Tamkang University

Social Media Apps Programming

Google Cloud Platform

1051SMAP10
TLMXM1A (8648) (M2143) (Fall 2016)
(MIS MBA) (2 Credits, Elective) [Full English Course]
Wed 8,9 (15:10-17:00) B310

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2016-12-07

Course Schedule (1/3)

Week	Date	Subject/Topics
1	2016/09/14	Course Orientation and Introduction to Social Media and Mobile Apps Programming
2	2016/09/21	Introduction to Android / iOS Apps Programming
3	2016/09/28	Developing Android Native Apps with Java (Eclipse) (MIT App Inventor)
4	2016/10/05	Developing iPhone / iPad Native Apps with Swift (XCode)
5	2016/10/12	Mobile Apps using HTML5/CSS3/JavaScript
6	2016/10/19	jQuery Mobile

Course Schedule (2/3)

Week	Date	Subject/Topics
7	2016/10/26	Create Hybrid Apps with PhoneGap
8	2016/11/02	jQuery Mobile/PhoneGap
9	2016/11/09	jQuery Mobile/PhoneGap
10	2016/11/16	Midterm Exam Week (Midterm Project Report)
11	2016/11/23	Case Study on Social Media Apps Programming and Marketing in Google Play and App Store
12	2016/11/30	Invited Talk [B302b]: Challenges in Natural Language Processing: Question Answering and Dialog System Invited Speaker: Prof. Yoshinobu Kano, Associate Professor, Faculty of Informatics, Shizuoka University, Japan

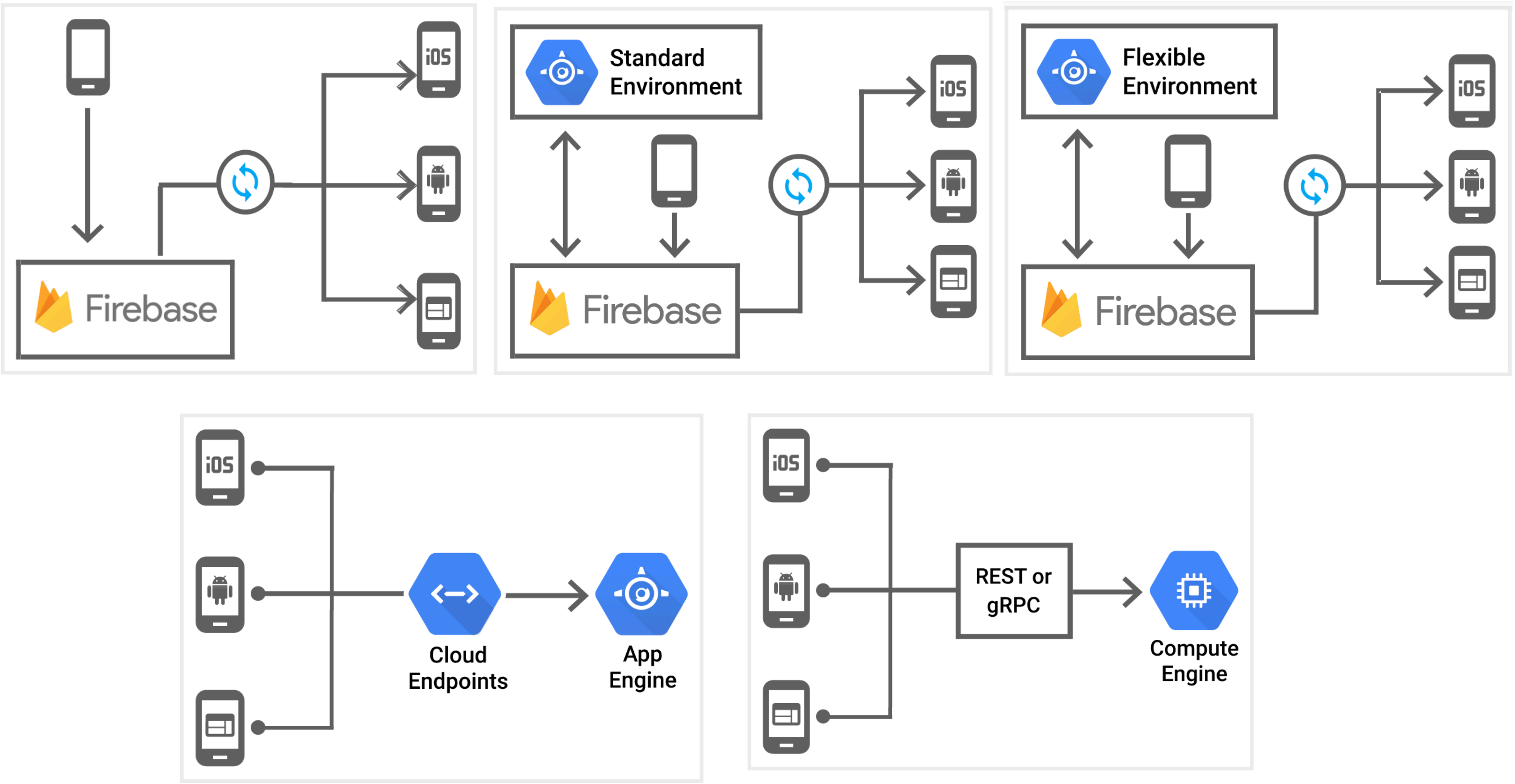
Course Schedule (3/3)

Week	Date	Subject/Topics
13	2016/12/07	Google Cloud Platform
14	2016/12/14	Google App Engine and Google Map API
15	2016/12/21	Facebook API (Facebook JavaScript SDK) (Integrate Facebook with iOS/Android Apps)
16	2016/12/28	Twitter API
17	2017/01/04	Final Project Presentation
18	2017/01/11	Final Exam Week (Final Project Presentation)

Outline

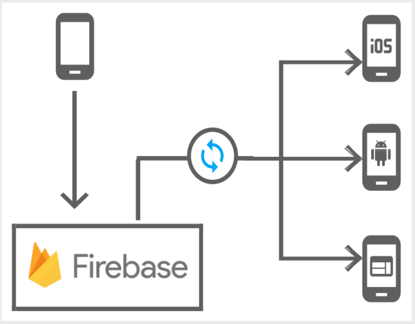
- Google Cloud Platform
  - Google App Engine
  - Google Cloud Datastore
  - Google Cloud Endpoints
- Firebase
- Mobile App with Google Cloud Platform

