

# Accelerated Kubernetes & Docker Bootcamp **KD250**

## Accelerated Kubernetes training for professionals

The Accelerated Kubernetes and Docker Bootcamp (KD250) is a consolidation of our famous Kubernetes and Docker Bootcamp I (KD100) and Kubernetes and Docker Bootcamp II (KD200) with added content to prepare the student for the [Certified Kubernetes Administrator \(CKA\)](#) exam and still fit into a single week session.

This course requires students to be very familiar with the Linux command line. It is broken up into a number of sections, each section typically includes an instructor-led presentation outlining theory followed by hands-on labs that put that theory into practice.

### Bundle the CKA with our KD250

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 a Kubernetes Certified Service Provider, Mirantis offers a bundle with our KD250 for the CKA which will save you \$50 off the total exam price (\$300). If you'd like to bundle the exam with our class, please email us at [training@mirantis.com](mailto:training@mirantis.com) after you've purchased your KD250 seat.

## Course Details

- Duration: 4 Days
- Hours: 9:00 a.m. - 5:00 p.m.
- Price: \$ 3595.00 USD

## Lab Requirements

- Laptop with WiFi connectivity
- Web browser supporting HTML5
- SSH Client

## Prerequisites

- Strong Linux command line skills
- Basic understanding of JSON and YAML
- Basic understanding of distributed application development and deployment
- Basic understanding of Virtualization and Linux execution environment, processes
- Basic understanding of L2, L3, networking and network namespaces
- Basic understanding of Network Attached Storage (NAS)

## Target Audience

- Developers and system administrators who want to deploy and manage Kubernetes and prepare for the CKA exam

## Course Objectives

- Preparation for the Certified Kubernetes Administrator (CKA) exam

## Outline

### Theory

- What is a container
- What is microservice design pattern
- What is container orchestration

### Docker

- Install Docker
- Use Docker to run and manage containers
- Docker images, image registry, image management
- Docker volumes and networks

### Kubernetes

- Install Kubernetes
- Kubernetes building blocks (pods, deployments, jobs, daemonSets, namespaces, quotas, secrets, configMaps)

### Kubernetes Continued

- Kubernetes services, service discovery, ingress to connect to containers
- Kubernetes labels, selectors, annotations, liveness and readiness probes
- Kubernetes pod scheduling, anti/affinity, taints and tolerations
- Kubernetes architecture, installation, high availability and security principles
- Kubernetes application troubleshooting, logging, and monitoring
- Kubernetes addons

## Day 1

### MODULE 1

#### INTRODUCTION

#### Theory

- Course introduction
- Containers, containerized applications

#### Workshops

- Explore the class environment

### MODULE 2

#### INTRODUCTION TO DOCKER

#### Theory

- Docker overview
- Images, containers, volumes, networks

#### Workshops

- Running a container
- Building an image

### MODULE 3

#### DOCKER BEST PRACTICES

#### Theory

- Image management, Docker Hub and Docker Registry
- Handling graceful termination and exit status

#### Workshops

- Image management

### MODULE 4

#### DOCKER COMPOSE

#### Theory

- Introduction to docker-compose
- Introduction to microservices design pattern

#### Workshops

- Build a multi-container application

### MODULE 5

#### CONTAINER ORCHESTRATION

#### Theory

- Introduction to container orchestration
- Introduction to Kubernetes
- Kubernetes Installation methods

#### Workshops

- Kubernetes Installation using kubeadm

## Day 2

### MODULE 6

#### KUBERNETES INTRODUCTION AND CONCEPTS

#### Theory

- Main Kubernetes building blocks (API Resources)
- Kubernetes API, kubectl options/shortcuts, accessing API using curl

#### Workshops

- Pods, volumes, labels, annotations
- Deployments, services
- Namespaces, quotas
- Kubernetes jobs, cronjobs, daemonSets
- Kubernetes statefulSets, init-containers
- kubectl shortcuts, display options
- kubectl proxy
- kubectl port-forward
- Using curl to access Kubernetes API

MODULE 7

KUBERNETES IN PRODUCTION

Theory

- Cohesive Application Deployment

Workshops

- Creating, configuring, and deploying a multi-tier application

MODULE 8

KUBERNETES ADDONS

Theory

- Kubernetes addons
- Kubernetes ingress/ingress controller
- Kubernetes ClusterDNS, dashboard, ingress

Workshops

- Kubernetes ClusterDNS, dashboard, ingress

Day 3

MODULE 9

KUBERNETES BEST PRACTICES

Theory

- Working with Kubernetes in production
- Private container repository
- Namespaces, quotas
- Multi-container pods, communications between containers in a pod
- Multi-tier applications
- Pods auto-healing
- Workload release and update strategies
- Pods auto-scaling

Workshops

- Multi-container applications
- Multi-container pods
- Pods auto-healing

MODULE 10

KUBERNETES TROUBLESHOOTING

Theory

- Kubernetes Troubleshooting

Workshops

- Cluster Monitoring And Horizontal Autoscaling

MODULE 11

KUBERNETES ARCHITECTURE

Theory

- Kubernetes architecture, components and addons
- Kubernetes components: etcd, kube-proxy
- Pods scheduling
- Kubernetes High Availability (HA)

Workshops

- Static pods
- Node selector
- Taints and tolerations
- Node affinity/anti-affinity
- Pod affinity/anti-affinity
- Custom scheduler

## Day 4

### MODULE 12

KUBERNETES  
SECURITY

#### Theory

- Security goals, roles
- Access to the Kubernetes API, authentication, authorization, RBAC
- Auditing, logging and security event management
- Pods security and isolation
- Storage security
- Traffic isolation and security
- Image security

#### Workshops

- User Authentication and Authorization
- Cluster Auditing
- Network Policy and Traffic Isolation

### MODULE 13

KUBERNETES  
NETWORKING  
DEEPCIVE

#### Theory

- Kubernetes networking overview

#### Workshops

- Tear down the cluster
- Install a Cluster with Calico
- Install a Cluster with Flannel

### MODULE 14

KUBERNETES  
COMPREHENSIVE  
PRACTICE

#### Workshops

- Comprehensive Practice