Kubernetes I - Introduction to Infrastructure

Course code: KUBERNETES_INTRO

The course is an introduction to the Kubernetes infrastructure. Kubernetes, abbreviated K8s, is now referred to as the cloud operating system and is a modern way of running applications that run in container mode. During the course we will introduce and explain the basic philosophy of container operation, orchestration and automation. We will show you how to get a very robust infrastructure that offers high availability, load balancing and a lot of other necessary things. Finally, participants will also learn to use the Helm tool to comfortably deploy applications to a K8s cluster. The course is intended for administrators who plan or already use K8s to run applications and want to better understand the capabilities of this infrastructure and its principles.

Affiliate	Duration	Course price	ITB
Praha	3	24 000 Kč	30
Brno	3	24 000 Kč	30
Bratislava	3	960 €	30

The prices are without VAT.

Course terms

	Date	Duration	Course price	Type	Course language	Location
G	24.02.2025	3	24 000 Kč	Presence	CZ/SK	Gopas Brno Prezenční
	12.03.2025	3	960 €	Presence	CZ/SK	Gopas Bratislava Prezenční
	05.05.2025	3	24 000 Kč	Presence	CZ/SK	Gopas Praha Prezenční
	09.06.2025	3	960 €	Online	CZ/SK	Gopas Bratislava Online
	09.06.2025	3	24 000 Kč	Online	CZ/SK	Gopas Praha Online
	11.06.2025	3	24 000 Kč	Presence	CZ/SK	Gopas Brno Prezenční

The prices are without VAT.

Required entry skills
- Basic knowledge of infrastructure technologies
- Networking (basic concepts such as IP address, routing, gateway, VPN)
- data storage (block and file storage, FC, iSCSI and NFS protocols)
- Basic knowledge of Docker or other container runtime
- Work in Linux command line

Teaching methods
- Expert interpretation with practical examples, exercises on computers.
- During the course we will use a real K8s cluster, installed in on-premise mode

Studying materials
- Printed presentations of the discussed material.

Course outline
Introduction to Kubernetes
- Operation of applications in containers (basic principles and options)
- CNCF organization and CRI, CNI, CSI standards
- Why Kubernetes is needed
- Kubernetes philosophy, basic rules and options
- Objects in Kubernetes (pod, static pod, service, daemonset, and others)

Kubernetes cluster structure
- Types of nodes in the cluster (master node, worker node)
- Control plane structure (API server, scheduler, etcd, controller, and others)
- Deployment options (cloud, on premise, minikube tools, etc.)

Basics of cluster administration
- Cluster information
- Orientation in the provided API
- Administration of nodes in the cluster (cordon/uncordon, drain, ...)
- Object tagging
- Networking in a cluster
- Persistent data

Application operation in the Kubernetes environment
- Creating a simple pod
- Multi-container pods and when to use them
- Application control using higher-level controllers
- Scaling and zero-downtime upgrade
- Centralized configuration (ConfigMap and its options)

Deploying applications using Helm
- What is Helm and how to use it
- Helm Hub and Repositories
- Helm Charts
- Simple application deployment
- Upgrade/downgrade using Helm