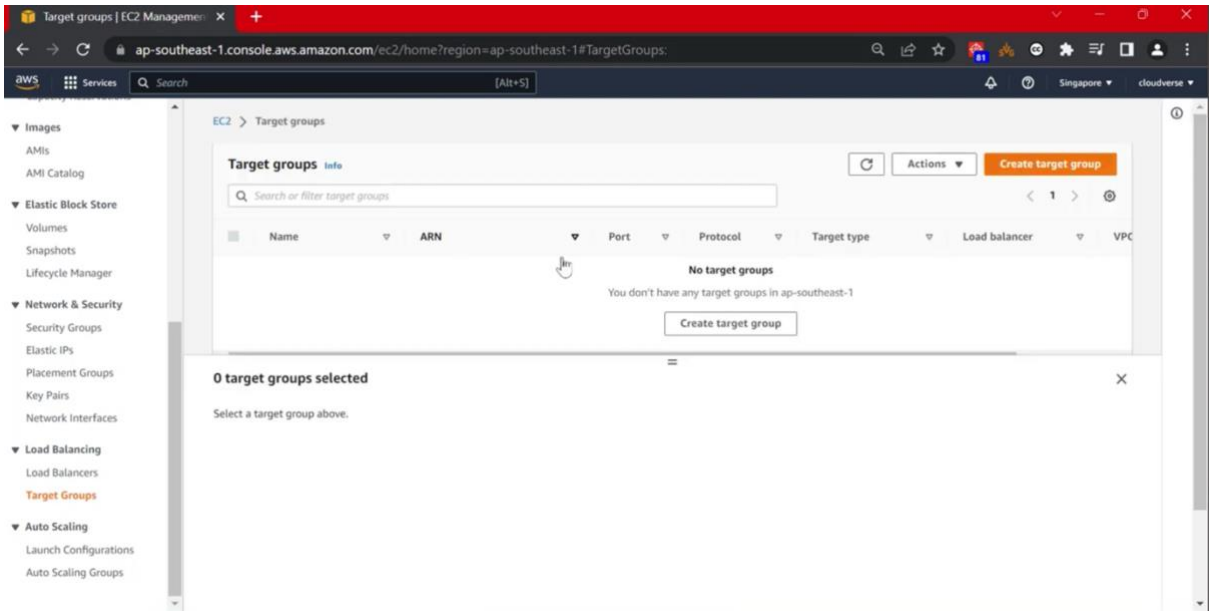
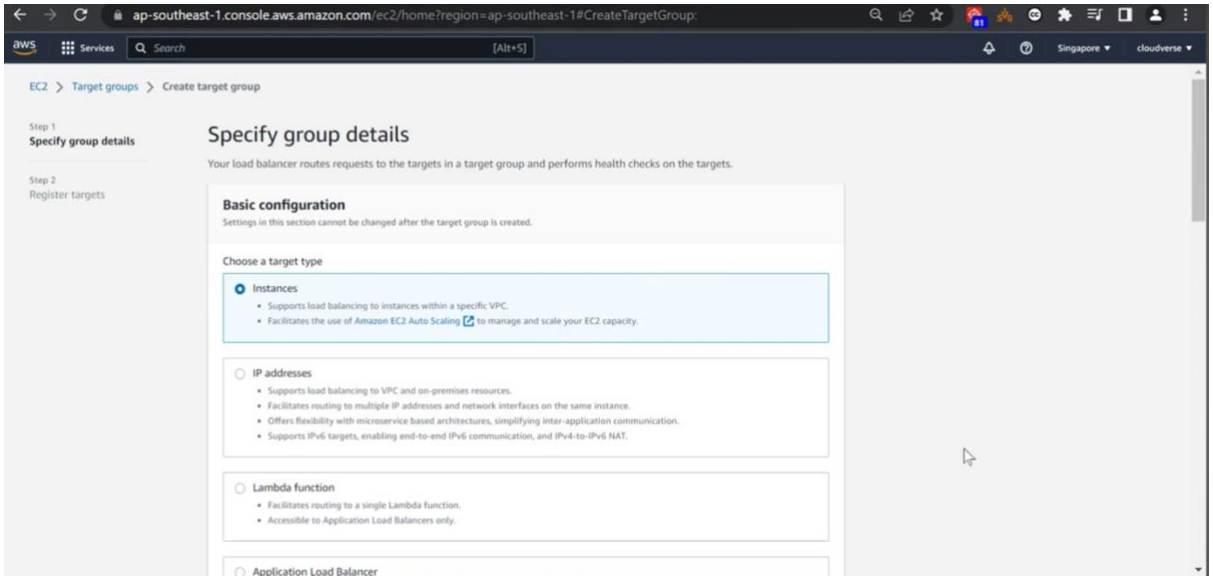
TASK 2

Step 1: Define a New Target Group

1. Navigate to EC2 Dashboard - Target Groups → Click on Create Target Group.
2. Set the following parameters:
   - Target type: Choose Instances
   - Protocol: Select HTTP
   - Port: Enter 8080 (this is for Jenkins)
1. Assign a suitable name to your target group.
2. Add your existing EC2 instance(s) to this target group.
3. In the Health checks section, set the path to / .




ap-southeast-1.console.aws.amazon.com/ec2/home?region=ap-southeast-1#CreateTargetGroup:
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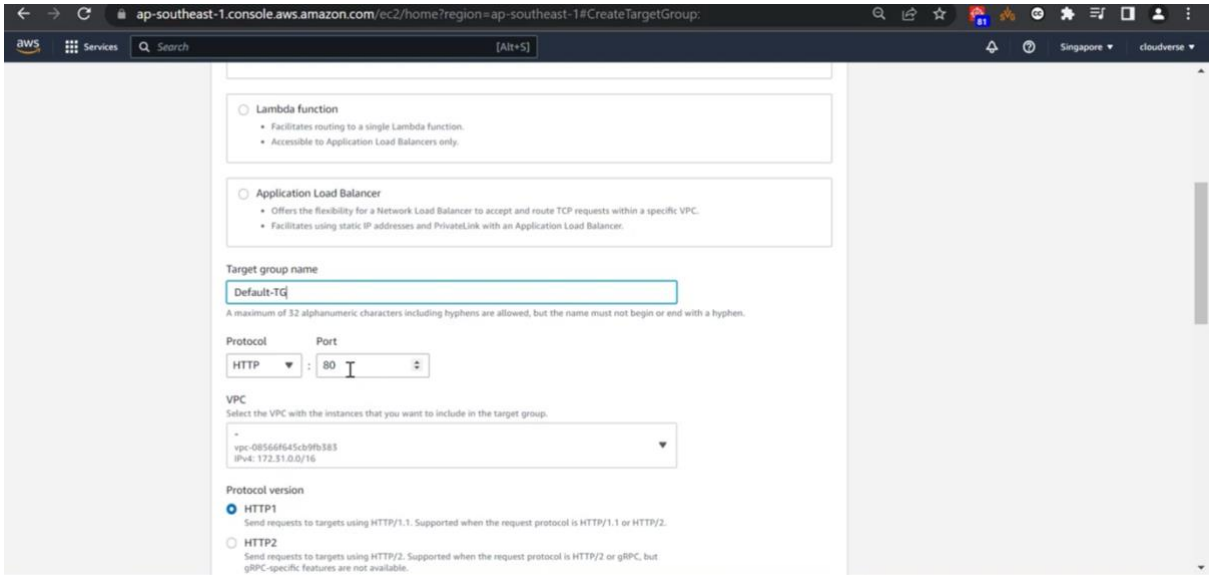
EC2 > Target groups > Create target group
Step 1
Specify group details
Step 2
Register targets
Specify group details
Your load balancer routes requests to the targets in a target group and performs health checks on the targets.
Basic configuration
Settings in this section cannot be changed after the target group is created.
Choose a target type
Instances
Supports load balancing to instances within a specific VPC.
Facilitates the use of Amazon EC2 Auto Scaling to manage and scale your EC2 capacity.
IP addresses
Supports load balancing to VPC and on-premises resources.
Facilitates routing to multiple IP addresses and network interfaces on the same instance.
Offers flexibility with microservice based architectures, simplifying inter-application communication.
Supports IPv6 targets, enabling end-to-end IPv6 communication, and IPv4-to-IPv6 NAT.
Lambda function
Facilitates routing to a single Lambda function.
Accessible to Application Load Balancers only.
Application Load Balancer


