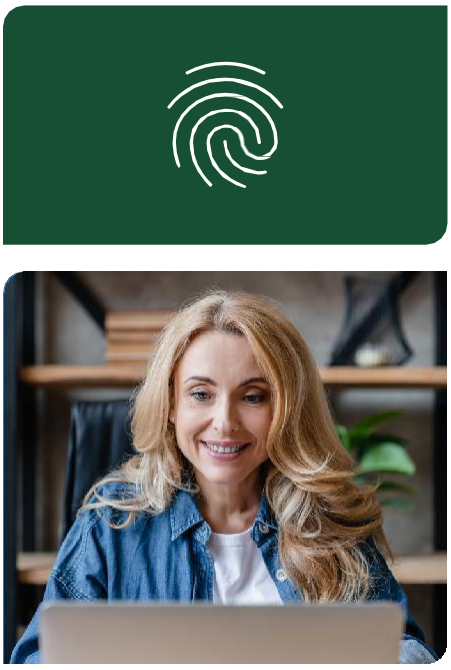
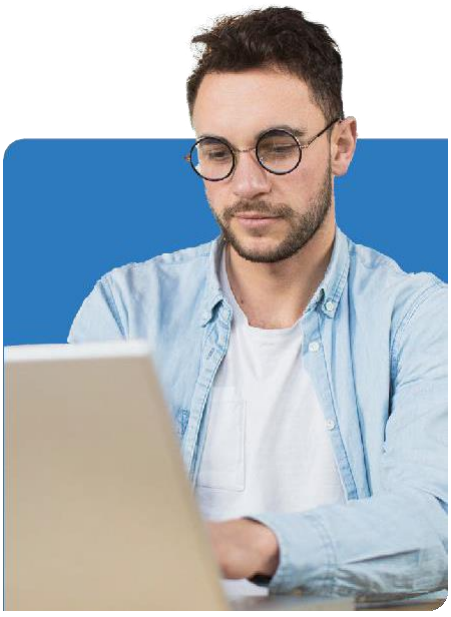
ThriveDX™

Kubernetes Basic to Advanced

TDXAD-104





ThriveDX Kubernetes Basic to Advanced

Time Commitment
3 days (total of 24 hours / 8 hours per day)

Skill Level
Professional Level

Course Category
Agile & Devops

Microservices are the emerging basis for the new application platform. It is the architecture that will serve as the basis for many applications over the next 10 years. There's a good reason for this: the advantages associated with microservices, such as their allowance for agile development and artifacts and an architecture that enables businesses to develop and roll out new digital offerings faster, make it the obvious choice.

Containers are the most common way of developing and delivering applications and IT infrastructure for microservices applications.

Now comes the question - how will we run our containers workload in production?

Kubernetes is arguably the most important container management technology in the world. This Seminar will take you from the basics of K8S objects to the depths of utilizing K8S as your multi-tier microservices application backbone, from theory to best practices, planning a microservices architecture, migrating from Monolith to microservices design, utilizing ingress controllers, along with deploying and packaging with Helm and ARGOCD, securing with RBAC, EKS (AWS Elastic Kubernetes, a cloud based managed Kubernetes solution).

Objectives

- Setup Kubernetes on a High Scale
- Develop & create Service in Containers Orchestration Framework
- Design microservices architecture with K8S
- Work with Ingress controllers for L7 traffic management
- HELM packaging and deployment using ARGOCD

Prerequisites

- Microservices Basic Seminar
- Docker basic to advanced Seminar

Program Structure

Module 1: Basic I 16 Hours

Introducing K8S

- Kubernetes Foundations
- K8S Architecture and design
- K8S Objects
- K8S Volumes
- K8S StateLess and Stateful applications
- Daemonsets
- microservices Design and best practices in the world of K8S
- DevOps / Developers - who is responsible for what?

Core Concepts of Kubernetes

- Cluster Orchestration
- Benefits
- Design Principles

Navigating Kubernetes Architecture

- Deployment design + best practices + HA
- Automation for CI/CD - Overview
- Monitoring in the world of microservices and K8S - Overview

- Master/Node
- Kubectl
- Replication Controller
- Kubelet
- Kube-Proxy
- Persistent Volumes
- Etcd
- High Availability
- Auto Scaling
- Base on metrics

Using Kubernetes Features

- Adv. using Pods
- Adv. using Labels
- Adv. using Services
- Adv. using Namespaces
- Adv. using Resource Quota

Networking and advance Kubernetes

- Docker Networking
- Kubernetes Networking
- Pod to Pod
- Exposing Services
- IP Per Pod
- Inter Pod Communication
- Intra Pod Communication

Ingress Controllers

- Nginx
- Common controller overview

Continuously Developing into K8S

- Using K8S Kind (K8s Cluster per Developer)
- Using EKS (AWS managed Kubernetes solution)
- Workshop - Building Custom deployments and Ingress by the developers.

Module 2 - Advance for operation I 8 hours

- CI/CD Into K8S Using Argo and containers Pipelines

Security

- Pods Policy
- Pods Security

POD Scheduling

- Affinities / Anti-affinities
- Node selectors
- Taints & tolerations

Accessing Services

- K8S Services & Services types
    - Load Balancing and Traffic shaping
    - Ingress & Ingress controllers (IC)
- Service discovery in Kubernetes

Resource Management

- Setting resources requests and limits
- Resource quotas
- HPA (Horizontal Pod Auto Scaling)

Deployment & Upgrades

- Canary deployment
- Rolling updates and revisions
- A/B Testing, BlueGreen & Canary deployments

HELM

- Overview
- Best practices

K8S Operations

- Centralized logging and monitoring using ECK
    - ELASTIC CLOUD K8S Operators
    - Monitoring with Prometheus Exporters + Alertmanager and Grafana
        - Deploy a centralized full fledged monitoring solution for your K8S infrastructure.
- Authentication - Review
    - Basic auth in K8S
    - Auth using a proxy
    - OpenID Auth

Authorization - Review

- Intro
- RBAC

- K8S Operators - Review
- Jobs and Cronjobs
- Scheduling - Review
    - Scheduling with CronJobs

TDX

The ThriveDX Advantage

1 Handcrafted Training Programs

2 State-Of-The-Art Learning Materials

3 Israel's Premier Training Center

4 Fueled by Industry Leading Experts

5 Over 20 Years of Proven IT Education Success