Wizeline Academy

Introduction to Kubernetes

leon@wizeline.com

Agenda

- What is Kubernetes
- Quick Overview of the Infrastructure
- Demo
- Resources
- Q / A

What is Kubernetes?

What is NOT Kubernetes

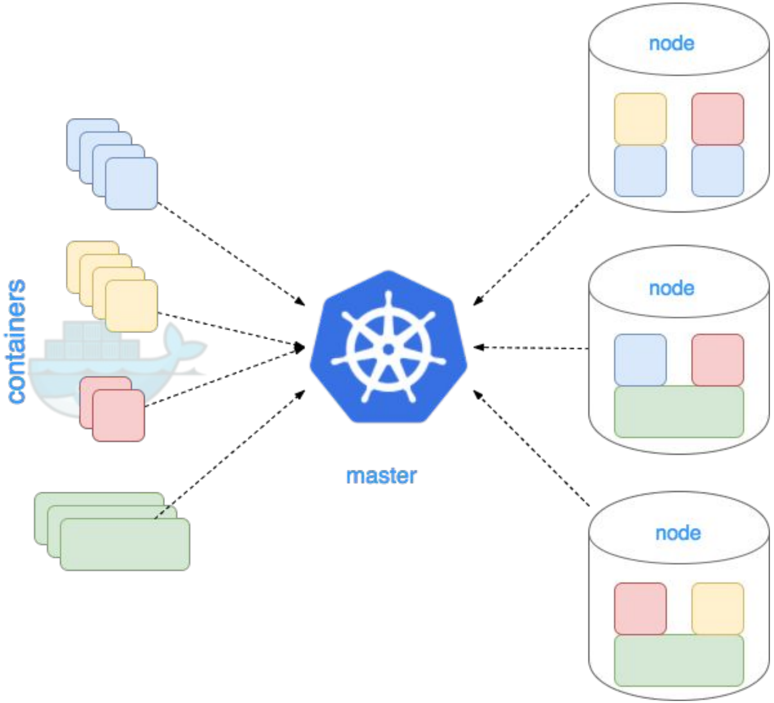
Not a replacement for Docker....

Not an alternative for Docker...

What is Kubernetes?

- Container Orchestration System
  - Supports Docker, Rkt, ACI*
- Developed by Google (BORG -> OMEGA -> Kubernetes)
- Open Source https://github.com/kubernetes/kubernetes
- Docker Compose on Steroids kind of thing

What is Kubernetes?



Kubernetes Components

- Master
  - Provides cluster control over the cluster nodes
  - Can work standalone or multi-master mode
  - etcd, kube-controller-manager, cloud-controller-manager, kube-scheduler, add-ons
- Nodes
  - Runs user' s containers
  - kubelet, kube-proxy, Docker, rkt, supervisor, fluentd

Kubernetes Objects

- Names
- Namespaces
- Labels
- Annotations

Kubernetes Pods

- Smallest Deployable Object
- Can have one or more containers
- Describes its status using PodStatus object (pending, running, succeeded, unknown, failed)
- Horizontal Scaling

Kubernetes Controllers

- Deployments
- Replica Sets
- Replication Controller
- Stateful Sets (PetSet)
- Daemon Sets
- Garbage Collectors
- Jobs
- Cron Jobs

Kubernetes Storage

- Volumes
- Persistent Volumes

Kubernetes Networking Services

- Services
- DNS
- Load Balancing
- Ingress
- Network Policies

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Where can I run Kubernetes?

- Google Container Engine (GKE)
- AWS
- Azure
- IBM Bluemix
- Minikube (locally)
- Supported by many Linux Distros

