



Kubernetes

32

Academic Hours

Kubernetes



Objectives

- The main objective of this course is to get familiar with Kubernetes, its architecture and how to use it in productions and large scale environments.





Content

Module 01 Intro

- | What is Kubernetes
- | Orchestration and scheduling
- | Declarative vs imperative
- | Kubernetes Architecture
 - Nodes
 - API
 - Scheduler
 - Control manager
- | Kubernetes network model
- | Install / Setup / minikube
- | kubeadm
- | kubectl
- | etcd
- | Running our first containers on Kubernetes
- | Kubernetes Objects and terminology
 - Pods
 - Services
 - Deployments
 - Namespaces
 - Replicas
 - Config

Module 02 Hands-on

- | Running containers with & Docker files / compose
- | Exposing containers
- | Deploying a self-hosted registry
- | Exposing services internally
- | Exposing services for external access
- | The Kubernetes dashboard
- | Security implications of kubectl apply
- | Exposing containers

Module 03 Microservices

- | Microservice Architecture Overview
- | Microservices and Containers
- | Managing complexity: service discovery, self-healing, etc.
- | Microservice Architecture Overview

Module 04 Application lifecycle

- | Scaling a deployment
- | Updating a service through labels and selectors
- | Daemon sets
- | Rolling updates
- | Using Helm



**to get familiar
with** Kubernetes
and its architecture"

Module 05 Networking

- | Calico
- | Profiles
- | Network Policies
- | Request lifecycle
- | Communication between services

Module 06 Advanced Topics

- | 12-factor app
- | Managing Resources
- | Horizontal Pod Autoscaler
- | Secrets
- | Configuration / ConfigMaps
- | Security
- | Ingress API
- | Client API / Addons
- | Logging / Metrics / Prometheus
- | Volumes
- | Configure Liveness and Readiness Probes
- | Azure AKS
- | DRP / Backups
- | Taints and Tolerations
- | Proxies
 - ▣ kubectl
 - ▣ apiserver proxy
 - ▣ kube proxy
- | <https://kubernetes.io/> - Serverless

Module 07 Hands-on

Full scale project , build deploy and manage multiple containers (micro services)



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