

Module 4: Case Study - 1

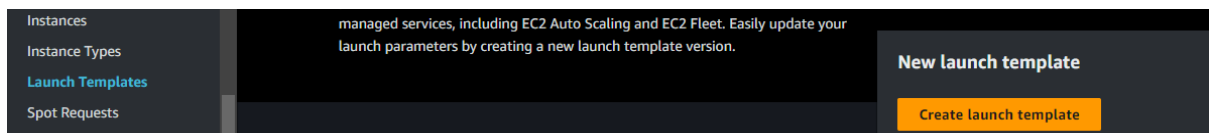
Problem Statement:

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.

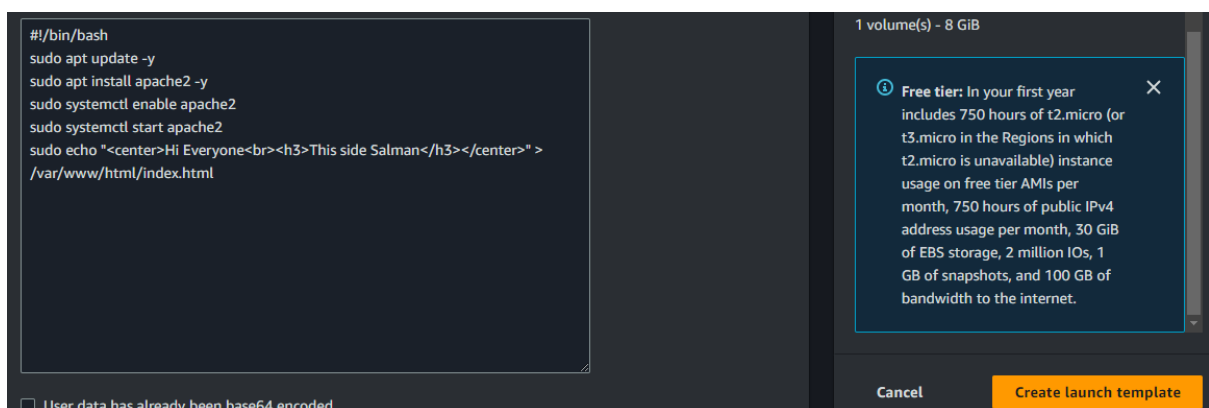
Tasks To Be Performed:

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.

1. Create **Launch Template** and Configure the Template



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



3. Go To ASG and give name and Select **Created Template**

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

Step 5 - optional
Add notifications

Step 6 - optional
Add tags

Step 7
Review

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.

ASG-Salman

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

Launch template Info

ⓘ 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.

ForASG

4. Select **VPC and Subnets** Which U Selected in that **Template**

VPC

vpc-052c6fc0932543ae9 [🔗](#)

Availability Zones and subnets

You must select a single subnet for each Availability Zone enabled. Only public subnets are available for selection to support DNS resolution.

| | |
|--|--------------------------|
| <input checked="" type="checkbox"/> us-east-1d | subnet-0e3fec1cb9edbe195 |
| <input checked="" type="checkbox"/> us-east-1f | subnet-0b0da25d1de72d588 |
| <input checked="" type="checkbox"/> us-east-1a | subnet-0034526f7e93c2851 |
| <input checked="" type="checkbox"/> us-east-1e | subnet-02ac3ec86570ac30f |
| <input checked="" type="checkbox"/> us-east-1c | subnet-0d7bcde4d71b45633 |
| <input checked="" type="checkbox"/> us-east-1b | subnet-0a488bbcd92240cbe |

5. Attach **New Load Balancer** and Provide **Loadbalancer** Name and Select **Internet-facing**

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.

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.

Load balancer scheme
Scheme cannot be changed after the load balancer is created.