ap-southeast-1.console.aws.amazon.com/ec2/home?region=ap-southeast-1#CreateTargetGroup:
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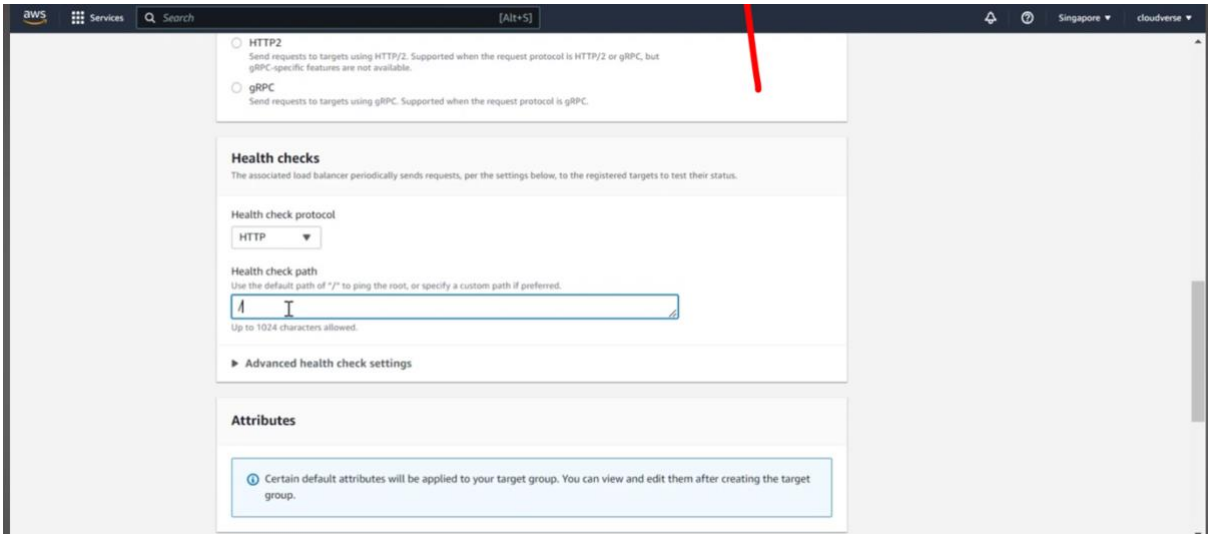
Lambda function
Facilitates routing to a single Lambda function.
Accessible to Application Load Balancers only.
Application Load Balancer
Offers the flexibility for a Network Load Balancer to accept and route TCP requests within a specific VPC.
Facilitates using static IP addresses and PrivateLink with an Application Load Balancer.
Target group name
Default-TG
A maximum of 32 alphanumeric characters including hyphens are allowed, but the name must not begin or end with a hyphen.
Protocol
Port
HTTP
80
VPC
Select the VPC with the instances that you want to include in the target group.
vpc-08566f645cb9fb383
IPv4: 172.31.0.0/16
Protocol version
HTTP1
Send requests to targets using HTTP/1.1. Supported when the request protocol is HTTP/1.1 or HTTP/2.
HTTP2
Send requests to targets using HTTP/2. Supported when the request protocol is HTTP/2 or gRPC, but gRPC-specific features are not available.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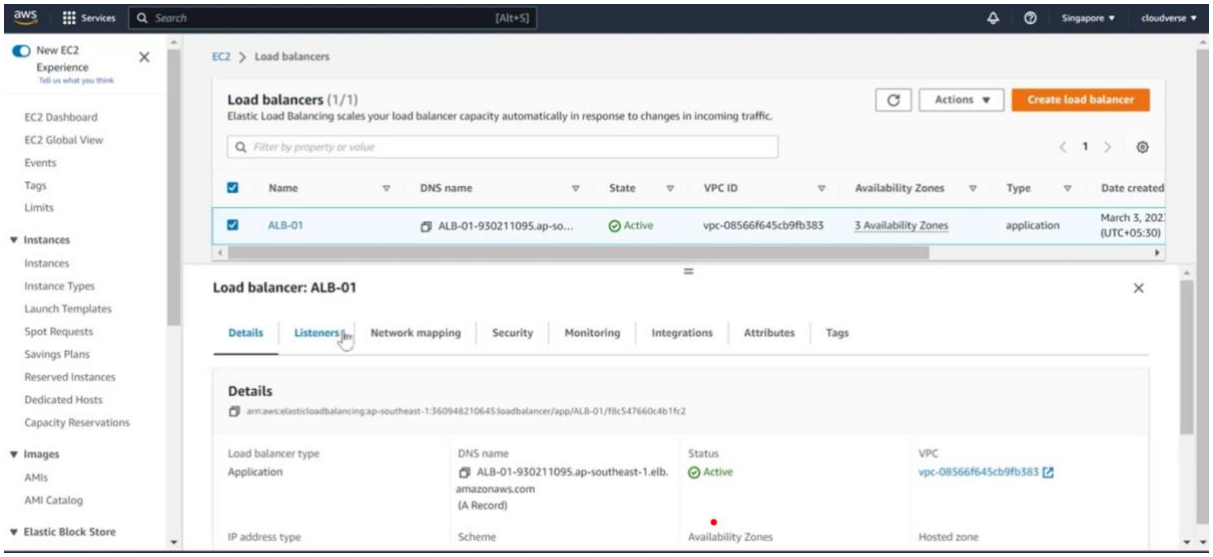
HTTP2
Send requests to targets using HTTP/2. Supported when the request protocol is HTTP/2 or gRPC, but gRPC-specific features are not available.
gRPC
Send requests to targets using gRPC. Supported when the request protocol is gRPC.
Health checks
The associated load balancer periodically sends requests, per the settings below, to the registered targets to test their status.
Health check protocol
HTTP
Health check path
Use the default path of "/" to ping the root, or specify a custom path if preferred.
/
Up to 1024 characters allowed.
Advanced health check settings
Attributes
Certain default attributes will be applied to your target group. You can view and edit them after creating the target group.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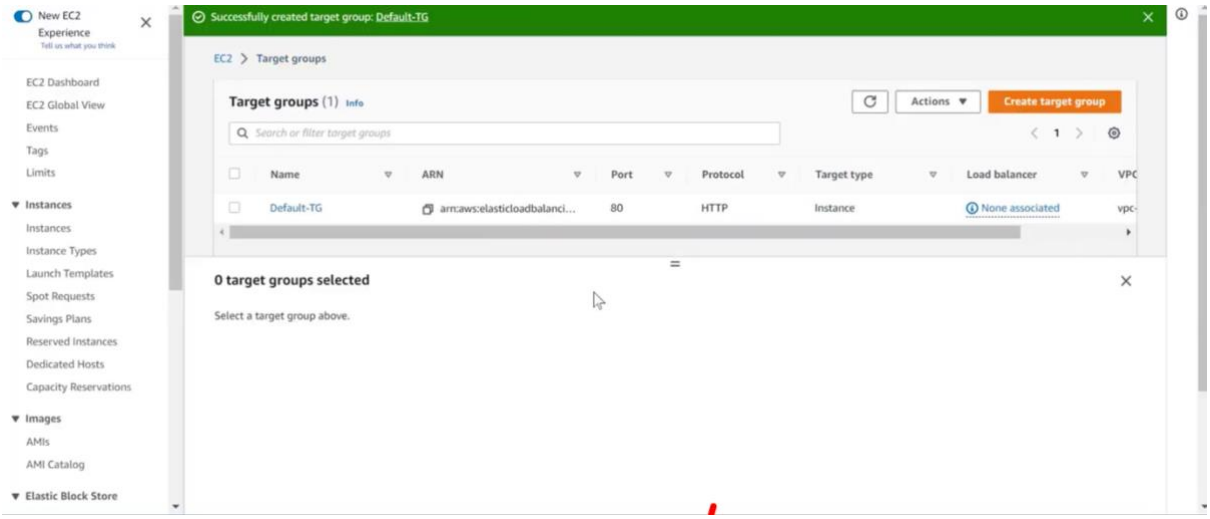
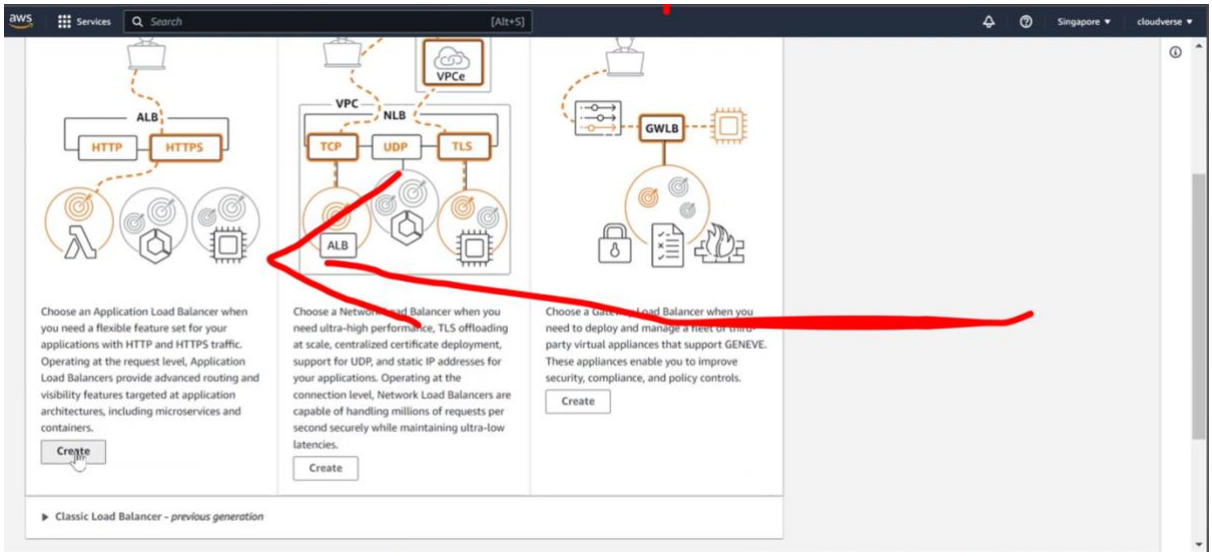
New EC2 Experience
Tell us what you think
EC2 Dashboard
EC2 Global View
Events
Tags
Limits
Instances
Instances
Instance Types
Launch Templates
Spot Requests
Savings Plans
Reserved Instances
Dedicated Hosts
Capacity Reservations
Images
AMIs
AMI Catalog
Elastic Block Store
EC2 > Load balancers
Load balancers (1/1)
Elastic Load Balancing scales your load balancer capacity automatically in response to changes in incoming traffic.
Actions
Create load balancer
Filter by property or value
Name
DNS name
State
VPC ID
Availability Zones
Type
Date created
ALB-01
ALB-01-930211095.ap-so...
Active
vpc-08566f645cb9fb383
3 Availability Zones
application
March 3, 202
(UTC+05:30)
Load balancer: ALB-01
Details
Listeners
Network mapping
Security
Monitoring
Integrations
Attributes
Tags
Details
arn:aws:elasticloadbalancing:ap-southeast-1:360948210645:loadbalancer/app/ALB-01/f8c547660c4b1fc2
Load balancer type
Application
DNS name
ALB-01-930211095.ap-southeast-1.elb.amazonaws.com
(A Record)
Status
Active
VPC
vpc-08566f645cb9fb383
IP address type
Scheme
Availability Zones
Hosted zone

