

CSOD Project - Setup & Deployment Guide

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Purpose: This guide explains how to create AWS infrastructure, configure Kubernetes access, and deploy the Node.js application using GitHub Actions. It also covers installing the metrics server for HPA. Monitoring setup is referenced from the repo README.

1. Clone Repository

```
git clone https://github.com/mrsantosh-devops/csod.git  
cd csod/terraform
```

Repository structure includes:

- terraform/ - for infra
- helm-chart/nodejs-app/ - Helm chart for Node.js deployment

2. Terraform Infrastructure Setup

```
# Initialize Terraform
```

```
terraform init
```

```
# Format Terraform files
```

```
terraform fmt -recursive
```

```
# Validate configuration
```

```
terraform validate
```

```
# Create execution plan
```

```
terraform plan -out=tfplan
```

```
# Apply the plan (create AWS infra)
```

```
terraform apply tfplan
```

Terraform creates:

- VPC
- S3 Bucket(s)
- ECR Repository(s)
- EKS Cluster

3. Configure Kubernetes Access

```
aws eks update-kubeconfig --region <REGION> --name <CLUSTER_NAME>
```

(Replace <REGION> and <CLUSTER_NAME> with Terraform outputs.)

4. Deployment Workflow (GitHub Actions)

The CI/CD pipeline automatically handles:

- Running tests (npm test)
- Building Docker image
- Tagging & pushing image to ECR
- Deploying/upgrading Node.js app to EKS using Helm chart

No manual commands required. Any changes to Dockerfile, Helm chart, or workflow will automatically trigger Actions.

5. Metrics Server (Required for HPA)

```
kubectl apply -f https://github.com/kubernetes-sigs/metrics-server/releases/latest/download/components.yaml
```

Verify deployment:

```
kubectl get deployment metrics-server -n kube-system
```

```
kubectl top nodes
```

HPA is already configured inside the Helm chart - no manual HPA commands needed.

6. Monitoring

Follow the repository monitoring instructions:

```
https://github.com/mrsantosh-devops/csod/blob/refs/heads/test/monitoring/Readme.md
```

7. Helpful Kubernetes Commands

```
kubectl get nodes
```

```
kubectl get pods -A
```

```
kubectl get svc -A
```

```
kubectl get hpa -A
```

8. Quick Summary

Step | Action

1 | Clone repo -> cd terraform

- 2 | Terraform: init -> fmt -> validate -> plan -> apply
- 3 | Configure kubectl for EKS
- 4 | Metrics server installation for HPA
- 5 | GitHub Actions handles tests, Docker build, push, and Helm deploy
- 6 | Monitoring -> follow repo README

This guide is intended for team members to set up the project step-by-step without requiring manual deployment commands.