☐ Internal

☒ Internet-facing

6. Create **Target Group In ASG**

Listeners and routing
If you require secure listeners, or multiple listeners, you can configure them from the [Load Balancing console](#) [↗](#) after your load balancer is created.

| | | |
|-----------------------------------|---------------------------------|-------------------------------------|
| Protocol | Port | Default routing (forward to) |
| <input type="text" value="HTTP"/> | <input type="text" value="80"/> | <div>Create a target group ▼</div> |

New target group name
An instance target group with default settings will be created.

7. Select **Desired Value** and **Maximum Value**

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 instances groups 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

1

Max desired capacity

3

Equal or less than desired capacity

Equal or greater than desired capacity

8. Skip Notification and Add Tags U want and Review and **Create ASG**

Cancel **Previous** **Create Auto Scaling group**

9. Created ASG

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"/> | ASG-Salman | ForASG Version Default | 2 | - | 2 | 1 | 3 |

10. See the **2 ASG Created** the Instances which we Give the **value in ASG** and **Copy Public IP** and Confirm it our **Apache Installed** Successfully or not

| | Name | Instance ID | Instance state | Instance type | Status check | Alarm status | Availability Zone |
|-------------------------------------|-------|---------------------|----------------|---------------|-------------------|-----------------------------|-------------------|
| <input checked="" type="checkbox"/> | ASG-1 | i-0abf3454892bae0d3 | Running | t2.micro | Initializing | View alarms | us-east-1d |
| <input type="checkbox"/> | ASG-2 | i-0874f5db2987f41ea | Running | t2.micro | 2/2 checks passed | View alarms | us-east-1c |

Instance: i-0abf3454892bae0d3 (ASG-1)

[Details](#) [Status and alarms](#) [Monitoring](#) [Security](#) [Networking](#) [Storage](#) [Tags](#)

Instance summary Info

| | | |
|--|--|---------------------------------------|
| Instance ID i-0abf3454892bae0d3 (ASG-1) | Public IPv4 address 44.202.102.202 open address | Private IPv4 addresses 172.31.89.1 |
|--|--|---------------------------------------|

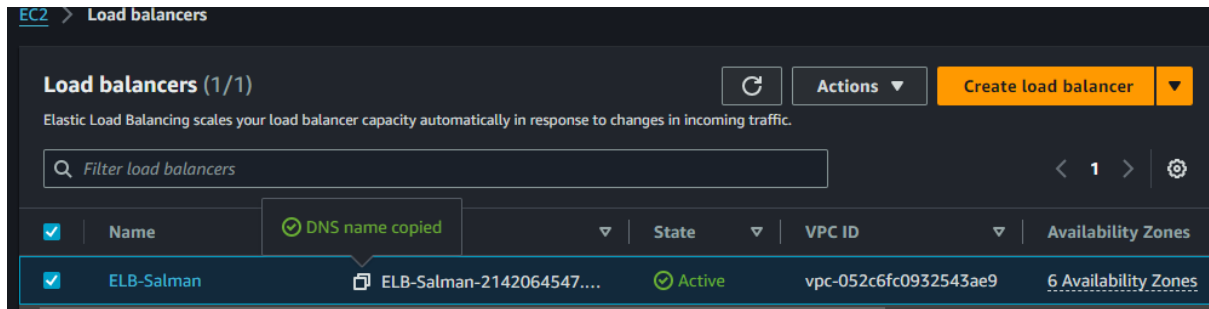
11. Successfully Installed and **Perform the Script**

