



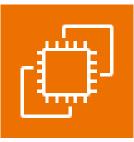


AWS Solution Architect Training with AWS Cloud Practitioner Global Certification Training

Trainer: Aravindraj.G- Nminds Academy

Configure Network Load Balancer with 3 Linux Web Servers in AWS







Deepakraj R B.E -Computer Science Engineering Mepco Schlenk Engineering College Sivakasi







Objective

An AWS Application Load Balancer (ALB) is a fully managed Layer 7 (HTTP/HTTPS) load balancing service provided by Amazon Web Services (AWS). It is designed to handle HTTP and HTTPS traffic and offers advanced routing capabilities, allowing you to direct traffic to different resources based on the content of the request (e.g., URL paths, hostnames, query parameters, HTTP headers, etc.).

When to Use AWS Application Load Balancer:

- Web Applications: If you are building a traditional web application or microservices application, ALB can route HTTP/HTTPS traffic to different services based on URL paths, hostnames, or headers.
- Microservices Architecture: ALB is a good choice for microservices, where
 different services are hosted on different target groups. It can route
 traffic to the appropriate service based on the URL or other request
 attributes.
- 3. Content-based Routing: If you need to route traffic based on URL paths, hostnames, HTTP headers, or query parameters, ALB's advanced routing features are very useful.
- SSL/TLS Termination: If you need to offload SSL/TLS decryption from your backend servers, ALB is a great option for handling HTTPS traffic securely.
- 5. WebSocket Applications: ALB supports WebSocket connections, making it suitable for applications that require persistent, real-time, full-duplex communication.
- 6. Global Applications: If you have applications that require high availability across multiple regions or availability zones, ALB's support for cross-zone load balancing helps ensure fault tolerance.

Nomenclature and Components:

- Listeners: A listener checks for connection requests, defined by a protocol (HTTP or HTTPS) and a port (typically port 80 for HTTP or port 443 for HTTPS). It forwards traffic to one or more target groups based on rules you define.
- 2. Target Groups: A target group is a set of backend resources (such as EC2 instances or containers) that the ALB forwards traffic to. Each target group can be associated with specific health check settings. Targets can be registered or deregistered as needed.







- 3. Rules: ALB allows you to define rules that determine how traffic is routed. You can configure rules to route traffic based on hostnames, path patterns, HTTP headers, query strings, or even the HTTP method (GET, POST, etc.).
- 4. Health Checks: ALB checks the health of targets by sending HTTP(S) requests to a specific path (e.g., /health). If a target is unhealthy, ALB stops routing traffic to it and forwards traffic to healthy targets.
- 5. Target Types: ALB supports three types of targets:
 - o Instance: EC2 instances registered directly to the target group.
 - IP: IP addresses, such as instances in a private subnet or onpremise servers.
 - Lambda functions: AWS Lambda functions can also be used as targets.

Example Use Case:

Consider an e-commerce application where different services handle user authentication, product search, and order processing. You can use an ALB to route traffic as follows:

- Requests to /auth/* go to the authentication service.
- Requests to /products/* go to the product search service.
- Requests to /orders/* go to the order processing service.

This routing setup can be achieved by configuring the ALB with path-based routing rules, improving the scalability and organization of the application.

Benefits:

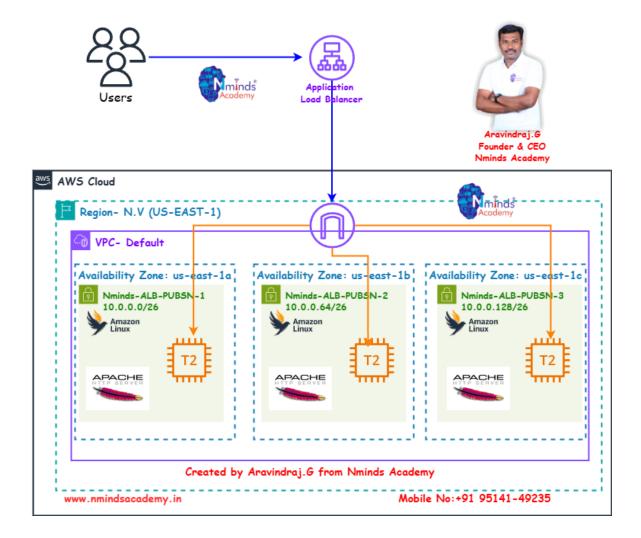
- Advanced Routing: ALB provides powerful content-based routing, making it suitable for modern applications and microservices.
- SSL/TLS Termination: Offload SSL/TLS decryption to the load balancer, reducing the overhead on your application servers.
- Improved Fault Tolerance: Health checks and automatic rerouting to healthy targets ensure high availability and reliability.
- Ease of Use: Fully managed and integrates easily with other AWS services like EC2, ECS, EKS, and Lambda.





