Kubernetes Interview Questions

Kubernetes Interview Questions

01 What do you understand by Kubernetes?

Kubernetes is an open-source container management (orchestration) tool. It's container management responsibilities include container deployment, scaling & descaling of containers, and also container load balancing.

Kubernetes Interview Questions

02 How is Kubernetes related to Docker?

Docker is responsible for managing the lifecycle of containers and these containers are manually linked and orchestrated with Kubernetes.

Kubernetes Interview Questions

03 Tell the difference between deploying applications on host and containers?

The old way: Application on Host

App	App
App	App
Libraries	
Kernel	

The New Way: Deploy Containers

App	App
Libraries	Libraries
App	App
Libraries	Libraries
Kernel	

Kubernetes Interview Questions

04 What do you understand by Container Orchestration?

Container Orchestration can be thought of as an automated management for all the containers present in the cluster. So, it's basically the communication of containers to fulfil the requirements of a single host server.

Kubernetes Interview Questions

Why do we need Container Orchestration?

Multiple Services running inside containers

Increases the human cost of running services

Increases the size of bills from public cloud providers

Increases the complexity of running something new in production

Scaling was difficult

Setting up services manually

Manual work of fixing if a node crashes

Challenges without Container Orchestration

06 How is Kubernetes different from Docker Swarm?

Features	Kubernetes	Docker Swarm
Installation & Cluster Config	Installation is very Complicated, but once setup cluster is very strong	Installation is very simple, but cluster is not very strong
GUI	GUI is the Kubernetes Dashboard	There is no GUI
Scalability	Highly scalable and scales fast	Highly scalable and scales 5x faster than Kubernetes
Auto scaling	Kubernetes can do auto scaling	Docker swarm cannot do auto scaling
Load Balancing	Manual intervention needed for load balancing traffic between different containers and pods	Docker swarm does auto load balancing of traffic between containers in the cluster
Rolling Updates & Rollbacks	Can deploy rolling updates and does automatic roll backs	Can deploy rolling updates, but not automatic rollbacks
DATA Volumes	Can share storage volumes only with the other containers in the same pod	Can share storage volumes with any other container
Logging & Monitoring	In-built tools for logging and monitoring	3rd party tools like ELK stack should be used for logging and monitoring

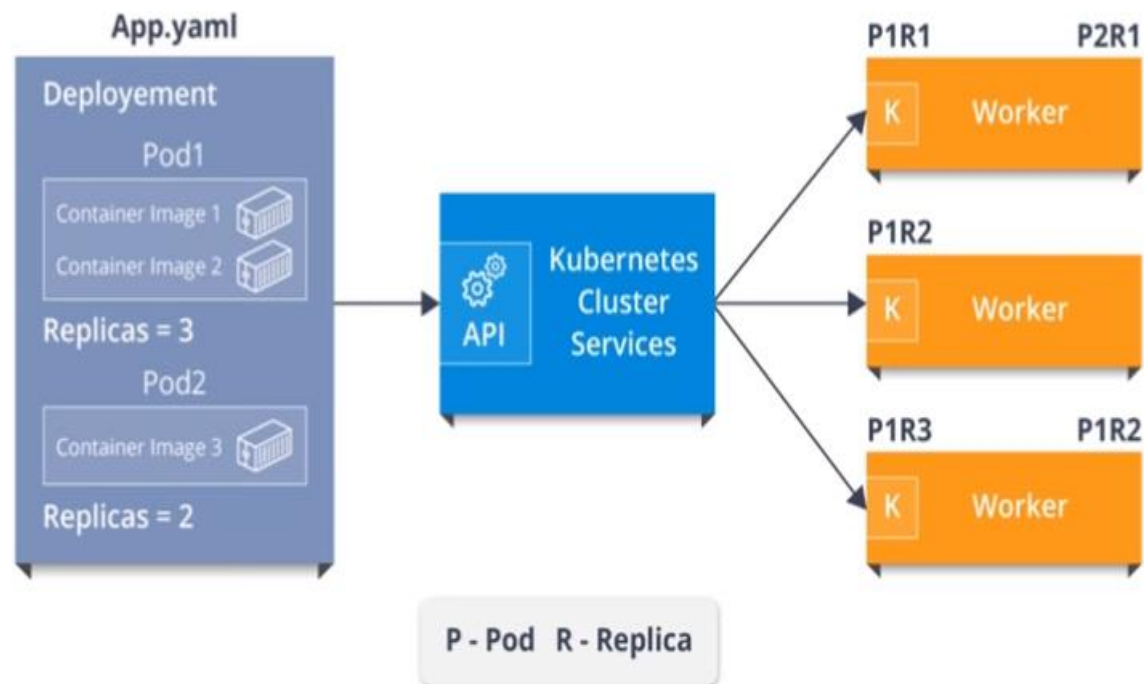## 08 How does Kubernetes simplify Containerized Deployment?

