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AMBIENT-IT

Kubernetes Training

3 days (21 hours)

Présentation

Kubernetes Container Orchestration (commonly referred to as "K8s") is an open source software application designed to automate the deployment, scaling and management of containerized applications. K8s has been originally developed by Google and donated to the Cloud Native Computing Foundation. It aims to provide a "platform to automate the deployment, scaling and container operations of applications across host clusters". It works with containers, and supports several technologies, most often coupled with Docker.

This tool will allow you to enter the "Native Cloud" era and expose your applications on a large scale, safely, reproducibly and flexibly. You will also learn how to upgrade your applications to the microservice standard, modular and scalable. Plebrated by the Silicon Valley giants, K8s is managed by responsible governance linked to the Cloud Native Computing Foundation (which itself attached to the Linux Foundation). Kubernetes provides a "platform to automate deployment, the scaling up and production of application containers on server clusters". It supports multiple container runtime engines including Docker and Rocket

With us, in this training, you will discover how to make your application infrastructure scalable with this powerful Docker orchestrator.

As in all our training courses, this one will introduce you to the latest version of Kubernetes.

Objectives

- Understanding the interest and characteristics of microservices
- Knowing how to deploy "Cloud-Native" applications
- Mastering kubeadm, the installation tool of Kubernetes
- Understanding how to deploy Kubernetes in production
- Large-scale deployment of applications on a cluster or in the cloud
- Enable automatic scaling of applications
- Implement high availability and self-repair of software services
- Optimize storage of large amounts of data with volumes
- Advanced monitoring of infrastructure and applications
- Automate the updating of software versions of its applications

Public visé

Développeurs, Architectes, Administrateurs systèmes, DevOps

Prerequisites

- Ideally have completed our Docker training, or have basic knowledge of containers.
- Basic knowledge of a Unix system

To get further into the cloud?

- Train in advanced mode on Kubernetes : Administration & Production
- Get trained on Amazon Web Service with its Kubernetes service : EKS
- Get trained on Google Cloud Platform with its Kubernetes service: GKE
- Control your Cloud Computing deployment with OpenStack

Kubernetes training program

Introduction to micro-services

- Good practice: the "12 factors" methodology
- Monolithic application versus Micro-services
- Upgrading an application to micro-services

Container recalls

- Overview of Docker
- Container overview
- Installing and running Docker images
- Interacting with containers
- Create your own images
- Difference between private and public deposits

Kubernetes: the basics

- Create a Kubernetes cluster: on your workstation, in your datacenter or in the cloud.
- Kubernetes architecture and components (Control Plane and Node side)
- Lifecycle of a kubectl query
- Deploy an application on several machines
- Explore an application

- Expose an application on the network
- Going to scale

Kubernetes: the main concepts

- Pod overview
- Interact with Pods
- Configuration and security of an application (ConfigMaps and Secrets)
- Services overview (ClusterIP, NodePort, LoadBalancer, Headless)
- Create your own services to showcase your applications
- Organizing your Pods with Labels

Deploying its micro-services

- Deployment strategies in "Cloud-Native" mode
- High Performance Computing Strategies (Jobs)
- Case study: deployments with kubectl and yaml
- Scaling strategies (Replicasets and Daemonsets)
- Case study: use of replicas
- Case study: installation of a distributed newspaper manager
- Software update strategy (Deployments)
- Case study: Rolling update
- Easily manage your application updates
- Advanced techniques: blue/green deployment, canary

Advanced concepts

- Volatile and persistent storage (PersistentVolume / PersistentVolumeClaim)
- Advanced supervision techniques : Prometheus
- Deployment of distributed databases (StatefulSet)
- Case study: installation of MongoDB and Redis in distributed mode

Module On Demand - Infrastructure Layer (+1 day)

- Service Mesh
- Ingress

Additional Modules Google GCP with GKE (2 jours)Amazon EKS (2

days) Kubernetes Avancé : Administration & Production (3 days)

Companies concerned

This training is intended for companies, small or large, wishing to train their teams in a new advanced computer technology.

Teaching methods

Practical training: 60% Practical, 40% Theory. Training support distributed in digital format to all participants

Organization

The course alternates the trainer's theoretical input supported by examples and brainstorming sessions, and group work.

Validation

At the end of the session, a multiple-choice questionnaire is used to verify the correct acquisition of skills.

Sanction

A certificate will be given to each trainee who has completed the entire training.