



Kubernetes

101

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kubernetes



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What are containers

- Isolated area with a separate resource namespace
- Can be simple as chroot shells to Microsoft's HyperV Container Isolation
- Container runtimes: Linux Containers (lxc), Docker





Containers for scalability and availability

1

Before containers, we either scaled vertically or scaled using cloud VMs. Led to resource wastage. Lesser dense server utilizations..

2

Containers emerged as a lightweight alternative to cloud VMs, providing higher cluster densities, lesser downtimes.

3

Maintaining a cluster container is hard. You don't want failures due to node failures. You need solutions to discover services. You need something to manage everything.

4

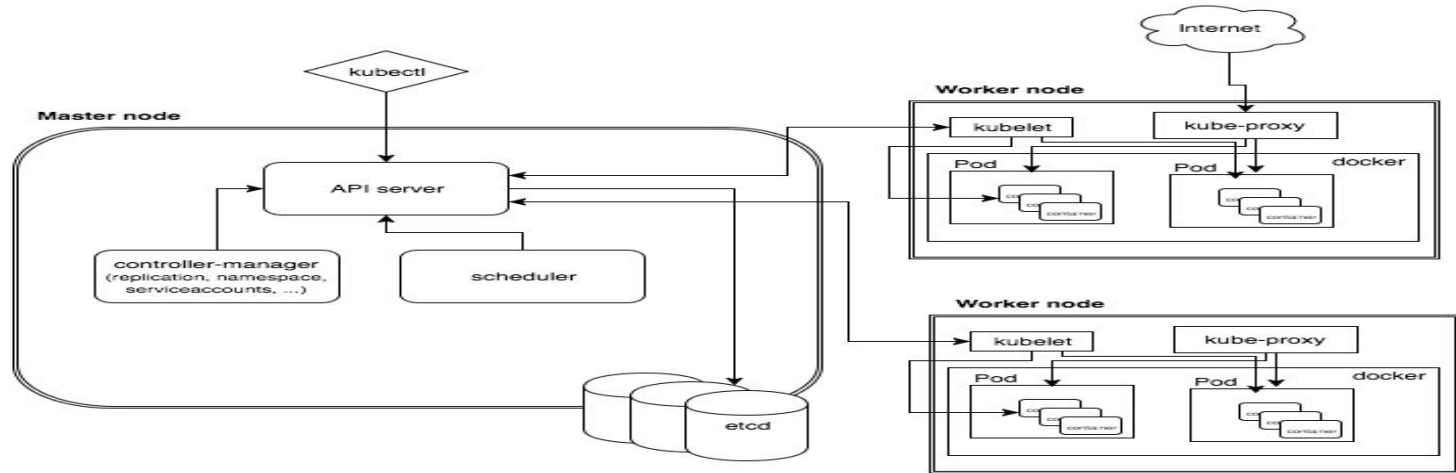
Kubernetes, Mesos, Docker Swarm are the answer. They schedule containers on physical nodes maintaining the required scalability and availability. Allows service discovery.



Introduction to kubernetes

- Kubernetes is an orchestration tool for automating deployment, scaling, and management of containerized applications.
- Originally developed by Google engineers, announced in mid-2014. It is an open-source project under the CNCF.
- It allows self monitoring, auto scaling, load balancing, resource provisioning and automates many other manual jobs.

Kubernetes Architecture





Kubernetes Key Terms

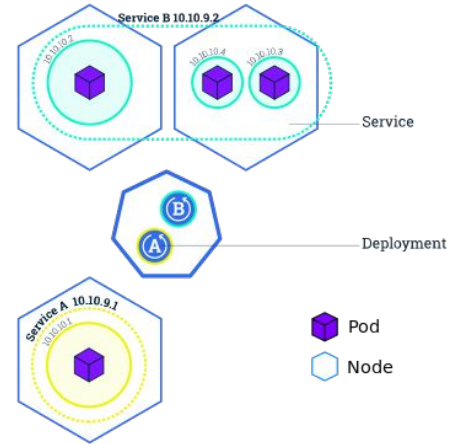
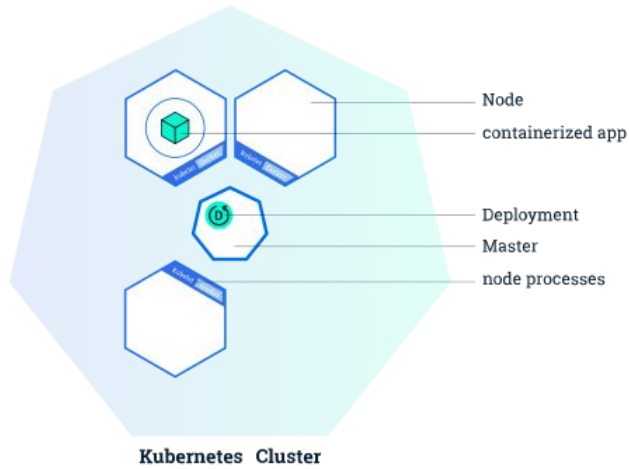
- Master: The cluster manager
- Node (minion): The individual machines in a K8s cluster, have container runtime and communicate with the master.
- A group of one or more containers is called a Pod.
- Services make resources pods accessible to other pods or public
- A deployment describes a collection of services and pods with labels



Minikube

- Creates a local kubernetes cluster for development
- Uses host docker / virtual machine to create a single node kubernetes cluster
- Supports all common operations in kubernetes such as deployments and services.

Understanding a deployment





Kubernetes on Production

- Design your cluster depending on your requirements.
- It is hard to configure a cluster by hand.
- If on self hosted environment, choose one of the distributions.
- If your environment is cloud based, choosing a (self) managed “turnkey” solution such as Google Kubernetes Engine or Amazon Elastic Kubernetes Service is the easiest and the most cost effective way.



Deploying our app to Google Kubernetes Engine (GKE)



Thank you.

Slides and demo code available at:
<https://github.com/agathver/gdg-bbsr-k8s>