A typical application has a cluster of containers across multiple hosts and these containers need to talk to each other. So, Kubernetes offers the required configurations for the users after the application state has been defined.

What do you know about Cluster in Kubernetes?

App.yaml

Deployement

Pod1

Container Image 1
Container Image 2

Replicas = 3

Pod2

Container Image 3

Replicas = 2

API · Kubernetes Cluster Services

P1R1 · P2R1 · K · Worker

P1R2 · K · Worker

P1R3 · P1R2 · K · Worker

P - Pod   R - Replica

10

What is the Google Container Engine?

A Google Container Engine also known as the GKE, is an open source container management system which is based on Kubernetes. This is mainly a container orchestration and management system for Dockers containers and clusters.

What is a Heapster?

Heapster supports Kubernetes natively on all the setups and is a cluster-wide aggregator of monitoring and event data.

12

What is a Minikube?

This is a tool that runs a single node Kubernetes cluster inside a virtual machine, thus simplifying it for the people to learn.

13   What is a Kubectl?

Kubectl is the command line interface available to run the commands against Kubernetes clusters. So, it has various features such as describing the command, operations, and providing examples for each and every operation.
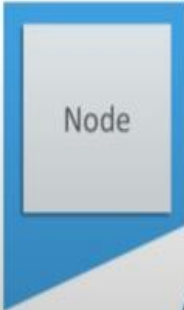
What is a Kubelet?

As, we all know, that the basic unit of Kubernetes is the pod, and Kubelet is a process that runs all the pods present in the clusters.

What do you understand by node in Kubernetes?

