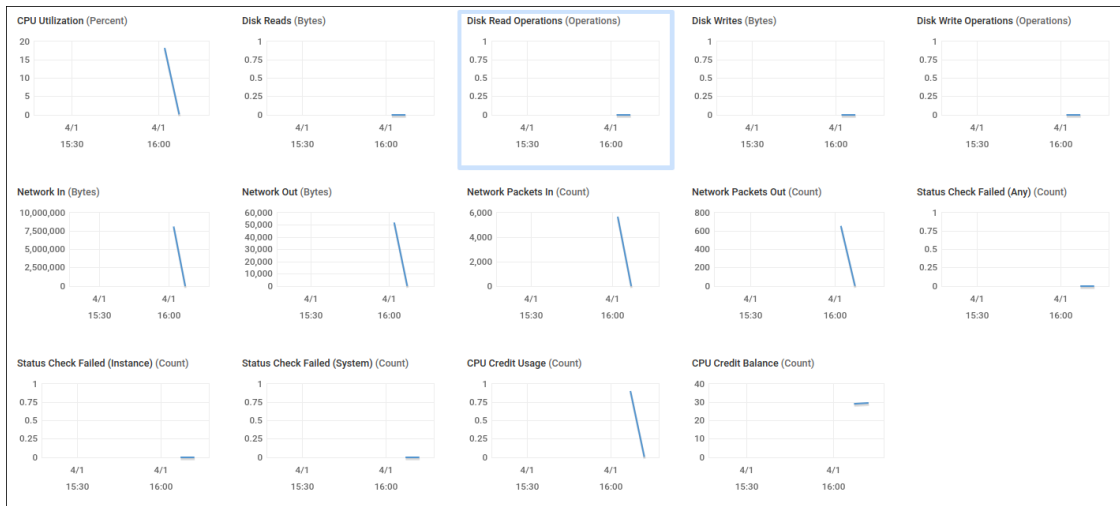
- In the first select the instance and in the details view click on **Monitoring**. Click on **Enable Detailed Monitoring**.
- In the second tab select the Auto Scaling Group and in the details view click on Monitoring.

Observe how the Auto Scaling Group after some time takes a scaling action to launch a new instance.

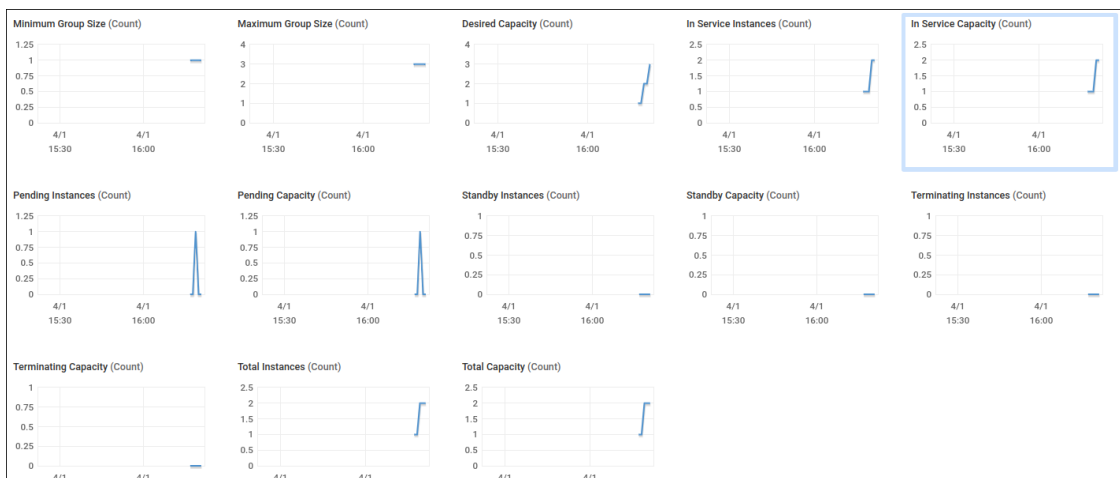
i-02bf3b40245ee...	t2.micro	us-east-1f	<span style="color: green;">●</span> running	✓ 2/2 check.
i-043122480bd61...	t2.micro	us-east-1f	<span style="color: red;">●</span> terminated	
i-0455be2752756...	t2.micro	us-east-1f	<span style="color: green;">●</span> running	✓ 2/2 check.
i-04e022f6b7718...	t2.micro	us-east-1f	<span style="color: green;">●</span> running	✓ 2/2 check.
i-09205fbd1c2e2...	t2.micro	us-east-1c	<span style="color: red;">●</span> terminated	

### Instances launched by the auto-scale group

We can see from the screenshot above that our auto-scale group created three instances. As we configured it to create one to three instances, it is a normal behavior. As CPU usage grows, it creates more and more instances, to a maximum of three.

