



Real Time College

Course: Kubernetes

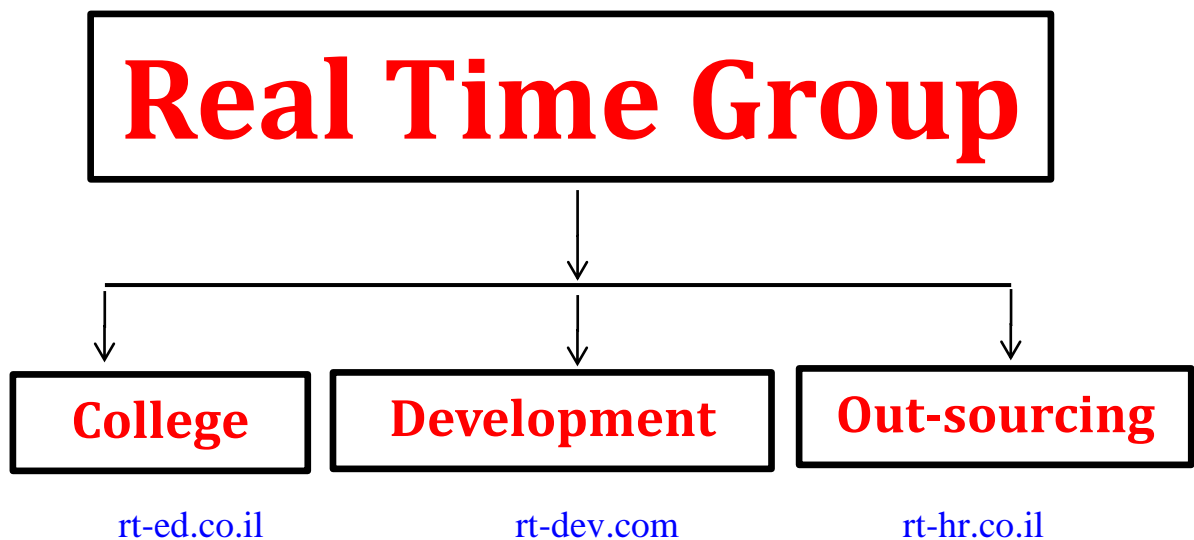
Duration: 30 Hours (6 meetings)

Hands-On-Training: 75%

Real Time Group is a multi-disciplinary dynamic and innovative Software Solutions Center, established in 2007.

Providing Bare-Metal and Embedded Linux solutions, professional services and consulting, end-to-end flexible system infrastructure, outsourcing, integration and training services for Hardware, Software and RT-OS \ Embedded Systems.

The company is divided into the following three Divisions:



Training Division:

Professional Training Services for Hardware, Software, RT-OS and Embedded systems industries.

We provide the knowledge and experience needed to enable professional engineers to Develop, Integrate and QA Hardware, Software and Networking Projects.

In order to insure experience, all courses are practical – hands-on-training. The latest Development, QA and Automation equipment which are adopted by the industry are used.

All students are supplied with access to Virtual Machines for home-work and course projects.

Course Overview:

This course aims to teach you how to deploy, use, and maintain your applications on Kubernetes. Rather we like it or not, Containers are here to stay!

This course will teach you how to efficiently manage them with Kubernetes.

The course starts with introduction to containers, fundamentals of Kubernetes concepts, then we'll go through installing Kubernetes, followed by Kubernetes architecture, we'll learn how to install and configure and deploy Kubernetes on cloud platforms.

Who should attend:

- This Course is intended for Devops personal or programmers who would like to learn how to manage containers through Kubernetes.

Prerequisite:

- Understanding of Software Development Life Cycle.
- Knowledge about Linux is mandatory.
- Experience with Docker is preferable but not mandatory
- AWS is a plus, but not mandatory to be able to do the course

Kubernetes Course Outline

1. **Introduction to Kubernetes**
 - a. What is Kubernetes used for?
 - b. From Monolith to Microservices
 - c. How the Cluster Operates
 - d. Adjust, Secure, and Tune the Cluster
 - e. Responding When Things Go Wrong
 - f. Extending the System with New and Custom Functionality
 - g. Summary

2. **Instating Kubernetes - Preparing Your Environment**
 - a. Kubeadm \ kubelet
 - b. Installing the Control Plane
 - c. kubeadm Configuration
 - d. Preflight Checks
 - e. etcd
 - f. kubeconfig
 - g. Installing Worker Nodes
 - h. Add-Ons
 - i. High Availability
 - j. Upgrades

3. **An Overview of Kubernetes**
 - a. Container Orchestration
 - b. The Kubernetes API
 - c. Basic Objects: Pods, ReplicaSets, and Services
 - d. Organizing Your Cluster with Namespaces, Labels, and Annotations
 - e. Advanced Concepts: Deployments, Ingress, and StatefulSets
 - f. Cluster Agents and Utilities: DaemonSets

4. **Kubernetes Architecture**

- a. Declarative Configuration
- b. Reconciliation or Controllers
- c. Implicit or Dynamic Grouping
- d. Head Node Components
- e. Components On All Nodes
- f. Scheduled Components

5. **Kubernetes Implementation**

- a. Setting Up a Single Node Kubernetes Cluster
- b. Kubernetes Building Blocks
- c. Deploying a Stand-Alone Application
- d. Kubernetes Volume Management
- e. ConfigMaps and Secrets **(Based on Timing Constraints)**
- f. Ingress
- g. Advanced Topics – Overview **(Based on Timing Constraints)**
- h. HELM packaging and deployment **(Based on Timing Constraints)**
- i. Kubernetes Community
- j. Final Exam