CKAD PRACTICE QUESTIONS

Part 1 Questions

1. Kubernetes Architecture

Question:
You are tasked with deploying a multi-container Pod that requires a specific container to always run first before the second one. How would you configure the order of container startup in the Pod specification?

A) Use initContainers in the Pod specification
B) Use preStop hook in the second container
C) Use readinessProbe in the first container
D) Use livenessProbe in the second container

---

2. Pod Design

Question:
You need to deploy a Pod that runs a web server and logs its output to a file. You also want to ensure that logs are persisted across Pod restarts. How would you accomplish this?

A) Mount a hostPath volume to the container's log directory
B) Use an emptyDir volume to store logs
C) Use a PersistentVolumeClaim (PVC) and mount it to the container
D) Use a ConfigMap to store the logs

---

3. Configuration and Secrets Management

Question:
You need to store database credentials securely for your application. How would you manage these credentials within Kubernetes?

A) Store them in a ConfigMap
B) Store them in a Secret
C) Store them as environment variables within the Pod
D) Store them as annotations on the Pod

---

4. Networking

Question:
You have two services, serviceA and serviceB, running in the same namespace. You need to enable communication between them. What is the correct way to allow serviceA to communicate with serviceB?

A) Use a NetworkPolicy to allow traffic between the two services
B) Use the DNS name of serviceB in the environment variable of serviceA
C) Expose both services via LoadBalancer
D) Bind serviceA to serviceB using a Kubernetes Pod definition

---

5. Deployments and Rollouts

Question:
You have a deployment and want to update it with a new image for the application while ensuring zero downtime. Which strategy would you use for this update?

A) Use kubectl apply with the --record flag
B) Use a rolling update strategy with the deployment
C) Use kubectl rollout restart
D) Use kubectl delete to remove the old pods and create new ones

---

6. Helm Charts

Question:
You are using Helm to deploy an application and need to override a value for a specific configuration. Which command would you use to set a custom value during installation?

A) helm install --set key=value
B) helm install --values values.yaml
C) helm install --config config.yaml
D) helm install --override key=value

---

7. Pod Scheduling

Question:
You need to ensure that a Pod is scheduled only on nodes that have at least 16 GB of memory. Which of the following methods can you use to achieve this?

A) Use a nodeSelector
B) Use a resource request and limit for memory

C) Use an affinity rule
D) Use a taint and toleration

---

8. Logging and Monitoring

Question:
You need to set up monitoring for your application running in Kubernetes and want to track HTTP requests and response times. Which tool would you use for application-level monitoring?

A) Prometheus
B) Fluentd
C) Istio
D) Kubernetes Dashboard

---

9. Pod Lifecycle Management

Question:
You have a pod with multiple containers, and you need to execute a command on one of the containers in a running Pod. Which command will allow you to execute the command inside the container?

A) kubectl exec <pod-name> --container <container-name> -- <command>
B) kubectl run <pod-name> --container <container-name> -- <command>
C) kubectl attach <pod-name> --container <container-name> -- <command>
D) kubectl exec <container-name> --pod <pod-name> -- <command>

---

10. Namespaces and Resource Management

Question:
You need to create a new namespace called dev and deploy an application that should only run in this namespace. Which command would you use to achieve this?

A) kubectl create namespace dev
B) kubectl set namespace dev
C) kubectl apply -f app.yaml -n dev
D) kubectl create deploy app -n dev

Part 2 Questions

Kubernetes Architecture & Configuration

1. **Which of the following statements is true about Kubernetes nodes?**

   A) A node in Kubernetes is a virtual machine only
   B) A node can be either a physical or virtual machine
   C) A node only runs the API server
   D) Nodes do not run containers in Kubernetes

2. **What is the purpose of `kubelet` in a Kubernetes node?**

   A) Manages the Kubernetes cluster's control plane
   B) Registers nodes with the Kubernetes API server
   C) Ensures containers in the node are running as expected
   D) Provides network services for pods

3. **How would you expose a Kubernetes Pod to external traffic?**

   A) Use a Kubernetes Service of type `ClusterIP`
   B) Use a Kubernetes Service of type `NodePort`
   C) Use a Kubernetes Service of type `LoadBalancer`
   D) Both B and C are correct

4. **Which Kubernetes object manages containerized applications' deployment and scaling?**
   A) ReplicaSet
   B) Pod
   C) Deployment
   D) Service

5. **In Kubernetes, how do you define a resource that uses an NFS volume as persistent storage?**

   A) Use `hostPath` volume
   B) Use `emptyDir` volume
   C) Use `nfs` volume
   D) Use `persistentVolumeClaim` volume

Pod Design & Management

6. **Which of the following ensures that a Pod is scheduled to run on a node with at least 4 CPUs?**

   A) `affinity` rules
   B) `taints` and `tolerations`
   C) `nodeSelector`
   D) Resource requests and limits

7. **Which option is used to specify that a container in a Pod should not restart if it fails?**

   A) `restartPolicy: Always`
   B) `restartPolicy: OnFailure`
   C) `restartPolicy: Never`
   D) `restartPolicy: Delayed`

