

Elastic Load Balancer in AWS

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Load Balancing Hands On

Build a Highly available Website

Step 1: Create ALB and Webserver Security Group —> “alb_sg” and “web_sg” alb_sg should allow 0.0.0.0/0 on port 80

web_sg should allow alb_sg on port 80

The screenshot shows the AWS VPC console with the URL <https://us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#SecurityGroup:groupId=sg-03b46667456449d9b>. The main content area displays a success message: "Security group (sg-03b46667456449d9b | web_sg) was created successfully". Below this, the security group details are shown:

Security group name	sg-03b46667456449d9b	Security group ID	sg-03b46667456449d9b	Description	VPC ID
Owner	867468445868	Inbound rules count	1 Permission entry	allow alb_sg on port 80	vpc-02ff6d56fc0cdff51
				Outbound rules count	1 Permission entry

The "Inbound rules" tab is selected, showing one rule:

Name	Security group rule ID	IP version	Type	Protocol	Port range	Source	Description
web_sg	sgr-0cc5af59d47b3c7c6	-	HTTP	TCP	80	sg-08b0b42059b0e45...	allows alb_sg on port 80

The left sidebar contains the following navigation items:

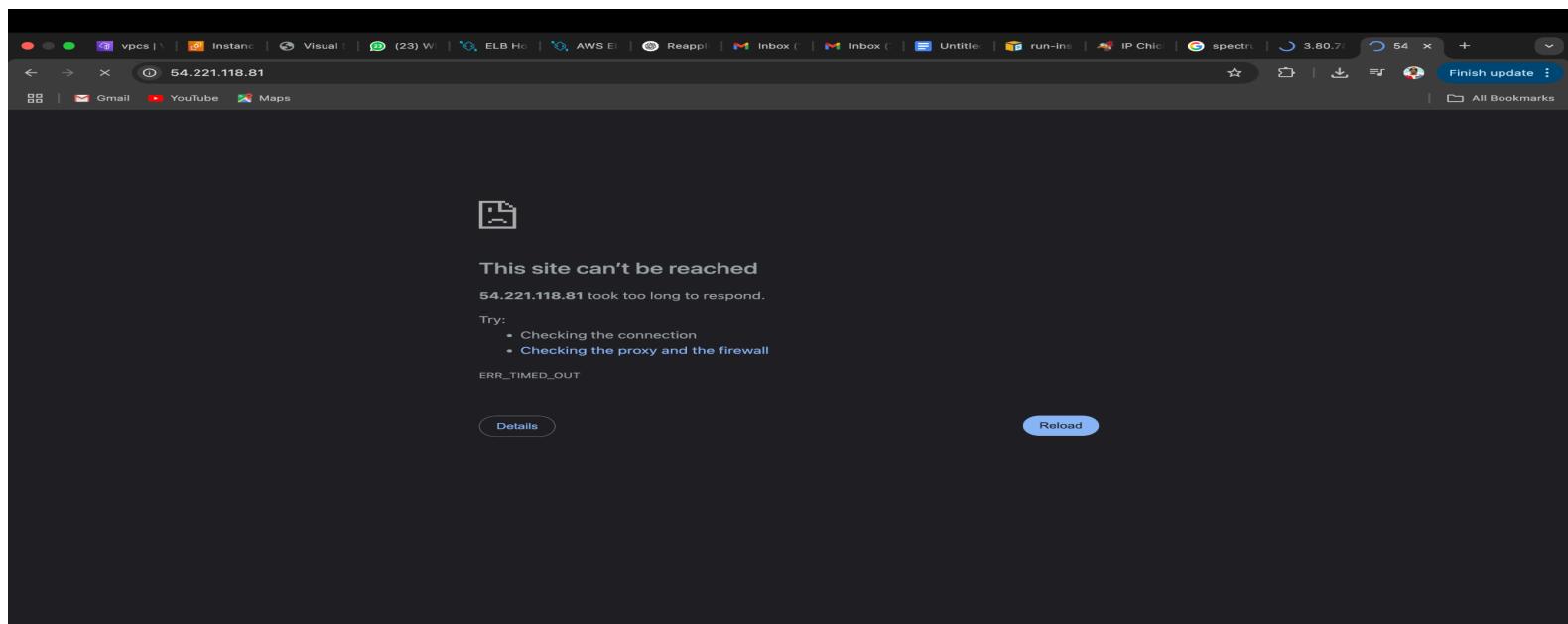
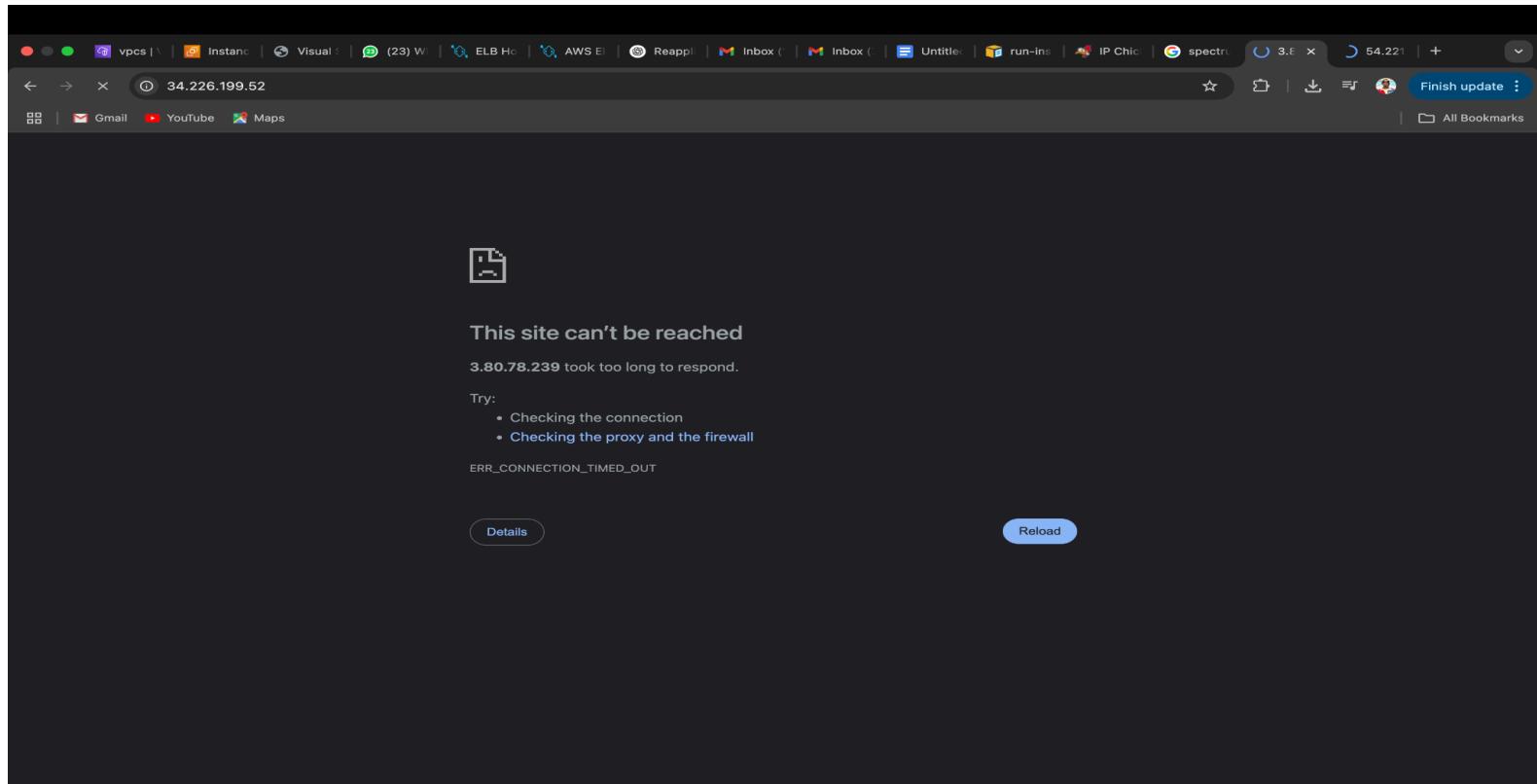
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- Virtual private cloud
 - Your VPCs
 - Subnets
 - Route tables
 - Internet gateways
 - Egress-only internet gateways
 - Carrier gateways
 - DHCP option sets
 - Elastic IPs
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 - Peering connections
 - Route servers [New](#)
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 - Endpoints [Updated](#)
 - Endpoint services
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 - Lattice services
 - Resource configurations [New](#)
 - Resource gateways [New](#)
 - Target groups
- DNS firewall
 - Rule groups
 - Domain lists

At the bottom right, there are links for CloudShell, Feedback, and footer text: © 2025, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences.

