Basic Docker & Kubernetes Workshop

3-Day Curriculum

Prerequisites:

Experience using Linux CLI and a general understanding of virtualization and container technology

Technical Requirements:

Mac, Linux OS or Windows laptop with SSH client (putty, cygwin), web browser supporting HTML5

Course Outline:

Day 1

- Introduction to Microservices
- Docker Basics
- Advanced Docker
- Managing Docker
- Docker Tooling
- Docker Ecosystem

Day 2

- Kubernetes Ecosystem, Kubernetes 101
- Kubernetes Concepts and features
- Networking
- Storage and Stateful Sets
- Multi-tenancy
- Packaging Applications with Helm

Day 1

Introduction to Microservices/Containers

- Quick intro on benefits of containers and microservices.
- **Hands-on:** setup classroom environment (deploy Docker engine and Docker compose).

Docker Basics

- Docker architecture and workflows.
- **Hands-on:** hands-on working with docker (start, stop, expose, inspect, copy inside container and etc.).

Advanced Docker

- How networking and storage work in Docker as well as logging andmonitoring.
- **Hands-on:** networking, storage, logging and monitoring.

Managing Docker

- Image mgm, Dockerfiles, CI/CD and security best practices.
- **Hands-on:** DockerFile best practices, different ways to build container images (manually, auto).

Docker Tooling

- Docker compose, machine, Swarm, Docker store and plugins, Moby project.
- **Hands-on:** Docker Compose.

Docker Ecosystem

- Review of the docker space and associated technologies.

Day 2 & 3

Kubernetes Ecosystem and Kubernetes 101

- Kubernetes upstream, community, ecosystem, third party tools, K8s architecture.
- **Hands-on:** deployment of Kubernetes cluster, locally and for CI needs.

Kubernetes Core Concepts

- Pods, RCs, deployments, svc, annotations and labels.
- **Hands-on:** deploy stateless app using RCs and deployments, Kubernetes manifests. Working with API.

Kubernetes Features

- Liveness, readiness, config maps, secrets, volumes, jobs, daemon sets, init containers.
- **Hands-on:** deployment of other workloads. migrating apps from Compose to Kubernetes.

Networking

- Kubernetes networking, CNI, overlays, L3, ELB, ingress and network segmentation.
- **Hands-on:** deploy applications with ingress and load balancers.

Persistent Storage and Stateful Sets

- PV, PVC, K8s storage in AWS, stateful sets.
- **Hands-on:** Dynamic volume provisioning, deploying databases with volumes.

Multi-tenancy

- Namespaces, authentication, RBAC, quotas, network policies.
- **Hands-on:** K8s environment isolation with namespaces, quotas and network policies.

Packaging Applications with Helm

- All about Helm
- **Hands-on:** deploy, create, update, Lint Helm charts. Monokular, Draft, VS