8. **How can you configure a Pod to wait for a specific container to complete before starting the other container?**

   A) Use `initContainers`
   B) Use `readinessProbe`
   C) Use `livenessProbe`
   D) Use `container.lifecycle` hooks

9. **Which of the following is the best way to ensure that logs from a Pod persist across Pod restarts?**

   A) Store logs in a `ConfigMap`
   B) Mount a `hostPath` volume to the log directory
   C) Store logs in a `PersistentVolumeClaim`
   D) Use `emptyDir` volume

10. **You need to define a set of environment variables for your application running in a Pod. Where should you define them?**

A) In the `metadata` section of the Pod
B) In the `spec.containers` section
C) In the `spec.volumes` section
D) In the `spec.initContainers` section

Services, Networking & Communication

11. **What is the default type of Kubernetes service?**

    A) `ClusterIP`
    B) `NodePort`
    C) `LoadBalancer`
    D) `ExternalName`

12. **How would you allow two Pods in different namespaces to communicate with each other?**
    A) Use `NetworkPolicies` to allow cross-namespace traffic
    B) Use `PodSecurityPolicies` to allow cross-namespace traffic
    C) Use DNS names like `<pod-name>.<namespace>.svc.cluster.local`
    D) Cross-namespace communication is not possible in Kubernetes

13. **Which component in Kubernetes manages the DNS for service discovery?**

    A) kube-apiserver
    B) kube-proxy
    C) CoreDNS
    D) etcd

14. **What does a `NetworkPolicy` define?**

    A) How services communicate with each other
    B) Which Pods can communicate with each other based on labels and namespaces
    C) Which nodes can access the Kubernetes cluster
    D) How to authenticate users in the cluster

15. **How would you ensure that only Pods in a specific namespace can access a service in that namespace?**

    A) Use `NetworkPolicy`
    B) Use `PodSelector`
    C) Use `RBAC`

D) Use `ServiceAccount`

StatefulSet & Persistent Storage

16. **What Kubernetes object should you use for managing stateful applications with persistent storage?**

    A) Deployment
    B) StatefulSet
    C) ReplicaSet
    D) DaemonSet

17. **What is the difference between `StatefulSet` and `Deployment`?**

    A) `StatefulSet` manages applications that require persistent storage and stable network identities
    B) `StatefulSet` can only manage stateless applications
    C) `StatefulSet` automatically creates `PersistentVolumeClaims` for pods
    D) `StatefulSet` is only for batch processing

18. **You have a StatefulSet with persistent volumes. What happens when the Pod fails?**

    A) A new Pod is created, but the volume is not reused
    B) A new Pod is created, and the volume is reused
    C) A new Pod is not created automatically
    D) The PersistentVolume is deleted

19. **Which of the following is the correct way to manage storage in a `StatefulSet`?**

    A) Use `emptyDir` for storage
    B) Use a `PersistentVolumeClaim` in the `volumeClaimTemplates` section
    C) Use a `hostPath` volume
    D) Use `ConfigMap` for storage

20. **What is the purpose of a `PersistentVolumeClaim` (PVC)?**

    A) To declare storage requirements for Pods
    B) To bind a Pod to a specific node
    C) To create a new storage resource

D) To manage access control to storage

Deployments & Rollouts

21. **How would you roll back a deployment to a previous version in Kubernetes?**

    A) Use `kubectl delete deployment <deployment-name>`
    B) Use `kubectl rollout undo deployment <deployment-name>`
    C) Use `kubectl apply -f <previous-version-file>`
    D) Kubernetes does not support rollbacks

22. **Which strategy does Kubernetes use by default when rolling out a new version of a deployment?**

    A) Rolling update
    B) Recreate
    C) Blue-green deployment
    D) Canary deployment

23. **Which command allows you to monitor the status of a deployment rollout?**

    A) `kubectl get deployment`
    B) `kubectl describe deployment`
    C) `kubectl rollout status deployment <deployment-name>`
    D) `kubectl get rollout`

24. **How can you configure a deployment to run only one replica of a pod?**

    A) Set `replicas: 1` in the deployment manifest
    B) Set `replicas: 0` in the deployment manifest
    C) Use `kubectl scale deployment`
    D) Set `replicas: true`

25. **How can you update the image of a running deployment?**

    A) `kubectl set image deployment <deployment-name> <container-name>=<new-image>`
    B) Edit the deployment manifest and reapply it
    C) Both A and B are correct
    D) Delete and recreate the deployment

Helm & Package Management

26. **What is the primary purpose of Helm in Kubernetes?**

    A) To deploy containers to Kubernetes clusters
    B) To manage and automate the deployment of applications using charts
    C) To monitor Kubernetes clusters
    D) To control traffic routing in Kubernetes

27. **What does the Helm chart `values.yaml` file define?**

    A) The Kubernetes cluster's configuration
    B) The configuration values for the Helm release
    C) The list of available charts
    D) The Helm repository URL

28. **Which command would you use to upgrade a Helm release with a new version of a chart?**
    A) `helm upgrade <release-name> <chart-name>`
    B) `helm install <release-name> <chart-name>`
    C) `helm deploy <release-name> <chart-name>`
    D) `helm update <release-name> <chart-name>`