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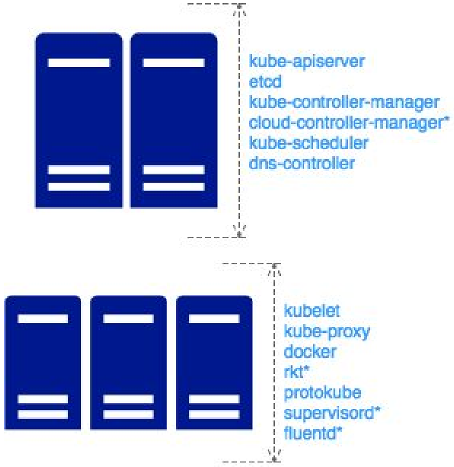
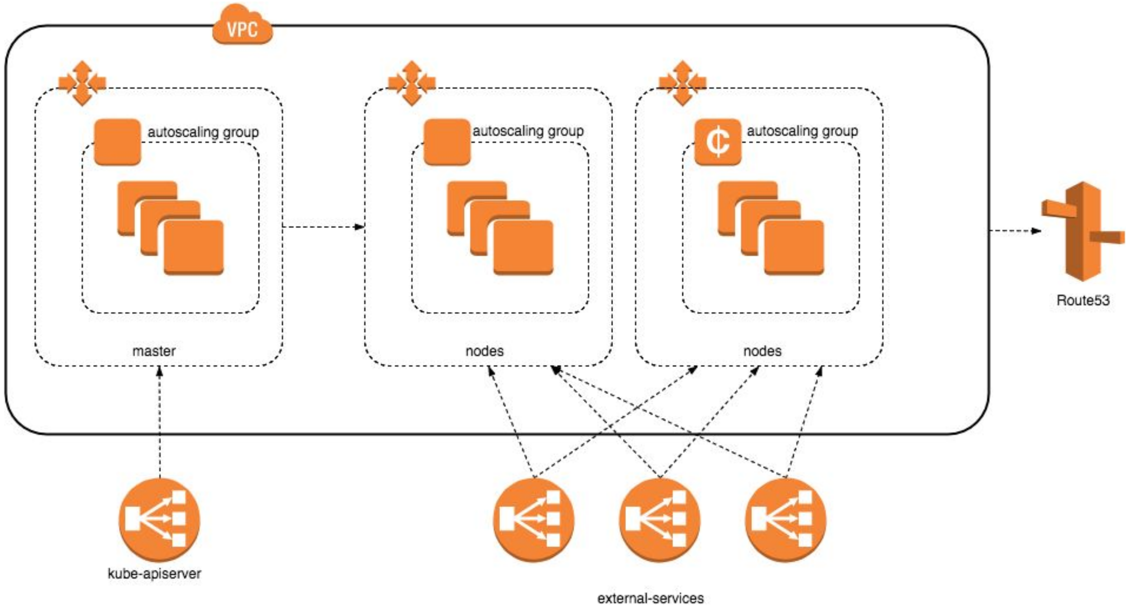
Overall Infrastructure Diagram



kube-apiserver
etcd
kube-controller-manager
cloud-controller-manager*
kube-scheduler
dns-controller

kubelet
kube-proxy
docker
rkt*
protokube
supervisord*
fluentd*



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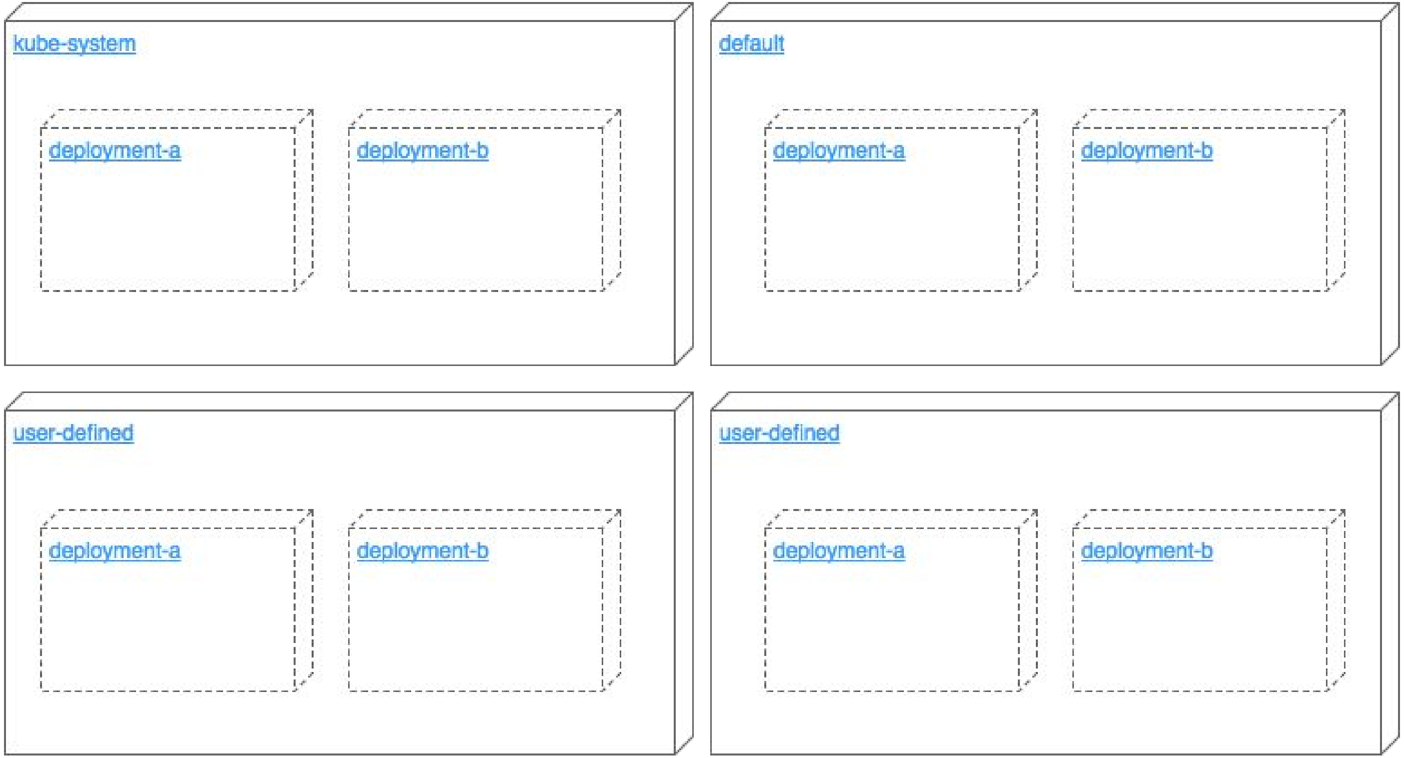
Kubernetes Namespaces



