

Kubernetes By Example

Dr Dan Schien – COMSM0010

Lecture 9

bristol.ac.uk



Admin

- AWS secret keys
 - AWS Account -> AWS Educate Starter Account
 - Account Details and AWS Console
 - All Starter account resources are created in the AWS Virginia region (us-east-1)
 - Require renewal every 3hours
- AWS account elevation
 - Manually request via <https://aws.amazon.com/education/awseducate/contact-us/>
 - \$100 of credits extra

Goals

- Be familiar with the steps involved in deploying a web app to Kubernetes

Backflash – Kubernetes

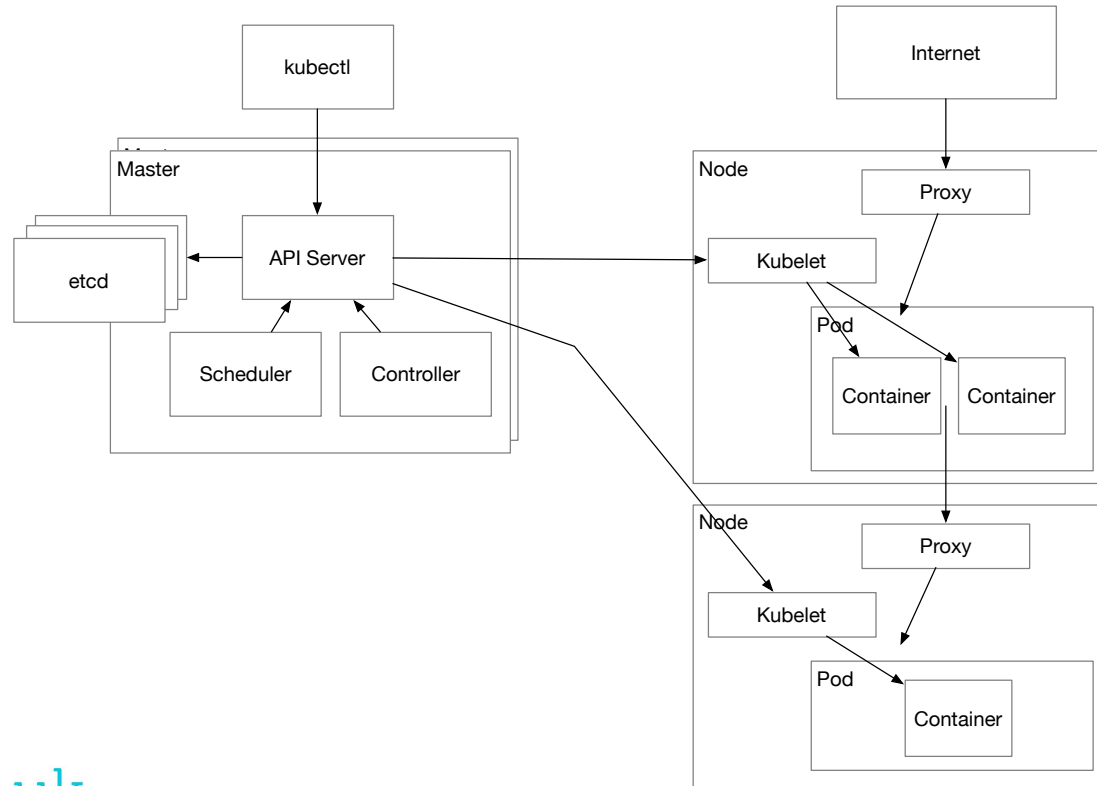
Features

- Automatic scheduling of work based on resource usage and constraints
- Self-healing: automatic replacement and rescheduling of failed containers
- Service discovery and Load balancing
- Automated rollouts and rollbacks

Kubernetes Runtime Objects

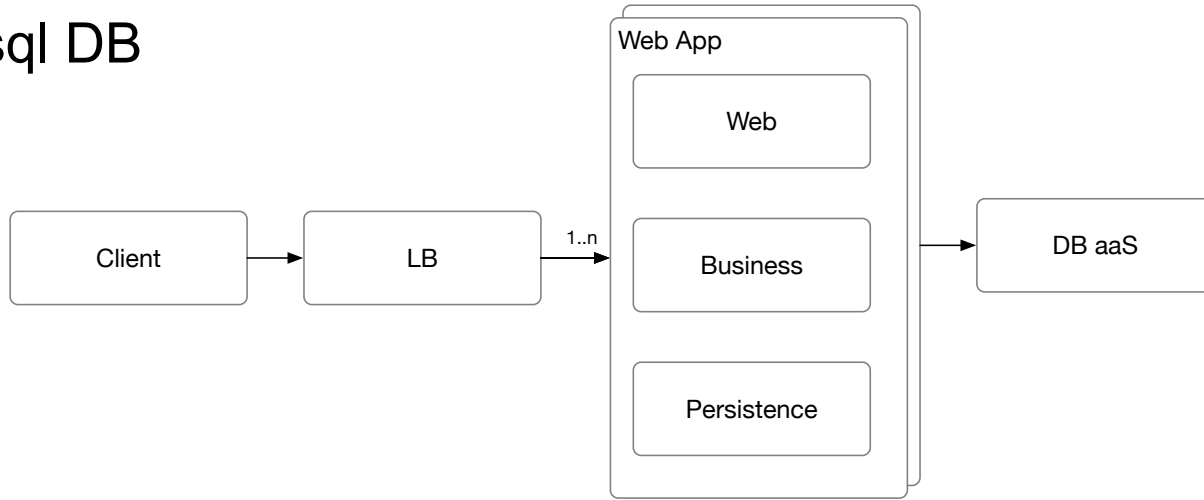
- Pods
- Deployments
- Services

Components Architecture



App

- https://github.com/dschien/spe_simple_demo/tree/kubernetes
- Spring Boot
- Postgresql DB



Spring Config Files

- Dev and Prod environments
- Properties set through environment variables and files
- Listening on port 8080
- Paths
 - /api/*
 - /view/lecturers
 - /view/lecturer/{id}

Properties

- Internet accessible in a conventional way
- Persistent storage that doesn't disappear when we move the database Scalable
- Recovery from failure

Persistent Storage

- PersistentVolume
- PersistentVolumeClaim
 - piece of storage in the cluster that has been provisioned by an administrator
 - is a request for storage by a user.
 - only a PV of the requested class and with the requested labels may be bound to the PVC.
- `kubectl get persistentvolume`

Kubernetes Networking

- every pod has its own cluster-private-IP address
- containers within a Pod can all reach each other's ports on localhost,
- all pods in a cluster can see each other without NAT
- DNS – with DNS add-on
 - All services get a DNS entry
- Otherwise, docker-like hostnames via /etc/hosts
 - <https://kubernetes.io/docs/concepts/services-networking/service/#discovering-services>

Questions?