

Learn Kubernetes Roadmap



GIVE ME A COMPLETE ROAD MAP FOR TO LEARN KUBERNETES FORM BASICS TO MASTER.COVERING ALL BASIC AND IMPORTANT TOPICS ONE BY ONE IN ORDER



Sure, here's a comprehensive roadmap to learning Kubernetes from basics to mastery, covering all the essential topics in order:

1. Introduction to Kubernetes

- **Overview and History**
 - What is Kubernetes?
 - History and evolution of Kubernetes
- **Core Concepts**
 - Containers vs. Virtual Machines
 - Container Orchestration

2. Setting Up Kubernetes

- **Minikube Installation**
 - Installing Minikube on local machine
- **kubectl Basics**
 - Installing and configuring kubectl
 - Basic kubectl commands

3. Kubernetes Architecture

- **Cluster Components**
 - Master and Node components
 - API Server, Scheduler, Controller Manager, etcd
 - Kubelet, Kube-proxy, Container Runtime
- **Pods**
 - What is a Pod?
 - Multi-container Pods

4. Kubernetes Objects

- **Workloads**
 - Deployments
 - ReplicaSets
 - DaemonSets
 - StatefulSets
 - Jobs and CronJobs

- **Services**
 - ClusterIP
 - NodePort
 - LoadBalancer
 - ExternalName
- **Config and Storage**
 - ConfigMaps
 - Secrets
 - Persistent Volumes and Persistent Volume Claims
 - Storage Classes
- **Ingress**
 - Ingress Controllers
 - Ingress Resources

5. Networking in Kubernetes

- **Networking Basics**
 - Kubernetes networking model
 - Service discovery and CoreDNS
- **Network Policies**
 - Defining and applying Network Policies

6. Security in Kubernetes

- **Authentication and Authorization**
 - Role-Based Access Control (RBAC)
 - Service Accounts
- **Security Best Practices**
 - Pod Security Policies
 - Network Policies
 - Image Security (Scanning and Signing)

7. Advanced Kubernetes Concepts

- **Helm**
 - Helm Charts
 - Installing and managing applications with Helm
- **Operators**
 - Custom Resource Definitions (CRDs)
 - Building and deploying Operators
- **Service Mesh**
 - Introduction to Istio/Linkerd
 - Traffic management, observability, and security with Service Mesh

8. Monitoring and Logging

- **Monitoring**
 - Prometheus setup and integration
 - Grafana dashboards for Kubernetes
- **Logging**
 - EFK (Elasticsearch, Fluentd, Kibana) stack

- Log aggregation and visualization

9. Scaling and Performance Tuning

- **Horizontal Pod Autoscaling (HPA)**
 - Setting up and configuring HPA
- **Vertical Pod Autoscaling (VPA)**
 - Understanding VPA
- **Cluster Autoscaling**
 - Setting up and configuring Cluster Autoscaler
- **Resource Requests and Limits**
 - Managing resource allocations

10. CI/CD Integration

- **CI/CD Pipelines**
 - Integrating Jenkins with Kubernetes
 - Using GitOps with ArgoCD or Flux
- **Continuous Deployment**
 - Blue/Green Deployments
 - Canary Releases

11. Multi-Cluster Management

- **Federation**
 - Kubernetes Cluster Federation
- **Multi-Cluster Management Tools**
 - Rancher, KubeSphere

12. Kubernetes on Cloud

- **Managed Kubernetes Services**
 - Google Kubernetes Engine (GKE)
 - Amazon Elastic Kubernetes Service (EKS)
 - Azure Kubernetes Service (AKS)
- **Deploying Applications on Cloud-based Kubernetes**

13. Kubernetes Troubleshooting and Best Practices

- **Debugging and Troubleshooting**
 - Common issues and solutions
 - Using kubectl for debugging
- **Best Practices**
 - Cluster setup and management
 - Application deployment and management
 - Security and compliance

14. Contributing to Kubernetes

- **Understanding Kubernetes Development**
 - Kubernetes project structure
 - How to contribute to Kubernetes

- **Community Involvement**
 - Participating in SIGs (Special Interest Groups)
 - Attending Kubernetes community meetings

Learning Resources:

- **Books**
 - "Kubernetes: Up and Running" by Kelsey Hightower, Brendan Burns, and Joe Beda
 - "The Kubernetes Book" by Nigel Poulton
- **Online Courses**
 - Kubernetes Academy by VMware
 - Udemy Kubernetes Courses
 - Coursera Specializations
- **Documentation and Tutorials**
 - Kubernetes Official Documentation
 - Tutorials from the CNCF (Cloud Native Computing Foundation)

This roadmap provides a structured path to mastering Kubernetes, starting from the basics and progressively covering more advanced topics.

ChatGPT can make mistakes. Check important info.