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Certs Exam Linux Foundation - KCSA

★ "Admission webhooks can be used to enforce custom policies on the objects being admitted." (e.g., validating signatures).

**References:**

Kubernetes Docs — Admission Controllers: <https://kubernetes.io/docs/reference/access-authn-authz/admission-controllers/>

Sigstore Project (cosign): <https://sigstore.dev/>

Kyverno ImageVerify Policy: <https://kyverno.io/policies/pod-security/require-image-verification/>

**Question #7 - [Compliance and Security Frameworks]**

As a Kubernetes and Cloud Native Security Associate, a user can set up **audit logging** in a cluster. What is the risk of logging every event at the full **RequestResponse** level?

A. No risk, as it provides the most comprehensive audit trail.

B. Increased storage requirements and potential impact on performance.

C. Improved security and easier incident investigation.

D. Reduced storage requirements and faster performance.

**Answer: B**

★ **Audit logging** records API server requests and responses for security monitoring.

★ The **RequestResponse** level logs the full request and response bodies, which can:

- ★ Significantly increase **storage and performance overhead**.
- ★ Potentially log sensitive data (including Secrets).

★ Therefore, while comprehensive, it introduces risks of performance degradation and excessive log volume.

**References:**

Kubernetes Documentation – Auditing

CNCF Security Whitepaper – Logging and monitoring: trade-offs between verbosity, storage, and security.

**Question #8 - [Kubernetes Threat Model / Multi-Tenancy]**

When should soft multitenancy be used over hard multitenancy?

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In today's competitive technology sector, the Linux Foundation KCSA certification is a vital credential. Many applicants, however, struggle to obtain up-to-date and genuine Linux Foundation KCSA exam questions in order to successfully prepare for the exam. If you find yourself in this circumstance, don't worry since PassSureExam has you covered with their real Linux Foundation KCSA Exam Questions. Let's look at the characteristics of these Linux Foundation Kubernetes and Cloud Native Security Associate test Questions and how they can help you pass the Linux Foundation KCSA certification exam on the first try.

## Linux Foundation KCSA Exam Syllabus Topics:

Topic	Details
Topic 1	<ul style="list-style-type: none"><li>Platform Security: This section of the exam measures the skills of a Cloud Security Architect and encompasses broader platform-wide security concerns. This includes securing the software supply chain from image development to deployment, implementing observability and service meshes, managing Public Key Infrastructure (PKI), controlling network connectivity, and using admission controllers to enforce security policies.</li></ul>
Topic 2	<ul style="list-style-type: none"><li>Kubernetes Security Fundamentals: This section of the exam measures the skills of a Kubernetes Administrator and covers the primary security mechanisms within Kubernetes. This includes implementing pod security standards and admissions, configuring robust authentication and authorization systems like RBAC, managing secrets properly, and using network policies and audit logging to enforce isolation and monitor cluster activity.</li></ul>

Topic 3	<ul style="list-style-type: none"> <li>• <b>Kubernetes Cluster Component Security:</b> This section of the exam measures the skills of a Kubernetes Administrator and focuses on securing the core components that make up a Kubernetes cluster. It encompasses the security configuration and potential vulnerabilities of essential parts such as the API server, etcd, kubelet, container runtime, and networking elements, ensuring each component is hardened against attacks.</li> </ul>
Topic 4	<ul style="list-style-type: none"> <li>• <b>Kubernetes Threat Model:</b> This section of the exam measures the skills of a Cloud Security Architect and involves identifying and mitigating potential threats to a Kubernetes cluster. It requires understanding common attack vectors like privilege escalation, denial of service, malicious code execution, and network-based attacks, as well as strategies to protect sensitive data and prevent an attacker from gaining persistence within the environment.</li> </ul>
Topic 5	<ul style="list-style-type: none"> <li>• <b>Overview of Cloud Native Security:</b> This section of the exam measures the skills of a Cloud Security Architect and covers the foundational security principles of cloud-native environments. It includes an understanding of the 4Cs security model, the shared responsibility model for cloud infrastructure, common security controls and compliance frameworks, and techniques for isolating resources and securing artifacts like container images and application code.</li> </ul>

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## Linux Foundation Kubernetes and Cloud Native Security Associate Sample Questions (Q34-Q39):

### NEW QUESTION # 34

Is it possible to restrict permissions so that a controller can only change the image of a deployment (without changing anything else about it, e.g., environment variables, commands, replicas, secrets)?

