

**School of Computer Science, Engineering and Applications(SCSEA)**

**B.C.A. TY (CCSA)**

**Subject : Infrastructure Orchestration (P)**

**Name of the Student:** Shrushti Krishna Shrivastav **PRN:** 20220801024

**Title of Practicle :** Setting up Application Load Balancer with Multiple EC2 instances

**NOTE:**

1. SECURITY GROUP: SG-CCSA-TY-1024
2. TARGET GROUP: TG-CCSAS-TY-1024
3. LOAD BALANCER: ALB-CCSA-TY-1024

**Step 1: Launch your EC2 Instance (4 instances)**

Log in and Navigate to the EC2 dashboard. Click on the "Launch Instance" button.

Now name your instance:

following the simple steps below.

**Name and tags** [Info](#)

Name

loadbal-TY-1024

Increase the number of instances to 4

(instead of manually launching 4 instances increase the number, 4 instances of same configuration will be created.)

▼ **Summary**

Number of instances [Info](#)

4

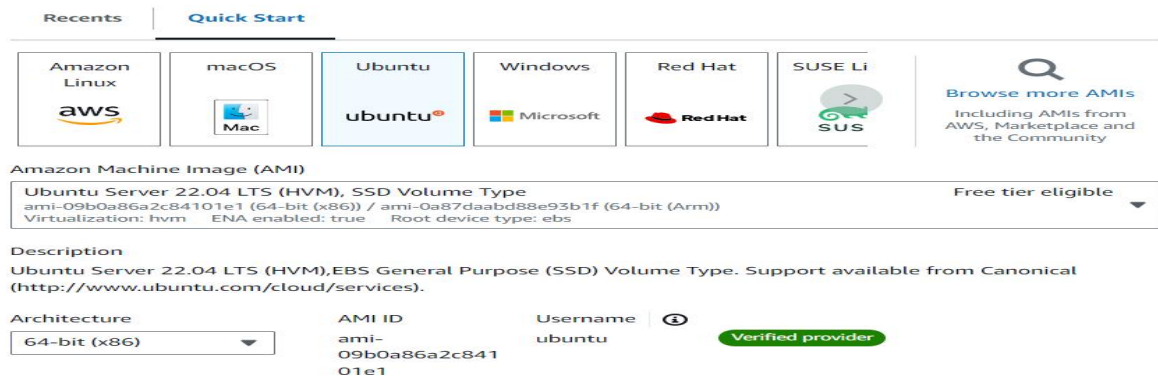
When launching more than 1 instance, consider [EC2 Auto Scaling](#)

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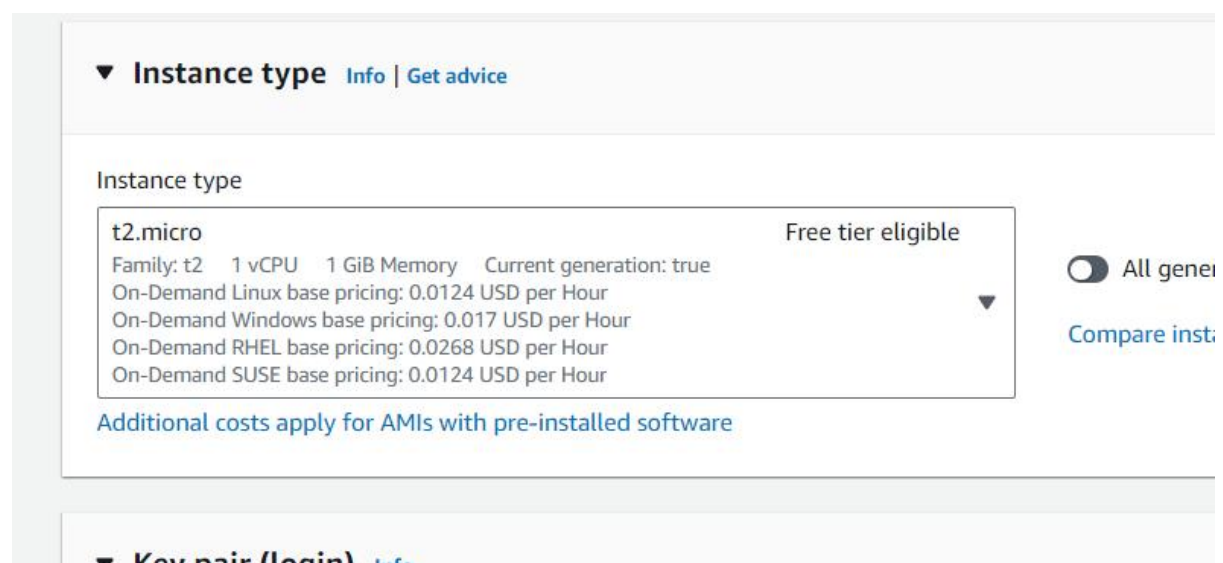
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Select AMI: Ubuntu server 22.04