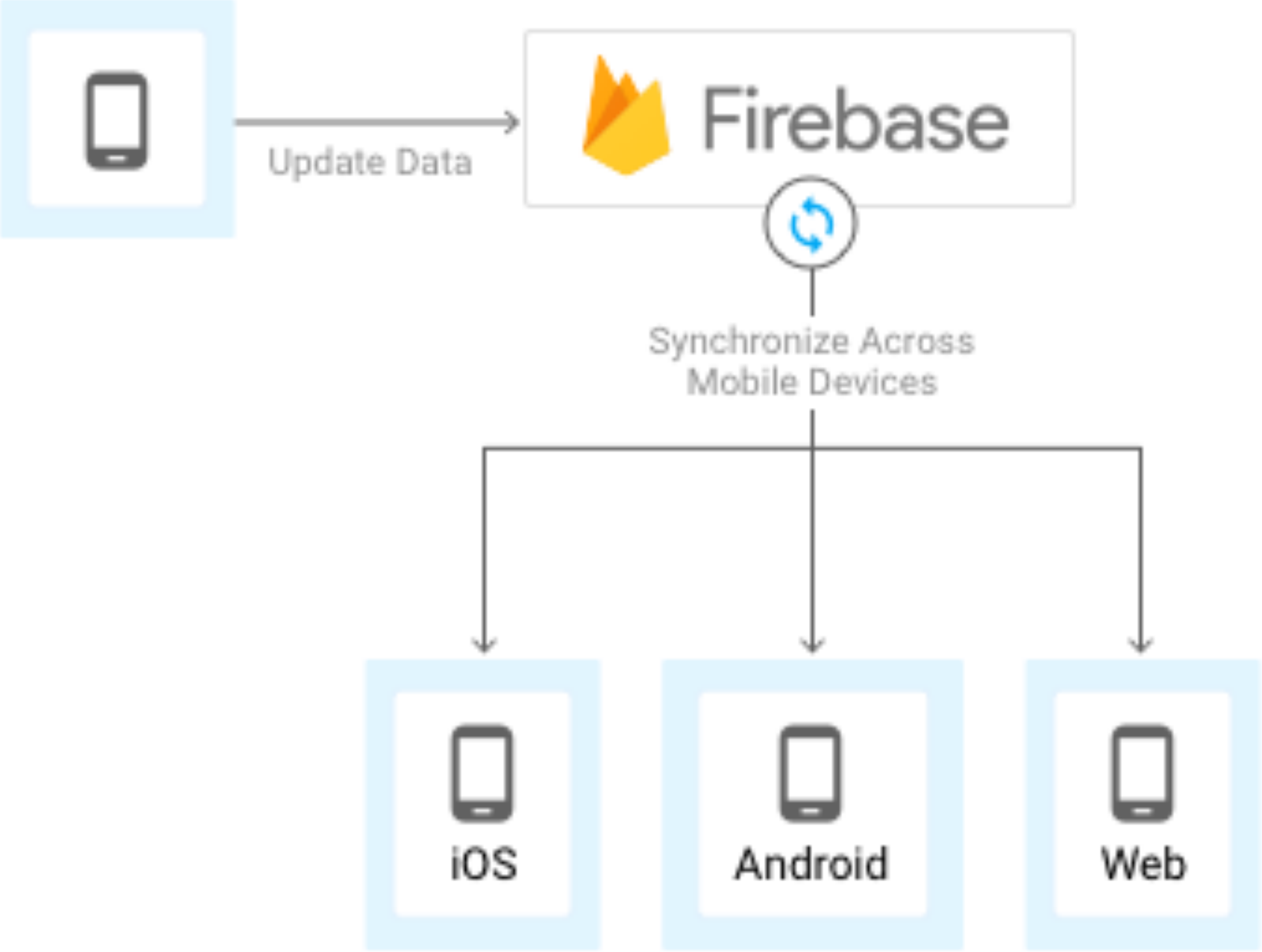
Mobile App Backend Services



Source: https://cloud.google.com/solutions/mobile/mobile-app-backend-services

Firebase

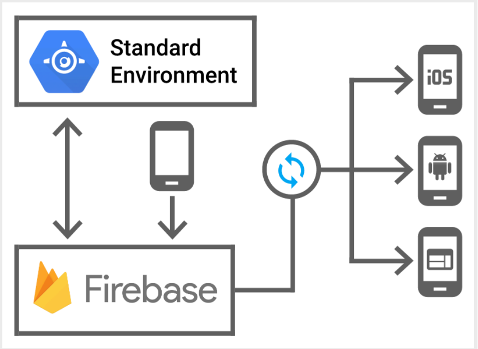


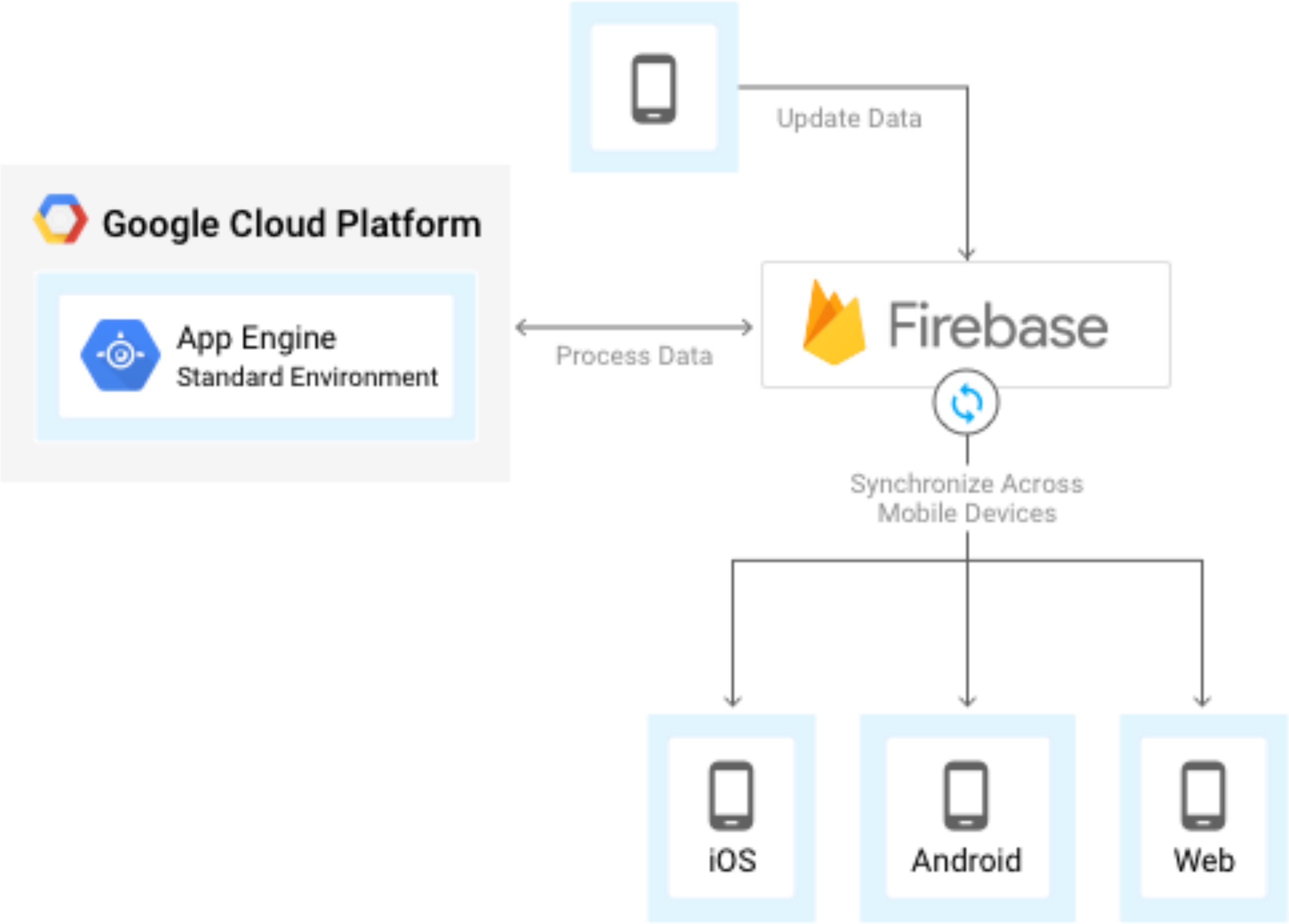


Source: https://cloud.google.com/solutions/mobile/mobile-app-backend-services

Firebase and Google App Engine

standard environment

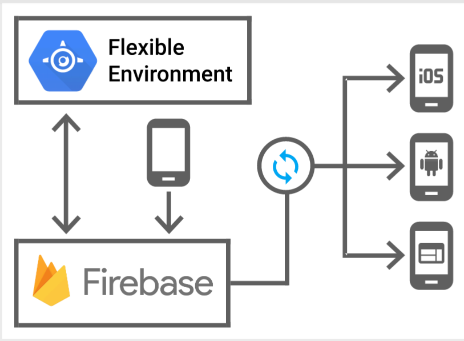


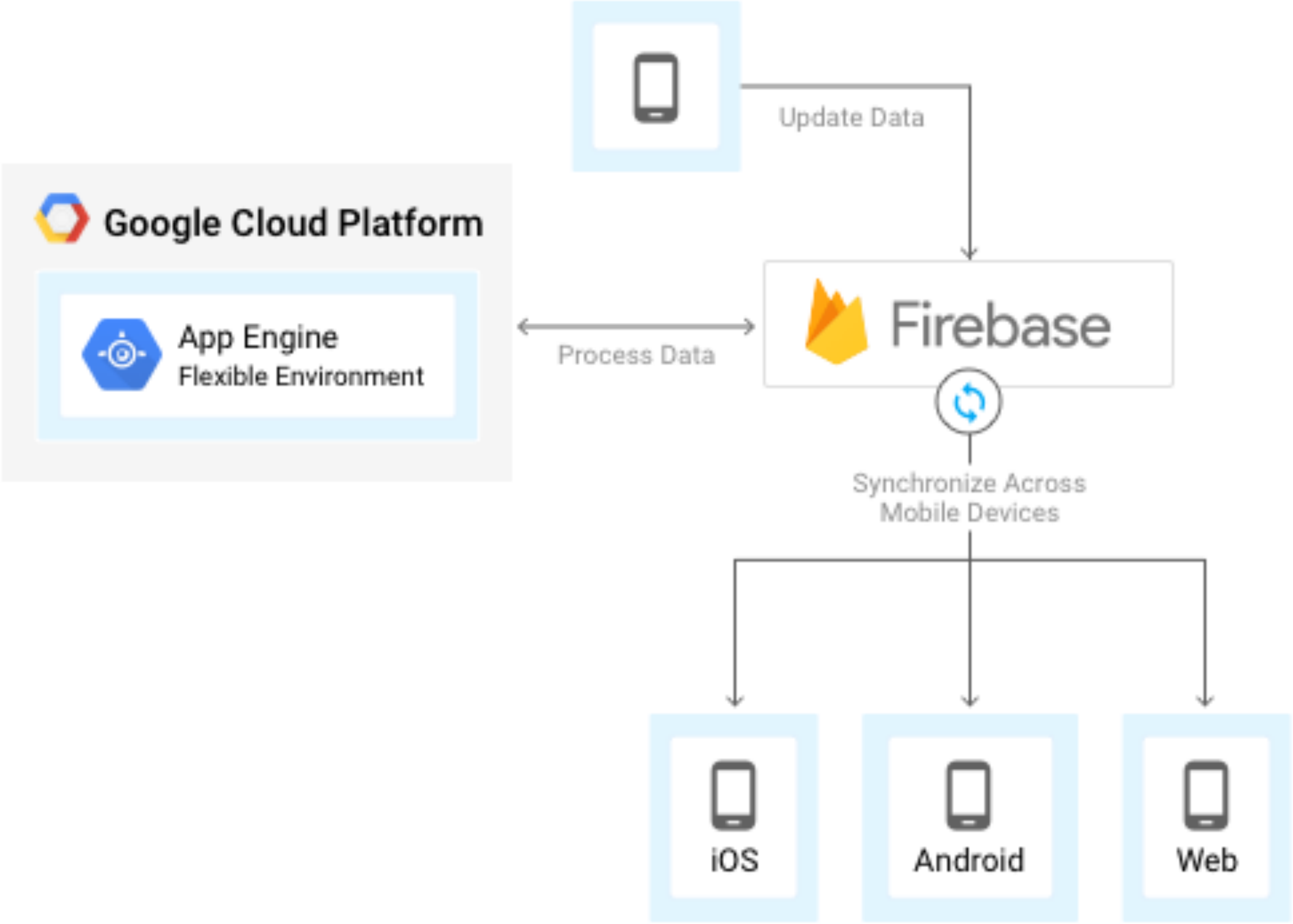


Source: https://cloud.google.com/solutions/mobile/mobile-app-backend-services

Firebase and App Engine

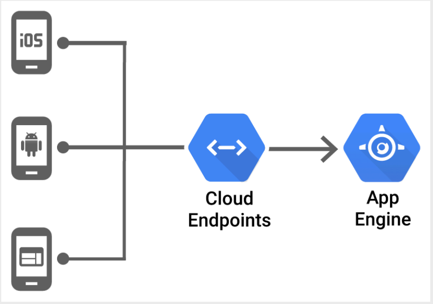
flexible environment

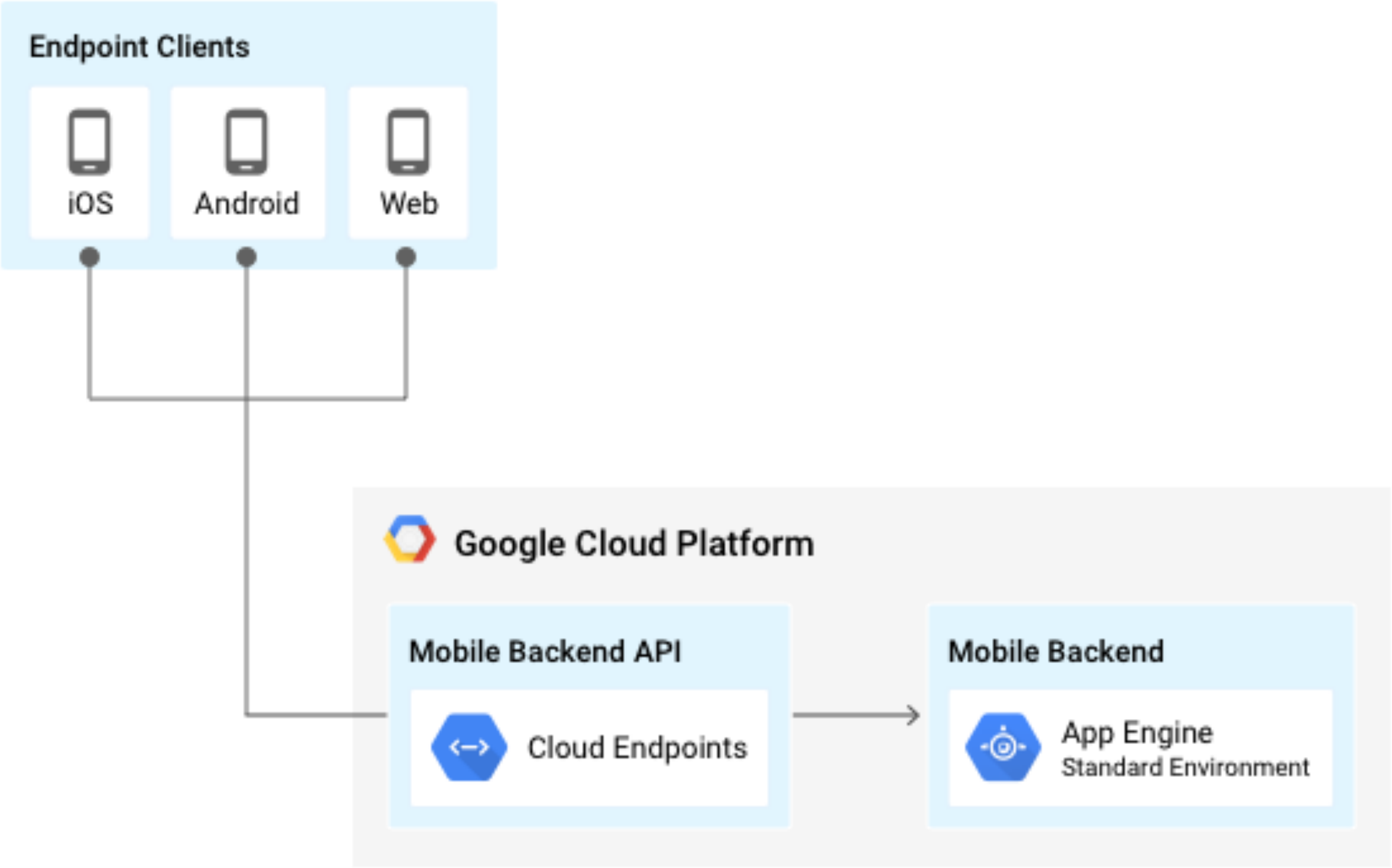




Source: https://cloud.google.com/solutions/mobile/mobile-app-backend-services

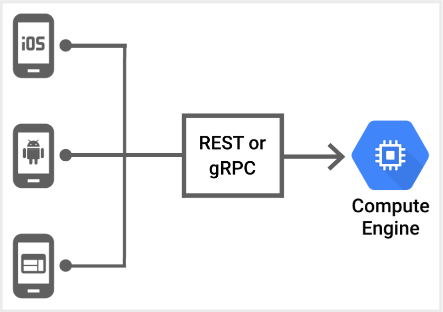
App Engine and Cloud Endpoints





Source: https://cloud.google.com/solutions/mobile/mobile-app-backend-services

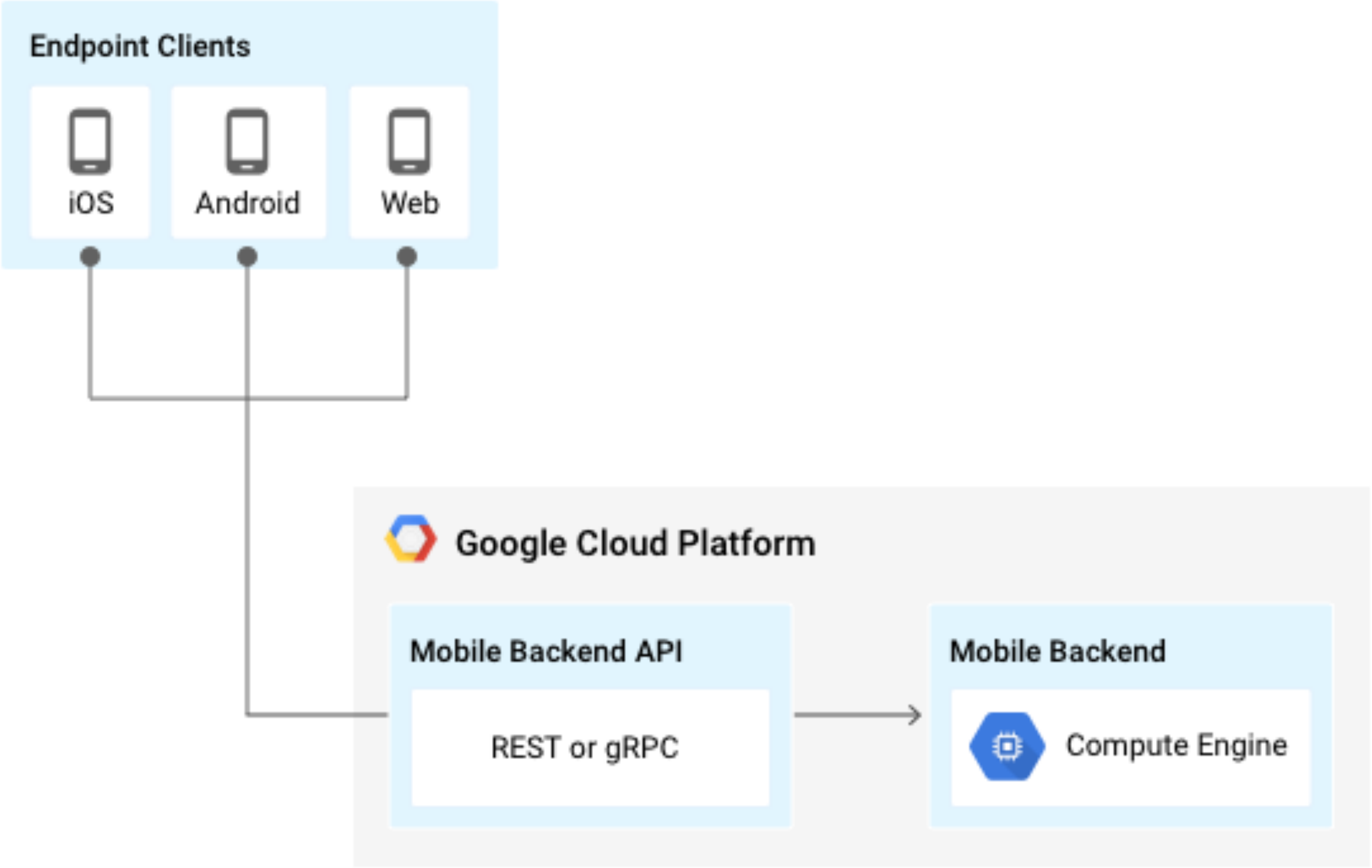
Compute Engine and REST or gRPC



iOS

REST or gRPC

Compute Engine



Endpoint Clients

iOS

Android

Web

Google Cloud Platform

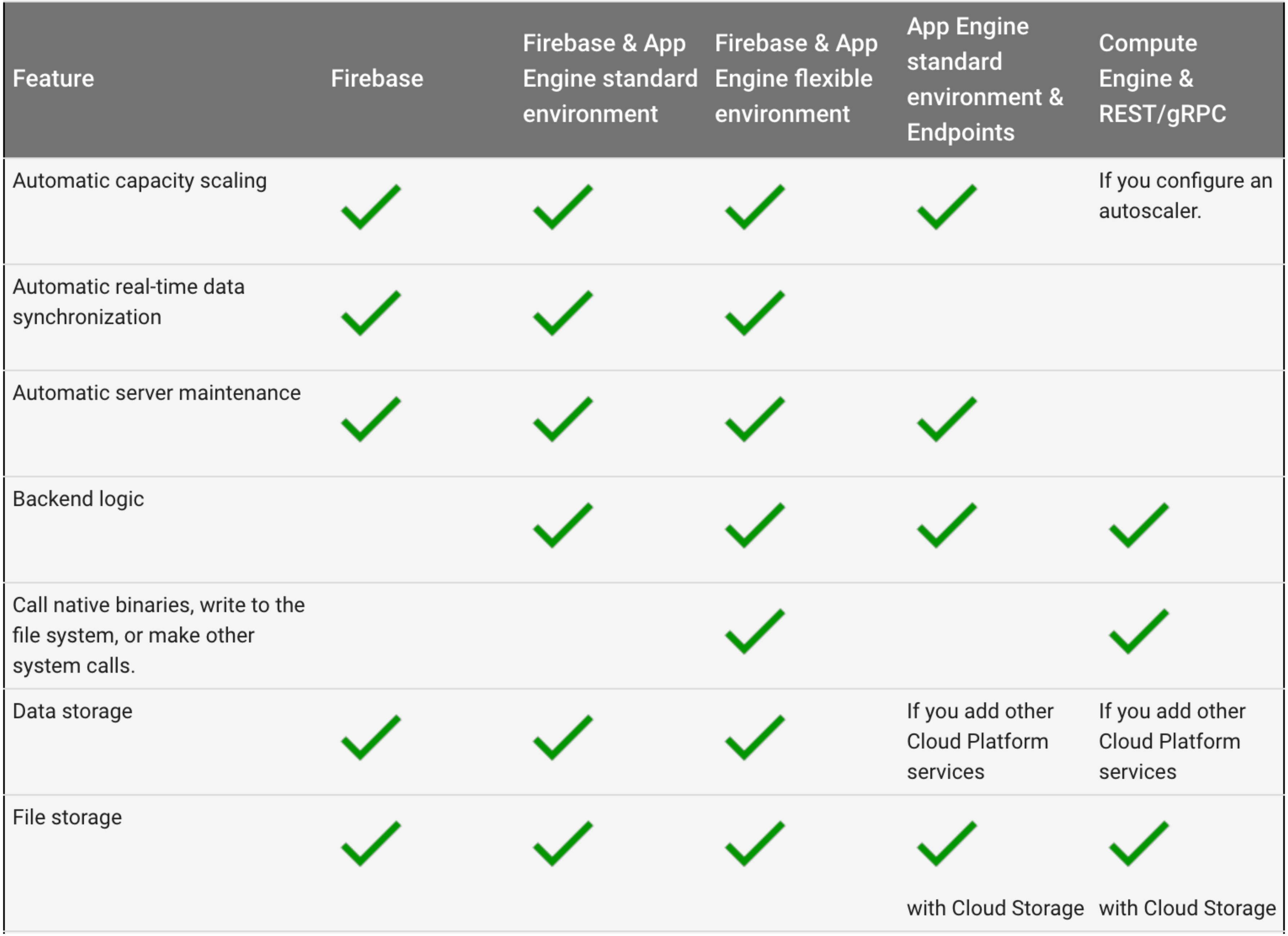
Mobile Backend API

REST or gRPC

Mobile Backend

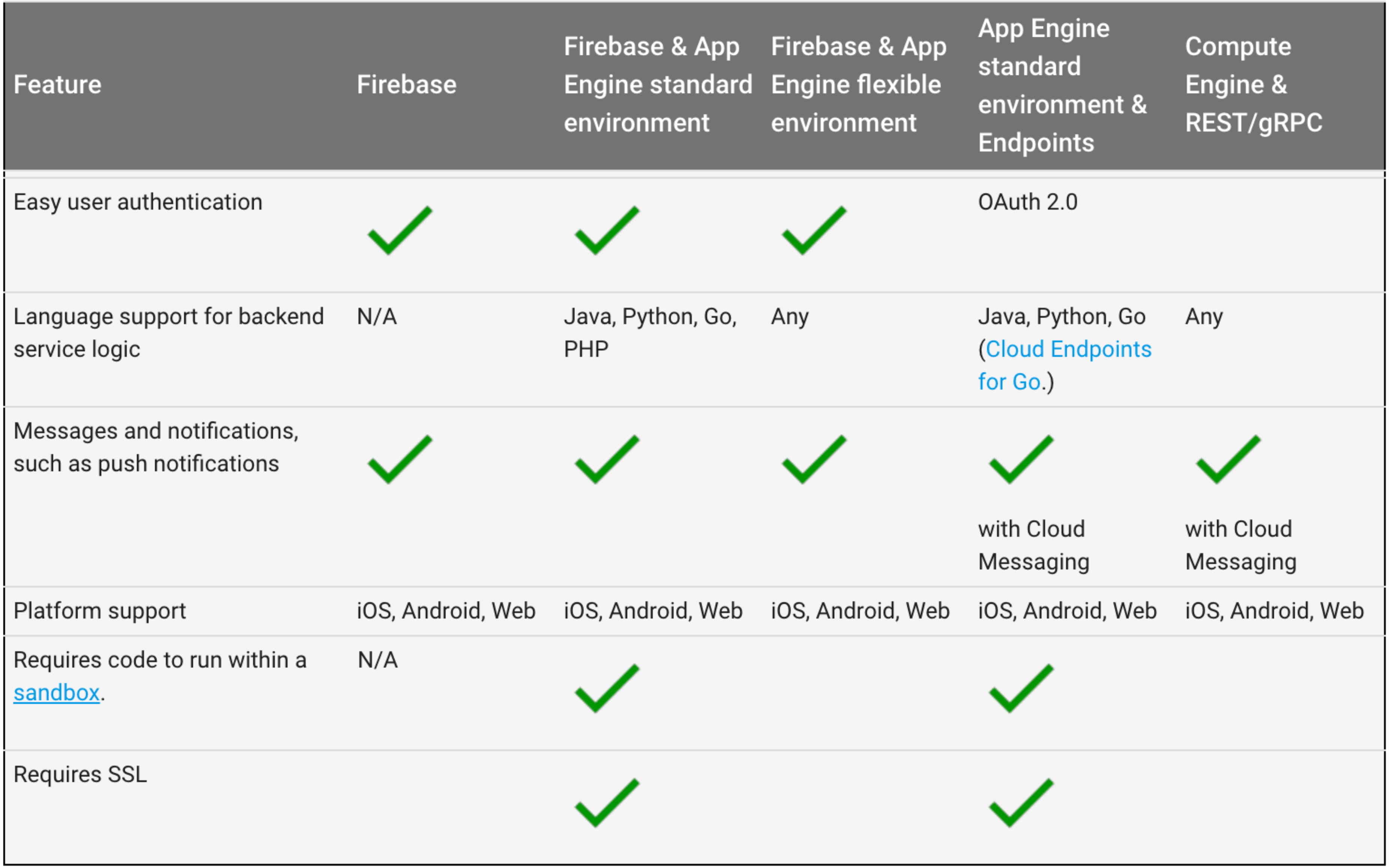
Compute Engine

Source: https://cloud.google.com/solutions/mobile/mobile-app-backend-services



Feature	Firebase	Firebase & App Engine standard environment	Firebase & App Engine flexible environment	App Engine standard environment & Endpoints	Compute Engine & REST/gRPC
Automatic capacity scaling	✓	✓	✓	✓	If you configure an autoscaler.
Automatic real-time data synchronization	✓	✓	✓		
Automatic server maintenance	✓	✓	✓	✓	
Backend logic		✓	✓	✓	✓
Call native binaries, write to the file system, or make other system calls.			✓		✓
Data storage	✓	✓	✓	If you add other Cloud Platform services	If you add other Cloud Platform services
File storage	✓	✓	✓	✓ with Cloud Storage	✓ with Cloud Storage

Source: https://cloud.google.com/solutions/mobile/mobile-app-backend-services

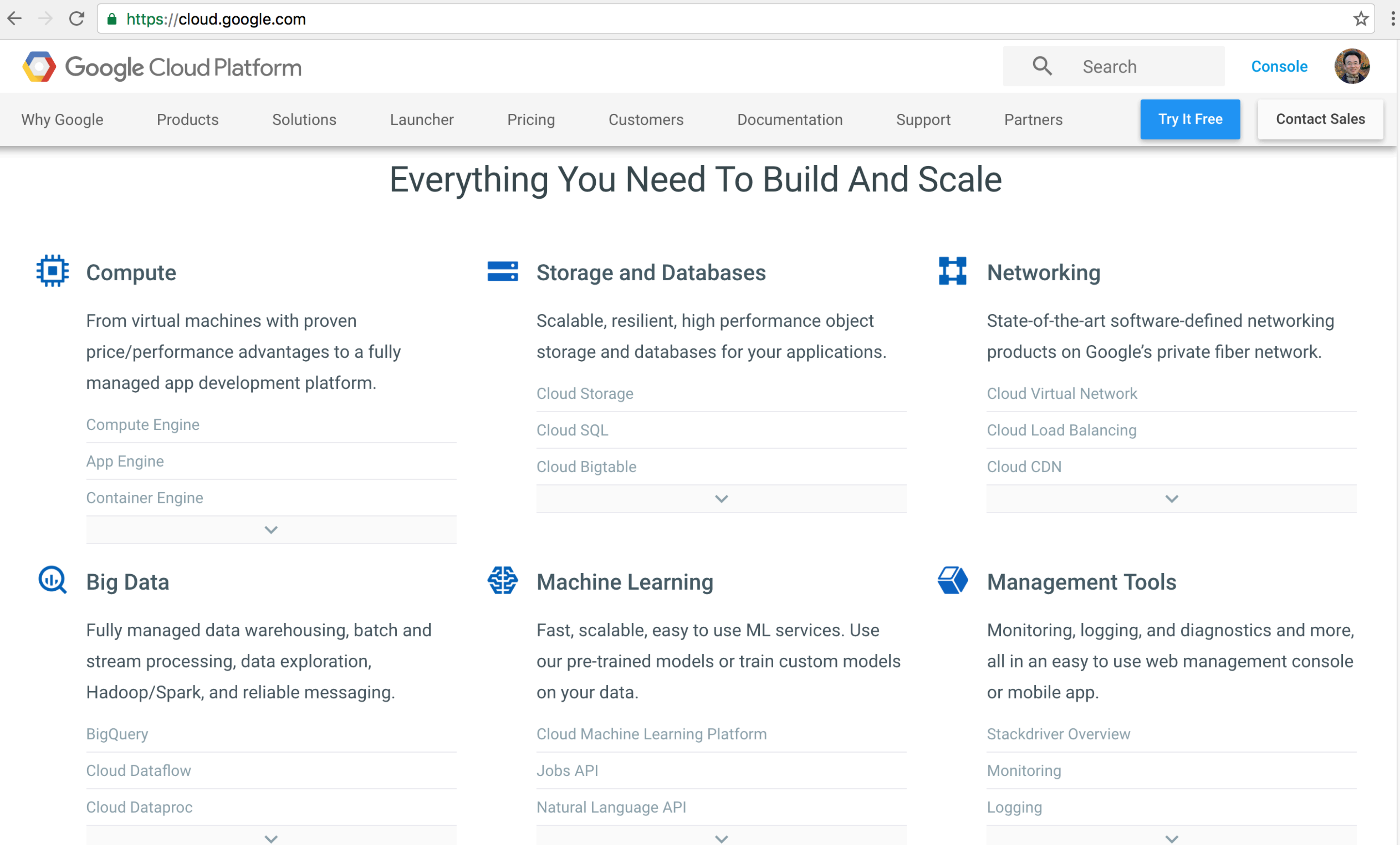


Feature	Firebase	Firebase & App Engine standard environment	Firebase & App Engine flexible environment	App Engine standard environment & Endpoints	Compute Engine & REST/gRPC
Easy user authentication	✓	✓	✓	OAuth 2.0	
Language support for backend service logic	N/A	Java, Python, Go, PHP	Any	Java, Python, Go (Cloud Endpoints for Go.)	Any
Messages and notifications, such as push notifications	✓	✓	✓	✓ with Cloud Messaging	✓ with Cloud Messaging
Platform support	iOS, Android, Web	iOS, Android, Web	iOS, Android, Web	iOS, Android, Web	iOS, Android, Web
Requires code to run within a sandbox.	N/A	✓		✓	
Requires SSL		✓		✓	

Source: https://cloud.google.com/solutions/mobile/mobile-app-backend-services

Google Cloud Platform

https://cloud.google.com/



Everything You Need To Build And Scale

Compute

From virtual machines with proven price/performance advantages to a fully managed app development platform.

- Compute Engine
- App Engine
- Container Engine

Storage and Databases

Scalable, resilient, high performance object storage and databases for your applications.

- Cloud Storage
- Cloud SQL
- Cloud Bigtable

Networking

State-of-the-art software-defined networking products on Google's private fiber network.

- Cloud Virtual Network
- Cloud Load Balancing
- Cloud CDN

Big Data

Fully managed data warehousing, batch and stream processing, data exploration, Hadoop/Spark, and reliable messaging.

- BigQuery
- Cloud Dataflow
- Cloud Dataproc

Machine Learning

Fast, scalable, easy to use ML services. Use our pre-trained models or train custom models on your data.

- Cloud Machine Learning Platform
- Jobs API
- Natural Language API

Management Tools

Monitoring, logging, and diagnostics and more, all in an easy to use web management console or mobile app.

