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Linux Foundation KCSA Exam Syllabus Topics:

Topic	Details

Topic 1	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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.
Topic 4	<ul style="list-style-type: none"> Compliance and Security Frameworks: This section of the exam measures the skills of a Compliance Officer and focuses on applying formal structures to ensure security and meet regulatory demands. It covers working with industry-standard compliance and threat modeling frameworks, understanding supply chain security requirements, and utilizing automation tools to maintain and prove an organization's security posture.
Topic 5	<ul style="list-style-type: none"> 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.

Linux Foundation Kubernetes and Cloud Native Security Associate Sample Questions (Q44-Q49):

NEW QUESTION # 44

In the event that kube-proxy is in a CrashLoopBackOff state, what impact does it have on the Pods running on the same worker node?

- A. The Pod's security context restrictions cannot be enforced.
- B. The Pod's resource utilization increases significantly.
- C. The Pod cannot mount persistent volumes through CSI drivers.
- D. The Pods cannot communicate with other Pods in the cluster.

Answer: D

Explanation:

* kube-proxy manages cluster network routing rules (via iptables or IPVS). It enables Pods to communicate with Services and Pods across nodes.

* If kube-proxy fails (CrashLoopBackOff), service IP routing and cluster-wide pod-to-pod networking breaks. Local Pod-to-Pod communication within the same node may still work, but cross-node communication fails.

* Exact extract (Kubernetes Docs - kube-proxy):

* "kube-proxy maintains network rules on nodes. These rules allow network communication to Pods from network sessions inside or outside of the cluster." References:

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

NEW QUESTION # 45

Which of the following is a valid security risk caused by having no egress controls in a Kubernetes cluster?

- A. Unauthorized access to external resources
- **B. Data exfiltration**
- C. Denial of Service
- D. Increased attack surface

Answer: B

Explanation:

- * Egress Network Policies restrict outbound traffic from Pods.
- * Without egress restrictions, a compromised Pod could exfiltrate sensitive data (secrets, logs, customer data) to an attacker-controlled server.
- * Exact extract (Kubernetes Docs - Network Policies):
- * "Egress rules control outbound connections from Pods. Without such restrictions, compromised workloads can connect freely to external endpoints."
- * Other options clarified:
- * A: DoS is more about flooding, not egress absence.
- * C: "Increased attack surface" is vague but not the main risk.
- * D: True in a sense, but the precise and most common risk is data exfiltration.

References:

Kubernetes Docs - Network Policies: <https://kubernetes.io/docs/concepts/services-networking/network-policies/>

NEW QUESTION # 46

What information is stored in etcd?

- A. Application logs and monitoring data for auditing and troubleshooting purposes.
- **B. Etcd manages the configuration data, state data, and metadata for Kubernetes.**
- C. Sensitive user data such as usernames and passwords.
- D. Pod data contained in Persistent Volume Claims (e.g. hostPath).

Answer: B

Explanation:

- * etcd is Kubernetes' key-value store for cluster state.
- * Stores: ConfigMaps, Secrets, Pod definitions, Deployments, RBAC policies, and metadata.
- * Exact extract (Kubernetes Docs - etcd):
- * "etcd is a consistent and highly-available key-value store used as Kubernetes' backing store for all cluster data."
- * Clarifications:
- * B: Logs/metrics are handled by logging/monitoring solutions, not etcd.
- * C: Secrets may be stored here but encoded in base64, not specifically "usernames/passwords" as primary use.
- * D: Persistent Volumes are external storage, not stored in etcd.

References:

Kubernetes Docs - etcd: <https://kubernetes.io/docs/concepts/overview/components/#etcd>

NEW QUESTION # 47

A container running in a Kubernetes cluster has permission to modify host processes on the underlying node.

What combination of privileges and capabilities is most likely to have led to this privilege escalation?

- A. hostNetwork and NET_RAW
- B. There is no combination of privileges and capabilities that permits this.
- **C. hostPID and SYS_PTRACE**
- D. hostPath and AUDIT_WRITE

Answer: C

Explanation:

- * hostPID: When enabled, the container shares the host's process namespace # container can see and potentially interact with host processes.
- * SYS_PTRACE capability: Grants the container the ability to trace, inspect, and modify other processes (e.g., via ptrace).
- * Combination of hostPID + SYS_PTRACE allows a container to attach to and modify host processes, which is a direct privilege

escalation.

* Other options explained:

* hostPath + AUDIT_WRITE: hostPath exposes filesystem paths but does not inherently allow process modification.

* hostNetwork + NET_RAW: grants raw socket access but only for networking, not host process modification.

* A: Incorrect - such combinations do exist (like B).

References:

Kubernetes Docs - Configure a Pod to use hostPID: <https://kubernetes.io/docs/tasks/configure-pod-container/share-process-namespace/>

Linux Capabilities man page: <https://man7.org/linux/man-pages/man7/capabilities.7.html>

NEW QUESTION # 48

Which of the following snippets from a RoleBinding correctly associates user bob with Role pod-reader ?

- A. subjects:
 - kind: User
 - name: bob
 - apiGroup: rbac.authorization.k8s.io
 - roleRef:
 - kind: Role
 - name: pod-reader
 - apiGroup: rbac.authorization.k8s.io
- B. subjects:
 - kind: User
 - name: pod-reader
 - apiGroup: rbac.authorization.k8s.io
 - roleRef:
 - kind: Role
 - name: bob
 - apiGroup: rbac.authorization.k8s.io
- C. subjects:
 - kind: User
 - name: bob
 - apiGroup: rbac.authorization.k8s.io
 - roleRef:
 - kind: ClusterRole
 - name: pod-reader
 - apiGroup: rbac.authorization.k8s.io
- D. subjects:
 - kind: Group
 - name: bob
 - apiGroup: rbac.authorization.k8s.io
 - roleRef:
 - kind: Role
 - name: pod-reader
 - apiGroup: rbac.authorization.k8s.io

Answer: A

Explanation:

Kubernetes RBAC uses RoleBinding to grant permissions defined in a Role to a subject (user, group, or service account) within a namespace. The official example shows binding user jane to Role pod-reader:

"A RoleBinding grants the permissions defined in a Role to a user or set of users...." Example:

subjects:

- kind: User

name: jane

apiGroup: rbac.authorization.k8s.io

roleRef:

kind: Role

name: pod-reader

apiGroup: rbac.authorization.k8s.io

- [illegible]