15

01 A node in Kubernetes cluster is the main worker machine

02 They are also known as minions

03 It could run on a physical machine or a VM

04 Node provides all the necesarry services to run Pods

05 Node in the Kubernetes system is managed by the master

Node

16 What are the different components of Kubernetes architecture?
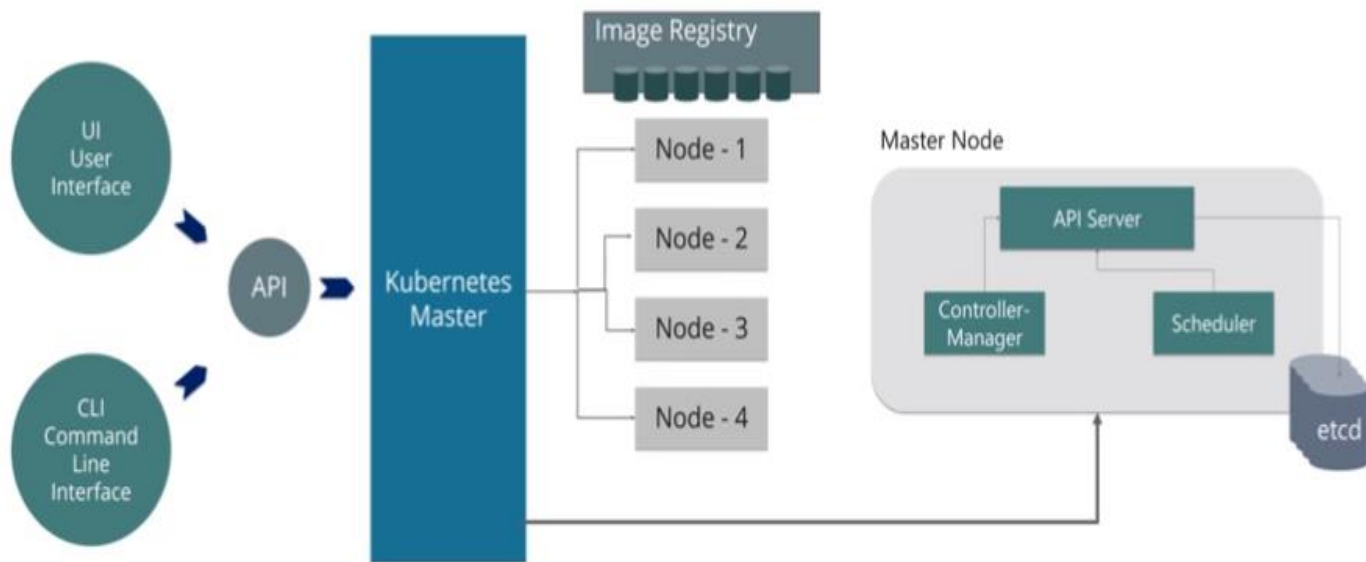
What do you understand by kube - proxy?
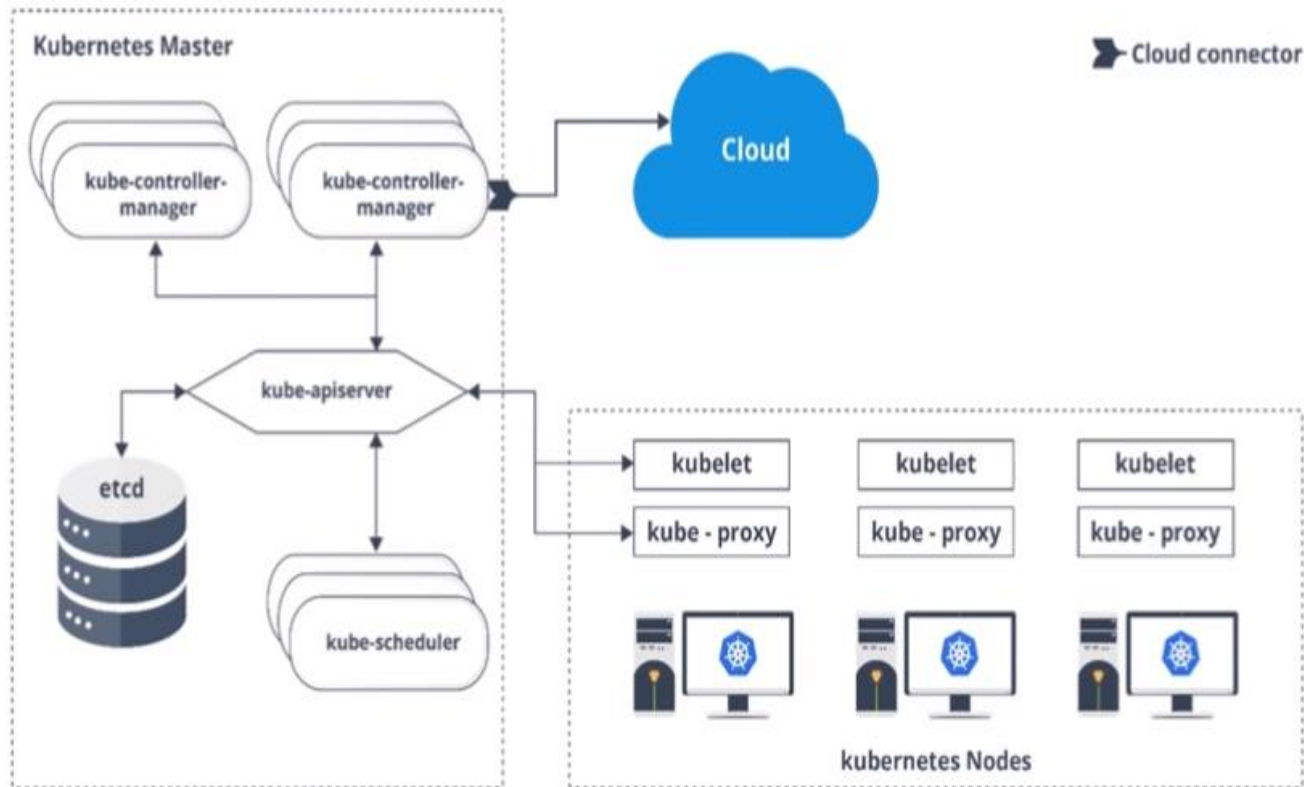
Kube-proxy can perform simple TCP/UDP packet forwarding across the backend network service, and is present on every node. It is a network proxy which reflects the services as configured in Kubernetes API.

