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Docker & Ansible training: Container DevOps
3 days (21 hours)

Presentation

With our course on Docker, which has become a mainstay of our DevOps catalog, you'll get to grips with the tool that has revolutionized the world of IT in recent years. Docker is a powerful open-source tool that automates the deployment of applications in software containers.

In this course, aimed at administrators and developers who want to get up and running straight away, you'll learn how to make intensive use of Docker technology, coupled with the automation provided by Ansible.

This expert-led 3-day training course will introduce you to the Docker platform and its entire ecosystem. You'll learn how to install it, integrate it into all your DevOps infrastructure projects, and use the best practices and usages to master this technology.

You'll also learn how to automate Docker using Ansible as a configuration management tool.

As with all our training courses, this one will introduce you to the latest version of Docker (at the time of writing: Docker 26) and Ansible 2.16.

Objectives

- Understanding the characteristics of a Linux container
- How to install and use Docker
- Learn how to create Docker images and Dockerfiles
- Containerize complex applications
- Networking under Docker
- Mastering data management with Docker
- Interacting with the Docker Hub and registries
- How to use Docker Compose

- Integrate Docker into your projects
- Understanding Ansible concepts
- Architecting complex projects with Ansible
- Deploying Docker with Ansible

Target audience

- Developer
- System administrator
- DevOps
- Cloud Architect

Prerequisites

- Basic knowledge of a Linux system
- Know how to use SSH and be able to SSH into a remote machine
- Git and a Github account
- WIndows with WSL and docker-desktop or Linux or Mac

Recommendations for pre- and post-course reading

- Official documentation, of course
- Take a look at Google engineer Prakhar Srivastav's website (no less).
- Refer to Farhan Hasin Chowdhury's Learn Docker for Beginners manual (which we'd like to thank him for).
- OWASP's cheat sheet of best security practices
- A Docker CheatSheet available on GitHub from a techno lover
- An educational video introduction to Docker by TechWorld with Nana :

Our Docker Ansible Training Program

Introduction to containers

- Introducing the Linux container concept
- Linux container use cases
- The differences between containers and virtual machines
- Introduction to Docker and its architecture
- Advantages and disadvantages of Docker
- Other container managers

Creating your first Docker containers

- Installing Docker
- Container life cycle
- Launch a container with docker run (interactive mode, detached mode)
- Interact with a container from the host (exec, inspect, logs)

Docker images

- Docker image concept
- Create an image from a container
- Image manipulation (save, export, load, commit)
- Dockerfile
- Difference between ADD/COPY ENTRYPOINT/CMD
- Registry and Dockerhub

Data persistence

- Create and persist Docker volumes (host/container, inter/container)
- Best practices for data persistence

Networking with Docker

- Understanding the Docker network stack
- Using Docker links
- Creating Docker networks

Advanced concepts

- Securing your Docker infrastructure (TLS, AppArmor)
- Build automation with buildX and Github Actions
- Resource consumption management
- Portainer
- Docker in Docker

Docker-compose

- Container assembly
- Notion of stack
- Scalability management
- Infrastructure as Code

The need for orchestration

- Introduction to the notion of orchestrator with Kubernetes
- Pod creation with Kubernetes

Ansible

- Introduction to Ansible: basic principles and architecture
- AWX
- Configuring the Ansible environment (SSH)
- Ansible modules
- ansible playbook creation
- Using jinja2 to manage templates
- Playbook portability
- Using ansible-vault to secure secrets
- Static and dynamic inventory management
- Example of using Ansible to manage cloud instance configuration on GCP
- Ansible Galaxy
- Container lifecycle management and orchestration with Ansible

Introduction to Swarm (Swarm optional module + 1 day)

- Orchestration and clustering
- Introducing Docker Machine
- Introducing the Swarm orchestrator
- Application deployment

Using containers with the Kubernetes orchestration platform (Optional module k8s + 1 day)

- Provision of a Kubernetes cluster: master with 2 nodes
- Installing the Kubernetes administration environment with Pycharm Pro
- First orders
- Kubernetes architecture overview

Practical work on Kubernetes (Optional module k8s)

- Management of imperative and declarative orders
- Writing Yaml files to drive Kubernetes
- Pod creation, labels, namespaces, ReplicaController, ReplicatSet
- CPU and memory management through namespaces
- Taints and Toleration.
- Example of RollingUpdate and Recreate deployments.
- DaemonSet, Static Pods
- Stateless and Stateful

How to install Kubernetes (k8s optional module)

- minikube
- kubeadm with its Ansible script
- With Google Kubernetes Engine (GKE)
- With Elastic Kubernetes Service (EKS)

Companies concerned

This course is aimed at both individuals and companies, large or small, wishing to train their teams in a new advanced computer technology, or to acquire specific business knowledge or modern methods.

Positioning on entry to training

Positioning at the start of training complies with Qualiopi quality criteria. As soon as registration is finalized, the learner receives a self-assessment questionnaire which enables us to assess his or her estimated level of proficiency in different types of technology, as well as his or her expectations and personal objectives for the training to come, within the limits imposed by the selected format. This questionnaire also enables us to anticipate any connection or security difficulties within the company (intra-company or virtual classroom) which could be problematic for the follow-up and smooth running of the training session.

Teaching methods

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

Organization

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

Validation

At the end of the session, a multiple-choice questionnaire verifies the correct acquisition of skills.

Sanction

A certificate will be issued to each trainee who completes the course.