EXP-5.3:

AIM:

Gain experience deploying a full stack application to AWS and configure load balancing for scalability and high availability. Learn about EC2, Elastic Load Balancing (ELB), and VPC basics.

PROCEDURE-

1. Prepare Your App Locally

- Make sure your React frontend and Node.js/Express backend are working locally.
- (Optional) Set up MongoDB or another database if needed.

2. Launch EC2 Instances

- Go to AWS Console > EC2 > Launch Instance.
- Choose Ubuntu or Amazon Linux AMI.
- For backend: Launch at least 2 EC2 instances (for load balancing).
- For frontend: Launch 1 EC2 instance.
- Configure security groups:
- Allow SSH (port 22) from your IP.
- Allow HTTP (port 80) and HTTPS (port 443) from anywhere.

3. Deploy Backend and Frontend

SSH into each EC2 instance:

ssh -i /path/to/key.pem ubuntu@<EC2-public-IP>

Update and install dependencies:

sudo apt update

sudo apt install nodejs npm nginx -y

sudo npm install -g pm2

Transfer your code (use scp or git clone).

Install app dependencies:
cd /home/ubuntu/your-app
npm install

Start backend with PM2:
pm2 start app.js
pm2 save
pm2 startup
For frontend, build React app and serve with Nginx or Node.js static server.

4. Set Up VPC and Subnets

- Use the default VPC or create a new one for isolation.
- Make sure your EC2 instances are in public subnets.

5. Create an Application Load Balancer (ALB)

- Go to EC2 > Load Balancers > Create Load Balancer > Application Load Balancer.
- Name your ALB, select the VPC, and choose at least 2 public subnets (for high availability).
- Configure a listener for HTTP (port 80).
- Create a target group for your backend EC2 instances.
- Register your backend EC2s as targets.
- Set up health checks (default is /, adjust if needed).

6. Configure Security Groups for ALB and EC2s

- ALB security group: Allow HTTP/HTTPS from anywhere.
- Backend EC2 security group: Allow traffic only from the ALB security group on the backend port (e.g., 3000).

7. Domain Routing

- Use Route 53 to create a hosted zone for your domain.
- Point your domain's A record to the ALB's DNS name.

8. Test Your Deployment

- Access your app via the ALB DNS or your domain.
- Try stopping one backend EC2 instance—ALB should route traffic to the healthy instance.

OUTPUT: