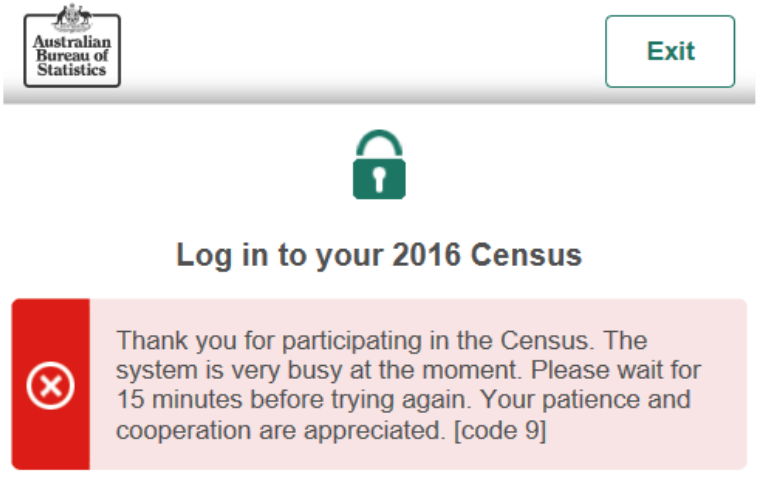
'Bad' Infrastructure



Building Web Apps on Google's Infrastrucutre

Maintained by

Eric Jiang

This presentation's code/slides can be found on
https://github.com/lorderikir/googlecloud-techtalk

Slide Deck Version: v2.0.0

Talk Summary

1. Introduction to Google Cloud
2. What is Google App Engine
   a. GAE Environments
   b. What is Scaling and Why is it Important?
3. Deep-Dive
   a. Deploying a simple API to Google App Engine
4. Other Tools

Introduction

What is Google Cloud Platform?

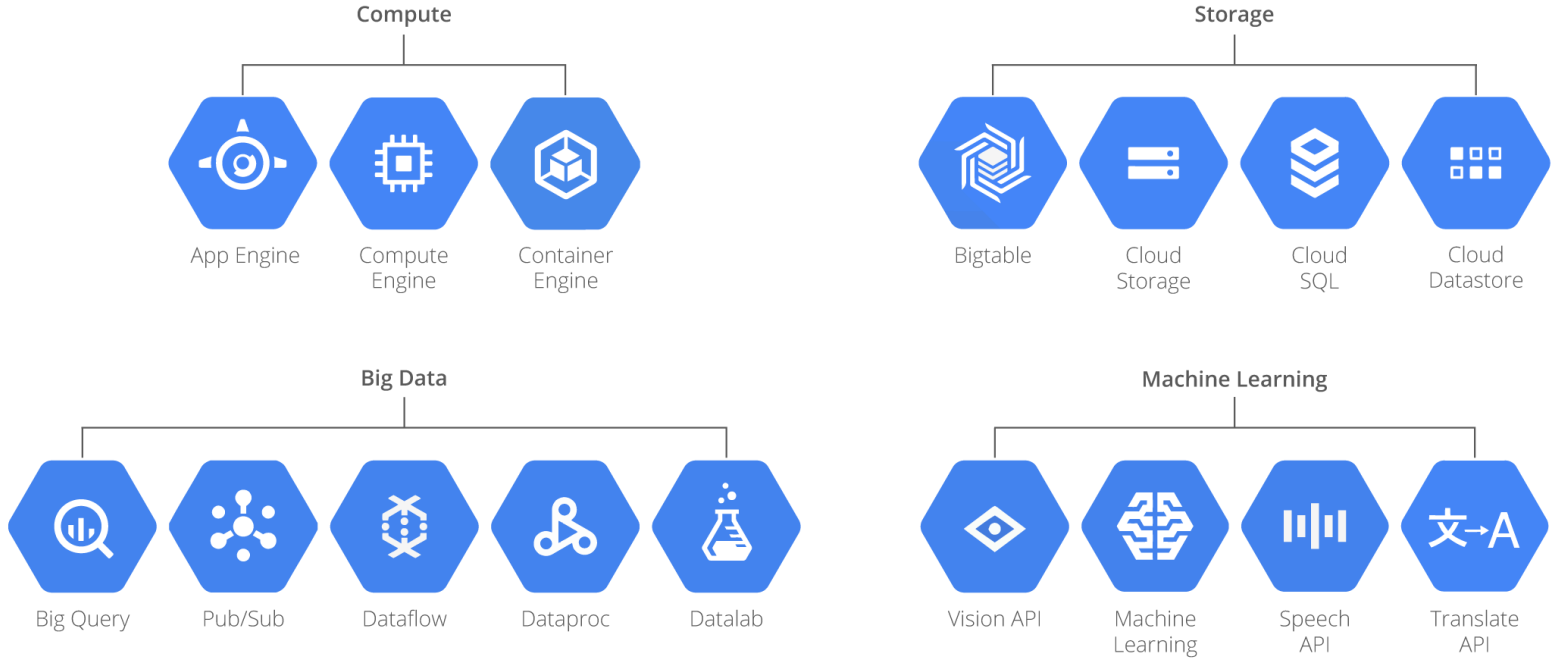
> Google Cloud Platform lets you build and host applications and websites, store data, and analyze data on Google's scalable infrastructure.