- Stackdriver Overview
- Monitoring
- Logging

Google Cloud Platform

Hosting + Compute

Storage

Big Data

Services

Source: https://cloud.google.com/products/

Google Cloud Platform

Compute

App Engine

Compute Engine

Container Engine

Storage

Cloud Datastore

Cloud SQL

Cloud Storage

Big Data

Big Query

Services

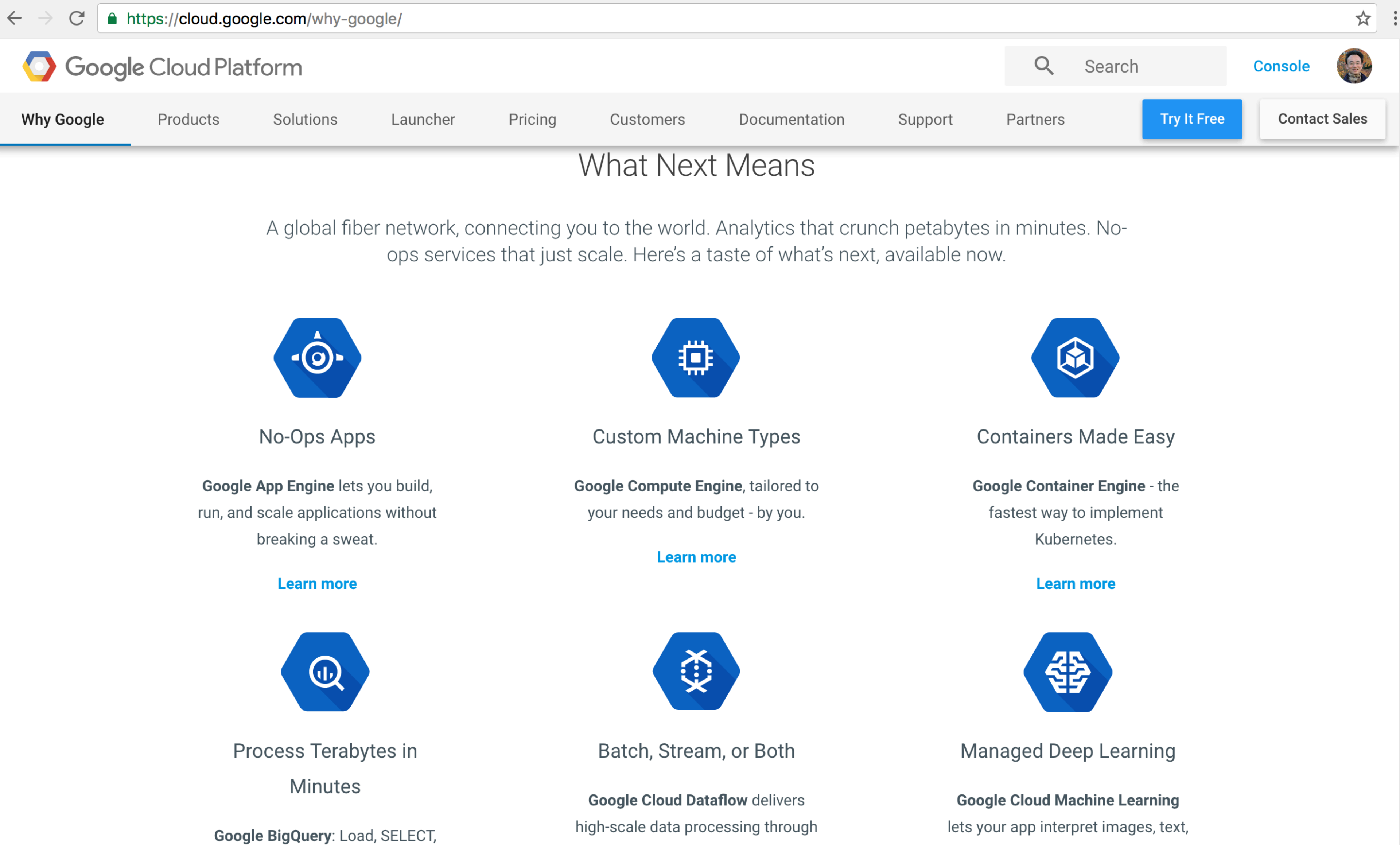
Cloud Endpoints

Translate API

Prediction API

Source: https://cloud.google.com/products/

Why Google Cloud Platform



What Next Means

A global fiber network, connecting you to the world. Analytics that crunch petabytes in minutes. No-ops services that just scale. Here's a taste of what's next, available now.

No-Ops Apps

Google App Engine lets you build, run, and scale applications without breaking a sweat.

Learn more

Custom Machine Types

Google Compute Engine, tailored to your needs and budget - by you.

Learn more

Containers Made Easy

Google Container Engine - the fastest way to implement Kubernetes.

Learn more

Process Terabytes in Minutes

Google BigQuery: Load, SELECT,

Batch, Stream, or Both

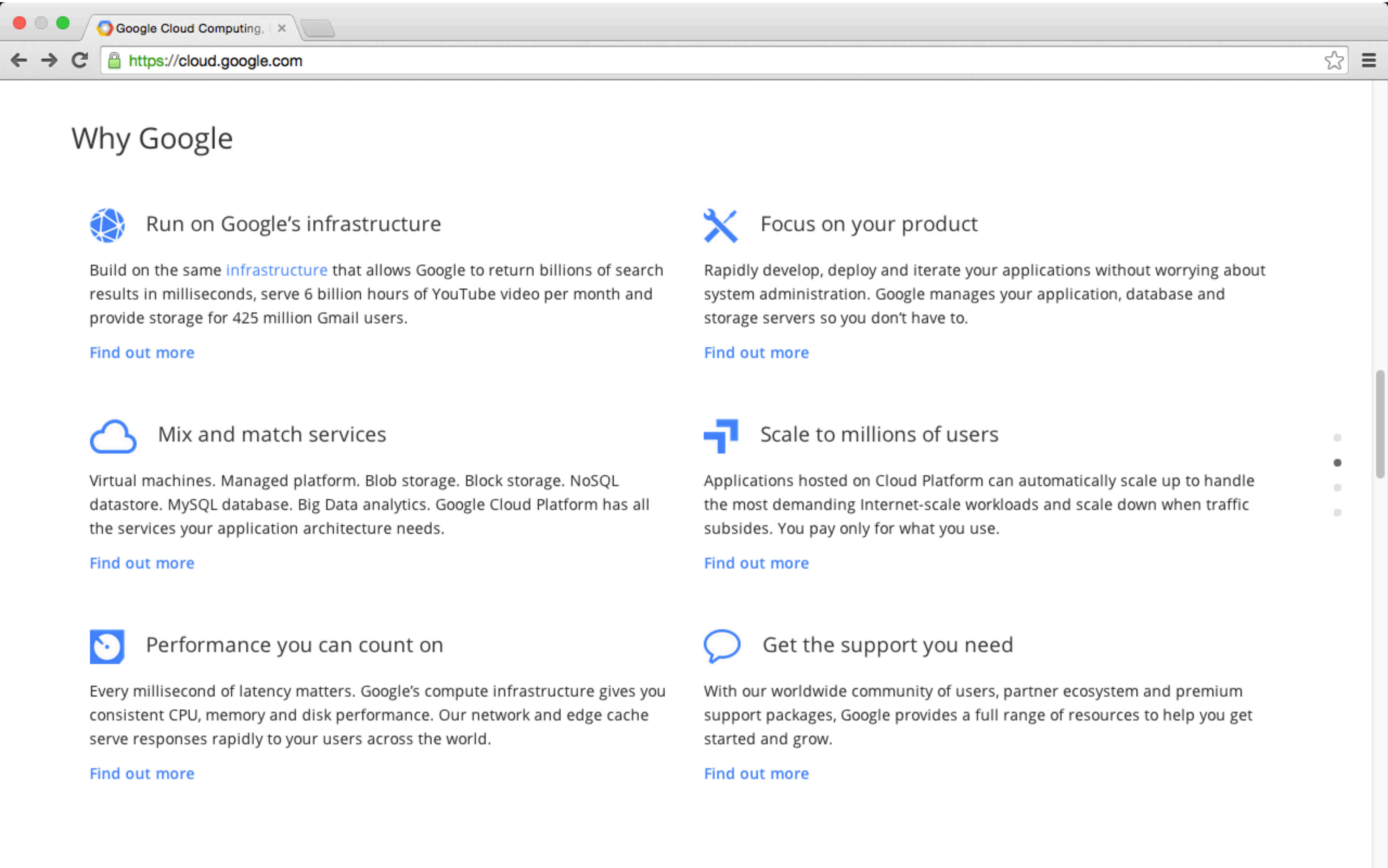
Google Cloud Dataflow delivers high-scale data processing through

Managed Deep Learning

Google Cloud Machine Learning lets your app interpret images, text,

Source: https://cloud.google.com/why-google/

Why Google Cloud Platform



Why Google

Run on Google's infrastructure

Build on the same infrastructure that allows Google to return billions of search results in milliseconds, serve 6 billion hours of YouTube video per month and provide storage for 425 million Gmail users.

Find out more

Focus on your product

Rapidly develop, deploy and iterate your applications without worrying about system administration. Google manages your application, database and storage servers so you don't have to.

Find out more

Mix and match services

Virtual machines. Managed platform. Blob storage. Block storage. NoSQL datastore. MySQL database. Big Data analytics. Google Cloud Platform has all the services your application architecture needs.

Find out more

Scale to millions of users

Applications hosted on Cloud Platform can automatically scale up to handle the most demanding Internet-scale workloads and scale down when traffic subsides. You pay only for what you use.

Find out more

Performance you can count on

Every millisecond of latency matters. Google's compute infrastructure gives you consistent CPU, memory and disk performance. Our network and edge cache serve responses rapidly to your users across the world.

Find out more

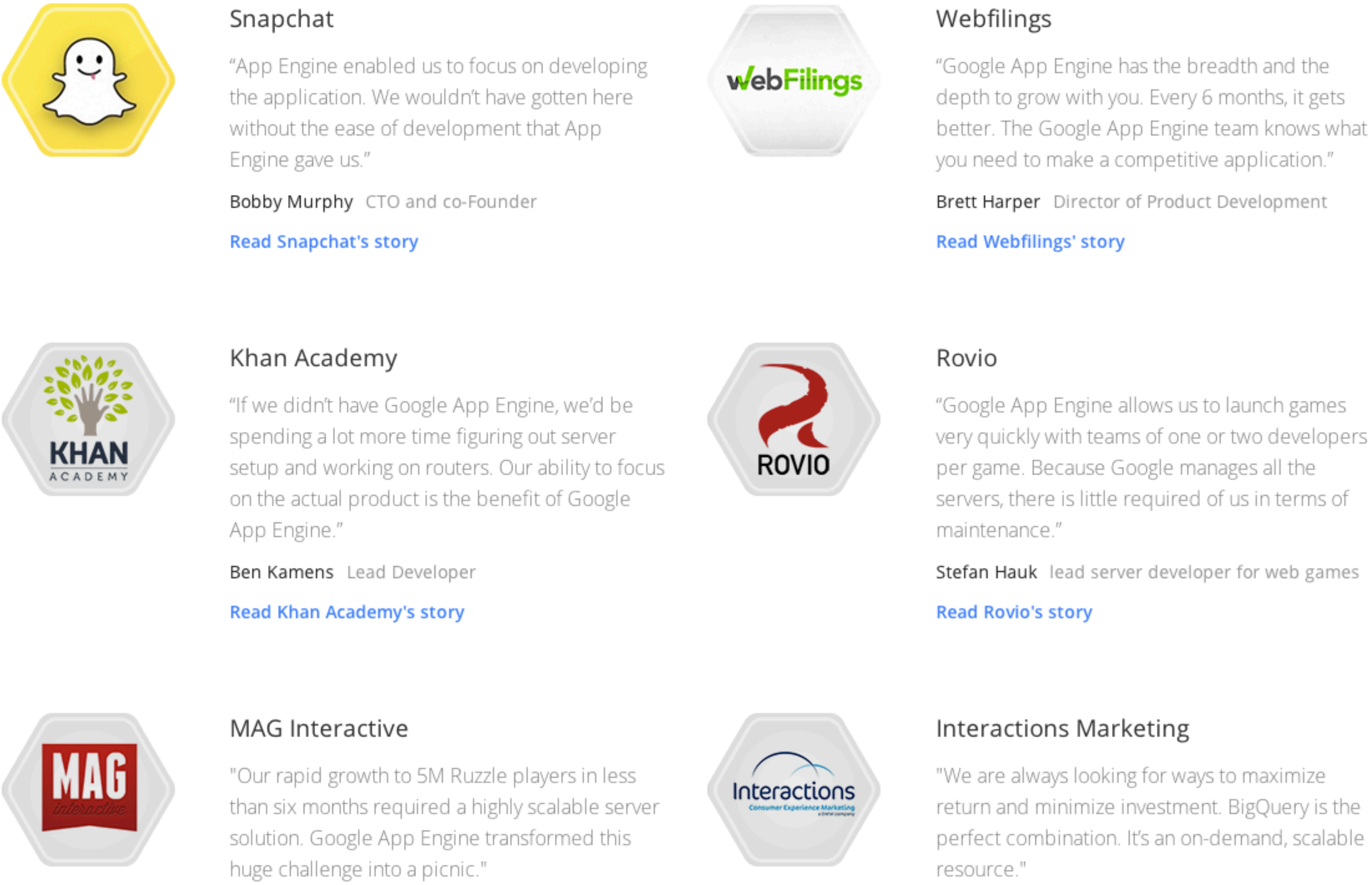
Get the support you need

With our worldwide community of users, partner ecosystem and premium support packages, Google provides a full range of resources to help you get started and grow.

Find out more

Source: https://cloud.google.com/

Customers of Google Cloud Platform



Snapchat

“App Engine enabled us to focus on developing the application. We wouldn’t have gotten here without the ease of development that App Engine gave us.”

Bobby Murphy CTO and co-Founder

Read Snapchat's story

Webfilings

“Google App Engine has the breadth and the depth to grow with you. Every 6 months, it gets better. The Google App Engine team knows what you need to make a competitive application.”

Brett Harper Director of Product Development

Read Webfilings' story

Khan Academy

“If we didn’t have Google App Engine, we’d be spending a lot more time figuring out server setup and working on routers. Our ability to focus on the actual product is the benefit of Google App Engine.”

Ben Kamens Lead Developer

Read Khan Academy's story

Rovio

“Google App Engine allows us to launch games very quickly with teams of one or two developers per game. Because Google manages all the servers, there is little required of us in terms of maintenance.”

Stefan Hauk lead server developer for web games

Read Rovio's story

MAG Interactive

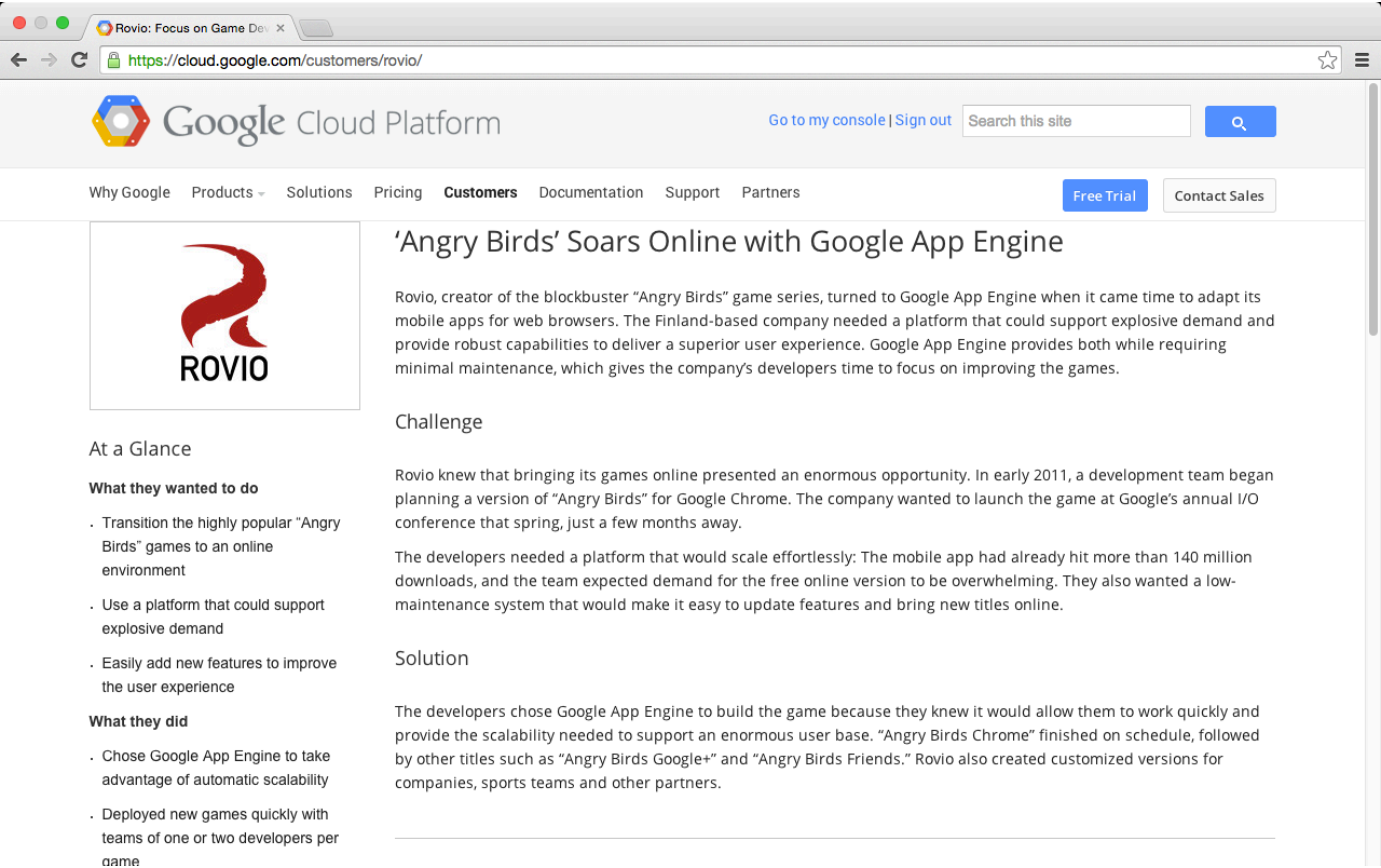
"Our rapid growth to 5M Ruzzle players in less than six months required a highly scalable server solution. Google App Engine transformed this huge challenge into a picnic."

Interactions Marketing

"We are always looking for ways to maximize return and minimize investment. BigQuery is the perfect combination. It’s an on-demand, scalable resource."

Source: https://cloud.google.com/customers/

Angry Birds



'Angry Birds' Soars Online with Google App Engine

Rovio, creator of the blockbuster "Angry Birds" game series, turned to Google App Engine when it came time to adapt its mobile apps for web browsers. The Finland-based company needed a platform that could support explosive demand and provide robust capabilities to deliver a superior user experience. Google App Engine provides both while requiring minimal maintenance, which gives the company's developers time to focus on improving the games.

Challenge

Rovio knew that bringing its games online presented an enormous opportunity. In early 2011, a development team began planning a version of "Angry Birds" for Google Chrome. The company wanted to launch the game at Google's annual I/O conference that spring, just a few months away.

The developers needed a platform that would scale effortlessly: The mobile app had already hit more than 140 million downloads, and the team expected demand for the free online version to be overwhelming. They also wanted a low-maintenance system that would make it easy to update features and bring new titles online.

Solution

The developers chose Google App Engine to build the game because they knew it would allow them to work quickly and provide the scalability needed to support an enormous user base. "Angry Birds Chrome" finished on schedule, followed by other titles such as "Angry Birds Google+" and "Angry Birds Friends." Rovio also created customized versions for companies, sports teams and other partners.

