

22.2 ELASTIC LOAD BALANCER

INTRODUCTION:

- Elastic Load Balancing automatically distributes incoming traffic across multiple EC2 instances.
- You create a load balancer and register instances with the load balancer in one or more Availability Zones.
- The load balancer serves as a single point of contact for clients.
- This enables you to increase the availability of your application.
- You can add and remove EC2 instances from your load balancer as, without disrupting the overall flow of traffic.
- If an EC2 instance fails, Elastic Load Balancing automatically reroutes the traffic to the remaining running EC2 instances.
- If a failed EC2 instance is restored, Elastic Load Balancing restores the traffic to that instance.
- Elastic Load Balancing can also serve as the first line of defence against attacks on your network.

Features of Elastic Load Balancing:

Features of Elastic Load Balancing Elastic Load Balancing provides the following features:

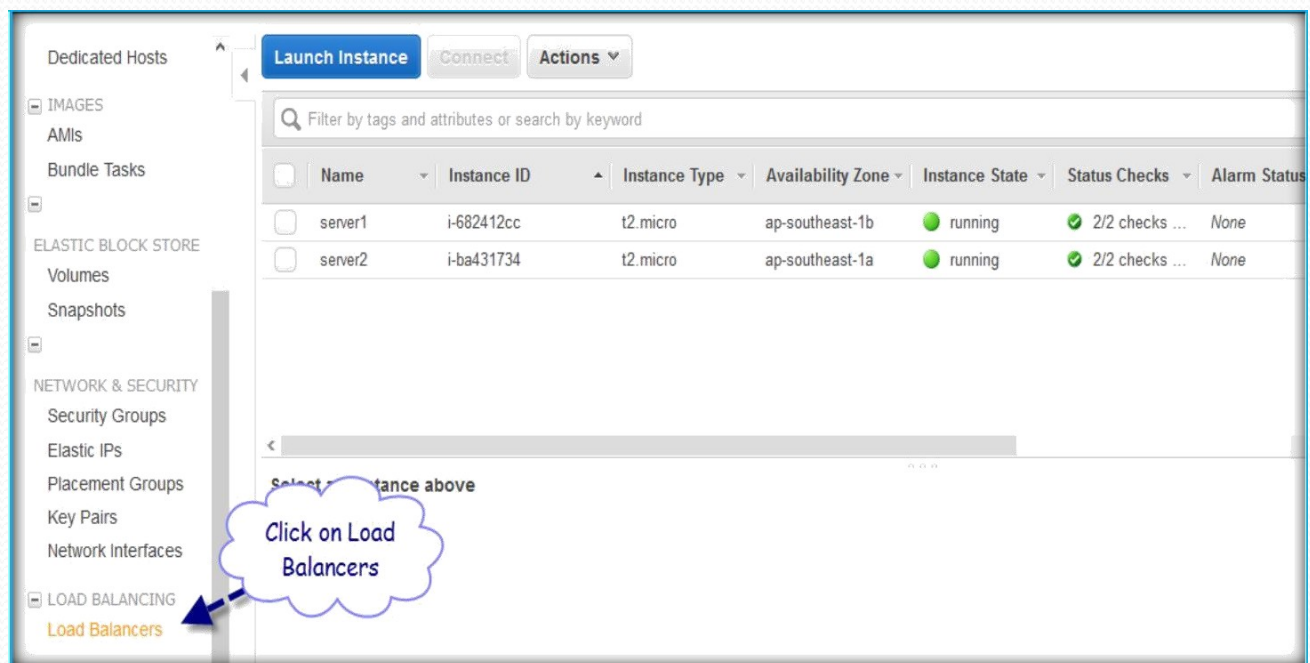
- You can use the operating systems and instance types supported by Amazon EC2. You can configure your EC2 instances to accept traffic only from your load balancer.
- You can configure the load balancer to accept traffic using the following protocols: HTTP, HTTPS (secure HTTP), TCP, and SSL (secure TCP).
- You can configure your load balancer to distribute requests to EC2 instances in multiple Availability Zones, minimizing the risk of overloading one single instance. If an entire Availability Zone goes offline, the load balancer routes traffic to instances in other Availability Zones.
- There is no limit on the number of connections that your load balancer can attempt to make with your EC2 instances. The number of connections scales with the number of concurrent requests that the load balancer receives.