The screenshot shows the AWS IAM console's 'Quick Start' tab for AMI selection. The 'Ubuntu' tile is selected. Below the tiles, the 'Amazon Machine Image (AMI)' section displays 'Ubuntu Server 22.04 LTS (HVM), SSD Volume Type' with AMI ID 'ami-09b0a86a2c84101e1'. The 'Description' section states 'Ubuntu Server 22.04 LTS (HVM),EBS General Purpose (SSD) Volume Type'. The 'Architecture' dropdown is set to '64-bit (x86)'. The 'AMI ID' is 'ami-09b0a86a2c84101e1' and the 'Username' is 'ubuntu'. A 'Verified provider' badge is visible.

Instance type : t2 micro



The screenshot shows the AWS IAM console's 'Instance type' section. The 't2.micro' instance type is selected, which is 'Free tier eligible'. The 'Family' is 't2' with '1 vCPU' and '1 GiB Memory'. The 'Current generation' is 'true'. The pricing details are: 'On-Demand Linux base pricing: 0.0124 USD per Hour', 'On-Demand Windows base pricing: 0.017 USD per Hour', 'On-Demand RHEL base pricing: 0.0268 USD per Hour', and 'On-Demand SUSE base pricing: 0.0124 USD per Hour'. A note states 'Additional costs apply for AMIs with pre-installed software'. The 'All gener' toggle is visible on the right.



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Key pair : attach your key-pair (must know location where it is downloaded) or create a new one

▼ **Key pair (login)** [Info](#)

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

Key pair name - required

IOdemo1

Security group: Attach security group that allow http traffic (SG-CCSA-TY-1024)

Common security groups [Info](#)

Select security groups

SG-CCSA-TY-1024 sg-08f4e0d7ab53772a8 ✕  
VPC: vpc-0662aa9456cd34d0a

Security groups that you add or remove here will be added to or removed from all you

Do the changes in advance detail:

▼ **Advanced details** [Info](#)

Domain join directory [Info](#)