Step 2: Create your Public webservers Image —> tag: image_server_1 and tag: image_server_2

test using public ip address

take screenshot showing timeout of both in the browser



Step 3: Create Target Group with targets (Webservers) —> name: "may2022class-tg"

please observe the status

- take screenshot showing “Health status details”

The screenshot shows the AWS EC2 Target groups page. A success message at the top states: "Successfully created the target group: may2022class-tg. Anomaly detection is automatically applied to all registered targets. Results can be viewed in the Targets tab." The main section is titled "may2022class-tg". It shows the following details:

- Target type:** Instance
- Protocol:** Port HTTP: 80
- IP address type:** IPv4
- Load balancer:** None associated
- Protocol version:** HTTP1
- VPC:** vpc-02ff6d56fc0cdff51

The target status table shows:

Total targets	Healthy	Unhealthy	Unused	Initial	Draining
2	0	0	2	0	0

Distribution of targets by Availability Zone (AZ): Select values in this table to see corresponding filters applied to the Registered targets table below.

The "Registered targets" table lists two instances:

Instance ID	Name	Port	Zone	Health status	Health status details	Administrative o...	Override details	Launch...	Anomaly c...
i-08a22d55d6395bc8f	image_server_2	80	us-east-1b (us...)	Unused	Target group is not co...	-	-	June 17, 2...	Normal
i-01b03994b2cad5d58	image_server_1	80	us-east-1a (us...)	Unused	Target group is not co...	-	-	June 17, 2...	Normal

Step 4: Create an Application Load Balancer (ALB) —> name: "may2022class-alb"

listener on http (80) only

select may2022class-alb > click on Listener

The screenshot shows the AWS EC2 Load balances page. A success message at the top states: "Successfully created the load balancer: may2022class-alb. Anomaly detection is automatically applied to all registered targets. Results can be viewed in the Targets tab." The main section is titled "may2022class-alb". It shows the following details:

- Load balancer type:** Application
- Status:** Active
- Hosted zone:** Z355XDOTRQ7X7K
- VPC:** vpc-08c9f91f76c8fe9b4
- Load balancer IP address type:** IPv4
- Availability Zones:** subnet-057bbf496b0863a57 (us-east-1a (use1-az4))
subnet-03e006f73ad167bc3 (us-east-1b (use1-az6))
- Date created:** June 18, 2025, 20:19 (UTC-02:30)
- DNS name info:** may2022class-alb-1829766277.us-east-1.elb.amazonaws.com (A Record)

The "Listeners and rules" section shows:

Protocol:Port	Default action	Rules	ARN	Security policy	Default SSL/TLS certificate	mTLS	Trust store
HTTP:80	Forward to target group may2022class-tg (100%) Target group stickiness: Off	1 rule	ARN	Not applicable	Not applicable	Not applicable	Not applicable

Step 5: Observe the target group status again in the console

- take a screenshot when it shows healthy

The screenshot shows the AWS EC2 Target groups console. The left sidebar navigation includes EC2, Dashboard, EC2 Global View, Events, Instances, Images, Elastic Block Store, Network & Security, Load Balancing, and Auto Scaling. The main content area displays the 'may2022class-tg' target group. The 'Details' section shows the ARN: arn:aws:elasticloadbalancing:us-east-1:867468445868:targetgroup/may2022class-tg/2b6e9cb8d585519b, Target type: Instance, IP address type: IPv4, Protocol: Port HTTP: 80, Load balancer: may2022class-alb, Protocol version: HTTP1, and VPC: vpc-08c9f1f76c8fe9b4. Below this, a table shows the distribution of targets by availability zone (AZ): 2 Total targets, 2 Healthy, 0 Unhealthy, 0 Anomalous, 0 Unused, 0 Initial, and 0 Draining. A note states: "Select values in this table to see corresponding filters applied to the Registered targets table below." The 'Targets' tab is selected, showing a table of registered targets with columns: Instance ID, Name, Port, Zone, Health status, Health status details, Administ... (dropdown), Override det... (dropdown), and Launch time. Two instances are listed: 'image_server_2' and 'image_server_1', both marked as healthy.

