

# Kubernetes

## Related Roadmaps

- ✓ DevOps Roadmap
- ✓ System Design Roadmap

Find the detailed version of this roadmap along with resources and other roadmaps

<https://roadmap.sh>

## Introduction

Overview of Kubernetes

Key Concepts and Terminologies

Kubernetes vs other Orchestration Tools

## Cluster Setup and Configuration

Setting up a Cluster

Configuring and Managing Nodes

Networking in a Cluster

Cluster Federation

Multi-cluster Management

## Pods and Replication

Pods and their Role in Kubernetes

Creating and Managing Pods

Replication and Scaling

Deployment Strategies & Rolling Updates

## Services and Networking

Networking & Pods Communication

Understanding and using services

Network load balancing with services

External access to services

## ConfigMaps and Secrets

Config Management & ConfigMaps

Using Secrets for Sensitive Data

Usage in Pods and Controllers

## Storage and Volumes

Storage Options in Kubernetes

Persistent Storage in Kubernetes

Volumes in Pods and Containers

## Monitoring and Logging

Cluster and Pod Health Monitoring

Log Collection and Analysis

Monitoring Tools Setup / Usage e.g. Prometheus, Fluentd, ElasticSearch

## Security

Securing a Kubernetes cluster

Role-based access control (RBAC)

Cluster and Network Security

Container and Pod Security

## Resource Management and Quotas

Resource Consumption and Limits

Assigning Quotas to Namespaces

Resource Usage and Perf. Monitoring

## Scheduling & Management

Scheduling Pods on Nodes

Configuring Taints and Tolerations

Automated scheduling and self-healing

Managing and upgrading the cluster

## Stateful Applications

Stateful vs Stateless Apps

StatefulSet Patterns and Usecases

Persistent Storage and Network identity

## Deployment Patterns

Blue-Green Deployment

Canary Deployment

A/B Testing

Rolling Update and Rollback

## Advanced Topics

Creating Custom Controllers

Custom schedulers and extenders

Custom resource definitions (CRDs)

Kubernetes extensions and APIs

Integration with CI/CD pipelines

## Kubernetes Best Practices

Architecture and Design

Performance and Scalability

Security best practices

Cluster Management

Troubleshooting and debugging

## Kubernetes in Production

Deploying and managing Production Workloads

Cluster and Application Scaling

Monitoring and Managing Cluster Performance

Upgrading the cluster and Applications.

Continue Learning with following relevant tracks

DevOps Roadmap

Backend Roadmap