At a Glance

What they wanted to do

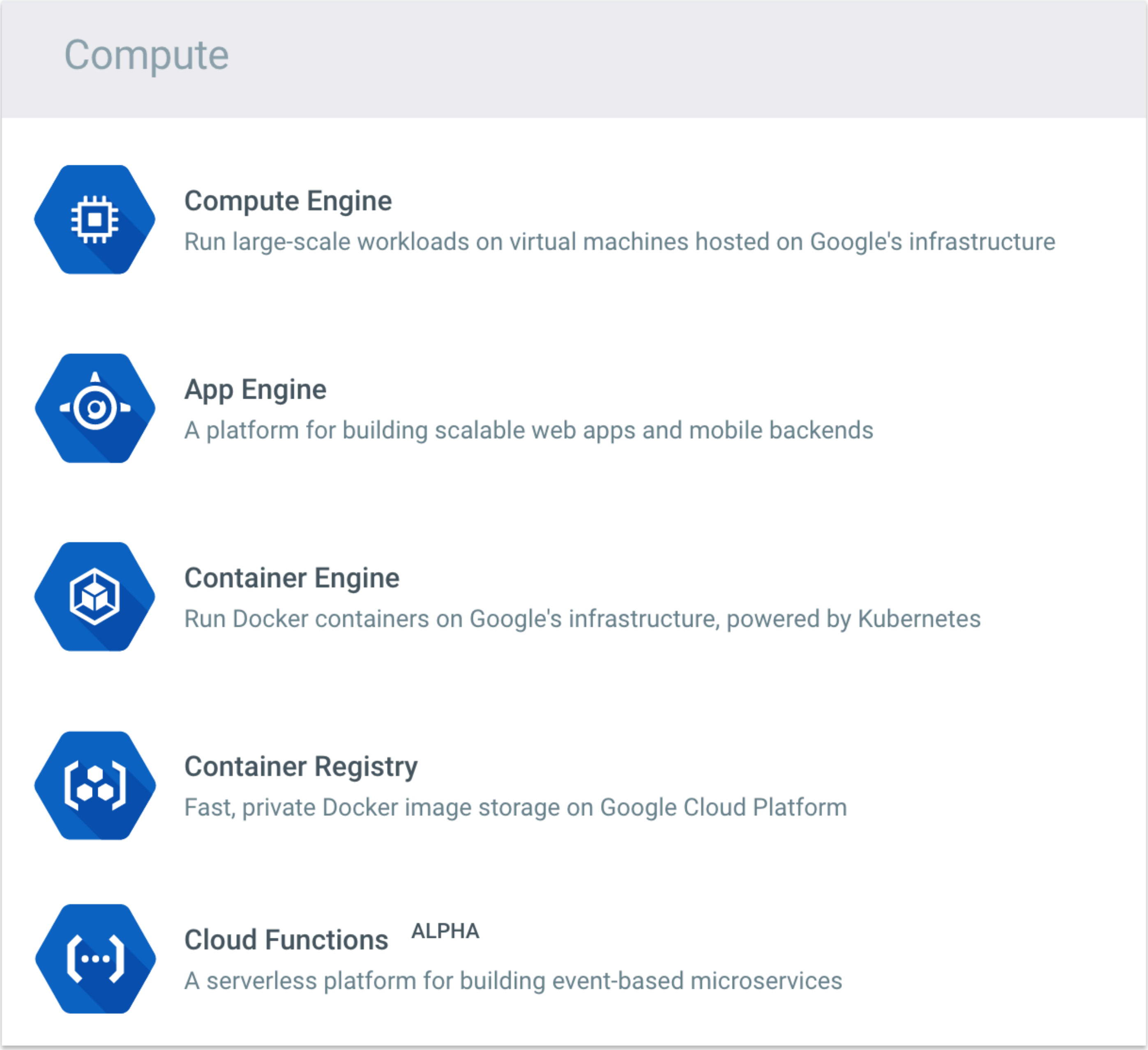
- Transition the highly popular "Angry Birds" games to an online environment
- Use a platform that could support explosive demand
- Easily add new features to improve the user experience

What they did

- Chose Google App Engine to take advantage of automatic scalability
- Deployed new games quickly with teams of one or two developers per game

Source: https://cloud.google.com/customers/

Google Cloud Platform



Compute

Compute Engine
Run large-scale workloads on virtual machines hosted on Google's infrastructure

App Engine
A platform for building scalable web apps and mobile backends

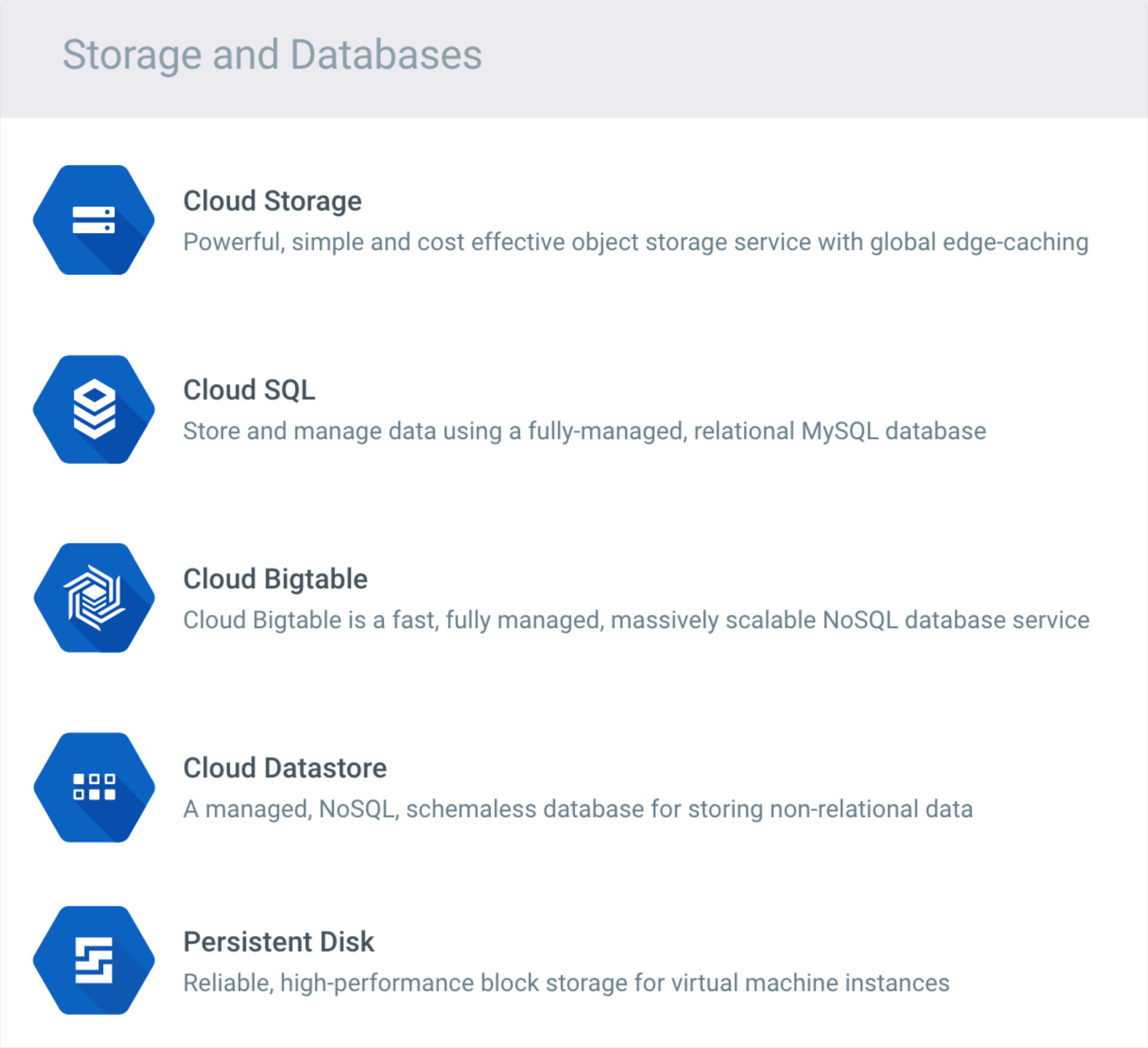
Container Engine
Run Docker containers on Google's infrastructure, powered by Kubernetes

Container Registry
Fast, private Docker image storage on Google Cloud Platform

Cloud Functions ALPHA
A serverless platform for building event-based microservices

Source: https://cloud.google.com/products/

Google Cloud Platform



Storage and Databases

Cloud Storage
Powerful, simple and cost effective object storage service with global edge-caching

Cloud SQL
Store and manage data using a fully-managed, relational MySQL database

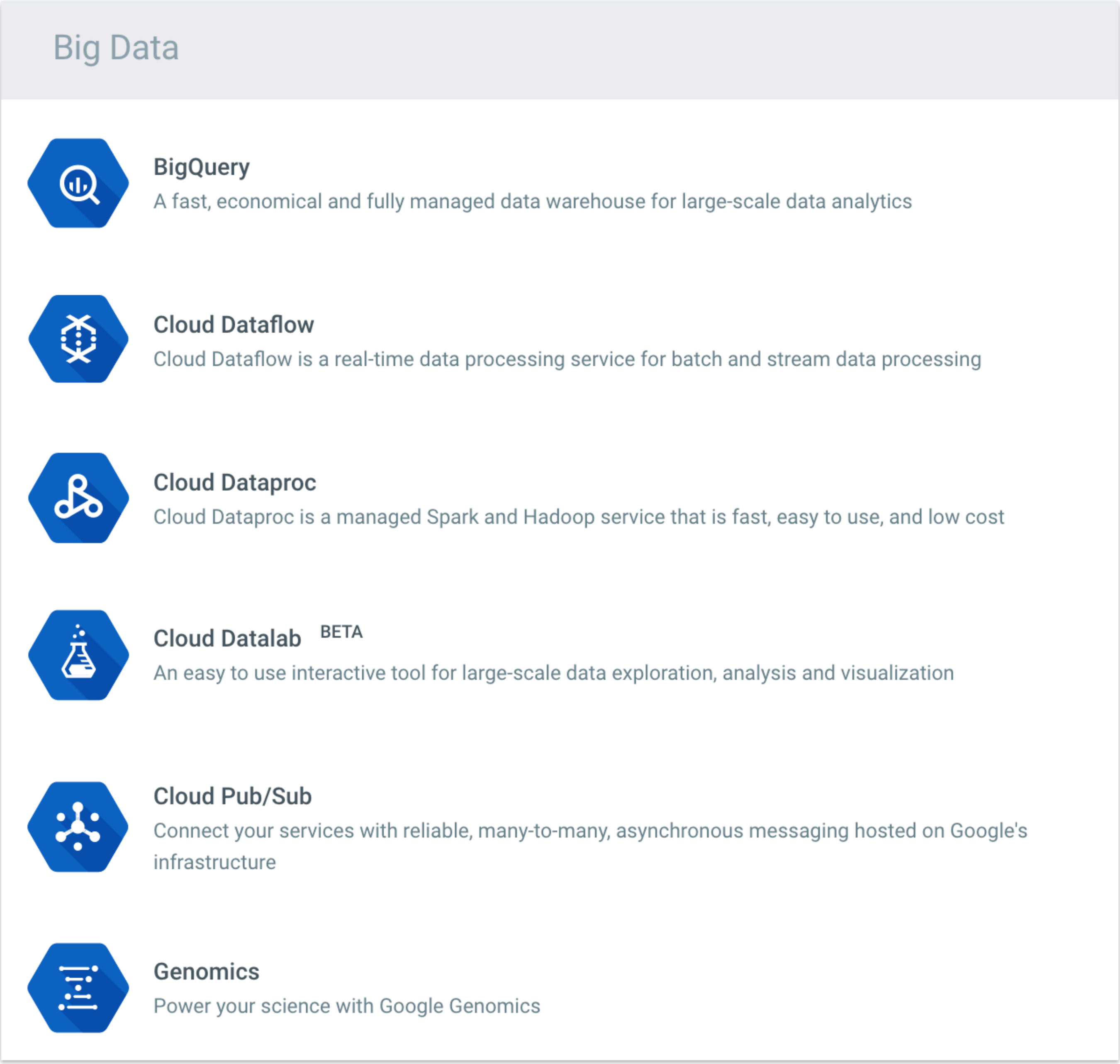
Cloud Bigtable
Cloud Bigtable is a fast, fully managed, massively scalable NoSQL database service

Cloud Datastore
A managed, NoSQL, schemaless database for storing non-relational data

Persistent Disk
Reliable, high-performance block storage for virtual machine instances

Source: https://cloud.google.com/products/

Google Cloud Platform



Big Data

BigQuery
A fast, economical and fully managed data warehouse for large-scale data analytics

Cloud Dataflow
Cloud Dataflow is a real-time data processing service for batch and stream data processing

Cloud Dataproc
Cloud Dataproc is a managed Spark and Hadoop service that is fast, easy to use, and low cost

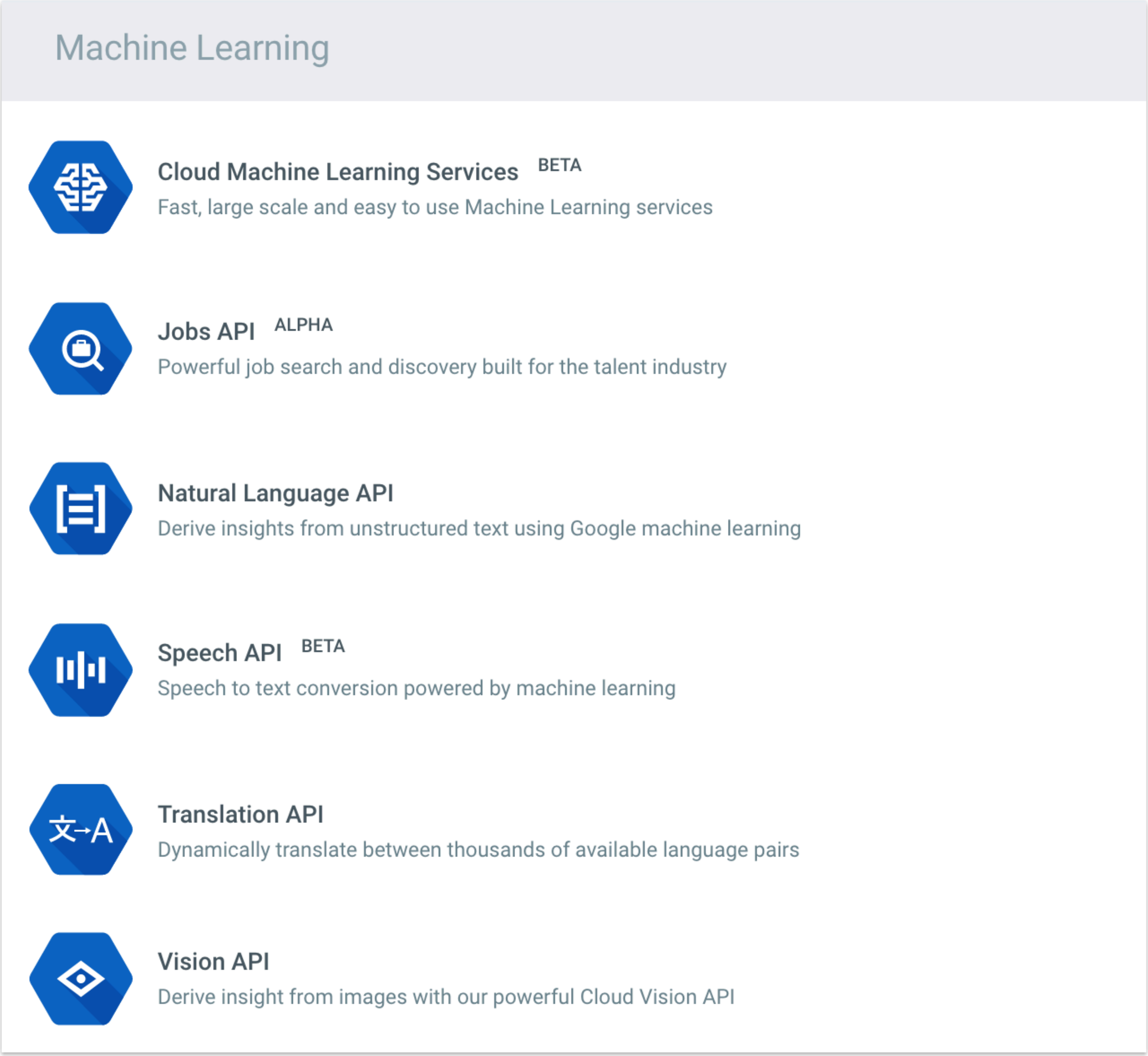
Cloud Datalab BETA
An easy to use interactive tool for large-scale data exploration, analysis and visualization

Cloud Pub/Sub
Connect your services with reliable, many-to-many, asynchronous messaging hosted on Google's infrastructure

Genomics
Power your science with Google Genomics

Source: https://cloud.google.com/products/

Google Cloud Platform



Machine Learning

Cloud Machine Learning Services BETA
Fast, large scale and easy to use Machine Learning services

Jobs API ALPHA
Powerful job search and discovery built for the talent industry

Natural Language API
Derive insights from unstructured text using Google machine learning

Speech API BETA
Speech to text conversion powered by machine learning

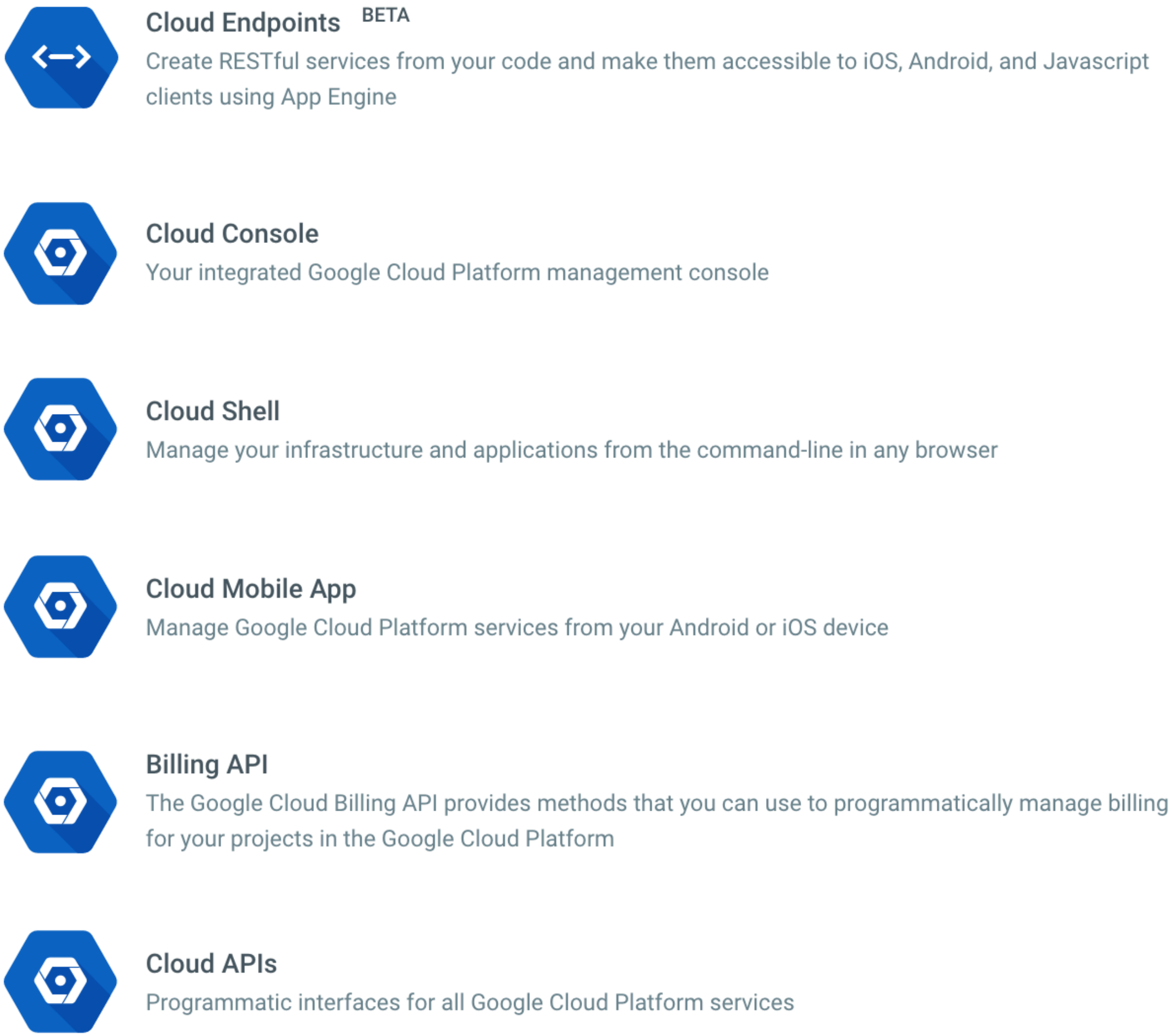
Translation API
Dynamically translate between thousands of available language pairs

Vision API
Derive insight from images with our powerful Cloud Vision API

Source: https://cloud.google.com/products/

Google Cloud Platform

Management Tools



Cloud Endpoints BETA

Create RESTful services from your code and make them accessible to iOS, Android, and Javascript clients using App Engine

Cloud Console

Your integrated Google Cloud Platform management console

Cloud Shell

Manage your infrastructure and applications from the command-line in any browser

Cloud Mobile App

Manage Google Cloud Platform services from your Android or iOS device

Billing API

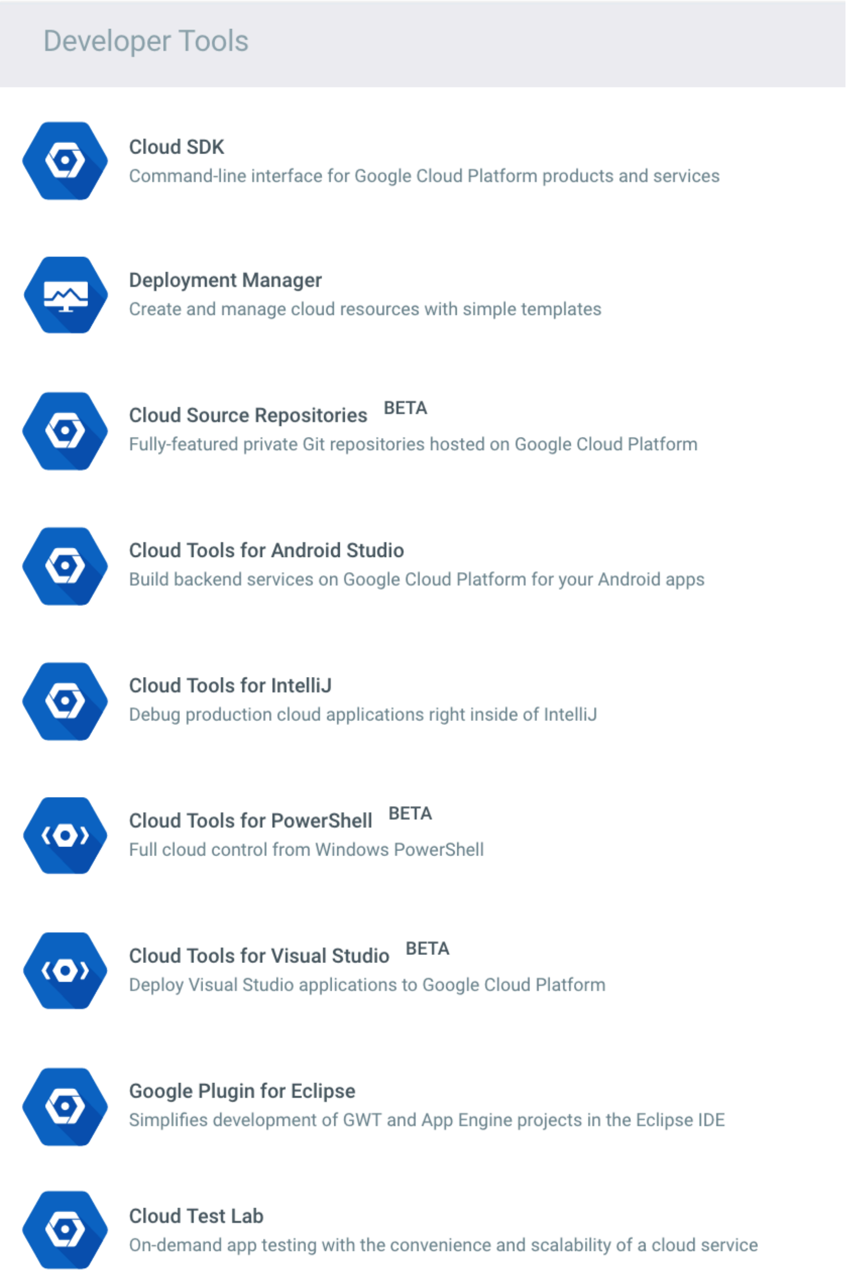
The Google Cloud Billing API provides methods that you can use to programmatically manage billing for your projects in the Google Cloud Platform

