

AKS Interview Questions:

1-2 Liner Question:

1. What is the Kubernetes control plane, and what components are part of it.

.> the k8s control plane manages the cluster workload and responds for the events.

control plane components:

- 1- Kube API Server
- 2- Controller Manager
- 3- Scheduler
- 4- ETCD

2. How do you upgrade the Kubernetes version in an AKS cluster?

During the cluster upgrade process, AKS performs the following operations:

- Add a new buffer node (or as many nodes as configured in max surge) to the cluster that runs the specified Kubernetes version.
 - Cordon and drain one of the old nodes to minimize disruption to running applications. If you're using max surge, it cordons and drains as many nodes at the same time as the number of buffer nodes specified.
 - For long running pods, you can configure the node drain timeout, which allows for custom wait time on the eviction of pods and graceful termination per node. If not specified, the default is 30 minutes.
 - When the old node is fully drained, it's reimaged to receive the new version and becomes the buffer node for the following node to be upgraded.
 - Optionally, you can set a duration of time to wait between draining a node and proceeding to reimage it and move on to the next node. A short interval allows you to complete other tasks, such as checking application health from a Grafana dashboard during the upgrade process. We recommend a short timeframe for the upgrade process, as close to 0 minutes as reasonably possible. Otherwise, a higher node soak time affects how long before you discover an issue. The minimum soak time value is 0 minutes, with a maximum of 30 minutes. If not specified, the default value is 0 minutes.
 - This process repeats until all nodes in the cluster are upgraded.
 - At the end of the process, the last buffer node is deleted, maintaining the existing agent node count and zone balance.
- Apply the below command to upgrade
- ```
az aks upgrade \
 --resource-group myResourceGroup \
 --name myAKSCluster \
 --kubernetes-version <KUBERNETES_VERSION>
```

### 3. What is a Kubernetes ConfigMap, and how can it be used in AKS?

It is a k8s object for storing the configuration and make it decoupled from the containerized apps.

### Scenario based Question.

**4. You are responsible for managing an Azure Kubernetes Service (AKS) cluster that hosts multiple microservices. One of the microservices is experiencing intermittent connectivity issues with an external service. Walk me through the steps you would take to troubleshoot and resolve this connectivity issue.**

- 1- First of all I will review the pod logs and observe if any logs related to this issue.
  - `Kubectl logs <pod-name>`
- 2- I will run some network commands from the pod
  - `Kubectl -it <pod-name> -- telnet <external-service>:<port>`  
If I got time out response I will assume that it's a network issue  
If I got connection refused I will assume that the service is down. Or a firewall block this flow.
  - `Kubectl -it <pod-name> -- nslookup <external-service>`  
  
Check if the pod is resolving the DNS for this external service
- 3- check there is no firewall blocks this flow.
- 4- Check the resource utilization for both node and pod
- 5- Check the cluster event
  - `Kubectl get events`

**5. You have a stateful application running in your Azure Kubernetes Service (AKS) cluster that utilizes persistent storage. The application needs to be scaled to handle increased traffic. Explain how you would scale this stateful application, considering both the stateful nature and the persistence requirements.**

- For stateful apps we should use statefulset k8s resource with a persistent volume in order to be able to scale it out.

**6. You are tasked with implementing rolling updates for a critical microservice in your Azure Kubernetes Service (AKS) cluster. The update includes a new version of the microservice that needs to be deployed seamlessly with minimal downtime. How would you approach and execute this rolling update?**

- I can do so by modifying the deployment manifest with the new image version and ensure that the strategy is rollingupdate.

**7. One of the nodes in your Azure Kubernetes Service (AKS) cluster is experiencing performance issues, and applications deployed on that node are failing to respond. Walk me through the steps you would take to troubleshoot and resolve this issue.**

- 1- Check the node resources and status.
- Kubectl describe node <node-name>
- 2- Run :
- Kubectl get events
- 3- Check the pod logs
- Kubectl logs <pod-name>

>> maybe there is a need to add additional worker node.

**8. You receive a request from the development team to deploy a new version of a microservice to the Azure Kubernetes Service (AKS) cluster. Walk me through the steps you would take to ensure a smooth deployment of the updated microservice.**

- I should test this new version in the stage environment and make sure it's working properly after that I can move it to production by modifying the manifest of the deployment with the new image version.
- Actually there are several strategy for the upgrade such as blue-green, rolling update, canary and rolling update.