

12-Day Kubernetes Training Course

Day 1: Introduction to Kubernetes

- **Morning Session:**
 - Overview of Containerization and Kubernetes
 - Key Concepts: Pods, Nodes, Clusters, Services, Namespaces
 - Kubernetes Architecture
- **Afternoon Session:**
 - Setting up a Kubernetes Environment
 - Installing Minikube
 - Setting up kubectl
 - Hands-on: Deploying a simple application

Day 2: Kubernetes Core Components

- **Morning Session:**
 - Deep Dive into Pods and Nodes
 - Understanding ReplicaSets and Deployments
- **Afternoon Session:**
 - Hands-on: Creating and managing Pods
 - Working with ReplicaSets and Deployments

Day 3: Networking in Kubernetes

- **Morning Session:**
 - Kubernetes Networking Basics
 - Services: ClusterIP, NodePort, LoadBalancer
- **Afternoon Session:**
 - Hands-on: Creating and configuring Services
 - Introduction to Ingress Controllers

Day 4: Storage in Kubernetes

- **Morning Session:**
 - Storage Concepts: Volumes, Persistent Volumes, Persistent Volume Claims
 - Storage Classes and Dynamic Provisioning
- **Afternoon Session:**
 - Hands-on: Configuring Persistent Storage
 - Working with different storage types (e.g., local, cloud-based)

Day 5: ConfigMaps and Secrets

- **Morning Session:**
 - Understanding ConfigMaps

- Working with Secrets

- ****Afternoon Session:****

- Hands-on: Creating and managing ConfigMaps and Secrets
- Best practices for handling sensitive data

****Day 6: Application Lifecycle Management****

- ****Morning Session:****

- Rolling Updates and Rollbacks
- Horizontal Pod Autoscaling

- ****Afternoon Session:****

- Hands-on: Implementing rolling updates and rollbacks
- Setting up and testing Horizontal Pod Autoscaling

****Day 7: Security in Kubernetes****

- ****Morning Session:****

- Kubernetes Security Overview
- Role-Based Access Control (RBAC)

- ****Afternoon Session:****

- Hands-on: Configuring RBAC
- Implementing Network Policies

****Day 8: Monitoring and Logging****

- ****Morning Session:****

- Monitoring Kubernetes Clusters
- Tools: Prometheus, Grafana

- ****Afternoon Session:****

- Hands-on: Setting up monitoring with Prometheus and Grafana
- Introduction to logging with ELK stack

****Day 9: Helm and Package Management****

- ****Morning Session:****

- Introduction to Helm
- Helm Charts and Repositories

- ****Afternoon Session:****

- Hands-on: Installing and managing applications with Helm
- Creating custom Helm charts

****Day 10: Advanced Kubernetes Topics****

- ****Morning Session:****

- Custom Resource Definitions (CRDs)
- Operators

- ****Afternoon Session:****

- Hands-on: Creating and managing CRDs
- Working with Kubernetes Operators

**Day 11: Troubleshooting and Best Practices**

- ****Morning Session:****

- Common Kubernetes Issues and Troubleshooting Techniques
- Best Practices for Kubernetes Deployment and Management

- ****Afternoon Session:****

- Hands-on: Troubleshooting common issues
- Implementing best practices in a sample application

**Day 12: Capstone Project**

- ****Full Day:****

- Design and deploy a comprehensive application on Kubernetes
- Implement all learned concepts: deployment, networking, storage, security, monitoring, and Helm
- Present the project and receive feedback

Additional Notes:

- Each day should start with a quick review of the previous day's concepts.
- Allocate time for Q&A sessions to address participants' queries.
- Encourage participants to work on mini-projects or exercises beyond the hands-on sessions to reinforce learning.