Experiment 5.3

Aim

To deploy a full stack application on AWS, set up load balancing for scalability and high availability, and understand EC2, ELB, and VPC basics.

Introduction

Deploying applications on cloud platforms like AWS enables scalability, high availability, and robust infrastructure management. This experiment demonstrates deploying a full stack application with a React frontend, Node.js/Express backend, and optionally a database like MongoDB. Traffic is distributed using an Application Load Balancer (ALB) to multiple backend instances, showcasing load balancing, fault tolerance, and basic VPC configuration.

Procedure

1. Build a full stack application with React frontend and Node.js/Express backend.
2. Deploy the backend to one or more EC2 instances.
3. Deploy the frontend to a separate EC2 instance or hosting service.
4. Configure security groups to allow HTTP/HTTPS traffic and backend communication.
5. Set up an Application Load Balancer (ALB) in AWS to distribute traffic to multiple backend EC2 instances.
6. Configure target groups for the ALB and attach backend instances.
7. (Optional) Set up a domain using Route 53 and point it to the ALB.
8. Test the deployment by accessing the application in a browser.
9. Verify that the ALB distributes traffic between backend instances, ensuring scalability and high availability.

Output

- A live full stack application accessible on the internet.
- AWS Application Load Balancer successfully distributing traffic across backend EC2 instances.
- Demonstration of scalability and fault tolerance.

Learning Outcomes

- Gain practical experience deploying a full stack application on AWS.
- Learn to configure EC2 instances for backend and frontend deployments.
- Understand the setup and functioning of an Application Load Balancer.
- Learn basic VPC and security group configurations.
- Gain knowledge of routing traffic using Route 53 and testing load balancing functionality.