Cloud APIs

Programmatic interfaces for all Google Cloud Platform services

Source: https://cloud.google.com/products/

Google Cloud Platform



Developer Tools

Cloud SDK
Command-line interface for Google Cloud Platform products and services

Deployment Manager
Create and manage cloud resources with simple templates

Cloud Source Repositories BETA
Fully-featured private Git repositories hosted on Google Cloud Platform

Cloud Tools for Android Studio
Build backend services on Google Cloud Platform for your Android apps

Cloud Tools for IntelliJ
Debug production cloud applications right inside of IntelliJ

Cloud Tools for PowerShell BETA
Full cloud control from Windows PowerShell

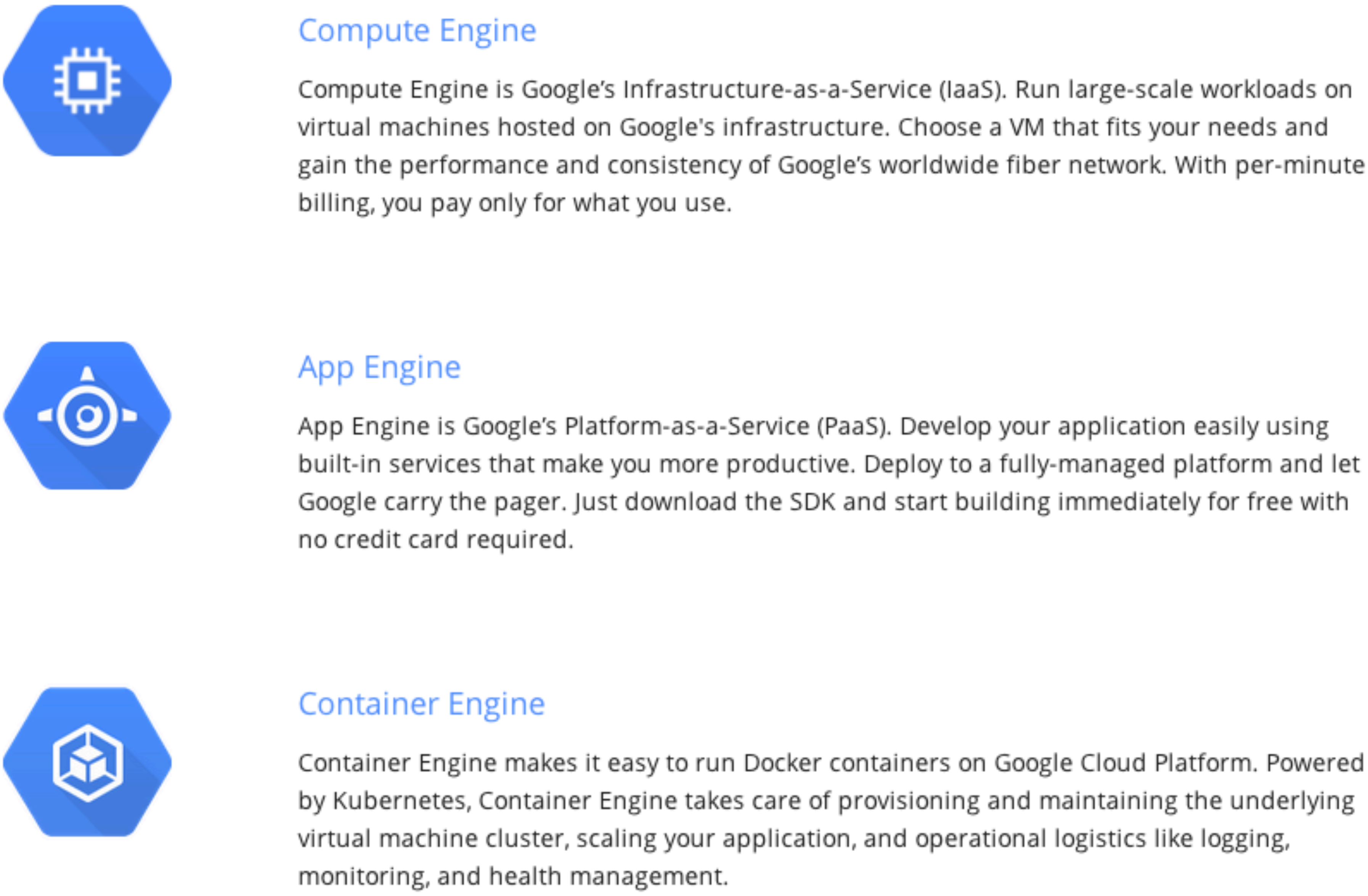
Cloud Tools for Visual Studio BETA
Deploy Visual Studio applications to Google Cloud Platform

Google Plugin for Eclipse
Simplifies development of GWT and App Engine projects in the Eclipse IDE

Cloud Test Lab
On-demand app testing with the convenience and scalability of a cloud service

Source: https://cloud.google.com/products/

Compute



Compute Engine

Compute Engine is Google's Infrastructure-as-a-Service (IaaS). Run large-scale workloads on virtual machines hosted on Google's infrastructure. Choose a VM that fits your needs and gain the performance and consistency of Google's worldwide fiber network. With per-minute billing, you pay only for what you use.

App Engine

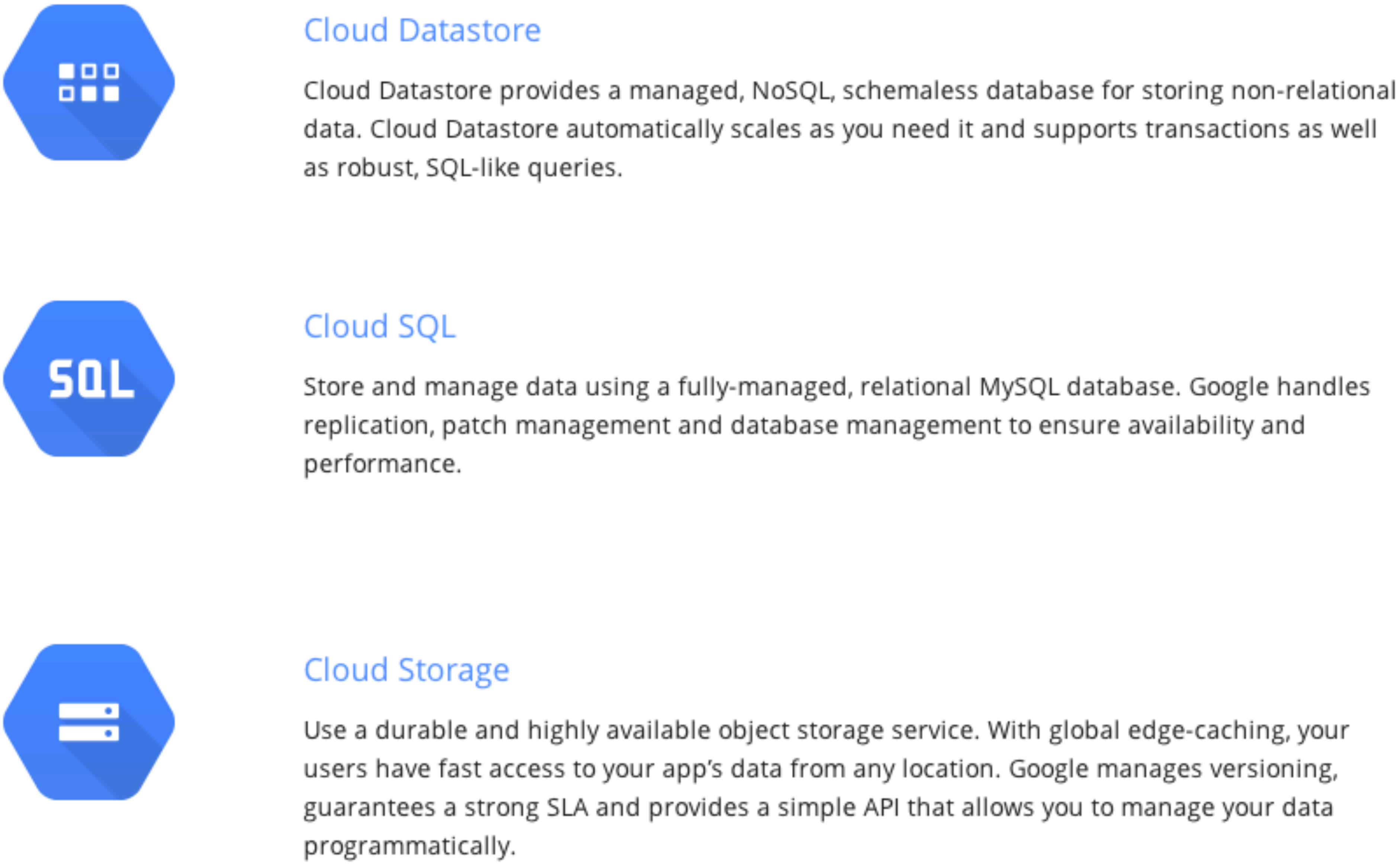
App Engine is Google's Platform-as-a-Service (PaaS). Develop your application easily using built-in services that make you more productive. Deploy to a fully-managed platform and let Google carry the pager. Just download the SDK and start building immediately for free with no credit card required.

Container Engine

Container Engine makes it easy to run Docker containers on Google Cloud Platform. Powered by Kubernetes, Container Engine takes care of provisioning and maintaining the underlying virtual machine cluster, scaling your application, and operational logistics like logging, monitoring, and health management.

Source: https://cloud.google.com/products/

Storage



Cloud Datastore

Cloud Datastore provides a managed, NoSQL, schemaless database for storing non-relational data. Cloud Datastore automatically scales as you need it and supports transactions as well as robust, SQL-like queries.

Cloud SQL

Store and manage data using a fully-managed, relational MySQL database. Google handles replication, patch management and database management to ensure availability and performance.

Cloud Storage

Use a durable and highly available object storage service. With global edge-caching, your users have fast access to your app's data from any location. Google manages versioning, guarantees a strong SLA and provides a simple API that allows you to manage your data programmatically.

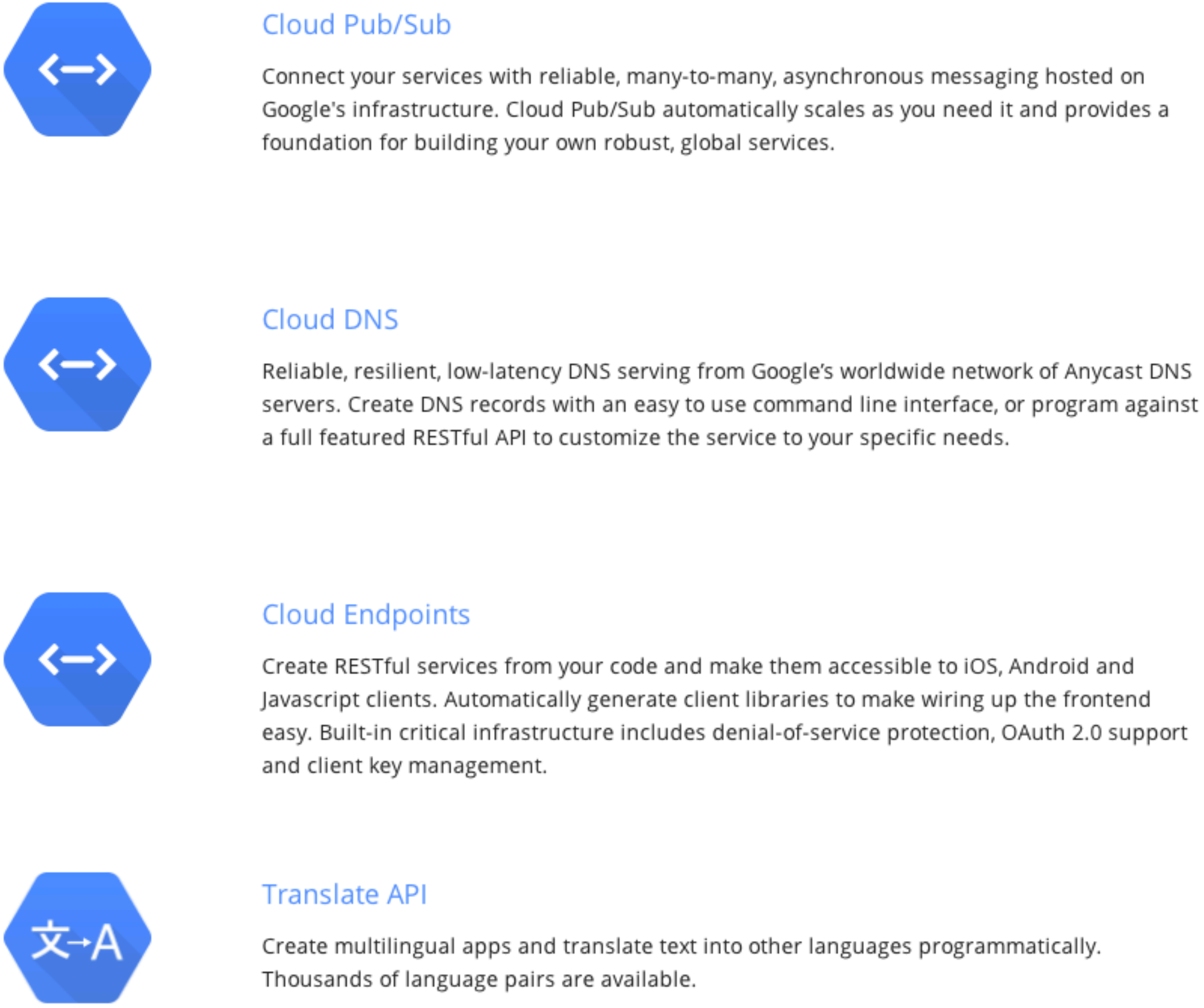
Source: https://cloud.google.com/products/

BigQuery

- Analyze Big Data in the cloud with BigQuery.
- Run fast, SQL-like queries against multi-terabyte datasets in seconds.
- Scalable and easy to use, BigQuery gives you real-time insights about your data

Source: https://cloud.google.com/products/

Services



Cloud Pub/Sub

Connect your services with reliable, many-to-many, asynchronous messaging hosted on Google's infrastructure. Cloud Pub/Sub automatically scales as you need it and provides a foundation for building your own robust, global services.

Cloud DNS

Reliable, resilient, low-latency DNS serving from Google's worldwide network of Anycast DNS servers. Create DNS records with an easy to use command line interface, or program against a full featured RESTful API to customize the service to your specific needs.

Cloud Endpoints

Create RESTful services from your code and make them accessible to iOS, Android and Javascript clients. Automatically generate client libraries to make wiring up the frontend easy. Built-in critical infrastructure includes denial-of-service protection, OAuth 2.0 support and client key management.

Translate API

Create multilingual apps and translate text into other languages programmatically. Thousands of language pairs are available.

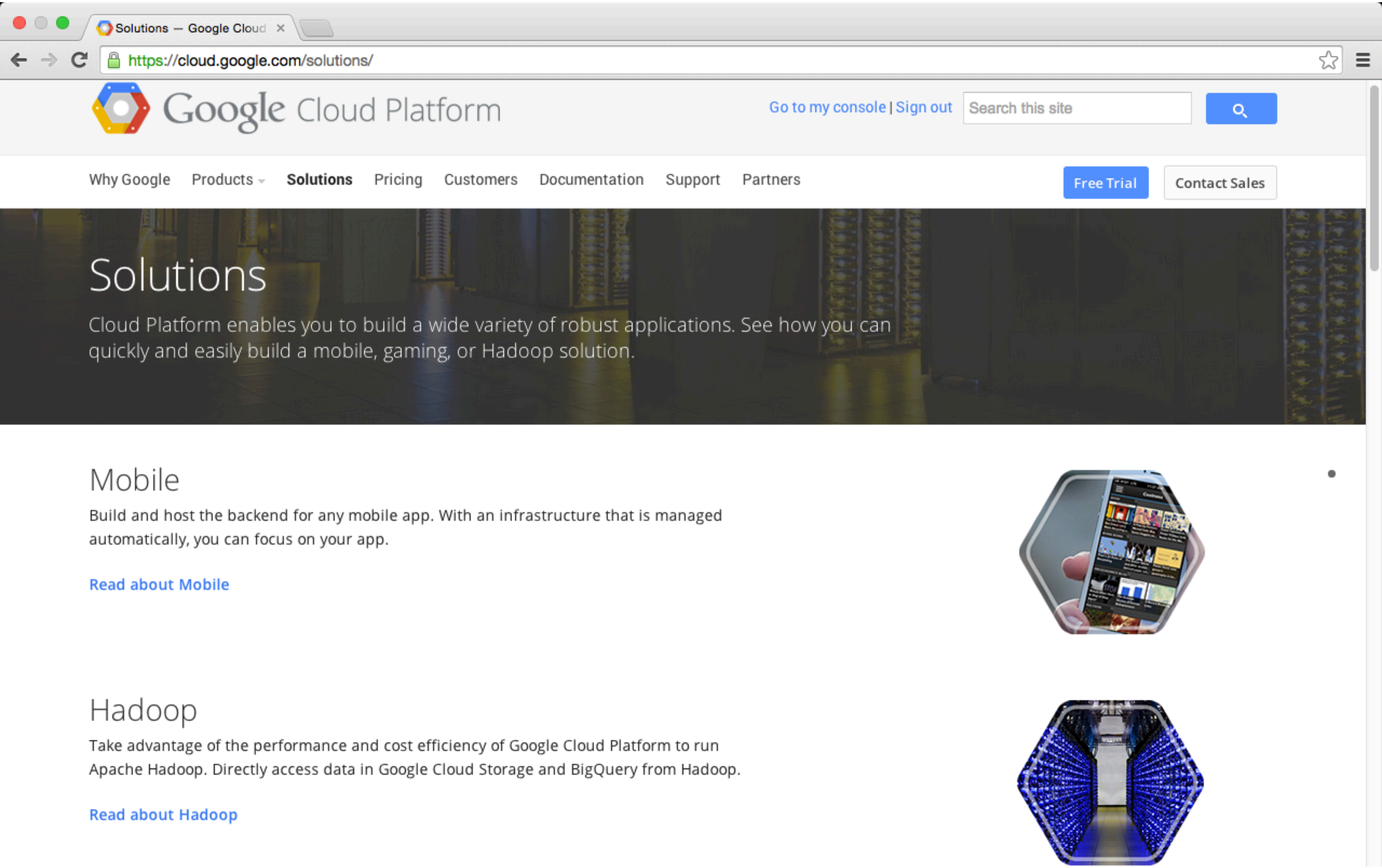
Source: https://cloud.google.com/products/

Prediction API

- Use Google’s machine learning algorithms to analyze data and predict future outcomes using a familiar RESTful interface.

Source: https://cloud.google.com/products/

Google Cloud Platform Solutions



Solutions

Cloud Platform enables you to build a wide variety of robust applications. See how you can quickly and easily build a mobile, gaming, or Hadoop solution.

Mobile

Build and host the backend for any mobile app. With an infrastructure that is managed automatically, you can focus on your app.

