

Module – 4

CASE STUDY – ELB

Problem Statement:

You work for XYZ Corporation that uses on premise solutions and a limited number of systems. With the increase in requests in their application, the load also increases. So, to handle the load the corporation has to buy more systems almost on a regular basis. Realizing the need to cut down the expenses on systems, they decided to move their infrastructure to AWS.

Tasks To Be Performed:

1. Manage the scaling requirements of the company by:
 - a. Deploying multiple compute resources on the cloud as soon as the load increases and the CPU utilization exceeds 80%
 - b. Removing the resources when the CPU utilization goes under 60%
2. Create a load balancer to distribute the load between compute resources.
3. Route the traffic to the company's domain.

Solutions:

Create Launch template and Configure the details

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*

ServerTemplate-Ruchi

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

Template version description

Version-0

Max 255 chars

Using User Data Installing apache server and Display Hi Everyone and Click Create Launch Template

```
#!/bin/bash
sudo apt update -y
sudo apt install apache2 -y
sudo systemctl enable apache2
sudo systemctl start apache2
sudo echo "<center>Hi Everyone<br><h3>This Side Ruchitha</h3></center>" >
/var/www/html/index.html
```

Launch Templates (1/1) [Info](#)

Actions

Create launch template

Search

<

1

>

Launch Template ID	Launch Template Name	Default Version	Latest Version	Create Time
<div><div></div>lt-032b91edd773da985</div>	ServerTemplate-Ruchi	1	1	2024-03-31T15:23:58.000Z

Create Auto Scaling Group with Load balancing and target groups

Choose launch template [Info](#)

Specify a launch template that contains settings common to all EC2 instances that are launched by this Auto Scaling group.

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](#)

Select the Created Template

Launch template [Info](#)

i For accounts created after May 31, 2023, the EC2 console only supports creating Auto Scaling groups with launch templates. Creating Auto Scaling groups with launch configurations is not recommended but still available via the CLI and API until December 31, 2023.

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.

ServerTemplate-Ruchi

↕

↺

[Create a launch template](#) [↗](#)

Version

Default (1)

↕

↺

[Create a launch template version](#) [↗](#)

Description	Launch template	Instance type
Version-0	ServerTemplate-Ruchi ↗ LA-073501-1-117771-005	t2.micro

Select the VPC and subnets

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-09e421fda8e59206f
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-southeast-1a | subnet-0cf105f46bf03a18f X
172.31.16.0/20 Default

ap-southeast-1b | subnet-09000fba630e2f3ca X
172.31.32.0/20 Default

ap-southeast-1c | subnet-0f757c191c1351ae0 X
172.31.0.0/20 Default

[Create a subnet](#)

Create the load Balancer and Target Group

Attach to a new load balancer

Define a new load balancer to create for attachment to this Auto Scaling group.

Load balancer type

Choose from the load balancer types offered below. Type selection cannot be changed after the load balancer is created. If you need a different type of load balancer than those offered here, [visit the Load Balancing console](#).

☒ Application Load Balancer
HTTP, HTTPS

☐ Network Load Balancer
TCP, UDP, TLS

Load balancer name

Name cannot be changed after the load balancer is created.

ServerALB-Ruchi

Load balancer scheme

Scheme cannot be changed after the load balancer is created.

☐ Internal

☒ Internet-facing

Auto Scaling Group

EC2 > Auto Scaling groups

Auto Scaling groups (1) [Info](#) [Refresh](#) [Launch configurations](#) [Launch templates](#) [Actions](#) [Create Auto Scaling group](#)

<input type="checkbox"/>	Name	Launch template/configuration	Instances	Status	Desired capacity	Min	Max
<input type="checkbox"/>	ServerASG-Ruchi	ServerTemplate-Ruchi Version Default	2	-	2	1	3

Load Balancers

Load balancers (1) [Refresh](#) [Actions](#) [Create load balancer](#)

Elastic Load Balancing scales your load balancer capacity automatically in response to changes in incoming traffic.