Topology

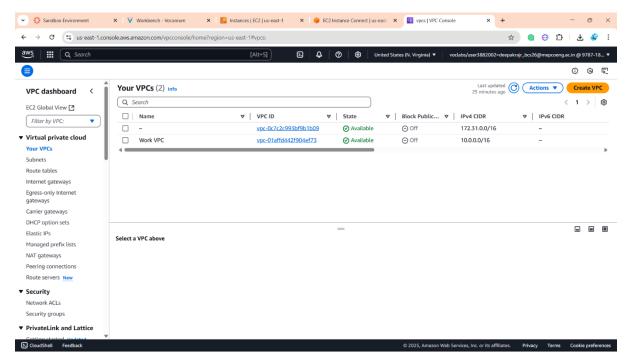
Configure High Availability with 3 Webservers using Application Load Balancer in AWS



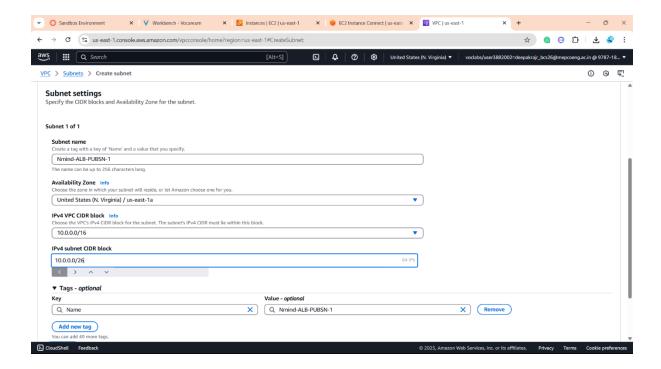


Execution Tasks:

Step1: Set Up the VPC and Subnets. Use the Default VPC

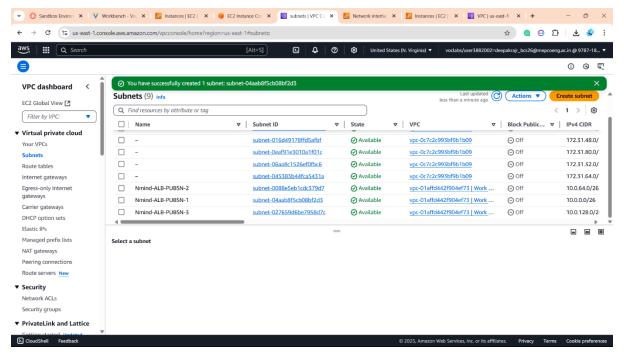


Step2: create the public subnets within the default VPC:

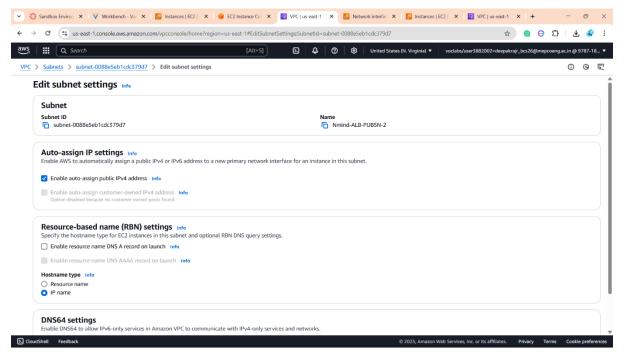








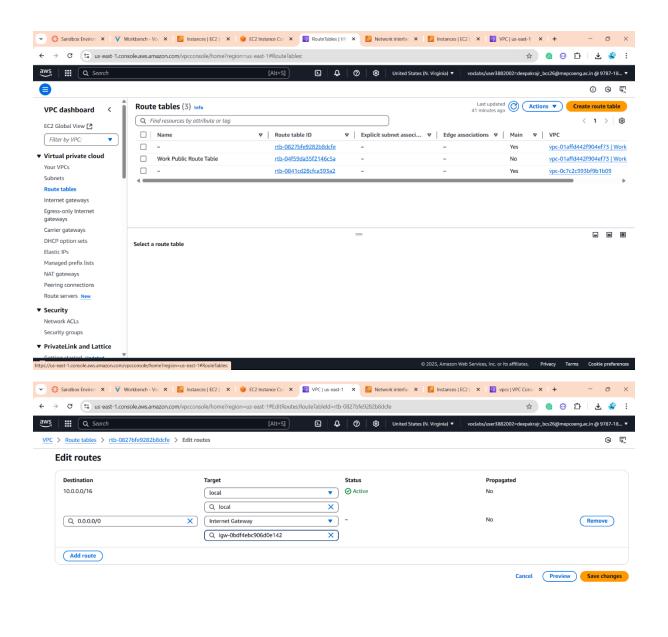
Step3: Select each subnet, click Actions > Edit Subnet Settings, and enable Auto-assign public IPv4 address.



Step4: Go to Route Tables, select the main route table associated with the default VPC, and ensure a route exists for 0.0.0.0/0 with a target of the Internet Gateway





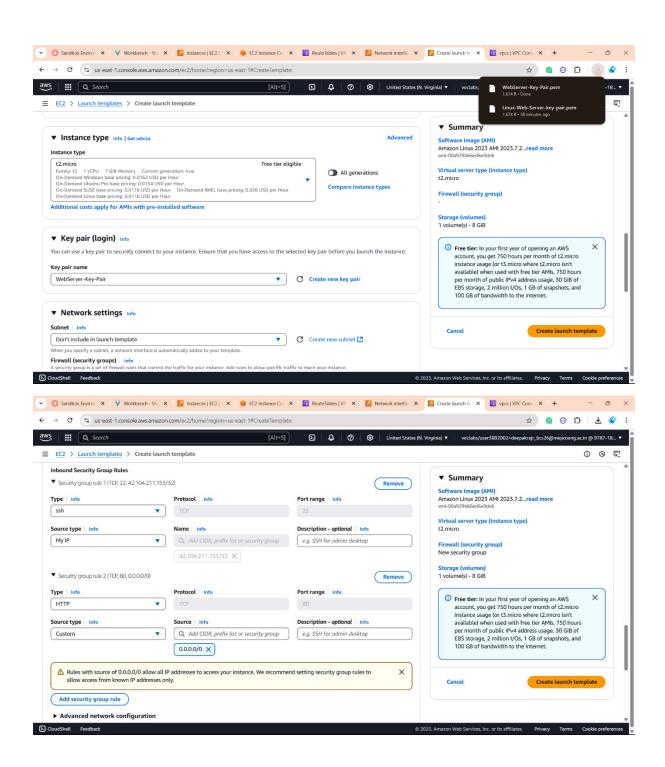


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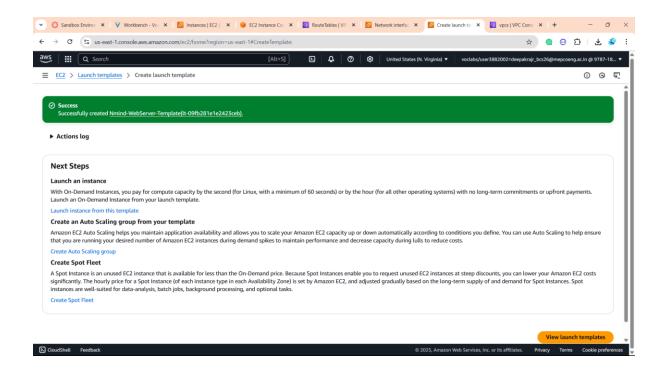
Step5: Navigate to Launch Templates and click Create Launch Template.



