Kubernetes 101

Overview of main components and hands on demo from a dev perspective.

Kubernetes

- Container orchestration engine.
- Features:
  - Declarative configuration and automation.
  - Service discover and load balancing.
  - Storage orchestration.
  - Automated rollouts, rollbacks and self healing.
 - Secret and configuration management.

Why containers?

- Decoupled from underlying infrastructure, making them portable across clouds and OS distributions

Traditional Deployment   **Virtualized Deployment**   **Container Deployment**
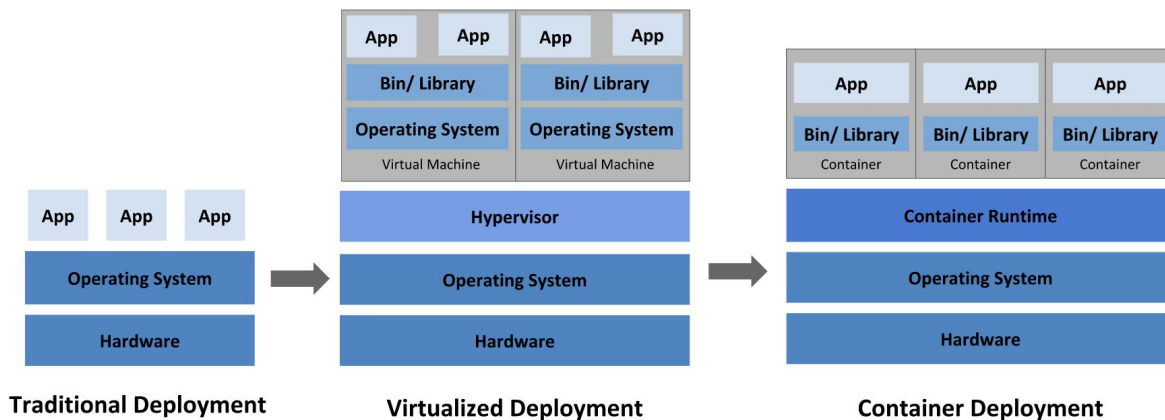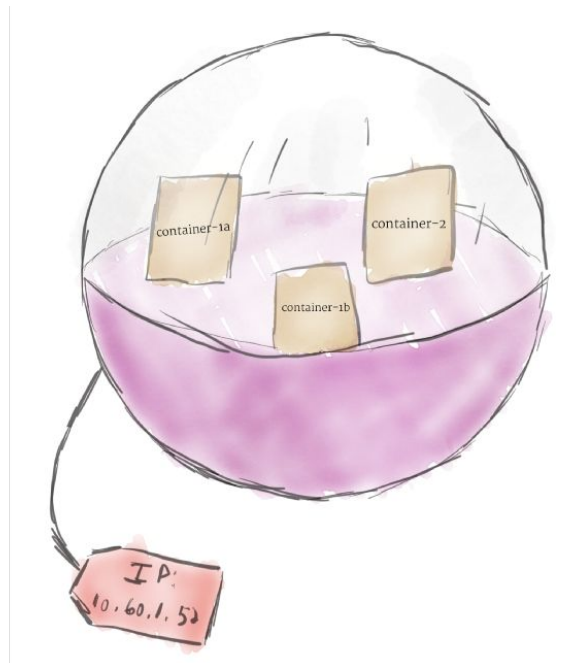
Node

- Smallest unit of computing hardware - physical or virtual.
- Workloads run on these nodes.
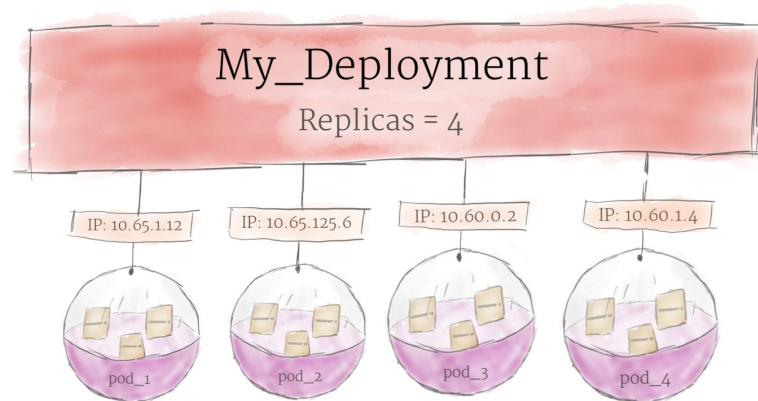- Multiple nodes are connected together to form a **cluster.**