Not secure 44.202.102.202

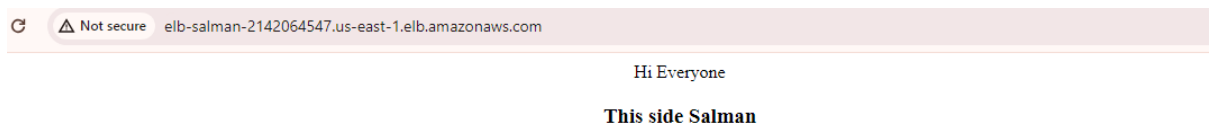
Hi Everyone

This side Salman

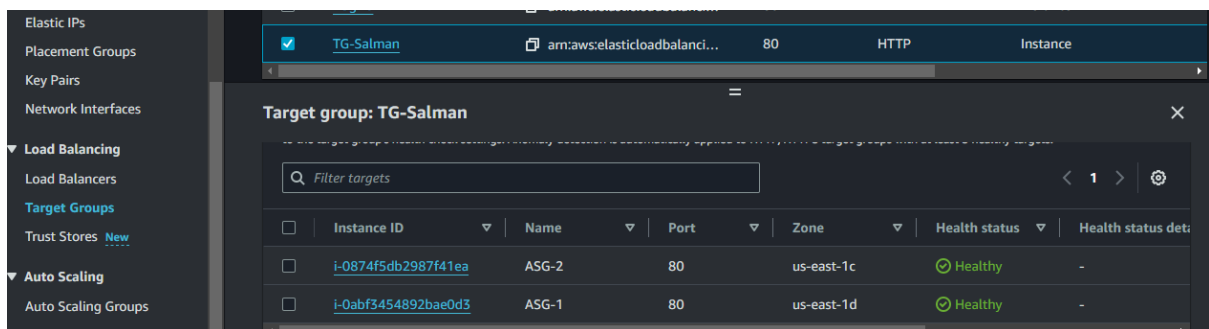
12. Go To Load Balancer and Select **DNS and Copy it**



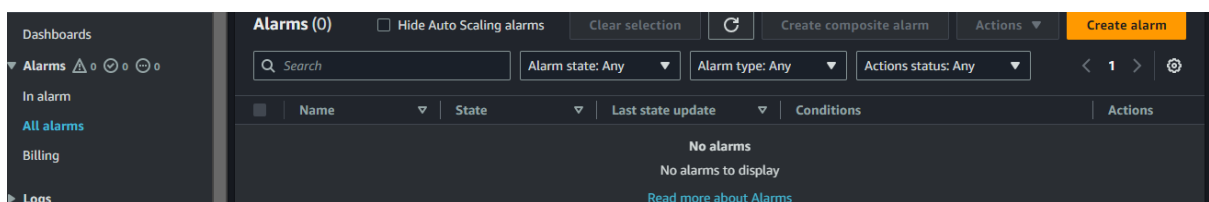
13. And **Paste in the Browser** and **Its work**



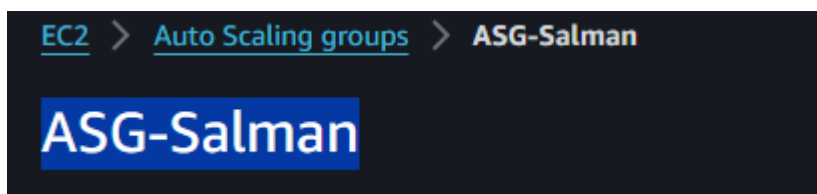
14. See in the **Target Group** We **Target ASG**



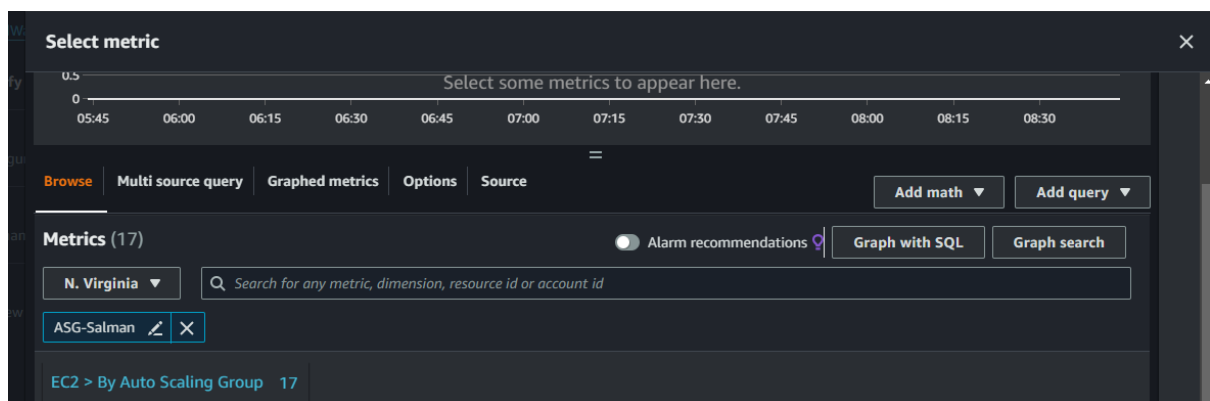
15. Now Go to CloudWatch and **Create Alarm**