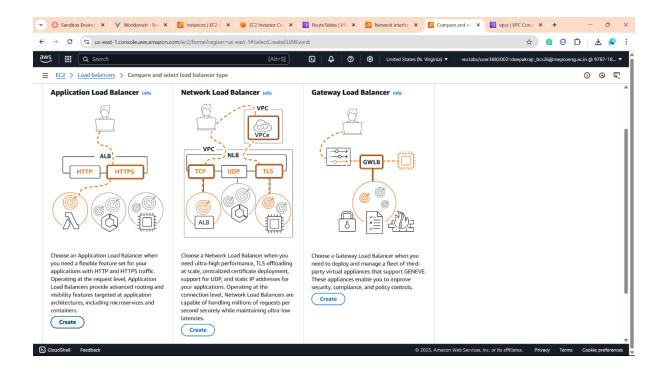








Step6: Create an Application Load Balancer (ALB)

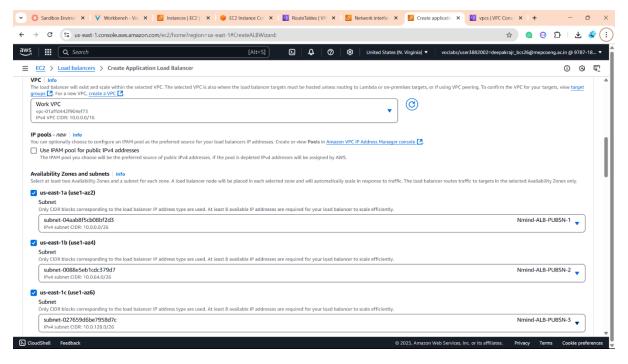


Step7: Configure ALB

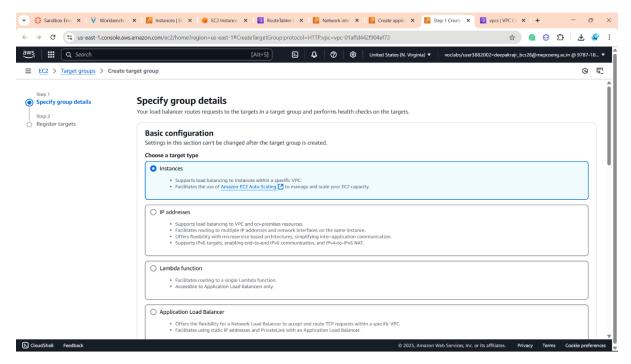






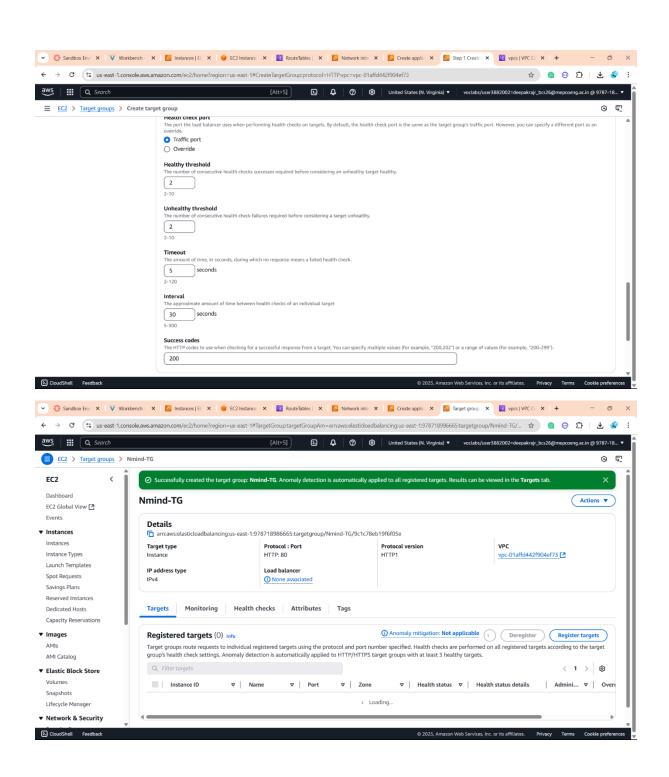


Step8: Create Target Group





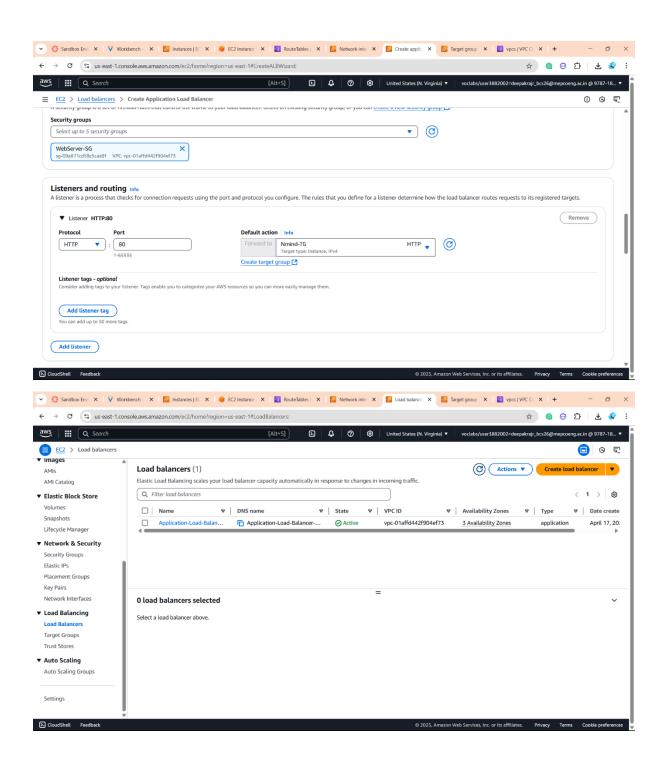




