

# Kubernetes:(CKA & CKAD)

## Unit-1 Introduction Kubernetes

- Introduction to Kubernetes
- Kubernetes Cluster Architecture
- Core Concept of Kubernetes
- Services
- ETCD & Controller & API & scheduler
- Exploring your Cluster
- Understanding YAML

## Unit-2 Installation

- Installation using kubeadm utility in HA mode
- Install Kubernetes the hard Way
- Add and remove the Nodes in the existing cluster

## Unit-3 Application Deployment

- Creating a Deployment in Kubernetes using YAML
- Creating a Service in Kubernetes
- Understanding about pod, Replication & Deployment configuration
- Using Rolling Updates in Kubernetes
- Deployment Strategy
- Ramped & Canary & blue-green strategy labs
- Configure Environment variable in application
- Configure secret resource for sensitive value
- Creating Config Map

- Scale Applications
- Multi Container PODs ( Sidecar & Ambassador pattern )
- Init Containers & static Pod

## Unit-4 Storage Management

- Creating Persistent volume
- Persistent Volume Claim & Storage Class
- Volume claim policy understanding
- Attach storage on deployment
- CSI Installation (Container Storage Interface)
- Dynamic Volume creation using Block and NAS storage
- NFS & EBS & Local volume

## Unit-5 Pod Scheduling

- Manual Scheduling
- Labels and Selectors
- Taints and Tolerations
- Node Selectors
- Node Affinity
- Configuring Kubernetes Scheduler

## Unit-6 Resource Allocation

- Restrict Limit Memory & CPU usages
- Creating Resource Quota
- Creating Limit Quota

## Unit-7 Networking

- Pod Network Arch
- Install Calico Network
- Service Discovery
- CORE-DNS
- Ingress Controllers
- Metal LB
- Network Policy
- External Load Balancer Integration

## Unit-8: STS & STL

1. Statefulset Deployment & Stateless Deployment
2. Deployment DB & Application

## Unit-9 Pod Security

- Authentication
- TLS Introduction
- Certificate System kubernetes
- Creating Certificate
- Role base Access Controls
- Cluster Role and Role Binding
- Service Account & Token
- Contexts configuration

## Unit-10: Monitoring

Prometheus Introduction and Arch  
Installation & Configuration with Kubernetes  
Grafana Integration  
Dashboard configuration