Step 2: Launch an Application Load Balancer (ALB)

1. Go to EC2 → Load Balancers → Click Create Load Balancer.
2. Pick Application Load Balancer as the type.
3. Provide a name like: 8-SEM-Workshop.
4. Set the scheme to Internet-facing.
5. Under Listeners, choose HTTP on Port 80.
6. Select two subnets, each from a different Availability Zone.
7. Use a security group that permits inbound traffic on port 80.

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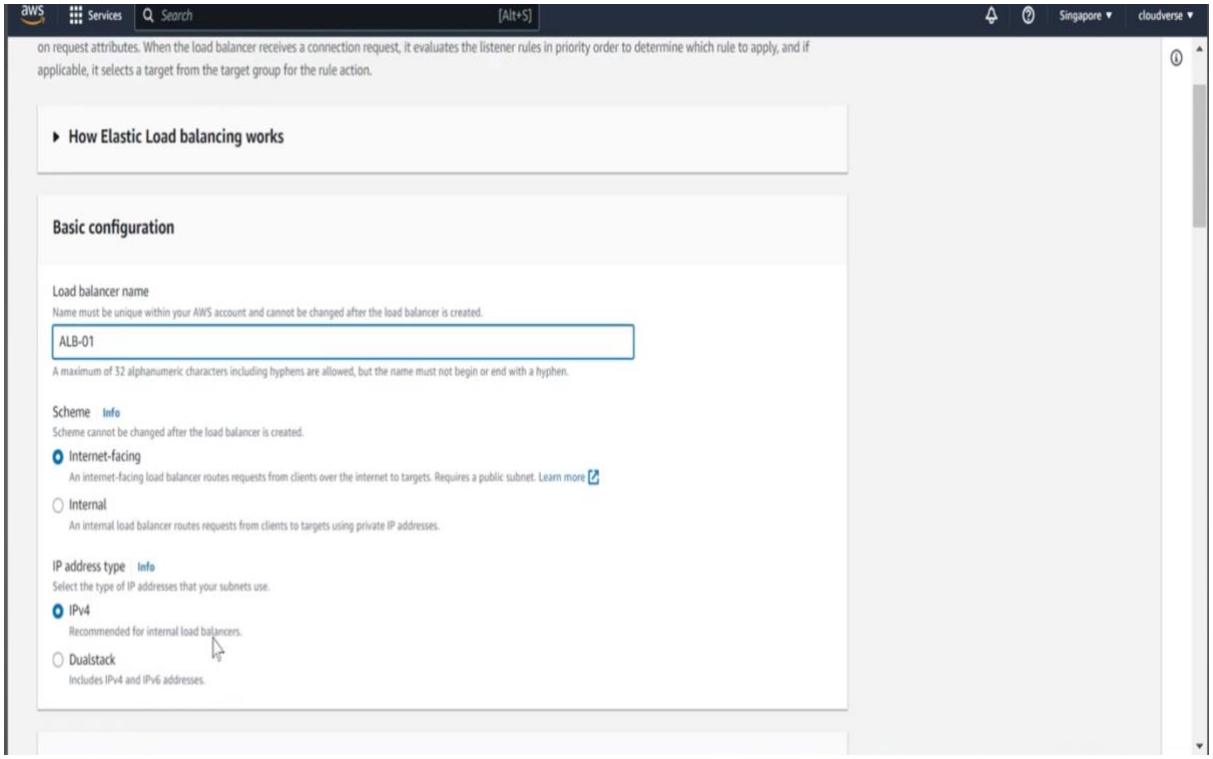
ALB
HTTP
HTTPS
VPC
VPCe
NLB
TCP
UDP
TLS
ALB
GWLB
Choose an Application Load Balancer when you need a flexible feature set for your applications with HTTP and HTTPS traffic. Operating at the request level, Application Load Balancers provide advanced routing and visibility features targeted at application architectures, including microservices and containers.
Create
Choose a Network Load Balancer when you need ultra-high performance, TLS offloading at scale, centralized certificate deployment, support for UDP, and static IP addresses for your applications. Operating at the connection level, Network Load Balancers are capable of handling millions of requests per second securely while maintaining ultra-low latencies.
Create
Choose a Gateway Load Balancer when you need to deploy and manage a fleet of third-party virtual appliances that support GENEVE. These appliances enable you to improve security, compliance, and policy controls.
Create
Classic Load Balancer - previous generation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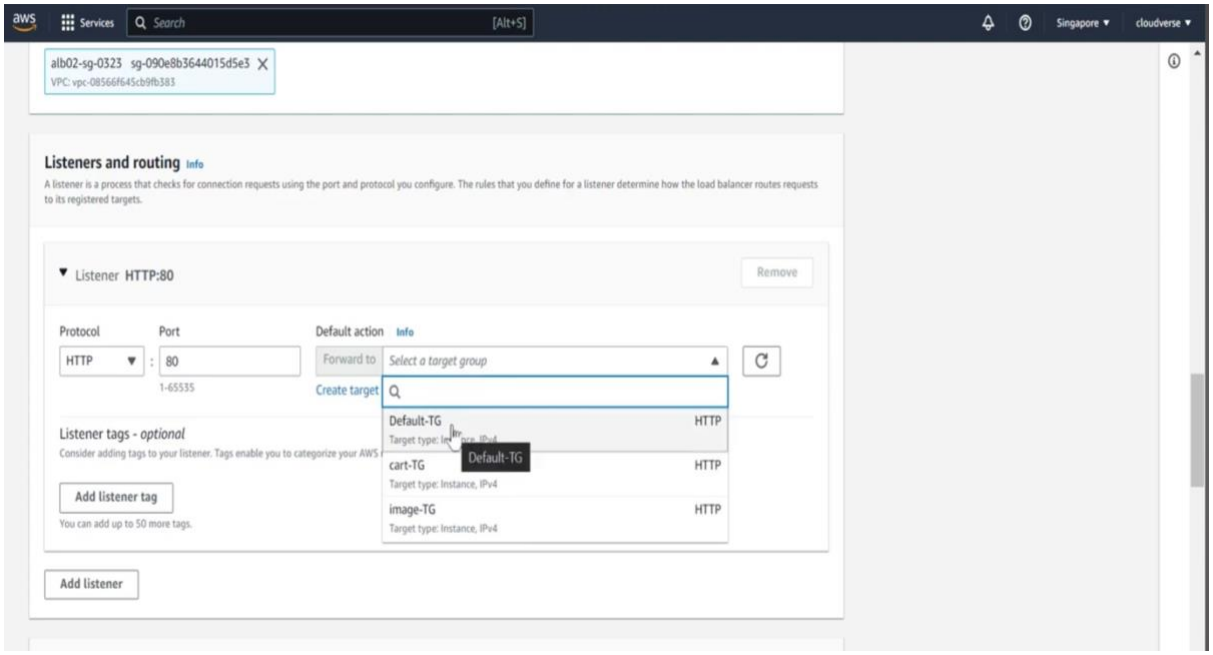
on request attributes. When the load balancer receives a connection request, it evaluates the listener rules in priority order to determine which rule to apply, and if applicable, it selects a target from the target group for the rule action.
How Elastic Load balancing works
Basic configuration
Load balancer name
Name must be unique within your AWS account and cannot be changed after the load balancer is created.