Step9: Attach Target Group



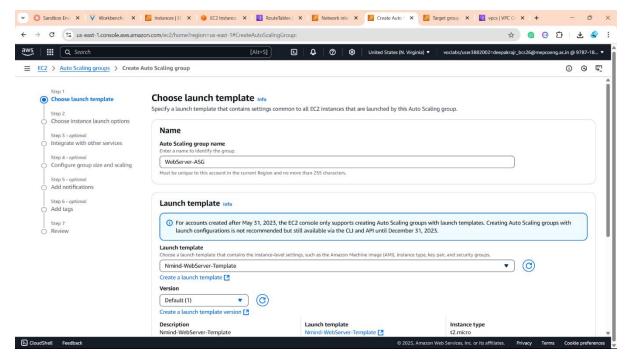




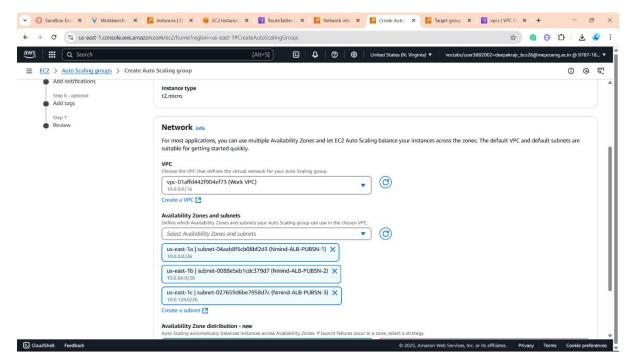
Step10: Create an Auto Scaling Group (ASG)







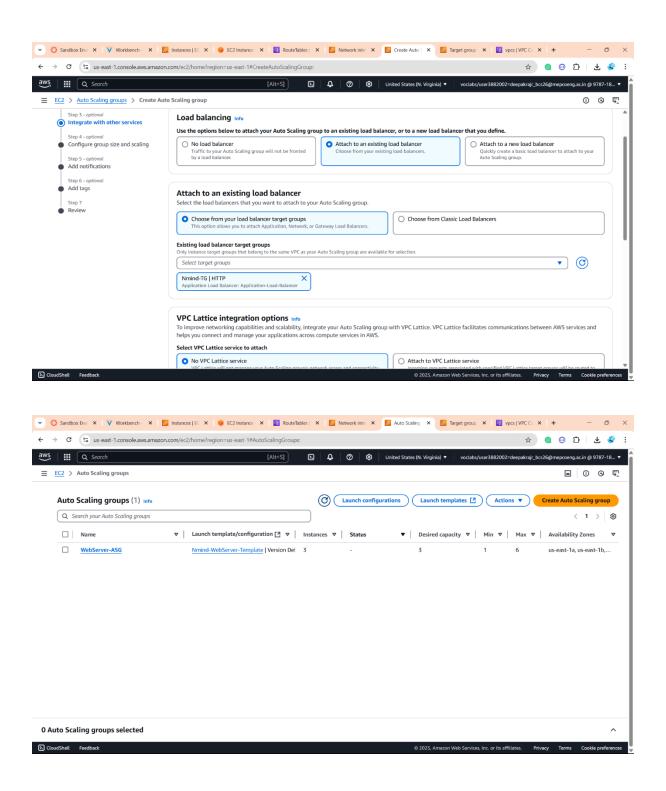
Step11: Configure ASG



Step12: Attach Application Load Balancer and associate with Target group.







Step13: Test the Configuration





