



TECH WORLD WITH MURALI

Courses Offered:

- DevOps
- AWS
- Kubernetes
- Terraform
- Helm
- Logging and Monitoring, etc.

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KUBERNETES ZERO TO HERO

25 Days of Kubernetes

Zero to Hero

Roadmap and Syllabus



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Must-Know Kubernetes Concepts for DevOps or Cloud Engineers

As a **DevOps Engineer or Cloud Engineer**, having hands-on knowledge of Kubernetes is **absolutely essential**. It is the most widely used container orchestration platform in modern infrastructure. Without a strong understanding of these core Kubernetes concepts, cracking interviews or working on production systems can be very challenging.

Most companies rely on Kubernetes for managing containerized workloads at scale, ensuring high availability, scalability, and automation.

Day 1 - Kubernetes Overview

- What is Kubernetes
- Why Kubernetes
- Advantages of Kubernetes
- Kubernetes Architecture

Day 2 - Tools Installation

- Creation of AWS IAM User
- Installation of AWS CLI in Windows
- Installation of Git in Linux
- Installation of GitBash in Windows

- Installation of Docker in Linux
- Installation of Docker in Windows
- Installation of kubectl in Linux
- Installation of kubectl in Windows
- Installation of Helm 3 in Linux
- Installation of Helm 3 in Windows

Day 3 - Getting Started with Amazon EKS

- Introduction about AWS EKS
- Creation of AWS EKS Cluster
- Adding Worker Nodes to EKS Cluster
- How to Connect to an Amazon EKS Cluster Using CLI
- Deleting an Amazon EKS Cluster

Day 4 - Kubernetes Basics

- Kubernetes Objects and API Versions
- Lab Session - Creating a Pod Using Imperative Commands in Kubernetes
- Lab Session - Creating Pods with YAML using Declarative Syntax
- Developing Kubernetes Manifest Files using Editor
- Lab Session - Deployments
- Lab Session - Updating and Rolling Back Deployments

Day 5 - Kubernetes Namespace

- What is Kubernetes Namespace
- Lab Session - Creating and deleting Kubernetes Namespace
- Deploy the sample application in specific namespace
- What are Resource Quotas?
- Why use Resource Quotas for resource management?
- Resource Quotas vs. LimitRanges

Day 6 - Kubernetes Services

- What are Kubernetes Services
- Types of Kubernetes Services
- What is ClusterIP
- Lab Session - ClusterIP
- Lab Session - NodePort
- Lab Session - Load Balancer

Day 7 - Kubernetes Ingress Controller

- What is Kubernetes Ingress Controller
- Ingress Controller Features
- Lab Session - Installing and Configuring an Ingress Controller
- Lab Session - Deploy Sample Ingress Resource
- Lab Session - Deploy Sample Ingress Resource with SSL
- Lab Session - Deletion of Sample Ingress Resource

Day 8 - Kubernetes ExternalDNS

- What is ExternalDNS?
- Why we use ExternalDNS?
- Lab Session - Deploy External DNS in Kubernetes
- Lab Session - Clean up External DNS in Kubernetes

Day 9 - Kubernetes ConfigMaps and Secrets

- Introduction to Kubernetes ConfigMaps
- Lab Session - Kubernetes ConfigMaps
- Introduction to Kubernetes Secrets
- Lab Session - Kubernetes Secrets

Day 10 - Kubernetes DaemonSets & StatefulSets

- What are Kubernetes DaemonSets
- Purpose of DaemonSets
- Lab Session - Deploying DaemonSets
- Lab Session - Clean up DaemonSets
- What is Kubernetes StatefulSets
- Use Cases for StatefulSets
- Lab Session - Kubernetes StatefulSets

Day 11 - Kubernetes Volumes

- Overview of Volumes
- Types of Volumes
- What is Persistent Volumes and Claims
- Lab Session - Provisioning and Managing PVs and PVCs
- What is Storage Classes
- Lab Session - Storage Classes

