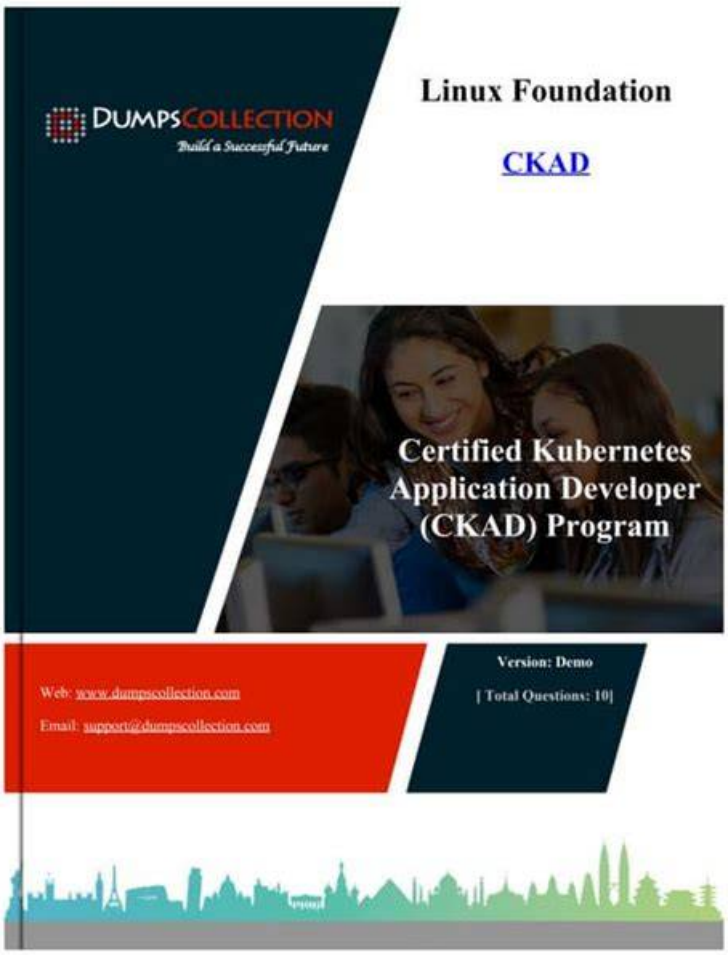
Effective Linux Foundation CKAD Exam Preparation In a Short Time



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Linux Foundation CKAD Exam Syllabus Topics:

Section	Weight	Objectives
Application Environment, Configuration and Security	25%	- Work with ConfigMaps - Configure resource requirements, limits and quotas - Use ServiceAccounts - Understand authentication, authorization and admission control - Use custom resources and extensions - Apply application security settings - Create and consume Secrets
Application Deployment	20%	- Implement deployment strategies - Use Helm package manager - Manage Deployments, rolling updates and rollbacks - Work with Kustomize

Services and Networking	20%	- Troubleshoot network access - Understand and apply NetworkPolicies - Expose applications via Services - Use Ingress rules
Application Observability and Maintenance	15%	- Monitor applications using CLI tools - Work with container logs - Understand API deprecations - Debug applications in Kubernetes - Implement probes and health checks
Application Design and Build	20%	- Understand multi-container Pod design patterns - Define, build and modify container images - Choose and use appropriate workload resources - Utilize persistent and ephemeral volumes

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Linux Foundation Certified Kubernetes Application Developer Exam Sample Questions (Q227-Q232):

NEW QUESTION # 227
You are deploying a resource-intensive application that requires a large amount of memory and CPU. How would you create a ResourceQuota to limit the resources consumed by this application and prevent it from impacting other workloads in the cluster?

Answer:

Explanation:
See the solution below with Step by Step Explanation.
Explanation:
Solution (Step by Step) :
I). Define the ResourceQuota:
- Create a ResourceQuota object named resource-limit' in the namespace where the application is deployed.
- Set the resource limits for the application by specifying the maximum allowed requests for CPU and memory.
- You can also set limits for other resources, such as pods and services.

```
apiVersion: v1
kind: ResourceQuota
metadata:
  name: resource-limit
spec:
  limits:
    requests.cpu: "2" # Set the maximum CPU request for the application
    requests.memory: "4Gi" # Set the maximum memory request for the application
    pods: "5" # Set the maximum number of Pods allowed for the application
```

2. Apply the ResourceQuota: - Apply the ResourceQuota configuration using 'kubectl apply -f resource-limit.yaml' 3. Test the Resource Limits. - Try to create or scale the resource-intensive application beyond the defined limits. - You should receive an error indicating that the ResourceQuota has been exceeded.

