Load Balancer

Siddesh Mandhare

Application Load Balancer

1) **Create Instances and Verify Applications**:

   o Launch two instances in different Availability Zones (AZ) with bootstrapping.

   o Ensure both applications are running correctly on these instances.

2) **Set Up Application Load Balancer (ALB)**:

   o **Network Mapping**: Map the created instances' AZs.

   o **Security Group**: Add rules for SSH (port 22), HTTP (port 80), and HTTPS (port 443).

   o **Listener**: Configure a listener on port 443 (HTTPS).

   o **Target Group**:

   ▪ Create a target group with protocol HTTP1 and path /index.html.

   ▪ Register the running instances to the target group with port 80.

   o **Certificate**: Upload an ACM (Amazon Certificate Manager) certificate.

   o Complete the ALB creation process.

3) **Configure Route 53**:

   o Add your domain to a hosted zone.

   o Select your domain and create a new record.

   o Enter the record name (e.g., www.domain-name).

   o Set the alias to the application and classic load balancer.

   o Choose the region (e.g., ap-south-1).

   o Select the load balancer created in step 2 and create the record.

4) **Access the Application**:

   o You will receive a URL with the record and domain name.

   o Open the URL (e.g., https://www.domain-name) in your browser.

Network Load Balancer

If you prefer to use a Network Load Balancer (NLB), follow the same steps as for the ALB. The only difference is in the network groups, where you need to configure rules for TCP, UDP, and TLS protocols. The NLB setup is optional; you can proceed with the ALB if preferred.

Gateway Load Balancer

Create Instances:

- Launch two instances in different AZs with bootstrapping.
- Verify both applications are running.

Set Up Gateway Load Balancer (GLB):

- Open the EC2 console and create a GLB.
- Configure network mapping, security groups, and listener settings.
- Create a target group with the GENEVE protocol and register your instances.
- Upload an ACM certificate and complete the GLB creation.

Create Endpoint Service:

- In the VPC console, create an endpoint service linked to your GLB.
- Configure the service name and acceptance settings.

Create Endpoint:

- In the VPC console, create an endpoint for the service.
- Select the VPC, subnets, and security group.

Update Route Tables:

- Add routes in the route table to direct traffic through the GLB endpoint.

Verify Traffic:

- Test traffic flow using tools like ping and tcpdump.

Feature	Application Load Balancer (ALB)	Network Load Balancer (NLB)	Gateway Load Balancer (GLB)	Classic Load Balancer (CLB)

OSI Layer	Layer 7 (Application)	Layer 4 (Transport)	Layer 3 (Network)	Layer 4 (Transport)
Protocols Supported	HTTP, HTTPS, WebSocket	TCP, UDP, TLS	IP	HTTP, HTTPS, TCP
Routing	Content-based (path, host, etc.)	Connection-based	IP-based	Connection-based
Advanced Features	Path-based routing, host-based routing, WebSocket support, SSL termination	Static IP, high performance, low latency	Integrates with third-party virtual appliances	Basic load balancing, SSL termination
Health Checks	Application-level	Network-level	Network-level	Basic health checks
Use Cases	Microservices, containerized applications, HTTP/HTTPS traffic	High-performance, low-latency applications, TCP/UDP traffic	Integrating third-party appliances, advanced networking	Legacy applications, basic load balancing
Security	Supports WAF, SSL termination	Supports TLS termination	Integrates with security appliances	Basic SSL termination
Pricing	Based on LCU (Load Balancer Capacity Units)	Based on LCU	Based on LCU	Based on usage