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## CTR-501 Kubernetes

### Overview

#### *About This Course*

Basic software knowledge

#### *Audience Profile*

For Devops, IT specialists, Full stack developers and automation engineers

#### *At Course Completion*

At the end of the course the student will master K8S

#### *Course outline*

Introduction:

- Overview of containers and container orchestration
- Understanding the need for Kubernetes

Cluster Setup and Configuration:

- Setting up a multi-node Kubernetes cluster
- Configuring networking, storage, and security options

Pods and Replication Controllers:

- Understanding pods and how they represent applications in Kubernetes.
- Creating and managing replication controllers for high availability
- Services and Networking:
- Creating and exposing services for applications in a cluster
- Understanding network communication within a cluster

Deployments and Rollouts:

- Creating and managing deployments for application updates
- Rolling out updates, rollbacks, and scaling applications

Stateful Sets and Persistent Volumes:

- Understanding stateful applications and their requirements
- Managing persistent storage for stateful applications

ConfigMaps and Secrets:

- Managing configuration data in Kubernetes
- Securing sensitive information using secrets

Autoscaling and Performance Optimization:

- Autoscaling applications based on resource utilization.
- Optimizing resource usage and performance in a cluster

Troubleshooting and Monitoring:

- Debugging and troubleshooting issues in a cluster
- Monitoring resource usage, logs, and events in a cluster

Custom Resource Definitions and Operator Development:

- Creating custom resources in Kubernetes
- Developing custom operators for managing complex applications

Project:

- Designing and deploying a real-world application on a Kubernetes cluster