

D Y Patil International University

School of Computer Science, Engineering, and Applications

Academic Year 2022-2023

Practical Assignment No. 1

Class: MCA-SEM III

Subject: Computer Forensics

Date 18 / 10 /2023

Name: - Udayan Mukund Pawar

PRN No.: - 20220804032

Experiments:

Aim:- Application Load Balancer

What is AWS?

AWS (Amazon Web Services) is a comprehensive, evolving cloud computing platform provided by Amazon that includes a mixture of infrastructure-as-a-service (IaaS), platform-as-a-service (PaaS) and packaged-software-as-a-service (SaaS) offerings. AWS services can offer an organization tools such as compute power, database storage and content delivery services.

Amazon.com Web Services launched its first web services in 2002 from the internal infrastructure that Amazon.com built to handle its online retail operations. In 2006, it began offering its defining IaaS services. AWS was one of the first companies to introduce a pay-as-you-go cloud computing model that scales to provide users with compute, storage or throughput as needed.

AWS offers many different tools and solutions for enterprises and software developers that can be used in data centers in up to 190 countries. Groups such as government agencies, education institutions, non-profits and private organizations can use AWS services.

What is Load Balancer:-

The elastic load balancer is a service provided by Amazon in which the incoming traffic is efficiently and automatically distributed across a group of backend servers in a manner that increases speed and performance. It helps to improve the scalability of your application and secures your applications. Load Balancer allows you to configure health checks for the registered targets. In case any of the registered targets (Autoscaling group) fails the health check, the load balancer will not route traffic to that unhealthy target. Thereby ensuring your application is highly

available and fault tolerant. To know more about load balancing refer to Load Balancing in Cloud Computing.

Types of Load Balancers

1. **Application Load Balancer:** This type of Load Balancer is used when decisions are to be made related to HTTP and HTTPS traffic routing. It supports path-based routing and host-based routing. This load balancer works at the Application layer of the OSI Model. The load balancer also supports dynamic host port mapping.
2. **Network Load Balancer:** This type of load balancer works at the transport layer(TCP/SSL) of the OSI model. It's capable of handling millions of requests per second. It is mainly used for load-balancing TCP traffic.
3. **Gateway Load Balancer:** Gateway Load Balancers provide you the facility to deploy, scale, and manage virtual appliances like firewalls. Gateway Load Balancers combine a transparent network gateway and then distribute the traffic.

Procedure:-

Step 1: Launch the two instances on the AWS management console named Instance A and Instance B. Go to services and select the load balancer. To create AWS free tier account refer to Amazon Web Services (AWS) – Free Tier Account Set up.

The screenshot shows the AWS EC2 Instances page. At the top, there are buttons for 'New EC2 Experience' (radio button selected), 'Launch Instance', 'Connect', and 'Actions'. Below this is a search bar labeled 'Security Group Name: default' and a 'Add filter' button. The main area is a table with columns: Name, Instance ID, Instance Type, Availability Zone, Instance State, Status Checks, Alarm Status, Public DNS (IPv4), IPv4 Public IP, and IPv6. Two instances are listed: 'instanceA' (i-015104070505078ef, t2.micro, us-east-1e, running, 2/2 checks, None, ec2-100-27-3-177.com..., 100.27.3.177) and 'instanceB' (i-0de23b37012599b..., t2.micro, us-east-1e, running, 2/2 checks, None, ec2-52-91-122-21.com..., 52.91.122.21). The left sidebar includes links for EC2 Dashboard, Events, Tags, Reports, Limits, Instances (selected), Instance Types, Launch Templates, Spot Requests, Savings Plans, Reserved Instances, Dedicated Hosts, Scheduled Instances, Capacity Reservations, and Images.

Step 2: Click on Create the load balancer.

The screenshot shows the AWS Load Balancers page. At the top, there are buttons for 'New EC2 Experience' (radio button selected), 'Create Load Balancer', and 'Actions'. Below this is a search bar labeled 'Filter by tags and attributes or search by keyword' and a 'None found' message. The main area is a table with columns: Name, DNS name, State, VPC ID, Availability Zones, Type, and Creator. A message at the bottom states 'You do not have any load balancers in this region.' The left sidebar includes links for AMIs, Bundle Tasks, ELASTIC BLOCK STORE (Volumes, Snapshots, Lifecycle Manager), NETWORK & SECURITY (Security Groups, Elastic IPs, Placement Groups, Key Pairs, Network Interfaces), and LOAD BALANCING (Load Balancers, selected).

