

Google Cloud

Next

Building ASP.NET apps on Google Cloud

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Agenda

Introduction

Why Windows, ASP.NET, SQL Server on Google Cloud?

Move existing ASP.NET apps to Google Cloud

Windows VM and SQL Server on Compute Engine, Cloud Tools for Visual Studio

Take it to the next level

Cloud Storage, PowerShell cmdlets, Vision API, Speech API

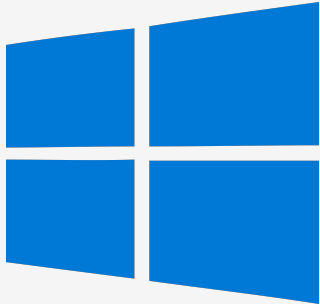
The new containerised world

ASP.NET Core on App Engine flex and Kubernetes/Container Engine

Windows Server, SQL Server, ASP.NET on Google Cloud?

The world of 2014

Visual Studio



SQL Server

PowerShell

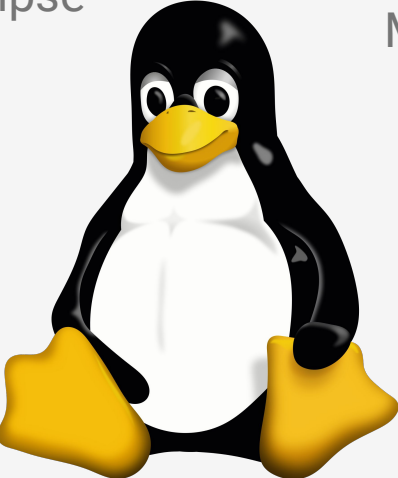
ASP.NET

C#

Eclipse

MySQL

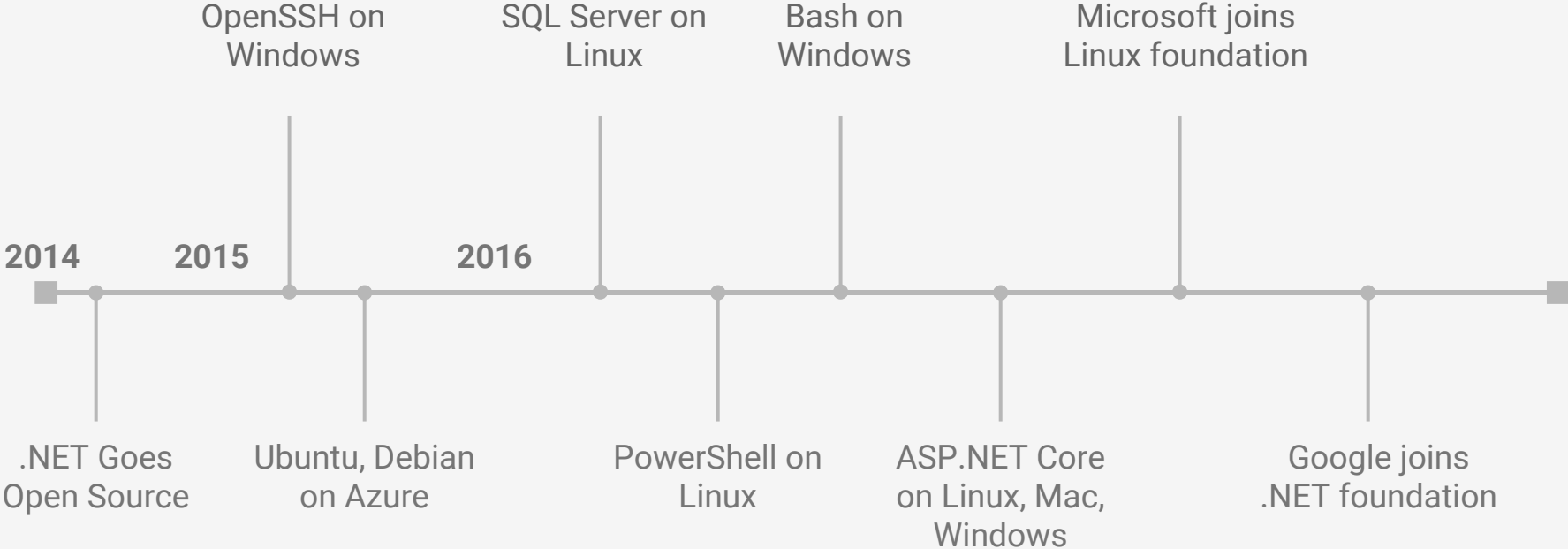
Java



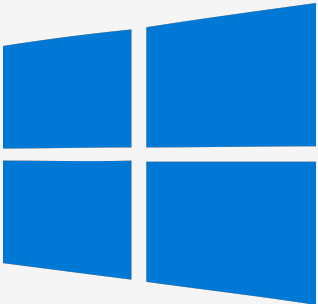
Apache

Bash

Things are changing



The convergence



SQL Server
Visual Studio
C#
MySQL

Eclipse
Bash
Java
PowerShell
ASP.NET
Apache



Great time to be
a .NET developer!

