Kubernetes Introduction

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What is Kubernetes

A Production-Grade Container Orchestration System

What does Kubernetes do?

Abstract away the underlying hardware

- Remove concept of nodes
- Manage your applications like Cattle instead of like Pets

Deploy your desired state

- You (admin) describe the desired state and kubernetes turn it into actual state

Kubernetes Users

From small startups to large enterprises

- Google
- Yahoo
- SAP
- Monzo
- O2

No vendor lock

Kubernetes is no vendor lock to specific provider, you can run Kubernetes on:

- AWS
- GCP
- DigitalOcean
- Azure
- OpenStack
- or your private infrastructure

For whom is Kubernetes

- If you need HA
- If you have to manage applications on many servers
- If you don't want to care about servers
- If you want easily deploy your Dockerized applications
- If you need some roles in cluster

Core Concepts

Pod - The basic and atomically schedulable building block of Kubernetes, which is a single instance of app. Pods are mortal.

Deployment - Atomic update of Pods. Deployments contains Pod & ReplicaSet templates and keep running desired pods.

Service - Provide immortal IP address or DNS name for some selected pods.

Namespace - Logical clusters in your cluster.

Kubernetes Cluster Components

API Server - Stateless API server backed by distributed **Etcd**

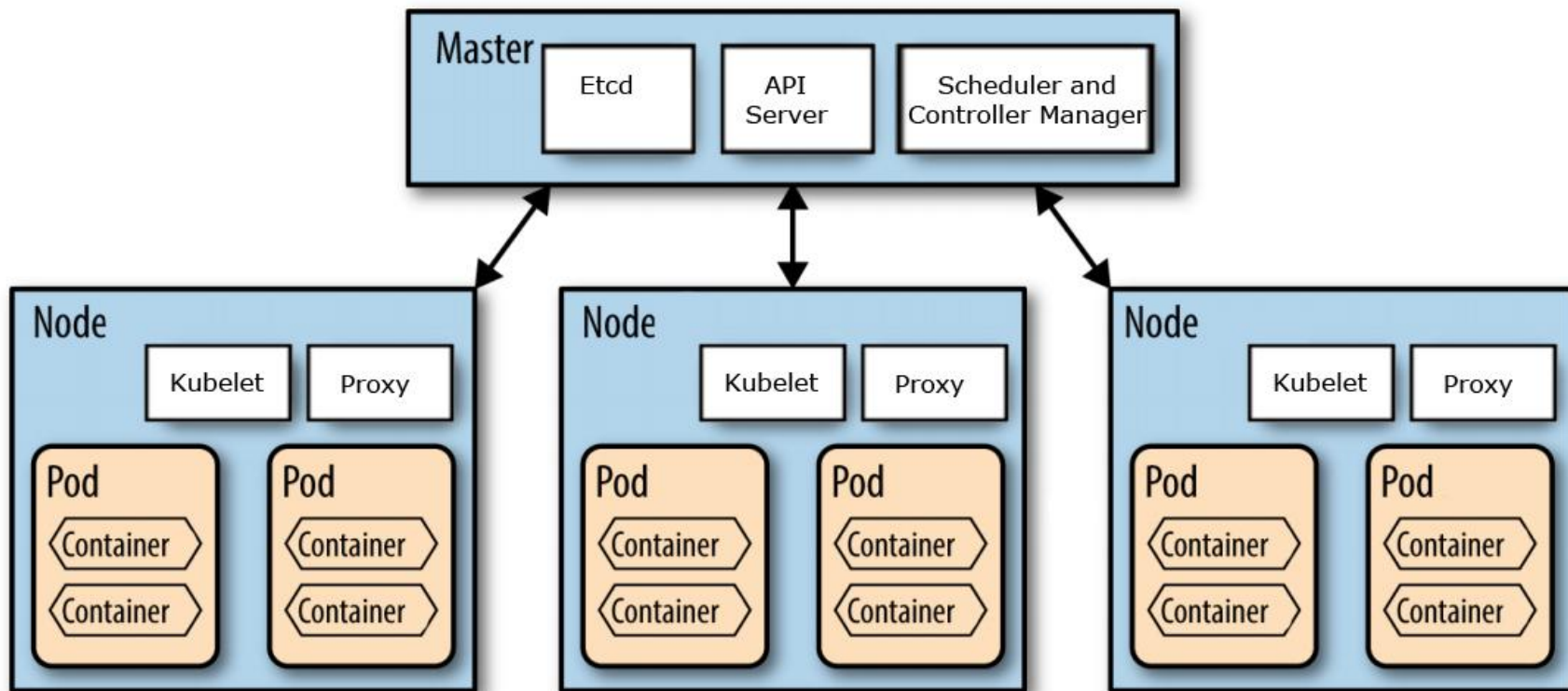**Controller Manager** - ensure the actual state of the cluster equals the desired state

Scheduler - Binds an unbound Pod to a Node

Kubelet - Client for API Server, run Pods

Kube Proxy - Forward traffic into cluster

Tools

kubeadm - Tool for Kubernetes cluster setup (on VMs)

kubectl - Kubernetes client

minikube - Run Kubernetes locally

kops - Create Kubernetes cluster in cloud

Kubernetes Components

- Workload
    - Pods
    - Controllers - Deployments, StatefulSets, Jobs, …
- Service & Load Balancing
- Storage
- Configuration

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Thank you & Questions

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