Read about Mobile

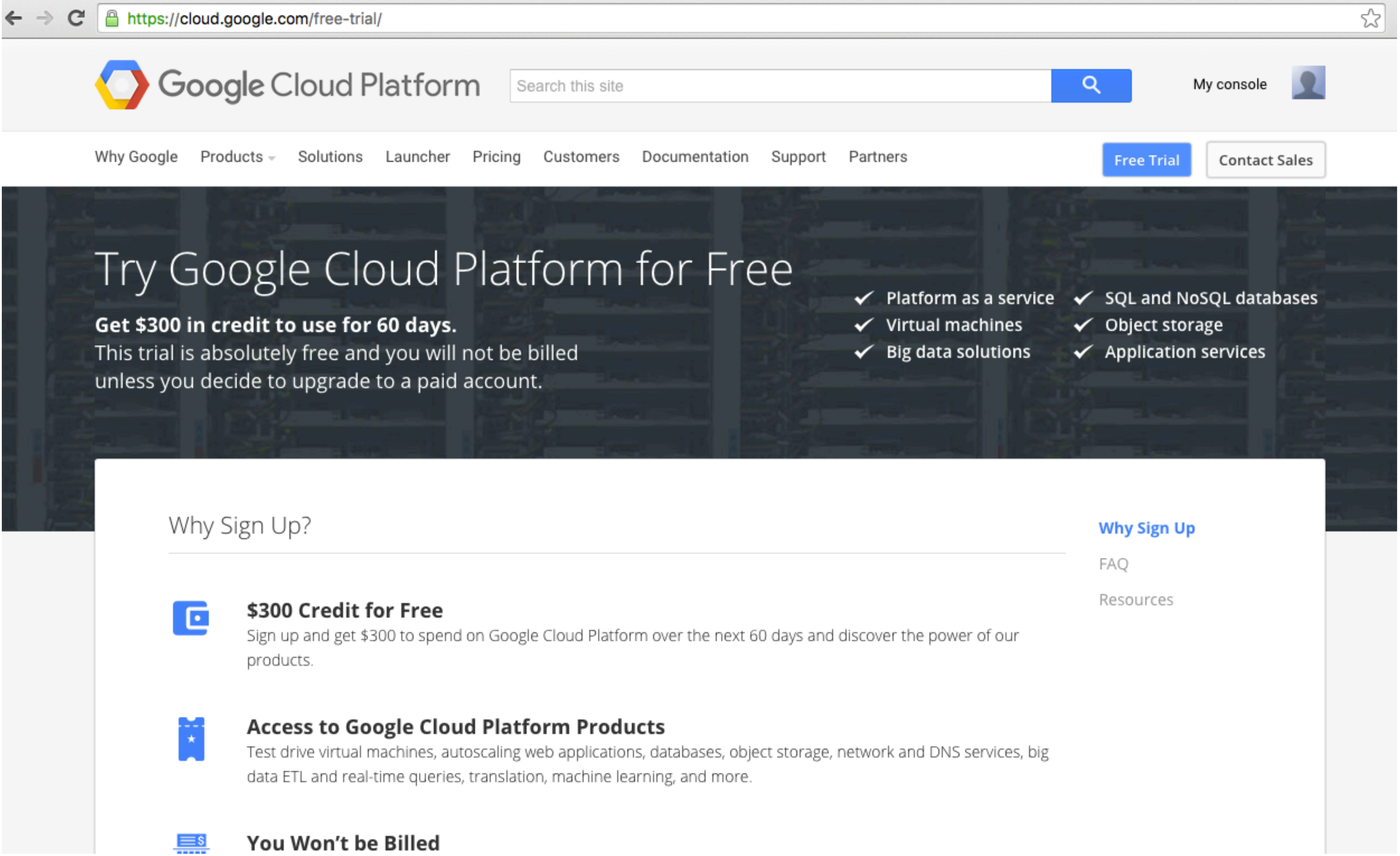
Hadoop

Take advantage of the performance and cost efficiency of Google Cloud Platform to run Apache Hadoop. Directly access data in Google Cloud Storage and BigQuery from Hadoop.

Read about Hadoop

Source: https://cloud.google.com/solutions/

Try Google Cloud Platform for Free



https://cloud.google.com/free-trial/

Try Google Cloud Platform for Free

Get $300 in credit to use for 60 days.
This trial is absolutely free and you will not be billed unless you decide to upgrade to a paid account.

- ✓ Platform as a service
- ✓ Virtual machines
- ✓ Big data solutions
- ✓ SQL and NoSQL databases
- ✓ Object storage
- ✓ Application services

Why Sign Up?

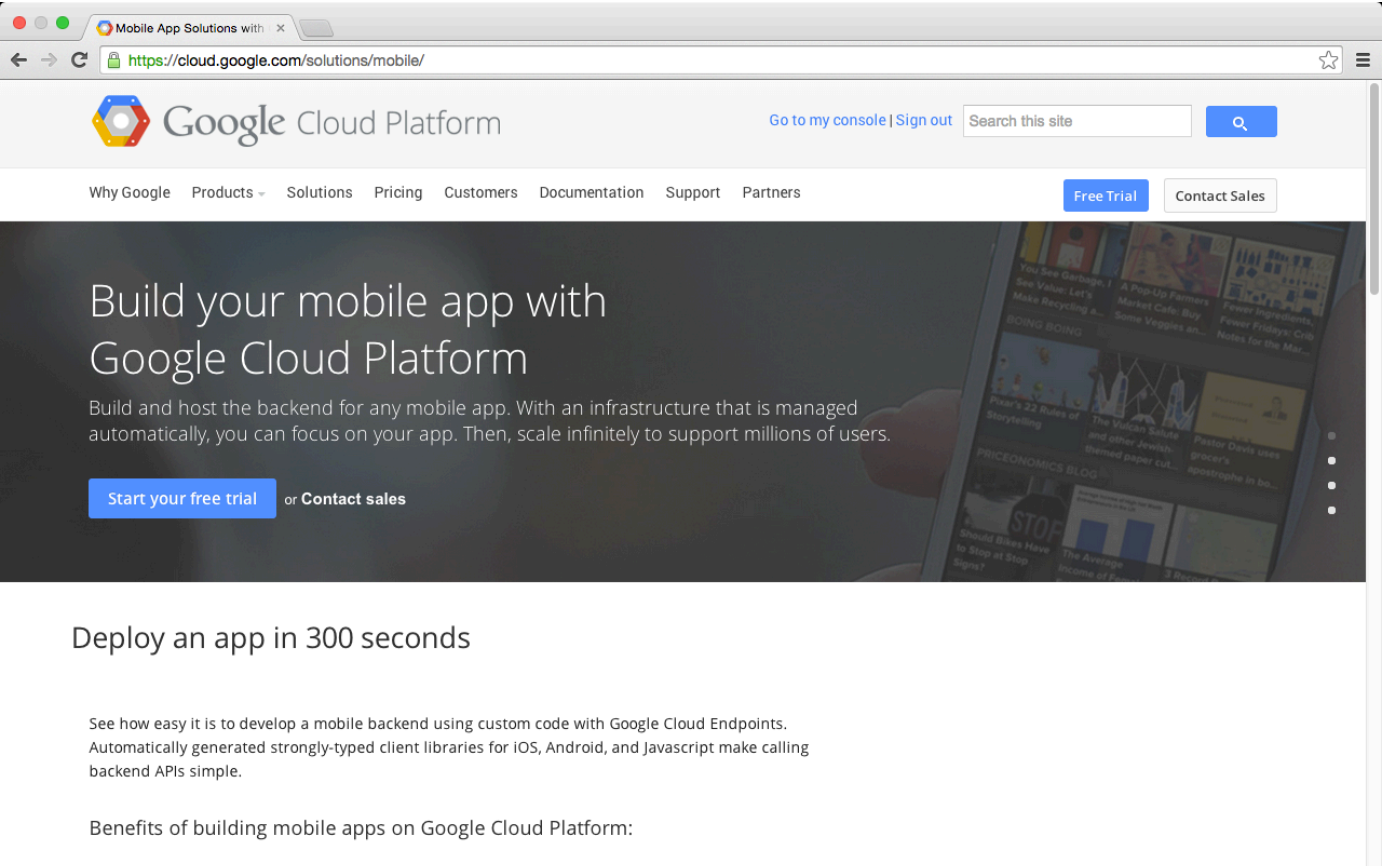
$300 Credit for Free
Sign up and get $300 to spend on Google Cloud Platform over the next 60 days and discover the power of our products.

Access to Google Cloud Platform Products
Test drive virtual machines, autoscaling web applications, databases, object storage, network and DNS services, big data ETL and real-time queries, translation, machine learning, and more.

You Won't be Billed

Source: https://cloud.google.com/free-trial/

Mobile App with Google Cloud Platform



Build your mobile app with Google Cloud Platform

Build and host the backend for any mobile app. With an infrastructure that is managed automatically, you can focus on your app. Then, scale infinitely to support millions of users.

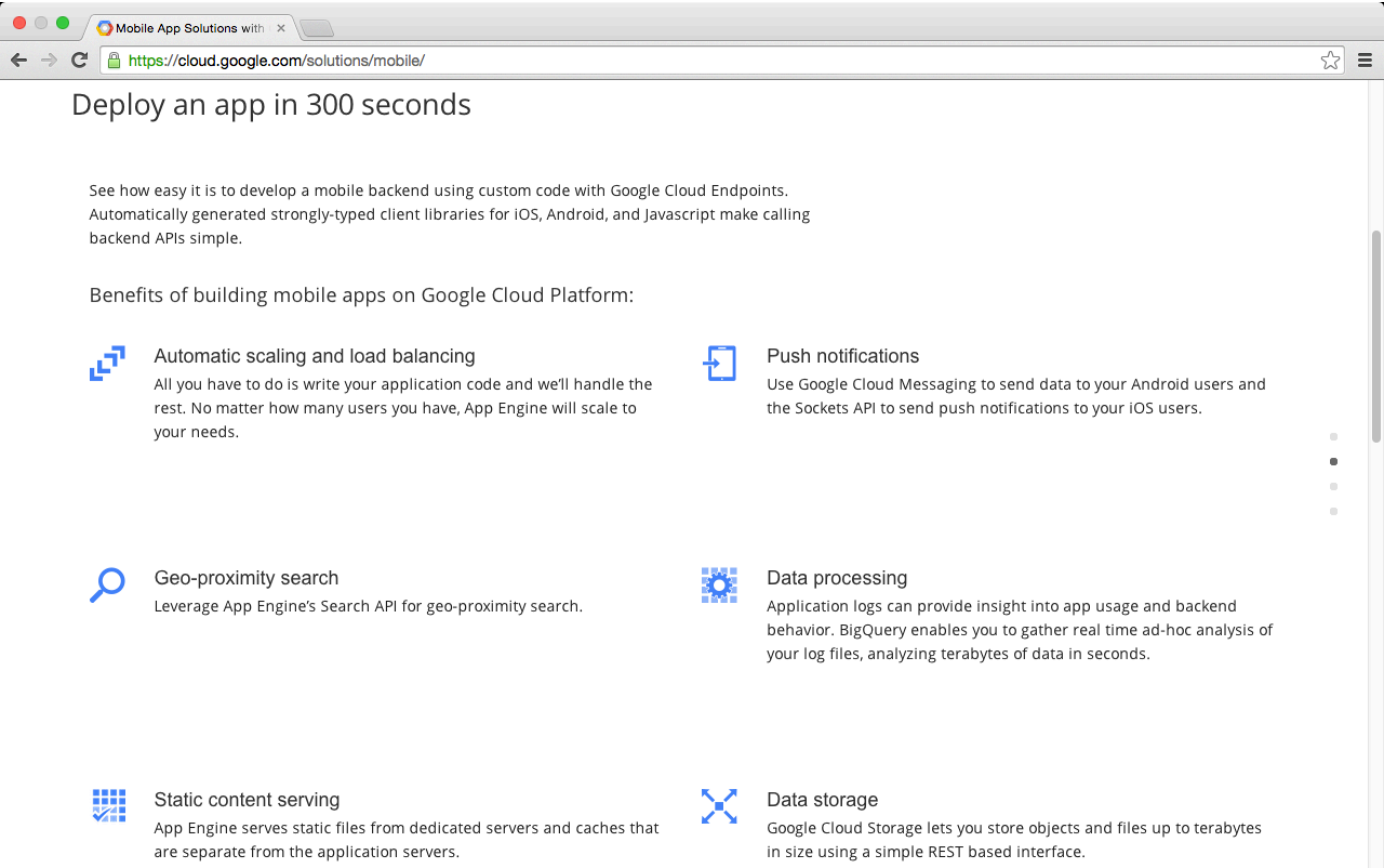
Deploy an app in 300 seconds

See how easy it is to develop a mobile backend using custom code with Google Cloud Endpoints. Automatically generated strongly-typed client libraries for iOS, Android, and Javascript make calling backend APIs simple.

Benefits of building mobile apps on Google Cloud Platform:

Source: https://cloud.google.com/solutions/mobile/

Mobile App with Google Cloud Platform



Mobile App Solutions with
https://cloud.google.com/solutions/mobile/

Deploy an app in 300 seconds

See how easy it is to develop a mobile backend using custom code with Google Cloud Endpoints. Automatically generated strongly-typed client libraries for iOS, Android, and Javascript make calling backend APIs simple.

Benefits of building mobile apps on Google Cloud Platform:

Automatic scaling and load balancing

All you have to do is write your application code and we'll handle the rest. No matter how many users you have, App Engine will scale to your needs.

Push notifications

Use Google Cloud Messaging to send data to your Android users and the Sockets API to send push notifications to your iOS users.

Geo-proximity search

Leverage App Engine's Search API for geo-proximity search.

Data processing

Application logs can provide insight into app usage and backend behavior. BigQuery enables you to gather real time ad-hoc analysis of your log files, analyzing terabytes of data in seconds.

Static content serving

App Engine serves static files from dedicated servers and caches that are separate from the application servers.

Data storage

Google Cloud Storage lets you store objects and files up to terabytes in size using a simple REST based interface.

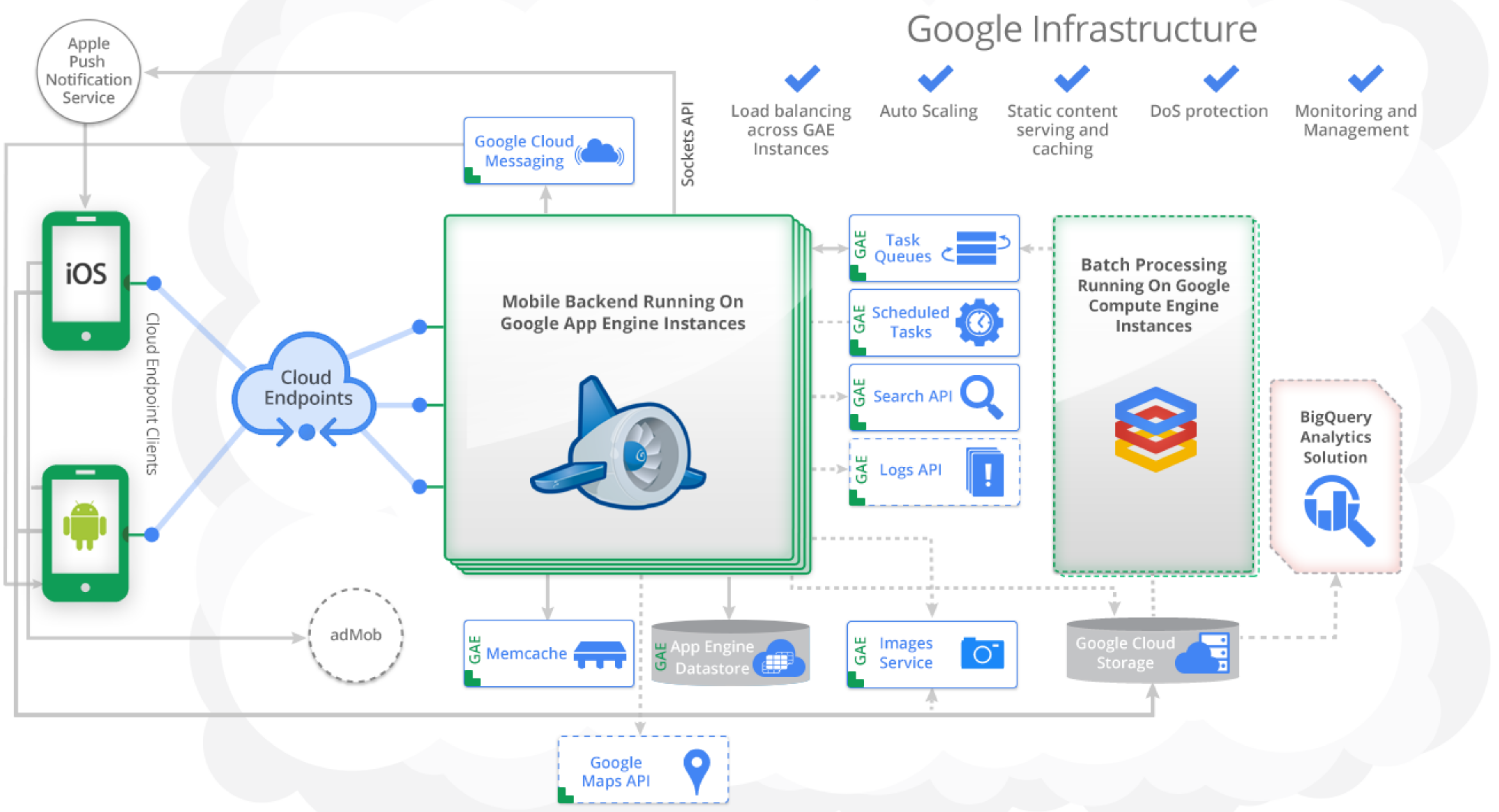
Source: https://cloud.google.com/solutions/mobile/

Mobile Solutions on the Google Cloud Platform

🟩 Your Application Code running on Google App Engine (GAE), Google Compute Engine (GCE), and Client Devices

▢ Google Cloud Platform Services ⬚ Optional components

✓ Capabilities Included



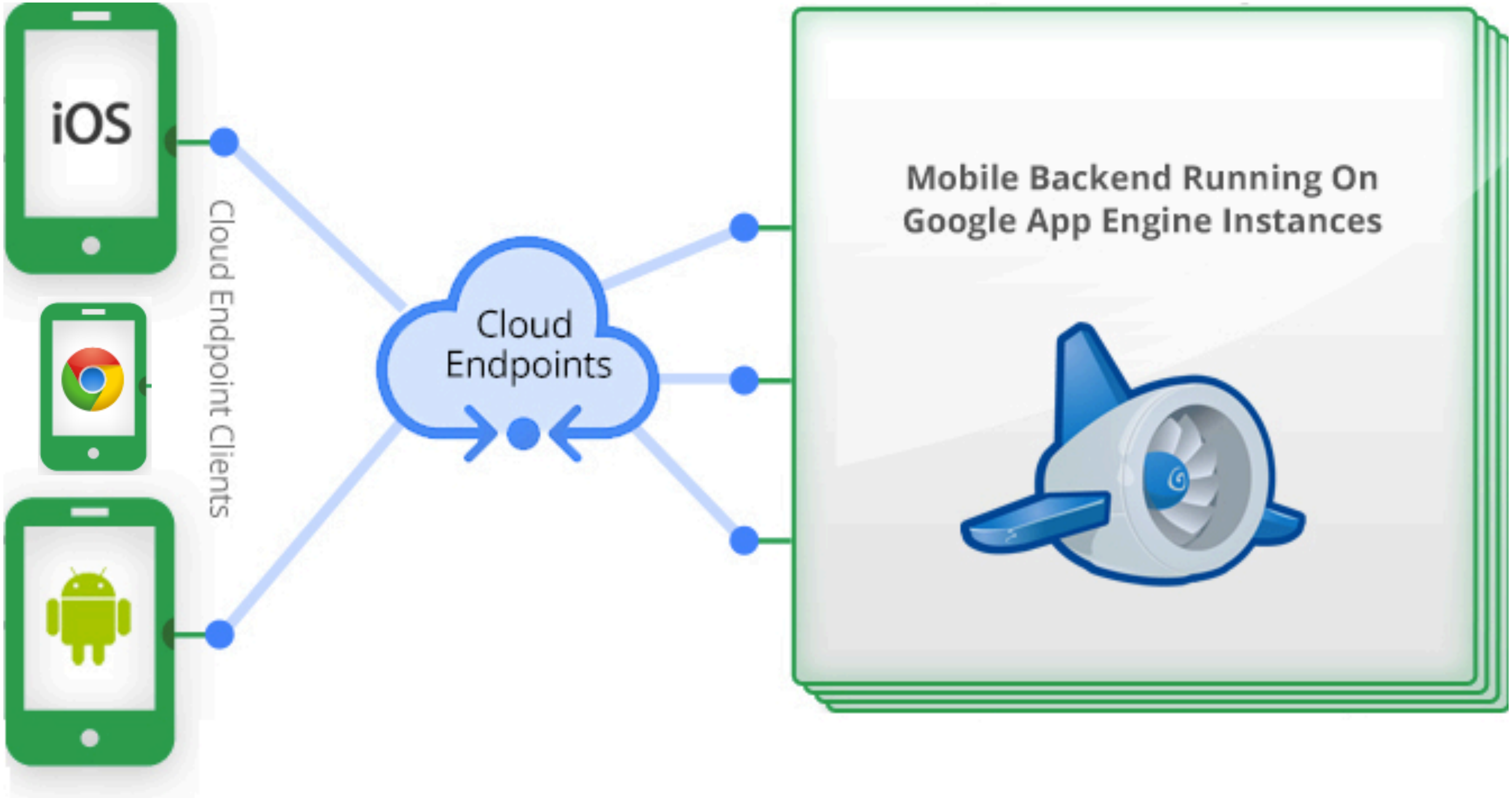
Source: https://cloud.google.com/developers/articles/mobile-application-solutions/

Mobile Solution on Google Cloud Platform

- Support for Android and iOS devices through native applications
- Storage, retrieval, and processing data outside of mobile devices
- Orchestrating push notification to Android and IOS devices
- Geo-location awareness and geo-proximity search
- User authentication
- High scalability

Source: https://cloud.google.com/developers/articles/mobile-application-solutions/

Mobile App Solutions Architecture



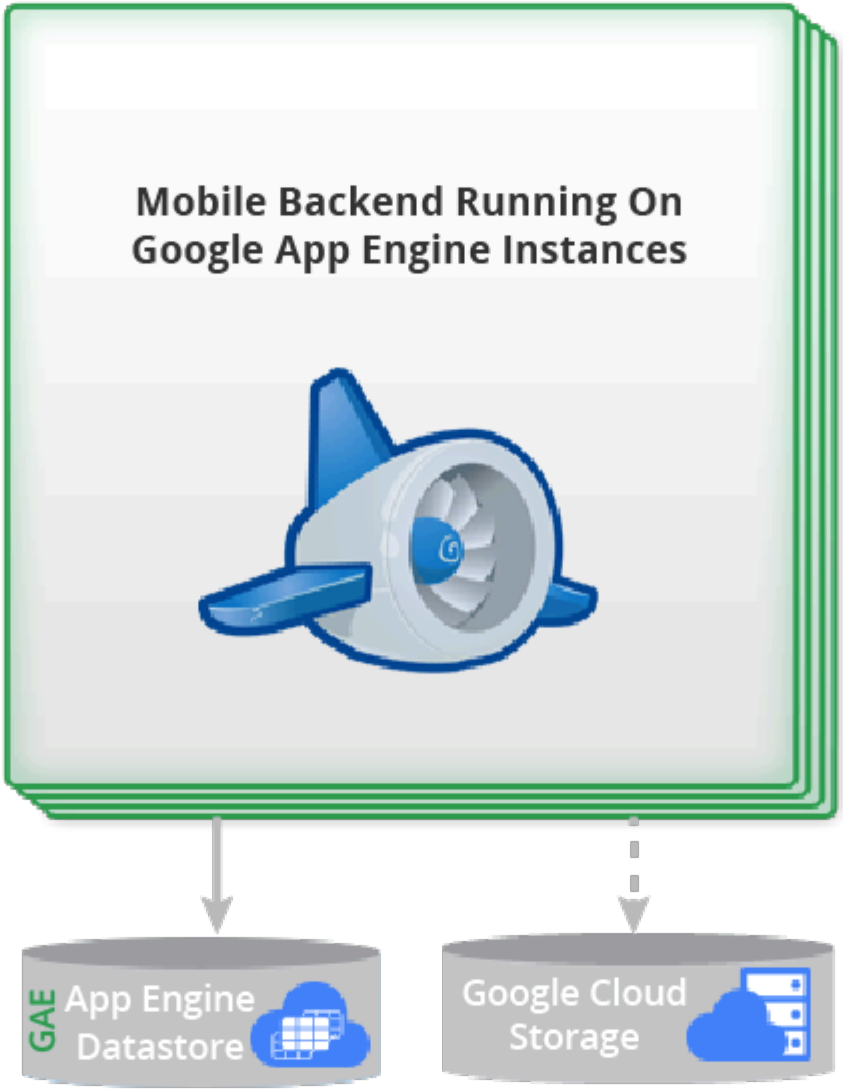
Source: https://cloud.google.com/developers/articles/mobile-application-solutions/

Mobile App Solutions Architecture

- Android and/or iOS mobile clients.
- Google Cloud Endpoints used for communications between the clients and the backend over REST API with optional OAuth2 authentication.
- Your mobile backend application code running on Google App Engine and responsible for serving requests from the clients.