My_Kube_Cluster

CPU: 40000
RAM: 320Gb

Node_001

CPU: 3000
RAM: 64Gb
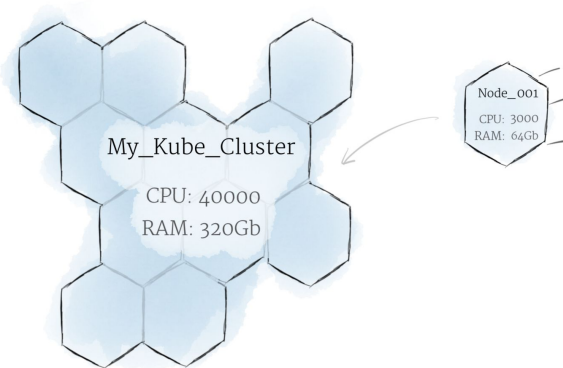
Pod

- A component that wraps container/s.
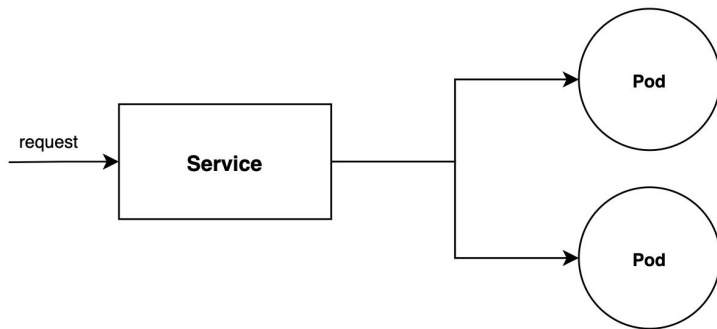- Unit of replication.
- A shared local network.

Deployment

- A management layer for pods.
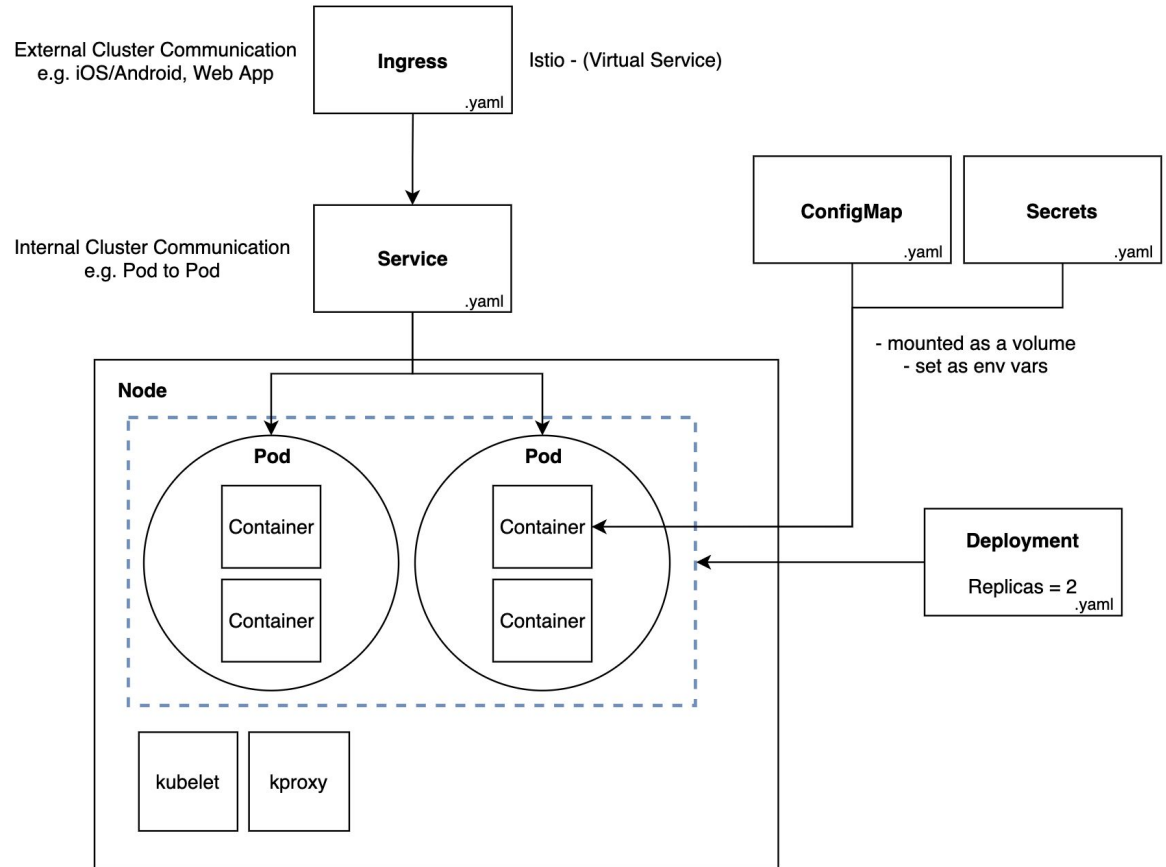- Declares the desired state which automates restarting of pods etc.

Service

- An abstraction for exposing pods as a network service.
- Provides load balancing across pods.
- Provides a DNS name for pods.

Full picture

External Cluster Communication
e.g. iOS/Android, Web App

Ingress
.yaml

Istio - (Virtual Service)

Internal Cluster Communication
e.g. Pod to Pod

Service
.yaml

ConfigMap
.yaml

Secrets
.yaml

- mounted as a volume
- set as env vars

Node

Pod

Container

Container

Pod

Container

Container

Deployment

Replicas = 2
.yaml

kubelet

kproxy

References

Kubernetes Docs

https://kubernetes.io/docs/home/

A great Medium article with awesome images.

https://medium.com/google-cloud/kubernetes-101-pods-nodes-containers-and-clusters-c1509e409e16