

Docker & Kubernetes

Instructor-led training

*designed & delivered by industry experts
public & private courses in Ireland, UK,
Europe, USA & Canada*



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Using Docker and Kubernetes in Production

4-DAY HANDS-ON PROGRAM

GTK85G

Course Overview

Designed and written by Docker and Kubernetes Guru, this Docker and Kubernetes in Production training is an intensive instructor-led course which combines developer and operator's knowledge. It brings you from zero to the main concepts in developing distributed applications and managing them with Kubernetes. It also covers operational knowledge of Kubernetes with security and advanced application configuration.

Duration

4 days

Target Audience

- Developers who want to containerize their applications and run them in production via Kubernetes
- Operators/System Administrators who want to learn about Kubernetes components, API and security features
- Cloud Architects who want to take advantage of cloud native technologies in their enterprise

Prerequisites

- Working knowledge of Linux and proficiency with the terminal
- Knowledge of Go and/or Python a plus
- Prior attendance of our Docker GTDK1 course would be beneficial

Course Outline

DAY 1: DOCKER

Morning:

- Introduction to containers
- The Docker CLI
- Managing containers
- Using Docker Images
- Managing Images
- Building containers from SCRATCH

Afternoon:

- Understanding Images (Layers and manifests)
- Building Docker Images with a Dockerfile
- Docker registry and automated builds
- Container Security (privilege containers and capabilities)
- Docker Volumes and Network

DAY 2: KUBERNETES

Morning:

- Introduction
- Architecture and main components
- Networking concepts (CNI and overlay add-ons)
- Installation (kubeadm)

Afternoon:

- API Access

- Pods/ReplicaSets
- Deployments and Services
- Ingress objects

DAY 3: KUBERNETES Ctd.

Morning:

- Rolling updates and Rollbacks
- Application configuration (configmap and secrets)
- Stateful Applications
- Volumes

Afternoon:

- Security concepts
- Network Policies
- Role Based Access Control
- Pod Security Policies
- Admission Control

DAY 4: KUBERNETES Ctd.

Morning:

- Scheduling concepts
- Monitoring with Prometheus
- Logging with Fluentd
- Troubleshooting

Afternoon:

- Helm and application configuration
- Declarative vs Imperative object management
- Intro to kustomize and GitOps

“Instructor's ability to demonstrate new features that are not part of the course help show his mastery as well as prepare us for changes in the technology. Great work.
Using Docker & Kubernetes in Production
Oct '18”

“The course was great. The instructor is true Kubernetes Ninja. Loved the hands on approach. Very happy with the course.
Using Docker & Kubernetes in Production
Oct '18”

“I am taking a lot away from this training. Beforehand I had no underlying knowledge of Docker or Kubernetes, but I now feel comfortable to start taking it on in my work environment.
Using Docker & Kubernetes in Production
Oct '18”



Private Team Training

- Fine-tune or re-design your course
- Delivered at your chosen location
- Optional hardware & software supplied

Upcoming public course dates:

See **SCHEDULE** at GuruTeamURL.com or call Neasa on +353(0)1 4029423. Courses available in Ireland, UK, Scandinavia and Europe, both on and off-site.

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GuruTeam are specialists in delivering learning, mentoring and consultancy services in Cloud, Linux, Big Data, DevOps, Kubernetes, Blockchain, IoT, Security, GDPR, Architecture, Software and Web Development Technologies.

Register Your Interest in joining a public course in a city near you.



Kubernetes Administration

(CERTIFIED KUBERNETES ADMINISTRATOR)

GTLFK

“Very relevant, good hands-on experience. Excellent teacher.”
Jan '19”

Course Description

This instructor-led Kubernetes Administration Certification training course covers the core concepts typically used to build and administer a Kubernetes cluster in production, using vendor-independent tools.

We build a cluster, determine network configuration, grow the cluster, deploy applications and configure the storage, security and other objects necessary for typical use. This Kubernetes training course offers exposure to the many skills necessary to administer Kubernetes in a production environment.

This course does not focus on one vendor's tools. Most courses are vendor-locked. We use kubernetes to deploy the cluster and focus on tools that would work on anyone's Kubernetes cluster.

Training Objectives:

In this Kubernetes Administration training course, you will learn how to install and configure a production-grade Kubernetes cluster, from network configuration to upgrades to making deployments available via services. Also handle the ongoing tasks necessary for Kubernetes Administration.