NEW QUESTION # 228
You have a ConfigMap named 'database-config' tnat stores sensitive information for connecting to a database. You want to ensure

that this ConfigMap is only accessible by a specific namespace and not by other namespaces in the cluster.

Answer:

Explanation:
See the solution below with Step by Step Explanation.
Explanation:
Solution (Step by Step) :
1. Create a Namespace:
bash
kubectl create namespace my-database-namespace
2. Move the ConfigMap to the Namespace:
bash
kubectl move configmap database-config -n my-database-namespace
3. Configure Role-Based Access Control (RBAC):
- Create a Role:

```
apiVersion: rbac.authorization.k8s.io/v1
kind: Role
metadata:
  name: database-config-reader
  namespace: my-database-namespace
rules:
- apiGroups: [""]
  resources: ["configmaps"]
  verbs: ["get", "list", "watch"]
```

- Create a RoleBinding:

```
apiVersion: rbac.authorization.k8s.io/v1
kind: RoleBinding
metadata:
  name: database-config-reader-binding
  namespace: my-database-namespace
roleRef:
  apiGroup: rbac.authorization.k8s.io
  kind: Role
  name: database-config-reader
subjects:
- kind: User
  name: my-service-account
  apiGroup: rbac.authorization.k8s.io
```

- Replace 'my-service-account with the actual name of the service account that needs access to the ConfigMap. 4. Apply the Role and Role3inding: bash kubectl apply -f database-config-reader.yaml kubectl apply -f database-config-reader-binding.yaml 5. Verify Access: - From the 'my-database-namespace': bash kubectl get configmap database-config -n my-database-namespace The command should succeed as the service account in this namespace has the necessary permissions. - From a different namespace: bash kubectl get configmap database-config -n another-namespace This command should fail as the service account in this namespace does not have access to the ConfigMap. This solution uses RBAC to restrict access to the ConfigMap to only the service account in the 'my-database-namespace'. This ensures that sensitive information is only accessible by authorized entities within the cluster,

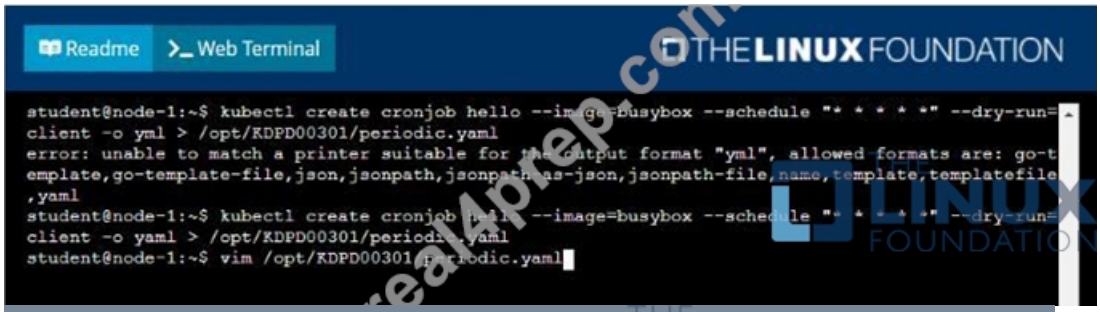
NEW QUESTION # 229

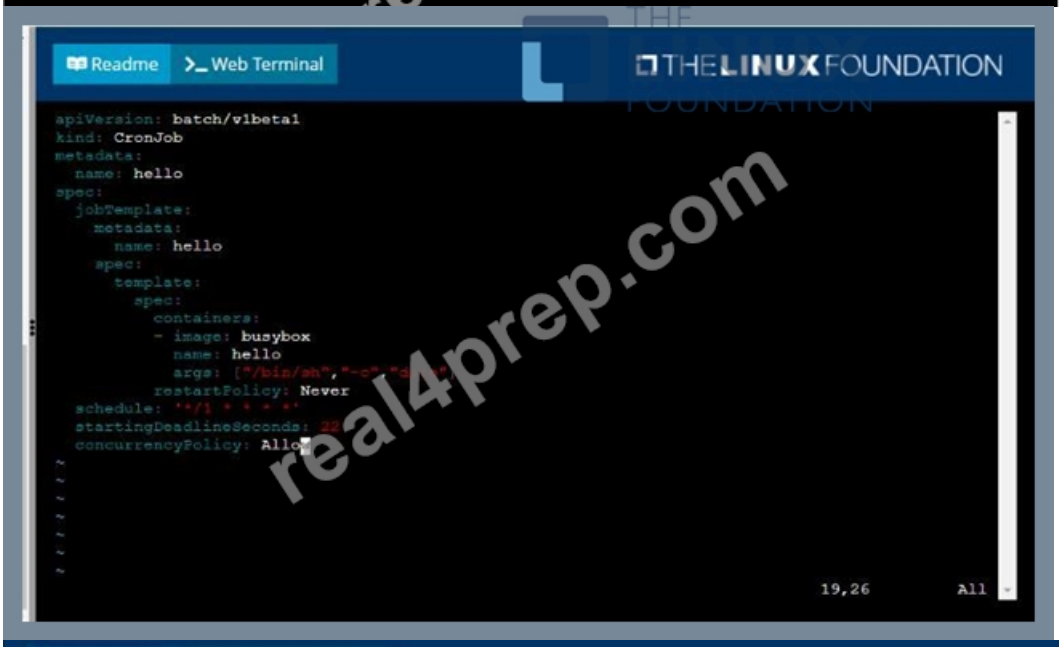
Context
Developers occasionally need to submit pods that run periodically.