Why deploy to Google Cloud?

Google's Infrastructure

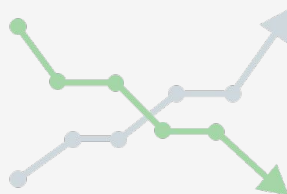


Google's privately owned fiber network

Fast VM provisioning

Autoscale that just works

Price

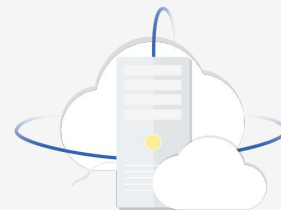


Per second billing

Sustained use discount: Up to 30% lower cost

Sizing recommendations

Flexibility in machine types

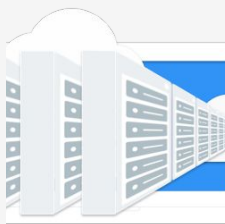


Custom VMs: Flexibility in CPU and Memory

Preemptible VMs: Up to 80% lower cost than regular instances

Why deploy to Google Cloud?

Deployment Options



Compute Engine
Container Engine
App Engine
Cloud Functions

Managed Services



BigTable	BigQuery
Datastore	Cloud SQL
Dataflow	Dataproc
Pub/Sub	Genomics
Stackdriver	Storage

Machine Learning



Vision API
Natural Processing API
Translation API
Speech API (Beta)
TensorFlow on Cloud
Machine Learning

ASP.NET Deployment Options

ASP.NET on Windows



Compute Engine

Containerised ASP.NET Core on Linux



App Engine
flexible environment



Kubernetes/Container
Engine

SQL Server, Libraries and Tools

Microsoft SQL Server




Compute Engine

Visual Studio plugin for Google Cloud on Visual Studio Gallery

.NET libraries for Google Cloud on NuGet

PowerShell cmdlets for Google Cloud as part of Google Cloud SDK



Move existing ASP.NET apps to Google Cloud

ASP.NET Deployment Options

ASP.NET on Windows



Compute Engine

Containerised ASP.NET Core on Linux



App Engine
flexible environment



Kubernetes/Container
Engine

Contoso University Application



Contoso University Home About Students Courses Instructors Departments Register Log in

Contoso University

Welcome to Contoso University

Contoso University is a sample application that demonstrates how to use Entity Framework Core 1.0 in an ASP.NET Core MVC 1.0 web application.

Build it from scratch

You can build the application by following the steps in a series of tutorials.

[See the tutorial »](#)

Download it

You can download the completed project from GitHub.

[See project source code »](#)

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Contoso University

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[Create New](#)

EnrollmentDate	FirstMidName	LastName	
9/1/2005 12:00:00 AM	Carson	Alexander	Edit Details Delete
9/1/2002 12:00:00 AM	Meredith	Alonso	Edit Details Delete
9/1/2003 12:00:00 AM	Arturo	Anand	Edit Details Delete
9/1/2002 12:00:00 AM	Gytis	Barzdukas	Edit Details Delete

Contoso University

Edit Student

[List](#)

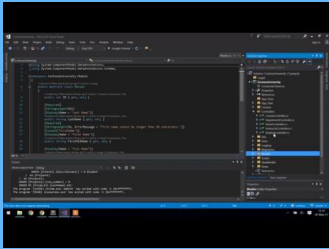
EnrollmentDate

FirstMidName

LastName

Demo

Let's run Contoso University locally



Move Contoso University to Google Cloud

Install Google Cloud Tools for Visual Studio

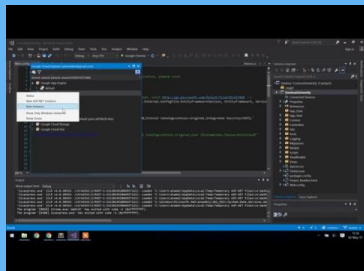
Get Windows Server VM with ASP.NET framework on Compute Engine