Topics include:

- Installation of a multi-node Kubernetes cluster using kubernetes, and how to grow a cluster.
- Choosing and implementing cluster networking.
- Various methods of application lifecycle management, including scaling, updates and roll-backs.
- Configuring security both for the cluster as well as containers.
- Managing storage available to containers.
- Learn monitoring, logging and trouble-shooting of containers and the cluster.
- Configure scheduling and affinity of container deployments.
- Use Helm and Charts to automate application deployment.

- Understand Federation for fault-tolerance and higher availability.

Target Audience

This course is suitable for anyone who wants to learn the skills necessary to build and administer a Kubernetes cluster.

Course Pre-Requisites

Students should have an understanding of Linux Administration skills, comfortable using the command line. Must be able to edit files using a command-line text editor.

Accreditation

This course is excellent preparation for the **Certified Kubernetes Administrator (CKA)** exam.

Duration 4 Days

About the Certified Kubernetes Administrator (CKA) Program

The Certified Kubernetes Administrator (CKA) program was **created by the Cloud Native Computing Foundation (CNCF), in collaboration with The Linux Foundation**, to help develop the Kubernetes ecosystem.

As the fourth highest velocity open source project, Kubernetes use is exploding. The Cloud Native Computing Foundation is committed to growing the community of Kubernetes Administrators, thereby allowing continued growth across the broad set of companies and organizations that are using Kubernetes.

Certification is a key step in that process, allowing certified administrators to quickly establish their credibility and value in the job market, and also allowing companies to more quickly hire high-quality teams to support their growth.

About the CKA Exam

The online exam consists of a set of performance-based items (problems) to be solved in a command line running Version 1.10.2 and candidates have 3 hours to complete the tasks. Exam is strongly recommended.

Check our Schedule for Public course dates.

Course Content

1. Introduction

- Linux Foundation Training & Certifications
- Laboratory Exercises, Solutions and Resources
- Distribution Details
- Labs

2. Basics of Kubernetes

- Define Kubernetes
- Meaning of Kubernetes
- Adoption
- Project Governance
- Labs

3. Installation and Configuration

- Getting Started With Kubernetes
- Minikube
- kubernetes
- More Installation Tools
- Labs

4. Kubernetes Architecture

- Kubernetes Architecture
- Networking
- Other Cluster Systems
- Labs

5. APIs and Access

- API Access
- Working with First Pod
- Kubectl and API
- Swagger and OpenAPI
- Labs

6. Managing State with Deployments

- Deployment Overview
- Managing Deployment States
- Deployments and Replica Sets
- Labels
- Labs

7. Services

- Overview
- Accessing Services
- DNS
- Labs

8. Volumes and Data

- Volumes Overview
- Volumes
- Persistent Volumes
- Secrets

- ConfigMaps
- Labs

9. Ingress

- Overview
- Ingress Controller
- Ingress Rules
- Labs

10. API Objects

- API Objects
- The v1 Group
- API Resources
- RBAC APIs
- Labs

11. Scheduling

- Overview
- Scheduler
- Policies
- Affinity Rules
- Taints and Tolerations
- Labs

12. Logging & Troubleshooting

- Overview
- Monitoring
- Logging
- Troubleshooting
- Labs

13. Custom Resource Definition

- Overview
- Third-Party Resources
- Custom Resources
- Labs

14. Kubernetes Federation

- Overview
- Federation
- Using Cluster API
- Labs

15. Helm

- Overview
- Helm
- Using Helm
- Labs

16. Security

- Overview
- Accessing the API
- Authentication and Authorization
- Admission Controller
- Pod Policies
- Network Policies
- Labs

About the Cloud Native Computing Foundation The Cloud Native Computing Foundation (CNCF) is an open source software foundation dedicated to making cloud-native computing universal and sustainable. Cloud-native computing uses an open source software stack to deploy applications as microservices, packaging each part into its own container, and dynamically orchestrating those containers to optimize resource utilization. Cloud-native technologies enable software developers to build great products faster.

Docker GTDK1

3-DAY HANDS-ON PROGRAM

Course Overview

This 3-day course covers all the core features of Docker including: container creation and management, interacting with Docker hub, using Dockerfile to create and manage custom images, advanced Docker networking (how to safely expose container services to the world, and link containers), the use of Docker volumes to manage persistent data, and Docker Compose to build multi-container applications. Emphasis is placed on best practices and how to secure Docker installations and containers. The course culminates with comprehensive labs where students use Docker, Git, and a continuous integration server to automate

the testing of containerized applications. This training will get sysadmins proficient with Docker so that they can immediately be productive as organizations continue to move applications onto containers.

