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DOE608 - Course Validation

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Course Materials

Access to the course materials, as well as to the LABS and Validation of Acquired Knowledge, is provided through an annual subscription per trainee to a web-based course platform.

The subscription allows trainees to:

- redo the LABS in autonomous mode,
- consult updated course content during the subscription period,
- exchange with other participants in the session and with former trainees.

What this course covered

- **DOE600 - Course Presentation**

- Prerequisites
  - Hardware
  - Software
  - Internet
- Use of the Infrastructure
- Curriculum

- **DOE601 - Virtualisation by Isolation**
  - Presentation of Virtualisation by Isolation
    - History
  - Presentation of Namespaces
  - Presentation of CGroups
    - LAB #1 - cgroups v1
      - 1.1 - Preparation
      - 1.2 - Presentation
      - 1.3 - Memory Limitation
      - 1.4 - The cgcreate command
      - 1.5 - The cgexec command
      - 1.6 - The cgdelete command
      - 1.7 - The /etc/cgconfig.conf file
      - 1.8 - The cgconfigparser command
    - LAB #2 - cgroups v2
      - 2.1 - Preparation
      - 2.2 - Overview
      - 2.3 - Limiting CPU Resources
      - 2.4 - The systemctl set-property command
  - Introducing Linux Containers
    - LAB #3 - Working with LXC
      - 3.1 - Installation
      - 3.2 - Creating a Simple Container
      - 3.3 - Starting a Simple Container
      - 3.4 - Attaching to a Simple Container
      - 3.5 - Basic LXC Commands
        - The lxc-console Command

        - The lxc-stop Command
        - The lxc-execute Command
        - The lxc-info Command
        - The lxc-freeze Command
        - The lxc-unfreeze Command
        - Other Commands
    - 3.6 - Creating an Ephemeral Container
        - The lxc-copy Command
    - 3.7 - Saving Containers
        - The lxc-snapshot Command

- **DOE602 - Getting started with Docker**
    - Introduction to Docker
        - Virtualisation and Containerisation
        - The AUFS File System
        - OverlayFS and Overlay2
        - Docker Daemon and Docker Engine
        - Docker CE and Docker EE
            - Docker CE
            - Docker EE
        - Docker and Mirantis
    - LAB #1 - Working with Docker
        - 1.1 - Installing docker on Linux
            - Debian 11
            - CentOS 8
        - 1.2 - Starting a Container
        - 1.3 - Viewing the list of Containers and Images
        - 1.4 - Searching for an Image in a Repository
        - 1.5 - Deleting a Container from an Image
        - 1.6 - Creating an Image from a Modified Container
        - 1.7 - Deleting an Image
        - 1.8 - Creating a Container with a Specific Name
        - 1.9 - Executing a Command in a Container
        - 1.10 - Injecting Environment Variables into a Container

        - 1.11 - Modifying a Container Host Name
        - 1.12 - Mapping Container Ports
        - 1.13 - Starting a Container in Detached mode
        - 1.14 - Accessing Container Services from the Outside
        - 1.15 - Stopping and Starting a Container
        - 1.16 - Using Signals with a Container
        - 1.17 - Forcing the deletion of a running Container
        - 1.18 - Simply using a Volume
        - 1.19 - Downloading an image without creating a Container
        - 1.20 - Attaching to a running Container
        - 1.21 - Installing software in a Container
        - 1.22 - Using the docker commit command
        - 1.23 - Connecting to the container from the outside

- **DOE603 - Managing and Storing Docker Images**
    - LAB #1 - Re-creating an official docker image
        - 1.1 - Using a Dockerfile
        - 1.2 - FROM
        - 1.3 - RUN
        - 1.4 - ENV
        - 1.5 - VOLUME
        - 1.6 - COPY
        - 1.7 - ENTRYPOINT
        - 1.8 - EXPOSE
        - 1.9 - CMD
        - 1.10 - Other commands
    - LAB #2 - Creating a Dockerfile
        - 2.1 - Creating and testing the script
        - 2.2 - Good Cache Practices
    - LAB #3 - Installing a Private Registry
        - 3.1 - Creating a Local Registry,
        - 3.2 - Creating a Dedicated Registry Server
            - Configuring the Client

