COURSE: Docker & Kubernetes

Duration: 5 days

Docker: 3 days, Kubernetes: 2 days

About Technology

Docker- The world's leading software container platform to modernize applications without disruption. Docker is available as Community Edition (CE) and Enterprise Edition (EE), with optimized installers for a variety of infrastructure. The Docker platform and associated toolchain provides the following features as a baseline for both CE and EE.

With Kubernetes, Deploy your applications quickly and predictably. The goal is to foster an ecosystem of components and tools that relieve the burden of running applications in public and private clouds. Kubernetes is Portable: public, private, hybrid, multi-cloud, Extensible: modular, pluggable, hookable, composable, Self-healing: auto-placement, auto-restart, auto-replication, auto-scaling.

Course Objective

- Set up Docker engine, workstation
- Configure Docker engine
- Build and Manage Docker Images
- Bundle applications in Docker images
- Introduction to swarm cluster
- Run applications on Kubernetes cluster

Course Outline

Module 1: Docker concepts and terms

- Terminologies in Docker world
- Containerization vs Virtualization
- Docker Labs (intro)
- Docker engine & tools installation
- Configuring Docker engine & tools

Module 2: Docker Containers

- Our first containers
- Running containers
- Images and containers
- Local development workflow
- Docker run
- Running containers in background
- Connecting containers

Module3: Provisioning Docker Image

- Introducing the Dockerfile
- Creating a Dockerfile
- Building images manually
- Building images using Continuous Integration tools
- Storing and retrieving Docker Images from Docker Hub
- Inspecting a Dockerfile from DockerHub

Module 4: Working with Registry

- Module Intro
- Creating a Public repo on Docker Hub,
- Using our Public repo on Docker Hub,
- Using a Private Registry,
- Docker Hub Enterprise

Module 5: Diving Deeper into Dockerfile

- Introducing the Dockerfile
- The Build cache
- Dockerfile and Layers
- Building a WebServer Container
- The CMD Instruction Docker
- The ENTRYPOINT Instruction
- The ENV Instruction
- Volumes and the VOLUME Instruction

Module 6: Docker Networking

- The docker0 Bridge
- Virtual Ethernet Interfaces
- Network Configuration Files
- Exposing Ports
- Viewing Exposed Ports
- Linking Containers
- Wrap-Up

Module 7: Orchestration

• Use Docker Machine
• Getting started with Compose
o Developer workflow with Compose

Module 8: Deploying Applications
• SWARM Networks
• Introduction - The Docker API
• Replications and Service YAML
Running and managing containers

Module 9: Kubernetes Basics
• Setting up Kubernetes
• Creating your own Pods
• Using Labels
• Services
• Rolling update for zero downtime deploys

Module 10:
• Node Architecture
• Docker Images Custom in KN
• YAML Definitions
• Config Map, Secrets
• Deployments
• Volumes
• Namespaces
• Jobs and CRON Jobs

Environment:
Participants must use their own desktop or laptop system.
• High Speed Internet connection
• Mac, Linux OS, Windows 7 or later
• A modern web browser • At least 20% free disk space