Supported Distributions:

- Red Hat Enterprise
- Linux 7
- Ubuntu 16.04 LTS

Target Audience

- System administrators who will need to install and manage Docker hosts.
- Developers who want to use Docker containers.

Register Your Interest in joining a public course in a city near you.

Prerequisites

Proficiency with the Linux CLI. A broad understanding of Linux system administration.



I particularly liked the heavy hands on sessions that went on with the training. Other than that, I really liked the instructor's training style. His experience in the field really shines through.

Feb '19



Course Outline

1. Container Technology Overview

- Instructor Docker Demo
- Application Management Landscape
- Application Isolation
- Resource Measurement and Control
- Container Security
- OverlayFS Overview
- Container Security
- Open Container Initiative
- Docker Alternatives
- Docker Ecosystem
- Docker Ecosystem (cont.)

Lab Tasks

- Container Concepts runC
- Container Concepts Systemd

2. Installing Docker

- Installing Docker
- Docker Architecture
- Starting the Docker Daemon
- Docker Daemon Configuration
- Docker Control Socket
- Enabling TLS for Docker
- Validating Docker Install

Lab Tasks

- Installing Docker
- Protecting Docker with TLS

3. Managing Containers

- Creating a New Container
- Listing Containers
- Managing Container Resources
- Running Commands in an Existing Container
- Interacting with a Running Container

- Stopping, Starting, and Removing Containers
- Copying files in/out of Containers
- Inspecting and Updating Containers
- Docker Output Filtering & Formatting

Lab Tasks

- Managing Containers
- Configure a docker container to start at boot

4. Managing Images

- Docker Images
- Listing and Removing Images
- Searching for Images
- Downloading Images
- Uploading Images
- Export/Import Images
- Save/Load Images
- Committing Changes

Lab Tasks

- Docker Images
- Docker Platform Images

5. Creating Images with Dockerfile

- Dockerfile
- Caching
- Docker image build
- Dockerfile Instructions
- ENV and WORKDIR
- Running Commands
- Getting Files into the Image
- Defining Container Executable
- HEALTHCHECK
- Best Practices
- Multi-Stage builds with Dockerfile

Lab Tasks

- Dockerfile Fundamentals
- Optimizing Image Build Size
- Image Builds and Caching

6. Docker Volumes

- Volume Concepts
- The docker volume Command
- Creating and Using Internal Volumes
- Internal Volume Drivers
- Removing Volumes
- Creating and Using External Volumes
- SELinux Considerations
- Mapping Devices

Lab Tasks

- Docker Internal Volumes
- Docker External Volumes

7. Docker Compose/Swarm

- Writing YAML Files
- Concepts
- Compose CLI
- Defining a Service Set
- Compose Versions
- Docker Engine Swarm Mode
- Docker Swarm Terms
- Docker Swarm Command Overview
- Creating a Swarm
- Creating Services
- Creating Secrets
- Stack Files
- Stack Command
- Swarm Placements
- Swarm Resource Limits & Reservations
- Swarm Networking
- Swarm Networking Troubleshooting

Lab Tasks

- Docker Compose
- Docker Engine Swarm Mode

8. Docker Networking

- Overview
- Data-Link Layer Details
- Network Layer Details
- Hostnames and DNS
- Service Reachability
- Container to Container Communication
- Container to Container: Links (deprecated)
- Container to Container: Private Network
- Managing Private Networks
- Remote Host to Container

Lab Tasks

- Docker Networking
- Exposing Ports
- Docker Networking

9. Docker Logging

- Docker Logging
- Docker Logging with json-file and journald
- Docker Logging with syslog
- Docker Logging with Graylog or Logstash
- Docker Logging with Fluentd
- Docker Logging with Amazon or Google
- Docker Logging with Splunk

Lab Tasks

- Logging to syslog

A. Docker Registry Lab Tasks

- Docker Registry
- Docker Registry (secured)
- Docker Content Trust

Contact us to learn more...

Tel: +353 (0)1 402 9423

+353 (0)91 395 536

(Berlin) +49 30 408192291

Neasa Glynn: +353 (0)87 413 2432

Catherine Ascough: +353 (0)87 832 8545

Email: hello@GuruTeamIRL.com

Dublin

Harcourt Centre, Block 4, Harcourt Road, Dublin 2, Ireland.

Cork

NSC Campus, Mahon, Cork, Ireland.

Galway

Tara Rock 7, Galway Technology Park, Parkmore, Galway.

Belfast

Forsyth House, Cromac Square, Belfast BT2 8LA, Northern Ireland.

Berlin

GuruTeam, Europaplatz 2, 10557 Berlin, Germany.

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