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The CKS exam is designed to test the knowledge and skills required to secure a Kubernetes cluster. CKS exam covers various topics such as Kubernetes architecture, network security, authentication and authorization, storage security, and cluster hardening. It also covers best practices and techniques for securing Kubernetes environments, including how to monitor and audit Kubernetes clusters for security vulnerabilities.

The CKS Exam is designed for professionals who have experience in deploying and managing Kubernetes clusters, and who are responsible for securing them. CKS Exam covers a wide range of topics related to Kubernetes security, including authentication and authorization, network security, container security, and data security. CKS exam is designed to test a candidate's understanding of these topics and their ability to apply their knowledge to real-world scenarios.

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Free PDF Quiz 2026 Linux Foundation Updated CKS: Reliable Certified Kubernetes Security Specialist (CKS) Learning Materials

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The Linux Foundation CKS Exam covers various aspects of Kubernetes security, including access control, network security, cluster hardening, authentication and authorization, and monitoring and logging. Candidates are required to demonstrate their knowledge of these topics through a series of practical, scenario-based questions that test their ability to analyze and solve security problems in real-world situations.

Linux Foundation Certified Kubernetes Security Specialist (CKS) Sample Questions (Q32-Q37):

NEW QUESTION # 32
SIMULATION
Create a new ServiceAccount named backend-sa in the existing namespace default, which has the capability to list the pods inside the namespace default.

Create a new Pod named backend-pod in the namespace default, mount the newly created sa backend-sa to the pod, and Verify that the pod is able to list pods.
Ensure that the Pod is running.

Answer:

Explanation:
A service account provides an identity for processes that run in a Pod.
When you (a human) access the cluster (for example, using kubectl), you are authenticated by the apiserver as a particular User Account (currently this is usually admin, unless your cluster administrator has customized your cluster). Processes in containers inside pods can also contact the apiserver. When they do, they are authenticated as a particular Service Account (for example, default).
When you create a pod, if you do not specify a service account, it is automatically assigned the default service account in the same namespace. If you get the raw json or yaml for a pod you have created (for example, kubectl get pods/<podname> -o yaml), you can see the spec.serviceAccountName field has been automatically set.
You can access the API from inside a pod using automatically mounted service account credentials, as described in Accessing the Cluster. The API permissions of the service account depend on the authorization plugin and policy in use.
In version 1.6+, you can opt out of automounting API credentials for a service account by setting automountServiceAccountToken: false on the service account:

```
apiVersion: v1
kind: ServiceAccount
metadata:
name: build-robot
automountServiceAccountToken: false
...
```

In version 1.6+, you can also opt out of automounting API credentials for a particular pod:

```
apiVersion: v1
kind: Pod
metadata:
name: my-pod
spec:
serviceAccountName: build-robot
automountServiceAccountToken: false
...
```

The pod spec takes precedence over the service account if both specify a automountServiceAccountToken value.

NEW QUESTION # 33
You are tasked with hardening a Kubernetes cluster to meet the requirements of the CIS Kubernetes Bencnmark. One of the key areas is to implement proper access control and authentication. You need to create a strong authentication mechanism that uses client certificates for authentication, while also using RBAC to define specific roles and permissions for different users.
How would you set up a strong authentication mechanism using client certificates for authentication and configure R8AC to define specific roles and permissions for different users, to comply With the CIS Kubernetes Benchmark?

Answer:

Explanation:
Solution (Step by Step) :
1. Generate Client Certificates:
- use a tool like 'ctssr to generate client certificates for each user who needs access to the cluster.
- Create a separate certificate authority (CA) to issue these Client certificates.
- For each user, create a certificate signing request (CSR) and use the CA to sign the CSR to generate the client certificate and private key.
2. Configure Kubernetes API Server:
- Modify the Kubernetes API server configuration (e.g., '/etc/kubernetes/manifests/kube-apiserver.yaml') to enable client certificate authentication:
- Set '--client-ca-file' to the path of the CA certificate.
- Set '--tls-cen-file' to the path of the API server certificate.
- Set '--tls-private-key-files to the path of the API server private key.
3. Define RBAC Roles: - Use 'kubectr to create RBAC roles for different user groups. - Define roles that map to specific permissions. For example. - 'admin': Full access to the cluster - 'developers: Ability to create and manage resources, but not access sensitive information. - 'viewer': Only able to view resources.