18 Can you brief on the working of Master node?

19

What is the role of kube - scheduler and kube - apiserver?

Kube-scheduler is responsible for distribution and management of workloads and the

Kube-api-server validates and configures data for the API objects such as the pods,

services etc.

What do you know about Kubernetes Controller Manager?

Controller Manager is a daemon that embeds controllers. It basically does namespace creation and garbage collection.

Node controller

Manages the status of the nodes (create, update, delete)

Replication controller

Maintains number of pods - for every replication controller object in the system.

Create default accounts and API access tokens for new namespaces

Service Account & Token Controllers

Takes care of endpoint objects (like pods, join services etc)

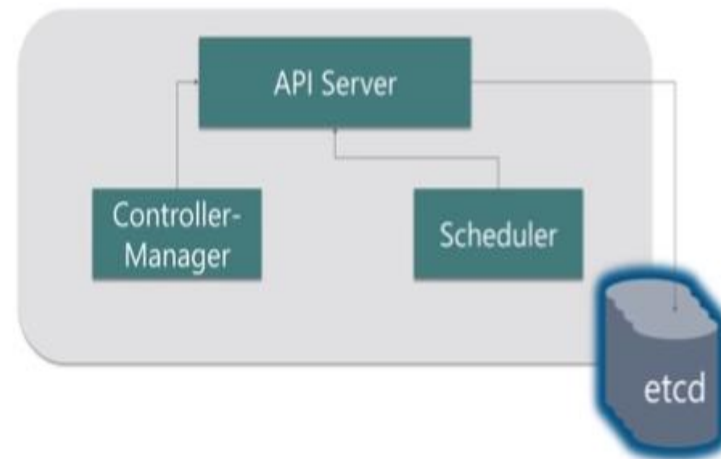**Endpoints Controller**

What is ETCD?

Provides reliable datastore through distributed locking mechanism, writes barriers, and ensures that the leader is sending heartbeats periodically.

Master Node

API Server

Controller-Manager

Scheduler

etcd

What are the different types of services used?

22

| Cluster IP	Node Port	Load Balancer	External Name
• Exposes the service on a cluster-internal IP.	• Exposes the service on each Node's IP at a static port	• Exposes the service externally using a cloud provider's load balancer.	• Maps the service to the contents of the External Name field by returning a CNAME record with its value.
• Makes the service only reachable from within the cluster.	• A Cluster IP service to which Node Port service will route, is automatically created	• Services, to which the external load balancer will route, are automatically created.	• No proxying of any kind is set up.
• This is the default Service Type			

How can you achieve load balancing in Kubernetes?

Load-balancer configuration depends upon the cloud provider. Few cloud providers allow to configure your own IP. Just incase IP is not specified then a temporary IP is assigned.

