

NG-Voice Kubernetes Deployment Summary

Task 1: Kubernetes Cluster Setup (AWS EKS)

Step-by-step guide to provision an EKS cluster:

1. Configure AWS CLI and install `eksctl`, `kubectl`.

2. Create EKS Cluster:

```
eksctl create cluster --name --region --nodes 2 --node-type t3.small
```

3. Validate cluster and node status using `kubectl get nodes`.

4. Upgrade from Kubernetes v1.27 to v1.28:

- `eksctl upgrade cluster --name --version 1.28 --approve`

- Create new nodegroup if upgrade fails.

- Drain and delete older nodegroup safely using `kubectl drain` and `eksctl delete nodegroup`.

Task 2: Deploy NGINX Web + MySQL Application

1. Create app namespace and deployment YAMLs:

- Deploy NGINX using `nginx-deployment.yml`

- Deploy MySQL using `mysql-deployment.yml`

2. Validate using:

- `kubectl get pods -n app-demo`

- `kubectl get svc -n app-demo`

3. Troubleshooting:

- ImagePullBackOff: check image repo.

- CrashLoopBackOff: validate config/env.

Task 3: Monitoring with Prometheus + Grafana

1. Create namespace: `kubectl create ns monitoring``

2. Apply configs:

- `prometheus-config.yml` (scrape settings)

- `prometheus-deploy.yml` (Deployment + Service)

- `grafana-deploy.yml` (Expose via NodePort)

- `node-exporter-deploy.yml` & `kube-state-metrics.yml`

3. Access via port-forward:

`kubectll port-forward svc/grafana-service 3000:3000 -n monitoring`

4. Grafana login: admin/admin → Add Prometheus data source.

5. Validate dashboards and target status.

Troubleshooting Summary

- Prometheus no target:

→ Missing annotations or relabel_configs mismatch.

→ Wrong port name or missing `metrics` in containerPort.

- Grafana shows N/A:

→ Ensure targets are scraping data (via Prometheus > Targets).

→ Restart Grafana and Prometheus to reload config.

- Permission Error:

→ Grant clusterRole to serviceAccount used by Prometheus to list pods.

Workaround:

- Patch annotations to node-exporter DaemonSet using `kubectll patch`

- Validate relabel_configs for matching labels and ports