Quiz Linux Foundation - CKS - Unparalleled Vce Certified Kubernetes Security Specialist (CKS) Test Simulator

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The CKS exam is designed to assess the candidate's proficiency in security best practices for Kubernetes platforms and containerized workloads, including securing Kubernetes components, securing container images and registries, securing network communication, and configuring security contexts. CKS exam is a performance-based test, which means that the candidate must complete a series of tasks in a live Kubernetes environment, demonstrating their ability to secure Kubernetes platforms and containerized workloads.

The CKS Certification is highly regarded in the industry and is recognized by major technology companies and organizations. Earning the CKS certification demonstrates a professional's commitment to mastering Kubernetes security and validates their expertise in the field. Certified Kubernetes Security Specialist (CKS) certification also opens up new job opportunities and career advancement for professionals in the fast-growing field of Kubernetes security.

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Linux Foundation CKS Test Dates & CKS Valid Exam Topics

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Linux Foundation CKS Exam Syllabus Topics:

Topic	Details
Topic 1	• Cluster Hardening: Cluster hardening focuses on securing Kubernetes API access, utilizing Role-Based Access Controls, managing service accounts, and keeping Kubernetes updated. This CKS exam topic measures Kubernetes practitioners' ability to enhance cluster security by reducing exposure and managing permissions effectively.

Topic 2	• Monitoring, Logging, and Runtime Security: This area of the Certified Kubernetes Security Specialist exam focuses on behavioral analytics, threat detection across infrastructure, and ensuring container immutability. The proficiency of the Kubernetes practitioner here demonstrates the ability to maintain security and investigate incidents effectively.
Topic 3	• Supply Chain Security: Supply chain security addresses securing base images, whitelisting registries, signing images, performing static analysis, and scanning for vulnerabilities. The CKA exam assesses the skills of Kubernetes practitioners in protecting the entire supply chain of containerized applications from creation to deployment.
Topic 4	• Cluster Setup: This topic assesses the skills of Kubernetes practitioners in configuring secure Kubernetes clusters. It covers network security policies, CIS benchmarks, ingress security, node metadata protection, minimizing GUI access, and verifying platform binaries. Proficiency in these areas ensures a secure foundation for Kubernetes deployments.
Topic 5	• Minimize Microservice Vulnerabilities: This topic of the Linux Foundation Kubernetes Security Specialist exam evaluates techniques to secure microservices, including OS-level security domains, managing Kubernetes secrets, using container runtime sandboxes, and implementing pod-to-pod encryption. It measures the ability to safeguard against vulnerabilities within a multi-tenant environment.

Linux Foundation Certified Kubernetes Security Specialist (CKS) Sample Questions (Q53-Q58):

NEW QUESTION # 53
You are responsible for securing the software supply chain of your company's applications deployed in a Kubernetes cluster. You are implementing a CI/CD pipeline that builds, tests, and deploys container images. Currently, your pipeline relies on pulling images directly from Docker Hub without any security checks. How would you enhance your pipeline to verify the integrity of the images pulled from Docker Hub?

Answer:

Explanation:
Solution (Step by Step):
1. Implement Image Signing:
- Step I: Generate a signing key and certificate pair for your organization.
- Step 2: Configure your CIICD pipeline to sign container images after they are built using the generated key and certificate.
- Step 3: Configure your Kubernetes cluster to only pull and deploy images that are signed with your organization's certificate. This step involves creating a 'PodSecurityPoIicy' (PSP) or 'PodSecurityAdmissioru (PSA) resource to enforce image signing.
Example Code:

```
      apiVersion: rbac.authorization.k8s.io/v1
      kind: Role
      metadata:
        name: image-signer
      rules:
      - apiGroups: [""]
        resources: ["pods"]
        verbs: ["create", "get", "list", "watch"]
      ---
      apiVersion: rbac.authorization.k8s.io/v1
      kind: RoleBinding
      metadata:
        name: image-signer-binding
      roleRef:
        apiGroup: rbac.authorization.k8s.io
        kind: Role
        name: image-signer
      subjects:
      - kind: User
        name: your-username
---
apiVersion: apps/v1
kind: Deployment
metadata:
  name: nginx-deployment
spec:
  replicas: 3
  selector:
    matchLabels:
      app: nginx
  template:
    metadata:
      labels:
        app: nginx
    spec:
      containers:
      - name: nginx
        image: your-registry/nginx:latest
        imagePullSecrets:
          - name: image-signer-secret
```