Composes of many applications, such as:

- Google App Engine (GAE)
- Google Kubernetes Engine (GKE) Previously known as Google Container Engine
- Google DataStore
- Cloud ML (built off *TensorFlow*)
- and much more

Did you know that Firebase and DialogFlow (API.AI) are both built on Google Cloud Platform

Google Cloud Platform



Google App Engine

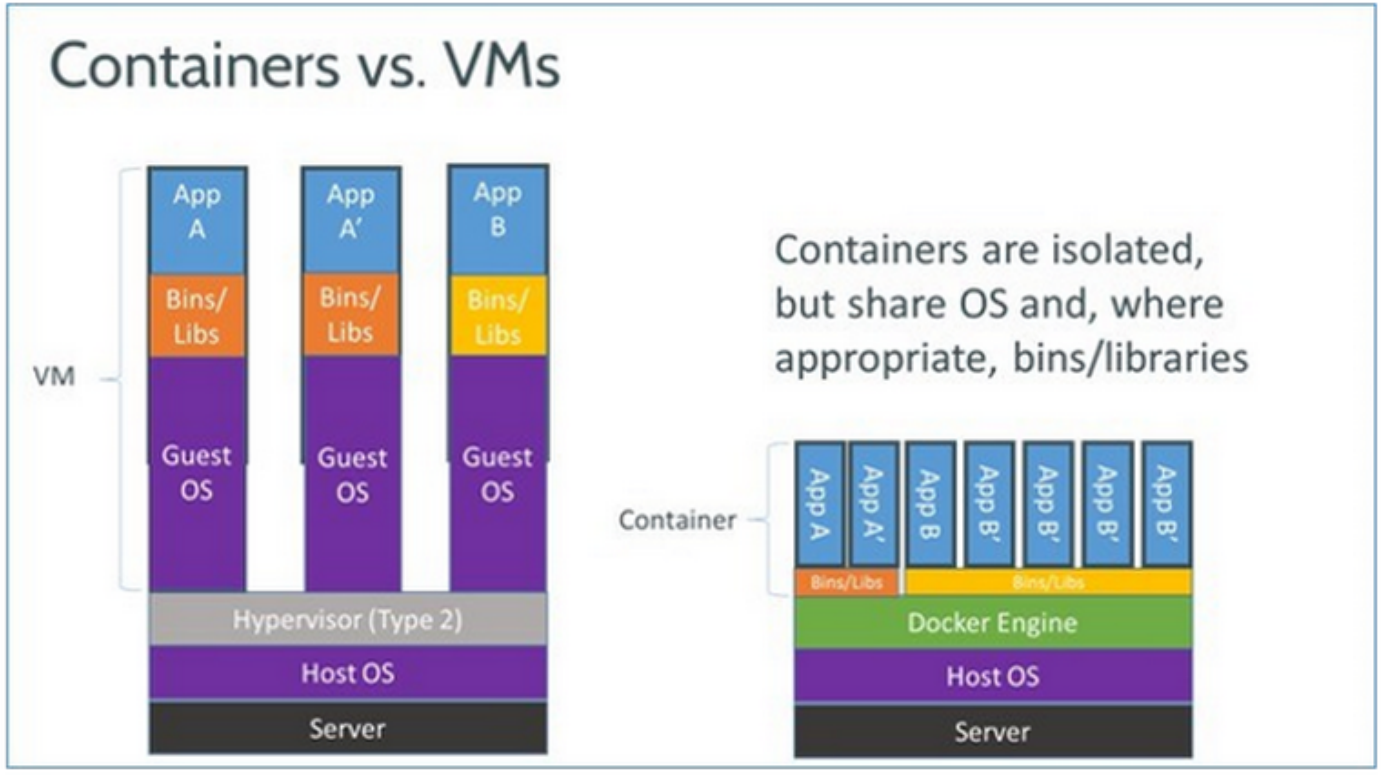
- designed around the fact that *Google just can't send everyone into their datacentre(s) and update applications across their many datacenters*
- Built off Remote Deployments