Select

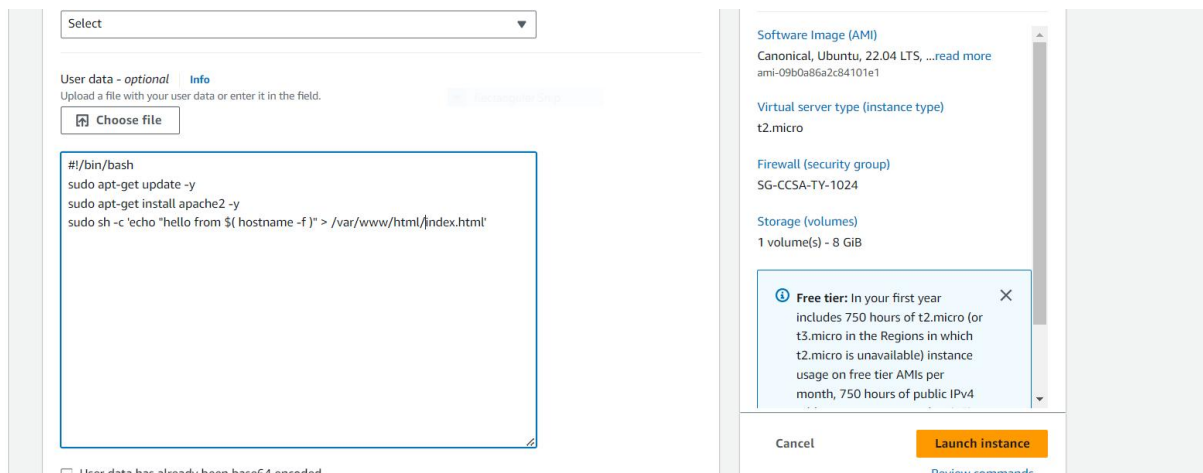
```
(#!/bin/bash  
sudo apt-get update -y  
sudo apt-get install apache2 -y  
sudo sh -c 'echo "hello from $(hostname -f)" > /var/www/html/index.html')
```

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Add this script at the end.



Select

User data - optional [Info](#)  
 Upload a file with your user data or enter it in the field.

[Choose file](#)

```
#!/bin/bash
sudo apt-get update -y
sudo apt-get install apache2 -y
sudo sh -c 'echo "hello from $(hostname -f)" > /var/www/html/index.html'
```

☐ User data has already been base64 encoded

Software Image (AMI)  
 Canonical, Ubuntu, 22.04 LTS, ...read more  
 ami-09b0a86a2c84101e1

Virtual server type (instance type)  
 t2.micro

Firewall (security group)  
 SG-CCSA-TY-1024

Storage (volumes)  
 1 volume(s) - 8 GiB

**Free tier:** In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which t2.micro is unavailable) instance usage on free tier AMIs per month, 750 hours of public IPv4

Cancel **Launch instance** [Review commands](#)

Now 'LAUNCH' your Instance

Wait for your instance status to show as 'running' and '2/2 checks passed'.

**Instances (4)** [Info](#)

Last updated less than a minute ago [Refresh](#) [Connect](#)

[All states](#)

<input type="checkbox"/>	Name <a href="#">✎</a>	Instance ID	Instance state <a href="#">▼</a>	Instance type <a href="#">▼</a>	Status check	Alarm <a href="#">🔔</a>
<input type="checkbox"/>	loadbal-TY-1024	i-07974b6180662676f	Running <a href="#">🔍</a> <a href="#">🔍</a>	t2.micro	2/2 checks passed	<a href="#">View</a>
<input type="checkbox"/>	loadbal-TY-1024	i-0b98b0d74269f6e86	Running <a href="#">🔍</a> <a href="#">🔍</a>	t2.micro	2/2 checks passed	<a href="#">View</a>
<input type="checkbox"/>	loadbal-TY-1024	i-0c67cee42c1538b25	Running <a href="#">🔍</a> <a href="#">🔍</a>	t2.micro	2/2 checks passed	<a href="#">View</a>
<input type="checkbox"/>	loadbal-TY-1024	i-032457bc552dabacc	Running <a href="#">🔍</a> <a href="#">🔍</a>	t2.micro	2/2 checks passed	<a href="#">View</a>

[Rectangular Shap](#)