Source: https://cloud.google.com/developers/articles/mobile-application-solutions/

Storing data

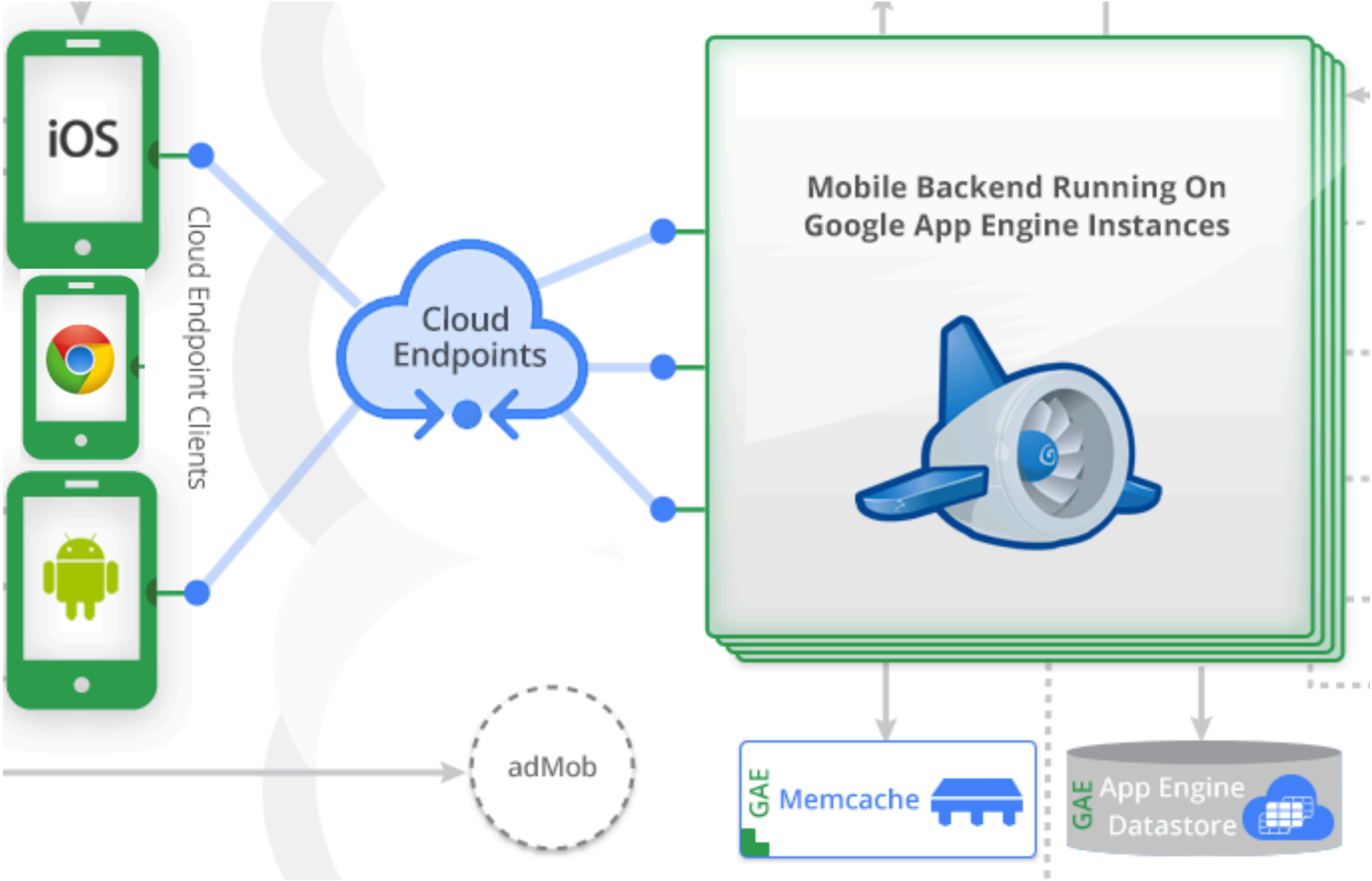


Google App Engine
Datastore Quotas and limits

Limit	Amount
Maximum entity size	1 megabyte
Maximum transaction size	10 megabytes
Maximum number of index entries for an entity	20000
Maximum number of bytes in composite indexes for an entity	2 megabytes

Source: https://cloud.google.com/appengine/docs/java/datastore/

Optimizing data access with Memcache



Source: https://cloud.google.com/developers/articles/mobile-application-solutions/

Google App Engine

Platform as a Service (PaaS)

build and run applications on Google's infrastructure

Source: https://cloud.google.com/appengine/docs

Google App Engine

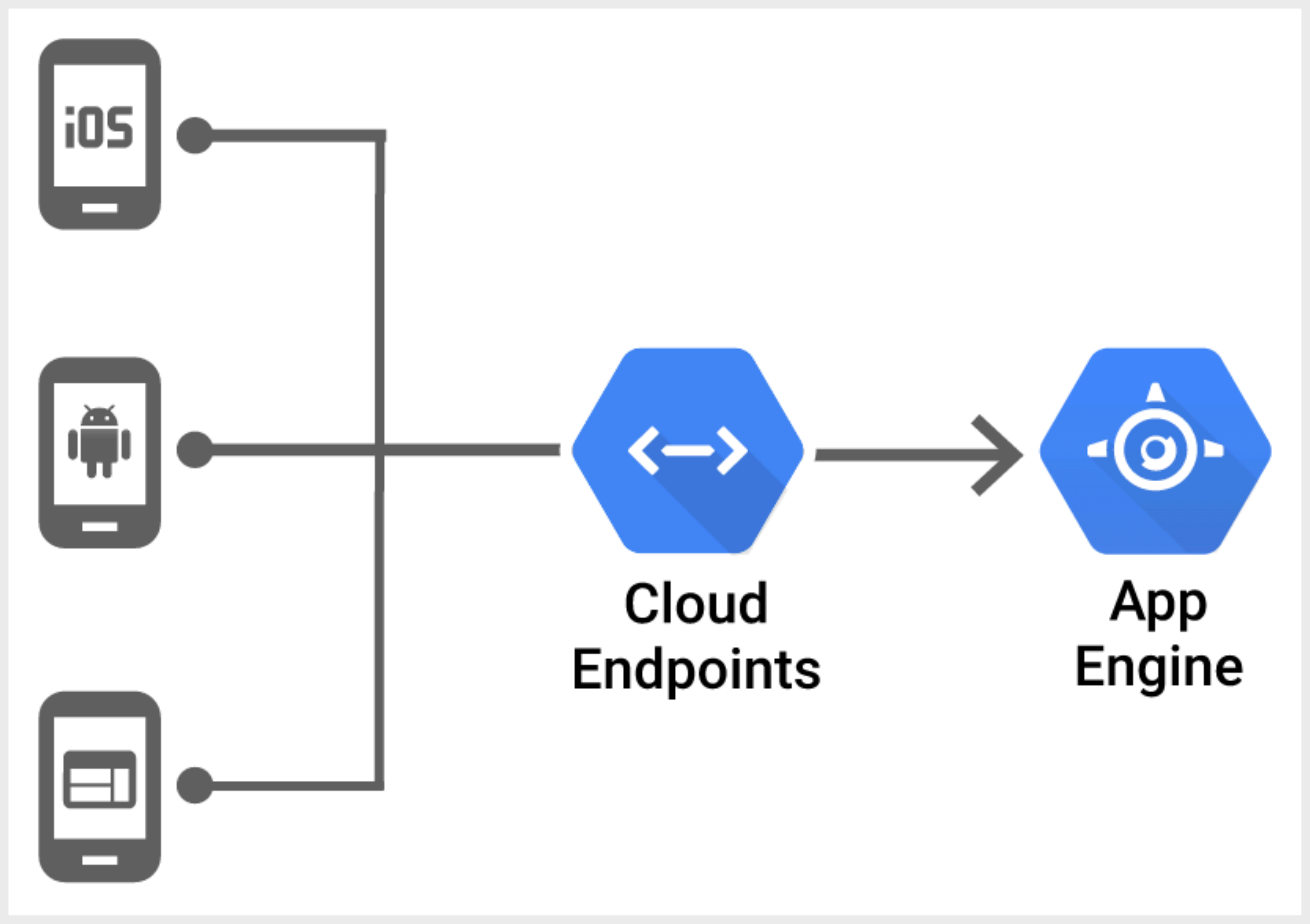
Platform as a Service (PaaS)

Google Compute Engine

Infrastructure as a Service (IaaS)

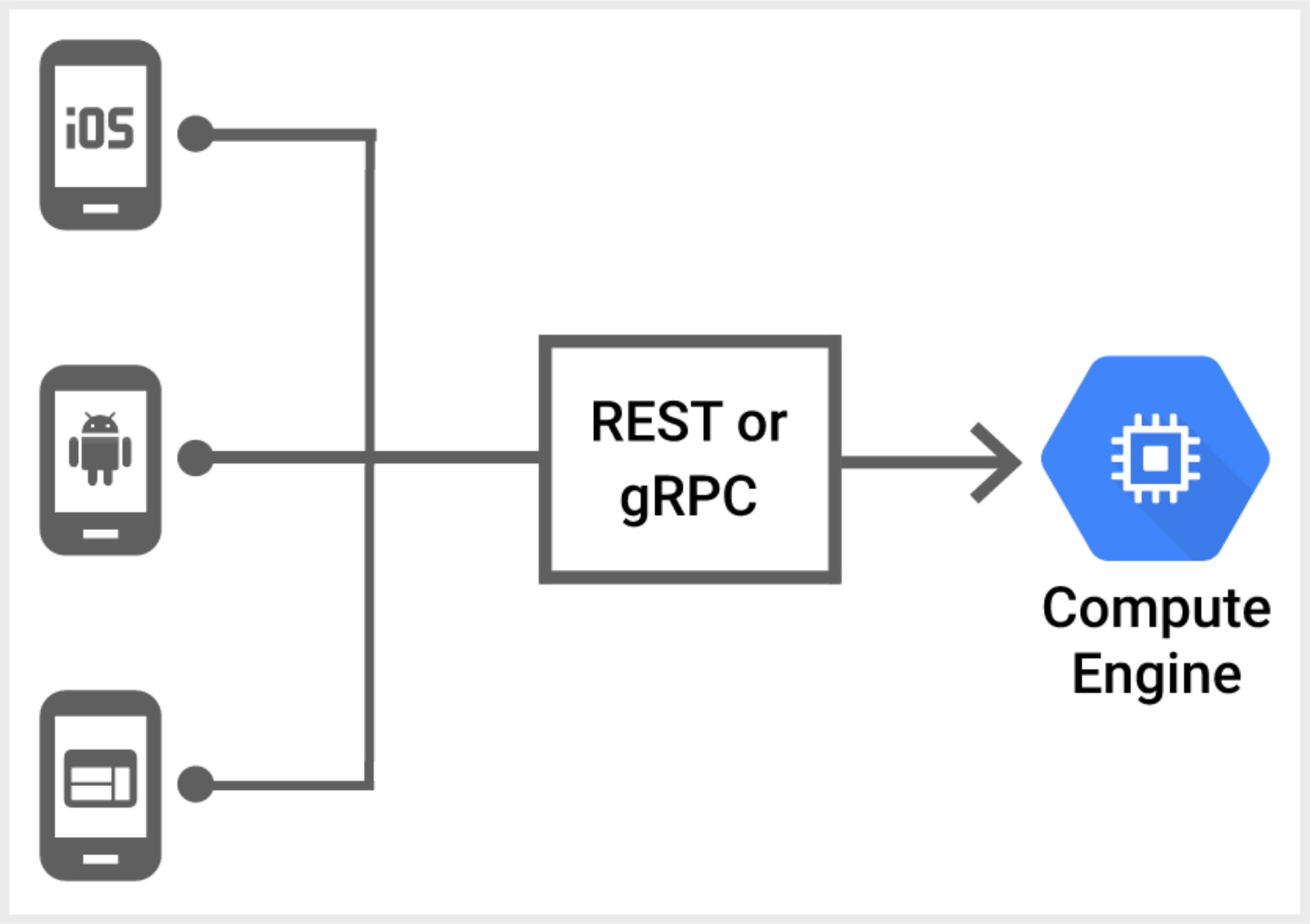
Source: https://cloud.google.com/appengine/docs

Mobile App Backend Services



Source: https://cloud.google.com/solutions/mobile/mobile-app-backend-services

Mobile App Backend Services



Source: https://cloud.google.com/solutions/mobile/mobile-app-backend-services

Google App Engine

- 1 GB of data storage and traffic for free

- can be increased by enabling paid applications

Source: https://cloud.google.com/appengine/docs/whatisgoogleappengine

Google App Engine

Google App Engine supports apps written in a variety of programming languages: Python, Java, PHP, Go

Python

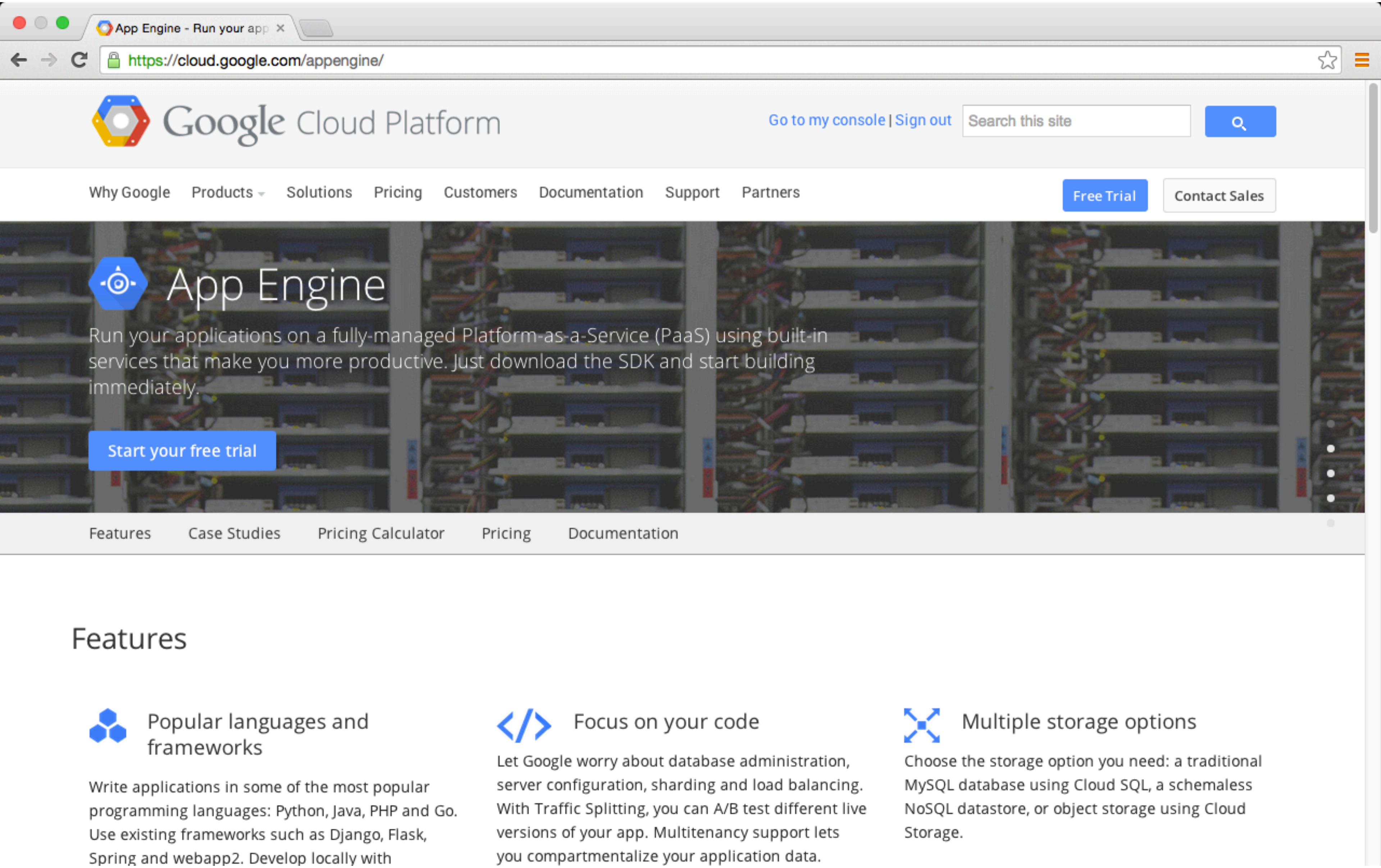
Java

PHP

Go

Source: https://cloud.google.com/appengine/docs/whatisgoogleappengine

Google App Engine



App Engine

Run your applications on a fully-managed Platform-as-a-Service (PaaS) using built-in services that make you more productive. Just download the SDK and start building immediately.

Features

Popular languages and frameworks

Write applications in some of the most popular programming languages: Python, Java, PHP and Go. Use existing frameworks such as Django, Flask, Spring and webapp2. Develop locally with

Focus on your code

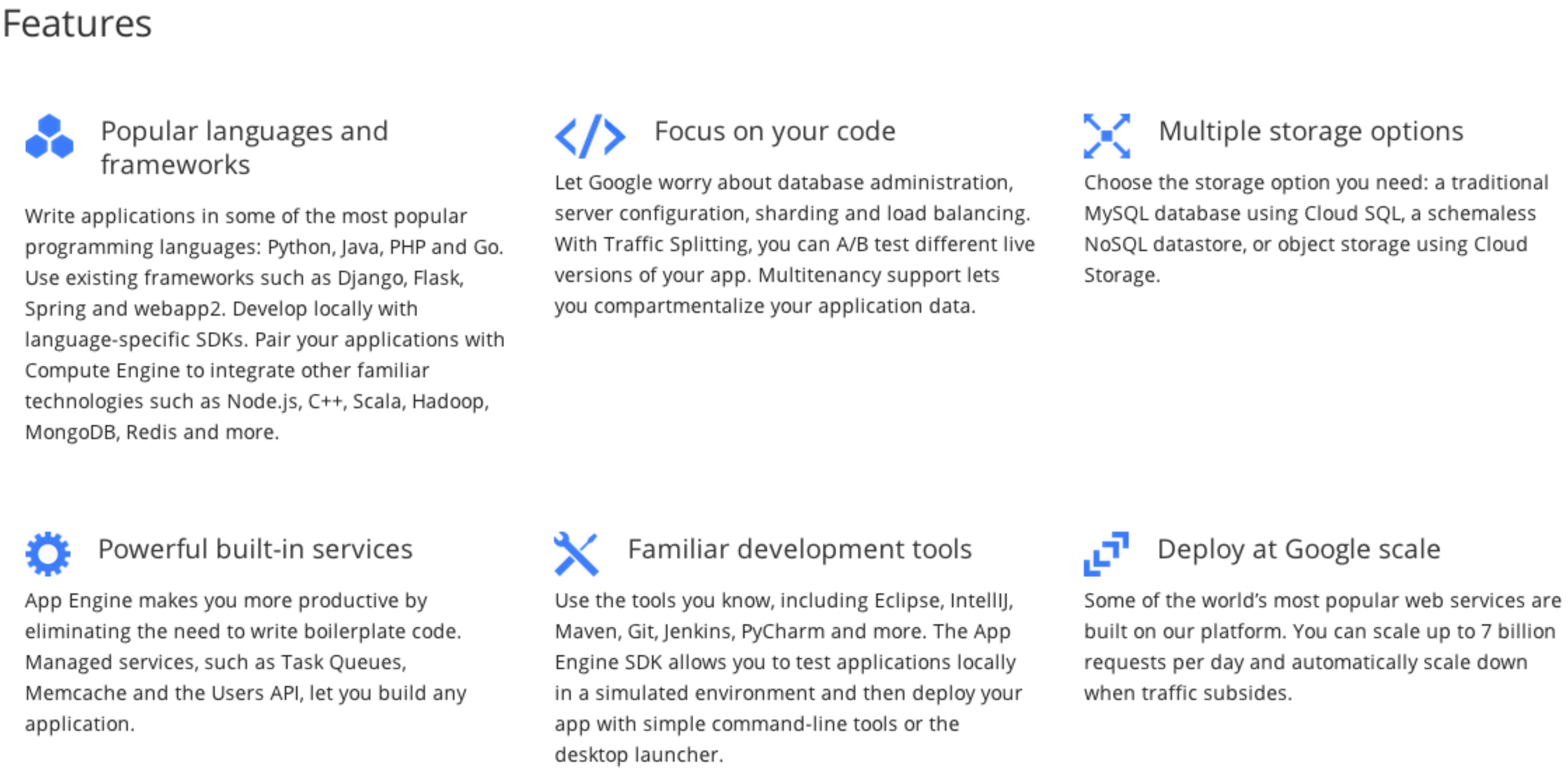
Let Google worry about database administration, server configuration, sharding and load balancing. With Traffic Splitting, you can A/B test different live versions of your app. Multitenancy support lets you compartmentalize your application data.