- You can configure the health checks that Elastic Load Balancing uses to monitor the health of the EC2 instances registered with the load balancer so that it can send requests only to the healthy instances.
- You can use end-to-end traffic encryption on those networks that use secure (HTTPS/SSL) connections.

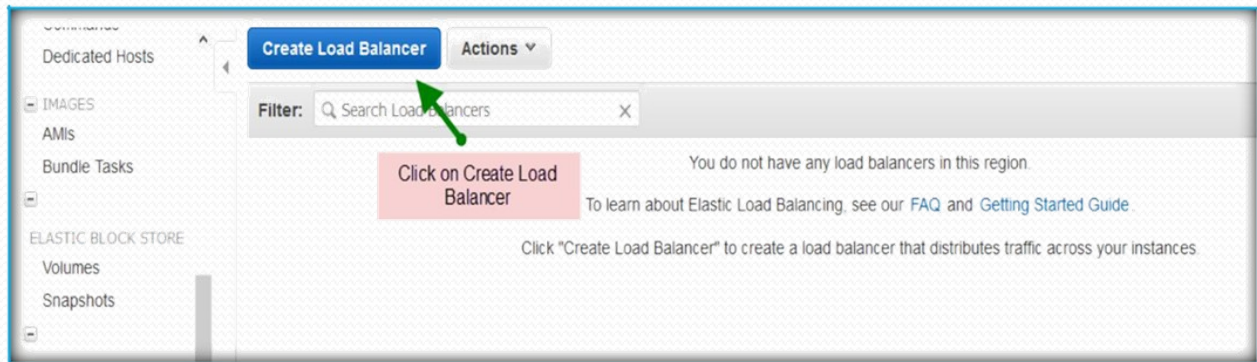
CREATE ELASTIC LOAD BALANCER

Once logged into AWS, go to EC2 section.

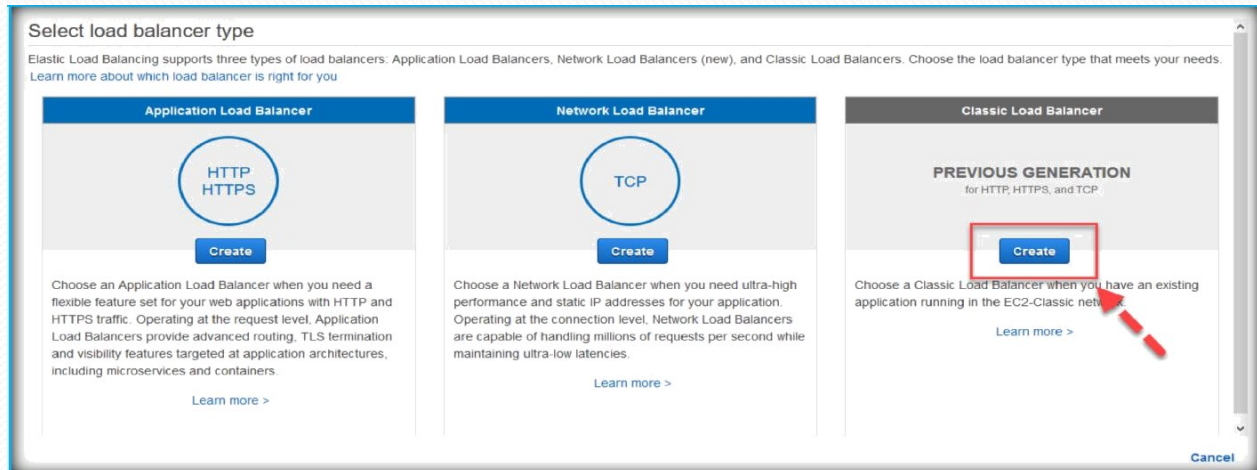
In EC2 page select Load Balancers under Load Balancing menu from the left pane.