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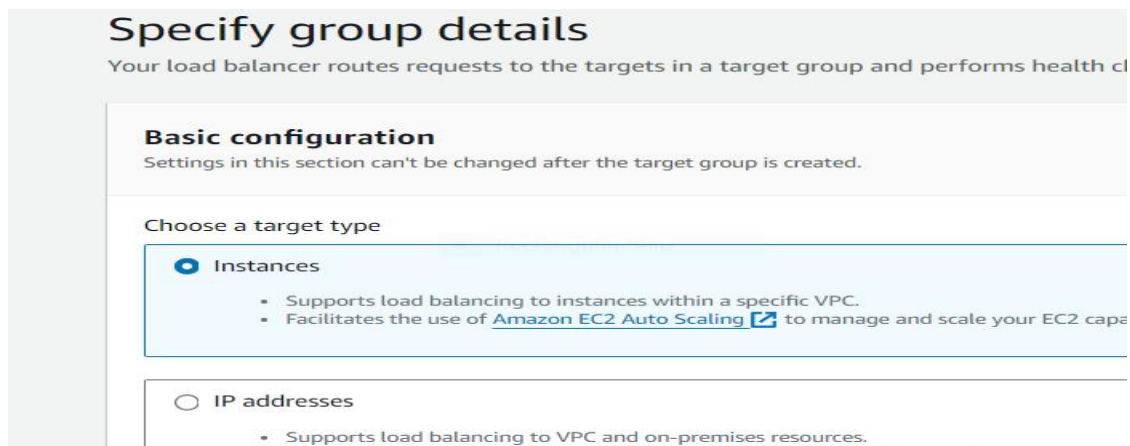
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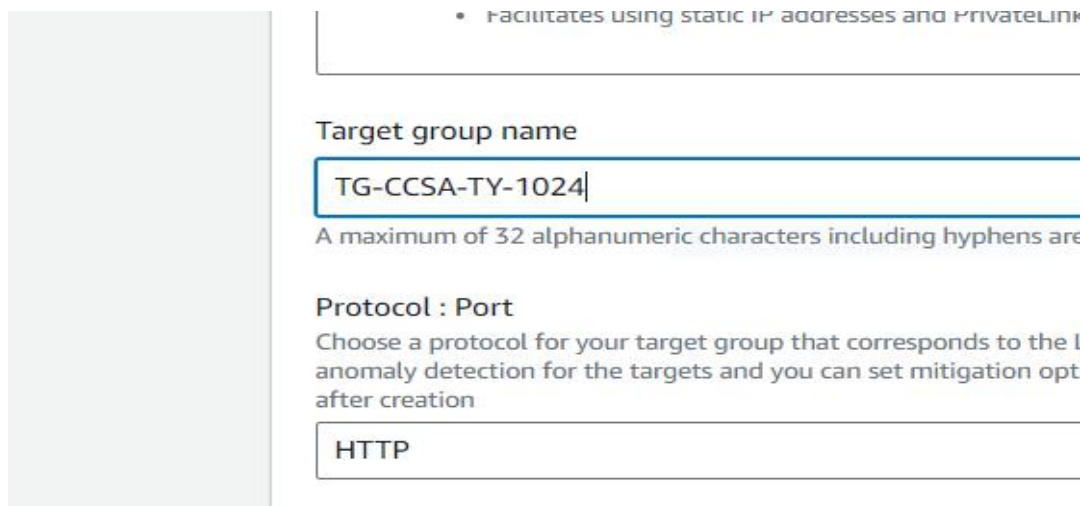
**Step2: TARGET GROUP**

At the bottom of side-bar in load balancing section there is Target Groups. 'create target group'

Target type: instances



Name your target group:



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Keep rest of the setting as default and proceed for next step in creation.

In last step add all the instances by selecting all instances and 'include as pending below'

**Review targets**

**Targets (4)**

☐ Show only pending

Instance ID	Name	Port	State	Security groups
i-07974b6180662676f	loadbal-TY-1024	80	Running	SG-CCSA-TY-1024
i-0b98b0d74269f6e86	loadbal-TY-1024	80	Running	SG-CCSA-TY-1024
i-0c67cee42c1538b25	loadbal-TY-1024	80	Running	SG-CCSA-TY-1024
i-032457bc552dabacc	loadbal-TY-1024	80	Running	SG-CCSA-TY-1024

And create target group.

