Docker and Kubernetes Core Concepts

Duration: *4 Day(s)*

Course Overview

Containers have revolutionized the process of developing and deploying applications. They offer many benefits including consistency between environments, predictable deployments, application scaling, management of microservices, and more. While this all sounds great in theory, how do you integrate containers into your existing business processes and reap the benefits they offer? How do you manage containers in production, scale and monitor them, and fix issues that come up?

The **Docker and Kubernetes course** provides a hands-on look at containers and the role they can play in your development and deployment environments and workflows. You'll learn about the many benefits containers provide, how you can use containers in your environment to work with web servers, databases (and more), key Docker tools and commands that you need to learn to use Docker effectively, how to work with images and containers, as well as how to get a fully functional container environment up and running.

After learning the ins-and-outs of containers, the course provides information on how Kubernetes can be used to orchestrate containers. This includes providing a look at the different components that Kubernetes provides (pods, deployments/replicasets, services and more), how to deploy containers, troubleshoot pods, and working with Kubernetes in the cloud.

If you've heard about Docker and Kubernetes and been wondering how to get started using them then this course is for you!

This course is taught by Dan Wahlin – a member of the Docker Captains group.

Review this course online at https://www.alta3.com/courses/DEV425

Objectives

- Understand the role of containers in modern development environments
- Learn key Docker tools and commands for effective container management
- Implement container orchestration with Kubernetes for scalable deployments
- Troubleshoot and manage containerized applications in the cloud

Who Should Attend

- DevOps professionals
- IT administrators
- Software developers
- Cloud engineers

Prerequisites

- Comfortable using command-line tools and virtual machines
- General familiarity with software development
- General familiarity with software deployment

Course Outline

Getting Started with Docker

1. Application Deployment
2. Shipping with Containers

3. Getting Started with Docker
4. Benefits to Developers and DevOps
5. Overview of Images and Containers
6. Layered File System
7. Containers vs Virtual Machines
8. Docker and Microservices

Docker Images and Containers

9. Container Registries
10. Working with Images
11. Working with Containers
12. Getting Started with a Custom Dockerfile
13. Building an Image
14. Updating an Image
15. Pushing an Image to a Registry

Containers and Volumes

16. Components Overview
17. Source Code and Containers
18. Introduction to Volumes
19. Creating a Volume
20. Inspecting Volumes
21. Defining a volume in a Dockerfile
22. Local Source Code and Containers

Orchestrating Containers with Docker Compose

23. Container Orchestration
24. Getting Started with Docker Compose
25. The docker-compose.yml File
26. Docker Compose Commands

Introduction to Kubernetes

27. Why Kubernetes?
28. The Big Picture
29. The Master Node
30. Worker Nodes and Pods
31. Services, ReplicaSets, and Deployments
32. Files and kubectl Commands
33. The Web UI Dashboard

Working with Pods

34. The Role of Pods
35. Getting a Pod Up and Running Quickly
36. Defining a Pod with YAML
37. Labels
38. Multi-Container Pods
39. Pod Health
40. Troubleshooting Pods and Containers

ReplicaSets and Deployments

41. The Role of ReplicaSets
42. Defining ReplicaSets
43. Working with ReplicaSets
44. The Role of Deployments
45. Defining Deployments
46. Working with Deployments

Working with Services

47. The Role of Services
48. Service Types
49. Creating a Service
50. Service Discovery Process
51. Port Forwarding

Updates and Rollbacks

52. Updating Pods
53. Zero-Downtime Deployments
54. Blue-Green Deployments
55. Rolling Updates
56. Rolling Back Deployments

Storage, ConfigMaps, and Secrets

57. Volumes and Mounts
58. PersistentVolumes and PersistentVolumeClaims
59. StorageClasses
60. ConfigMaps
61. Secrets

Kubernetes in the Cloud with AKS

62. Introduction to Azure Kubernetes Service (AKS)
63. Azure CLI
64. Creating an AKS Cluster
65. Additional Tools
66. Helm
67. Draft
68. Azure Dev Spaces