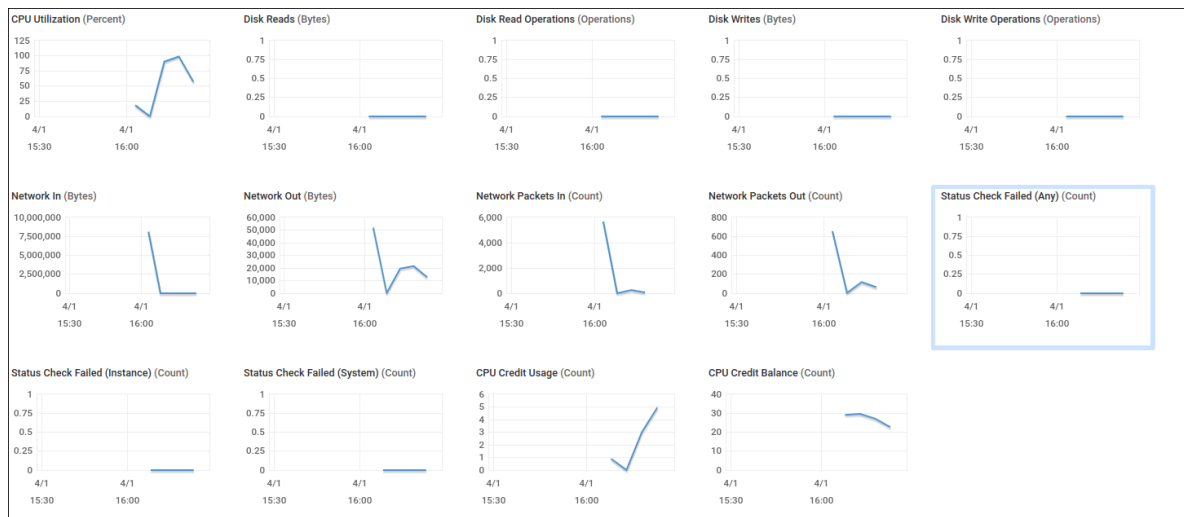


### Instance

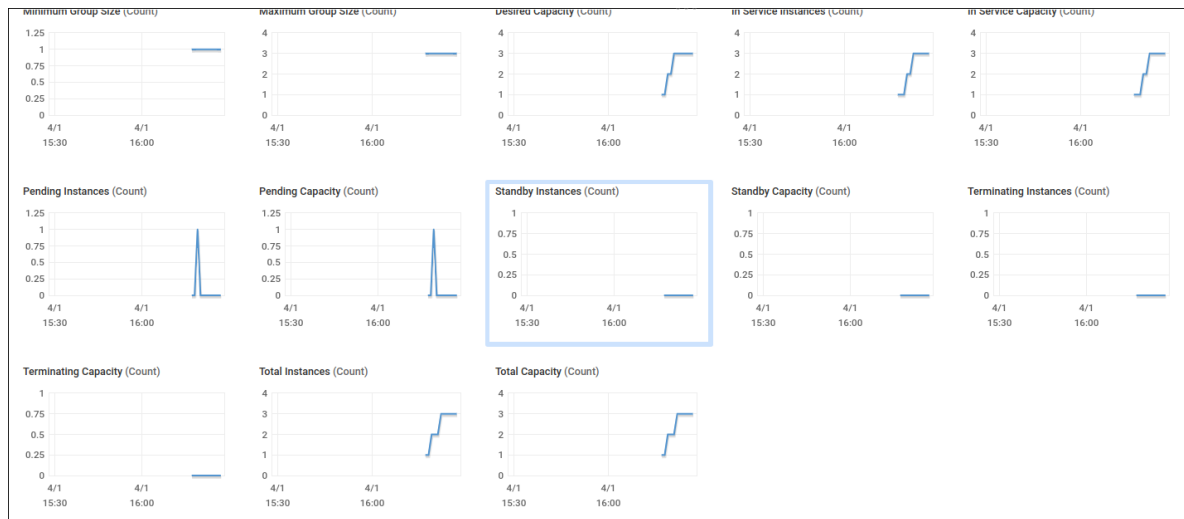


### Auto-scale group

- Let the instance sit idle and observe how the Auto Scaling group after some time terminates an instance.



## Instance



## Auto-scale group

### Deliverables:

- Document your observations of the Auto Scaling Group behavior.