29. **How would you install a Helm chart from a local directory?**

    A) `helm install <chart-name> ./chart`
    B) `helm add <chart-name> ./chart`
    C) `helm install ./chart`
    D) `helm install --local <chart-name>`

30. **What command would you use to check the values of a Helm release?**

    A) `helm get values <release-name>`
    B) `helm show values <release-name>`
    C) `helm values <release-name>`
    D) `helm status <release-name>`

Troubleshooting & Logs

31. **Which command would you use to get the logs of a container in a Pod?**

    A) `kubectl logs <pod-name>`
    B) `kubectl logs <container-name> -p`
    C) `kubectl get logs <pod-name>`
    D) `kubectl describe logs <pod-name>`

32. **If a Pod is stuck in the `ContainerCreating` state, which of the following is a possible reason?**

    A) There is an issue with the container image
    B) The Pod is not scheduled to any node
    C) The node has insufficient resources for the Pod
    D) All of the above

33. **You want to monitor the resource usage of a Pod. Which command should you use?**

    A) `kubectl top pod <pod-name>`
    B) `kubectl describe pod <pod-name>`
    C) `kubectl logs <pod-name>`
    D) `kubectl get pod <pod-name>`

34. **What does the `kubectl describe` command provide when run on a Pod?**

    A) Pod's logs
    B) Detailed status and event information about the Pod
    C) Pod's resource usage
    D) Pod's containers and their configuration

35. **How would you troubleshoot a failing Pod using `kubectl`?**

    A) Use `kubectl logs <pod-name>` to check logs
    B) Use `kubectl describe pod <pod-name>` to check events
    C) Use `kubectl exec <pod-name> -- <command>` to run debugging commands
    D) All of the above

Security & Access Control

36. **Which Kubernetes resource is used to control access to resources within a cluster?**

A) `RBAC` (Role-Based Access Control)
B) `NetworkPolicy`
C) `ServiceAccount`
D) `ConfigMap`

37. **Which Kubernetes resource defines the permissions for users or service accounts to access resources?**

A) `Role` and `RoleBinding`
B) `PodSecurityPolicy`
C) `Deployment`
D) `ServiceAccount`

38. **How can you limit a Pod's access to a specific set of nodes?**

A) Use `nodeSelector`
B) Use `affinity`
C) Use `taints` and `tolerations`
D) All of the above

39. **Which of the following can be used to run a container with restricted privileges in Kubernetes?**

A) Use `SecurityContext`
B) Use `ServiceAccount`
C) Use `PodSecurityPolicy`
D) Use `NetworkPolicy`

40. **How can you enforce that containers only run as non-root users in your Kubernetes cluster?**

A) Use `PodSecurityPolicy`
B) Use `RBAC`
C) Use `SecurityContext` with `runAsUser`
D) Use `NetworkPolicy`

Other Important Topics

41. **What is the function of `kubectl expose` command?**

    A) To create a Kubernetes Service
    B) To create a new Deployment
    C) To scale a deployment
    D) To monitor pod status

42. **Which of the following would be the best way to isolate an application that should not be accessed by others in the same cluster?**

    A) Use `NetworkPolicies`
    B) Use `PodSecurityPolicies`
    C) Use `Namespace`
    D) Use `PodSecurityContext`

43. **What does the `kubectl scale` command do?**

    A) It resizes the number of Pods in a Deployment, ReplicaSet, or StatefulSet
    B) It increases the resource limits of a Pod
    C) It increases the number of nodes in the cluster
    D) It resizes the volume attached to a Pod

44. **You are configuring resource requests and limits for a container in Kubernetes. What happens when a container exceeds its CPU limit?**

    A) The container is restarted automatically
    B) The container's CPU usage is throttled
    C) The container is evicted
    D) The container's memory is expanded

45. **What is the purpose of `kubectl apply`?**

    A) To deploy resources to the cluster
    B) To delete resources from the cluster
    C) To get a list of resources in the cluster
    D) To update an existing resource or create it if it does not existt

---

More Questions

46. **How do you prevent a Pod from being scheduled on certain nodes?**

A) Use `taints` and `tolerations`
B) Use `affinity`
C) Use `nodeSelector`
D) All of the above

47. **Which command would you use to manually restart a Pod in Kubernetes?**

A) `kubectl restart pod <pod-name>`
B) `kubectl delete pod <pod-name>`
C) `kubectl restart deployment <deployment-name>`
D) `kubectl rollout restart deployment <deployment-name>`

48. **What is the default `kube-proxy` mode in Kubernetes?**

A) `iptables`
B) `ipvs`
C) `proxy`
D) `loadbalancer`

49. **How would you limit the CPU and memory resources for a container in a Pod?**

A) Use the `limits` and `requests` fields in the container's resource specification
B) Use `affinity` rules
C) Use a `ServiceAccount`
D) Use `NetworkPolicies`

50. **What Kubernetes feature allows you to automatically scale the number of Pods in a Deployment?**

A) Horizontal Pod Autoscaler
B) ReplicaSet
C) StatefulSet
D) Vertical Pod Autoscaler