Get SQL Server on Compute Engine

Publish from Visual Studio to Google Cloud

Demo

Let's move Contoso University to Google Cloud





Take it to the next
level

Now, the fun begins

Let's add some profile pictures for students with Cloud Storage

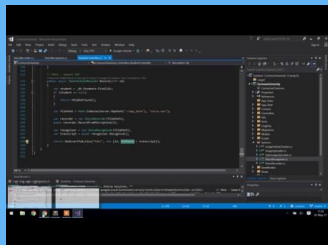
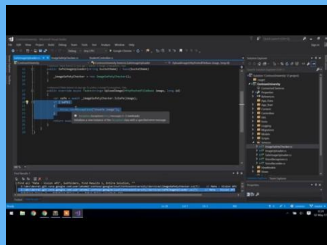
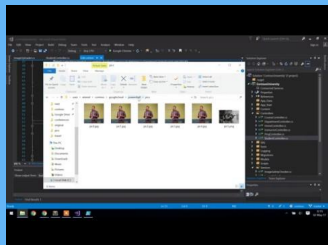
Use PowerShell cmdlets to bulk upload those pictures

Make sure pictures are safe (not violent, adult, etc.) with Vision API

Add fun facts about students with Speech API

Demo

Let's take Contoso University to the next level



The background features a large, abstract geometric composition. A light grey triangle is positioned on the left side. To its right, a large blue shape is formed by two overlapping triangles: a darker blue one on top and a lighter blue one on the bottom. The overall effect is a modern, clean, and dynamic design.

The new containerised world

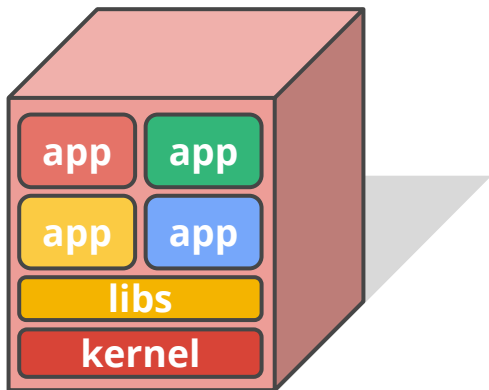
Containerised ASP.NET Core

ASP.NET Core runs on Linux

ASP.NET Core app can be wrapped into an image and run in a Docker container

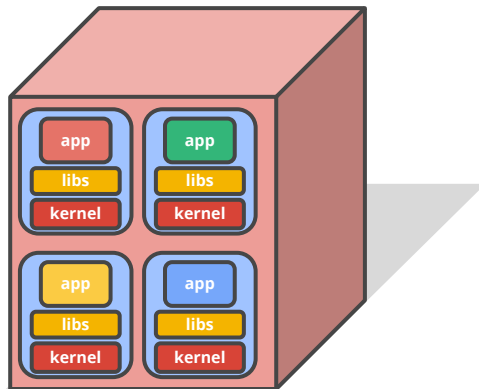
Containerised ASP.NET Core apps runs on **App Engine** or **Kubernetes/GKE** on Google Cloud

Why containers?



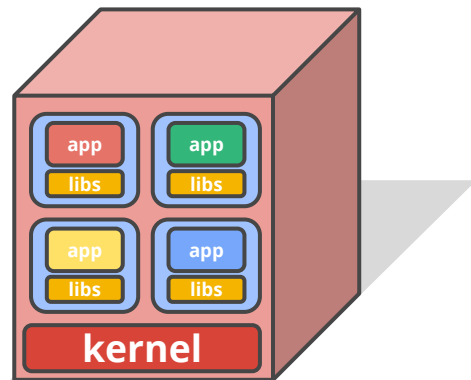
Physical Machine

- ✗ No isolation
- ✗ Common libs
- ✗ Highly coupled Apps & OS



Virtual Machines

- ✓ Isolation
- ✓ No Common Libs
- ✗ Expensive and Inefficient
- ✗ Hard to manage



Containers

- ✓ Isolation
- ✓ No Common Libs
- ✓ Less overhead
- ✗ Less Dependency on Host OS

What is a container?