<input type="checkbox"/>	Name	DNS name	State	VPC ID	Availability Zones
<input type="checkbox"/>	ServerALB-Ruchi	ServerALB-Ruchi-1158980...	Active	vpc-09e421fda8e59206f	3 Availability Zones

Target Groups

EC2 > Target groups

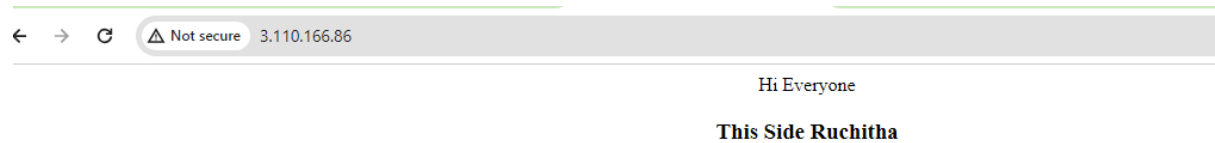
Target groups (1) [Info](#) [Refresh](#) [Actions](#) [Create target group](#)

<input type="checkbox"/>	Name	ARN	Port	Protocol	Target type	Load balancer
<input type="checkbox"/>	ServerTG-Ruchi	arn:aws:elasticloadbalanci...	80	HTTP	Instance	ServerALB-Ruchi

Instances

<input type="checkbox"/>	Instance ID	Name	Port	Zone	Health status	Health status details
<input type="checkbox"/>	i-0b53cf5aaa4b1c24d	1-Instance-ruchi	80	ap-south-1b	Healthy	-
<input type="checkbox"/>	i-08231bfecabaebe2d	2-Instance-ruchi	80	ap-south-1a	Healthy	-

Select the public IP Address and confirm whether **Apache server** is installed properly

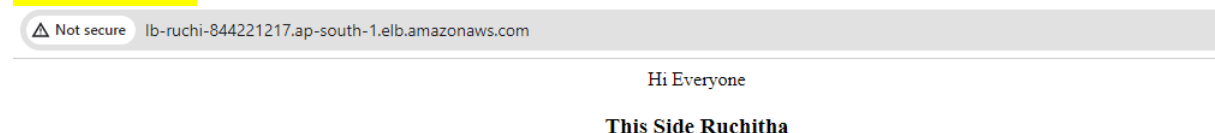


Select the DNS and copy to the browser and check it works

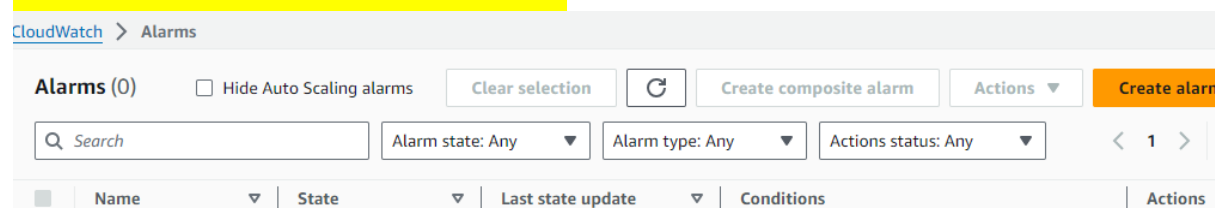
Load balancer: LB-ruchi

	subnet-060f97c177193232b ap-south-1c (aps1-az2) subnet-04f015fdebab1cef5 ap-south-1a (aps1-az1)
Load balancer ARN <code>arn:aws:elasticloadbalancing:ap-south-1:730335274013:loadbalancer/app/LB-ruchi/60742af856544c06</code>	DNS name Info <code>LB-ruchi-844221217.ap-south-1.elb.amazonaws.com</code> (A Record)

It is working



Go to Cloudwatch and create Alarms



Select Metric browse created ASG and Select CPU utilization, edit to >80% & <60%

Alarms (2) ☐ Hide Auto Scaling alarms

Alarm state: Any Alarm type: Any Actions status: Any < 1 >

<input type="checkbox"/>	Name	State	Last state update	Conditions	Actions
<input type="checkbox"/>	ASG<60%-Ruchi	⚠ In alarm	2024-04-01 08:17:39	CPUUtilization < 60 for 1 datapoints within 5 minutes	✔ Actions enabled
<input type="checkbox"/>	ASG>80%-Ruchi	✔ OK	2024-04-01 08:16:38	CPUUtilization > 80 for 1 datapoints within 5 minutes	✔ Actions enabled