Example Code: 2. Integrate SBOM Generation: - Step 1: Configure your CI/CD pipeline to generate a Software Bill of Materials (SBOM) for each container image. - Step 2: Store the SBOM alongside the container image in your artifact repository. - Step 3: Implement a process to verify the SBOM against a vulnerability database to ensure the image does not contain any known vulnerabilities. Example Code: # Example of generating an SBOM with Syft syn packages my-image.tar 3. Utilize Container Scanning Tools: - Step 1: Integrate container scanning tools like Clair, Anchore, or Trivy into your CI/CD pipeline. - Step 2: Configure these tools to scan images before deployment for known vulnerabilities. - Step 3: Configure your pipeline to fail the build if vulnerabilities are detected. Example Code: # Example of scanning a container image with Trivy trivy image my-image:latest By implementing these security measures, you can significantly strengthen your software supply chain, reducing the risk ot vulnerabilities and malicious attacks.

NEW QUESTION # 54

SIMULATION

Given an existing Pod named nginx-pod running in the namespace test-system, fetch the service-account-name used and put the content in /candidate/KSC00124.txt Create a new Role named dev-test-role in the namespace test-system, which can perform

update operations, on resources of type namespaces.
Create a new RoleBinding named dev-test-role-binding, which binds the newly created Role to the Pod's ServiceAccount (found in the Nginx pod running in namespace test-system).

- A. Sendusyourfeedbackonit

Answer: A

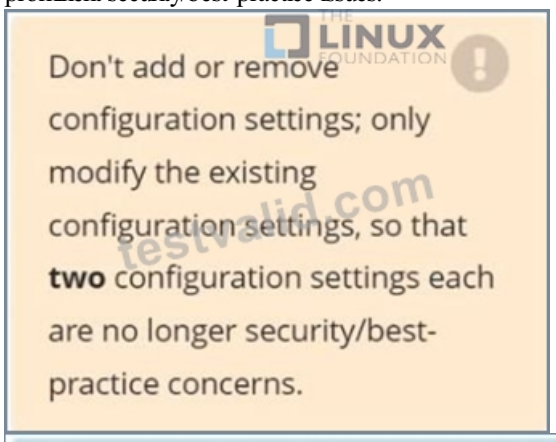
NEW QUESTION # 55
You must complete this task on the following cluster/nodes: Cluster: trace Master node: master Worker node: worker1 You can switch the cluster/configuration context using the following command: [desk@cli] $ kubectl config use-context trace Given: You may use Sysdig or Falco documentation. Task: Use detection tools to detect anomalies like processes spawning and executing something weird frequently in the single container belonging to Pod tomcat. Two tools are available to use: 1. falco 2. sysdig Tools are pre-installed on the worker1 node only. Analyse the container's behaviour for at least 40 seconds, using filters that detect newly spawning and executing processes. Store an incident file at /home/cert_masters/report, in the following format: [timestamp],[uid], [processName] Note: Make sure to store incident file on the cluster's worker node, don't move it to master node.