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Successfully created the target group: TG-CCSA-TY-1024. Anomaly detection is automa

[EC2](#) > [Target groups](#) > TG-CCSA-TY-1024

## TG-CCSA-TY-1024

**Details**  
 `arn:aws:elasticloadbalancing:ap-south-1:339712766612:targetgroup/TG-CCSA-TY-1024/fee`  
[Refresh target group](#)

Target type	Protocol : Port
Instance	HTTP: 80
IP address type	Load balancer
IPv4	<a href="#">None associated</a>

4 Total targets	 0 Healthy	 0 Unhealthy
	0 Anomalous	

**Step3: LOAD BALANCER**

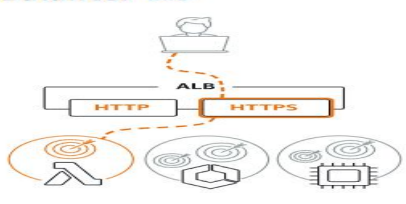
Now create an 'Application Load Balancer'

### Compare and select load ba


A complete feature-by-feature comparison along with d

**Load balancer types**

**Application Load Balancer**  
[Info](#)



**Network Load Balancer**  
[Info](#)



Name the load balancer and ensure it has (scheme) 'internet-facing' enabled





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### Basic configuration

#### Load balancer name

Name must be unique within your AWS account and can't be changed after creation.

ALB-CCSA-TY-1024

A maximum of 32 alphanumeric characters including hyphens are allowed.

#### Scheme [Info](#)

Scheme can't be changed after the load balancer is created.

☒ **Internet-facing**

An internet-facing load balancer routes requests from clients over the internet.

☐ **Internal**

An internal load balancer routes requests from clients to targets using private IP addresses.

#### Load balancer IP address type [Info](#)

Select the front-end IP address type to assign to the load balancer. The VPC must have an IPv4 address pool.

☒ **IPv4**

Includes only IPv4 addresses.

In network mapping select all the Availability Zones

#### Mappings [Info](#)

Select at least two Availability Zones and one subnet per Availability Zone. If no subnets or the VPC are not available for selection.

#### Availability Zones

☒ **ap-south-1a (aps1-az1)**

Subnet

subnet-0eb625152a51d805e

IPv4 subnet CIDR: 172.31.32.0/20

IPv4 address

Assigned by AWS

☒ **ap-south-1b (aps1-az3)**

Subnet

subnet-03acd2c431efc85dd

IPv4 subnet CIDR: 172.31.0.0/20

IPv4 address

Assigned by AWS

☒ **ap-south-1c (aps1-az2)**

Subnet

subnet-01945cf8c6a395f06



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Add your security group

**Security groups** [Info](#)  
A security group is a set of firewall rules that control the traffic to your load balancer.

Security groups

Select up to 5 security groups

SG-CCSA-TY-1024  
sg-08f4e0d7ab53772a8 VPC: vpc-0662aa9456cd34d0a

Attach target group

**Listeners and routing** [Info](#)  
A listener is a process that checks for connection requests using the port and protocol you configure. The rules that you define for a listener determine how traffic is routed to its registered targets.

▼ Listener HTTP:80

Protocol

HTTP ▼

:

Port

80

1-65535

Default action

Forward to

TG-CCSA-TY-1024

Target type: Instance, IPv4

[Create target group](#)

**Listener tags - optional**  
Consider adding tags to your listener. Tags enable you to categorize your AWS resources so you can more easily manage them.

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Review the summary and create the load balancer

Review the load balancer configurations and make changes if needed. After you finish reviewing the configurations, choose **Create load balancer**.