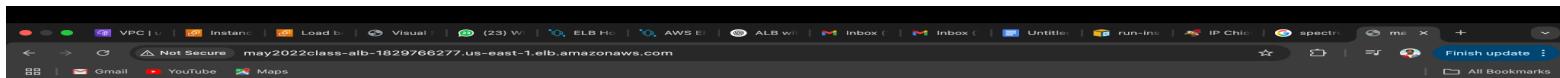
Step 6: test your website in a browser using the ALB dns name and refresh multiple time

- take screenshots of both Blue and Red

The screenshot shows a web browser window with the URL 'may2022class-alb-1829766277.us-east-1.elb.amazonaws.com'. The page title is 'Not Secure'. The main content of the page is 'Welcome to the Image Server 2 (Red)'. The browser's address bar also shows the URL.

The screenshot shows a web browser window with the URL 'may2022class-alb-1829766277.us-east-1.elb.amazonaws.com'. The page title is 'Not Secure'. The main content of the page is 'Welcome to the Image Server 1 (Blue)'. The browser's address bar also shows the URL.

Step 7: stop webserver 1 and test again to see which server is now responding
take a screenshot



Step 8: clean up your environment by deleting in the reverse order that you created all resources

- Delete Application Load Balancer

A screenshot of the AWS Management Console EC2 Load Balancers page. The URL in the address bar is 'us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#LoadBalancers:'. On the left, there is a navigation sidebar with sections like Dashboard, Instances, Images, Elastic Block Store, Network & Security, Load Balancing, and Auto Scaling. The main content area shows a green success message: 'Successfully deleted load balancer: arn:aws:elasticloadbalancing:us-east-1:867468445868:loadbalancer/app/may2022class-alb/bcea91d94212b6cd.' Below this, there is a table header for 'Load balancers' with columns: Name, DNS name, State, VPC ID, Availability Zones, Type, and Date created. A note says 'No load balancers' and 'You don't have any load balancers in us-east-1'. A 'Create load balancer' button is visible. At the bottom, it says '0 load balancers selected' and 'Select a load balancer above.'

● Delete Target Group

The screenshot shows the AWS EC2 Target Groups page. A green success banner at the top reads "Successfully deleted target group: may2022class-tg.". Below it, the "Target groups" section is empty, displaying the message "No target groups" and "You don't have any target groups in us-east-1". A "Create target group" button is visible. The left sidebar contains navigation links for Instances, Images, Elastic Block Store, Network & Security, Load Balancing, and Auto Scaling.

● Delete and Terminate Web Servers

The screenshot shows the AWS EC2 Instances page. A green success banner at the top reads "Successfully initiated termination (deletion) of i-02051d67d96f921d5,i-0912c5fac49cf0a5e". Below it, the "Instances (2/8) Info" section shows two terminated instances: "image_server_2" and "image_server_1". A "2 instances selected" message is displayed. The "Monitoring" section displays various metrics for the terminated instances, including CPU utilization, network traffic, and metadata token counts. The left sidebar contains navigation links for Instances, Images, Elastic Block Store, Network & Security, Load Balancing, and Auto Scaling.

2: Internet-facing Load Balancer with Private Subnet

Repeat All step in 1 except step 2, create your EC2 Instance in the Private Subnet

Step 1: Create ALB and Webserver Security Group —> “alb_sg” and “web_sg” alb_sg should allow 0.0.0.0/0 on port 80

web_sg should allow alb_sg on port 80

The screenshot shows the AWS VPC Security Groups console. In the main pane, a green success message says "Inbound security group rules successfully modified on security group (sg-03f954ddcb7838fb0 | alb_sg)". Below it, a table lists security groups with their details. A row for "web_sg" is selected. In the bottom half of the screen, a specific security group "sg-07cf9bae351743f4d - web_sg" is shown. Under the "Inbound rules" tab, there is one rule: "sg-00e2dd1ee8aba6dd default" which allows "http" (TCP port 80) from "sg-03f954ddcb7838fb0".