Create dynamic scaling policy for Adding and removing servers with 1 capacity units

EC2>Auto Scaling Policy> Automatic Scaling>create dynamic scaling policy

Dynamic scaling policies (2) [Info](#) < 1 >

<div>AddingServers</div> <div>Simple scaling</div> <div>Enabled</div>	<div>RemovingServers</div> <div>Simple scaling</div> <div>Enabled</div>
-----------------------------------------------------------------------	-------------------------------------------------------------------------

We Selected Simple Scaling to Deleting One Instance because We do not have Load so It will Delete Automatically if load <60 %

1 instance got terminated

Instances (2) [Info](#) Instance state Actions

All states < 1 >

<input type="checkbox"/>	Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability
<input type="checkbox"/>	1-Instance-ruchi	i-0b53cf5aaa4b1c24d	✔ Running	t2.micro	✔ 2/2 checks passed	View alarms	ap-south-1
<input type="checkbox"/>	2-Instance-ruchi	i-08231bfecabaebe2d	⊖ Terminated	t2.micro	-	View alarms	ap-south-1

Last part,

Route the server to the company's domain

Amazon Route 53

A reliable way to route users to internet applications

Amazon Route 53 is a highly available and scalable cloud Domain Name System (DNS) web service.

Get started with Route 53

Get started by registering a domain, configuring DNS, or using another Route 53 feature.

[Get started](#)

Go to

Route 53 > Hosted zones > create hosted zone

Route 53 > Hosted zones

Hosted zones (0) [Refresh](#) [View details](#) [Edit](#) [Delete](#) [Create hosted zone](#)

Automatic mode is the current search behavior optimized for best filter results. [To change modes go to settings.](#)

[<](#) **1** [>](#) [Settings](#)

Hosted zone name	Type	Created by	Record c...	Descripti...	Hosted...
------------------	------	------------	-------------	--------------	-----------

Give Your Domain Name Select Here Private since we have **Not Registered** any Domain Name to Host Publicly

Hosted zone configuration

A hosted zone is a container that holds information about how you want to route traffic for a domain, such as subdomains.

Domain name [Info](#)

This is the name of the domain that you want to route traffic for.

Valid characters: a-z, 0-9, ! " # \$ % & ' () * + , - / : ; < = > ? @ [\] ^ _ ` { | } . ~

Description - optional [Info](#)

This value lets you distinguish hosted zones that have the same name.

The description can have up to 256 characters. 0/256

Type [Info](#)

The type indicates whether you want to route traffic on the internet or in an Amazon VPC.

☐ Public hosted zone

A public hosted zone determines how traffic is routed on the internet.

☒ Private hosted zone

A private hosted zone determines how traffic is routed within an Amazon VPC.

Choose the VPC

VPCs to associate with the hosted zone [Info](#)

To use this hosted zone to resolve DNS queries for one or more VPCs, choose the VPCs. To associate a VPC with a hosted zone when the VPC was created using a different AWS account, you must use a programmatic method, such as the AWS CLI.

[For each VPC that you associate with a private hosted zone, you must set the Amazon VPC settings `enableDnsHostnames` and `enableDnsSupport` to true.](#)

Region [Info](#)

Asia Pacific (Mumbai)

Add VPC

VPC ID [Info](#)

Q vpc-08460ba432d043e6a

Use: vpc-08460ba432d043e6a

vpc-08460ba432d043e6a

Remove VPC

Hosted Zone created

Hosted zones (1)

Automatic mode is the current search behavior optimized for best filter results. [To change modes go to settings.](#)

Q Filter records by property or value

< 1 > ⚙

	Hosted zone name	Type	Create...	Record ...	Descrip...	Hosted zo...
<input type="radio"/>	serverruchi.in	Private	Route 53	2	-	Z03727972V...

