

Certified Kubernetes Administrator Training

Alta3 Research Authorized Training · Applied Technology Academy

This class prepares students for the Certified Kubernetes Administrator (CKA) exam. Kubernetes is a Cloud Orchestration Platform providing reliability, replication, and stability while maximizing resource utilization for applications and services. By the conclusion of this hands-on, vendor agnostic training you will go back to work with the knowledge, skills, and abilities to design, implement, and maintain a production-grade Kubernetes cluster. We prioritize covering all objectives and concepts necessary for passing the Certified Kubernetes Administrator (CKA) exam. You will be provided the components necessary to assemble your own high availability Kubernetes environment and configure, nexpend, and control it to meet the demands made of cluster administrators. Your week of intensive, hands-on training will conclude with a mock CKA exam that simulates the real exam.

LEVEL	DURATION	EXPERIENCE	AVERAGE SALARY	LABS
Intermediate	5 Days	3 years: Cloud Computing	\$121,000	Yes

Course Overview

What You'll Learn:

- Cluster architecture, installation, and configuration
- Rolling out and rolling back applications in production
- Scaling clusters and applications to best use
- How to create robust, self healing deployments
- Networking configuration on cluster nodes, services, and CoreDNS
- Persistent and intelligent storage for applications
- Troubleshooting cluster, application, and user errors
- Vendor-agnostic cloud provider-based Kubernetes

Course Outline

- **Lesson 1: Cluster Architecture**
 - Kubernetes Architecture
 - Pods and the Control Plane
- **Lesson 2: Installation**
 - Kubeadm Prerequisites
 - Kubeadm Prerequisites
 - Configure Network Plugin Requirements
 - Configure Network Plugin Requirements
 - Kubeadm Basic Cluster

- Installing Kubeadm
- Join Node to Cluster
- Join Node to Cluster
- **Lesson 3: Cluster Administration**
 - ETCD Snapshot and Restore
 - ETCD Snapshot and Restore
 - Kubeadm Cluster Upgrade
 - Kubeadm cluster upgrade
 - Purge Kubeadm
 - Purge Kubeadm
 - k8s with Ansible
 - Deploy Kubernetes using Ansible
- **Lesson 4: Containers**
 - Container Essentials
 - Creating a Docker Image
- **Lesson 5: Kubectl**
 - Kubectl get and sorting
 - kubectl get
 - kubectl describe
- **Lesson 6: Pod Basics**
 - Namespaces
 - Namespaces
 - YAML
 - Manifests
 - Basic Pods
 - API Versioning and Deprecations
- **Lesson 7: Resource Management**
 - Kubectl Top and Application Monitoring
 - Limits, Requests, and Namespace ResourceQuotas
 - Resource Requests and Limits
 - Namespace Resource Quota
- **Lesson 8: User Administration**
 - Contexts
 - Contexts
 - Authentication and Authorization
 - Role Based Access Control
 - Role Based Access Control

- RBAC Distributing Access
- **Lesson 9: Advanced Pod Design**
 - Multi-Container Pods
 - Multi-Container Pod Design Patterns
 - Init Containers
 - Understand the Init Container Multi-Container Pod Design Pattern
 - Readiness and Liveness Probes
 - Implement Probes and Health Checks
 - ConfigMaps and Volume Mounting
 - Persistent Configuration with ConfigMaps
 - Secrets
 - Create and Consume Secrets
 - Taints, Tolerations, and Pod Affinity
 - Tainted Nodes and Tolerations
- **Lesson 10: Logging and Troubleshooting**
 - Logging with kubectl log
 - Advanced Logging Techniques
 - Cluster, Node, and Container Logging
 - Ephemeral Storage for Fluentd Logging Sidecar
- **Lesson 11: Deployments**
 - Deployments – Purpose and Advantages
 - Writing a Deployment Manifest
 - Deployments – Version Control
 - Performing Rolling Updates and Rollbacks with Deployments
 - Deployments – Horizontal Scaling
 - Horizontal Scaling with kubectl scale
 - Horizontal Pod Autoscaling
- **Lesson 12: Persistent Storage**
 - Persistent Volumes, Claims, and StorageClasses
 - PVC, PV, and StorageClass config
 - Persistent Storage with NFS
- **Lesson 13: Services & Networking**
 - Services – LoadBalancer, NodePort, and ClusterIP
 - Host Networking
 - Access to applications via services
 - Networking Plugins
 - Ingress Controllers

- Ingress Controllers Expose a Service

- **Lesson 14: DNS**

- Hostnames and FQDNs
- Hostnames and FQDNs
- CoreDNS
- Install CoreDNS
- Configure CoreDNS
- Configure CoreDNS
- Revert CoreDNS to KubeDNS

Intended Audience

- Professionals who need to maintain or set up a Kubernetes cluster
- Container Orchestration Engineers
- DevOps Professionals

Prerequisites

This course is intended for students who have the basic knowledge of the core components of Kubernetes, such as Pods and Deployments.

It is suggested that students take the Kubernetes Bootcamp course prior to taking the Certified Kubernetes Administrator course. However, instructors will always strive to assure every student gains a very thorough understanding of the material covered, regardless of the students' prior experience.

Follow-On Courses

- Windows Server Administration (55371)
- Microsoft Administering Windows Server Hybrid Core Infrastructure (AZ-800)
- Microsoft Azure Security Technologies (AZ-500)
- Azure Administrator (AZ-104) and Azure Security Technologies (AZ-500)

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