

# **Kubernetes Orchestration**

# Audience course Kubernetes Orchestration

The course Kubernetes Orchestration is intended for developers and devops professionals who want to gain knowledge of Kubernetes for deploying and orchestrating containers.

#### Prerequisites course Kubernetes Orchestration

To participate in the course Kubernetes Orchestration participants must have experience in developing applications. Experience with containers is recommended.

#### **Realization Training Kubernetes Orchestration**

The theory is covered on the basis of presentations. The concepts are explained with demos. The theory is interchanged with exercises. The course times are from 9.30 to 16.30.

# **Certificate course Kubernetes Orchestration**

After successfully completing the course participants receive a certificate Kubernetes Orchestration.



# **Content Course Kubernetes Orchestration**

In the course Kubernetes Orchestration participants learn how to set up a Kubernetes cluster to deploy and manage a system of microservices and containers. Kubernetes provides container orchestration in a system of container-based microservices.

# **Kubernetes Introduction**

The course Kubernetes Orchestration starts with a discussion of the packaging of applications in images from which containers are instantiated. In particular Docker Containers, Docker Engine and the role of Dockerfiles and docker-compose.yaml are discussed.

#### **Kubernetes Components**

Next it is explained which components make up a Kubernetes cluster, how these components are built up and how they work together. This includes Nodes, Pods and Services. Also covered is how the kubectl command line tool can be used to control the cluster.

#### **Kubernetes Architecture**

The course Kubernetes Orchestration also explains the architecture of a Kubernetes cluster with the scheduler, replication controllers and rest services. The role of YAML Files, the Pod Manifest, Metadata and ConfigMaps is treated.

#### **Cluster Deployments**

Then it's time to cover Cluster Deployments. The deployment lifecycle of a cluster with container states such as Desired State, Actual State and Pod phases such as Complete Stage and Failed Stage is treated. And scaling of deployments and the rollback of deployments are also discussed.

# **Kubernetes Services**

Subsequently attention is paid to the various services that are present in a Kubernetes cluster, such as the ClusterIP, the NodePort and the LoadBalancer service. Service discovery and port configurations are covered as well.

#### Networking

Finally networking in a Kubernetes cluster is on the program of the course. Container communication and pod communication are treated. Ingress networking and ingress rules are explained.

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# **Modules Course Kubernetes Orchestration**

Module 1 : Kubernetes Intro	Module 2 : Kubernetes Components	Module 3 : Kubernetes Architecture
What is Kubernetes?	Kubernetes Cluster	Scheduler
Packaging Applications	Nodes and Pods	Replication Controllers
Images	Services	Rest Services
Docker Containers	kubectl	etcd
Docker Engine	cluster-info	kube-proxy
Environment Replication	Kubernetes Dashboard	YAML Files
Control Groups	Grafana Monitoring	Pod Manifest
Namespaces	Rest-API	Metadata
Layered File System	Swagger Dashboard	Label Selectors
Resource Utilization	Master Container	Storage
Development Life Cycle	kube-scheduler	ConfigMaps
Containers and Microservices	kube-apiserver	ConfigMap from File
Container Orchestration	Using CLI	ConfigMap in Pod
Module 4 : Cluster Deployments	Module 5 : Kubernetes Services	Module 6 : Networking
Deployment Lifecycle	Types of Services	Container Communication
Deployment Stages	ClusterIP	Ded Communication
	Clusterin	Pod Communication
Progressing Stage	NodePort	Pod Communication Pod to Service Communication
Progressing Stage Desired State	NodePort LoadBalancer	Pod Communication Pod to Service Communication Ingress
Progressing Stage Desired State Actual State	NodePort LoadBalancer ExternalName	Pod Communication Pod to Service Communication Ingress HTTP(S) Routes
Progressing Stage Desired State Actual State Complete Stage	NodePort LoadBalancer ExternalName Proxy Modes	Pod Communication Pod to Service Communication Ingress HTTP(S) Routes Ingress Rules
Progressing Stage Desired State Actual State Complete Stage Failed Stage	NodePort LoadBalancer ExternalName Proxy Modes userspace	Pod Communication Pod to Service Communication Ingress HTTP(S) Routes Ingress Rules Types Of Ingress
Progressing Stage Desired State Actual State Complete Stage Failed Stage Rollback Deployments	NodePort LoadBalancer ExternalName Proxy Modes userspace iptables	Pod Communication Pod to Service Communication Ingress HTTP(S) Routes Ingress Rules Types Of Ingress Single Service
Progressing Stage Desired State Actual State Complete Stage Failed Stage Rollback Deployments Scale Deployment	NodePort LoadBalancer ExternalName Proxy Modes userspace iptables Service Discovery	Pod Communication Pod to Service Communication Ingress HTTP(S) Routes Ingress Rules Types Of Ingress Single Service Simple Fanout
Progressing Stage Desired State Actual State Complete Stage Failed Stage Rollback Deployments Scale Deployment Pause Deployment	NodePort LoadBalancer ExternalName Proxy Modes userspace iptables Service Discovery DNS versus ENV Var	Pod Communication Pod to Service Communication Ingress HTTP(S) Routes Ingress Rules Types Of Ingress Single Service Simple Fanout Virtual Hosting
Progressing Stage Desired State Actual State Complete Stage Failed Stage Rollback Deployments Scale Deployment Pause Deployment Cluster Workloads	NodePort LoadBalancer ExternalName Proxy Modes userspace iptables Service Discovery DNS versus ENV Var Headless Services	Pod Communication Pod to Service Communication Ingress HTTP(S) Routes Ingress Rules Types Of Ingress Single Service Simple Fanout Virtual Hosting Ingress Controllers
Progressing Stage Desired State Actual State Complete Stage Failed Stage Rollback Deployments Scale Deployment Pause Deployment Cluster Workloads Health Checks	NodePort LoadBalancer ExternalName Proxy Modes userspace iptables Service Discovery DNS versus ENV Var Headless Services Port Configurations	Pod Communication Pod to Service Communication Ingress HTTP(S) Routes Ingress Rules Types Of Ingress Single Service Simple Fanout Virtual Hosting Ingress Controllers Helm Charts

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