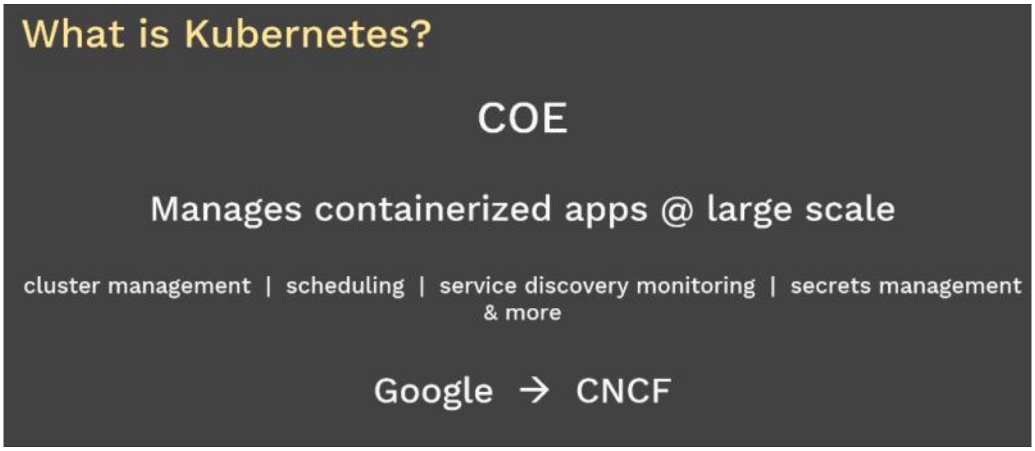
OVERVIEW



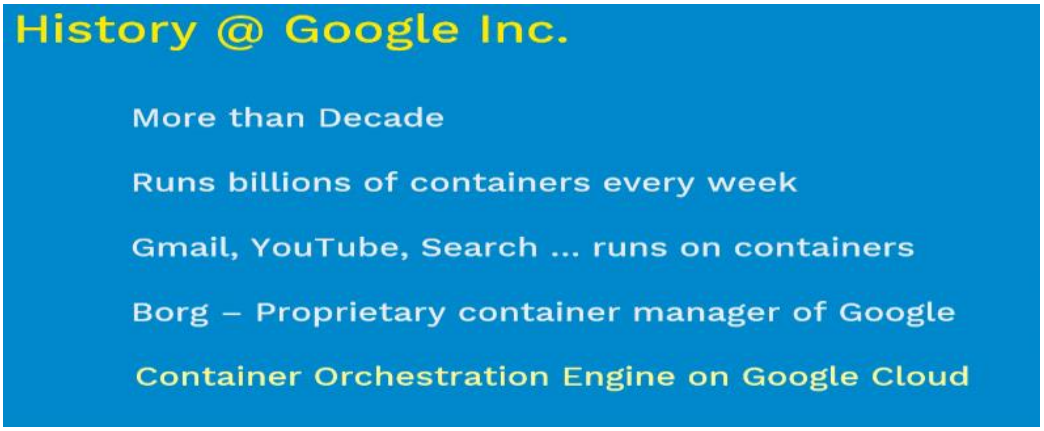
What is Kubernetes?

COE

Manages containerized apps @ large scale

cluster management | scheduling | service discovery monitoring | secrets management & more

Google → CNCF



History @ Google Inc.

