**Setting up Multi-Cluster Kubernetes on AWS EC2 using Kops**

**Overview**

This guide provides a step-by-step approach to setting up a multi-cluster Kubernetes environment on AWS EC2 instances using Kops. Kops (Kubernetes Operations) is a powerful tool for provisioning, managing, and scaling Kubernetes clusters on AWS.

**1. Prerequisites**

**✅ AWS Requirements**

* AWS CLI installed and configured
* IAM user with necessary permissions
* Route 53 hosted zone for cluster domain
* S3 bucket for Kops state storage

**✅ Local Machine Setup**

* Install Kops & kubectl
* Configure AWS CLI
* Set up SSH keys

**2️.Installing Kops & kubectl**

# Install Kops

curl -LO https://github.com/kubernetes/kops/releases/latest/download/kops-linux-amd64

chmod +x kops-linux-amd64

sudo mv kops-linux-amd64 /usr/local/bin/kops

# Install kubectl

curl -LO "https://dl.k8s.io/release/$(curl -L -s https://dl.k8s.io/release/stable.txt)/bin/linux/amd64/kubectl"

chmod +x kubectl

sudo mv kubectl /usr/local/bin/kubectl

**3️.Setting Up Kops State Storage**

export KOPS\_STATE\_STORE=s3://my-kops-state-store

aws s3api create-bucket --bucket my-kops-state-store --region us-east-1

**4️.Creating a Kubernetes Cluster**

kops create cluster --name=k8s.example.com \

--state=$KOPS\_STATE\_STORE \

--zones=us-east-1a,us-east-1b \

--node-count=3 \

--node-size=t3.medium \

--master-size=t3.medium \

--dns-zone=k8s.example.com \

--yes

**5️.Verifying Cluster Status**

kops validate cluster --state=$KOPS\_STATE\_STORE

kubectl get nodes

**6️.Managing Multiple Clusters**

To manage multiple clusters, specify different cluster names:

export KOPS\_STATE\_STORE=s3://my-kops-state-store

kops create cluster --name=dev.k8s.example.com --zones=us-west-2a --yes

kops create cluster --name=prod.k8s.example.com --zones=us-east-1a --yes

**7️.Scaling & Deleting Clusters**

**Scale Nodes:**

kops edit ig nodes --name=k8s.example.com

kops update cluster k8s.example.com --yes

**Delete Cluster:**

kops delete cluster --name=k8s.example.com --state=$KOPS\_STATE\_STORE --yes

**Conclusion**

Kops simplifies multi-cluster Kubernetes deployments on AWS, providing automated provisioning, scaling, and management. With the right setup, it becomes easier to maintain isolated environments for different applications.

🔹 **Best Practices:**

* Use different S3 buckets for each environment
* Enable cluster backups using Velero
* Use Terraform with Kops for IaC