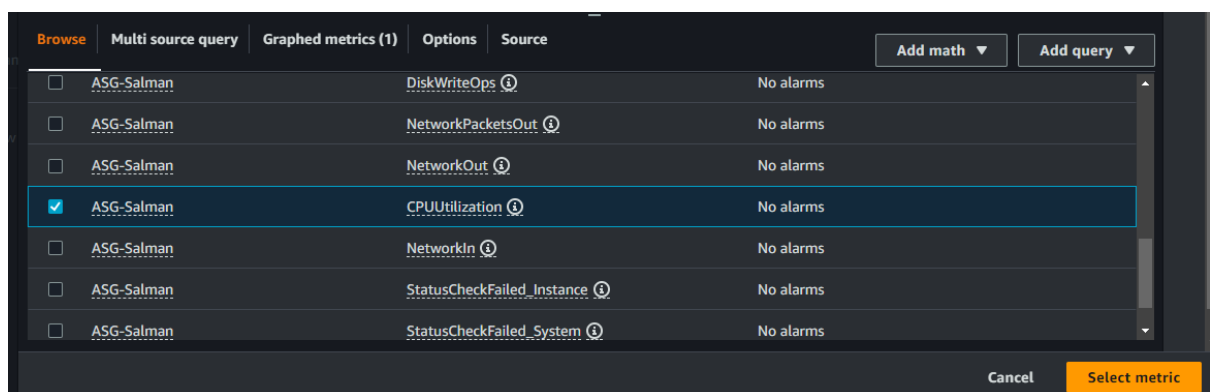
16. Copy Your **ASG name**



17. Paste it and Select **Auto Scaling Group**



18. Select **CPU-Utilization** Metric



19. I Select **Greater then 80** and **Click Next**

Step 2

Configure actions

Step 3

Add name and description

Step 4

Preview and create

Metric

Edit

Graph

This alarm will trigger when the blue line goes above the red line for 1 datapoints within 5 minutes.

Percent

80

40.1

0.133

06:30

07:30

08:30

CPUUtilization

Namespace

AWS/EC2

Metric name

CPUUtilization

AutoScalingGroupName

ASG-Salman

Statistic

Q Average

Period

5 minutes

Conditions

Threshold type

☒ Static

Use a value as a threshold

☐ Anomaly detection

Use a band as a threshold

Whenever CPUUtilization is...

Define the alarm condition.

☒ Greater

> threshold

☐ Greater/Equal

>= threshold

☐ Lower/Equal

<= threshold

☐ Lower

< threshold

20. Give **Alarm Name** and **Next**

Step 3

Add name and description

Step 4

Preview and create

Alarm name

Add-Server-If-Greaterthan80%

Alarm description - optional [View formatting guidelines](#)

Edit

Preview

This is an H1
double asterisks will produce strong character
This is [an example](https://example.com/) inline link.

Up to 1024 characters (0/1024)

Markdown formatting is only applied when viewing your alarm in the console. The description will remain in plain text in the alarm notifications.