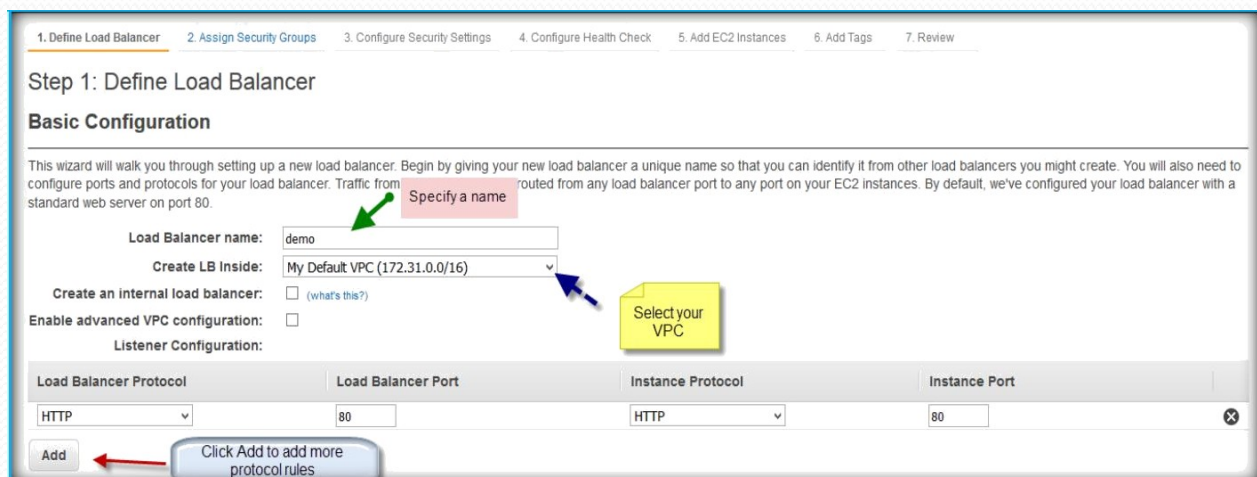
Then click on Create Load Balancer to create a new one.



Click on Create under Classic Load Balancer.



In the next page Specify a name to your load balancer, select VPC from **Create LB inside** drop down list. Then click on Add button which is below the protocol rules to add more rules.



Once you clicked on Add button, select Load balancer protocol from drop down list.

1. Define Load Balancer 2. Assign Security Groups 3. Configure Security Settings 4. Configure Health Check 5. Add EC2 Instances 6. Add Tags 7. Review

Step 1: Define Load Balancer

Basic Configuration

This wizard will walk you through setting up a new load balancer. Begin by giving your new load balancer a unique name so that you can identify it from other load balancers. Then, configure ports and protocols for your load balancer. Traffic from your clients can be routed from any load balancer port to any port on your EC2 instances. By default, we route traffic to a standard web server on port 80.

Load Balancer name:

Create LB Inside:

Create an internal load balancer: ☐ (what's this?)

Enable advanced VPC configuration: ☐

Listener Configuration:

Load Balancer Protocol	Load Balancer Port	Instance Protocol	Instance Port
HTTP	80	HTTP	80
Choose a protocol		Choose a protocol	

Select Load balancer port from drop down list

Select instance protocol from drop down list.

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Step 1: Define Load Balancer

Basic Configuration

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Load Balancer name:

Create LB Inside:

Create an internal load balancer: ☐ (what's this?)

Enable advanced VPC configuration: ☐

Listener Configuration:

Load Balancer Protocol	Load Balancer Port	Instance Protocol	Instance Port
HTTP	80	HTTP	80
HTTPS (Secure HTTP)	443	HTTP	80

Add

Select a protocol from drop down list

Then click on Next button after specifying both Load balancer and Instance protocols.

Load Balancer name: demo

Create LB Inside: My Default VPC (172.31.0.0/16)

Create an internal load balancer: ☐ (what's this?)