### Summary

Review and confirm your configurations. [Estimate cost](#)

<b>Basic configuration</b> <a href="#">Edit</a> ALB-CCSA-TY-1024 <ul style="list-style-type: none"><li>Internet-facing</li><li>IPv4</li></ul>	<b>Security groups</b> <a href="#">Edit</a> <a href="#">Recreate</a> <ul style="list-style-type: none"><li>SG-CCSA-TY-1024 <a href="#">sg-08f4e0d7ab53772a8</a></li></ul>	<b>Network mapping</b> <a href="#">Edit</a> VPC: <a href="#">vpc-0662aa9456cd34d0a</a> <ul style="list-style-type: none"><li>ap-south-1a <a href="#">subnet-0eb625152a51d805e</a></li><li>ap-south-1b <a href="#">subnet-03acd2c431efc85dd</a></li><li>ap-south-1c <a href="#">subnet-01845cf8c6ea95f06</a></li></ul>	<b>Listeners and routing</b> <a href="#">Edit</a> <ul style="list-style-type: none"><li>HTTP:80 defaults to <a href="#">TG-CCSA-TY-1024</a></li></ul>
<b>Service integrations</b> <a href="#">Edit</a> AWS WAF: None AWS Global Accelerator: None		<b>Tags</b> <a href="#">Edit</a> None	
<b>Attributes</b> <div> Certain default attributes will be applied to your load balancer. You can view and edit them after creating the load balancer.</div>			

Wait until the status is 'ACTIVE' and then paste the DNS to browser

### Load balancers (1/1)

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

Filter load balancers

<input checked="" type="checkbox"/>	Name	DNS name	State	VPC ID	Availa
<input checked="" type="checkbox"/>	<a href="#">ALB-CCSA-TY-1024</a>	<a href="#">ALB-CCSA-TY-1024-17530...</a>	Active	vpc-0662aa9456cd34...	3 Avail

To ensure load balancer is working refresh the page

Instance 1

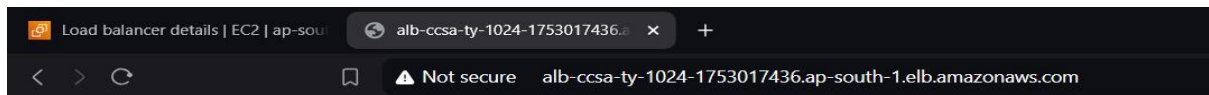
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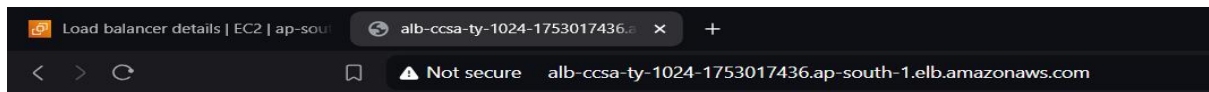
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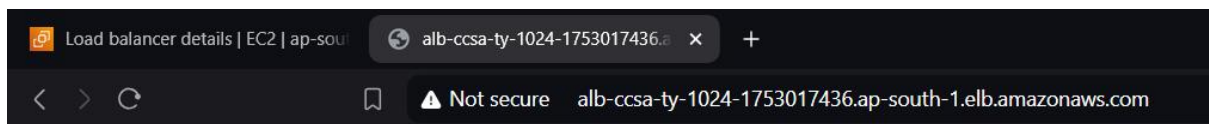
hello from ip-172-31-43-95.ap-south-1.compute.internal

**Instance 2**



hello from ip-172-31-39-230.ap-south-1.compute.internal

**Instance 3**



hello from ip-172-31-40-95.ap-south-1.compute.internal



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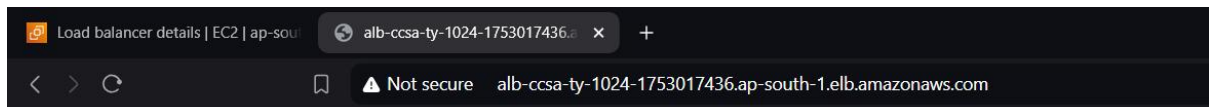
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Instance 4



hello from ip-172-31-43-244.ap-south-1.compute.internal

Done.

First delete load balancer then target group and finally terminate instances.