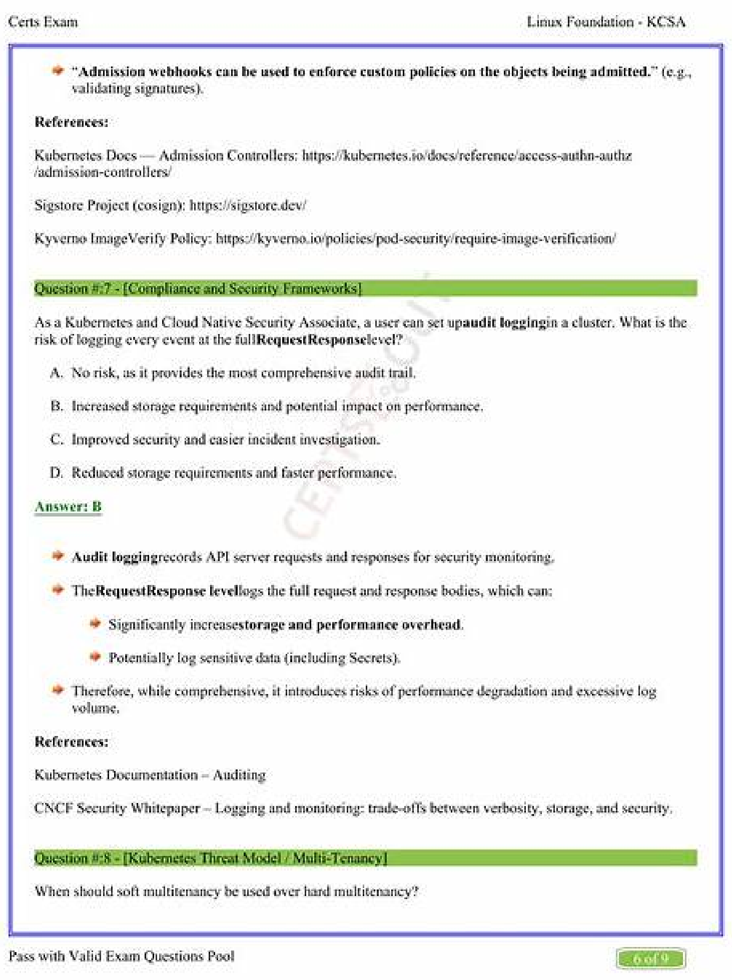
KCSA Detail Explanation, Valid KCSA Test Question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- **"Admission webhooks can be used to enforce custom policies on the objects being admitted."** (e.g., validating signatures).

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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Linux Foundation KCSA Exam Syllabus Topics:

Topic	Details
Topic 1	• Overview of Cloud Native Security: 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.
Topic 2	• Kubernetes Cluster Component Security: 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.
Topic 3	• 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.
Topic 4	• 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.

Linux Foundation Kubernetes and Cloud Native Security Associate Sample Questions (Q14-Q19):

NEW QUESTION # 14
How can a user enforce thePod Security Standardwithout third-party tools?

- A. It is only possible to enforce the Pod Security Standard with additional tools within the cloud native ecosystem.
- B. No additional measures have to be taken to enforce the Pod Security Standard.
- C. Use the PodSecurity admission controller.
- D. Through implementing Kyverno or OPA Policies.

Answer: C

Explanation:
* ThePodSecurity admission controller(built-in as of Kubernetes v1.23+) enforces the Pod Security Standards (Privileged, Baseline, Restricted).
* Enforcement is namespace-scoped and configured throughnamespace labels.
* Incorrect options:
* (A) Kyverno/OPA are external policy tools (useful but not required).
* (C) Not true, PodSecurity admission provides native enforcement.
* (D) Enforcement requires explicit configuration, not automatic.
References:
Kubernetes Documentation - Pod Security Admission
CNCF Security Whitepaper - Policy enforcement and admission control.

NEW QUESTION # 15
A cluster is failing to pull more recent versions of images from k8s.gcr.io. Why may this be?