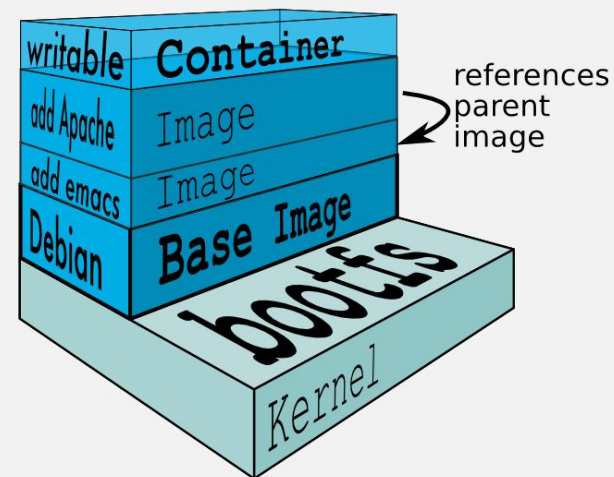
A **lightweight** way to virtualize applications

Linux (or Windows) processes

Lightweight
Hermetically sealed
Isolated

Easily deployable
Introspectable
Composable

Docker



ASP.NET Deployment Options

ASP.NET on Windows



Compute Engine

Containerised ASP.NET Core on Linux



App Engine
flexible environment



Kubernetes/Container
Engine

App Engine (flex)

Deploy your container and let App Engine figure out how to scale it

Dashboards

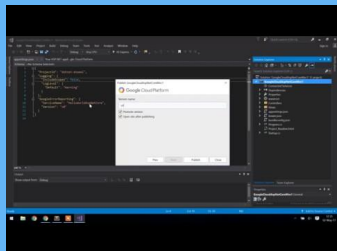
Versioning

Traffic splitting

Autoscaling

Demo

ASP.NET Core on App Engine flex



Kubernetes

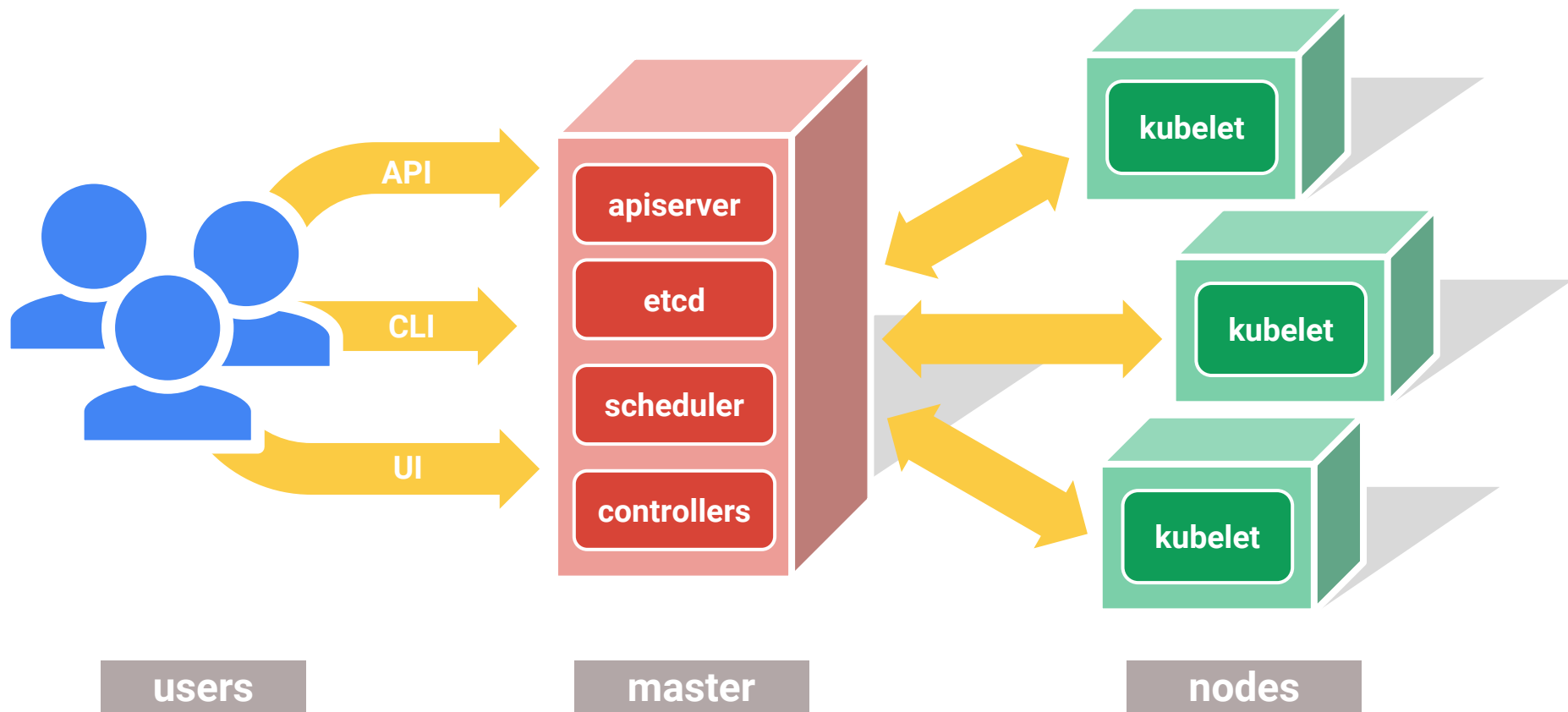
Greek for “Helmsman”; also the root of the words “governor” and “cybernetic”

