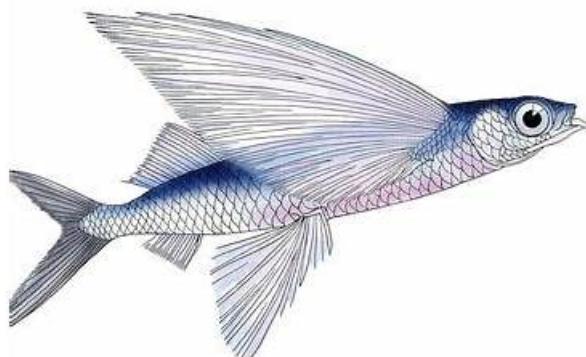


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## Kubernetes and Cloud Native Associate (KCNA) Study Guide

In Depth Exam Prep and Practice



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Linux Foundation KCNA Exam is a comprehensive certification program that covers a wide range of topics related to Kubernetes and other cloud-native technologies. It is a performance-based exam that requires candidates to complete real-world tasks in a Linux environment. Kubernetes and Cloud Native Associate certification is highly regarded in the IT industry and is recognized by many organizations as a benchmark for cloud-native expertise. It is an ideal certification for IT professionals who want to enhance their career prospects and for organizations that want to validate the skills of their employees in Kubernetes and other cloud-native technologies.

Linux Foundation KCNA (Kubernetes and Cloud Native Associate) Exam is a certification program designed to validate the skills of individuals who work with cloud-native technologies. Cloud-native technologies are a collection of software tools and practices that help organizations build and run scalable applications in modern, dynamic environments such as the cloud. KCNA exam is designed to assess the knowledge and skills required to design, deploy, and manage cloud-native applications using Kubernetes and other cloud-native tools.

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## Linux Foundation Kubernetes and Cloud Native Associate Sample Questions (Q180-Q185):

### NEW QUESTION # 180

Explain the difference between a Kubernetes Deployment and a ReplicaSet. When would you use each of these resources?

- A. Deployment is a high-level resource that manages the lifecycle of ReplicaSets, while ReplicaSet is a low-level resource that manages a set of Pods with the same template.
- B. ReplicaSet is a high-level resource that manages the lifecycle of Deployments, while Deployment is a low-level resource that manages a set of Pods with the same template.
- C. Deployment is a low-level resource that manages the lifecycle of ReplicaSets, while ReplicaSet is a high-level resource that manages a set of Pods with the same template.
- D. ReplicaSet is a low-level resource that manages the lifecycle of Deployments, while Deployment is a high-level resource that manages a set of Pods with the same template.
- E. Deployment and ReplicaSet are interchangeable, and both manage the lifecycle of Pods with the same template.

### Answer: A

Explanation:

A Deployment is a high-level resource that manages the lifecycle of ReplicaSets. It defines the desired number of replicas, the pod template, and handles updates and rollbacks. A ReplicaSet is a low-level resource that manages a set of Pods with the same template. It ensures that the desired number of Pods are running based on the defined selector and ensures that pods are replaced when needed. You would use a Deployment for managing updates, rollbacks, and scaling of your application. You would use a ReplicaSet if you only need to manage a set of Pods with the same template and don't require the features provided by a Deployment.

### NEW QUESTION # 181

You are using Prometheus to monitor a Kubernetes cluster. You want to set up an alert that triggers when the average CPU usage of all nodes in the cluster exceeds 80% for the last 10 minutes. Which Prometheus query can achieve this?

- A. 

```
LINUX
sum(node_cpu_seconds_total{mode="system"}[10m]) > 0.8
```
- B. 

```
LINUX
avg_over_time(node_cpu_seconds_total{mode="system"}[10m]) > 0.8
```
- C. 

```
LINUX
sum(node_cpu_seconds_total{mode="user"}[10m]) > 0.8
```
- D. 

```
LINUX
avg_over_time(node_cpu_seconds_total[10m]) > 0.8
```
- E. 

```
LINUX
avg_over_time(node_cpu_seconds_total{mode="user"}[10m]) > 0.8
```

### Answer: B

Explanation:

The query `> 0.8` calculates the average system CPU usage across all nodes over the last 10 minutes. The filter ensures that only system CPU usage is considered. If the average exceeds 0.8 (80%), the alert will trigger.

## NEW QUESTION # 182

Which storage operator in Kubernetes can help the system to self-scale, self-heal, etc?

- A. Helm
- B. Rook
- C. Container Storage Interface (CSI)
- D. Kubernetes

### Answer: B

Explanation:

Rook is a Kubernetes storage operator that helps manage and automate storage systems in a Kubernetes-native way, so A is correct. The key phrase in the question is "storage operator ... self-scale, self-heal." Operators extend Kubernetes by using controllers to reconcile a desired state. Rook applies that model to storage, commonly by managing storage backends like Ceph (and other systems depending on configuration).