Cancel

Previous

Next

21. Create Alarm

Cancel

Previous

Create alarm

22. One Alarm Created Which is Greater then 80% and Its Add Instances

CloudWatch > Alarms

Alarms (1) ☐ 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"/> | Add-Server-If-Greaterthan80% | ⚠️ Insufficient data | 2024-03-23 08:52:47 | CPUUtilization > 80 for 1 datapoints within 5 minutes | No actions |

23. Like Created Less then 60% Utilization Alarm to Remove Instances

Alarms (2) ☐ Hide Auto Scaling alarms

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

| | | | | | |
|--------------------------|--|----------------------|---------------------|---|------------|
| <input type="checkbox"/> | Add-Server-If-Lessthen60% | ⚠️ Insufficient data | 2024-03-23 08:56:08 | CPUUtilization < 60 for 1 datapoints within 5 minutes | No actions |
| <input type="checkbox"/> | Add-Server-If-Greaterthan80% | ✅ OK | 2024-03-23 08:53:59 | CPUUtilization > 80 for 1 datapoints within 5 minutes | No actions |

24. Go To ASG > Automatic Scaling and Create Dynamic Scaling Policy

EC2 > Auto Scaling groups > ASG-Salman

ASG-Salman

[Details](#) | [Activity](#) | [Automatic scaling](#) | [Instance management](#) | [Monitoring](#) | [Instance refresh](#)

25. As of Now Select **Simple Scaling** to **Deleting One Instance** because We do not have Load so **It will Delete Automatically** if **load less then 60 %**

EC2 > Auto Scaling groups > ASG-Salman

Create dynamic scaling policy

Policy type
Simple scaling ▼

Scaling policy name
Simple-Scale

CloudWatch alarm
Choose an alarm that can scale capacity whenever:
Add-Server-If-Lessthen60% ▼

[Create a CloudWatch alarm](#)

breaches the alarm threshold: CPUUtilization < 60 for 1 consecutive periods of 300 seconds for the metric dimensions:

AutoScalingGroupName = ASG-Salman

Take the action
Remove ▼ 1 capacity units ▼

And then wait
100 seconds before allowing another scaling activity

Cancel Create

26. See the **One Dynamic Scaling Policy Created Successfully**

Details Activity Automatic scaling Instance management Monitoring Instance refresh

Scaling policies resize your Auto Scaling group to meet changes in demand. With reactive dynamic scaling policies, you can track specific CloudWatch metrics and take action when the CloudWatch alarm threshold is met. Use predictive scaling policies along with dynamic scaling policies in the following situations: when your application demand changes quickly, but with a recurring pattern, or when your EC2 instances require more time to initialize.

Dynamic scaling policies (2) [Info](#) Actions ▼ [Create dynamic scaling policy](#)

< 1 >

| | |
|--|--|
| Simple-Scale | Simple-Scale |
| Simple scaling | Simple scaling |
| Enabled | Enabled |
| No alarm selected | No alarm selected |
| Remove 1 capacity units | Remove 1 capacity units |
| 100 seconds before allowing another scaling activity | 100 seconds before allowing another scaling activity |

27. See one Instances **Deleting Automatically**

| Instances (2) Info | | | | | | | |
|--|-------|---------------------|----------------|---------------|-------------------|---------------|----------------|
| Find Instance by attribute or tag (case-sensitive) | | | | | | | |
| All states | | | | | | | |
| <input type="checkbox"/> | Name | Instance ID | Instance state | Instance type | Status check | Alarm status | Availability Z |
| <input type="checkbox"/> | ASG-1 | i-0abf3454892bae0d3 | Running | t2.micro | 2/2 checks passed | View alarms + | us-east-1d |
| <input type="checkbox"/> | ASG-2 | i-0874f5db2987f41ea | Terminated | t2.micro | - | View alarms + | us-east-1c |

28. Now the 3rd Step is to Route The **Load Balancer** to Custom Domain

Route 53 Dashboard

DNS management
A hosted zone tells Route 53 how to respond to DNS queries for a domain such as example.com.
[Create hosted zone](#)

Traffic management
A visual tool that lets you easily create policies for multiple endpoints in complex configurations.
[Create policy](#)

Availability monitoring
Health checks monitor your applications and web resources, and direct DNS queries to healthy resources.
[Create health check](#)

Domain registration
A domain is the name, such as example.com, that your users use to access your application.
[Register domain](#)

29. R53 Dashboard > Hosted Zones > **Create Hosted Zone**

Route 53 Hosted zones

Hosted zones (0) [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.