More than Decade

Runs billions of containers every week

Gmail, YouTube, Search … runs on containers

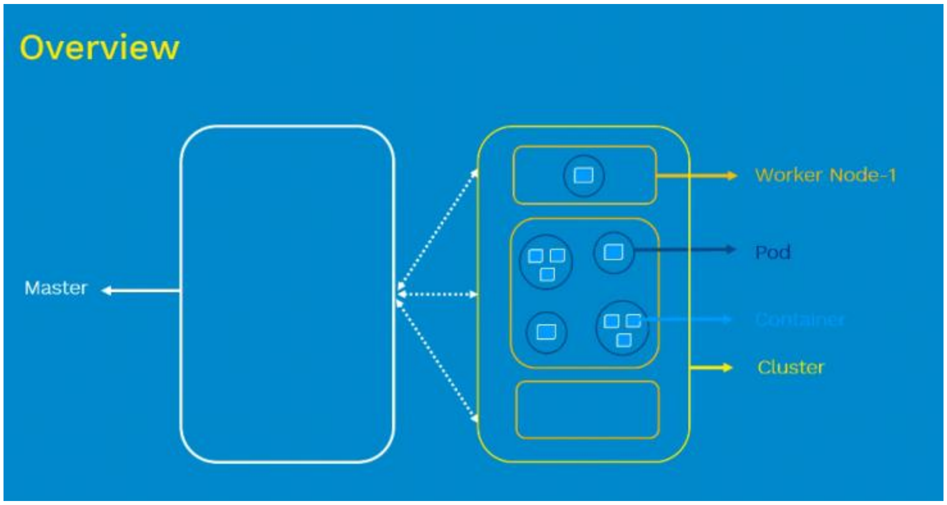
Borg – Proprietary container manager of Google

Container Orchestration Engine on Google Cloud

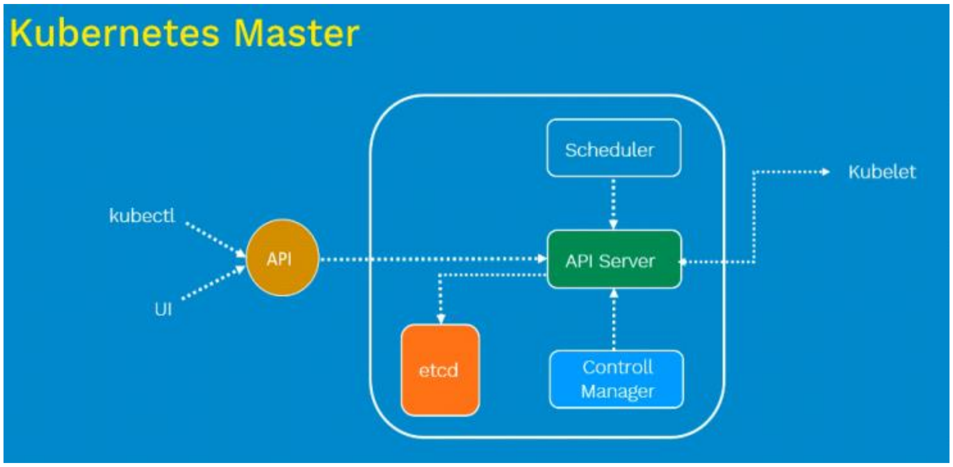
Who is using Kubernetes?

Walmart
CONCUR
VIACOM
buffer
Home Office
Arkena
Goldman Sachs
monzo
EVE ONLINE
Pearson
The New York Times
box
OpenAI
ticketmaster
SKY
COMCAST
Bloomberg
Pokémon GO

