

Kubernetes Administration

Course LFS458

4 Days

Instructor-led, Hands on

Course Information

This course covers the core concepts typically used to build and administer a Kubernetes cluster in production, using vendor-independent tools. We build a cluster, determine network configuration, grow the cluster, deploy applications and configure the storage, security and other objects necessary for typical use. This course offers exposure to the many skills necessary to administer Kubernetes in a production environment and is excellent preparation for the Certified Kubernetes Administrator (CKA) exam.

At Course Completion

Upon successful completion of this course, students will understand and acquire the following skills:

- Basics of Kubernetes
- Installation and Configuration
- Kubernetes Architecture
- APIs and Access
- API Objects
- Managing State with Deployments
- Volumes and Data
- Services
- Helm
- Ingress
- Scheduling
- Logging and Troubleshooting
- Custom Resource Definition
- Security
- High Availability
- Domain Review

Prerequisites

Students should understand Linux administration skills, comfortable using the command line. Must be able to edit files using a command-line text editor. It is recommended to take Linux Fundamentals prior to attending this course.

Course Outline

Module 1: Introduction

- Linux Foundation
- Linux Foundation Training
- Linux Foundation Certifications
- Linux Foundation Digital Badges
- Laboratory Exercises, Solutions and Resources
- Things Change in Linux and Open Source Projects
- E-Learning Course: LFS258
- Platform Details

Module 2: Basics of Kubernetes

- Define Kubernetes
- Cluster Structure
- Adoption
- Project Governance and CNCF
- Labs

Module 3: Installation and Configuration

- Getting Started With Kubernetes
- Minikube
- kubectl
- More Installation Tools
- Labs

Module 4: Kubernetes Architecture

- Kubernetes Architecture
- Networking
- Other Cluster Systems
- Labs

Module 5: APIs and Access

- API Access
- Annotations
- Working with A Simple Pod
- kubectl and API
- Swagger and OpenAPI

- Labs

Module 6: API Objects

- API Objects
- The v1 Group
- API Resources
- RBAC APIs
- Labs

Module 7: Managing State With Deployments

- Deployment Overview
- Managing Deployment States
- Deployments and Replica Sets
- DaemonSets
- Labels
- Labs

Module 8: Volumes and Data

- Volumes Overview
- Volumes
- Persistent Volumes
- Rook
- Passing Data To Pods
- ConfigMaps
- Labs

Module 9: Services

- Overview
- Accessing Services
- DNS
- Labs

Module 10: Helm

- Overview
- Helm
- Using Helm
- Labs

Module 11: Ingress

- Overview
- Ingress Controller
- Ingress Rules
- Service Mesh
- Labs

Module 12: Scheduling

- Overview
- Scheduler Settings
- Policies
- Affinity Rules
- Taints and Tolerations
- Labs

Module 13: Logging and Troubleshooting

- Overview
- Troubleshooting Flow
- Basic Start Sequence
- Monitoring
- Plugins
- Logging
- Troubleshooting Resources
- Labs

Module 14: Custom Resource Definition

- Overview
- Custom Resource Definitions
- Aggregated APIs
- Labs

Module 15: Security

- Overview
- Accessing the API
- Authentication and Authorization
- Admission Controller
- Pod Policies
- Network Policies

- Labs

Module 16: High Availability

- Overview
- Stacked Database
- External Database
- Labs

Module 17: Closing and Evaluation Survey

- Evaluation Survey

Module 18: Domain Review

- CKA Exam
- Exam Domain Review

Module 19: Cilium Network Plugin

- Using Cilium