Filter records by property or value

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

30. Give Your Domain Name Select Here Private Because We are Not Registered any Domain Name to Host Publicly

Route 53 > Hosted zones > Create hosted zone

Create hosted zone Info

Hosted zone configuration

A hosted zone is a container that holds information about how you want to route traffic for a domain, such as `example.com`, and its 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.

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

VPC ID Info

31. Its Created Name Servers which Brings the Traffic and Created SOA

| Records (2) <small>Info</small> | | | | | | | |
|--|--------------|--------|-------------|-------------|------------------|--|-------------|
| Automatic mode is the current search behavior optimized for best filter results. To change modes go to settings. | | | | | | | |
| <input type="text" value="Filter records by property or value"/> | | | | Type ▼ | Routing pol... ▼ | Alias ▼ | < 1 > ⚙ |
| <input type="checkbox"/> | Record ... ▼ | Type ▼ | Routin... ▼ | Differ... ▼ | Alias ▼ | Value/Route traffic to ▼ | TTL (s... ▼ |
| <input type="checkbox"/> | salmanfar... | NS | Simple | - | No | ns-1536.awsdns-00.co.uk. ns-0.awsdns-00.com. ns-1024.awsdns-00.org. ns-512.awsdns-00.net. | 172800 |
| <input type="checkbox"/> | salmanfar... | SOA | Simple | - | No | ns-1536.awsdns-00.co.uk. a... | 900 |

32. Create a Record Type **A** and Click Alias and we are Mapping to LB and **Select Region** and **Select ELB DNS**

Quick create record [Switch to wizard](#)

▼ Record 1 Delete

Record name [Info](#) Record type [Info](#) **A – Routes traffic to an IPv4 address and some AWS resources**

Keep blank to create a record for the root domain.

☒ Alias

Route traffic to [Info](#) **Alias to Application and Classic Load Balancer**

US East (N. Virginia)

×

Alias hosted zone ID: Z35SXDOTRQ7X7K

Routing policy [Info](#) **Simple routing** Evaluate target health ☒ Yes

Add another record

Cancel Create records

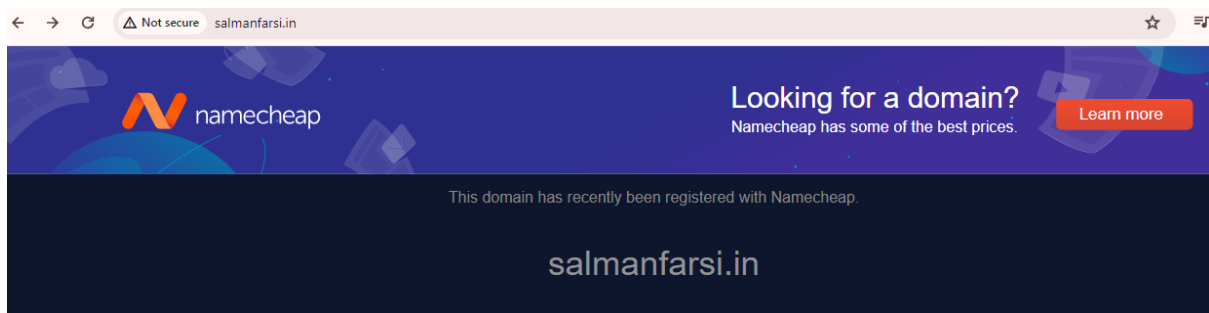
33. Copy **Hostname salmanfarsi.in**

[Route 53](#) > [Hosted zones](#) > **salmanfarsi.in**

Private **salmanfarsi.in** [Info](#) Delete zone Test record Configure query logging

