

Phase 4: High Availability & Scalability

Task 1: Create Application Load Balancer (ALB)

The screenshot displays the AWS Management Console for an Application Load Balancer (ALB) named 'xyzload'. The console is in the 'us-east-1' region. The left sidebar shows the navigation menu with categories like AMIs, Elastic Block Store, Network & Security, Load Balancing, and Auto Scaling. The main content area shows the 'Details' tab for 'xyzload'. Key information includes:

- Load balancer type:** Application
- Scheme:** Internet-facing
- Status:** Active
- Hosted zone:** Z35SXDOTRQ7X7K
- VPC:** vpc-01641f7451945b988
- Load balancer IP address type:** IPv4
- Availability Zones:** subnet-0aa48eddbbcdec6f7 (us-east-1a), subnet-0b5560763688bef4f (us-east-1b)
- Date created:** December 12, 2025, 15:12 (UTC+05:30)
- Load balancer ARN:** arn:aws:elasticloadbalancing:us-east-1:793855739232:loadbalancer/app/xyzload/e0736e2135d...
- DNS name:** xyzload-128953234.us-east-1.elb.amazonaws.com (A Record)

Below the details, there are tabs for 'Listeners and rules', 'Network mapping', 'Resource map', 'Security', 'Monitoring', 'Integrations', 'Attributes', 'Capacity', and 'Tags'. The 'Listeners and rules' tab is selected, showing a single listener with a filter for 'Filter listeners'.

Create Target Group:

The screenshot displays the AWS Management Console for a Target Group named 'xyz-target'. The console is in the 'us-east-1' region. The left sidebar shows the navigation menu. The main content area shows the 'Details' tab for 'xyz-target'. Key information includes:

- Target type:** Instance
- Protocol : Port:** HTTP: 80
- Protocol version:** HTTP1
- VPC:** vpc-01641f7451945b988
- IP address type:** IPv4
- Load balancer:** xyzload

Below the details, there is a table showing the status of targets:

Target ID	Health	Unused	Initial	Draining	
2	2 Healthy	0 Unhealthy	0 Unused	0 Initial	0 Draining

Below the table, there is a section for 'Distribution of targets by Availability Zone (AZ)' with a note: 'Select values in this table to see corresponding filters applied to the Registered targets table below.'

At the bottom, there are tabs for 'Targets', 'Monitoring', 'Health checks', 'Attributes', and 'Tags'. The 'Targets' tab is selected, showing 'Registered targets (2)'. Below this, there is a section for 'Anomaly mitigation: Not applicable' with buttons for 'Deregister' and 'Register targets'.

Task 2: Auto Scaling

The screenshot displays the AWS Management Console for the 'xyzauto-scale' Auto Scaling Group. The left sidebar shows the navigation menu with categories like Elastic Block Store, Network & Security, Load Balancing, and Auto Scaling. The main content area is titled 'xyzauto-scale' and includes a 'Capacity overview' section with a table showing 'Desired capacity' (2), 'Scaling limits (Min - Max)' (2 - 3), 'Desired capacity type' (Units (number of instances)), and 'Status' (-). Below this is a 'Launch template' section with a table showing 'Launch template' (lt-0e026079d10ffe596), 'AMI ID' (ami-0c02bcb2f2c4d4501), 'Instance type' (t3.micro), and 'Owner' (arn:aws:sts:793855739232:assumed-role/voclabs/user4081998-23p31a0561@acet.ac.in). The bottom of the console shows a Windows taskbar with various application icons and system tray information.

Desired capacity	Scaling limits (Min - Max)	Desired capacity type	Status
2	2 - 3	Units (number of instances)	-

Launch template	AMI ID	Instance type	Owner
lt-0e026079d10ffe596 xyztemplate	ami-0c02bcb2f2c4d4501	t3.micro	arn:aws:sts:793855739232:assumed-role/voclabs/user4081998-23p31a0561@acet.ac.in

Create AMI

The screenshot displays the AWS Management Console for the 'ami-0c02bcb2f2c4d4501' AMI. The left sidebar shows the navigation menu with categories like Instances, Images, and Elastic Block Store. The main content area is titled 'Image summary for ami-0c02bcb2f2c4d4501' and includes a table with details such as 'AMI ID' (ami-0c02bcb2f2c4d4501), 'AMI name' (xyzimage), 'Root device name' (/dev/sda1), 'Boot mode' (uefi-preferred), 'Description' (Last launched time: Fri Dec 12 2025 17:56:30 GMT+0530 (India Standard Time)), 'Status' (Available), 'State reason' (-), 'Product codes' (-), 'Block devices' (/dev/sda1=snap-035c21acca09fc936:8, /dev/gp3, /dev/sdb=ephemeral0, /dev/sdc=ephemeral1), 'Source AMI ID' (ami-0ecb62995f68bb549), 'Source AMI Region' (us-east-1), 'Platform details' (Linux/UNIX), 'Architecture' (x86_64), 'Source' (793855739232/xyzimage), 'Creation date' (2025-12-12T09:50:21.000Z), 'RAM disk ID' (-), 'Deregistration protection' (Disabled), 'Root device type' (EBS), 'Usage operation' (RunInstances), 'Virtualization type' (hvm), 'Kernel ID' (-), 'Deprecation time' (-), and 'Allowed image' (-). The bottom of the console shows a Windows taskbar with various application icons and system tray information.