Traffic

Load Balancer

Service

Pod   Pod   Pod

Kubernetes Cluster
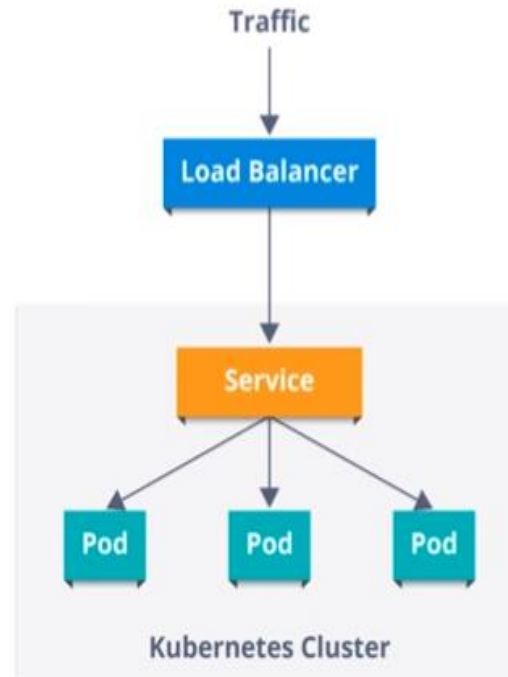
What is Ingress Network and how does it work in Kubernetes?
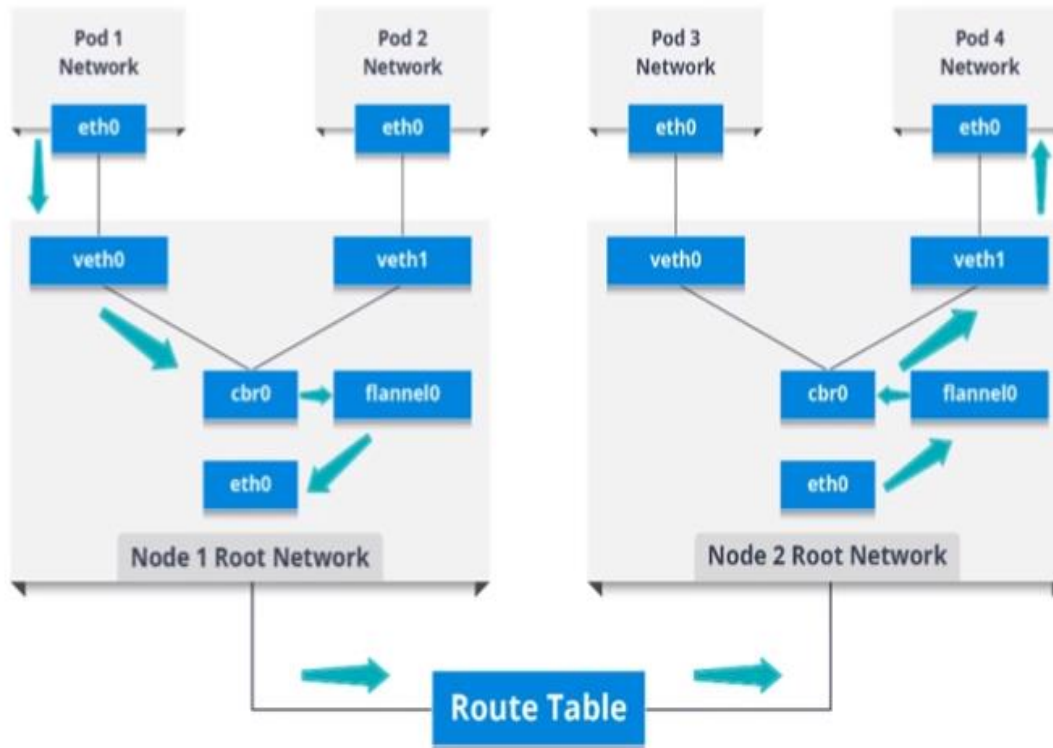
25 What do you understand about Cloud Controller manager in Kubernetes?

Cloud Controller manager helps abstracting the cloud specific code from the core Kubernetes specific code.

Node controller
It checks and confirms that node is deleted properly after it has been stopped.

Route controller
It manager the traffic routes in the underlying cloud infrastructure.

Manages the storage volume and interacts with cloud provider to orchestrate volume.

Volume Controller:

It is responsible for the management of cloud provide load balancers.

Service Controller

What do you understand by Container Resource Monitoring?