- A. No, because granting access to the spec.containers.image field always grants access to the rest of the spec object.
- B. Yes, with a 'managed fields' annotation.
- **C. Not with RBAC, but it is possible with an admission webhook.**
- D. Yes, by granting permission to the /image subresource.

**Answer: C**

Explanation:

\* RBAC in Kubernetes is coarse-grained: it controls verbs (get, update, patch, delete) on resources (e.g., deployments), but not individual fields within a resource.

\* There is no /image subresource for deployments (there is one for pods but only for ephemeral containers).

\* Therefore, RBAC cannot restrict changes only to the image field.

\* Admission Webhooks (mutating/validating) can enforce fine-grained policies (e.g., deny updates that change anything other than spec.containers[\*].image).

\* Exact extract (Kubernetes Docs - Admission Webhooks):

\* "Admission webhooks can be used to enforce custom policies on objects being admitted." References:

Kubernetes Docs - RBAC: <https://kubernetes.io/docs/reference/access-authn-authz/rbac/> Kubernetes Docs - Admission

Webhooks: <https://kubernetes.io/docs/reference/access-authn-authz/>

/extensible-admission-controllers/

### NEW QUESTION # 35

In a Kubernetes cluster, what are the security risks associated with using ConfigMaps for storing secrets?

- A. Using ConfigMaps for storing secrets might make applications incompatible with the Kubernetes cluster.
- B. ConfigMaps store sensitive information in etcd encoded in base64 format automatically, which does not ensure confidentiality of data.
- **C. Storing secrets in ConfigMaps can expose sensitive information as they are stored in plaintext and can be accessed by unauthorized users.**
- D. Storing secrets in ConfigMaps does not allow for fine-grained access control via RBAC.

**Answer: C**

Explanation:

- \* ConfigMaps are explicitly not for confidential data.
- \* Exact extract (ConfigMap concept): "A ConfigMap is an API object used to store non-confidential data in key-value pairs."
- \* Exact extract (ConfigMap concept): "ConfigMaps are not intended to hold confidential data. Use a Secret for confidential data."
- \* Why this is risky: data placed into a ConfigMap is stored as regular (plaintext) string values in the API and etcd (unless you deliberately use binaryData for base64 content you supply). That means if someone has read access to the namespace or to etcd/API Server storage, they can view the values.
- \* Secrets vs ConfigMaps (to clarify distractor D):
- \* Exact extract (Secret concept): "By default, secret data is stored as unencrypted base64-encoded strings. You can enable encryption at rest to protect Secrets stored in etcd."
- \* This base64 behavior applies to Secrets, not to ConfigMap data. Thus option D is incorrect for ConfigMaps.
- \* About RBAC (to clarify distractor A): Kubernetes does support fine-grained RBAC for both ConfigMaps and Secrets; the issue isn't lack of RBAC but that ConfigMaps are not designed for confidential material.
- \* About compatibility (to clarify distractor C): Using ConfigMaps for secrets doesn't make apps "incompatible"; it's simply insecure and against guidance.

References:

Kubernetes Docs - ConfigMaps: <https://kubernetes.io/docs/concepts/configuration/configmap/> Kubernetes Docs - Secrets: <https://kubernetes.io/docs/concepts/configuration/secret/> Kubernetes Docs - Encrypting Secret Data at Rest: <https://kubernetes.io/docs/tasks/administer-cluster/encrypt-data/>

Note: The citations above are from the official Kubernetes documentation and reflect the stated guidance that ConfigMaps are for non-confidential data, while Secrets (with encryption at rest enabled) are for confidential data, and that the 4C's map to defense in depth.

## NEW QUESTION # 36

What mechanism can I use to block unsigned images from running in my cluster?

