
- Objective -

Your task is to provision infrastructure and deploy a basic web application in a scalable and observable way. You will use tools commonly seen in DevOps workflows.

- Requirements -
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1. Infrastructure Provisioning
   - Use Terraform to provision cloud resources (AWS preferred).
   - Infrastructure should include:
     - A virtual private cloud (VPC)
     - A container orchestration platform (EKS/GKE/AKS or Docker + EC2)
     - A load balancer
     - Auto-scaling groups or node pools
2. Application Deployment
   - Deploy a simple web app (very basic hello_world Node.js app).
   - Containerize it using Docker.
   - Deploy using Kubernetes or Docker Compose, depending on what you set up.
   - Include a CI/CD pipeline (GitHub Actions, GitLab CI, CircleCI, etc.) that:
     - Builds Docker images
     - Pushes to a container registry (Docker Hub, ECR, etc.)
     - Deploys to the cluster
3. Monitoring & Logging
   - Ensure basic metrics (CPU, memory, requests/sec) are exposed and viewable.
   - Set up basic alerting (email/Slack webhook is fine).
4. Bonus Points
   - Add HTTPS using cert-manager or a reverse proxy with TLS.
   - Implement blue-green or canary deployments.
   - Use Secrets management (AWS Secrets Manager, HashiCorp Vault, etc.).
   - Add health checks for the deployed app.

- Deliverables -

- A GitHub repository with:
  - `README.md` explaining architecture, how to deploy, and how to checks
  - Where to check alerting and monitoring dashboards
  - Infrastructure code
  - CI/CD config
  - Dockerfile(s)
  - Kubernetes manifests or Docker Compose
- Diagrams or notes on:
  - System architecture
  - Any tradeoffs or decisions you made
- Replication instructions
  - step by step instructions on how to clone the github repository and deploy it start to finish on another AWS account

Use a brand new, free AWS account and resources. Avoid any additional billing.