

[VMKF]: Kubernetes Foundations

Length : 2 Days
Delivery Method : Instructor-led (Classroom)

Course Overview

This two-day course is the first step in learning about Containers and Kubernetes. Through a series of lectures and lab exercises, the fundamental concepts of Kubernetes will be presented and put to practice by containerizing and deploying a two-tier application into Kubernetes.

Audience Profile

- Anyone involved with using or building a Kubernetes cluster

At Course Completion

- Build, test, and publish Docker container images
- Become familiar with authoring YAML files and its syntax
- Understand Kubernetes core user-facing concepts, including Pods, Services, and Deployments
- Use kubectl the Kubernetes CLI, and become familiar with its commands and options
- Understand the architecture of Kubernetes (Control plane and its components, worker nodes, and kubelet)
- Learn to debug issues with application deployments on Kubernetes
- Apply resource requests, limits, and probes to deployments
- Manage dynamic application configuration using ConfigMaps and Secrets
- Deploy other workloads, including StatefulSets, DaemonSets, Jobs, CronJobs
- Learn about user-facing security best practices using ServiceAccounts, RBAC, and NetworkPolicies

Pre-Requisites

This course requires completion of the following courses:

- Linux concepts and command line proficiency
- General networking proficiency

Course Outline

Module 1: Introduction to Containers

Lessons

- What and Why Containers
- Building images
- Running containers
- Debugging containers
- Registry and image management

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Module 2: Kubernetes Fundamentals**Lessons**

- Why Kubernetes?
- YAML
- Pods
- Services
- Deployments

Module 3: Kubernetes Architecture & Troubleshooting**Lessons**

- Cluster architecture
- Cluster components
- Namespaces
- Debugging 101

Module 4: Deployment Management**Lessons**

- Application deployment strategies
- Controlling active deployments

Module 5: Pod and Container Configurations**Lessons**

- Resource requests, limits, and quotas
- Probes

Module 6: Kubernetes Networking**Lessons**

- Pod networking
- Services deep dive
- Ingress controllers

Module 7: Kubectl and Resource Organization**Lessons**

- kubeconfig
- Namespaces deep dive
- Labels
- Node/Pod affinity
- Taints/Tolerations

Module 8: Stateful Applications**Lessons**

- Persistent storage
- StatefulSets

Module 9: Dynamic Application Configuration**Lessons**

- Docker dynamic configuration

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- ConfigMaps
- Secrets

Module 10: Additional Workloads**Lessons**

- Jobs
- CronJobs
- DaemonSets

Module 11: Security**Lessons**

- Service accounts
- Role-Based access control
- Network policies
- SecurityContext

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