Answer:

Explanation:
$vim /etc/falco/falco_rules.local.yaml
- rule: Container Drift Detected (open+create)
desc: New executable created in a container due to open+create
condition: >
evt.type in (open,openat,creat) and
evt.is_open_exec=true and
container and
not runc_writing_exec_fifo and
not runc_writing_var_lib_docker and
not user_known_container_drift_activities and
evt.rawres>=0
output: >
%evt.time,%user.uid,%proc.name # Add this/Refer falco documentation
priority: ERROR
$kill -1 <PID of falco>
Explanation
[desk@cli] $ ssh node01 [node01@cli] $ vim /etc/falco/falco_rules.yaml search for Container Drift Detected & paste in falco_rules.local.yaml [node01@cli] $ vim /etc/falco/falco_rules.local.yaml
- rule: Container Drift Detected (open+create)
desc: New executable created in a container due to open+create
condition: >
evt.type in (open,openat,creat) and
evt.is_open_exec=true and
container and
not runc_writing_exec_fifo and
not runc_writing_var_lib_docker and
not user_known_container_drift_activities and
evt.rawres>=0
output: >
%evt.time,%user.uid,%proc.name # Add this/Refer falco documentation
priority: ERROR
[node01@cli] $ vim /etc/falco/falco.yaml

```
file_output:
  enabled: true
  keep_alive: false
  filename: /home/cert_masters/report
```

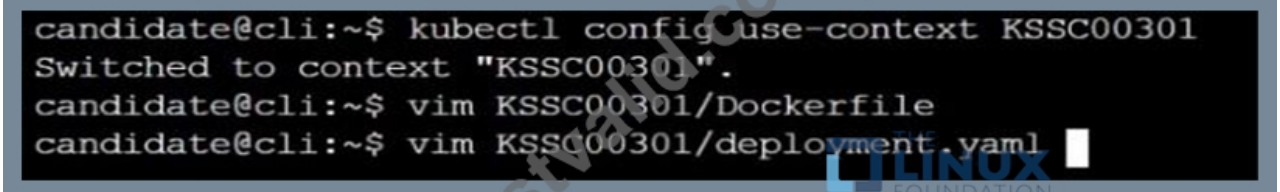
NEW QUESTION # 56
Task
Analyze and edit the given Dockerfile /home/candidate/KSSC00301/Docker file (based on the ubuntu:16.04 image), fixing two instructions present in the file that are prominent security/best-practice issues.
Analyze and edit the given manifest file /home/candidate/KSSC00301/deployment.yaml, fixing two fields present in the file that are prominent security/best-practice issues.



Answer:

Explanation:

```
FROM ubuntu:16.04

USER root
RUN apt-get update && \
    apt-get install -yq --no-install-recommends runiti=2.1.2-3ubuntu1 wget=1.17.1-1ubuntu1.5
 \
        chrpath=0.16-1 tzdata=2020a-0ubuntu0.16.04 lsof=4.89+dfsg-0.1 lshw=02.17-1.1ubuntu3
\
        sysstat=11.2.0-1ubuntu0.3 net-tools=1.60-26ubuntu1 numactl=2.0.11-1ubuntu1.1 \
        bzip2=1.0.6-8ubuntu0.2 && \
    apt-get autoremove && apt-get clean && \
    rm -rf /var/lib/apt/lists/* /tmp/* /var/tmp/*

ARG CB_VERSION=6.5.1
ARG CB_RELEASE_URL=https://packages.couchbase.com/releases/6.5.1
ARG CB_PACKAGE=couchbase-server-enterprise_6.5.1-ubuntu16.04_amd64.deb
ARG CB_SHA256=80427193137e5cb5a4795b2675b1c450c1af8cf1a5c634d[illegible]6f2047e66

ENV PATH=$PATH:/opt/couchbase/bin:/opt/couchbase/bin/tools:/opt/couchbase/bin/install

RUN groupadd -g 1000 couchbase && useradd couchbase -u 1000 -g couchbase -M

SHELL ["/bin/bash", "-o", "pipefail", "-c"]
RUN export INSTALL_DONT_START_SERVER=1 && \
    wget -N --no-verbose $CB_RELEASE_URL/$CB_PACKAGE && \
    echo "$CB_SHA256  $CB_PACKAGE" | sha256sum -c - && \
    dpkg -i ./$CB_PACKAGE && rm -f ./$CB_PACKAGE
COPY scripts/run /etc/service/couchbase-server/run
RUN chown -R couchbase:couchbase /etc/service

COPY scripts/dummy.sh /usr/local/bin/
RUN ln -s dummy.sh /usr/local/bin/iptables-save && \
    ln -s dummy.sh /usr/local/bin/lvdisplay && \
    ln -s dummy.sh /usr/local/bin/vgdisplay && \
    ln -s dummy.sh /usr/local/bin/pvdisplay

RUN chrpath -r "\$ORIGIN/../lib" /opt/couchbase/bin/curl

COPY scripts/entrypoint.sh /
ENTRYPOINT ["/entrypoint.sh"]
USER nobody
CMD ["couchbase-server"]

EXPOSE 8091 8092 8093 8094 8095 8096 11207 11210 11211 18091 18092 18093 18094 18095 18096
VOLUME /opt/couchbase/var
```



```
candidate@cli:~$ kubectl config use-context KSSC00301
Switched to context "KSSC00301".
candidate@cli:~$ vim KSSC00301/Dockerfile
candidate@cli:~$ vim KSSC00301/deployment.yaml
```

```
        securityContext:
          {'capabilities': {'add': ['NET_BIND_SERVICE'], 'drop': ['all']}, 'privileged': F
alse, 'readOnlyRootFilesystem': True, 'runAsUser': 65535}
        resources:
          limits:
            cpu: 2
            memory: 1024Mi
          requests:
            cpu: 1
            memory: 512Mi
      volumes:
        - name: database-storage
```