Enable advanced VPC configuration: ☐

Listener Configuration:

Load Balancer Protocol	Load Balancer Port	Instance Protocol	Instance Port
HTTP	80	HTTP	80
HTTPS (Secure HTTP)	443	HTTPS (Secure HTTP)	443

Add

Once specified both protocols click on Next button

Cancel Next: Assign Security Groups

In the next page select security groups you want to assign to ELB or create a new one and select, then click on Next to continue.

Step 2: Assign Security Groups

You have selected the option of having your Elastic Load Balancer inside of a VPC, which allows you to assign security groups to your load balancer. Please select the security groups to assign to this load balancer. This can be changed at any time.

Assign a security group: ☐ Create a new security group ☒ Select an existing security group

Filter: VPC security groups

Security Group ID	Name	Description	Actions
sg-0eb96a6a	default	default VPC security group	Copy to new
sg-a9b86bcd	test	test	Copy to new

Select Security groups

Click on Next to continue

Cancel Previous Next: Configure Security Settings

If you have SSL certificate for your domain, you can paste that information in the coming page.

Specify a name for your certificate, paste your private key in Private key box text field, paste your public key in Public key certificate text field, and paste if you have a SSL certificate chain.

1. Define Load Balancer 2. Assign Security Groups 3. Configure Security Settings 4. Configure Health Check 5. Add EC2 Instances 6. Add Tags 7. Review

Step 3: Configure Security Settings

Select Certificate

An SSL Certificate allows you to configure the HTTPS/SSL listeners of your load balancer. You may select a previously uploaded certificate below, or define a new SSL Certificate. [Learn more](#) about setting up HTTPS load balancers and certificate management.

Certificate Type: ☐ Choose an **existing** certificate from AWS Identity and Access Management (IAM) ☒ Upload a **new** SSL certificate to AWS Identity and Access Management (IAM)

Certificate Name: test certificate Specify a name for your cert

Private Key: xxxxxx Paste your Private key of SSLcertificate
(pem encoded)

Public Key Certificate: xxxxxxxx paste your Public key certificate
(pem encoded)

Certificate Chain: xxxxxxxxxxxx Paste your ssl cert

Then come below of the same page and click on Next to continue.

1. Define Load Balancer 2. Assign Security Groups 3. Configure Security Settings 4. Configure Health Check 5. Add EC2 Instances 6. Add Tags 7. Review

Step 3: Configure Security Settings

(pem encoded)

Public Key Certificate: xxxxxx
(pem encoded)

Certificate Chain: xxxxxxxx
(pem encoded)

Select a Cipher

Configure SSL negotiation settings for the HTTPS/SSL listeners of your load balancer. You may select one of the Security Policies listed below, or customize your own settings. [Learn more](#) about the Security Policies and configuring SSL negotiation settings.

☒ Predefined Security Policy
ELBSecurityPolicy-2015-05

☐ Custom Security Policy

SSL Protocols

☒ Protocol-TLSv1
☐ Protocol-SSLv3
☒ Protocol-TLSv1.1

Click on Next to continue

[Cancel](#) [Previous](#) [Next: Configure Health Check](#)

Now we need to configure health checks.

Ping Protocol: The protocol to use to connect with the instance. Valid values: TCP, HTTP, HTTPS, and SSL

Ping Port: The port to use to connect with the instance, and check the availability. If the load balancer fails to connect with the instance at the specified port within the configured response timeout period, the instance is considered unhealthy.

Ping Path: The destination for the HTTP or HTTPS request.

Response Timeout: The amount of time to wait when receiving a response from the health check, in seconds. Valid values: 2 to 60

HealthCheck Interval: The amount of time between health checks of an individual instance, in seconds. Valid values: 5 to 300

Unhealthy Threshold: The number of consecutive failed health checks that must occur before declaring an EC2 instance unhealthy. Valid values: 2 to 10

Healthy Threshold: The number of consecutive successful health checks that must occur before declaring an EC2 instance healthy. Valid values: 2 to 10

Then click on Next to continue.

