

## **Kubernetes Architecture**

### **Learning Objective:**

Explore the Kubernetes architecture along with the terminology, components, architecture, and more

### **Topics**

- Kubernetes Terminology
- Kubernetes Components
- Kubernetes Cluster Architecture
- Understanding Kubernetes Master Components
- Understanding Kubernetes Node Components

## **Kubernetes Setup and Validation**

### **Learning Objective:**

Learn to deploy Kubernetes clusters using various tools

### **Topics**

- Understanding different tools for deploying Kubernetes Cluster
- Release Binaries, Provisioning and Types of Clusters
- Building the Kubernetes Cluster using kubeadm
- Installing Kubernetes Master and Nodes
- Configuring Secure Cluster Communications
- Testing the Cluster

## **Working with Pod**

### **Learning Objective:**

Learn to work with different kinds of pods and how to use them effectively

### **Topics**

- Pod Overview
- Understanding Pod Lifecycle
- Multi-container Pod
- Static Pod
- Init Containers
- Labels, Selectors & Annotations

## **Kubernetes Networking and Service**

### **Learning Objective:**

Learn networking in Kubernetes and various types of services

### **Topics**

- Cluster Communications
- Pod and Node Networking
- Container Network Interface (CNI)
- Service Networking: ClusterIP, NodePort & Load Balancer
- Ingress Rules
- Cluster DNS
- Network Policies

## **Working with Kubernetes Scheduler**

### **Learning Objective:**

Learn how to use the various features of Kubernetes scheduler

### **Topics**

- Pod Scheduling within the Kubernetes Cluster
- Configuring the Kubernetes Scheduler
- Running Multiple Schedulers for Multiple Pods
- Taints, Tolerances, Node Selector, labels & Selectors
- Scheduling Pods with Resource Limits and Label Selectors

- Displaying Scheduler Events

## **Storage**

### **Learning Objective:**

Learn how to work with Kubernetes Volume Service

### **Topics**

- Managing Data in the Kubernetes Cluster
- EmptyDir, hostPath, PV, PVC, StorageClass
- Volume Access Modes
- Applications with Persistent Storage
- ConfigMaps, Secrets

## **Security**

### **Learning Objective:**

Learn the features of security with reference to Kubernetes

### **Topics**

- Securing the Kubernetes Cluster
- Kubernetes Security Primitives
- Cluster Authentication and Authorization
- Creating TLS Certificates
- Service Accounts, Users
- Roles and Role Bindings
- ClusterRole and Cluster Role Binding
- KubeConfig, Security Context

## **Logging and Monitoring**

### **Learning Objective:**

Find out how to manage and monitor logs and events

## **Topics**

- Describe Resources
- Pod/container logs
- Metric Server & top command

## **Managing Cluster**

### **Learning Objective:**

Learn to work with Kubernetes Clusters

## **Topics**

- Managing the Kubernetes Cluster
- Upgrading the Kubernetes Cluster
- Backing Up and Restoring a Kubernetes Cluster

## **Troubleshooting**

### **Learning Objective:**

Learn how to solve issues in Kubernetes

## **Topics**

- Control Plane Failures
- Node Failure
- Application Failure
- Components manifests and errors
- Scenarios and Solutions