4. Bind Roles to Users: - Create RoleBindings that link the roles to the users who need access to them. - Use the client certificate and private key to authenticate as the user and bind the appropriate role. - You can bind roles to users individually or to groups. 5. Configure 'kubectr' - Configure the 'kubectr command-line tool to use client certificates for authentication. - Set the 'KI-IBECONFIG' environment variable to point to a file containing the client certificate and private key. - Run 'kubectl config set-credentials -client-key -client-certificate to configure the user with the certificate. 6. Verify Configuration: - Test that the configuration works by logging in as different users and verifying that they have the expected permissions.

NEW QUESTION # 34
You have a Kubernetes cluster running a critical application With a Deployment named 'critical-app-deployment' . This deployment uses a container image from a private registry hosted on a separate server. You want to secure the communication between your Kubernetes cluster and the private registry to prevent unauthorized access to your sensitive container images.
Explain how you would secure this communication using TLS/SSL certificates and describe the steps involved in configuring it.

Answer:

Explanation:
Solution (Step by Step) :
1. Generate a Self-Signed Certificate:
use OpenSSL to create a certificate and a private key:
bash

```
openssl req -x509 -newkey rsa:2048 -keyout server-key -out server.cn -days 365 -nodes
```

Replace the prompts with appropriate values for your registry server: CommonName, Organizational Unit Name, etc.
2. Configure the Registry Server:
Enable TLS/SSL: Configure the registry server to listen on HTTPS using the generated certificate and key.
Example configuration (Docker Registry):

```
[service "registry"]
# other configuration .
tls = true
tls_certiticate =
tls_key = "/path/to/server.key"
```

3. Configure Kubernetes:
Add the certificate to the Kubernetes cluster:
Create a Kubernetes Secret to store the certificate and key:
Configure the ImagePullSecret: UPdate the Deployment to use the secret
4. Verify the Configuration: Test image pulls from the deployment: Ensure that the containers can pull images from the registry using HTTPS. Verify the certificate and key are properly loaded: Use tools like 'kubectl describe secret registry-secret to confirm the secret contents. Note: This is a simplified setup for self-signed certificates. For a production environment, consider using a trusted Certificate Authority (CA) to issue certificates for enhanced security.

NEW QUESTION # 35
SIMULATION
You can switch the cluster/configuration context using the following command:
[desk@cli] $ kubectl config use-context test-account
Task: Enable audit logs in the cluster.
To do so, enable the log backend, and ensure that:
1. logs are stored at /var/log/Kubernetes/logs.txt
2. log files are retained for 5 days
3. at maximum, a number of 10 old audit log files are retained
A basic policy is provided at /etc/Kubernetes/logpolicy/audit-policy.yaml. It only specifies what not to log.
Note: The base policy is located on the cluster's master node.
Edit and extend the basic policy to log:
1. Nodes changes at RequestResponse level
2. The request body of persistentvolumes changes in the namespace frontend
3. ConfigMap and Secret changes in all namespaces at the Metadata level Also, add a catch-all rule to log all other requests at the Metadata level Note: Don't forget to apply the modified policy.

Answer:

Explanation:
See the Explanation belowExplanation:

```
$ vim /etc/kubernetes/log-policy/audit-policy.yaml
- level: RequestResponse
userGroups: ["system:nodes"]
- level: Request
resources:
- group: "" # core API group
resources: ["persistentvolumes"]
namespaces: ["frontend"]
- level: Metadata
resources:
- group: ""
resources: ["configmaps", "secrets"]
- level: Metadata
$ vim /etc/kubernetes/manifests/kube-apiserver.yaml
```

Add these

```
- --audit-policy-file=/etc/kubernetes/log-policy/audit-policy.yaml
- --audit-log-path=/var/log/kubernetes/logs.txt
- --audit-log-maxage=5
- --audit-log-maxbackup=10
```