NEW QUESTION # 57

You have a Kubernetes cluster with a network policy that allows access to specific ports on pods within a namespace. However, you need to restrict access to specific users based on their identity. Describe how you can implement identity-based access control using network policies in Kubernetes.

Answer:

Explanation:
Solution (Step by Step) :
1. Configure Network Policy with Ingress Rules:
- Define a network policy tnat allows incoming traffic to specific pons on pods within the namespace.
- This policy should include an 'ingress' rule specifying the allowed ports and protocols.
- For example:

```
apiVersion: networking.k8s.io/v1
kind: NetworkPolicy
metadata:
  name: allow-access-to-ports
  namespace: default
spec:
  podSelector: {}
  ingress:
  - from:
    - podSelector: {}
  ports:
  - protocol: TCP
    port: 80
  - protocol: TCP
    port: 443
```

2. Enable Identity-Based Authentication: - Use a Kubernetes authentication plugin to enable identity-based authentication for users connecting to the cluster - This Plugin can be configured to authenticate users using external identity providers like OpenID Connect (OIDC) or SAML. 3. Configure Network Policy with Peer Identity Rules: - Extend the network policy to include rules that specify the required user identity for incoming traffic. - Use the 'peer field within the ' ingress' rule to define the identity requirements. - For example:

```
apiVersion: networking.k8s.io/v1
kind: NetworkPolicy
metadata:
  name: allow-access-to-ports-with-identity
  namespace: default
spec:
  podSelector: {}
  ingress:
  - from:
    - podSelector: {}
      peer:
        # Require the "developer" group for access
        group: developer
  ports:
  - protocol: TCP
    port: 80
  - protocol: TCP
    port: 443
```

4. Associate Users With Groups: - Associate the authenticated users with the appropriate groups defined in the network policy. - This can be done by configuring your authentication Plugin to map user attributes to Kubernetes groups. 5. Test the Configuration: - Test the network policy by attempting to access the pods from different users with varying identities. - Verify that only users belonging to the "developer' group can successfully connect to the specified ports. 6. Security Considerations: - Use strong authentication mechanisms for user logins. - Implement a robust identity provider to manage user identities and groups. - Ensure that the network policy rules are carefully defined to minimize the attack surface and prevent unintended access.

NEW QUESTION # 58
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