

# Implementing Kubernetes

Hands-on course of 3 days - 21h

Ref.: UBE - Price 2024: CHF2 520 (excl. taxes)

## EDUCATIONAL OBJECTIVES

At the end of the training, the trainee will be able to:

Understand the positioning of Kubernetes and the notion of orchestration

Install Kubernetes and its various components

Use YAML descriptive files

Define best practices for working with Kubernetes

## THE PROGRAMME

last updated: 07/2021

### 1) Introduction to kubernetes

- From virtualization to containerization. The Docker/Kubernetes pair.
- Installation solutions (MiniKube, On-Premise, etc.).
- Installing and configuring Docker.
- Accessing the Kubernetes cluster: CLI (kubectl), GUI (dashboard) and APIs.
- Manual deployment and publishing.
- Detail and introspection of deployment.

*Hands-on work* : Deployment of a test platform.

### 2) Descriptive files

- YAML syntax.
- Scalability of a deployment.
- Update/rollback strategy.
- Deleting a deployment.

*Hands-on work* : Deployment, publication and analysis of a deployment.

### 3) Kubernetes Architecture

- Components of the master node: API server, scheduler, controller manager, etc.
- Architecture of a minion: Kubelet, the container engine (docker), Kube-proxy.
- Kubernetes objects: volume, service, pod, etc.
- Solution of the deployment.
- Stateful object, stateless object.

*Hands-on work* : Use of deployment.

### 4) Running Kubernetes

- Clustering with replicas and deployment.
- Types of services.
- Labels and choosing a node for deployment.
- Affinity and anti-affinity.
- Daemons set, health check, config map and secrets.
- Persistent Volumes and Persistent Volumes Claim.

*Hands-on work* : Deployment of a database and an application.

### 5) Advanced container management

- Creation and automation of custom images.
- Dockerfile.

## TRAINER QUALIFICATIONS

The experts leading the training are specialists in the covered subjects. They have been approved by our instructional teams for both their professional knowledge and their teaching ability, for each course they teach. They have at least five to ten years of experience in their field and hold (or have held) decision-making positions in companies.

## ASSESSMENT TERMS

The trainer evaluates each participant's academic progress throughout the training using multiple choice, scenarios, hands-on work and more. Participants also complete a placement test before and after the course to measure the skills they've developed.

## TEACHING AIDS AND TECHNICAL RESOURCES

- The main teaching aids and instructional methods used in the training are audiovisual aids, documentation and course material, hands-on application exercises and corrected exercises for practical training courses, case studies and coverage of real cases for training seminars.
- At the end of each course or seminar, ORSYS provides participants with a course evaluation questionnaire that is analysed by our instructional teams.
- A check-in sheet for each half-day of attendance is provided at the end of the training, along with a course completion certificate if the trainee attended the entire session.

## TERMS AND DEADLINES

Registration must be completed 24 hours before the start of the training.

## ACCESSIBILITY FOR PEOPLE WITH DISABILITIES

Do you need special accessibility accommodations? Contact Mrs. Fosse, Disability Manager, at psh-accueil@ORSYS.fr to review your request and its feasibility.

- One container and multiple services.
  - Deployment of a custom image.
- Hands-on work : Creation and automation of custom images.*

#### 6) Kubernetes in production

- Frontal administrable Ingress.
  - Resource limitation.
  - Resource management and autoscaling.
  - Service Discovery (env, DNS).
  - Namespaces and quotas.
  - Access management.
  - High availability and maintenance mode.
- Hands-on work : Container deployment and scalability management.*

#### 7) Deploying a Kubernetes cluster

- Preparing the knots.
  - Deployment: of a master-nodeadm, a master-node, a worker-node.
  - Setting up the Dashboard and the network.
- Hands-on work : Deploying a cluster.*

## DATES

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### REMOTE CLASS

2024 : 05 Jun, 18 Sep, 16 Dec