

Quiz One:

1.

Which of the following compute options is best suited to a hybrid, multi-cloud world?

- A. Containers running on Kubernetes clusters; containers are portable and support hybrid architectures; Kubernetes is supported by several major cloud providers
- B. Virtual machines, which are both portable across on-premise and the cloud, and are also supported on all cloud platforms
- C. Serverless computing such as Lambda Functions on AWS and Cloud Functions on GCP
- D. PaaS compute, such as Elastic Beanstalk on AWS and App Engine on GCP

2.

Containers differ from Virtual Machines in which of the following respects?

- A. All the other alternatives are correct
- B. Containers do not contain an operating system, VMs do
- C. Containers tend to be smaller images than VMs
- D. Containers are more portable than VMs

3.

How can the relationship between Docker and Kubernetes best be described?

- A. Docker as a container format is complementary to Kubernetes as an orchestration service; Docker Swarm competes with Kubernetes
- B. Docker as a container format competes with Kubernetes as an orchestration service and Docker Swarm competes with Kubernetes
- C. Docker and Kubernetes are substitutes for each other and compete in the market
- D. Docker and Mesosphere are rivals container formats to Kubernetes

4.

Which of the following best describes Kubernetes?

- A. It is a container orchestration system that manages clusters of infra running containers
- B. It is a hypervisor that runs between the infra and virtual machines on cloud instances
- C. Docker and Kubernetes are rival container formats
- D. Kubernetes is a way for public cloud providers to offer PaaS as a compute option

Quiz Two:

5.

Which of the following statements about Pods in Kubernetes is NOT true?

- A. Pods support auto-healing and auto-scaling
- B. Pods are the atomic unit of deployment on Kubernetes; all containers in a pod start successfully, else none do
- C. One pod can never be scheduled on more than one node

- D. Pods are encapsulated and managed by higher level objects such as ReplicaSets or Deployments

6.

What relationship do containers within a multi-container pod share?

- A. Such containers are tightly coupled; they can access each other using localhost and share access to the same volumes; they might compete for resources on the same node
- B. Multi-container pods are not allowed in Kubernetes, as pods are the atomic unit of work
- C. Multi-container pods are the standard abstraction used for scaling
- D. Multi-container pods are the standard abstraction used for auto-healing and high availability

7.

Where do pods run?

- A. Pods are scheduled by the Kubernetes scheduler to run on some node in the cluster; this node could be a cloud instance, bare metal or a VM running on-prem
- B. Each pod is distributed across multiple nodes in a cluster
- C. Pods run in the control plane and control individual containers which are scheduled on the cluster
- D. Pods run inside ReplicaSets or Deployment objects

8.

Match the rows and columns:

Rows:

- I. Kube-apiserver
- II. Etcd
- III. Kube-scheduler
- IV. Cloud-controller manager

Columns:

- A. Keeps the actual and desired state of the cluster in synch
- B. Makes decisions about where and when pods should run
- C. Accepts incoming HTTP post requests from users
- D. Stores metadata that forms the state of the cluster

Alternatives:

- A. I - B; II - D; III - B; IV - A
- B. I - D; II - B; III - B; IV - A
- C. I - A; II - B; III - D IV - C
- D. I - B; II - C; III - A IV - D

9.

Which of the following types of intra-cluster communication do not need special attention from a security perspective?

- A. Cluster -> Master
- B. Kube-apiserver -> Kubelet
- C. Kube-apiserver -> Pods
- D. All of the above

10.

Which of the following components do NOT run on individual nodes in a cluster?

- A. Kube-apiserver
- B. Kube proxy
- C. Kubelet agent
- D. Container Engine

Quiz Three:

11.

Which of the following environments can host a Kubernetes cluster?

- A. All of the other alternatives are correct
- B. Google Cloud Platform
- C. Microsoft Azure
- D. AWS
- E. On-premise

12.

Which feature of Kubernetes lends itself to running on multi-cloud environments

- A. Federated clusters
- B. Horizontal Pod Autoscalers
- C. Deployments and ReplicaSets
- D. Services and Ingress objects

13.

Which element of the Kubernetes master will vary based on the platform where our cluster is running?