ALB-01
A maximum of 32 alphanumeric characters including hyphens are allowed, but the name must not begin or end with a hyphen.
Scheme Info
Scheme cannot be changed after the load balancer is created.
Internet-facing
An internet-facing load balancer routes requests from clients over the internet to targets. Requires a public subnet. Learn more
Internal
An internal load balancer routes requests from clients to targets using private IP addresses.
IP address type Info
Select the type of IP addresses that your subnets use.
IPv4
Recommended for internal load balancers.
Dualstack
Includes IPv4 and IPv6 addresses.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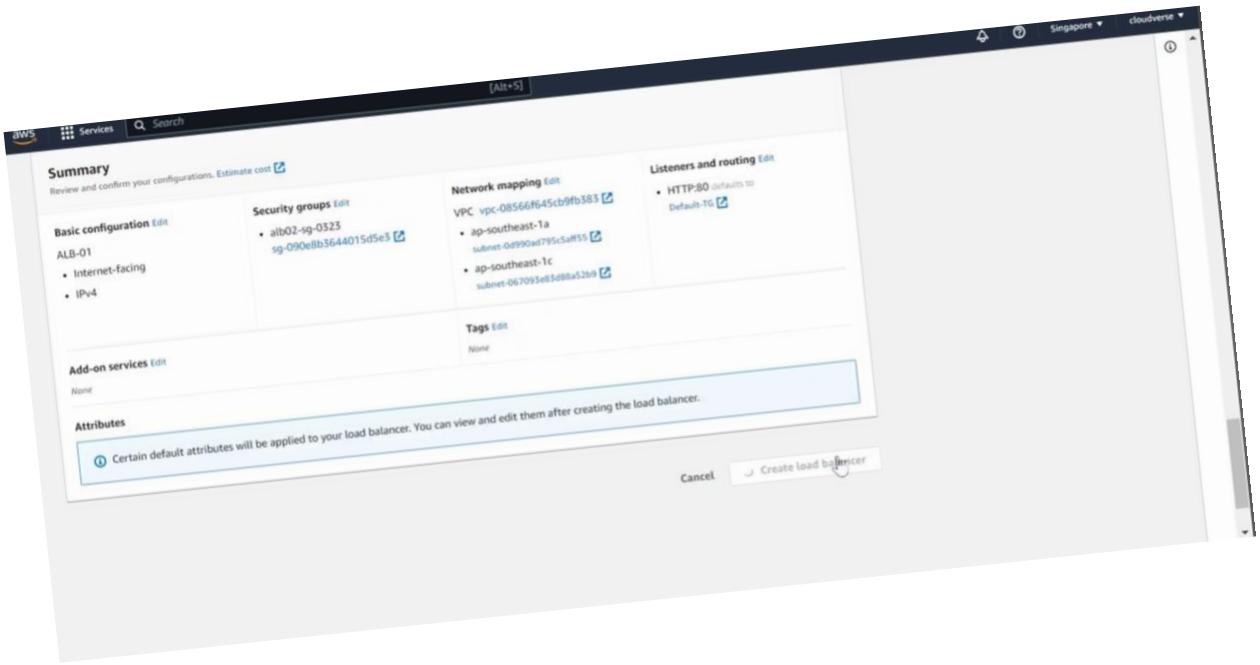
alb02-sg-0323 sg-090e8b3644015d5e3
VPC: vpc-08566f645cb9fb383
Listeners and routing Info
A listener is a process that checks for connection requests using the port and protocol you configure. The rules that you define for a listener determine how the load balancer routes requests to its registered targets.
Listener HTTP:80
Remove
Protocol
Port
Default action Info
HTTP
80
1-65535
Forward to
Select a target group
Create target
Default-TG
HTTP
Target type: Instance, IPv4
cart-TG
HTTP
Target type: Instance, IPv4
image-TG
HTTP
Target type: Instance, IPv4
Listener tags - optional
Consider adding tags to your listener. Tags enable you to categorize your AWS
Add listener tag
You can add up to 50 more tags.
Add listener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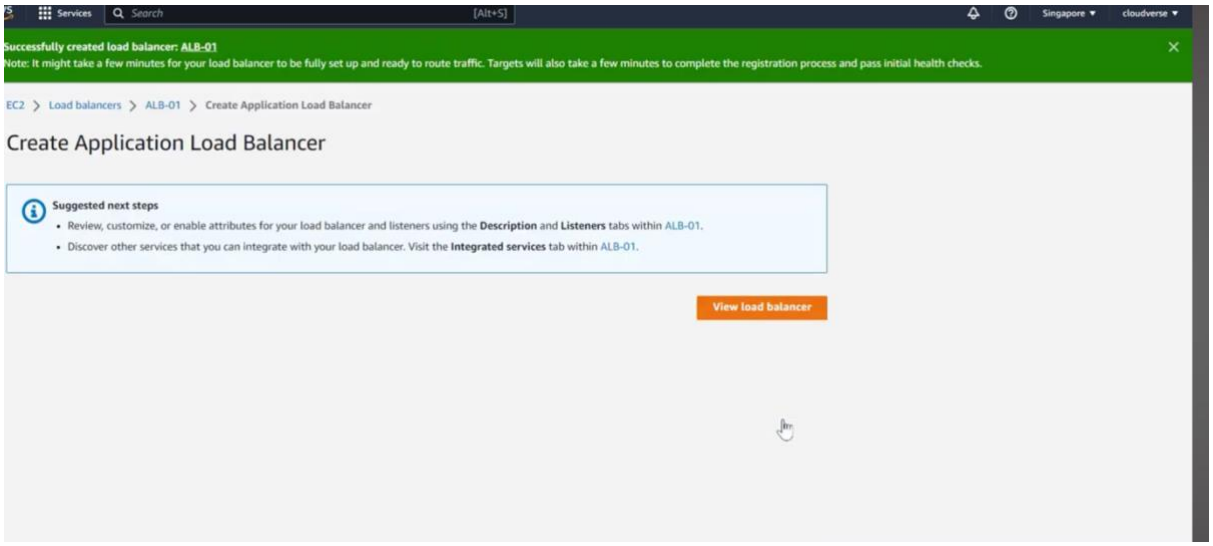
Summary
Review and confirm your configurations. Estimate cost
Basic configuration Edit
ALB-01
Internet-facing
IPv4
Security groups Edit
alb02-sg-0323
sg-090e8b3644015d5e3
Network mapping Edit
VPC vpc-08566f645cb9fb383
ap-southeast-1a
ap-southeast-1c
Listeners and routing Edit
HTTP:80
Default-TG
Tags Edit
None
Add-on services Edit
None
Attributes
Certain default attributes will be applied to your load balancer. You can view and edit them after creating the load balancer.
