Kubernetes Basic Concepts

What are Containers?

- Having an application with all its dependencies, libraries, configuration files all packaged as a single unit is called container.
- They are the isolated application platform.
- Built from one or more images.

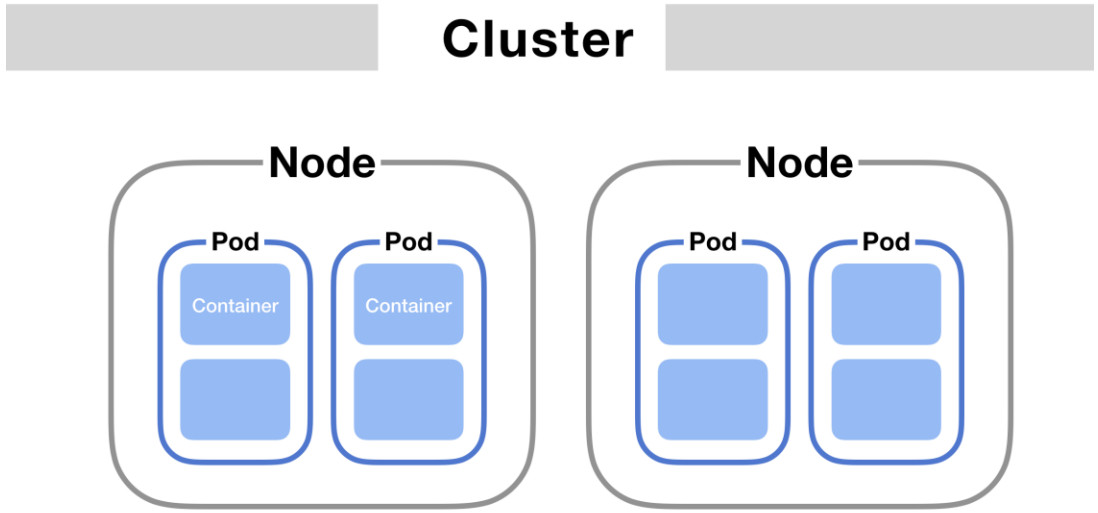
What is Kubernetes/k8s?

- Kubernetes is a popularly known Containerization management orchestration tool.
- It manages the availability, scaling, and networking of the containers, monitoring the clusters, and managing the timing of container creation.
- Kubernetes is also called as k8s, eight characters between k and s in the name.

kubernetes

What are PODS?

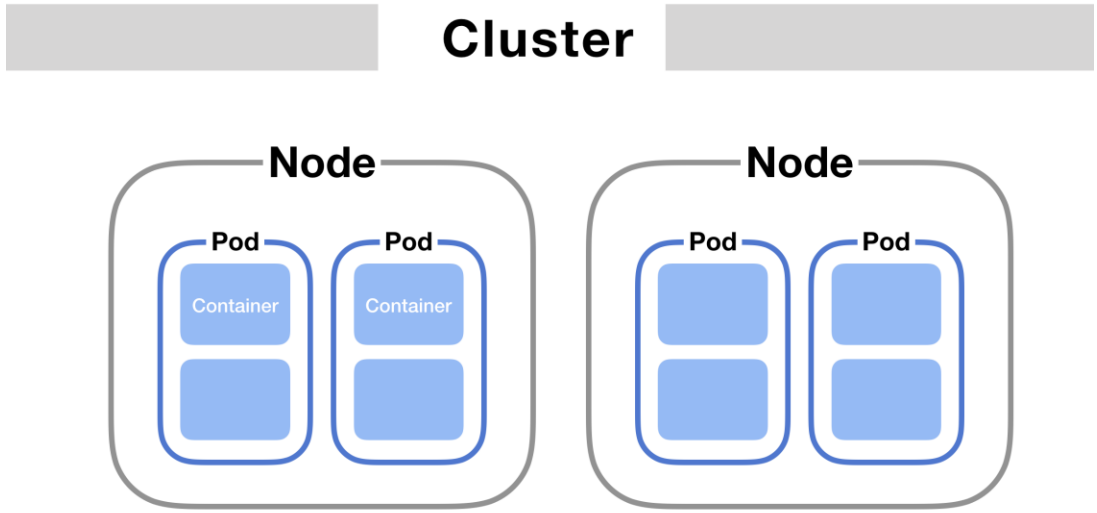
- Pods are the smallest unit of Kubernetes.
- We can run single container or multiple containers inside a pod.
- On each worker node we can have multiple pods.
- If a container stops or die inside a pod, it will be automatically restarted.
- Every Pod has unique IP address.



Credits: https://matthewpalmer.net/kubernetes-app-developer/articles/kubernetes-networking-guide-beginners.html

What are Node?