- A. Using Pod Security Standards (PSS) to enforce validation of signatures.
- **B. Enabling Admission Controllers to validate image signatures.**
- C. Using PodSecurityPolicy (PSP) to enforce image signing and validation.
- D. Configuring Container Runtime Interface (CRI) to enforce image signing and validation.

**Answer: B**

Explanation:

- \* Kubernetes Admission Controllers (particularly Validating Admission Webhooks) can be used to enforce policies that validate image signatures.
  - \* This is commonly implemented with tools like Sigstore/cosign, Kyverno, or OPA Gatekeeper.
  - \* PodSecurityPolicy (PSP): deprecated and never supported image signature validation.
  - \* Pod Security Standards (PSS): only apply to pod security fields (privilege, users, host access), not image signatures.
  - \* CRI: while runtimes (containerd, CRI-O) may integrate with signature verification tools, enforcement in Kubernetes is generally done via Admission Controllers at the API layer.
- Exact extract (Admission Controllers docs):
- \* "Admission webhooks can be used to enforce custom policies on the objects being admitted." (e.g., validating signatures).

References:

Kubernetes Docs - Admission Controllers: <https://kubernetes.io/docs/reference/access-authn-authz/admission-controllers/>  
Sigstore Project (cosign): <https://sigstore.dev/>  
Kyverno Image Verify Policy: <https://kyverno.io/policies/pod-security/require-image-verification/>

### NEW QUESTION # 37

What is the difference between gVisor and Firecracker?

- A. gVisor is a user-space kernel that provides isolation and security for containers. At the same time, Firecracker is a lightweight virtualization technology for creating and managing secure, multi-tenant container and function-as-a-service (FaaS) workloads.
- B. gVisor and Firecracker are both container runtimes that can be used interchangeably.
- C. gVisor is a lightweight virtualization technology for creating and managing secure, multi-tenant container and function-as-a-service (FaaS) workloads. At the same time, Firecracker is a user-space kernel that provides isolation and security for containers.
- D. gVisor and Firecracker are two names for the same technology, which provides isolation and security for containers.

**Answer: A**

Explanation:

\* gVisor:

\* Google-developed, implemented as a user-space kernel that intercepts and emulates syscalls made by containers.

\* Provides strong isolation without requiring a full VM.

\* Official docs: "gVisor is a user-space kernel, written in Go, that implements a substantial portion of the Linux system call interface."

\* Source: <https://gvisor.dev/docs/>

\* Firecracker:

\* AWS-developed, lightweight virtualization technology built on KVM, used in AWS Lambda and Fargate.

\* Optimized for running secure, multi-tenant microVMs (MicroVMs) for containers and FaaS.

\* Official docs: "Firecracker is an open-source virtualization technology that is purpose-built for creating and managing secure, multi-tenant container and function-based services."

\* Source: <https://firecracker-microvm.github.io/>

\* Key difference: gVisor # syscall interception in userspace kernel (container isolation). Firecracker # lightweight virtualization with microVMs (multi-tenant security).

\* Therefore, option A is correct.

References:

gVisor Docs: <https://gvisor.dev/docs/>

Firecracker Docs: <https://firecracker-microvm.github.io/>

### NEW QUESTION # 38

In order to reduce the attack surface of the Scheduler, which default parameter should be set to false?

- A. --scheduler-name
- B. --profiling
- C. --bind-address
- D. --secure-kubeconfig

**Answer: B**

Explanation:

\* The kube-scheduler exposes a profiling/debugging endpoint when --profiling=true (default).

\* This can unnecessarily increase the attack surface.

\* Best practice: set --profiling=false in production.

\* Exact extract (Kubernetes Docs - kube-scheduler flags):

\* "--profiling (default true): Enable profiling via web interface host:port/debug/pprof."

\* Why others are wrong:

\* --scheduler-name: just identifies the scheduler, not a security risk.

\* --secure-kubeconfig: not a valid flag.

\* --bind-address: changing it limits exposure but is not the default risk parameter for profiling.

References:

Kubernetes Docs - kube-scheduler options: <https://kubernetes.io/docs/reference/command-line-tools-reference/kube-scheduler/>

### NEW QUESTION # 39

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