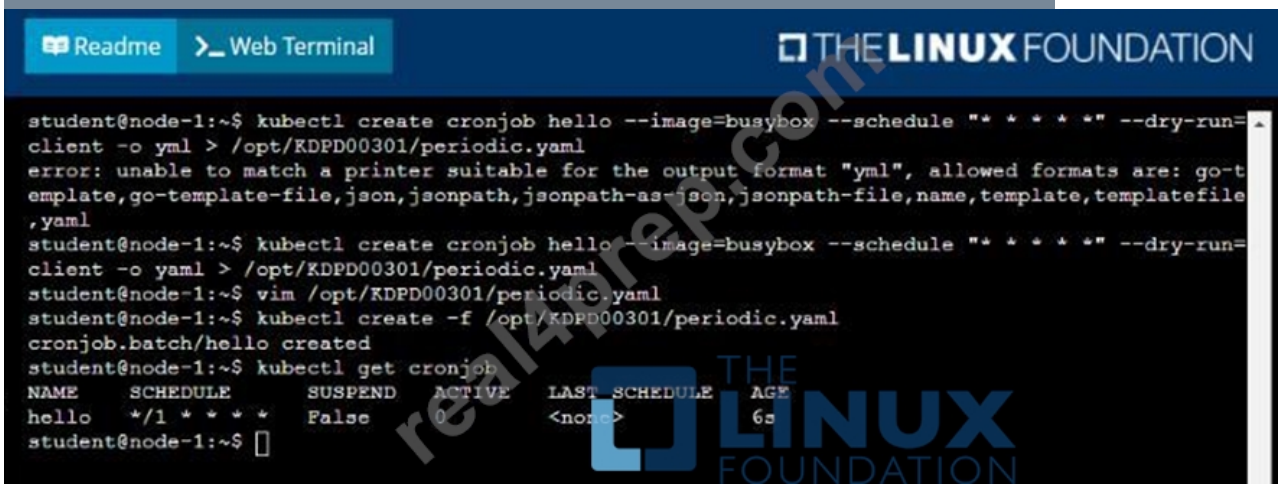
Task
Follow the steps below to create a pod that will start at a predetermined time and]which runs to completion only once each time it is started:
* Create a YAML formatted Kubernetes manifest /opt/KDPD00301/periodic.yaml that runs the following shell command: date in a single busybox container. The command should run every minute and must complete within 22 seconds or be terminated oy Kubernetes. The Cronjob namp and container name should both be hello
* Create the resource in the above manifest and verify that the job executes successfully at least once See the solution below.

Answer:

Explanation:
Explanation
Solution:







NEW QUESTION # 230
You are developing a multi-container application that includes a web server, a database, and a message broker. You want to ensure

that the database and message broker start before the web server to avoid dependency issues. How can you design your deployment to achieve this?

Answer:

Explanation:
See the solution below with Step by Step Explanation.
Explanation:
Solution (Step by Step) :
1. Define Pod with Containers:
- Create a 'Pod' definition with three containers: 'web-server', 'database' , and 'message-broker
- Include the appropriate image names for each container.

```
apiVersion: v1
kind: Pod
metadata:
  name: multi-container-app
spec:
  containers:
  - name: web-server
    image: example/web-server:latest
  - name: database
    image: example/database:latest
  - name: message-broker
    image: example/message-broker:latest
```

2. Implement Init Containers: - Define ' initcontainers' within the 'Pod' spec to run containers before the main application containers.
- Use 'initContainers' to set up the database and message broker:

```
apiVersion: v1
kind: Pod
metadata:
  name: multi-container-app
spec:
  initContainers:
  - name: database-init
    image: example/database-init:latest
    command: ["/bin/sh", "-c", "echo 'Database initialized'"]
  - name: message-broker-init
    image: example/message-broker-init:latest
    command: ["/bin/sh", "-c", "echo 'Message broker initialized'"]
  containers:
  - name: web-server
    image: example/web-server:latest
  - name: database
    image: example/database:latest
  - name: message-broker
    image: example/message-broker:latest
```