- A. There is a network connectivity issue between the cluster and k8s.gcr.io.
- B. The container image registry k8s.gcr.io has been deprecated.
- C. The authentication credentials for accessing k8s.gcr.io are incorrectly scoped.

* D. There is a bug in the container runtime or the image pull process.

Answer: B

Explanation:
* k8s.gcr.iowas the historic Kubernetes image registry.
* It has beendeprecatedand replaced withregistry.k8s.io.
* Exact extract (Kubernetes Blog):
* "The k8s.gcr.io image registry will be frozen from April 3, 2023 and fully deprecated. All Kubernetes project images are now served from registry.k8s.io."
* Pulling newer versions from k8s.gcr.io fails because the registry no longer receives updates.
References:
Kubernetes Blog - Image Registry Update: https://kubernetes.io/blog/2023/02/06/k8s-gcr-io-freeze- announcement/

NEW QUESTION # 16
An attacker compromises a Pod and attempts to use its service account token to escalate privileges within the cluster. Which Kubernetes security feature is designed tolimit what this service account can do?

* A. Role-Based Access Control (RBAC)
* B. NetworkPolicy
* C. RuntimeClass
* D. PodSecurity admission

Answer: A

Explanation:
* When a Pod is created, Kubernetes automatically mounts aservice account tokenthat can authenticate to the API server.
* TheRole-Based Access Control (RBAC)system defines what actions a service account can perform.
* By carefully restricting Roles and RoleBindings, administrators limit the blast radius of a compromised Pod.
* Incorrect options:
* (A)PodSecurity admissionenforces workload-level security settings but does not control API access.
* (B)NetworkPolicycontrols network communication, not API privileges.
* (D)RuntimeClassselects container runtimes, unrelated to privilege escalation through API tokens.
References:
Kubernetes Documentation - Using RBAC Authorization
CNCF Security Whitepaper - Identity & Access Management: limiting lateral movement by constraining service account permissions.

NEW QUESTION # 17
Why does the defaultbase64 encodingthat Kubernetes applies to the contents of Secret resources provide inadequate protection?

* A. Base64 encoding relies on a shared key which can be easily compromised.
* B. Base64 encoding is not supported by all Secret Stores.
* C. Base64 encoding is vulnerable to brute-force attacks.
* D. Base64 encoding does not encrypt the contents of the Secret, only obfuscates it.

Answer: D

Explanation:
* Kubernetes stores Secret data asbase64-encoded stringsin etcd by default.
* Base64 is not encryption- it is a simple encoding scheme that merelyobfuscatesdata for transport and storage. Anyone with read access to etcd or the Secret manifest can easily decode the value back to plaintext.
* For actual protection, Kubernetes supportsencryption at rest(via encryption providers) and external Secret management (Vault, KMS, etc.).
References:
Kubernetes Documentation - Secrets
CNCF Security Whitepaper - Data protection section: highlights that base64 encoding does not protect data and encryption at rest is recommended.

NEW QUESTION # 18
A cluster administrator wants to enforce the use of a different container runtime depending on the application a workload belongs to.

- A. By modifying the kube-apiserver configuration file to specify the desired container runtime for each application.
- B. By manually modifying the container runtime for each workload after it has been created.
- C. By configuring avalidating admission controllerwebhook that verifies the container runtime based on the application label and rejects requests that do not comply.
- D. By configuring amutating admission controllerwebhook that intercepts new workload creation requests and modifies the container runtime based on the application label.

Answer: D

Explanation:
* Kubernetes supports workload-specific runtimes viaRuntimeClass.
* Amutating admission controllercan enforce this automatically by:
* Intercepting workload creation requests.
* Modifying the Pod spec to set runtimeClassName based on labels or policies.
* Incorrect options:
* (A) Manual modification is not scalable or secure.
* (B) kube-apiserver cannot enforce per-application runtime policies.
* (C) A validating webhook can onlyreject, not modify, the runtime.
References:
Kubernetes Documentation - RuntimeClass
CNCF Security Whitepaper - Admission controllers for enforcing runtime policies.

NEW QUESTION # 19
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