Three-Tier Architecture with Multi-Region Disaster Recovery

Overview

This project provisions a highly available three-tier architecture on AWS using Terraform, designed for disaster recovery across two AWS regions:

- **Primary Region: us-east-1**

- **Secondary Region: us-east-2**

The environment includes:

- **Public-facing Web Tier (ALB + EC2)**

- **Internal App Tier (ALB + EC2)**

- **Private DB Tier (RDS)**

- **Shared resources (S3, IAM, Route 53, Security Groups)**

Modules Structure

DisasterRecovery/

├── main.tf	# Root module orchestrator
├── variables.tf	# Variable declarations
├── terraform.tfvars	# Environment-specific values
├── networking/	# VPC, subnets, route tables
├── security_groups/	# Tiered security group definitions
├── alb_asg/	# ALB + ASG per tier
├── rds/	# RDS instance module
├── s3/	# Cross-region replicated S3

Architecture
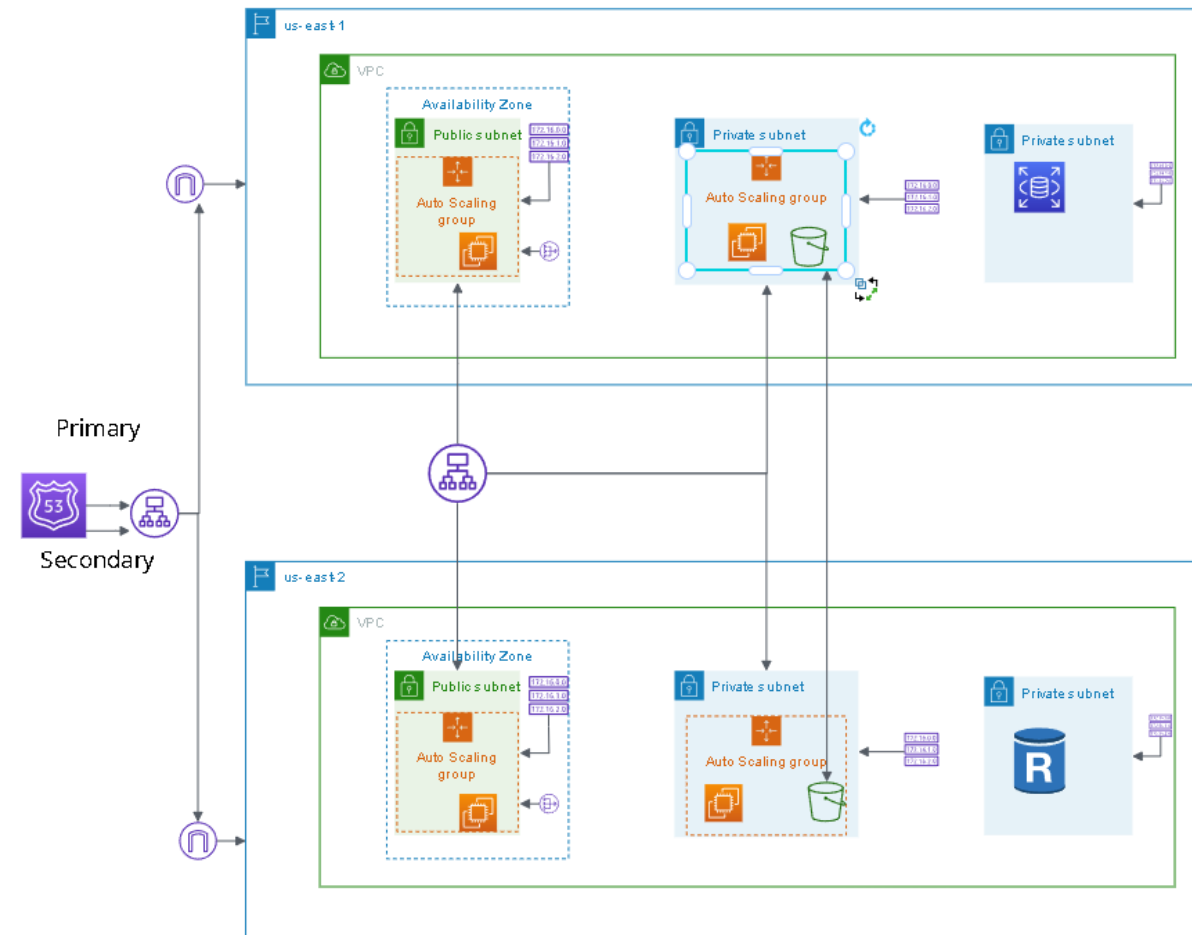
What's Deployed

VPC & Networking

- 2 VPCs: 1 per region
- 3 Subnet tiers per VPC:
    - **Public**: ALB & Web EC2
    - **App**: Internal ALB & App EC2
    - **DB**: Private subnets for RDS
- NAT Gateway for outbound access from private subnets

Security Groups

- **ALB External SG**: Allows HTTP/HTTPS from internet

- **Web SG**: Allows HTTP from ALB

- **App SG**: Allows traffic from Web SG on port 8080

- **DB SG**: Allows MySQL from App SG

Compute & Load Balancing

- 2 Web ALBs (1 per region, public)

- 2 App ALBs (1 per region, internal)

- 4 Auto Scaling Groups (web/app × 2 regions)

- Launch templates install Apache and expose test endpoints

Storage

- RDS MySQL deployed in **primary region only**

- Cross-region S3 bucket for backups and state sharing

High Availability / DR

- **Route 53 Failover Routing**:

  o Primary ALB (us-east-1) with Health Check

  o Secondary ALB (us-east-2) takes over if primary fails

- **Multi-region design** ensures failover and resilience

Deployment Instructions

Initialize: terraform init

Preview: terraform plan

Deploy: terraform apply -auto-approve

Destroy: terraform destroy