Day 12 - Resource Monitoring using Metrics Server & HPA

- What is Metrics Server
- Metrics Server Architecture
- Resource Metrics in Kubernetes
- Lab Session - Installation and Configuration of Metrics Server
- Introduction to Horizontal Pod Autoscaling (HPA)
- Lab Session - Creating and Managing HPA Resources

Day 13 - Kubernetes Cluster AutoScaler

- What is Cluster Autoscaler
- Create IAM OIDC provider
- Create IAM policy for Cluster Autoscaler
- Create IAM role for Cluster Autoscaler
- Deploy Kubernetes Cluster Autoscaler
- Create an Nginx deployment to test the Cluster Autoscaler functionality

Day 14 - Kubernetes Probes

- What are Probes in Kubernetes
- Types of Probes (Readiness, Liveness)
- Lab Session - Configuring Readiness Probes
- Lab Session - Configuring Liveness Probes

Day 15 - RBAC in Kubernetes

- What is RBAC in Kubernetes?
- RBAC components: Roles, RoleBindings, ClusterRoles, and ClusterRoleBindings
- What is Role and RoleBinding in Kubernetes
- Lab Session - Creating and testing Roles and RoleBindings
- What are ClusterRoles and ClusterRoleBindings
- Lab Session - Creating and testing ClusterRoles and ClusterRoleBindings

Day 16 - Logging in Kubernetes

- Explanation of EFK: Elasticsearch, Fluentd, Kibana
- What is Elasticsearch?
- What is Kibana?
- Lab Session - Setting up Elasticsearch and Kibana in AWS
- What is Fluentd?
- Lab Session - Deploying Fluentd as a Daemonset for Log Collection and sending logs to Elasticsearch

Day 17 - Monitoring in Kubernetes

- What is Monitoring in Kubernetes
- What is Prometheus
- What is Grafana?
- Installation of Prometheus and Grafana using Helm Chart

Day 18 - Kubernetes Taints and Tolerations

- What are Taints and Tolerations
- Lab Session - Applying Taints to Nodes
- Creating Toleration Specifications
- Lab Session - Implementing Taints and Tolerations
- Node Affinity and Node Anti-Affinity in Kubernetes
- Lab Session - Implementing Node Affinity and Node Anti-Affinity

Day 19 - Kubernetes Project 1

- Deploying an Application to EKS with an Image from DockerHub

Day 20 - Kubernetes Project 2

- Deploying an Application to EKS with an Image from AWS ECR

Day 21 - Kubernetes Project 3

- Deploying Argo CD on Kubernetes

Day 22 - EKS Upgrade Process

- Preparing for EKS Upgrade
- Lab Session - Upgrading AWS EKS

Day 23 - Exploring Various Methods for Creating AWS EKS Clusters

- Setting Up AWS EKS with eksctl

Day 24 - Kubernetes Troubleshooting Part 1

- Container image pull fails with 'image not found' or 'access denied' errors: How to troubleshoot and resolve this issue
- Liveness and readiness probe failed
- Connection refused
- Service not accessible externally: How to troubleshoot?

Day 25 - Kubernetes Troubleshooting Part 2

- Disk pressure / Node out of disk
- Node is Not Ready: How to investigate?
- Ingress resource not being created
- Kubelet NotReady

For More Details:

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About the Author:



MOOLE MURALIDHARA REDDY
Solution Architect / DevOps Consultant

- I am having rich experience in DevOps and Cloud technologies and have done many projects on all varieties of tools which are hot cake in the market.
- I am passionate about learning new technology and teaching.
- My courses focus on providing students with an interactive and hands-on experience in learning new technology that makes learning really interesting.
- I have a wide range of experience in Telecom, Banking, Healthcare, Retail domains.
- I have been training people in newer technologies, like DevOps, AWS, Kubernetes, Terraform, Rancher, etc. and they have settled in MNC's and drawing respectable salaries.
- I have undergone many challenges and changed the entire phase of the projects and mastered in DevOps implementation and many more to go.
- Certified in AWS, Kubernetes , Terraform, Linux and many to go.

Please check out my courses and join me with thousands of others who are learning the latest DevOps and Cloud tools!

Youtube : <https://www.youtube.com/@TechWorldwithMural>

Website : <https://techworldwithmurali.com/>