AMI ID	AMI name	Root device name	Boot mode	Description	Status	State reason	Product codes	Block devices	Source AMI ID	Source AMI Region
ami-0c02bcb2f2c4d4501	xyzimage	/dev/sda1	uefi-preferred	Last launched time: Fri Dec 12 2025 17:56:30 GMT+0530 (India Standard Time)	Available	-	-	/dev/sda1=snap-035c21acca09fc936:8 /dev/gp3 /dev/sdb=ephemeral0 /dev/sdc=ephemeral1	ami-0ecb62995f68bb549	us-east-1

Create Launch Template:

The screenshot displays the AWS Management Console for the 'us-east-1' region, specifically the 'Launch template details' page for a template named 'xyztemplate' (ID: lt-0e026079d10ffe596). The console shows the following details:

- Launch template details:**
 - Launch template ID: lt-0e026079d10ffe596
 - Launch template name: xyztemplate
 - Default version: 1
 - Owner: arn:aws:sts::793855739232:assumed-role/voclabs/user4081998-23p31a0561@acet.ac.in
- Launch template version details:**
 - Version: 1 (Default)
 - Description: -
 - Date created: 2025-12-12T09:52:48.000Z
 - Created by: arn:aws:sts::793855739232:assumed-role/voclabs/user4081998-23p31a0561@acet.ac.in
- Instance details:**
 - AMI ID: ami-0c02bcb2f2c4d4501
 - Instance type: t3.micro
 - Availability Zone: -
 - Availability Zone Id: -
 - Key pair name: vockey
 - Security groups: -
 - Security group IDs: sg-09df04208afe01012

Create Auto Scaling Group:

The screenshot displays the AWS Management Console for the 'us-east-1' region, specifically the 'Auto Scaling group details' page for a group named 'xyzauto-scale' (ID: arn:aws:autoscaling:us-east-1:793855739232:autoScalingGroup:e94a78c8-18a7-4ed8-8b59-92b965be24d6:autoScalingGroupName/xyzauto-scale). The console shows the following details:

- xyzauto-scale Capacity overview:**
 - 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)
- Launch template:**
 - Launch template: lt-0e026079d10ffe596 (xyztemplate)
 - AMI ID: ami-0c02bcb2f2c4d4501
 - Instance type: t3.micro
 - Owner: arn:aws:sts::793855739232:assumed-role/voclabs/user4081998-23p31a0561@acet.ac.in
 - Version: Default
 - Security groups: -
 - Security group IDs: sg-09df04208afe01012
 - Create time: Fri Dec 12 2025 15:22:48 GMT+0530 (India Standard Time)
 - Description: -
 - Storage (volumes): -
 - Key pair name: -
 - Request Spot Instances: -

Task 3: Access the Application through Loadbalancer DNS

The screenshot shows the AWS Management Console for the 'us-east-1' region. The left sidebar shows the navigation menu with 'Load Balancing' selected. The main content area displays the details for the 'xyzload' Application Load Balancer. A notification banner at the top introduces the 'ALB target optimizer'. The details section includes:

- Load balancer type:** Application
- Status:** Active
- VPC:** vpc-01641f7451945b988
- Load balancer IP address type:** IPv4
- Scheme:** Internet-facing
- Hosted zone:** Z35SXDOTRQ7X7K
- Availability Zones:** subnet-0aa48eddbcbdec6f7 (us-east-1a), subnet-0b5560763688bef4f (us-east-1b)
- Load balancer ARN:** arn:aws:elasticloadbalancing:us-east-1:793855739232:loadbalancer/app/xyzload/e0736e2135d...36e2135d99f3c
- DNS name:** xyzload-128953234.us-east-1.elb.amazonaws.com (A Record)

Below the details, there are tabs for 'Listeners and rules', 'Network mapping', 'Resource map', 'Security', 'Monitoring', 'Integrations', 'Attributes', 'Capacity', and 'Tags'. The 'Listeners and rules' tab is active, showing 'Listeners and rules (1) Info'.

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 Management Console for the 'us-east-1' region. The left sidebar shows the navigation menu with 'Auto Scaling' selected. The main content area displays the 'Activity history' for the 'xyzauto-scale' Auto Scaling Group. The activity history table shows the following entries:

Status	Description	Cause	Start time	End time
Successful	Launching a new EC2 instance: i-0fa1df1eec33a23eb	At 2025-12-12T12:26:29Z an instance was launched in response to an unhealthy instance needing to be replaced.	2025 December 12, 05:56:31 PM +05:30	2025 December 12, 05:56:31 PM +05:30
Successful	Terminating EC2 instance: i-03e868527ae00690e	At 2025-12-12T12:26:29Z an instance was taken out of service in response to an EC2 health check indicating it has been terminated or stopped.	2025 December 12, 05:56:29 PM +05:30	2025 December 12, 05:56:29 PM +05:30
Successful	Launching a new EC2 instance: i-00211a5be3ece0527	At 2025-12-12T12:24:27Z an instance was launched in response to an unhealthy instance needing to be replaced.	2025 December 12, 05:54:28 PM +05:30	2025 December 12, 05:54:28 PM +05:30
Successful	Terminating EC2 instance: i-0d2beb8e34c873e3b	At 2025-12-12T12:24:27Z an instance was taken out of service in response to an EC2 health check indicating it has been terminated or stopped.	2025 December 12, 05:54:27 PM +05:30	2025 December 12, 05:54:27 PM +05:30
Successful	Launching a new EC2 instance: i-0d2beb8e34c873e3b	At 2025-12-12T09:55:25Z a user request created an AutoScalingGroup changing the desired capacity	2025 December 12, 09:55:25 AM +05:30	2025 December 12, 09:55:25 AM +05:30

Final Test through LB DNS



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