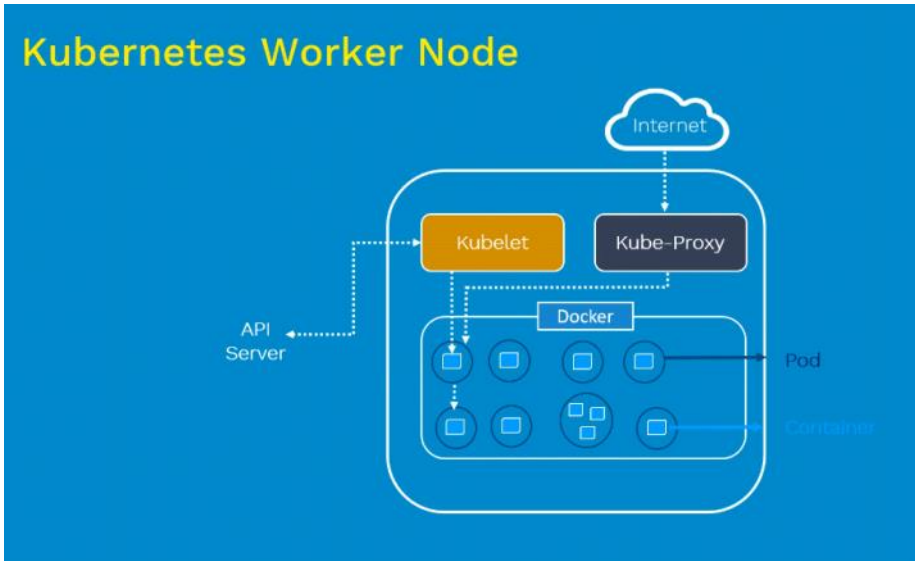
Kubernetes Architecture



Overview



Kubernetes Master



Kubernetes Worker Node

It is consisted of at least one Master node
It can have up to 5K worker nodes
Pod is consisted of one or more container
Container is where actual application is running and inside the container

Master Components

To manage all the worker node

API Server

The Kubernetes API server validates and configures data for the api objects which include pods, services, replicationcontrollers, and others. The API Server services REST operations and provides the frontend to the cluster's shared state through which all other components interact.

Scheduler

A scheduler watches for newly created Pods that have no Node assigned. For every Pod that the scheduler discovers, the scheduler becomes responsible for finding the best Node for that Pod to run on.

Control Manager

The Kubernetes controller manager is a daemon that embeds the core control loops shipped with Kubernetes. In applications of robotics and automation, a control loop is a non-terminating loop that regulates the state of the system. In Kubernetes, a controller is a control loop that watches the shared state of the cluster through the apiserver and makes changes attempting to move the current state towards the desired state. Examples of controllers that ship with Kubernetes today are the replication controller, endpoints controller, namespace controller, and service accounts controller.

etcd

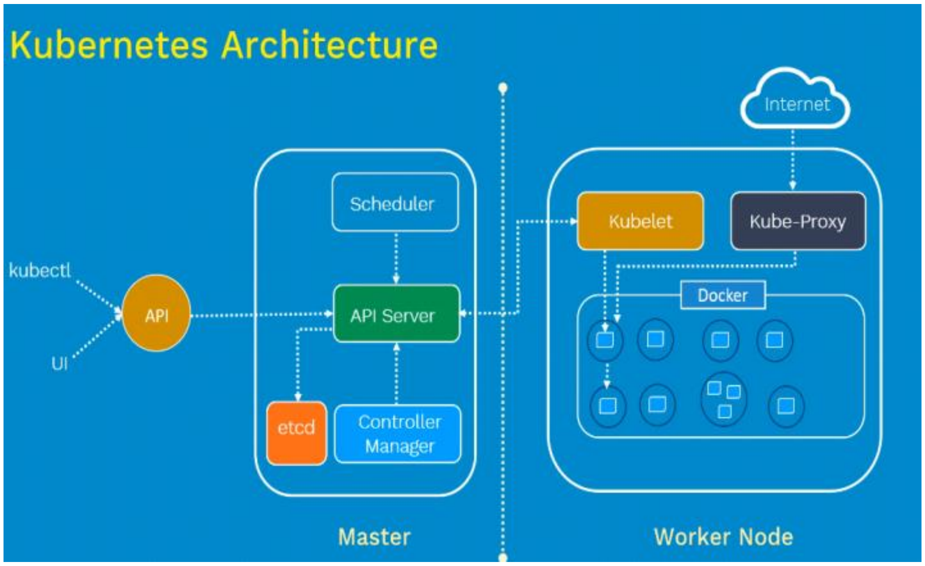
etcd is a consistent and highly-available key value store used as Kubernetes' backing store for all cluster data.

Worker Node Components

kubelet

It takes a set of PodSpecs that are provided through various mechanisms (primarily through the apiserver) and ensures that the containers described in those PodSpecs are running and healthy. The **kubelet** doesn't manage containers which were not created by **Kubernetes**.

The **Kubernetes** network **proxy** runs on each node. This reflects services as defined in the **Kubernetes** API on each node and can do simple TCP, UDP, and SCTP stream forwarding or round robin TCP, UDP, and SCTP forwarding across a set of backends


Kubernetes Architecture
Internet
Scheduler
Kubelet
Kube-Proxy
kubectl
API
API Server
Docker
UI
etcd
Controller Manager
Master
Worker Node