

# Phase 4: High Availability & Scalability

## Task 1: Create Application Load Balancer (ALB)

The screenshot shows the AWS Cloud Console interface for an Application Load Balancer (ALB). The left sidebar navigation includes EC2, Load Balancers, and xyzload. The main content area displays the 'xyzload' ALB details:

- Details:**
  - Load balancer type: Application
  - Status: Active
  - Scheme: Internet-facing
  - Hosted zone: Z355XD0TRQ7X7K
  - VPC: [vpc-01641f7451945b988](#)
  - Availability Zones:
    - subnet-0aa48eddbbcdec6f7 us-east-1a (use1-aZ4)
    - subnet-0b556076368bef4f us-east-1b (use1-aZ6)
  - Load balancer ARN: arn:aws:elasticloadbalancing:us-east-1:793855739232:loadbalancer/app/xyzload/e0736e2135d99f3c
  - DNS name info:
    - xyzload-128953234.us-east-1.elb.amazonaws.com (A Record)
- Listeners and rules (1) Info:** A listener checks for connection requests on its configured protocol and port. Traffic received by the listener is routed according to the default action and any additional rules.

Below the main content, there are tabs for Listeners and rules, Network mapping, Resource map, Security, Monitoring, Integrations, Attributes, Capacity, and Tags. The bottom of the screen shows the AWS navigation bar and system status.

## Create Target Group:

The screenshot shows the AWS Cloud Console interface for a Target Group named xyz-target. The left sidebar navigation includes EC2, Target groups, and xyz-target. The main content area displays the 'xyz-target' target group details:

- Details:**
  - Target type: Instance
  - Protocol: Port
  - Protocol version: HTTP1
  - VPC: [vpc-01641f7451945b988](#)
  - IP address type: IPv4
  - Load balancer: xyzload
  - Total targets: 2
    - Healthy: 2
    - Anomalous: 0
    - Unused: 0
    - Initial: 0
    - Draining: 0
- Distribution of targets by Availability Zone (AZ):** Select values in this table to see corresponding filters applied to the Registered targets table below.
- Registered targets (2) Info:** Target groups route requests to individual registered targets using the protocol and port number specified. Health checks are performed on all registered targets according to the target's health check configuration. Anomaly mitigation is set to Not applicable.

Below the main content, there are tabs for Targets, Monitoring, Health checks, Attributes, and Tags. The bottom of the screen shows the AWS navigation bar and system status.

## Task 2: Auto Scaling

The screenshot shows the AWS CloudWatch Metrics console with the URL <https://us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#AutoScalingGroupDetails:id=xyzauto-scale&view=details>. The page displays the 'xyzauto-scale' Auto Scaling group details. The 'Automatic scaling' tab is selected. Key information shown includes:

- Desired capacity:** 2
- Scaling limits (Min - Max):** 2 - 3
- Desired capacity type:** Units (number of instances)
- Status:** -
- Date created:** Fri Dec 12 2025 15:25:25 GMT+0530 (India Standard Time)

The left sidebar shows the navigation menu for EC2, including options like AMIs, Auto Scaling Groups, and Load Balancing.

## Create AMI

The screenshot shows the AWS CloudWatch Metrics console with the URL <https://us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#ImageDetails:id=ami-0c02bcb2f2c4d4501>. The page displays the 'Image summary for ami-0c02bcb2f2c4d4501'. Key information shown includes:

- AMI ID:** ami-0c02bcb2f2c4d4501
- Image type:** machine
- Platform details:** Linux/UNIX
- Root device type:** EBS
- AMI name:** xyzimage
- Owner account ID:** 793855739232
- Architecture:** x86\_64
- Usage operation:** RunInstances
- Root device name:** /dev/sda1
- Status:** Available
- Source:** 793855739232/xyzimage
- Virtualization type:** hvm
- Boot mode:** uefi-preferred
- State reason:** -
- Creation date:** 2025-12-12T09:50:21.000Z
- Kernel ID:** -
- Description:** -
- Product codes:** -
- RAM disk ID:** -
- Deprecation time:** -
- Last launched time:** Fri Dec 12 2025 17:56:30 GMT+0530 (India Standard Time)
- Block devices:** /dev/sda1=snap-035c21acc09fc936:8: true,gpt3  
/dev/sdb=ephemeral0  
/dev/sdc=ephemeral1
- Deregistration protection:** Disabled
- Allowed image:** -
- Source AMI ID:** ami-0ecb62995f68bb549
- Source AMI Region:** us-east-1

The left sidebar shows the navigation menu for EC2, including options like AMIs, Instances, and Images.