- A. Cloud-controller manager
- B. Kube-apiserver
- C. Etcd
- D. Kube-scheduler

14.

Match the columns

- I. Kubectl
- II. Kubeadm
- III. Kops

- A. Opinionated provisioning service, used to roll cluster on AWS
- B. Most command command, works with both imperative and declarative modes
- C. Used to bootstrap a cluster from a set of infra nodes

Alternatives:

- A. I - B; II - C; III - A
- B. I - A; II - B; III - C
- C. I - C; II - A; III - B
- D. I - C; II - B; III - A

15.

How can we tell, by looking at a kubectl command, whether or not it uses Declarative object management?

- A. Any command of the form kubectl apply -f is declarative
- B. Any command of the form kubectl create -f is declarative
- C. Declarative object management uses programmatic HTTP requests and does not use kubectl
- D. Declarative commands use kubeadm, not kubectl

16.

How can we tell, by looking at a kubectl command, whether or not it uses Imperative object management?

- E. Any command of the form kubectl apply -f is declarative; any other type of command is imperative
- F. Any command that employs the -f switch and references a YAML file is declarative
- G. Any command that employs the -f switch and references a YAML file is imperative
- H. Imperative commands use kubeadm, not kubectl

17.

Which of the following is NOT one of the standard object management techniques in Kubernetes?

- A. Kops for opinionated cluster provisioning
- B. "Kubectl apply -f" for declarative management
- C. "Kubectl create -f", "Kubectl delete -f" etc for imperative management with config files
- D. "Kubectl run", "Kubectl scale" etc for purely imperative object management of live objects

Quiz Four - Volumes

18.

What are volumes?

- A. Storage abstractions that have a life longer than that of an individual container
- B. Storage abstractions that have a life longer than that of an individual pod
- C. Directories mounted by containers from the operating system of the node
- D. Config files used to parameterize containers inside a pod

19.

Which of the following is NOT a kind of volume object?

- A. Ingress object
- B. emptyDir
- C. gitRepo
- D. hostPath
- E. azureDisk

20.

What are persistent volumes?

- E. Storage abstractions that have a life longer than that of an individual pod
- F. Storage abstractions that have a life longer than that of an individual container
- G. Directories mounted by containers from the operating system of the node
- H. Config files used to parameterize containers inside a pod

21.

Each cloud provider has persistent volume abstractions that can only be used for Kubernetes clusters hosted on that provider. For instance

- gcePersistentDisk can only be used for clusters running on GCP
- AWSElasticBlockStore can only be used for clusters running on AWS
- AzureDisk and AzureFile can only be used for clusters running on Azure

True or False?

- A. True
- B. False - this would violate the portability of Kubernetes
- C. Sometimes True - gcePersistentDisk can be used with any infra, but the others are tied to specific platform providers

Quiz Five - Containers

22.

The pod specification can reference container images from which of the following locations

- A. All the other alternatives are correct
- B. DockerHub
- C. Google Container Registry

- D. Elastic Container Registry on AWS
- E. Private registries

23.

Which of the following bits of information is NOT accessible, by default, within a container in a pod?

- A. Metadata and labels of the pod (need to explicitly specify using Downward API)
- B. Image name and file system
- C. Services in the cluster - ClusterIP and NodePort of each service
- D. Name of pod running the container

24.

How can containers react to events in their own lifecycle

- A. Using PostStart and PreStop hooks
- B. Via environment variables
- C. Using liveness and readiness probes
- D. Using Init Containers

25.

Which of the following is a way to force a pod to be scheduled on a specific type of node?

- A. The nodeSelector element in the pod config spec
- B. Taints
- C. Tolerations
- D. Pod affinities

26.

Which of the following is a way to force pods to be scheduled on different underlying nodes?

- E. Pod anti-affinity
- F. Node anti-affinity
- G. Node taints
- H. Node tolerations

27.

InitContainers differ from “regular” App Containers in which of the following respects?

- A. They run serially and each must complete successfully
- B. They run in parallel and each must complete successfully
- C. They support readiness probes
- D. Init containers can not access mounted volumes

28.

Which of the following statements about Restart Policy is false?

- A. RestartPolicy applies to pods in a deployment or replicaset
- B. RestartPolicy applies to containers within a pod

- C. Possible values are: Always, Never and OnFailure
- D. Default RestartPolicy is Always

29.

