Terraform + Jenkins Blue/Green Deployment Architecture

1. Architecture Overview

- Developer Push → GitHub → Jenkins Pipeline
- Build ROOT.war using Maven
- SonarQube Analysis and Quality Gate Validation
- Upload WAR to S3 Artifact Bucket
- Terraform Plan and Manual Approval
- Terraform Apply (Green Environment Creation)
- Environment Warmup
- Smoke Test (5 minutes)
- CNAME Swap (Blue → Green)
- CloudFront Cache Invalidation
- Traffic Shifted to New Environment

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2. Infrastructure Components

- Custom VPC with 2 Public and 2 Private Subnets
- Internet Gateway and NAT Gateway
- Route Tables and Associations
- Separate Security Groups for ALB and EC2
- Elastic Beanstalk Application and Environments (Blue/Green)
- Autoscaling Configuration and Health Checks
- CloudFront Distribution with ACM HTTPS
- Route53 Alias Record pointing to CloudFront

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3. Deployment Flow Details

- WAR built using mvn clean package
- Artifact uploaded using aws s3 cp command
- Terraform Plan executed with build_number variable
- Manual Approval before terraform apply
- Terraform creates Green environment
- Smoke testing performed for 5 minutes against /health endpoint
- aws elasticbeanstalk swap-environment-cnames executed
- CloudFront invalidation performed to clear cache

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4. Configuration Management

- Tomcat configuration handled via .platform or .ebextensions
- Beanstalk infrastructure settings managed in Terraform setting blocks
- Environment variables defined in Terraform
- Autoscaling and instance types managed via Terraform

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5. Rollback Strategy

- If smoke test fails → Swap CNAME back to Blue
- Rollback time approximately 30 seconds
- No rebuild required for rollback

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6. Estimated Cost (ap-south-1 - UAT)

- EC2 (2 x t3.small): Approx ■4,000 – ■5,000/month
- ALB: Approx ■1,800 – ■2,500/month
- NAT Gateway: Approx ■2,500 – ■3,000/month
- CloudFront: Approx ■1,000 – ■2,000/month
- S3 + Route53: Approx ■500 – ■800/month
- Total Estimated UAT Cost: ■10,000 – ■14,000/month

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7. Production Readiness

- Blue/Green zero-downtime deployment
- Manual approval control gate
- SonarQube quality enforcement
- Smoke test validation before traffic shift
- Immediate rollback capability
- Cost-optimized UAT configuration scalable to production