Monitoring the Kubernetes cluster environment is very much different from regular client-server architecture. So, the Container Resource Monitoring is used to monitor the cluster environment

Heapster

InfluxDB

Grafana

cAdvisor

Prometheus

27 Can you tell the difference between ReplicaSet & Replication Controller?

Both of them use different types of selectors to replicate the pods. So, the ReplicaSet uses Set-Based selectors while the Replication Controllers use Equity-Based selectors.
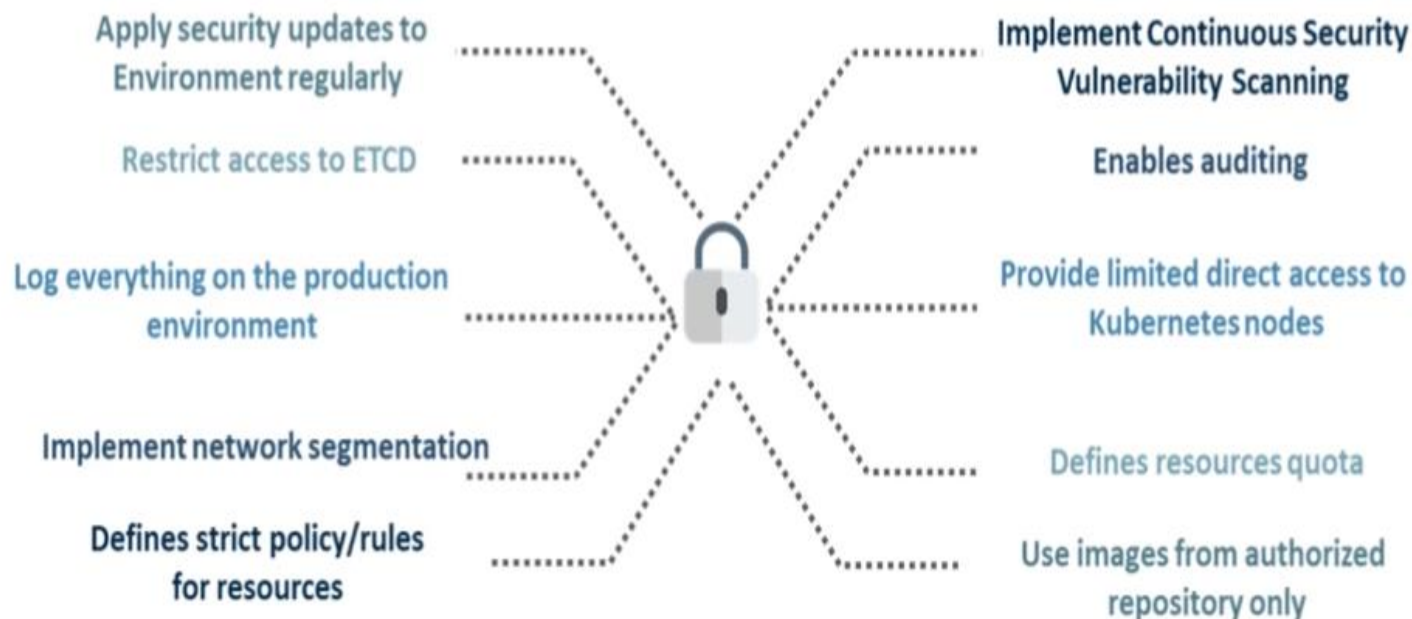
What do you understand by Headless Service?

When you don't want load-balancing or a single cluster IP, you use Headless Service. So, the Headless Service allows to reduce coupling to Kubernetes system.

29

What are the best security practices that you can follow?

Apply security updates to Environment regularly

Restrict access to ETCD

Log everything on the production environment

Implement network segmentation

Defines strict policy/rules for resources

Implement Continuous Security Vulnerability Scanning

Enables auditing

Provide limited direct access to Kubernetes nodes

Defines resources quota

Use images from authorized repository only

What do you understand by federated clusters?

30

Cross cluster discovery

It provides the ability to have DNS and Load Balancer with backend from all the participating cluster.

Sync resources across clusters

- As the name suggests, Federation helps to keep the resource sync across multiple clusters
- To Deploy same deployment set across multiple clusters

31 Suppose there is a company handling various number of products and as it's business expands rapidly, their monolithic application started causing problem.

How do you they shifted from monolithic to microservices, and deployed their containers in Kubernetes?