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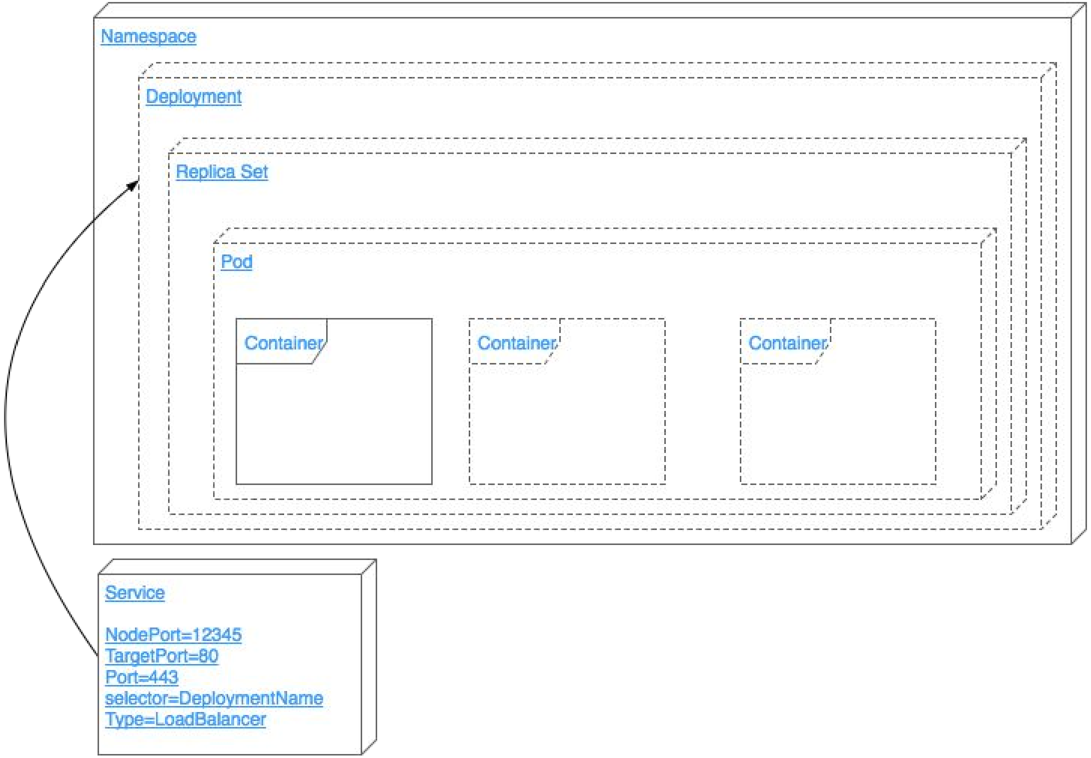
Kubernetes Namespaces



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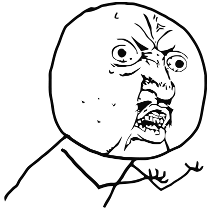

Interesting but show me how it works and how I can use it

```
# Client installation

# OS X
brew install kubectl

# Linux
curl -LO https://storage.googleapis.com/kubernetes-release/release/$(curl -s
https://storage.googleapis.com/kubernetes-release/release/stable.txt)/bin/linux/amd64/kubectl

# Windows
www.google.com/search?q=how+to+install+kubectl+on+windows
```

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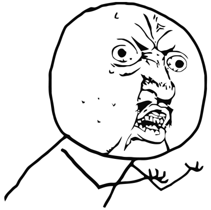

Interesting but show me how it works and how I can use it

```
kubectl cluster-info: Displays information about the cluster in the current context.
kubectl get <deployment|service|pod|nodes>: List the objects in the current context and namespace.
kubectl describe <deployment|service|pod|nodes> objName: Provides a description of an object.
kubectl log <pod-name>: Provides real time logs of the running pod.
kubectl hpa <deployment>: Manages Horizontal Pod Autoscale feature based on CPU or other provided metric.
kubectl expose <deployment>: Creates a service to expose the pod internally / externally.
kubectl attach <pod>: Attaches outout of the running pod to your console.
kubectl port-forward <pod-name> <podPort>:<localPort>: Allows connectivity between your local and the pod
kubectl exec <pod-name> <command>: Executes a command inside an specific running container.
kubectl run: Creates a new deployment within the the current context and namespace
kubectl proxy: Starts a proxy to the kubernetes API
```

DEMO

https://github.com/wizelineacademy/kubernetes-intro

Learning Resources

Free Resources:

https://kubernetes.io/docs/tutorials/kubernetes-basics

https://speakerdeck.com/thesandlord/kubernetes-best-practices

https://www.youtube.com/watch?v=4ht22ReBjno

Paid Resources:

https://www.udemy.com/learn-devops-the-complete-kubernetes-course

Based on this project: https://github.com/WeAreWizards/protojson

THANK YOU