2 records are created, that is **Name Server(NS)** which brings the traffic and **SOA**

<input type="checkbox"/>	Record ... ▾	Type ▾	Routin... ▾	Differ... ▾	Alias ▾	Value/
<input type="checkbox"/>	serverruc...	NS	Simple	-	No	ns-153 ns-0.av ns-102 ns-512
<input type="checkbox"/>	serverruc...	SOA	Simple	-	No	ns-153

Create another A Record type

▼ Record 1

Delete

Record name [Info](#)

Record type [Info](#)

serverruchi.in

Keep blank to create a record for the root domain.

☒ Alias

Route traffic to [Info](#)

Alias to Application and Classic Load Balancer ▾

Asia Pacific (Mumbai) ▾

Alias hosted zone ID: ZP97RAFLXTNZK

Routing policy [Info](#)

Evaluate target health

Simple routing ▾

☒ Yes

Create new windows instance

Instances (2) Info							
<input type="button" value="Refresh"/> <input type="button" value="Connect"/>				Instance state ▾	Actions ▾	<input type="button" value="Launch instances"/> ▾	
<input type="text" value="Find Instance by attribute or tag (case-sensitive)"/>					All states ▾	< 1 > <input type="button" value="Settings"/>	
<input type="checkbox"/>	Name ↗ ▾	Instance ID	Instance state ▾	Instance type ▲	Status check	Alarm status	Availability
<input type="checkbox"/>	windows-insta...	i-045dac65df00f4542	<input checked="" type="checkbox"/> Running <input type="button" value="Refresh"/>	t2.micro	<input checked="" type="checkbox"/> 2/2 checks passed View alarms +		ap-south-1


Connect to instance [Info](#)


Connect to your instance i-045dac65df00f4542 (windows-instance) using any of these options

Session Manager


RDP client

EC2 serial console

 You may not be able to connect to this instance as ports 3389 may need to be open in order to be accessible. The current associated security groups don't have ports 3389 open.



Instance ID


 i-045dac65df00f4542 (windows-instance)

Connection Type

☒ **Connect using RDP client**


Download a file to use with your RDP client and retrieve your password.

☐ **Connect using Fleet Manager**


To connect to the instance using Fleet Manager Remote Desktop, the SSM Agent must be installed and running on the instance. For more information, see [Working with SSM Agent](#) 

Upload the private key to generate password.

Instance ID


 i-045dac65df00f4542 (windows-instance)


Key pair associated with this instance

 ruchy-kp

Private key

Either upload your private key file or copy and paste its contents into the field below.

 Upload private key file

 ruchy-kp.pem

1.678KB


Private key contents - optional

-----BEGIN RSA PRIVATE KEY-----
MIIEpAIBAAKCAQEAs+oGy9IYtc1xaoqoNBbPafrBW8sxBulaQwv9lvxw4LHHZo6U
lkN1H1XxnZnpHr2/WgB2rlgW56JE1zAjvxDIECJw8zSC/isuklf9KzGBR9ymNGV5
6ywct6Ck4FACBzwlPkCrSm80WS9ivkQw04n0KT7ftY2yUPnTEuBqGvWbW0gfrd00
CEXhOdOzlZ08CtmcM7vUVZSwi3jEvah+nG/kYU07NuUXPgayv0joIETTpnLrHhSu
TtOzzEekKShzHu3fJljlwqVWPGaX+/9DWe0PsgkcyrrHBOGv7eWahYmcOUUij/4k
XidrrMpjQmWX/f31J3sowcEJLJvs6RswPNiORQIDAQABAolBAEL+nLE/htwMCHmt
MD1VUR8RtPbNjxAVGdplmHlyr0W8bZgO992MeQyWIEajjV9ZIOwOyCLbwou2rRPE

Cancel


Decrypt password

Using the RDP shortcut file below.

 Download remote desktop file

When prompted, connect to your instance using the following username and password:

Public DNS

 ec2-15-206-174-215.ap-south-
.compute.amazonaws.com

Username [Info](#)

 Administrator ▼

Password

With the help of public DNS, Username and password open the web page in your local Remote desktop.

Hi Everyone

This Side Ruchitha