Language	Environment
Java 7 (and Kotlin[1])	Standard
Java 8	Standard (Beta)/Flexible
Node.js	Flexible
Python 2.7	Standard
Python 3.5	Flexible

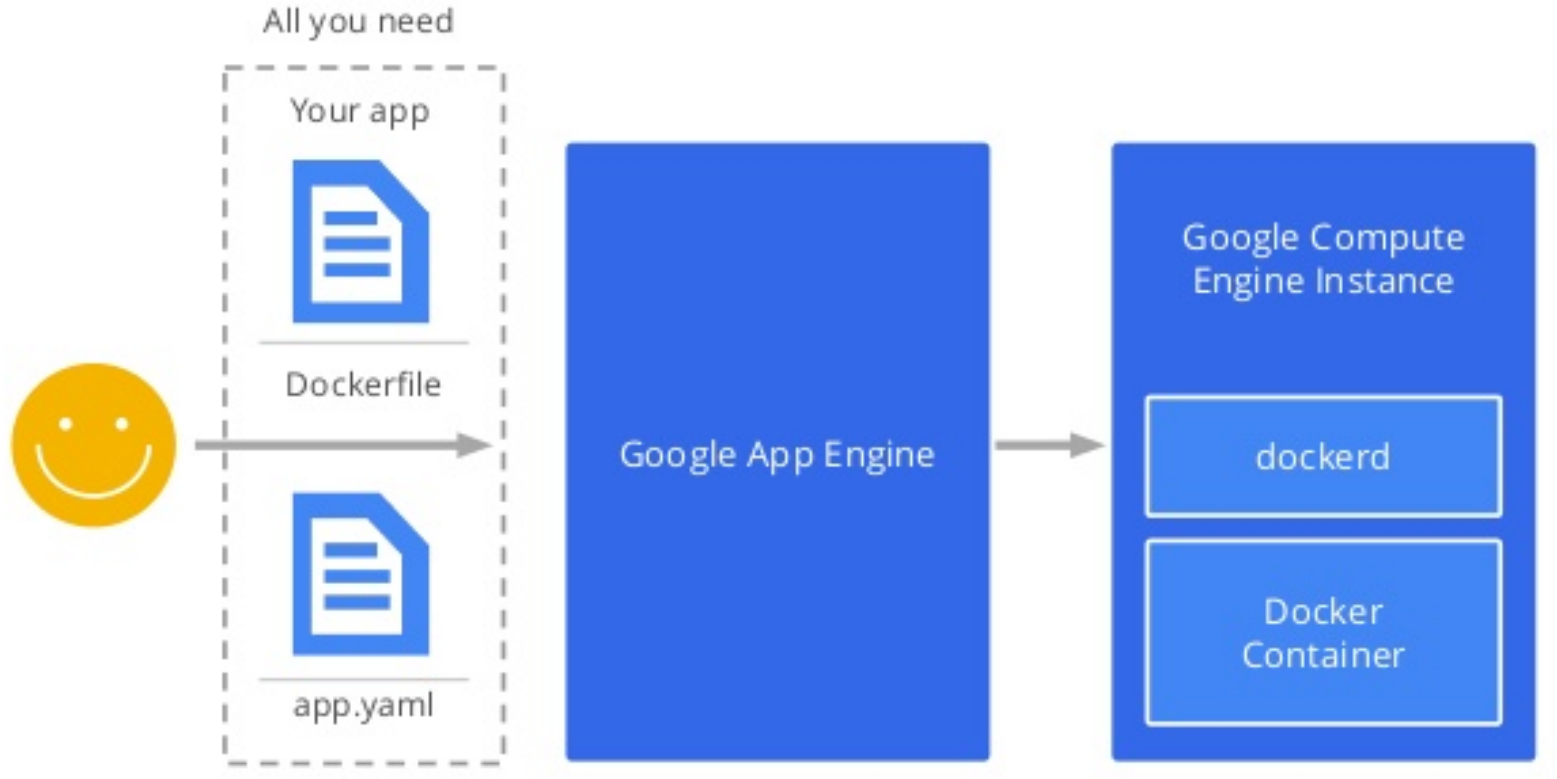
[1] This for you Kotlin fans out there

Standard Environments run in a specialised envrionment. Though building the application is more constrained then other environments, it means scaling up is faster.

Flexible Environment applications run off a Docker container, it is designed for applications that recieve constant traffic. When deployed they are Google Compute Engine as Virtual Machines*



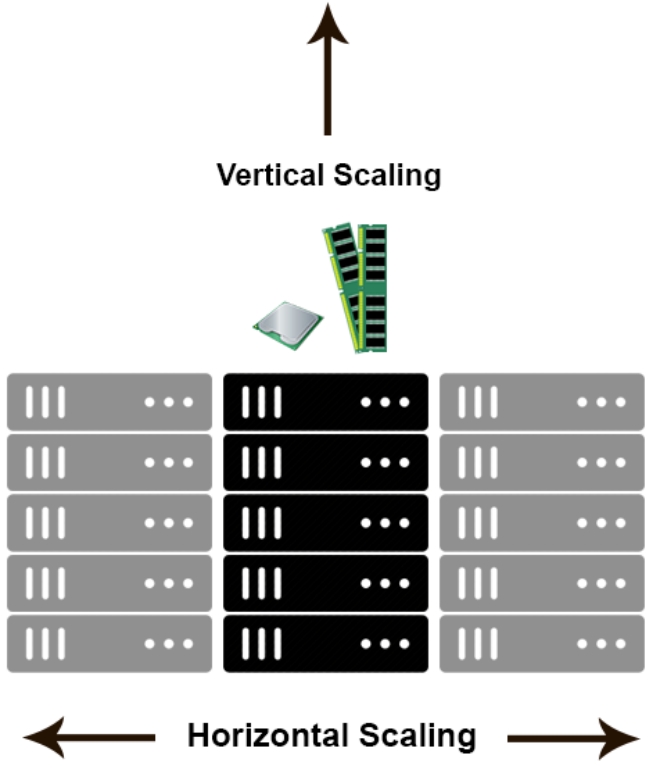
* Because they run off Docker, you can write your own Dockerfile Configuration to deploy, and deploy it anywhere, you can even move it to AWS


All you need
Your app
Dockerfile
app.yaml
Google App Engine
Google Compute Engine Instance
dockerd
Docker Container

Scaling Modern Web Applications

Me when I look at Scaling:

What is the difference between Vertical and Horizontally Scaling



Horizontal Scaling: scale by adding more machines into your pool of resources machine.

Vertical Scaling: scale by adding more power (CPU, RAM) to an existing machine.

> An easy way to remember this is to think of a machine on a server rack, we add more machines across the horizontal direction and add more resources to a machine in the vertical direction.

