Kubernetes – Introduction, Tekton, Kyverno and CRD

Duration: 5days (8hrs/day)

Prerequisites:

- Basic knowledge of Linux Server Administration.

- Having Knowledge of Containers and Kubernetes

Kubernetes Version: Latest

Lab Requirement: Koenig-DC

Module 1 – Docker Containerization Essentials

Introduction to Docker

Installing Docker

Managing Containers – Start, Stop, Delete

Container Port Mapping

Creating Images using Dockerfile

Pushing Images to DockerHub

Module 2 – Kubernetes Application Essentials

Introduction to Kubernetes

Kubernetes Architecture

Overview of Kubernetes Resources with basic practical – Pods, Replica Set, Deployments, Daemonsets

Module 3 – Tekton CI/CD Pipelines

Overview of Jenkins

What is CI/CD?

What is Tekton?

Tekton Architecture

Working with Pipeline

Workspaces

Authentication

Cluster Tasks

Resolvers

Tekton Triggers

Event Listener

Trigger Binding

Trigger Template

Interceptor

Tekton CLI

Tekton Plugins

Tekton Dashboard

Tekton Hub

Module 4 - Kubernetes Policies with Kyverno

The importance of Kubernetes policies: Why we need them

Setting up Kyverno in Kubernetes

Creating Basic Kyverno Policies

Advanced Policy Creation in Kyverno

Mutating Policies in Kyverno

Policy Validation and Testing with Kyverno

Module 5 - Custom Resources in Kubernetes

Introduction to Custom Resources

Why Customize Kubernetes

Custom Resources

Custom Resource Definition

Lab: Creating Objects from Custom Resources

Controllers and the Kubernetes Control Loop

Built in Controllers

Lab: Interacting with the kube-controller-manager

Why Custom Controllers?

Lab: Creating a Custom Controller

Deploying Custom Controllers

What are Operators

Bootstrapping an Operator

Lab: Using the Operator SDK to Bootstrap an Operator

Creating Operators with the Operator SDK

Custom Resource Subresources

Lab: Creating the operator's Custom Resource Types

Lab: Implementing the Operator's Business Logic

Lab: Configuring and Deploying an Operator

Schedulers Overview

Lab: Exploring the Built-in Scheduler

Creating Custom Schedulers

Lab: Creating a Custom Scheduler

Module 6 - Helm Kubernetes Package Manager

Introduction to Helm

Installing Helm

Managing Repositories

Managing Packages through Helm Charts

Creating Helm Chart