

CENGN Academy

Docker and Kubernetes Basics



CENGN's Docker & Kubernetes Basics covers the key concepts and skills required to deploy and orchestrate containerized applications. Docker and Kubernetes, the industry leading container runtime and orchestration tools, are used throughout. In particular, the course covers Kubernetes architecture and key objects including replication controllers, deployments and services. The course culminates with a guided Kubernetes troubleshooting exercise.



Audience:

- Software Engineers and Architects
- Network Engineers and Architects
- Cloud Engineers and Architects
- Cloud Team Managers



Delivery Mode: Learn on your own schedule with self-paced online training and labs



Duration: Learners will need approximately 20 hours to complete the course. Learners will have access to the online content and labs for 4 weeks



Hands-on Labs: This course features hands-on labs performed on CENGN's private cloud infrastructure. The labs build on each other and enable the learner to deploy a web server in a containerized scenario



Recommended Prerequisites:

This course is best suited for learners with the following knowledge and skills

- Intermediate experience with networking
- Intermediate experience Linux, including command line interface
- Moderate level of understanding of virtualization



Learner Support: The CENGN Academy team of subject matter experts will be available to support you while you take this course. We will answer your questions, confirm your labs, and check in with you after your course to assist with your badge exam preparations

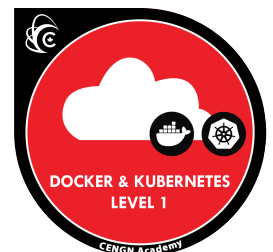
Exam and Digital Badge

Learners who complete this course are ready the CENGN Docker + Kubernetes Basics exam. Those who successfully complete the exam will earn a CENGN Docker + Kubernetes Level 1 digital badge, which can be posted on LinkedIn and other social media

Course Objectives

After completing this course, the learner will be able to:

- Explain key container concepts
- Manage Docker containers
- Describe Kubernetes components and architecture
- Create a single-node Kubernetes cluster
- Work with standard Kubernetes objects





Course Content

Module 1 – Docker Basics

- Compare virtual machines and containers
- Describe how containers use Linux namespaces
- Describe how Docker manages containers
- Compare Host and Guest operating systems
- Describe Type 1 and Type 2 hypervisors
- Manage containers using Docker CLI commands such as `docker run`, `docker start/stop`, `docker ps`, `docker images`
- Manage Docker images through Docker Hub
- Modify a running Docker container
- Commit changes to a new Docker container image with a tag

Module 2 – Kubernetes Basics

- Explain why a container orchestrator is needed
- Describe the components of the Kubernetes architecture (nodes, pods, api-server, etc.)
- Compare Kubernetes worker nodes and master nodes
- Describe Kubernetes cluster types
- Retrieve details about Kubernetes objects using `kubectl get`, `kubectl describe`, and `kubectl explain`
- Describe ClusterIP and NodePort service types, and their associated ports
- Compare Kubernetes deployments, replication controllers, and replica sets
- Install and configure a single-node Kubernetes cluster
- Define standard Kubernetes objects using manifest files
- Create and manage Kubernetes objects using `kubectl` commands
- Use Kubernetes labels and selectors to group objects and organize clusters
- Find and resolve errors in an existing Kubernetes manifest file