

# Kubernetes Application Developer (CKAD) Fast Track



Days: 3

**Prerequisites:** Kubernetes Fundamentals, Linux for Absolute Beginners, or any other Formal Linux Training.

**Audience:** This course is designed for Application Developers and Team Leaders who plan to work with Kubernetes at any level or tier of involvement; any company or individual who wants to achieve CKAD Certification; any Developer/Leader expanding their Kubernetes Learning; any company or individual who wants to advance their knowledge of deploying microservices.

**Description:** This accelerated course is designed for students preparing for the Certified Kubernetes Application Developer (CKAD) exam. Building upon foundational Kubernetes knowledge, the CKAD Fast Track course emphasizes application design, deployment, and troubleshooting within a live Kubernetes environment. Through concise lectures and intensive, scenario-based labs, you will develop the skills required to define, build, and manage applications using core Kubernetes resources. Students will practice real-world tasks such as implementing probes, configuring security contexts, deploying multi-container Pods, and managing workloads with Deployments, Jobs, and CronJobs.

This course goes beyond theory—each module reinforces exam-level proficiency through hands-on CKAD practice labs, mirroring the time-sensitive and practical nature of the certification exam. By the conclusion of this training, you will possess the applied expertise and confidence to succeed on the CKAD exam and to design, deploy, and maintain cloud-native applications in production Kubernetes environments.

**Course Objectives:** In this course, you will:

- Initialize and manage a Kubernetes cluster using automation tools such as Ansible
- Build, configure, and deploy containerized applications using Kubernetes primitives
- Define, create, and modify Kubernetes resource manifests efficiently with YAML
- Implement resource requests, limits, and quotas for effective cluster resource management
- Configure health probes, security contexts, and observability for application reliability
- Manage access control using Contexts, ServiceAccounts, and Role-Based Access Control (RBAC)
- Create and consume ConfigMaps and Secrets for secure and dynamic application configuration
- Configure persistent and ephemeral storage using PersistentVolumes, Claims, and CSI drivers
- Deploy, scale, and update workloads using Deployments, ReplicaSets, DaemonSets, and Jobs
- Design multi-container Pods with init containers and sidecars for advanced application patterns
- Define and apply NetworkPolicies to control traffic flow between Pods and Namespaces
- Expose applications using Services (ClusterIP, NodePort, LoadBalancer) and Ingress controllers
- Template and manage deployments using Helm and Kustomize
- Extend Kubernetes functionality with Custom Resource Definitions (CRDs)
- Troubleshoot application and cluster issues using kubectl tools and debugging strategies

## OUTLINE:

### INITIALIZE KUBERNETES

- Lecture: Kubernetes the Alta3 Way
- Lecture + Lab: Deploy Kubernetes using Ansible

### CONTAINERS

- Lecture: Container Essentials
- Lecture + Lab: Creating a Docker Image

### POD BASICS

- Lecture: Manifests for Pods

- Lecture + Lab: Create and Configure Basic Pods
- CKAD Practice - Pod Basics

### RESOURCE MANAGEMENT

- Lecture: Limits, Requests, and Namespace ResourceQuotas
- Lecture + Lab: Defining Resource Requirements, Limits and Quotas
- CKAD Practice - Resource Requirements

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## CONTAINER HEALTH, SECURITY, AND OBSERVABILITY

- Lecture: Readiness and Liveness Probes
- Lecture + Lab: Implement Probes and Health Checks
- CKAD Practice - Adding Probes

## RBAC

- Lecture: Contexts
- Lecture + Lab: Cluster Access with Kubernetes Context
- Lecture: Role Based Access Control
- Lecture + Lab: Service Accounts
- CKAD Practice - ServiceAccounts

## EPHEMERAL STORAGE

- Lecture: ConfigMaps and Volume Mounting
- Lecture + Lab: Persistent Configuration with ConfigMaps
- Lecture: Secrets
- Lecture + Lab: Create and Consume Secrets
- CKAD Practice - Secrets

## PERSISTENT STORAGE

- Lecture: Persistent Volumes, Claims, and StorageClasses
- Lecture + Lab: Using PersistentVolumeClaims for Storage
- Lecture: Persistent Volumes with CSI
- Lecture + Lab: CSI Storage Solution: NFS
- CKAD Practice - Storage

## DEPLOYMENTS

- Lecture: ReplicaSets
- Lecture: DaemonSets
- Lecture: Deployments - Purpose and Advantages
- Lecture + Lab: Create and Configure a Deployment
- CKAD Practice - Deployments
- Lecture: Deployments Rollout
- Lecture + Lab: Performing Rolling Updates and Rollbacks
- CKAD Practice - Rollbacks
- Lecture: Blue/Green and Canary Deployment Strategies
- Lecture + Lab: Advanced Deployment Strategies

- Lecture: Deployments - Horizontal Scaling
- Mastery Challenge - Horizontal Pod Autoscaler

## MULTI-CONTAINER POD DESIGN

- Lecture: Multi-Container Pods
- Lecture + Lab: Configuring a Fluentd Logging Sidecar
- Lecture: Init Containers
- Lecture + Lab: Using Init Container for Pod Initialization
- CKAD Practice - Multi-Container Pods

## JOBS AND CRONJOBS

- Lecture: Jobs and CronJobs
- Lecture + Lab: Running and Executing a Job
- Lecture + Lab: Scheduling a CronJob
- CKAD Practice - Jobs and CronJobs

## NETWORKPOLICY

- Lecture: NetworkPolicy
- Lecture + Lab: Network Policy Basics
- Lecture + Lab: Namespace Network Policy
- CKAD Practice - Network Policies

## SERVICES AND INGRESS

- Lecture: Networking with Services
- Lecture + Lab: Expose Applications via Services
- Lecture: Networking Plugins
- Lecture: Ingress Controllers
- Lecture + Lab: Expose Applications via Ingress Controllers
- CKAD Practice - Services

## DNS

- Lecture: Hostnames and FQDNs
- Lecture + Lab: Utilizing FQDNs

## HELM AND KUSTOMIZE

- Lecture: Helm
- Lecture + Lab: Making Charts and Templates with Helm
- Lecture + Lab: Deploy Existing Packages via Helm
- Lecture + Lab: Using Kustomize
- CKAD Practice - Helm

## EXTENDING KUBERNETES

- Lecture: Custom Resource Definitions
- Lecture + Lab: Introduction to CRDs

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## TROUBLESHOOTING

- Troubleshooting

## CKAD

- Lecture: Tips to Pass your CKAD Exam!