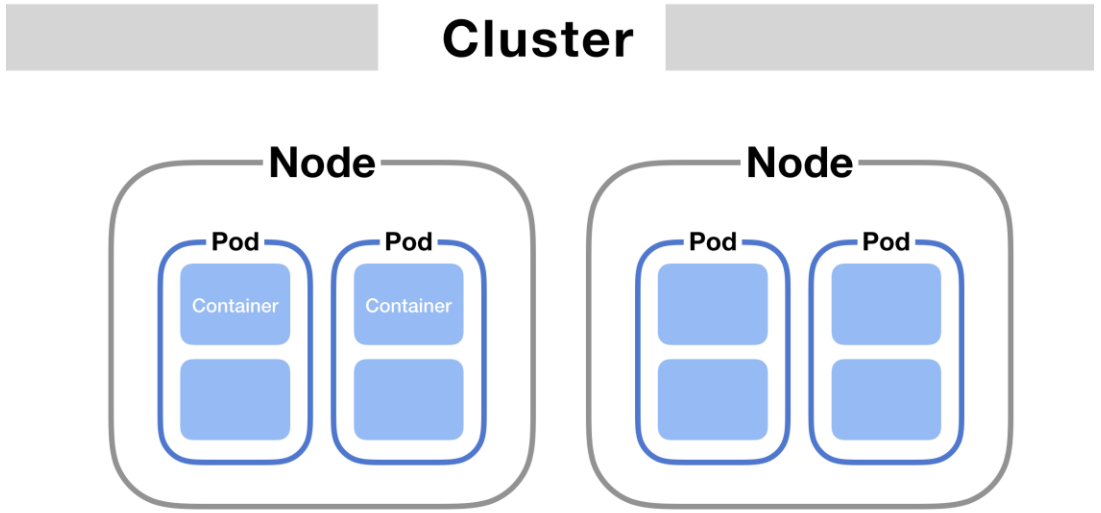
- Nodes are machine, they can be physical, on-prem or virtual cloud machines.
- A node can have multiple pods.



Credits: https://matthewpalmer.net/kubernetes-app-developer/articles/kubernetes-networking-guide-beginners.html

What are Clusters?

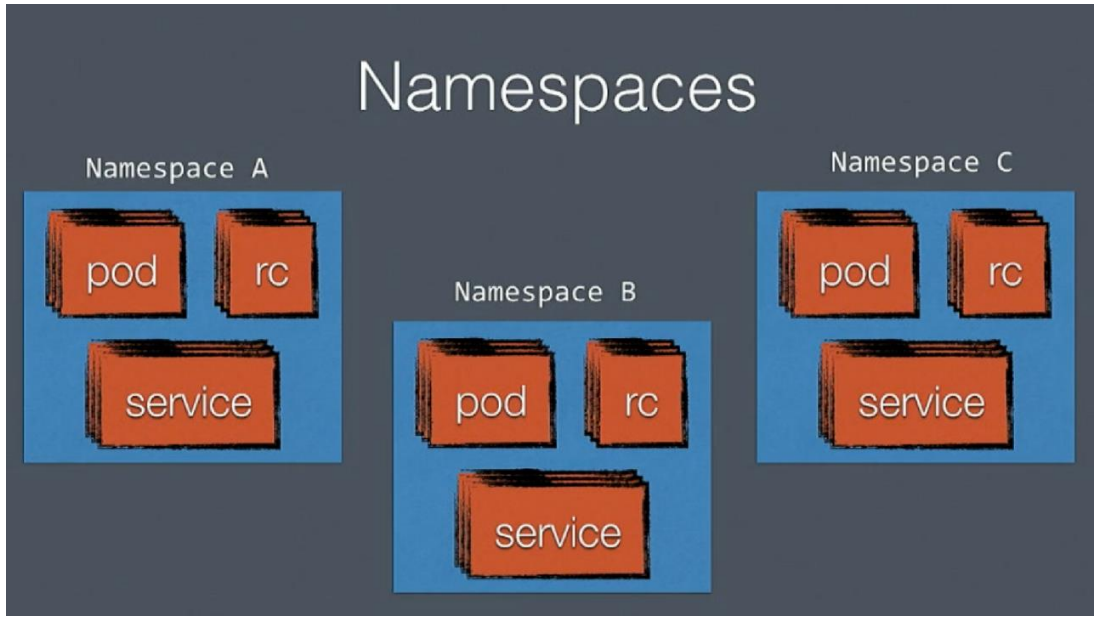
- Cluster are considered as set of nodes that run containerized application.
- Each cluster will have at least one worker node.



Credits: https://matthewpalmer.net/kubernetes-app-developer/articles/kubernetes-networking-guide-beginners.html

What is Namespace?