Which of the following best describes Liveness and Readiness probes?

- A. Liveness probes help the kubelet check if a container is alive and readiness probes indicate that the container is ready to accept incoming requests
- B. Liveness probes help the kubelet check if a pod is alive and readiness probes indicate that the pod is ready to accept incoming requests
- C. Readiness probes help the kubelet check if a container is alive and liveness probes indicate that the container is ready to accept incoming requests
- D. Readiness probes help the kubelet check if a pod is alive and liveness probes indicate that the pod is ready to accept incoming requests

Quiz Six - Controllers:

30.

Which of the following best describes the uses of Deployment objects?

- A. Versioning, rollback and advanced deployment options such as rolling updates
- B. Autohealing - ensuring that a specific number of replicas of a pod are running
- C. Frontend - a stable IP address and port at which pods will be accessible
- D. Node-specific pods, for instance to ensure that each node in a cluster runs a specific daemon

31.

Which of the following best describes the uses of ReplicationController objects?

- E. They offer the same functionality as ReplicaSets + Deployments, and are no longer the recommended way of ensuring scaling and versioning
- F. Autohealing - ensuring that a specific number of replicas of a pod are running
- G. Frontend - a stable IP address and port at which pods will be accessible
- H. Node-specific pods, for instance to ensure that each node in a cluster runs a specific daemon

32.

Which of the following best describes the uses of ReplicaSet objects?

- I. Ensuring that a specific number of replicas of a pod are running
- J. Versioning, rollback and advanced deployment options such as rolling updates
- K. Frontend - a stable IP address and port at which pods will be accessible
- L. Node-specific pods, for instance to ensure that each node in a cluster runs a specific daemon

33.

What determines which pods are controlled by a ReplicaSet object?

- A. The pod selector in the replicaset template (.spec.selector) specifies certain labels; all pods that have all those labels will be controlled by the ReplicaSet
- B. The ReplicaSet template lists out all pods that are governed by it, as well as the number of replicas
- C. The kube-controller listens for pod updates and requests and schedules the appropriate ReplicaSet
- D. The kube-scheduler listens for pod updates and requests and schedules the appropriate ReplicaSet

34.

Why is the coupling between a ReplicaSet and the pods it controls said to be loose?

- A. All the other alternatives are correct
- B. It is possible to delete a ReplicaSet without affecting the pods it controls (use the --cascade=false option)
- C. A pod can be isolated from a ReplicaSet by changing the labels it carries
- D. The labels in the ReplicaSet pod selector can be updated to change the pods it controls

35.

What Kubernetes object would you use to scale the number of replicas of a pod based on a metric such as CPU utilization?

- A. Horizontal Pod Autoscaler
- B. ReplicaSet
- C. ReplicationController
- D. Deployment

36.

Which of the following objects can not be used as the target of a HPA?

- A. Daemon sets
- B. Deployments
- C. ReplicaSets
- D. ReplicationControllers

37.

How is rollback accomplished using Deployment objects?

- A. Any change to the pod template of a deployment triggers a revision; a single command can rollback the deployment to any previous revision
- B. Any change to a deployment (including scaling) triggers a revision; a single command can rollback the deployment to any previous revision
- C. To rollback a deployment, simply delete it
- D. To rollback a deployment, simply delete it with the --cascade = false option

38.

What kind of changes to a deployment trigger the creation of a new revision?

- A. Only changes to the pod template
- B. All changes to the template (required state)
- C. All changes to the status (actual state)
- D. All changes to either required state or actual state

39.

What is the Strategy field in the spec of a deployment object?

- A. During the rollout of a new version, Strategy = Recreate will kill existing pods before new ones are brought up while Strategy = RollingUpdate will balance the number of old and new pods
- B. During the rollout of a new version, Strategy = RollingUpdate will kill existing pods before new ones are brought up while Strategy = Recreate will balance the number of old and new pods
- C. During the rollout of a new version, Strategy=RollingUpdate will keep replicaset for both the old and new versions, while Strategy=Canary will create just 1 pod for the new version
- D. During the rollout of a new version, Strategy=Canary will keep replicaset for both the old and new versions, while Strategy=RollingUpdate will create just 1 pod for the new version

40.