- **DOE604 - Volume, Network and Resource Management**

- LAB #1 - Volume Management
  - 1.1 - Automatic management using Docker
  - 1.2 - Manual Volume Management
  - 1.3 - Manual management of a Bindmount
- LAB #2 - Network Management
  - 2.1 - The Docker Network Approach
    - Bridge
    - Host
    - None
    - Links
  - 2.2 - Running Wordpress in a container
  - 2.3 - Managing a Microservices Architecture
- LAB #3 - Monitoring Containers
  - 3.1 - Logs
  - 3.2 - Processes
  - 3.3 - Continuous Activity

- **DOE605 - Docker Compose, Docker Machine and Docker Swarm**
  - LAB #1 - Docker Compose
    - 1.1 - Installation
    - 1.2 - Installing Wordpress with Docker Compose
  - LAB #2 - Docker Machine
    - 2.1 - Introduction
    - 2.2 - Creating Docker Virtual Machines
    - 2.3 - Listing Docker VMs
    - 2.4 - Obtaining VM IP addresses
    - 2.5 - Connecting to a Docker VM
  - LAB #3 - Docker Swarm
    - 3.1 - Overview
    - 3.2 - Initializing Docker Swarm
    - 3.3 - Leader status
    - 3.4 - Joining the Swarm
    - 3.5 - Viewing Swarm Information
    - 3.6 - Starting a Service

        - 3.7 - Scaling Up and Scaling Down a Service
        - 3.8 - Checking Node Status
        - 3.9 - High Availability
        - 3.10 - Deleting a Service
        - 3.11 - Backing up Docker Swarm
        - 3.12 - Restoring Docker Swarm

- **DOF606 - Overlay Network Management with Docker in Swarm mode**
    - The Docker Network Model
    - LAB #1 - Overlay Network Management
        - 1.1 - Creating a network overlay
        - 1.2 - Creating a Service
        - 1.3 - Moving the Service to another Overlay Network
        - 1.4 - DNS container discovery
        - 1.5 - Creating a Custom Overlay Network
    - LAB #2 - Microservices Architecture Management
        - 2.1 - Implementing Docker Swarm with overlay networks

- **DOF607 - Docker Security Management**
    - LAB #1 - Using Docker Secrets
    - LAB #2 - Creating a Trusted User to Control the Docker Daemon
    - LAB #3 - The docker-bench-security.sh script
    - LAB #4 - Securing the Docker Host Configuration
    - LAB #5 - Securing the Docker daemon configuration
        - 5.1 - The /etc/docker/daemon.json file
    - LAB #6 - Securing Images and Build Files
    - LAB #7 - Securing the Container Runtime
    - LAB #8 - Securing Images with Docker Content Trust
        - 8.1 - DOCKER_CONTENT_TRUST
        - 8.2 - DCT and the docker pull command
            - The disable-content-trust option
        - 8.3 - DCT and the docker push command
        - 8.4 - DCT and the docker build command
            - Creating a second Repositry
            - Deleting a signature

    - LAB #9 - Securing the Docker daemon socket
        - 9.1 - Creating the Certificate Authority Certificate
        - 9.2 - Creating the Docker Daemon Host Server Certificate
        - 9.3 - Creating the Client Certificate
        - 9.4 - Starting the Docker Daemon with a Direct Invocation
        - 9.5 - Configuring the Client

- **DOE608 - Course Validation**
    - Course Materials
    - What this course covered
    - Validation of acquired knowledge
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Training Evaluation

To validate your training, please complete the Training Evaluation and the Validation of Acquired Knowledge.