Cancel
Create load balancer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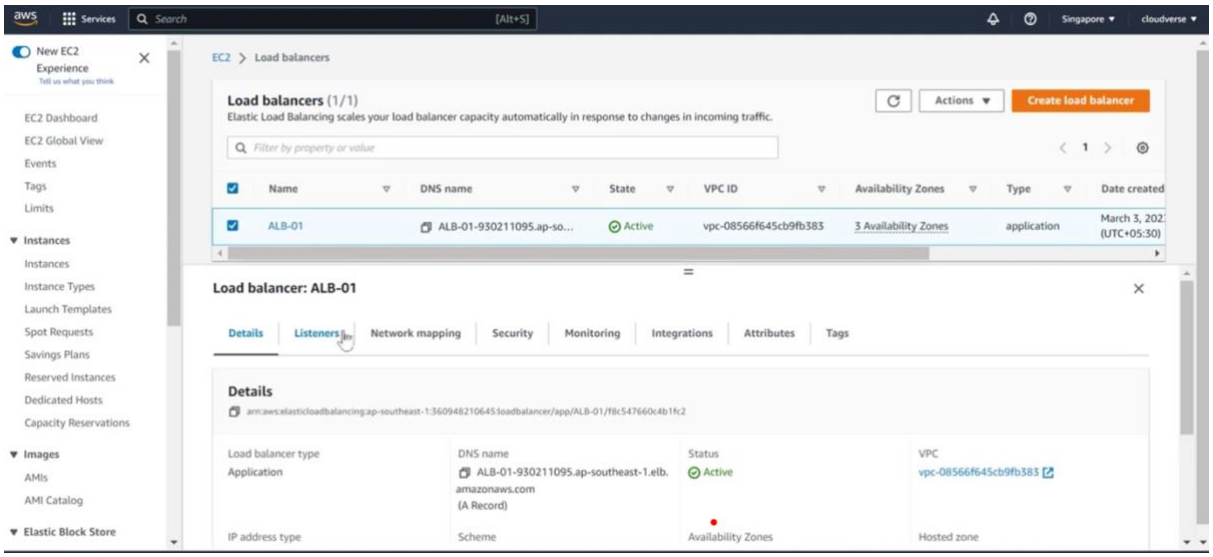
Successfully created load balancer: ALB-01
Note: It might take a few minutes for your load balancer to be fully set up and ready to route traffic. Targets will also take a few minutes to complete the registration process and pass initial health checks.
EC2 > Load balancers > ALB-01 > Create Application Load Balancer
Create Application Load Balancer
Suggested next steps
Review, customize, or enable attributes for your load balancer and listeners using the Description and Listeners tabs within ALB-01.
Discover other services that you can integrate with your load balancer. Visit the Integrated services tab within ALB-01.
View load balancer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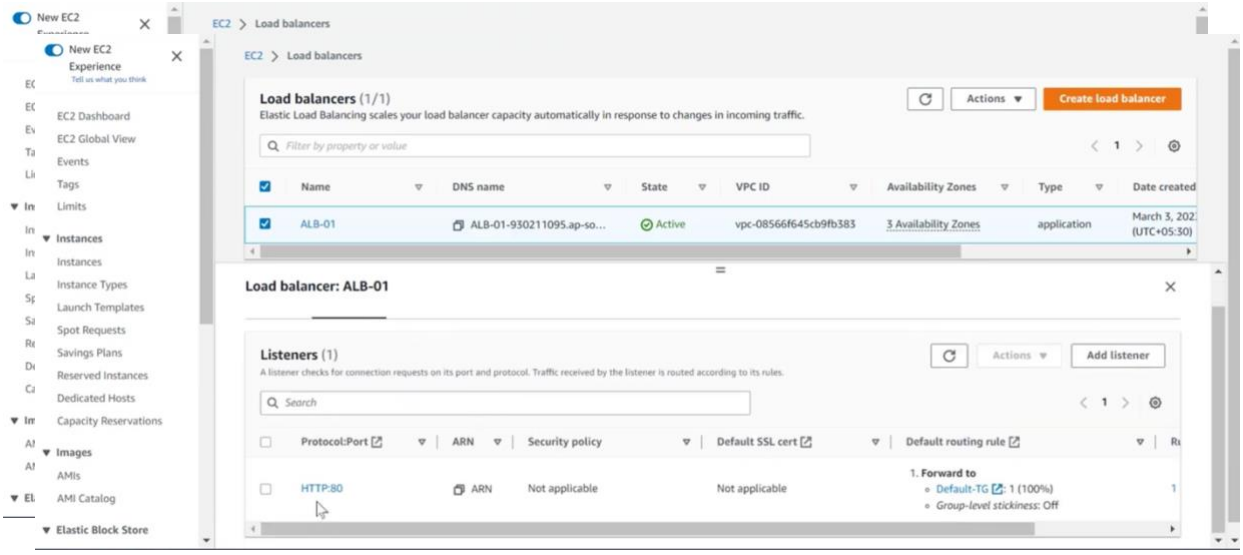
New EC2 Experience
Tell us what you think
EC2 Dashboard
EC2 Global View
Events
Tags
Limits
Instances
Instances
Instance Types
Launch Templates
Spot Requests
Savings Plans
Reserved Instances
Dedicated Hosts
Capacity Reservations
Images
AMIs
AMI Catalog
Elastic Block Store
EC2 > Load balancers
Load balancers (1/1)
Elastic Load Balancing scales your load balancer capacity automatically in response to changes in incoming traffic.
Actions
Create load balancer
Filter by property or value
Name
DNS name
State
VPC ID
Availability Zones
Type
Date created
ALB-01
ALB-01-930211095.ap-so...
Active
vpc-08566f645cb9fb383
3 Availability Zones
application
March 3, 202
(UTC+05:30)
Load balancer: ALB-01
Details
Listeners
Network mapping
Security
Monitoring
Integrations
Attributes
Tags
Details
arn:aws:elasticloadbalancing:ap-southeast-1:360948210645:loadbalancer/app/ALB-01/f8c547660c4b1fc2
Load balancer type
Application
DNS name
ALB-01-930211095.ap-southeast-1.elb.amazonaws.com
(A Record)
Status
Active
VPC
vpc-08566f645cb9fb383
IP address type
Scheme
Availability Zones
Hosted zone