Step 3: Select Application Load Balancer and click on Create.

Select load balancer type

Elastic Load Balancing supports three types of load balancers: Application Load Balancers, Network Load Balancers (new), and Classic Load Balancers. Choose the load balancer type that meets your needs. [Learn more about which load balancer is right for you](#)

Application Load Balancer



Create

Choose an Application Load Balancer when you need a flexible feature set for your web 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.

[Learn more >](#)

Network Load Balancer



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 application. Operating at the connection level, Network Load Balancers are capable of handling millions of requests per second securely while maintaining ultra-low latencies.

[Learn more >](#)

Classic Load Balancer

PREVIOUS GENERATION
for HTTP, HTTPS, and TCP



Create

Choose a Classic Load Balancer when you have an existing application running in the EC2-Classic network.

[Learn more >](#)

Step 4: Here you are required to configure the load balancer. Write the name of the load balancer. Choose the scheme as internet facing.

1. Configure Load Balancer 2. Configure Security Settings 3. Configure Security Groups 4. Configure Routing 5. Register Targets 6. Review

Step 1: Configure Load Balancer

Basic Configuration

To configure your load balancer, provide a name, select a scheme, specify one or more listeners, and select a network. The default configuration is an Internet-facing load balancer in the selected network with a listener that receives HTTP traffic on port 80.

Name: my-loadbalancer

Scheme: internet-facing internal

IP address type: IPv4

Listeners

A listener is a process that checks for connection requests, using the protocol and port that you configured.

Load Balancer Protocol	Load Balancer Port
HTTP	80

[Add listener](#) [Cancel](#) [Next: Configure Security Settings](#)

Step 5: Add at least 2 availability zones. Select us-east-1a and us-east-1b

1. Configure Load Balancer 2. Configure Security Settings 3. Configure Security Groups 4. Configure Routing 5. Register Targets 6. Review

Step 1: Configure Load Balancer

Availability Zones

Specify the Availability Zones to enable for your load balancer. The load balancer routes traffic to the targets in these Availability Zones only. You can specify only one subnet per Availability Zone. You must specify subnets from at least two Availability Zones to increase the availability of your load balancer.

VPC	Availability Zones	IPv4 address
vpc-c63330bc (172.31.0.0/16) (default)	<input checked="" type="checkbox"/> us-east-1a	subnet-07a25158
	<input checked="" type="checkbox"/> us-east-1b	subnet-f6629590
	<input type="checkbox"/> us-east-1c	subnet-e8d22fc9
	<input type="checkbox"/> us-east-1d	subnet-919214dc
	<input type="checkbox"/> us-east-1e	subnet-28f6cc16
	<input type="checkbox"/> us-east-1f	subnet-54e1495a

[Cancel](#) [Next: Configure Security Settings](#)

Step 6: We don't need to do anything here. Click on Next: Configure Security Groups

1. Configure Load Balancer 2. Configure Security Settings 3. Configure Security Groups 4. Configure Routing 5. Register Targets 6. Review

Step 2: Configure Security Settings

⚠ Improve your load balancer's security. Your load balancer is not using any secure listener.
If your traffic to the load balancer needs to be secure, use the HTTPS protocol for your front-end connection. You can go back to the first step to add/configure secure listeners under Basic Configuration section. You can also continue with current settings.

Cancel Previous Next: Configure Security Groups

Step 7: Select the default security group. Click on Next: Configure Routing

1. Configure Load Balancer 2. Configure Security Settings 3. Configure Security Groups 4. Configure Routing 5. Register Targets 6. Review

Step 3: Configure Security Groups

A security group is a set of firewall rules that control the traffic to your load balancer. On this page, you can add rules to allow specific traffic to reach your load balancer. First, decide whether to create a new security group or select an existing one.