Step 2: Create Target Group with targets (Webservers) —> name: “may2022class-tg”

The screenshot shows the AWS EC2 Target Groups console. A green success message at the top says "Successfully created the target group: may2022class-tg. Anomaly detection is automatically applied to all registered targets. Results can be viewed in the Targets tab." Below it, the target group "may2022class-tg" is displayed with the following details:

- Target type: Instance
- Protocol: Port
- Load balancer: None associated
- VPC: vpc-0c151cc0aeb124b
- Total targets: 2 (both healthy)
- Protocol version: HTTP1
- Health status: 2 healthy, 0 unhealthy, 0 unused, 0 initial, 0 draining

In the "Registered targets" section, two targets are listed:

Instance ID	Name	Port	Zone	Health status	Health status details	Administrative o...	Override details	Launch...	Anomaly c...
i-0572471b5d5a52bbb	image_server_2	80	us-east-1b (us...)	Unused	Target group is not co...	-	-	June 18, 2...	Normal
i-0da27adb4089b5ec4	image_server_1	80	us-east-1a (us...)	Unused	Target group is not co...	-	-	June 18, 2...	Normal

Step 3: Create an Application Load Balancer (ALB) —> name: "may2022class-alb"

listener on http (80) only

may2022class-alb

Listeners and rules (1) Info

Protocol:Port	Default action	Rules	ARN	Security policy	Default SSL/TLS certificate	mTLS	Trust store
HTTP:80	Forward to target group • may2022class-tg: 1 (100%) • Target group stickiness: Off	1 rule	ARN	Not applicable	Not applicable	Not applicable	Not applicable

Step 4: Observe the target group status again in the console

may2022class-tg

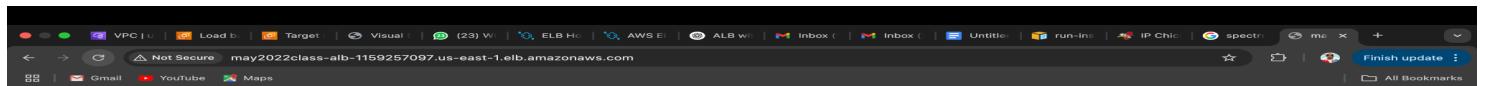
Targets

Total targets	Healthy	Unhealthy	Unused	Initial	Draining
2	2	0	0	0	0

Registered targets (2) Info

Instance ID	Name	Port	Zone	Health status	Health status details	Administrati...	Override det...	Launch time
i-0372471b5d3a52bb6	image_server_2	80	us-east-1b (us...)	Healthy	-	No override	No override is c...	June 18, 2025, ...
i-0da27adb4089b5ec4	image_server_1	80	us-east-1a (us...)	Healthy	-	No override	No override is c...	June 18, 2025, ...

Step 5: test your website in a browser using the ALB dns name and refresh multiple time



Step 8: clean up your environment by deleting in the reverse order that you created all resources

- Delete Application Load Balancer

A screenshot of the AWS EC2 Load balancers page. The left sidebar shows navigation options like Instances, Images, Elastic Block Store, Network & Security, Load Balancing, and Auto Scaling. A success message at the top states 'Successfully deleted load balancer: arn:aws:elasticloadbalancing:us-east-1:867468445868:loadbalancer/app/may2022class-alb/f09ff7cc9028d7bb.' Below this, a table header for 'Load balancers' is shown with columns for Name, DNS name, State, VPC ID, Availability Zones, Type, and Date created. A note below the table says 'No load balancers' and 'You don't have any load balancers in us-east-1'. A 'Create load balancer' button is visible at the bottom of the table area.

● Delete Target Group

The screenshot shows the AWS EC2 Target Groups page. A green success message at the top states "Successfully deleted target group: may2022class-tg." Below this, there is a table header for "Target groups" with columns: Name, ARN, Port, Protocol, Target type, Load balancer, and VPC ID. A note below the table says "No target groups" and "You don't have any target groups in us-east-1". A blue "Create target group" button is visible. On the left, a sidebar lists various EC2 services like Instances, Images, and Auto Scaling.

● Delete and Terminate Web Servers

The screenshot shows the AWS EC2 Instances page. A green success message at the top states "Successfully initiated termination (deletion) of i-027ad56031739e6a4, i-0a160f2efb, i-00341". Below this, there is a table of instances with columns: Instance ID, Instance Type, Status check, Alarm status, Availability Zone, Public IPv4 DNS, Public IPv4 IP, Elastic IP, and IPv6 IPs. Two instances are selected: "image_server_2" and "image_server_1", both of which are currently terminating. On the left, a sidebar lists various EC2 services like Instances, Images, and Auto Scaling.