With an operator approach, you declare how you want storage to look (cluster size, pools, replication, placement, failure domains), and the operator works continuously to maintain that state. That includes operational behaviors that feel "self-healing" such as reacting to failed storage Pods, rebalancing, or restoring desired replication counts (the exact behavior depends on the backend and configuration). The important KCNA-level idea is that Rook uses Kubernetes controllers to automate day-2 operations for storage in a way consistent with Kubernetes' reconciliation loops.

The other options do not match the question: "Kubernetes

" is the orchestrator itself, not a storage operator. "Helm" is a package manager for Kubernetes apps-it can install storage software, but it is not an operator that continuously reconciles and self-manages. "CSI" (Container Storage Interface) is an interface specification that enables pluggable storage drivers; CSI drivers provision and attach volumes, but CSI itself is not a "storage operator" with the broader self-managing operator semantics described here.

So, for "storage operator that can help with self-\* behaviors," Rook is the correct choice.

## NEW QUESTION # 183

Kubernetes \_\_\_ allows you to automatically manage the number of nodes in your cluster to meet demand.

- A. Cluster Autoscaler
- B. Node Autoscaler
- C. Vertical Pod Autoscaler
- D. Horizontal Pod Autoscaler

### Answer: A

Explanation:

Kubernetes supports multiple autoscaling mechanisms, but they operate at different layers. The question asks specifically about automatically managing the number of nodes in the cluster, which is the role of the Cluster Autoscaler-therefore B is correct.

Cluster Autoscaler monitors the scheduling state of the cluster. When Pods are pending because there are not enough resources (CPU/memory) available on existing nodes-meaning the scheduler cannot place them-Cluster Autoscaler can request that the underlying infrastructure (typically a cloud provider node group / autoscaling group) add nodes. Conversely, when nodes are underutilized and Pods can be rescheduled elsewhere, Cluster Autoscaler can drain those nodes (respecting disruption constraints like PodDisruptionBudgets) and then remove them to reduce cost. This aligns with cloud-native elasticity: scale infrastructure up and down automatically based on workload needs.

The other options are different: Horizontal Pod Autoscaler (HPA) changes the number of Pod replicas for a workload (like a Deployment) based on metrics (CPU utilization, memory, or custom metrics). It scales the application layer, not the node layer.

Vertical Pod Autoscaler (VPA) changes resource requests/limits (CPU/memory) for Pods, effectively "scaling up/down" the size of individual Pods. It also does not directly change node count, though its adjustments can influence scheduling pressure. "Node Autoscaler" is not the canonical Kubernetes component name used in standard terminology; the widely referenced upstream component for node count is Cluster Autoscaler.

In real systems, these autoscalers often work together: HPA increases replicas when traffic rises; that may cause Pods to go Pending if nodes are full; Cluster Autoscaler then adds nodes; scheduling proceeds; later, traffic drops, HPA reduces replicas and Cluster Autoscaler removes nodes. This layered approach provides both performance and cost efficiency.

## NEW QUESTION # 184

Which of the following is a feature Kubernetes provides by default as a container orchestration tool?

- A. A portable operating system.
- **B. Automated rollouts and rollbacks.**
- C. File system redundancy.
- D. A container image registry.

**Answer: B**

Explanation:

Kubernetes provides automated rollouts and rollbacks for workloads by default (via controllers like Deployments), so D is correct. In Kubernetes, application delivery is controller-driven: you declare the desired state (new image, new config), and controllers reconcile the cluster toward that state. Deployments implement rolling updates, gradually replacing old Pods with new ones while respecting availability constraints. Kubernetes tracks rollout history and supports rollback to previous ReplicaSets when an update fails or is deemed unhealthy.

This is a core orchestration capability: it reduces manual intervention and makes change safer. Rollouts use readiness checks and update strategies to avoid taking the service down, and kubectl rollout status/history/undo supports day-to-day release operations. The other options are not "default Kubernetes orchestration features":

Kubernetes is not a portable operating system (A). It's a platform for orchestrating containers on top of an OS.

Kubernetes does not provide filesystem redundancy by itself (B). Storage redundancy is handled by underlying storage systems and CSI drivers (e.g., replicated block storage, distributed filesystems).

Kubernetes does not include a built-in container image registry (C). You use external registries (Docker Hub, ECR, GCR, Harbor, etc.). Kubernetes pulls images but does not host them as a core feature.

So the correct "provided by default" orchestration feature in this list is the ability to safely manage application updates via automated rollouts and rollbacks.

## NEW QUESTION # 185

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