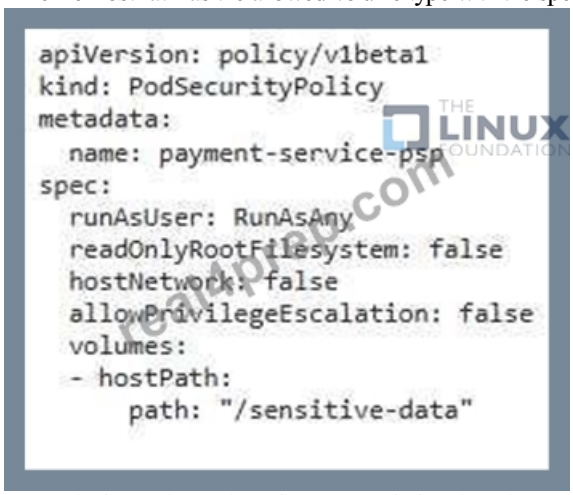
3. Apply the Pod Definition: - Apply the 'Pod' definition using 'kubectl apply -f multi-container-app.yamr 4. Verify Container Startup Order: - Check the pod logs using 'kubectl logs -f multi-container-app'. You will observe the init containers ('database-init and 'message-broker-init') starting first, followed by the main containers ('web-server', 'database' , and 'message-broker'). Note: In this example, the 'database-init and 'message-broker-init containers simply print a message. You can replace these with actual initialization scripts or commands relevant to your specific database and message broker services.

NEW QUESTION # 231
You are deploying a new microservice called 'payment-service' that requires access to a confidential data volume mounted at /sensitive- data'. This volume is mounted as a Secret in Kubernetes. The 'payment-service' container should only be allowed to access this volume. You need to configure the PodSecurityPolicy to enforce this access restriction.

Answer:

Explanation:
See the solution below with Step by Step Explanation.
Explanation:
Solution (Step by Step) :
I). Create a PodSecurityPolicy:

- Create a YAML file for your P0dSecurityP01icy.
- Define the 'apiVersion' and 'kind'
- Add a 'metadata' section with a unique name for the policy (e.g., 'payment-service-psp').
- In the 'spec' section:
- Set 'runAsUser' to ' RunAsAny' to allow any user ID.
- Set readOnlyRootFilesystem' to 'talse' to allow modifications within the container.
- Set 'hostNetworR to 'false' to avoid using the host's network.
- Set 'allowPrivilegeEscalatiorU to 'false' to prevent privilege escalation.
- In the 'volumes' sectiom
- Define 'hostPath' as the allowed volume type with the specified path "Isensitive-data'



2. Apply the PodSecurityPolicy: - Use ' kubectl apply -f payment-service-psp.yamr to create the PodSecurityPoIicy in your cluster.
3. Create a ServiceAccount: - Create a new ServiceAccount tor the 'payment-service deployment. - Apply the ServiceAccount YAML file using 'kubectl apply -f payment-service-sa_yamr 4. Bind the PodSecurityPolicy to the ServiceAccount: - Create a RoleBinding to bind the 'payment-service-psp' to the 'payment-service' ServiceAccount - Apply the RoleBinding YAML file using "kubectl apply -f payment-service-rb.yaml'

```
apiVersion: rbac.authorization.k8s.io/v1
kind: RoleBinding
metadata:
  name: payment-service-binding
roleRef:
  apiGroup: rbac.authorization.k8s.io
  kind: Role
  name: payment-service-psp
subjects:
- kind: ServiceAccount
  name: payment-service
  namespace: default
```

5. Deploy the Payment Service: - Create the 'payment-service' Deployment configuration. - Specify the 'payment-service' ServiceAccount in the field. - Define the 'volumeMount tor the 'sensitive-data' volume and specify the corresponding 'volume' in the 'volumes' section. - Ensure the volume is mounted as a Secret from the 'default' namespace.

- The PodSecurityPolicy restricts the benavior of pods and their containers. - 'runAslJser' , 'readOnlyRootFilesystem', 'hostNetwork' , and sallowPrivilegeEscalation' define various security constraints for the container. - The 'volumes' section specifies allowed volume types (e.g., 'hostPath') and paths. - The ServiceAccount binds the PodSecurityPolicy to the deployment. - The ROIeBinding assigns the PodSecurityPolicy to the ServiceAccount, effectively enforcing the specified constraints. This configuration ensures that only the payment-service' deployment can access the confidential data volume mounted as a Secret in Kubernetes.

NEW QUESTION # 232

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