Certified Kubernetes Administrator (CKA) exam:

Exam Overview

- **Focus:** Validates the skills required to perform the responsibilities of a Kubernetes administrator in the industry.
- **Type:** Hands-on, performance-based test.
- **Format:** Online, proctored.
- **Duration:** 2 hours.
- **Domains Covered:**
  - **Cluster Architecture, Installation, & Configuration:** 25%
  - **Workloads & Scheduling:** 15%
  - **Services & Networking:** 20%
  - **Storage:** 10%
  - **Troubleshooting:** 30%

Preparation Guide

1. **Topics to Study:**
   - Installing Kubernetes clusters using tools like `kubeadm`.
   - Managing workloads, including Deployments, Pods, and Jobs.
   - Configuring networking components such as Services, Ingress, and NetworkPolicies.
   - Debugging issues in clusters and resolving them.
   - Persistent storage setup and management【62】【64】.
2. **Practice Resources:**
   - CNCF Candidate Handbook and Curriculum Overview【63】【64】.
   - Labs and simulations available through platforms like KodeKloud and Killer.sh【64】.
   - Free introductory courses like CNCF's *Introduction to Kubernetes*【64】.
3. **Tools to Enable Success:**
   - Set up a local Kubernetes environment with Minikube or Kind.
   - Use the official Kubernetes documentation during the exam (it's allowed).

Exam Details

- **Fee:** $395 (includes one free retake)【62】【64】.
- **Pass Mark:** Specific passing criteria are not disclosed by CNCF but aim to complete all tasks accurately within the time limit【62】【64】.

Sample Question

Scenario: A pod is failing due to an incorrect image name. Debug and update the pod configuration to ensure it runs successfully.
Command Line Tasks:

- Check pod status: `kubectl get pods`.
- View logs: `kubectl logs <pod-name>`.
- Edit and fix deployment: `kubectl edit deployment <deployment-name>`.

Here are more **sample questions and areas to focus on for the CKA exam**:

Cluster Architecture, Installation, and Configuration (25%)

1. **Install Kubernetes cluster using `kubeadm`:**
    - Set up a Kubernetes cluster with a control plane and worker nodes.
    - Example Task:
        - Install Kubernetes with `kubeadm init --pod-network-cidr=192.168.0.0/16`.
        - Join worker nodes using the `kubeadm join` command.
2. **Configure cluster networking:**
    - Install a network plugin like Calico or Flannel.
    - Example Question:

Apply a pod network plugin YAML:
kubectl apply -f https://docs.projectcalico.org/manifests/calico.yaml

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3. **Upgrade Kubernetes version:**
    - Upgrade clusters using `kubeadm` and update kubelet/kubectl.

Workloads and Scheduling (15%)

1. **Pod Creation and Management:**
    - Create pods using YAML files or imperative commands.

Example Task:
Create a pod using a YAML file:
apiVersion: v1

kind: Pod

metadata:

name: nginx

spec:

containers:

- name: nginx

image: nginx

Apply it:
kubectl apply -f pod.yaml

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2. **Node Affinity and Taints:**
    - Configure node affinity rules to restrict pod placement.
    - Example Question:

Schedule a pod only on nodes with a specific label (e.g., `environment: dev`):
affinity:

nodeAffinity:

requiredDuringSchedulingIgnoredDuringExecution:

nodeSelectorTerms:

- matchExpressions:

- key: environment

operator: In

values:

- dev

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3. **Job and CronJob Management:**
    - Manage batch jobs and recurring tasks.
    - Example Question:

Create a CronJob to run every 5 minutes:
apiVersion: batch/v1

kind: CronJob

metadata:

name: example

spec:

schedule: "*/5 * * * *"

jobTemplate:

spec:

template:

spec:

containers:

- name: hello

image: busybox

command: ["echo", "Hello Kubernetes"]

restartPolicy: OnFailure

Services and Networking (20%)

1. **Create Services:**

Example Task: Create a LoadBalancer service:

```
apiVersion: v1
kind: Service
metadata:
  name: nginx-service
spec:
  type: LoadBalancer
  selector:
    app: nginx
  ports:
  - protocol: TCP
    port: 80
    targetPort: 80
```

Use the command:

```
kubectl apply -f service.yaml
```

2. **Ingress Configuration:**
    - Create and expose applications via Ingress.
3. **Network Policies:**
    - Example Question: Write a NetworkPolicy to allow traffic only from pods in the same namespace.

Storage (10%)

1. **Persistent Volumes (PV) and Persistent Volume Claims (PVC):**

Example Task: Create a PVC for dynamic provisioning:
```
apiVersion: v1

kind: PersistentVolumeClaim

metadata:

  name: pvc-demo

spec:

  accessModes:

  - ReadWriteOnce

  resources:

    requests:

      storage: 1Gi
```
Apply it:
```
kubectl apply -f pvc.yaml
```

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2. **StorageClass Management:**
   - Use different storage classes to handle storage backends.

Troubleshooting (30%)

1. **Identify Pod Issues:**

Example Question: Debug a failing pod:
```
kubectl logs <pod-name>

kubectl describe pod <pod-name>
```

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2. **Fix Node Failures:**

Example Task: Check node health:
kubectl get nodes

kubectl describe node <node-name>

    ○

3. **Diagnose Cluster Networking:**
    ○ Example Question: Use tools like `kubectl exec` to ping between pods.

Additional Study Resources

1. **CNCF GitHub Curriculum:**
   CNCF offers a detailed curriculum to prepare for the CKA exam. Review it on their GitHub page【63†source】.
2. **Practice Platforms:**
    ○ Killer.sh (CNCF official lab partner).
    ○ KodeKloud hands-on labs.

Let me know if you'd like more tailored questions or additional examples!

How to Register

Register through the **Linux Foundation Training portal**. CNCF also offers wholesale pricing for bulk purchases by training organizations【62】【64】.

Let me know if you'd like additional information or guidance!