The screenshot shows the 'Step 4: Configure Health Check' page in the AWS Management Console. The page has a progress bar at the top with seven steps: 1. Define Load Balancer, 2. Assign Security Groups, 3. Configure Security Settings, 4. Configure Health Check (active), 5. Add EC2 Instances, 6. Add Tags, and 7. Review. Below the progress bar, the title 'Step 4: Configure Health Check' is followed by a descriptive paragraph. The main configuration area includes 'Ping Protocol' (HTTP), 'Ping Port' (80), and 'Ping Path' (/index.html). Annotations with arrows point to these fields: a blue bubble for 'Select a protocol to ping to instances for availability' points to the Ping Protocol dropdown; a red bubble for 'Specify port' points to the Ping Port input; and a yellow bubble for 'specify a index file' points to the Ping Path input. Below these is the 'Advanced Details' section with 'Response Timeout' (5 seconds), 'Health Check Interval' (30 seconds), 'Unhealthy Threshold' (2), and 'Healthy Threshold' (10). At the bottom right, a cloud-shaped callout says 'Click on Next to continue' with an arrow pointing to the 'Next: Add EC2 Instances' button. The bottom of the page features 'Cancel', 'Previous', and 'Next: Add EC2 Instances' buttons.

Then select your instances from the instances list and click next.

1. Define Load Balancer 2. Assign Security Groups 3. Configure Security Settings 4. Configure Health Check 5. Add EC2 Instances 6. Add Tags 7. Review

Step 5: Add EC2 Instances

The table below lists all your running EC2 instances. Check the boxes in the Select column to add those instances to this load balancer.

VPC vpc-adfea0c8 (172.31.0.0/16)

<input type="checkbox"/>	Instance	Name	State	Security Groups	Zone	Subnet ID	Subnet CIDR
<input type="checkbox"/>	i-ba431734	server2	running	test	ap-southea...	subnet-4a585b3d	172.31.16.0/20
<input type="checkbox"/>	i-682412cc	server1	running	test	ap-southea...	subnet-e2595387	172.31.0.0/20

Select instance you want to configure under ELB

Availability Zone Distribution

☒ Enable Cross-Zone Load Balancing ⓘ

☒ Enable Connection Draining ⓘ 300 seconds

Click on Next

Cancel Previous Next: Add Tags

Specify a Tag name and specify a tag value, then click on below button Review and Create.

1. Define Load Balancer 2. Assign Security Groups 3. Configure Security Settings 4. Configure Health Check 5. Add EC2 Instances 6. Add Tags 7. Review

Step 6: Add Tags

Apply tags to your resources to help organize and identify them.

A tag consists of a case-sensitive key-value pair. For example, you could define a tag with key = Name and value = Webserver. [Learn more](#) about tagging your Amazon EC2 resources.

Key	Value
Name	DEMO

Create Tag

Add a tag Key

Add a tag value

Click on Review and Create

Cancel Previous Review and Create

Check your settings before submitting your changes and then click Create button below.

1. Define Load Balancer 2. Assign Security Groups 3. Configure Security Settings 4. Configure Health Check 5. Add EC2 Instances 6. Add Tags 7. Review

Step 7: Review

Please review the load balancer details before continuing

▼ Define Load Balancer

Load Balancer name: demo
Scheme: internet-facing
Port Configuration: 80 (HTTP) forwarding to 80 (HTTP)
443 (HTTPS) forwarding to 443 (HTTPS)

Edit load balancer definition

▼ Configure Health Check

Ping Target: HTTP:80/index.html
Timeout: 5 seconds
Interval: 30 seconds
Unhealthy Threshold: 2
Healthy Threshold: 10

Edit health check

▼ Add EC2 Instances

Cross-Zone Load Balancing: Enabled
Connection Draining: Enabled, 300 seconds
Instances: i-ba431734 (server2), i-682412cc (server1)

Edit instances

Click on Create

Cancel Previous Create

After completion of creation process of ELB you can find it under the ELB section on EC2 page.