## Create Launch Template:

The screenshot shows the AWS EC2 Launch Templates console. A launch template named "xyztemplate (lt-0e026079d10ffe596)" is displayed. The "Launch template details" section shows the launch template ID (lt-0e026079d10ffe596), name (xyztemplate), default version (1), and owner information. The "Launch template version details" section shows the version (1 (Default)), description, date created (2025-12-12T09:52:48.000Z), and created by (arn:aws:sts::793855739232:assumed-role/voclabs/user4081998=23p31a0561@acet.ac.in). The "Instance details" tab is selected, showing the AMI ID (ami-0c02bcb2f2c4d4501), instance type (t3.micro), key pair name (vokey), availability zone, security group IDs (sg-09df04208afe01012), and advanced details.

## Create Auto Scaling Group:

The screenshot shows the AWS Auto Scaling Groups console. An auto scaling group named "xyzauto-scale" is displayed. The "Capacity overview" section shows the desired capacity (2), scaling limits (Min - Max: 2 - 3), desired capacity type (Units (number of instances)), and status. The "Launch template" section shows the launch template (xyztemplate), AMI ID (ami-0c02bcb2f2c4d4501), instance type (t3.micro), owner (arn:aws:sts::793855739232:assumed-role/voclabs/user4081998=23p31a0561@acet.ac.in), create time (Fri Dec 12 2025 15:22:48 GMT+0530 (India Standard Time)), and request spot instances. The "Details" tab is selected, showing integrations, automatic scaling, instance management, instance refresh, activity, monitoring, and tags.

## Task 3: Access the Application through Loadbalancer DNS

The screenshot shows the AWS CloudWatch Metrics interface. On the left, a navigation pane includes links for Lab Instructions, Load balancer, xyzdb - Database, Cloud9 | us-east, CHARANVANGU, Students, Web app setup, and Students. The main area displays a chart titled 'xyzauto-scale' with a Y-axis for 'CPU Utilization' and an X-axis for 'Time'. The chart shows a sharp increase in CPU utilization starting around December 12, 2025, peaking at approximately 100% utilization. Below the chart, there is a table with columns for 'Metric Name', 'Unit', 'Value Type', and 'Value'.

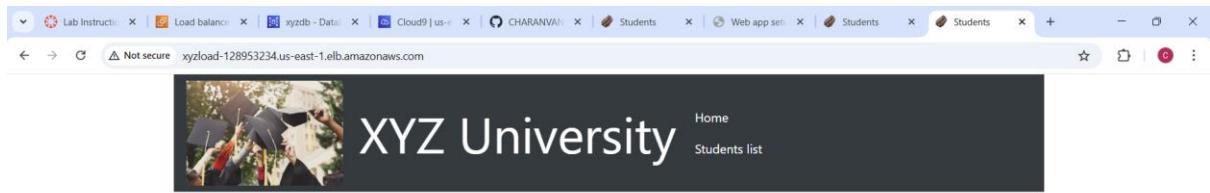
## Task 4: Load Test

```
sudo npm install -g loadtest
```

```
loadtest --rps 1000 -c 500 -k http://xyzdb.cs8f15ln7jey.us-east-1.rds.amazonaws.com/
```

The screenshot shows the AWS CloudWatch Metrics interface. On the left, a navigation pane includes links for Lab Instructions, Auto Scaling groups, xyzdb - Database, Cloud9 | us-east, CHARANVANGU, Students, Web app setup, and Students. The main area displays a chart titled 'xyzauto-scale' with a Y-axis for 'CPU Utilization' and an X-axis for 'Time'. The chart shows a sharp increase in CPU utilization starting around December 12, 2025, peaking at approximately 100% utilization. Below the chart, there is a table with columns for 'Metric Name', 'Unit', 'Value Type', and 'Value'.

## Final Test through LB DNS



The screenshot shows a web browser window displaying the "All students" page of the XYZ University application. The header includes a graduation photo, the text "XYZ University", and links for "Home" and "Students list". The main content area is titled "All students" and contains a table listing two student records:

Name	Address	City	State	Email	Phone
Aditya	kakinada	Kakinada	Andhra Pradesh	aditya768@gmail.com	09666497484
shanmukh	mamidada	anaparthi	Andhra Pradesh	shanmukh12@gmail.com	8529631478

A green button at the bottom left of the table says "Add a new student". The browser's status bar indicates the time as 12:44 and the date as 14-12-2025.

