Kubernetes

1. Why is Kubernetes is widely used ?

* Kubernetes is widely used because of three distinct area one is that kubernetes in an open-source platform that is readily available for management of containers and allows you to manage the deployment , scaling and management of those containers.

1. What is google container engine ?

* Google container engine is another open source solution but it’s design for managing the docker container and cluster and so kubernetes container management solution and docker is the most popular solution out there. Docker container manage the application and kubernetes match the scale of your application .

1. What is the difference between kubernetes and docker ?

* **Kubernetes** - Kubernetes is about taking pods which contain containers which have application and deploying them at scale across a cloud network.

Kubernetes is designed for auto scaling is highly available.

The kubernetes environment will check for liveness and readiness of the entire infrastructure.

Kubernetes is high fault tolerance.

**Docker** - Docker is the container solution itself so actual application itself is put into container.

the health checks are limited to services in docker.

The tolerance ration in docker is low.

1. What is notable features of kubernetes ?

* Container balancing – kubernetes always know where to place containers.

Services – services manage containers offers security networking and storage services.

Self-monitoring – it monitors and continuously checks the health of nodes and containers.

Scaling – kubernetes allow you to scaling resources not only vertically but also horizontally.

Open-source – kubernetes is an open-source platform and can run in any environment.

Storage orchestration – kubenetes mounts and adds storage system to run apps.

1. what are the main advantages of kubernetes ?

* kuberntes allows you to automated rollback for changes that go wrong in version or releases. Kuberntes allows you to automated various manual process and controls server hosting and launching . kuberntes allow you to scaling resources not only horizontally but also vertically. Kuberntes saves your by optimizing resources.

1. What are the main components of Kubernetes architecture ?

* There are two primary components of Kubernetes Architecture: the master node and the worker node. Each of these components has individual components in them.

1. Explain the working of the kubernetes of the master node in kubernetes ?

* The master node controls and manages the set of worker nodes. The nodes are responsible for the cluster management and API used to configure and manages the resources. The master node of kubernetes can run with with kubernetes itself , the asset of dedicated pods.

1. What is the role of kube-apiserver ?

* Kube-apiserver provides configuration data for the API objects. It include pods, services, replication controller. Also, it provides REST operation and also the frontend of the cluster. This frontend cluster state is shared through which all other components interacts.

1. What is node in kubernetes ?

* A node is the smallest fundamental unit of computing hardware. It represents a single machine in a cluster, which could be a physical machine in a data center or a virtual machine from a cloud provider. The master in Kubernetes controls the nodes that have containers.

1. What does the node status contain ?

* The main components of a node status are address, condition, capacity and info.

1. What process runs on kubernetes master nodes ?

* The Kube-api server process runs on the master node and serves to scale the deployment of more instances.

1. What is pod in kubernetes ?

* Pods are high-level structures that wrap one or more containers. This is because containers are not run directly in Kubernetes. Containers in the same pod share a local network and the same resources.

1. What is the job of the kube-scheduler ?

* The kube-scheduler assigns nodes to newly created pods.

1. What is a cluster of containers in kubernetes ?

* A cluster of containers is a set of machine elements that are nodes. Clusters initiate specific routes so that the containers running on the nodes can communicate with each other. In Kubernetes, the container engine (not the server of the Kubernetes API) provides hosting for the API server.

1. What are daemon sets ?

* A Daemon set is a set of pods that runs only once on a host. They are used for host layer attributes like a network or for monitoring a network, which you may not need to run on a host more than once.

1. What is ‘heapster’ in kubernetes ?

* A Heapster is a performance monitoring and metrics collection system for data collected by the Kublet. This aggregator is natively supported and runs like any other pod within a Kubernetes cluster, which allows it to discover and query usage data from all nodes within the cluster.

1. What is minikube ?

* With the help of minikube you can run a single-node Kubernetes cluster on your personal computer, including Windows, macOS, and Linus PCs. With this, users can try out Kubernetes also for daily development work.

1. What is namespace ?

* Namespaces are used for dividing cluster resources between multiple users. They are meant for environments where there are many users spread across projects or teams and provide a scope of resources.

1. Name the initial namespace from which kubernetes starts ?

* Default , kube – system , kube – public .

1. What is kuberntes controller manager ?

* The controller manager is a daemon that is used for embedding core control loops, garbage collection, and Namespace creation. It enables the running of multiple processes on the master node even though they are compiled to run as a single process.

