

# Scalable Web Application with ALB and Auto Scaling

## Project Description:

This project provides a robust and scalable web application infrastructure hosted on a cloud platform to handle variable traffic loads efficiently using an Application Load Balancer (ALB) and Auto Scaling. The architecture is organized within a Virtual Private Cloud (VPC) and spans multiple Availability Zones (AZs) for high availability.

## Project Components:

### 1) AWS Cloud / VPC:

Public Subnet 1: (Availability Zone A)

Public Subnet 2: (Availability Zone B)

**2) Application Load Balancer:** distribution the Load or the requests form the clients to EC2s by using HTTP/HTTPS Protocols and SSL/TLS for two-way authentication.

**3) Auto Scaling Group (ASG):** for scaling based on demand by using some policies and CloudWatch.

**4) EC2:** Launch template by using user data to create to setup web server Nginx for example.

**5) Amazon RDS:** Database Tier MySQL/PostgreSQL with Amazon RDS Multi-AZ Deployment for High Availability.

**6) IAM:** Role-based access to instances for security.

**7) CloudWatch & SNS:** Monitor performance and send alerts.

## Major Benefits:

**1)High Availability:** Utilize ALB and ASG to ensure zero downtime.

**2)Scalability:** Automatically scale resources based on demand to maintain optimal performance.

**3)Security:** Implement IAM for managing permissions and ensuring security.

**Explanation:** users access and request the application with the Domain name , Route 53 translate the domain to the ALB in public subnets, The ALB distributes traffic to healthy EC2 in an Auto Scaling group across private subnets in multiple AZs, EC2 instances web tier and App tier requests and interact with the RDS master instance in a private subnet for data storage and with the RDS standby incase failure.

**for Administrator:** CloudWatch monitors metrics like CPU, Latency and triggers SNS notifications to admins if there is an issues .

