Certified Kubernetes Administrator (CKA)

This document provides the curriculum outline of the Knowledge, Skills and Abilities that a Certified Kubernetes Administrator (CKA) can be expected to demonstrate.

Contents:

Installation, Configuration & Validation

- Design a Kubernetes cluster.
- Install Kubernetes masters and nodes, including the use of TLS bootstrapping.
- Configure secure cluster communications.
- Configure a Highly-Available Kubernetes cluster.
- Know where to get the Kubernetes release binaries.
- Provision underlying infrastructure to deploy a Kubernetes cluster.
- Choose a network solution.
- Choose your Kubernetes infrastructure configuration.
- Run end-to-end tests on your cluster.
- Analyse end-to-end tests results.
- Run Node end-to-end tests.

Scheduling

- Use label selectors to schedule Pods.
- Understand the role of DaemonSets.
- Understand how resource limits can affect Pod scheduling.

- Understand how to run multiple schedulers and how to configure Pods to use them.
- Manually schedule a pod without a scheduler.
- Display scheduler events.
- Know how to configure the Kubernetes scheduler.

Security

- Know how to configure authentication and authorization.
- Understand Kubernetes security primitives.
- Know to configure network policies.
- Create and manage TLS certificates for cluster components.
- Work with images securely.
- Define security contexts.
- Secure persistent key value store.
- Work with role-based access control.

Storage

- Understand persistent volumes and know how to create them.
- Understand access modes for volumes.
- Understand persistent volume claims primitive.
- Understand Kubernetes storage objects.
- Know how to configure applications with persistent storage.

Networking

- Understand the networking configuration on the cluster nodes.
- Understand Pod networking concepts.
- Understand service networking.
- Deploy and configure network load balancer.
- Know how to use Ingress rules.
- Know how to configure and use the cluster DNS.
- Understand CNI.

Application Lifecycle Management

- Understand Deployments and how to perform rolling updates and rollbacks.
- Know various ways to configure applications.
- Know how to scale applications.
- Understand the primitives necessary to create a self-healing application.

Cluster Maintenance

- Understand Kubernetes cluster upgrade process.
- Facilitate operating system upgrades.
- Implement backup and restore methodologies.

Core Concepts

- Understand the Kubernetes API primitives.
- Understand the Kubernetes cluster architecture.
  Understand Services and other network primitives.

Logging/Monitoring

- Understand how to monitor all cluster components.
- Understand how to monitor applications.
- Manage cluster component logs.
- Manage application logs.

Troubleshooting

- Troubleshoot application failure.
- Troubleshoot control plane failure.
- Troubleshoot worker node failure.
- Troubleshoot networking.