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

Security Group ID	Name	Description	Actions
sg-0bb0a9bc3e885adfb	AutoScaling-Security-Group-1	AutoScaling-Security-Group-1 (2020-06-15 12:00:39.275+05:30)	Copy to new
sg-0b3772fb578fb44ce	AutoScaling-Security-Group-2	AutoScaling-Security-Group-2 (2020-06-15 15:18:53.000+05:30)	Copy to new
sg-103a4f3e	default	default VPC security group	Copy to new
sg-0b13f451747da2fc2	launch-wizard-1	launch-wizard-1 created 2020-05-12T23:27:45.924+05:30	Copy to new
sg-0458b504a37badf44	launch-wizard-10	launch-wizard-10 created 2020-06-13T14:16:46.319+05:30	Copy to new
sg-0fd12e18e2b9c22d6	launch-wizard-11	launch-wizard-11 created 2020-06-15T11:38:34.722+05:30	Copy to new
sg-04b73529392cc9a7	launch-wizard-12	launch-wizard-12 created 2020-06-15T15:10:02.695+05:30	Copy to new
sg-0f3b470cd95160c71	launch-wizard-13	launch-wizard-13 created 2020-06-15T20:33:05.606+05:30	Copy to new
sg-0d9aa46000ea55a53f	launch-wizard-2	launch-wizard-2 created 2020-05-13T05:34:24.807+05:30	Copy to new

Filter VPC security groups

Cancel Previous Next: Configure Routing

Step 8: Choose the name of the target group to be my target group. Click on Next: Register Targets.

1. Configure Load Balancer 2. Configure Security Settings 3. Configure Security Groups 4. Configure Routing 5. Register Targets 6. Review

Step 4: Configure Routing

Your load balancer routes requests to the targets in this target group using the protocol and port that you specify, and performs health checks on the targets using these health check settings. Note that each target group can be associated with only one load balancer.

Target group

Target group: New target group
Name: my-target-group
Target type: Instance
Protocol: HTTP
Port: 80

Health checks

Protocol: HTTP
Path: /

Cancel Previous Next: Register Targets

Step 9: Choose instance A and instance B and click on Add to register. Click on Next: Review

The screenshot shows the 'Step 5: Register Targets' page. At the top, there are tabs for 1. Configure Load Balancer, 2. Configure Security Settings, 3. Configure Security Groups, 4. Configure Routing, 5. Register Targets (which is highlighted), and 6. Review. Below the tabs, there's a section titled 'Registered targets' with a note: 'To deregister instances, select one or more registered instances and then click Remove.' A 'Remove' button is shown above a table. The table has columns: Instance, Name, Port, State, Security groups, and Zone. It lists two instances: 'instanceA' (running, port 80, default security group, us-east-1e) and 'instanceB' (running, port 80, default security group, us-east-1e). Below this is an 'Instances' section with a note: 'To register additional instances, select one or more running instances, specify a port, and then click Add. The default port is the port specified for the target group. If the instance is already registered on the specified port, you must specify a different port.' A 'Add to registered' button is followed by a search bar 'Search Instances'. Another table shows the same two instances with their details: subnet IDs and subnet CIDRs. At the bottom right are 'Cancel', 'Previous', and 'Next: Review' buttons.

Step 10: Review all the configurations and click on create

The screenshot shows the 'Step 6: Review' page. At the top, there are tabs for 1. Configure Load Balancer, 2. Configure Security Settings, 3. Configure Security Groups, 4. Configure Routing, 5. Register Targets, and 6. Review (highlighted). A note says: 'Please review the load balancer details before continuing.' Below are three sections: 'Load balancer' (Name: my-loadbalancer, Scheme: internet-facing, Listeners: Port 80 - Protocol: HTTP, IP address type: ipv4, VPC: vpc-c63330bc, Subnets: subnet-07a25158, subnet-f6629590, Tags), 'Security groups' (Security groups: sg-103a4f3e), and 'Routing' (Target group: New target group, Target group name: my-target-group, Port: 80, Target type: Instance, Protocol: HTTP, Health check protocol: HTTP, Path: /, Health check port: traffic port, Healthy threshold: 5). At the bottom right are 'Cancel', 'Previous', and 'Create' buttons.

Step 11: Congratulations!! You have successfully created a load balancer. Click on close.

The screenshot shows the 'Load Balancer Creation Status' page. It displays a green box with a checkmark and the message: 'Successfully created load balancer. Load balancer my-loadbalancer was successfully created. Note: It might take a few minutes for your load balancer to be fully set up and ready to route traffic, and for the targets to complete the registration process and pass the initial health checks.' Below this is a 'Suggested next steps' section with two items: 'Discover other services that you can integrate with your load balancer. Visit the Integrated services tab within my-loadbalancer' and 'Consider using AWS Global Accelerator to further improve the availability and performance of your applications. AWS Global Accelerator console'. At the bottom right is a 'Close' button.

Result:- We have successfully created a load Balancer.