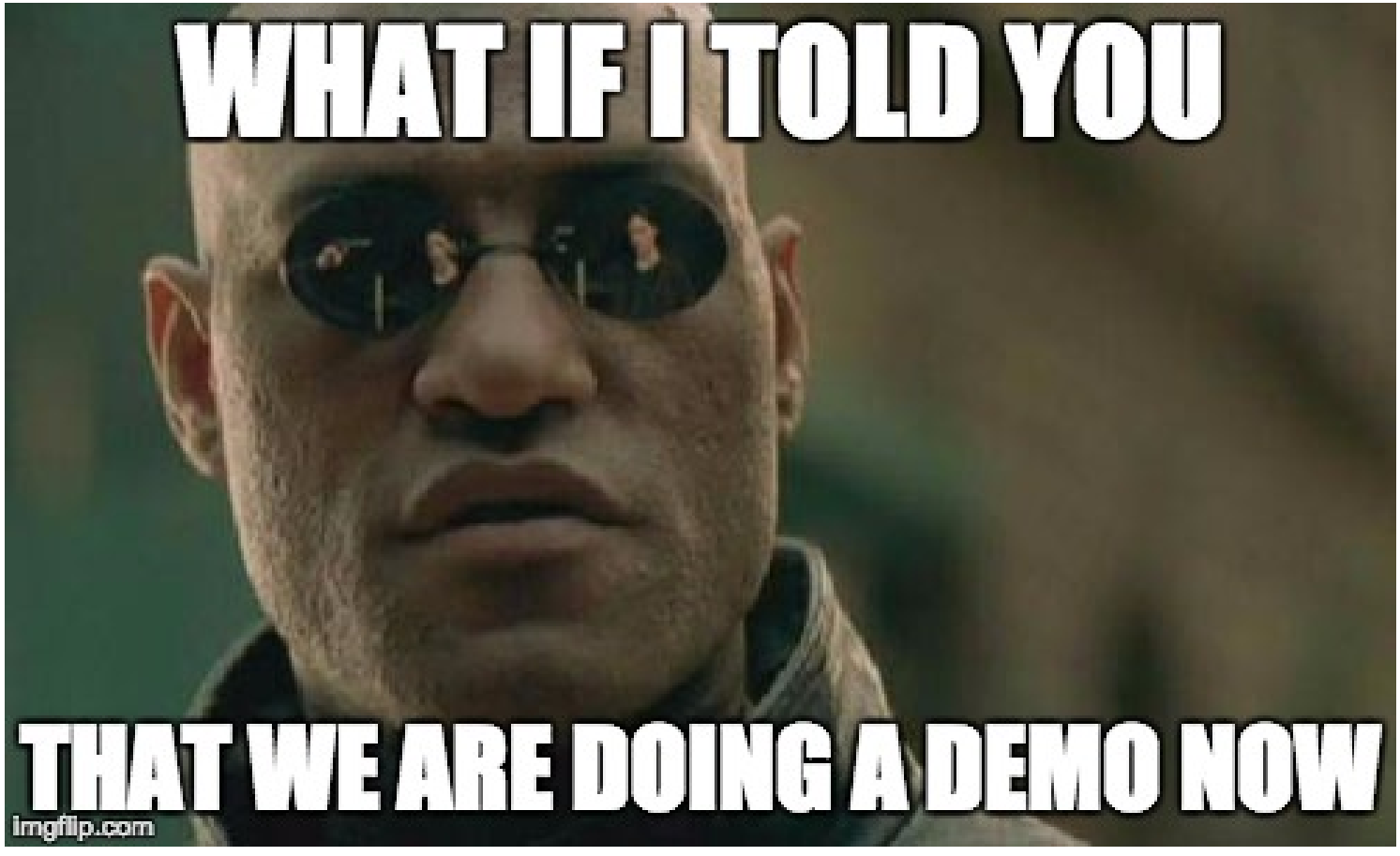
Benefits of Horizontal Scaling

- Dynamic scaling allows spinning up more instances and nodes faster, i.e. if you suddenly get a influx of traffic
- Vertical Scaling is limited to capacity of resources, simply adding more resources
- Just simplying load testing isn't good enough, examples of this include Niantic (PokemonGo) and Australian Census 2016

Scaling in Action: The monPlan Stack

- The frontend and backend has been seperated into 2 projects. The backend stores the information for the frontend,
- So when an increase in load happens, the frontend scales up, but not necessarily the backend, as the frontend requests information when necessary

Demo Section



Installing the SDK

1. Install the SDK over https://cloud.google.com/sdk/downloads
2. Authenticate Using `gcloud init` (login using your Monash Student Account)
3. You may need Java (JDK 1.8) and Maven (MVN) Installed if you are using the package provided.

> If you are interested in developing on the framework provided I strongly suggest for you to read the docs.

Framework: http://tinyurl.com/mplan-baseapi

Deploying the App

- Reason's why we are using a Java Environment is that since its developed directly on the Standard Environment, it scales up way faster.

Other Tools Available on GCP that you play with

- Cloud ML (Google Cloud Machine Learning) which is built off TensorFlow
- Compute Engine - Google VMs
- Container Engine - built off Kubernetes and allows deployment of custom applications
- Cloud Storage - CDN provider of files (like *Amazon S3*)
- Network Balancer - for Load Balancing of traffic for your applications
- Cloud ML APIs such as Natural Language Processing, Data Loss Prevention, etc.

Questions