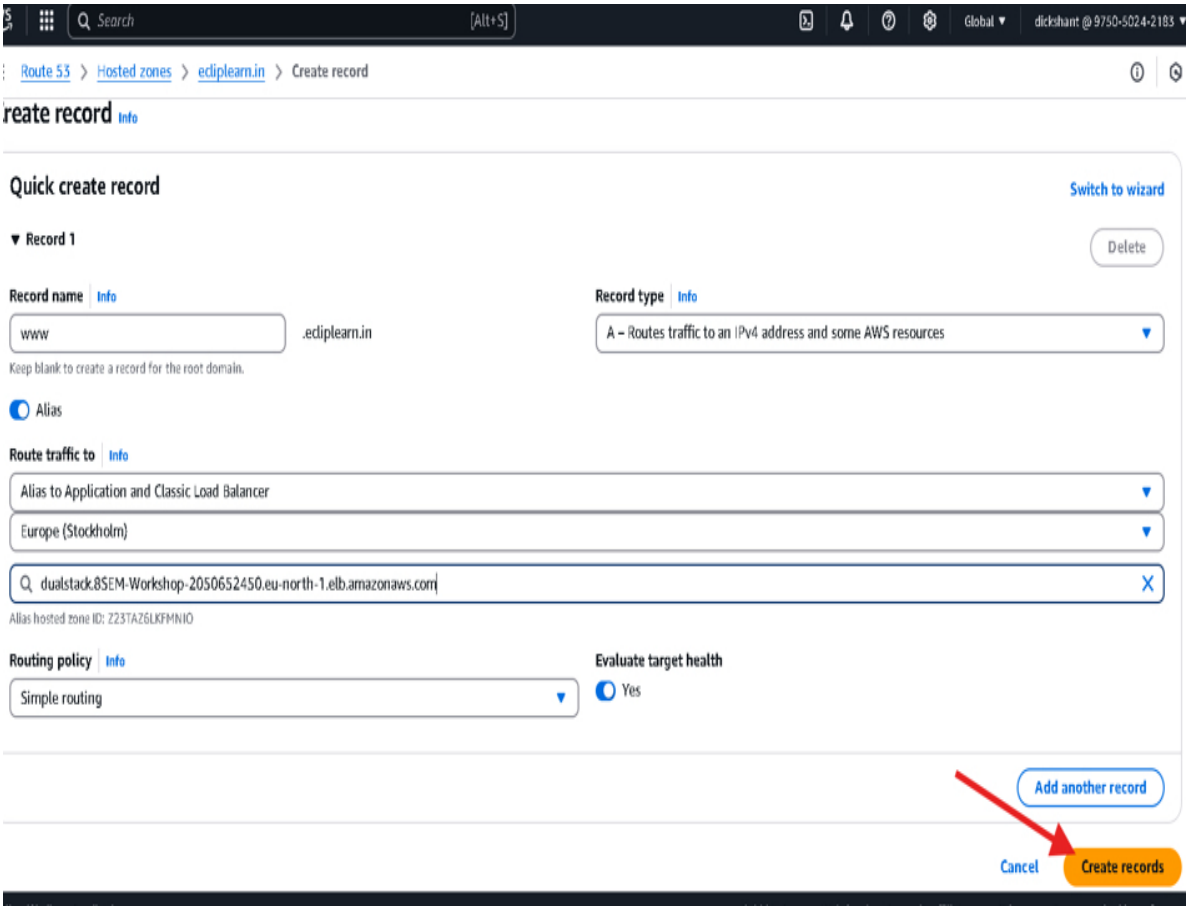
Step 3: Configure Path-Based Routing Rules

