

Kubernetes for App Developers

Course LFD459

3 Days

Instructor-led, Hands on

Course Information

This course will teach you how to containerize, host, deploy, and configure an application in a multi-node cluster. It also serves as preparation for the Certified Kubernetes Application Developer (CKAD) exam.

At Course Completion

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

- Kubernetes Architecture
- Build
- Design
- Deployment Configuration
- Security
- Exposing Applications
- Troubleshooting

Prerequisites

To get the most out of this course, you should have:

Basic Linux command line and file editing skills and be familiar with using a programming language (such as Python, Node.js, Go). Knowledge of Cloud Native application concepts and architectures is helpful for this course.

Please note, Kubernetes Administration (LFS458) is not a pre-requisite for this course. There is overlap in the course materials as each one is designed to stand alone and aligns with the related exams.

Course Outline

Module 1: Introduction

- Objectives
- Who You Are
- The Linux Foundation
- Linux Foundation Training
- Certification Programs and Digital Badging

Contact ISInc for more information at 916.920.1700 or by visiting our website at <http://www.isinc.com>



- Preparing Your System
- Course Registration
- Labs

Module 2: Kubernetes Architecture

- What Is Kubernetes?
- Components of Kubernetes
- Challenges
- The Borg Heritage
- Kubernetes Architecture
- Terminology
- Master Node
- Minion (Worker) Nodes
- Pods
- Services
- Controllers / Operators
- Single IP per Pod
- Networking Setup
- CNI Network Configuration File
- Pod-to-Pod Communication
- Cloud Native Computing Foundation
- Resource Recommendations
- Labs

Module 3: Build

- Container Options
- Containerizing an Application
- Creating the Dockerfile
- Hosting a Local Repository
- Creating a Deployment
- Running Commands in a Container
- Multi-Container Pod
- readinessProbe
- livenessProbe
- Testing
- Labs

Module 4: Design

- Traditional Applications: Considerations
- Decoupled Resources

Contact ISInc for more information at 916.920.1700 or by visiting our website at <http://www.isinc.com>

- Transience
- Flexible Framework
- Managing Resource Usage
- Using Label Selectors
- Multi-Container Pods
- Sidecar Container
- Adapter Container
- Ambassador
- Points to Ponder
- Jobs
- Labs

Module 5: Deployment Configuration

- Volumes Overview
- Introducing Volumes
- Volume Spec
- Volume Types
- Shared Volume Example
- Persistent Volumes and Claims
- Persistent Volume
- Persistent Volume Claim
- Dynamic Provisioning
- Secrets
- Using Secrets via Environment Variables
- Mounting Secrets as Volumes
- Portable Data with ConfigMaps
- Using ConfigMaps
- Deployment Configuration Status
- Scaling and Rolling Updates
- Deployment Rollbacks
- Labs

Module 6: Security

- Security Overview
- Accessing the API
- Authentication
- Authorization
- ABAC
- RBAC
- RBAC Process Overview
- Admission Controller

Contact ISInc for more information at 916.920.1700 or by visiting our website at <http://www.isinc.com>

- Security Contexts
- Pod Security Policies
- Network Security Policies
- Network Security Policy Example
- Default Policy Example
- Labs

Module 7: Exposing Applications

- Service Types
- Services Diagram
- Service Update Pattern
- Accessing an Application with a Service
- Service without a Selector
- ClusterIP
- NodePort
- LoadBalancer
- ExternalName
- Ingress Resource
- Ingress Controller
- Service Mesh
- Labs

Module 8: Troubleshooting

- Troubleshooting Overview
- Basic Troubleshooting Steps
- Ongoing (Constant) Change
- Basic Troubleshooting Flow: Pods
- Basic Troubleshooting Flow: Node and Security
- Basic Troubleshooting Flow: Agents
- Monitoring
- Logging Tools
- Monitoring Applications
- System and Agent Logs
- Conformance Testing
- More Resource
- Labs

Module 9: Closing and Evaluation Survey

- Evaluation Survey