Docker Administration and Operations («DOCKER»)

After the training, attendees will have a theoretical and practical knowledge of the Docker platform.

Duration: 3 days
Price: 2'700.–

Content

1. Quick Wins
   - Some examples of the immediate benefits brought by using Docker
2. Useful concepts
   - Linux containers' building blocks
   - Containers vs Virtual Machines
   - Micro-services architecture
   - Cloud Native application
   - DevOps
3. The Docker platform
   - Client / server architecture
   - Essentials concepts
   - Installation
   - Online playground
   - Exercises :
     - Installation
     - First command on «Play With Docker»
4. Docker containers
   - Container creation
   - Ports publication
   - Bind-mount
   - Resources limitation
   - Base commands
   - Useful aliases
   - Exercises :
     - Containers creation
     - Base commands
5. Docker images
   - Definition
   - Union filesystem & Copy-On-Write
   - Dockerfile
   - Images creation
   - Multi-stages build
   - Cache
   - Build context
   - Base commands
   - Exercises :
     - Images creation
     - Review of Dockerfile's instructions
     - Usage of the multi-stage build
6. Registry
   - Usage
   - Various providers
   - Docker Hub
   - Registry Open Source

- Docker Trusted Registry
- Exercises :
  - Setup and configuration of the open source registry

7. Storage
- Container and data persistence
- Volumes
- Volume drivers
- Storage orchestration with REX-Ray
- Exercises :
  - Volume creation
  - Ceph cluster with REX-Ray

8. Docker Machine
- Usage
- Commands
- Host creation
- Communication with a remote host
- Exercises :
  - Creation of a host on VirtualBox
  - Creation of a host on a cloud provider

9. Docker Compose
- Usage
- Docker-compose.yml file format
- Docker-compose binary
- Deployment of the VotingApp as a Docker Compose application
- Usage in development
- Exercises :
  - Deployment of a stack Elastic

10. Docker Compose
- Presentation
- The docker-composes.yml file format
- Basic instructions
- The docker-composing binary and its use
- Practical work:
  - Deploying applications with Docker Compose
  - Example with an Elastic stack

11. Orchestration
- Docker Swarm
- Role of the nodes
- Services deployment
- Rolling update and rollback
- Secrets and Configs
- Stack
- Management interfaces
- Exercises :
  - Setup a Swarm on a cloud provider
  - Creation of Services
  - Creation of a Stack
  - Usage of Secrets and Configs

12. Network
- Container Network Model
- Network drivers
- Networks on a single host
- Networks in a Swarm
- Routing mesh

13. Security
- Isolation and resources limitation

- - Linux Security Modules
  - Capabilities / Seccomp
  - Vulnerability scanning
  - Content Trust
  - Security in a Swarm
14. Log management
    - Best practices
    - Log drivers
    - Exercises :
      - Send logs entries to an Elastic stack
      - Send logs entries to Sumologic cloud solution
15. Monitoring
    - Prometheus stack
    - Netdata
    - Exercises :
      - Deployment of a Prometheus stack
16. CI/CD
    - Principles
    - Workflow
    - Setup with GitLab
17. Docker Enterprise
    - Overview
    - Deployment on a cloud provider
    - Demo

Key Learnings

- Understanding the building blocks of the Linux containers
- Configuring and running the Docker daemon
- Running containers with various options
- Building Docker images
- Setup of an image registry
- Using Docker Machine to deploy Docker hosts
- Using Docker Compose to build and deploy complex applications
- Setup of a Swarm cluster
- Deploy services and applicative stacks on a Swarm
- Using various storage options
- Understanding the default security components available in Docker
- Understanding of how containers can communicate with each other
- Setup of a supervision stack
- Using a centralized log management solution
- Setup of a simple CI/CD pipeline

Methodology & didactics

This training is made up of several parts. Each part contains some theory, demos, and practical exercises.

Target audience

This course is targeted at people who wish to become a qualified Docker professional in the administration and operation of this first platform of software containers.

Any questions?

We are happy to advise you on +41 44 447 21 21 or info@digicomp.ch. You can find detailed information about dates on www.digicomp.ch/courses-software-engineering/devops/course-docker-administration-and-operations

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