1. In EC2 → Load Balancers, go to the Listeners tab of your ALB.
2. For the HTTP:80 listener, click View/Edit Rules.
3. Either keep or remove the default rule.
4. Add a new rule with the following:
    - Condition: Path matches /jenkins*
    - Action: Forward the request to your jenkins-tg (target group)
5. Save the updated routing rules.



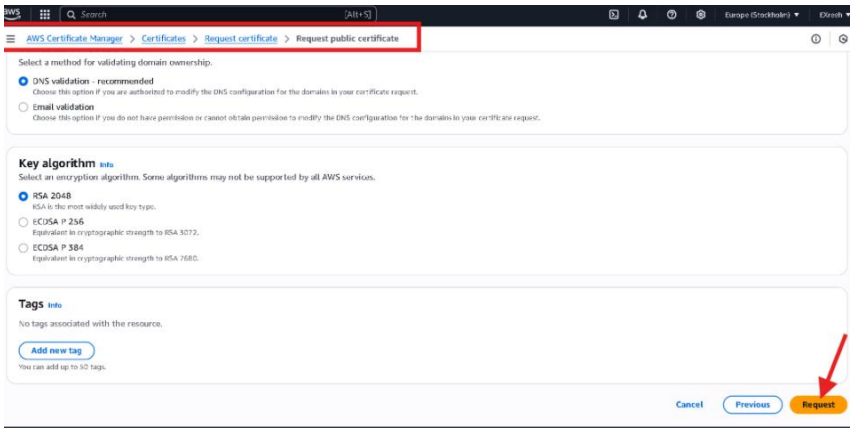
Step 4: Map Domain to Load Balancer Using Route 53

1. Open Route 53 → Hosted Zones → Select your domain (e.g., ecliplearn.in)
2. Click on Create Record.
3. Choose these options:
    - Record Type: A – IPv4 address (Alias)
    - Name: www.ecliplearn.in
    - Alias: Yes
4. Set the Alias Target to your ALB DNS name.
5. Save the record



Step 5: Acquire a Public SSL Certificate from ACM

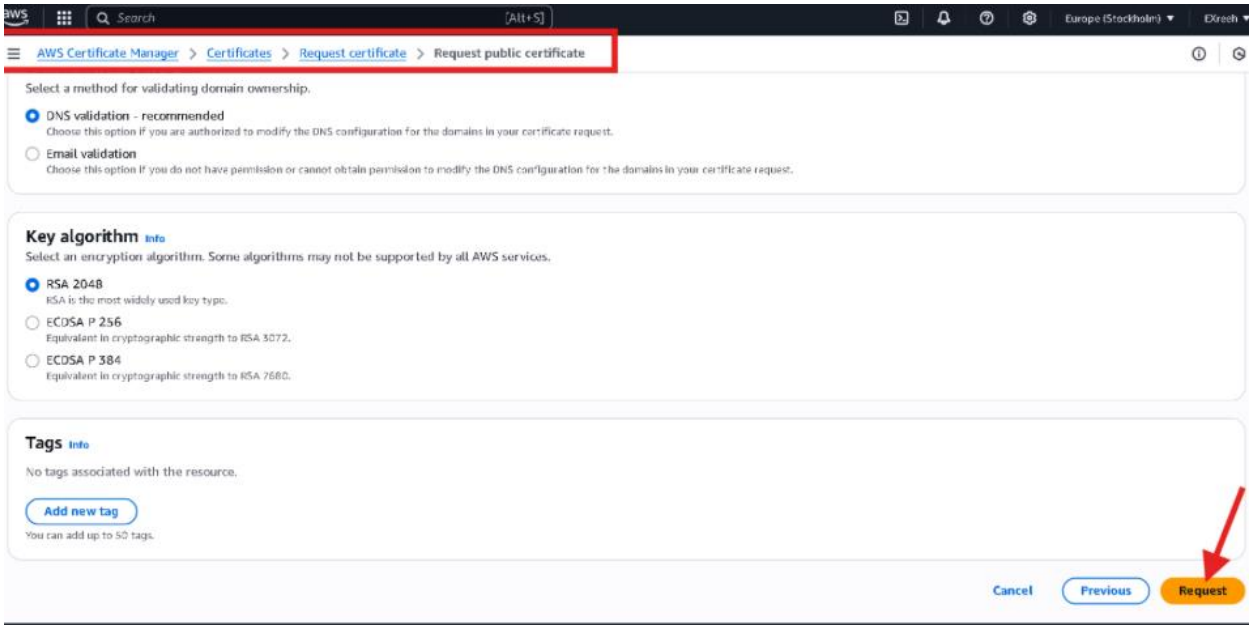
1. Head over to AWS Certificate Manager (ACM).
2. Choose Request a certificate.
3. Select Request a public certificate, then click Next.
4. Enter the domain names:
    - ecliplearn.in
    - www.ecliplearn.in (recommended)
5. Proceed by clicking Next.
6. Choose DNS validation as your validation method.
7. Confirm and submit the certificate request.