- Manages container clusters
- Inspired and informed by Google’s experiences and internal systems (borg)
- Supports multiple cloud and bare-metal environments
- Supports multiple container runtimes
- 100% Open source, written in Go

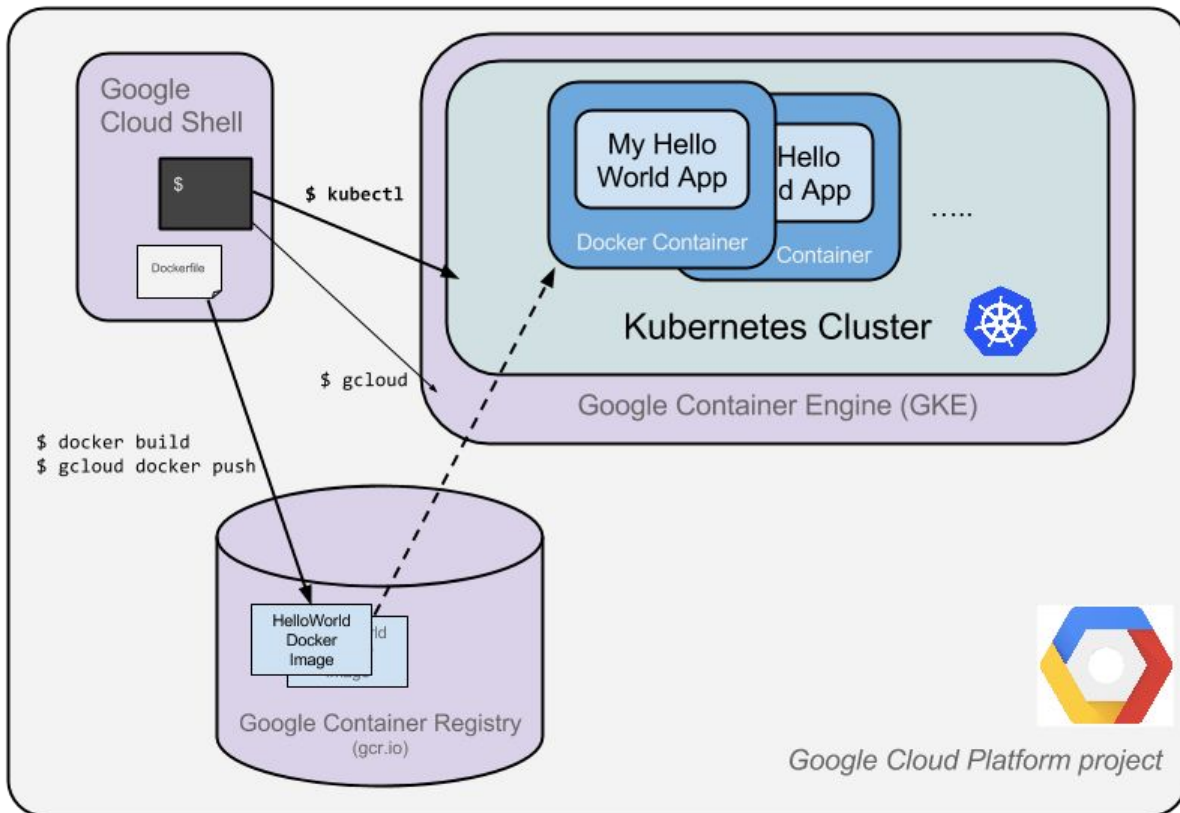
Manage **applications**, not machines



The 10000 foot view



Kubernetes cluster on GKE



Summary

Started with an ASP.NET app running locally

Moved to a Windows Server and SQL Server on Compute Engine

Added pictures and saved to Cloud Storage

Added intelligence with Machine Learning APIs

Tried the new containerised ASP.NET Core on App Engine flex

Took a look at Kubernetes/GKE

Thank You

cloud.google.com/dotnet
cloud.google.com/windows
cloud.google.com/appengine
cloud.google.com/container-engine
kubernetes.io

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meteatamel.wordpress.com