

OpenShift Administration

Course Summary

Description

This hands-on course with lab exercises will help students to install and manage an OpenShift cluster. Throughout the course students will understand the benefits and purposes of the platform. This includes how to install the cluster, explore networking concepts, understand commands, manage OpenShift resources, configure storage, manage application deployments, and administer the cluster through logging and monitoring.

Topics

- Installation And Core Concepts
- Application Lifecycle Management
- Networking
- Storage
- Scheduling
- Security
- Jobs And Cronjobs
- Linux Containers

Audience

This course is designed for system administrators or developers.

Prerequisites

Students will need a working knowledge of Linux systems administration skills or the equivalent knowledge of skills found in the Linux Fundamentals and Enterprise Linux Systems Administration courses. Also students will benefit from an understanding of containerization as found in the Docker course.

Duration

Three days

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Course Outline

I. INSTALLATION AND CORE CONCEPTS

- A. OCP 4.x Installation
- B. DEMO: Installing OpenShift on AWS
- C. Kubernetes Architecture
- D. Cluster Communication
- E. Objects
- F. Object Properties
- G. Labels & Selectors
- H. Annotations
- I. Object Management
- J. Image Fundamentals
- K. Container Fundamentals
- L. Pod Fundamentals
- M. Working with Pods
- N. Openshift Overview
- O. DEMO: Configuring an Identity Provider
- P. DEMO: Openshift Web Console
- Q. LAB TASKS
- R. Container and Pod Fundamentals
- S. Pod Fundamentals
- T. Openshift CLI Basics
- U. Openshift GUI Basics

II. APPLICATION LIFECYCLE MANAGEMENT

- A. Pod Lifecycle
- B. Container Lifecycle
- C. Init Containers
- D. Container: command and args
- E. Container: Defining Environment
- F. ReplicaSet
- G. Deployments
- H. Working with Deployments
- I. Deployment Rollouts
- J. DEMO: Sock Shop Microservice on OpenShift
- K. LAB TASKS
- L. Pod Lifecycle
- M. Init Containers
- N. Deployments
- O. Scaling Workloads

III. NETWORKING

- A. Network Overview
- B. Openshift Networking
- C. Service Discovery & CoreDNS
- D. Container Network Interface (CNI)
- E. Services
- F. Ingress Objects
- G. DEMO: Installing a Valid SSL Certificate
- H. LAB TASKS
- I. Port-Forwarding

- J. Services
- K. Openshift Routes

IV. STORAGE

- A. Storage
- B. Volume Types
- C. Static Volumes (DEMO)
- D. ConfigMaps
- E. Secrets
- F. Openshift Container Storage
- G. LAB TASKS
- H. (DEMO) Static Volumes
- I. (DEMO) —GUI— Deploy GitLab with Persistent Storage
- J. (DEMO) —CLI— Deploy GitLab with Persistent Storage
- K. (DEMO) ConfigMaps & Secrets
- L. Static Volume Provisioning
- M. ConfigMaps and Secrets

V. SCHEDULING

- A. Controlling and Tracking Resources
- B. Scheduler Operation
- C. DaemonSet
- D. Node Affinity & Anti-affinity
- E. Pod Affinity & Anti-affinity
- F. Taints & Tolerations
- G. LAB TASKS
- H. (DEMO) Affinity and Taints
- I. Pod Resources and Scheduling
- J. Static Scheduling and Daemonsets
- K. Pod and Node Affinities

VI. SECURITY

- A. Controlling Access to the Kubernetes API
- B. Kubectl Configuration
- C. Role-Based Access Control
- D. Service Accounts
- E. Admission Controllers
- F. PodSecurityPolicy Admission Controller
- G. Default Admission Controllers
- H. LOGGING
- I. Logging Basics
- J. Aggregated Cluster Logging
- K. LAB TASKS
- L. DEMO - Cluster Logging

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Course Summary (cont'd)

VII. JOBS AND CRONJOBS

- A. Jobs
- B. CronJobs
- C. LAB TASKS
- D. Jobs
- E. CronJobs

VIII. LINUX CONTAINERS

- A. Application Management Landscape
- B. Application Isolation
- C. Resource Measurement and Control
- D. Container Security
- E. OverlayFS Overview
- F. Container Security
- G. Open Container Initiative
- H. LAB TASKS
- I. Container Concepts runC