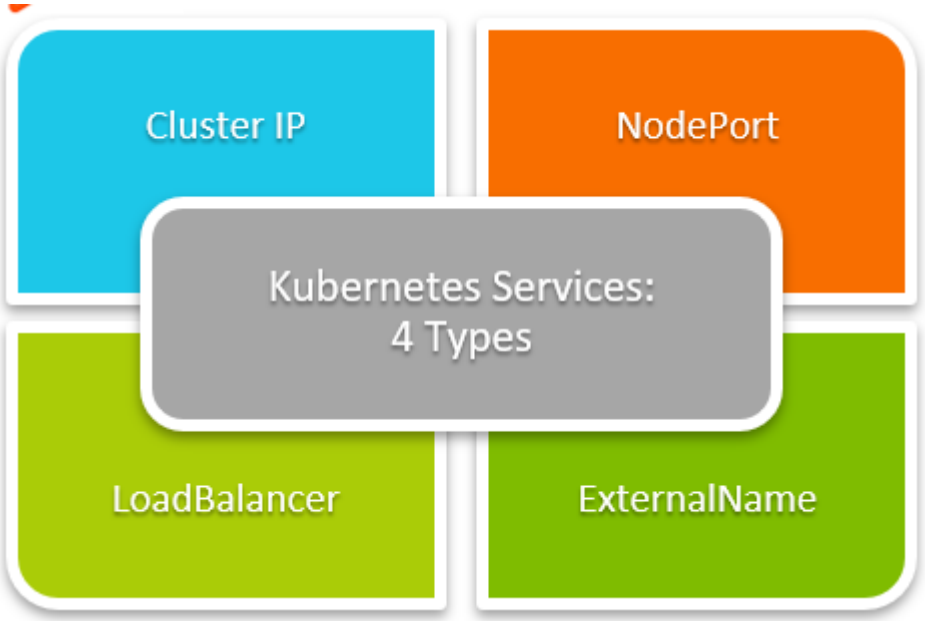
- Namespaces allows us to organize our Kubernetes resources.
- We can have multiple namespaces in a cluster.
- It uses grouping mechanism. For eg: having namespace per team working in a project.
- One more example: We can have one namespace that is dedicated to database resources, and the other namespace dedicated for monitoring, Elastic stack and many more.



Credit: https://www.mundodocker.com.br/kubernetes-namespaces/

What are service?

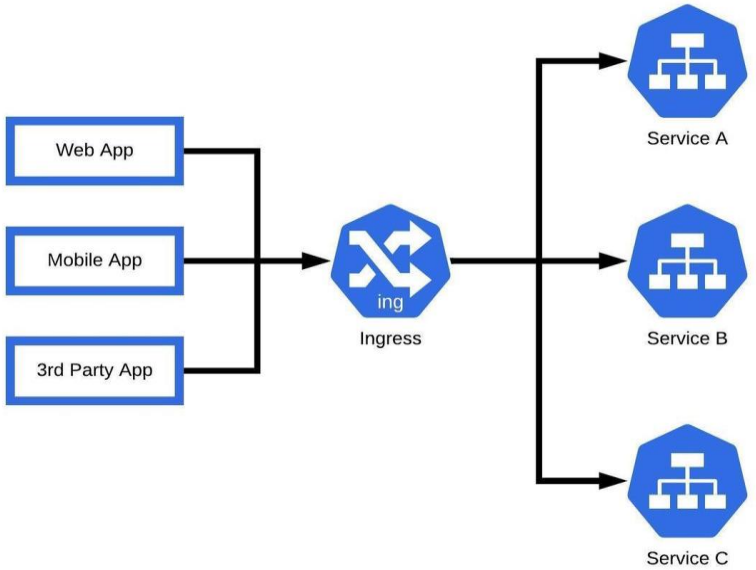
- Services allow us to define how to access pods over the network.
- Types of service available: ClusterIP, LoadBalancer, NodePort, ExternalName.
- Service helps us in providing a stable IP address, loadbalancing



Credits: https://www.bmc.com/blogs/kubernetes-networking/

What is Ingress?

- Ingress is a rule set that allows us to define how we want to accept the traffic into the cluster.
- It exposes HTTP and HTTPS routes from outside the cluster to services within the cluster. Traffic routing is controlled by rules defined on the Ingress resource.



Credits: https://www.infoworld.com/article/3542633/how-to-use-the-kubernetes-ingress-api.html

- **ConfigMap**: -They usually contains configuration data such as URL of a database, service data and many more.
- **Secrets**: - Kubernetes objects that stores and manage sensitive information like password, keys, tokens etc.
- **Kubectl**: - Kubectl is a command line interface for running commands against kubernetes cluster.
- **Tkgi**: - tkgi stands for Tanzu Kubernetes Grid Integrated Edition.
- **Context**: - A context in Kubernetes is a group of access parameters.
- **Volume**: - A volume in Kubernetes is a directory that contains data accessible across multiple containers in a pod.

Thank you