Well, as microservices handle their own databases. Moving from monolithic architecture to containerization, can shift applications and databases from third-party servers to the company's own clusters on Docker and Kubernetes.

32 A multinational company with a very much distributed system, with various number of data centers, virtual machines, and many employees working on various tasks.

How do you think can such company manage all the tasks in a consistent way with Kubernetes?

A company with a distributed systems, may have many clusters associated with it. So, these clusters can communicate with each other via the cluster networking with the help of the suitable network plugins.

33 Consider a situation, where a company wants to increase the efficiency and speed of it's technological operations by maintaining minimal costs.

How do you think they will try to achieve this?

The company can adopt the DevOps methodology by launching a CI/CD pipeline to reduce the deployment time. So, this will automatically increase the company's rate to scale across various environments.

34 Suppose a company wants to revise it's deployment methods and wants to build a platform which is much more scalable and responsive.

How do you think the company can achieve this to satisfy their customers?

The company can come up with a plan to use a cloud service such as AWS. So, with this the teams can be very autonomous in building and delivering their applications very quickly and frequently.

35 A multinational company with a very much distributed system, is looking to solve its monolithic code base problem.

How do you think they can solve their problem?

The company can transform their monolithic code base to microservices, so that they put the services in Docker containers. Once they are done with that they can orchestrate their containers with the help of Kubernetes.

36 It's a known fact that the shift from monolithic to microservices solves the problem from development side, but increases the problem at deployment side.

How can you solve the problem at the deployment side?

Well, the problem at the deployment side can be solved by implementing the container orchestration platform at the data centres. So, this will not only increase the resilience, but will also improve the performance impact.

37 Suppose a company wants to optimize the distribution of it's workloads, by adopting new technologies.

How can the company achieve the distribution of resources efficiently?

To optimize the distribution of resources, the company can allocate the available resources into containers, so that the resources are only used as per the requirement.

38

Consider a car pooling company wants to increase their number of servers by simultaneously scaling their platform.

How do you think will the company deal with the servers and their installation?

The company can use the concept of containerization, and deploy clusters. Then, these clusters can use network plugins to perform the communication, and finally they can use the monitoring tools to monitor their actions.

39 Consider a scenario where a company wants to provide all the required hand-outs to it's customers who have various environments.

How do you think they can achieve this critical target in a dynamic manner?

They can use a cross-sectional team to build a web application using Kubernetes, so that they can achieve their target of getting the deployments into production within the minimum time-frame.

40

Suppose a company wants to run various workloads on different cloud Infrastructures from bare metal to public cloud.

How will the company achieve this with the presence of different interfaces?

The company can target universal set of portable concepts across all the clouds by decomposing their infrastructure into microservices.

41

What are minions in Kubernetes cluster ?

They are cartoon character

They are work-horse / worker node of the cluster

They are monitoring engine used widely in kubernetes

They are docker container service.

42 Kubernetes cluster data is stored in which of the following?

Kube-apiserver

Kubelet

Etcd

None of the above

43 Which of them is a Kubernetes Controller?

ReplicaSet

Deployment

Rolling Updates

Both ReplicaSet and Deployment

44

Which of the following are core Kubernetes objects?

Pods

Services

Volumes

All of the above

45 The Kubernetes network proxy runs on which node?

Master node

Worker node

All the nodes

None of the above

46

What are the responsibilities of node controller?

To assign a CIDR block to the nodes

To maintain the list of nodes

To monitor the health of the nodes

All of the above

47

What are the responsibilities of Replication Controller?

Update or delete multiple pods with single command

Helps to achieve the desired state

Creates a new pod, if the existing pod crashes

All of the above

48

How to define a service without a selector?

Specify the external name

Specify an end point with IP Address and port

Just by specifying the IP address

Specifying the label and api-version

49

What did the 1.8 version of Kubernetes introduce?

Taints and Tolerations

Cluster level Logging

Secrets

Federated Clusters

50 The handler invoked by Kubelet to check if a container's IP address is open or not is?

HTTPGetAction

ExecAction

TCPSocketAction

None of the above