

SQL SERVER & KUBERNETES

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#K8sAtSQLBits

SESSION AIM

To give you background knowledge (and code) to get started with Kubernetes

WHAT IS KUBERNETES?

“Kubernetes is a portable, extensible open-source platform for managing containerized workloads and services, that facilitates both declarative configuration and automation. It has a large, rapidly growing ecosystem. Kubernetes services, support, and tools are widely available

- kubernetes.io

KUBERNETES

Open source orchestration engine

Designed by Google

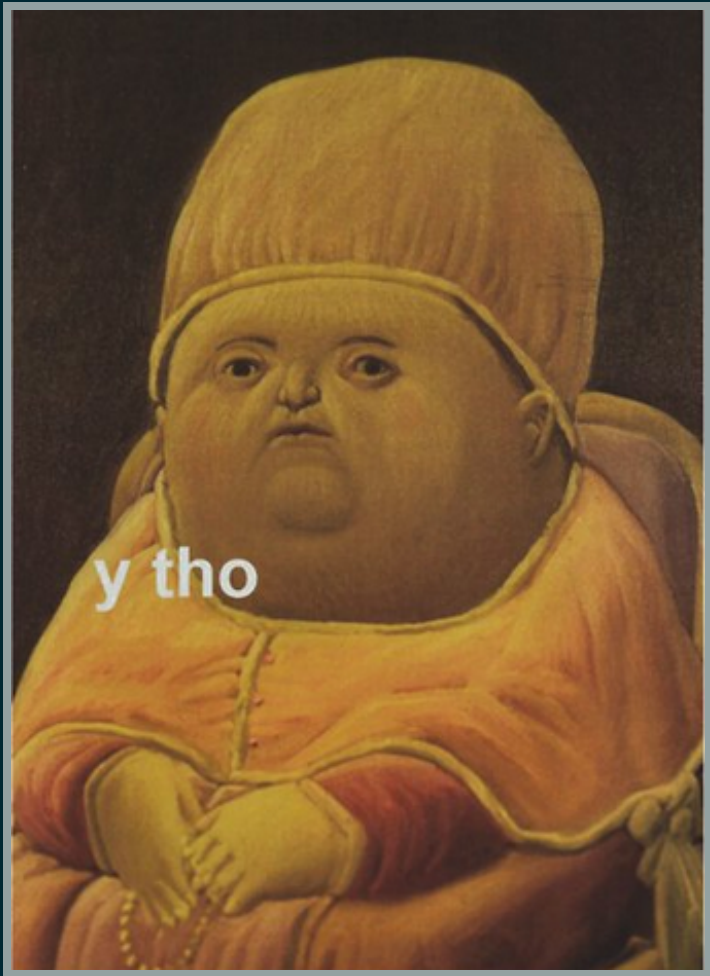
Hosted by the Cloud Native

Computing Foundation

Kubernetes v1.0 was released on

July 21, 2015





WHY LEARN KUBERNETES?

Leading orchestrator

Easy to deploy and mantain containers

Quick to spin up containers

High availability built-in

Big Data Clusters

GETTING STARTED

RUNNING KUBERNETES LOCALLY

Minikube

Docker for Desktop

Minishift

Micro k8s

OTHER TOOLS

Visual Studio Code

Kubectl

kube-shell

DEMO

DEPLOYING TO A REMOTE CLUSTER

MASTER

Components for controlling the cluster

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



NODES

Running and maintaining pods

- kubelet
- kube-proxy
- Docker



PODS

Smallest deployable units of computing
Group of one or more containers
Shared storage/network
Holds specifications of containers



SERVICES

An abstraction over a set of pods

Provides a stable networking endpoint

Different types: -

- ClusterIP
- NodePort
- LoadBalancer
- External Name



Example yaml file

```
apiVersion: apps/v1beta1
kind: Deployment
metadata:
  name: sqlserver
spec:
  replicas: 1
  template:
    metadata:
      labels:
        name: sqlserver
spec:
  containers:
    - name: sqlserver1
      image: mcr.microsoft.com/mssql/server:2019-CTP2.3-ubuntu
      ports:
        containerPort: 1433
```

DEMO

PERSISTING DATA

PERSISTING DATA

Same issue with Docker containers

Data changes not on a persistent volume will be lost

PERSISTENT VOLUMES

Just a piece of storage in the cluster

Lifecycle independent of the pods

Can be either dynamic or static



PERSISTENT VOLUME CLAIMS

Request for storage by a user

Request for size and access type

PVC is attached to a pod



Persistent Volume yaml file

```
kind: StorageClass
apiVersion: storage.k8s.io/v1beta1
metadata:
  name: azure-disk
provisioner: kubernetes.io/azure-disk
parameters:
  storageaccounttype: Standard_LRS
  kind: Managed

apiVersion: v1
kind: PersistentVolumeClaim
metadata:
  name: mssql-data
spec:
  accessModes:
    - ReadWriteOnce
```

Creating Kubernetes Secret

```
kubectl create secret generic mssql --from-literal=SA_PASSWORD="T
```


Using Persistent Volume Claims

```
apiVersion: apps/v1beta1
kind: Deployment
metadata:
  name: sqlserver2
spec:
  replicas: 1
  template:
    metadata:
      labels:
        app: mssql
    spec:
      containers:
      - name: sqlserver2
        image: mcr.microsoft.com/mssql/server:2019-CTP2.3-ubuntu
        ports:
          containerPort: 1433
```

DEMO

CLOUD PROVIDERS

Azure Kubernetes Service

Amazon Elastic Container Service for Kubernetes

Google Kubernetes Service

IBM Kubernetes Service

HELM

Package manager for Kubernetes
SQL Server available in the Helm Hub
<https://hub.helm.sh/>



RESOURCES

<http://tinyurl.com/yyz8fe9x/SQLServerAndKubernetes>

<http://tinyurl.com/y3x29t3j/summary-of-my-container-series/>