► **Hosted zone details** Edit hosted zone

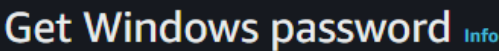
34. Its Already **Registered with this name in Publically** and otherwise it will show error



35. So Go Launch **Windows Instances**

| Instances (1/3) Info | | | | | | | |
|---|-----------------|---------------------|------------------|-----------------|-------------------|-------------------------------|-------------|
| <input type="text" value="Find Instance by attribute or tag (case-sensitive)"/> | | | | All states ▼ | | < 1 > ⚙️ | |
| <input checked="" type="checkbox"/> | Name ↗ | Instance ID | Instance state ▼ | Instance type ▼ | Status check | Alarm status | Availabilit |
| <input checked="" type="checkbox"/> | Windows-Inst... | i-04b89ea85886a9c06 | Running | t2.micro | Initializing | View alarms + | us-east-1b |
| <input type="checkbox"/> | ASG-1 | i-0abf3454892bae0d3 | Running | t2.micro | 2/2 checks passed | View alarms + | us-east-1d |
| <input type="checkbox"/> | ASG-2 | i-0874f5db2987f41ea | Terminated | t2.micro | – | View alarms + | us-east-1c |

Connect > RDP and Upload Private Key



Instance ID

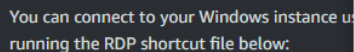
Key pair associated with this instance

Private key

 Upload private key file

Private key contents - optional

```
-----BEGIN RSA PRIVATE KEY-----
MIIEogIBAAKCAQEAJX953LjTus3mjdhHjaYU3C7Xfnvd+wXUIk9XeJd08Zy/pU
GLE7asRksxvzvmfrqXdBl51eSt/6dw4wlRuyRy4jSb4WSdqUeDKTfAmex6oLcLwA
nT+xlIPcdPq8fLPG6681vx3aHS9HlvWadpQ0W3zlyIgD9WMfmed60c5Mw3GC2zCM
```

[Download RD file](#)

When prompted, connect to your instance using

Public DNS

ec2-18-212-122-84.compute-1.amazon

Password


Qcuvpoy4-8n)7Lx0vfaEalgBS6!9!UfO

- ❗ If you've joined your instance to a directory instance.

The screenshot shows a Windows File Explorer window. The address bar indicates the current location is 'This PC > Windows (C:) > Users > shaik > Downloads'. The left sidebar shows the 'Downloads' folder selected. The main pane displays a list of files and folders. The file 'Windows-Instances' is highlighted. The list includes columns for 'Name', 'Date modified', and 'Type'.

| Name | Date modified | Type |
|--------------------------|------------------|----------------------|
| Today (2) | | |
| Windows-Instances | 23-03-2024 14:59 | Remote Desktop ... |
| UserData-Sudip-1 | 23-03-2024 12:48 | Compressed (zipp... |
| Yesterday (4) | | |
| Test2-Salman_credentials | 22-03-2024 15:26 | Microsoft Excel C... |

39 items | 1 item selected 98 bytes

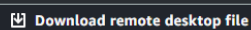
 Publisher: **Unknown publisher**
Type: Remote Desktop Connection
Remote computer: ec2-18-212-122-84.compute-1.amazonaws.com

☐ Don't ask me again for connections to this computer Show Details

Connect

Cancel

Username and Password



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

Public DNS

ec2-18-212-122-84.compute-1.amazonaws.com

✔ Username copied

Administrator

These credentials will be used to connect to
ec2-18-212-122-84.compute-1.amazonaws.com.

Administrator

.....

☐ Remember me

39. Go To Browser type domain name it will work in within a VPC only because its Private Hosted Domain we Selected, If we selected Public salmanfarsi.in not able to select need to select another name to publically need to host. So for the testing purpose generally use private hosted domain so the Assignment Task is Completed