1. What are the types of controller managers ?

* The primary controller managers that can run on the master node are the endpoints controller, service accounts controller, namespace controller, node controller, token controller, and replication controller.

1. What is ETCD ?

* ETCD is a distributed reliable key-value store that is simple, secure & fast. Which store metadata and configuration data and allows nodes in kubernetes cluster to read and write data.

1. What are the different services within kubernetes ?

* Different types of Kubernetes services include:

Cluster IP service

Node Port service

External Name Creation service and

Load Balancer service

1. What is clusterIP ?

* The ClusterIP is the default Kubernetes service that provides a service inside a cluster (with no external access) that other apps inside your cluster can access.

1. What is node port ?

* The NodePort service is used to get external traffic directly to your service. It opens a specific port on all Nodes and forwards any traffic sent to this port to the service.

1. What is load balancer in kuberntes ?

* The LoadBalancer service is used to expose services to the internet. A Network load balancer, for example, creates a single IP address that forwards all traffic to your service.

1. What is the ingress network, and how does it work ?

* An ingress is an object that allows users to access your Kubernetes services from outside the Kubernetes cluster. Users can configure the access by creating rules that define which inbound connections reach which services.

How does it work - This is an API object that provides the routing rules to manage the external users' access to the services in the Kubernetes cluster through HTTPS/ HTTP. With this, users can easily set up the rules for routing traffic without creating a bunch of load balancers or exposing each service to the nodes.

1. What do you understand by cloud controller manager ?

* You must have heard about Public, Private and hybrid clouds. With the help of cloud infrastructure technologies, you can run Kubernetes on them. In the context of Cloud Controller Manager, it is the control panel component that embeds the cloud-specific control logic. This process lets you link the cluster into the cloud provider's API and separates the elements that interact with the cloud platform from components that only interact with your cluster.

This also enables the cloud providers to release the features at a different pace compared to the main Kubernetes project. It is structured using a plugin mechanism and allows various cloud providers to integrate their platforms with Kubernetes.

1. What is container resource monitoring ?

* This refers to the activity that collects the metrics and tracks the health of containerized applications and microservices environments. It helps to improve health and performance and also makes sure that they operate smoothly.

1. What is the difference between a replica set and a replication controller ?

* A replication controller is referred to as RC in short. It is a wrapper on a pod. This provides additional functionality to the pods, which offers replicas.

It monitors the pods and automatically restarts them if they fail. If the node fails, this

controller will respawn all the pods of that node on another node. If the pods die, they

won't be spawned again unless wrapped around a replica set.

Replica Set, on the other hand, is referred to as rs in short. It is told as the next-generation replication controller. This kind of support has some selector types and supports the equality-based and the set-based selectors.

It allows filtering by label values and keys. To match the object, they have to satisfy all the specified label constraints.

1. What is headless service ?

* A headless service is used to interface with service discovery mechanisms without being tied to a ClusterIP, therefore allowing you to directly reach pods without having to access them through a proxy. It is useful when neither load balancing nor a single Service IP is required.

1. What are federated clusters ?

* The aggregation of multiple clusters that treat them as a single logical cluster refers to cluster federation. In this, multiple clusters may be managed as a single cluster. They stay with the assistance of federated groups. Also, users can create various clusters within the data center or cloud and use the federation to control or manage them in one place.

You can perform cluster federation by doing the following:

Cross cluster that provides the ability to have DNS and Load Balancer with backend from the participating clusters.

Users can sync resources across different clusters in order to deploy the same deployment set across the various clusters.

1. What is kubelet ?

* The kubelet is a service agent that controls and maintains a set of pods by watching for pod specs through the Kubernetes API server. It preserves the pod lifecycle by ensuring that a given set of containers are all running as they should. The kubelet runs on each node and enables the communication between the master and slave nodes.

1. Give example of recommended security measures for kubernetes.

* Examples of standard Kubernetes security measures include defining resource quotas, support for auditing, restriction of etcd access, regular security updates to the environment, network segmentation, definition of strict resource policies, continuous scanning for security vulnerabilities, and using images from authorized repositories.

1. What is kube-proxy ?

* Kube-proxy is an implementation of a load balancer and network proxy used to support service abstraction with other networking operations. Kube-proxy is responsible for directing traffic to the right container based on IP and the port number of incoming requests.

1. How can you get a static IP for a kubernetes load balancer ?

* A static IP for the Kubernetes load balancer can be achieved by changing DNS records since the Kubernetes Master can assign a new static IP address.