Explanation:

```
[desk@cli] $ ssh master1
[master1@cli] $ vim /etc/kubernetes/log-policy/audit-policy.yaml
apiVersion: audit.k8s.io/v1 # This is required.
kind: Policy
# Don't generate audit events for all requests in RequestReceived stage.
omitStages:
- "RequestReceived"
rules:
# Don't log watch requests by the "system:kube-proxy" on endpoints or services
- level: None
users: ["system:kube-proxy"]
verbs: ["watch"]
resources:
- group: "" # core API group
resources: ["endpoints", "services"]
# Don't log authenticated requests to certain non-resource URL paths.
- level: None
userGroups: ["system:authenticated"]
nonResourceURLs:
- "/api*" # Wildcard matching.
- "/version"
# Add your changes below
- level: RequestResponse
userGroups: ["system:nodes"] # Block for nodes
- level: Request
resources:
- group: "" # core API group
resources: ["persistentvolumes"] # Block for persistentvolumes
namespaces: ["frontend"] # Block for persistentvolumes of frontend ns
- level: Metadata
resources:
- group: "" # core API group
resources: ["configmaps", "secrets"] # Block for configmaps & secrets
- level: Metadata # Block for everything else
[master1@cli] $ vim /etc/kubernetes/manifests/kube-apiserver.yaml
apiVersion: v1
kind: Pod
metadata:
annotations:
```

```
kubeadm.kubernetes.io/kube-apiserver.advertise-address.endpoint: 10.0.0.5:6443 labels:
component: kube-apiserver
tier: control-plane
name: kube-apiserver
namespace: kube-system
spec:
containers:
- command:
- kube-apiserver
- --advertise-address=10.0.0.5
- --allow-privileged=true
- --authorization-mode=Node,RBAC
- --audit-policy-file=/etc/kubernetes/log-policy/audit-policy.yaml #Add this
- --audit-log-path=/var/log/kubernetes/logs.txt #Add this
- --audit-log-maxage=5 #Add this
- --audit-log-maxbackup=10 #Add this
...
output truncated
```
Note: log volume & policy volume is already mounted in vim /etc/kubernetes/manifests/kube-apiserver.yaml so no need to mount it.

NEW QUESTION # 36
You can switch the cluster/configuration context using the following command:
[desk@cli] $ kubectl config use-context prod-account
Context:
A Role bound to a Pod's ServiceAccount grants overly permissive permissions. Complete the following tasks to reduce the set of permissions.
Task:
Given an existing Pod named web-pod running in the namespace database.
1. Edit the existing Role bound to the Pod's ServiceAccount test-sa to only allow performing get operations, only on resources of type Pods.
2. Create a new Role named test-role-2 in the namespace database, which only allows performing update operations, only on resources of type statuefulsets.
3. Create a new RoleBinding named test-role-2-bind binding the newly created Role to the Pod's ServiceAccount.
Note: Don't delete the existing RoleBinding.

Answer:

Explanation:
```
$ k edit role test-role -n database
apiVersion: rbac.authorization.k8s.io/v1
kind: Role
metadata:
creationTimestamp: "2021-06-04T11:12:23Z"
name: test-role
namespace: database
resourceVersion: "1139"
selfLink: /apis/rbac.authorization.k8s.io/v1/namespaces/database/roles/test-role uid: 49949265-6e01-499c-94ac-5011d6f6a353
rules:
- apiGroups:
- ""
resources:
- pods
verbs:
- * # Delete
- get # Fixed
$ k create role test-role-2 -n database --resource statefulset --verb update
$ k create rolebinding test-role-2-bind -n database --role test-role-2 --serviceaccount=database:test-sa Explanation
[desk@cli]$ k get pods -n database
NAME READY STATUS RESTARTS AGE LABELS
web-pod 1/1 Running 0 34s run=web-pod
```

```
[desk@cli]$ k get roles -n database
test-role
[desk@cli]$ k edit role test-role -n database
apiVersion: rbac.authorization.k8s.io/v1
kind: Role
metadata:
creationTimestamp: "2021-06-13T11:12:23Z"
name: test-role
namespace: database
resourceVersion: "1139"
selfLink: /apis/rbac.authorization.k8s.io/v1/namespaces/database/roles/test-role uid: 49949265-6e01-499c-94ac-5011d6f6a353
rules:
- apiGroups:
- ""
resources:
- pods
verbs:
- "*" # Delete this
- get # Replace by this
[desk@cli]$ k create role test-role-2 -n database --resource statefulset --verb update role.rbac.authorization.k8s.io/test-role-2
created [desk@cli]$ k create rolebinding test-role-2-bind -n database --role test-role-2 --serviceaccount=database:test-sa
rolebinding.rbac.authorization.k8s.io/test-role-2-bind created Reference: https://kubernetes.io/docs/reference/access-authn-
authz/rbac/ role.rbac.authorization.k8s.io/test-role-2 created
[desk@cli]$ k create rolebinding test-role-2-bind -n database --role test-role-2 --serviceaccount=database:test-sa
rolebinding.rbac.authorization.k8s.io/test-role-2-bind created
[desk@cli]$ k create role test-role-2 -n database --resource statefulset --verb update role.rbac.authorization.k8s.io/test-role-2
created [desk@cli]$ k create rolebinding test-role-2-bind -n database --role test-role-2 --serviceaccount=database:test-sa
rolebinding.rbac.authorization.k8s.io/test-role-2-bind created Reference: https://kubernetes.io/docs/reference/access-authn-
authz/rbac/
```

NEW QUESTION # 37
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