ADMIN-238

Administering Kubernetes

Course Overview

Course Type
Instructor-Led Training

Level
Advanced

Duration
5 days

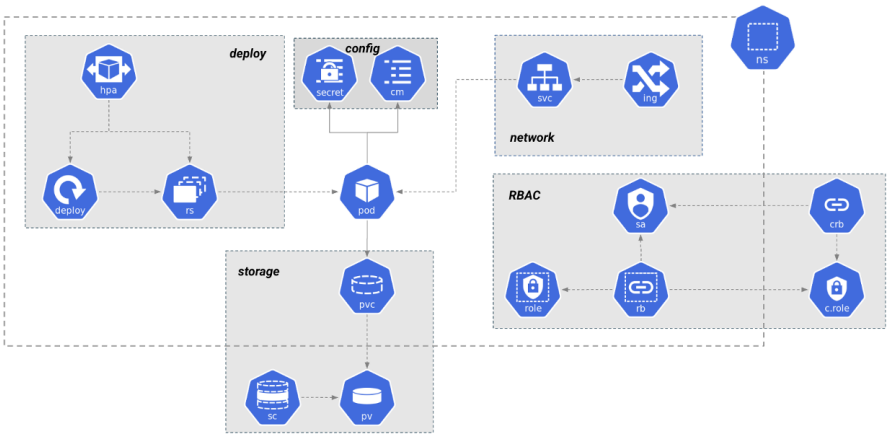
Platform
Kind on MacOS, Windows 11, or Cloud

Topics Covered

- Deploying Microservices
- Scheduling Resources
- Creating Variables and Secrets
- User Management
- Establishing Networking
- Connecting to Storage
- Design and Build
- Operations and Maintenance
- Troubleshooting

About This Training

This five-day course provides the in-depth explanation and skills to become highly productive with Kubernetes by teaching its architecture, deployment, configuration, logging, reporting, and more. Kubernetes's complexity is due to its extensive feature set and intricate object model, which includes concepts like Pods, Deployments, and Services. It also relies on YAML configuration files and requires managing a distributed system across multiple nodes.The course provides references for architecture and recommended practices used by administrators.



What Skills You Will Gain

- Understand the architecture of Kubernetes and its components.
- Deploy and manage applications on Kubernetes.
- Utilize Kubernetes features for scaling and self-healing.
- Implement best practices for security and networking.
- Troubleshoot common issues in Kubernetes environments.

Who Should Take This Course?

This course is an immersive training for a full range of Kubernetes users, from administrators to DevOps to developers. This course is intended for senior technicians with strong skills in Linux and application lifecycle. Students must have proficiency in Linux CLI. Students must have access to high-speed Internet to download various public Git repositories. The classroom environment is a four-node cluster running on Linux.

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Get Aboard

- Introduction to Visual Studio Code
- Introduction to Git repos
- Documentation and Resources

Access and Interact

- Building Kubernetes Clusters
- Implementing Container Network Interface
- Install kubectl and K9s

Architecture

- Kubernetes Design Principles
- Kubernetes Clusters
- Kubernetes Control Plane
- Kubernetes Networking

Microservices

- The purpose of microservices
- Running Docker containers
- Building a microservice

Running Kubernetes

- Manifest Files
- Namespaces
- Pods
- Labels and Selectors
- Pod Logging
- Deployments
- Services
- Multi-Container Pods
- Init Containers

Scheduling Pods

- Scheduling Process
- Manual Scheduling
- Node Labels and Node Selectors
- Node Affinity
- Pod Affinity and Pod Antiaffinity
- Taints and tolerations

Scheduling Resources

- CPU and Memory Units
- Monitoring Tools
- Resource Requests
- Resource Limits
- Managing Resources
- Quality of Service
- Resource Quotas for Namespaces

Command, Args, and Env

- Docker CMD and ENTRYPOINT
- Kubernetes CMD and ARGS
- Environment Variables

Config Map and Secret

- ConfigMaps
- Create ConfigMaps
- Inject ConfigMaps
- Secrets
- Create Secrets
- Inject Secrets
- Private Registry

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User Authentication

- User Authentication
- Controller Manager User Certificates
- Manage CertificateSigningRequests
- Manage User Certificates
- Submitting with curl
- Static Files for Passwords or Tokens

User Access Control

- Architecture for Authorization
- Authorization Modes
- CLI Process
- Manifest Files

Cluster Role Access Control

- Cluster Roles
- Cluster Role Binding
- Manifest Files

Service Accounts

- Service Accounts
- Create a Service Account
- Inspect a Service Account
- Default Service Account
- Disable Service Account Token

Kubeconfig

- Kubeconfig and Multicluster Access
- Running Multi-Node Clusters
- User Config Files
- Manage Contexts

Networking

- Kubernetes Networks
- OSI Architecture
- Network Architecture
- External Load Balancer
- Host Network
- Service Network
- Pods Network

Cluster DNS

- Domain Name Service
- CoreDNS
- Switch Namespace Context
- Kube-Proxy and iptables

Services

- Services
- Connect to an Endpoint
- Types of Services
- Service ClusterIP
- Service NodePort
- Service LoadBalancer
- Service Commands

Ingress

- Ingress Controllers
- Ingress Resources
- Ingress Routing Rules
- Configure Ingress

Network-Policies

- Network Policies
- Rules for Network Policies
- Templates for Network Policies
- Create Network Policies

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Docker Storage

- Docker Storage Architecture
- Storage Drivers
- Volume Drivers

Storage

- Volumes
- Volume Types
- Persistent Volumes
- Persistent Volume Claims
- Storage Classes
- Creating CSI Volumes

Operations

- Rolling Out Versions
- Health Probes
- Performance Testing with K6
- Horizontal Auto Scalers
- Vertical Auto Scalers

Maintaining

- Static Pods
- Daemonsets
- etcd
- Backups
- Upgrade Control Plane
- Upgrade Workers
- Inspect Clusters
- Fault Isolation Process

Summary

- Next steps
- Cloudera Support