Which of the following statements about the Revision History Limit of a deployment is NOT true?

- A. Use this field in the template to determine whether pods will automatically be freed from control by the Deployment after a certain number of revisions
- B. Do not set this field to zero unless you wish to make rollbacks impossible
- C. This field governs how many old replicaset are preserved by a deployment
- D. All of the other alternatives are true

41.

Which of the following statements about paused deployments is true?

- A. If you pause a deployment, make fixes to it, then resume, all new pods in the ReplicaSet for the current revision, even those created before you paused will pick up the changes you made
- B. If you pause a deployment, make fixes to it, then resume, only the pods created post-resumption will pick up the changes you made
- C. You can not roll back a paused deployments
- D. You can not change the image of a paused deployment

42.

Which of the following statements about StatefulSets is NOT true?

- A. StatefulSets are commonly used to ensure that all nodes run a certain container, such as a file daemon
- B. For a StatefulSet with N replicas, when Pods are being deployed, they are created sequentially, in order from {0..N-1}.
- C. When Pods are being deleted, they are terminated in reverse order, from {N-1..0}.
- D. Before a scaling operation is applied to a Pod, all of its predecessors must be Running and Ready.

43.

Which of the following statements about DaemonSets is NOT true?

- A. Pods in a DaemonSets are created and destroyed in a specific order
- B. A DaemonSets ensures that all (or some) Nodes run a copy of a Pod.
- C. As nodes are added to the cluster, Pods are added to them.
- D. As nodes are removed from the cluster, those Pods are garbage collected.
- E. Deleting a DaemonSet will clean up the Pods it created.

44.

Which of the following statements about Job objects is NOT true?

- A. Job objects are used to ensure a stable networking frontend for pods
- B. A *job* creates one or more pods and ensures that a specified number of them successfully terminate.
- C. Deleting a Job will cleanup the pods it created.

45.

Which of the following are use-cases for Job objects?

- D. As pods successfully complete, the *job* tracks the successful completions. When a specified number of successful completions is reached, the job itself is complete.
- E. Create one Job object in order to reliably run one Pod to completion

F. A Job can be used to run multiple pods in parallel.

G. All of the other alternatives are correct

Quiz Seven - Services:

46.

What functionality do Service objects in Kubernetes provide?

- A. All of the other alternatives are correct
- B. A stable networking front-end for a set of backend pods
- C. Load-balancing across different pods hosting an application
- D. A loose coupling between the frontend IP and backend pods

47.

How are backend pods associated with a Service object?

- A. The endpoint object keeps track, dynamically, of all pods that are associated with a service object
- B. Environment variables in each pod associate it with the correct service object
- C. The downward API helps pods tell containers which service object they are associated with
- D. Using ingress objects

48.

What is the ClusterIP?

- A. A stable frontend IP address that can be used to access a service object from anywhere in the cluster
- B. A global IP that can be used by external clients to access a service
- C. An IP address that can be used to connect to each node and get access to the corresponding service
- D. The IP address of a load balancer type of service

49.

What role does the kube-proxy play in supporting Service objects?

- A. The kube-proxy which runs on each node relays incoming requests on the NodePort to the corresponding service
- B. External clients can hit the cluster IP address and node port, and the kube-proxy will relay the request to the service
- C. The kube-proxy acts as a load balancer for services of type loadbalancer
- D. All of the other alternatives are true

50.

What is a headless service?

- A. A service object that does not have a Cluster IP
- B. A service object without an endpoint object
- C. Services that can only be accessed from within the cluster
- D. Services that sit behind an external cloud load balancer

51.

How do clients within a cluster discover how to access services?

- I. Environment variables
 - II. DNS lookup
 - III. End-point objects
-
- A. I and II, but preferably I (DNS lookup is dynamic, environment variables are not)
 - B. I and II, but preferably I (environment variables are dynamic, DNS lookup is not)
 - C. I and III, but preferably III (endpoint objects are dynamic, environment variables are not)
 - D. I, II and III

52.

Which of the following types of service objects are NOT accessible from outside the cluster?

- A. ClusterIP
- B. NodePort
- C. LoadBalancer
- D. ExternalName

