Kubernetes Administration (4 Days)

In this course you'll learn how to install and configure a production-grade Kubernetes cluster, from network configuration to upgrades to making deployments available via services. Also handle the ongoing tasks necessary for Kubernetes administration.

This course does not focus on one vendor's tools. Most courses are vendor-locked. We use kubeadm to deploy the cluster and focus on tools that would work on anyone's Kubernetes cluster.
Topics Include:

- Installation of a multi-node Kubernetes cluster using kubeadm, and how to grow a cluster.
- Choosing and implementing cluster networking.
- Various methods of application lifecycle management, including scaling, updates and roll-backs.
- Configuring security both for the cluster as well as containers.
- Managing storage available to containers.
- Learn monitoring, logging and troubleshooting of containers and the cluster.
- Configure scheduling and affinity of container deployments.
- Use Helm and Charts to automate application deployment.
- Understand Federation for fault-tolerance and higher availability.

Prerequisites

Students should have an understanding of Linux administration skills, comfortable using the command line. Must be able to edit files using a command-line text editor. A knowledge of Cloud Native application concepts and architectures (such as is taught in our free **Introduction to Kubernetes** edX MOOC) is helpful for this course.

Course Outline

Introduction
- Linux Foundation
- Linux Foundation Training
- Linux Foundation Certifications
- Laboratory Exercises, Solutions and Resources
- Distribution Details

Basics of Kubernetes
- Define Kubernetes
- Cluster Structure
- Adoption
- Project Governance and CNCF

Installation and Configuration
- Getting Started With Kubernetes
- Minikube
- kubeadm
- More Installation Tools

Kubernetes Architecture
- Kubernetes Architecture
- Networking
- Other Cluster Systems

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

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

Managing State With Deployments
- Deployment Overview
- Managing Deployment States
- Deployments and Replica Sets
- DaemonSets
- Labels
- Policies

Services
- Accessing Services
- DNS

Volumes and Data
- Volumes Overview
- Volumes
- Persistent Volumes
- Passing Data To Pods
- ConfigMaps

Ingress
- Ingress Controller
- Ingress Rules

Scheduling
- Scheduler Settings
- Policies
- Affinity Rules
- Taints and Tolerations

Logging and Troubleshooting
- Troubleshooting Flow
- Basic Start Sequence
- Monitoring
- Logging
- Troubleshooting Resources

Custom Resource Definition
- Custom Resource Definitions
- Aggregated APIs

Kubernetes Federation
- Federated Resources

Helm
- Helm
- Using Helm

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