Kubernetes Fundamentals (FI-KuF)

Course Description

This course is intended for system administrators and application developers who are interested in deploying and orchestrating container applications at scale and have a basic understanding of containers, mainly docker, and want to understand the basic concepts of Kubernetes and it is internal processes.

The course starts with a small refresher on what containers are and afterwards it goes and presents the kubernetes architecture and it is main components. Next, each student will create it is own Kubernetes cluster and also submit workloads under a common cluster across all students simulating a more production like environment. Kubernetes resources like pod, deployment, services, volumes, and many more are presented alongside with their major features and each student will have the chance to create and use them in the hands-on laboratories which are at the end of each chapter.

Course Duration:

2 days

Objectives:

After completing this course, students will have a firm understating of the main components of a kubernetes cluster and also on some kubernetes resources like pod, deployment, services, volumes .

Course Outline:

Chapter 01: Reviewing Containers and Docker

- Containers vs VMs
- Docker
- OS Components
- Docker Registries
- The need for K8s
- The K8s story

Chapter 02: Kubernetes History and Architecture

- Kubernetes history
- K8s Architecture
- Workers and Masters

Chapter 03: Installing Kubernetes

- Installing Kubernetes
- K8s Terminology
- Pods
- Namespaces
- Anatomy of a Kubernetes Node
- Getting help
- Hands-on Lab

Chapter 04: Running Workloads Imperatively

- CLI Commands
- kubectl run | get | describe | delete - explained
- Running K8s Workloads
- Pod Lifecycle
- Namespaces
- Hands-on Lab

Chapter 05: The Declarative Model

- From imperative to declarative model
- JSON and YAML
- Manifest Files
- Creating the YAML
- The Kubernetes API
- Hands-on Lab

Chapter 06: Deployments

- Labels and Selectors
- ReplicaSets
- Deployment
- Jobs
- Scaling and updating
- Hands-on Lab

Module 7: Persisting Data

- Volumes
- Types of K8s volumes
- Persistent Volumes
- NFS Persistent Volume
- Hands-on Lab

Chapter 08: K8s Networking

- Docker Networking Model
- K8s Networking Model
- Services
- Kube-proxy
- K8s DNS
- Hands-on Lab

Chapter 09: Monitoring and Logging

- Kubernetes metrics
- Metrics Terminology
- Monitoring with ES/Kibana
- Monitoring with Prometheus/Grafana

Chapter 10: Introspection

- Introspection
- Debugging pods
- Debugging K8s Clusters
- CI/CD with K8s
- Hands-on Lab

Who should attend:

- DevOps engineers
- Linux system administrators
- Systems design engineers
- Architects