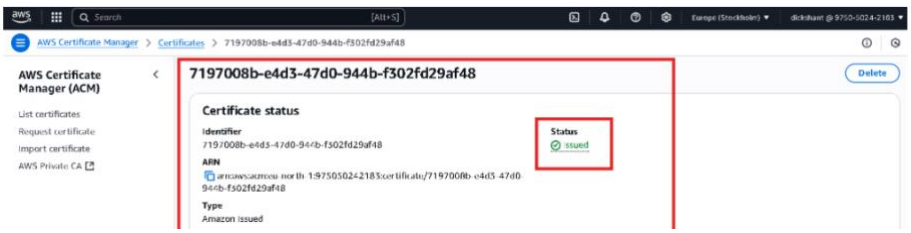


Step 6: Validate Certificate with DNS via Route 53

1. After submitting, ACM will generate a CNAME record for verification.
2. Go back to Route 53 → Hosted Zone for ecliplearn.in
3. Click Create record.
4. Use the CNAME details shown in ACM:
    - Name: Provided by ACM
    - Value: Provided by ACM
    - Type: CNAME
5. Save the record.

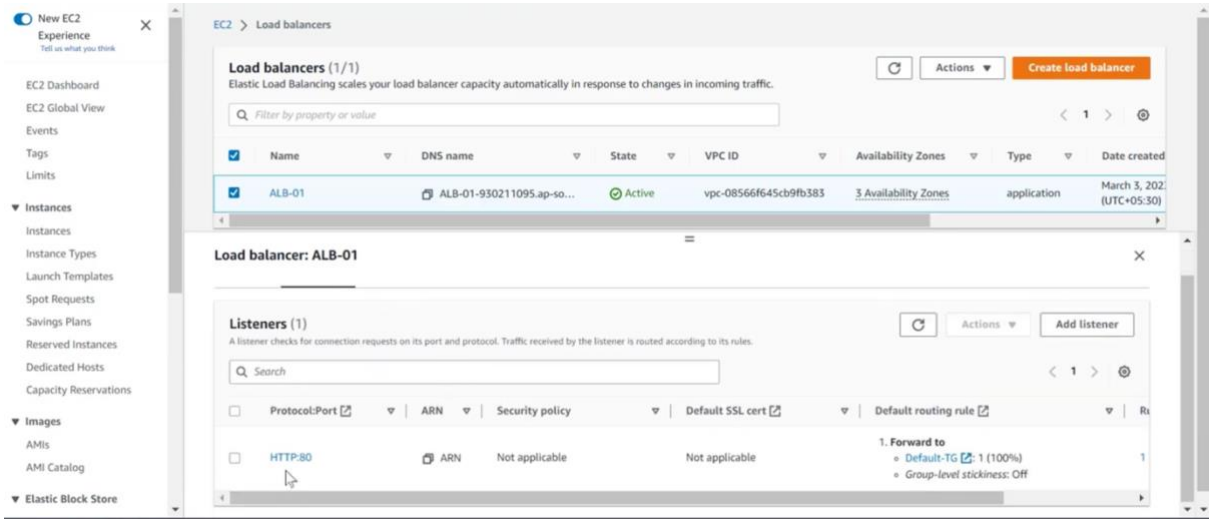
6. Wait a few minutes; once DNS is propagated, the certificate will be marked as Issued.

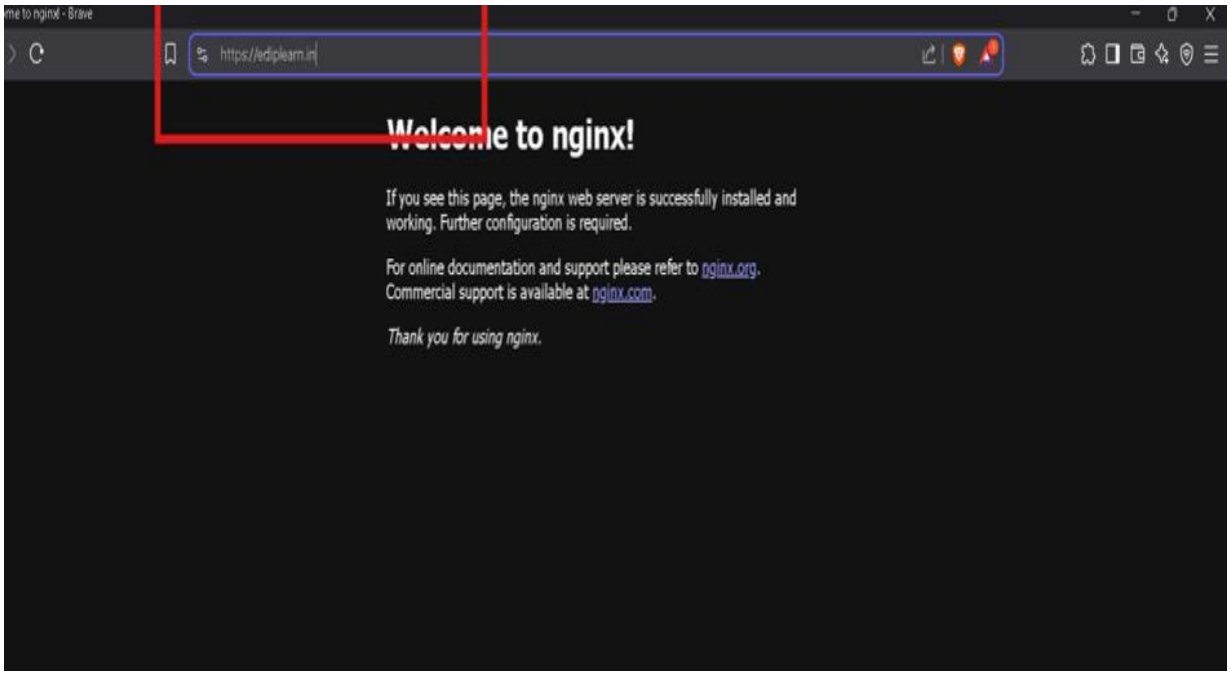




Step 7: Enable HTTPS (Port 443) on ALB

1. Open EC2 → Load Balancers.
2. Select your Application Load Balancer.
3. Go to the Listeners tab → Click on Add listener.
4. Configure the following:
    - Protocol: HTTPS
    - Port: 443
    - Default Action: Forward to your Jenkins Target Group
    - SSL Certificate: Choose From ACM, then select your validated certificate
5. Save the HTTPS listener.




https://ediplearn.in
Welcome to nginx!
If you see this page, the nginx web server is successfully installed and working. Further configuration is required.
For online documentation and support please refer to nginx.org.
Commercial support is available at nginx.com.
Thank you for using nginx.

Ayush