Multiple storage options

Choose the storage option you need: a traditional MySQL database using Cloud SQL, a schemaless NoSQL datastore, or object storage using Cloud Storage.

https://cloud.google.com/appengine/

Google App Engine



Features

Popular languages and frameworks

Write applications in some of the most popular programming languages: Python, Java, PHP and Go. Use existing frameworks such as Django, Flask, Spring and webapp2. Develop locally with language-specific SDKs. Pair your applications with Compute Engine to integrate other familiar technologies such as Node.js, C++, Scala, Hadoop, MongoDB, Redis and more.

Focus on your code

Let Google worry about database administration, server configuration, sharding and load balancing. With Traffic Splitting, you can A/B test different live versions of your app. Multitenancy support lets you compartmentalize your application data.

Multiple storage options

Choose the storage option you need: a traditional MySQL database using Cloud SQL, a schemaless NoSQL datastore, or object storage using Cloud Storage.

Powerful built-in services

App Engine makes you more productive by eliminating the need to write boilerplate code. Managed services, such as Task Queues, Memcache and the Users API, let you build any application.

Familiar development tools

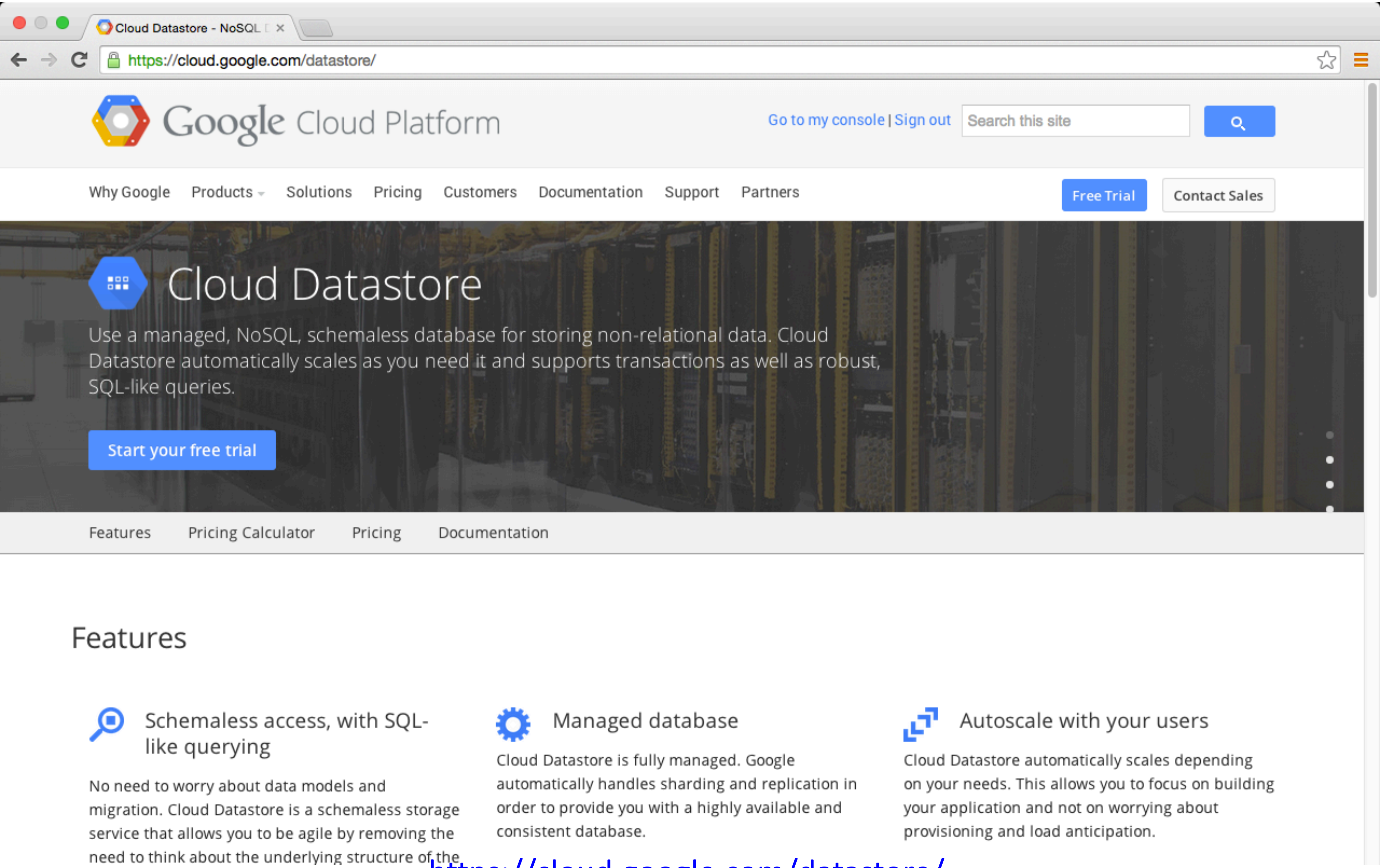
Use the tools you know, including Eclipse, IntelliJ, Maven, Git, Jenkins, PyCharm and more. The App Engine SDK allows you to test applications locally in a simulated environment and then deploy your app with simple command-line tools or the desktop launcher.

Deploy at Google scale

Some of the world's most popular web services are built on our platform. You can scale up to 7 billion requests per day and automatically scale down when traffic subsides.

https://cloud.google.com/appengine/

Google Cloud Datastore



Cloud Datastore

Use a managed, NoSQL, schemaless database for storing non-relational data. Cloud Datastore automatically scales as you need it and supports transactions as well as robust, SQL-like queries.

Features

Schemaless access, with SQL-like querying

No need to worry about data models and migration. Cloud Datastore is a schemaless storage service that allows you to be agile by removing the need to think about the underlying structure of the

Managed database

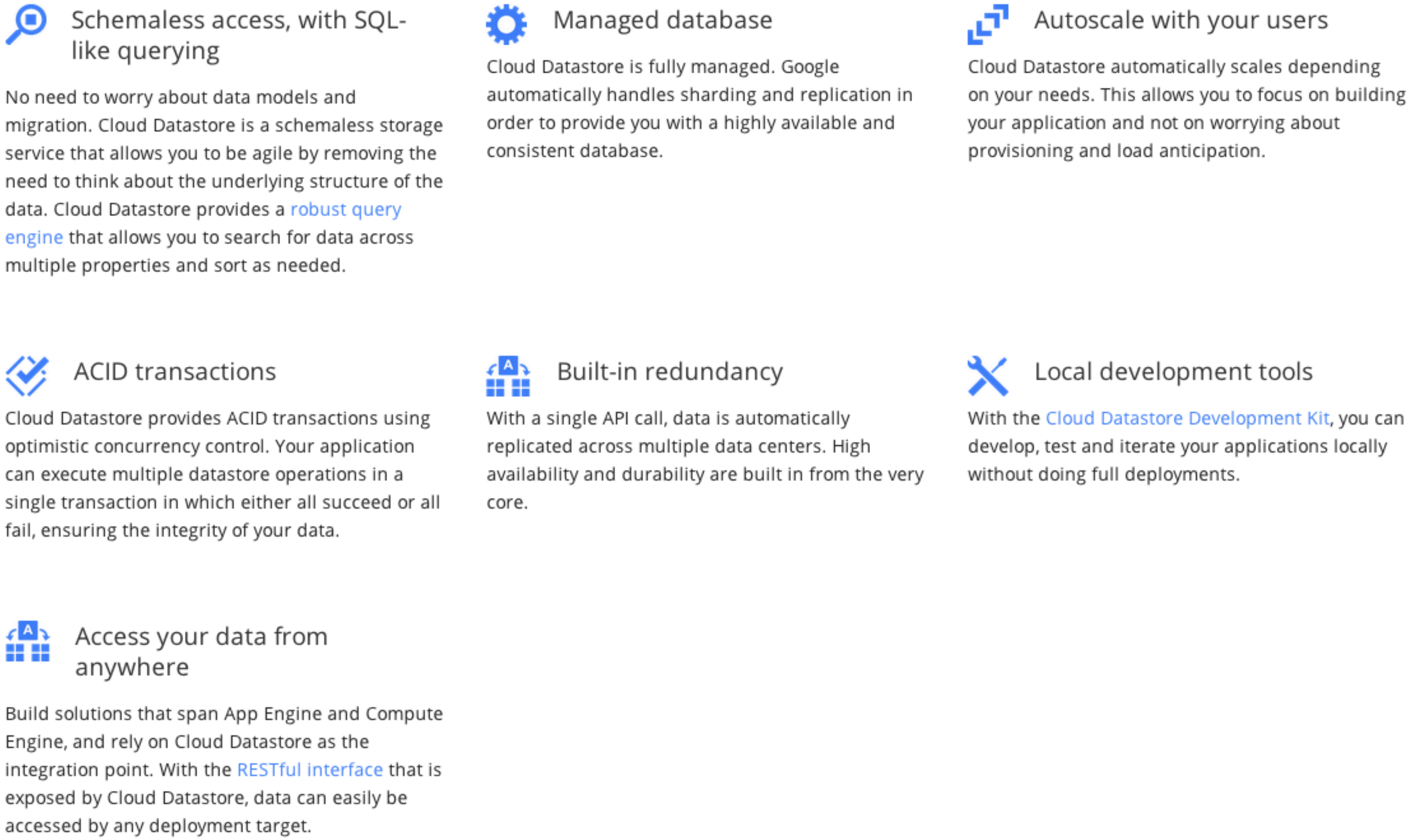
Cloud Datastore is fully managed. Google automatically handles sharding and replication in order to provide you with a highly available and consistent database.

Autoscale with your users

Cloud Datastore automatically scales depending on your needs. This allows you to focus on building your application and not on worrying about provisioning and load anticipation.

https://cloud.google.com/datastore/

Google Cloud Datastore



Schemaless access, with SQL-like querying

No need to worry about data models and migration. Cloud Datastore is a schemaless storage service that allows you to be agile by removing the need to think about the underlying structure of the data. Cloud Datastore provides a robust query engine that allows you to search for data across multiple properties and sort as needed.

Managed database

Cloud Datastore is fully managed. Google automatically handles sharding and replication in order to provide you with a highly available and consistent database.

Autoscale with your users

Cloud Datastore automatically scales depending on your needs. This allows you to focus on building your application and not on worrying about provisioning and load anticipation.

ACID transactions

Cloud Datastore provides ACID transactions using optimistic concurrency control. Your application can execute multiple datastore operations in a single transaction in which either all succeed or all fail, ensuring the integrity of your data.

Built-in redundancy

With a single API call, data is automatically replicated across multiple data centers. High availability and durability are built in from the very core.

Local development tools

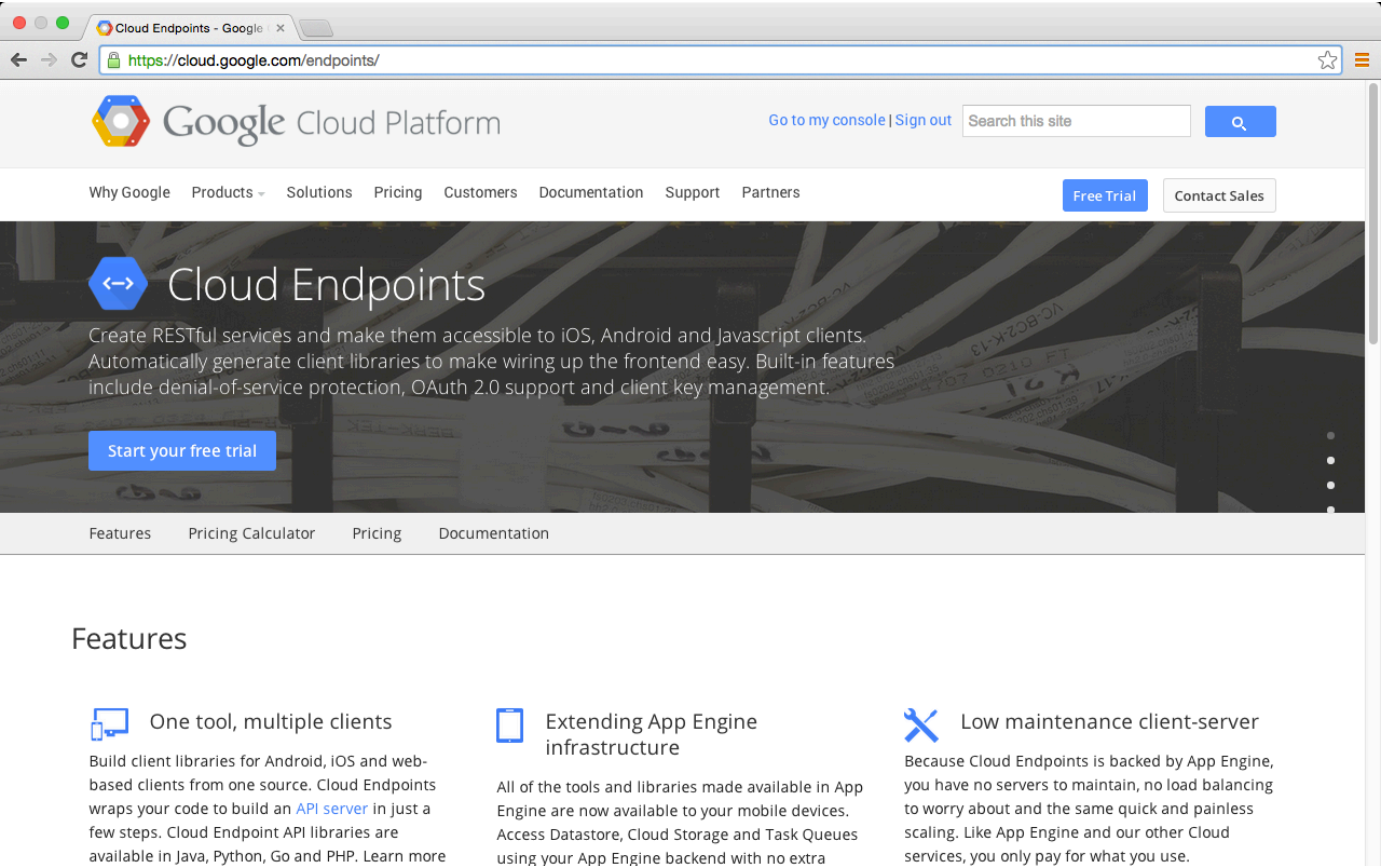
With the Cloud Datastore Development Kit, you can develop, test and iterate your applications locally without doing full deployments.

Access your data from anywhere

Build solutions that span App Engine and Compute Engine, and rely on Cloud Datastore as the integration point. With the RESTful interface that is exposed by Cloud Datastore, data can easily be accessed by any deployment target.

https://cloud.google.com/datastore/

Google Cloud Endpoints



Cloud Endpoints - Google

https://cloud.google.com/endpoints/

Google Cloud Platform

Go to my console | Sign out

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Cloud Endpoints

Create RESTful services and make them accessible to iOS, Android and Javascript clients. Automatically generate client libraries to make wiring up the frontend easy. Built-in features include denial-of-service protection, OAuth 2.0 support and client key management.

Start your free trial

Features Pricing Calculator Pricing Documentation

Features

One tool, multiple clients

Build client libraries for Android, iOS and web-based clients from one source. Cloud Endpoints wraps your code to build an API server in just a few steps. Cloud Endpoint API libraries are available in Java, Python, Go and PHP. Learn more

Extending App Engine infrastructure

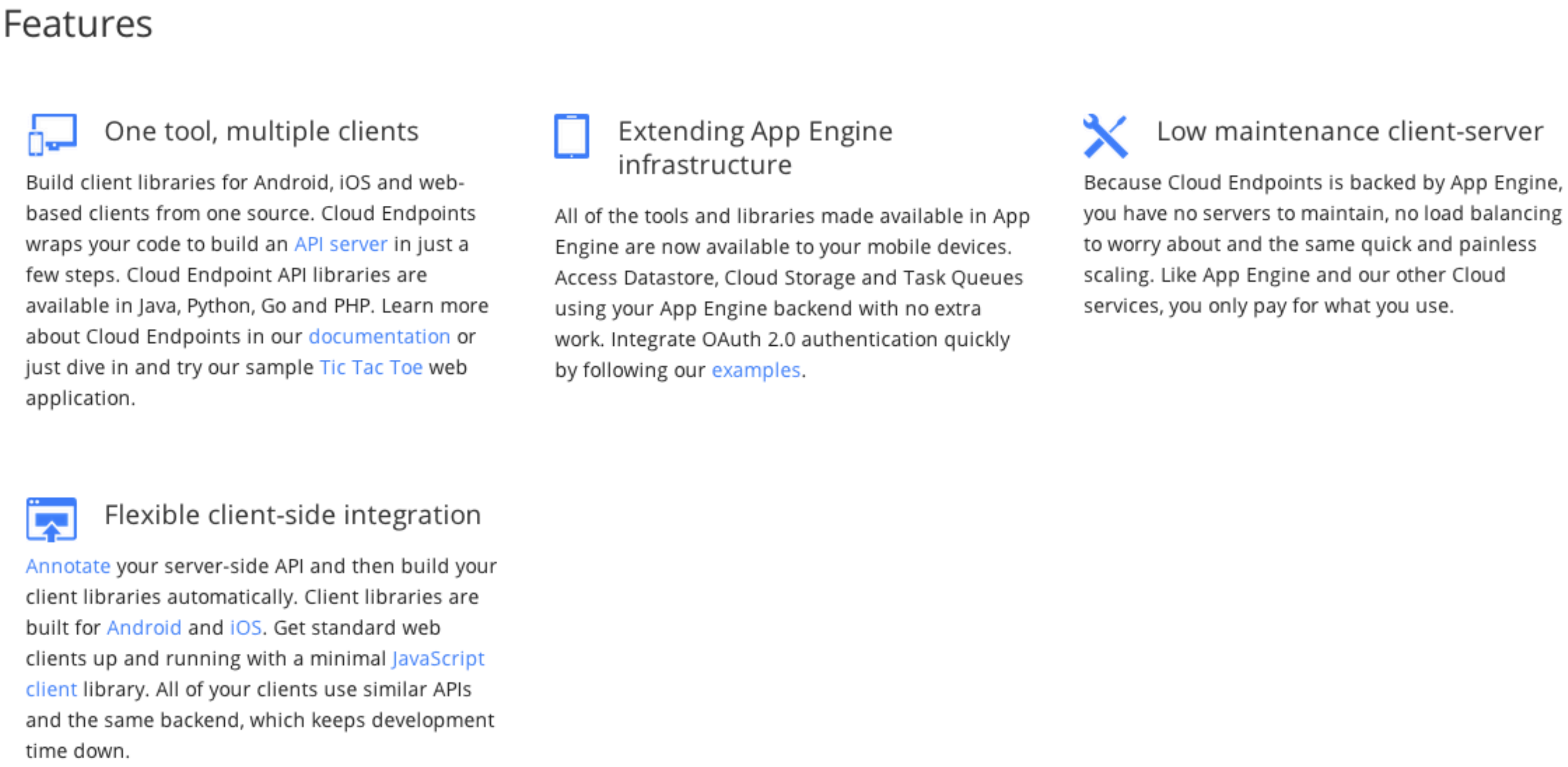
All of the tools and libraries made available in App Engine are now available to your mobile devices. Access Datastore, Cloud Storage and Task Queues using your App Engine backend with no extra

Low maintenance client-server

Because Cloud Endpoints is backed by App Engine, you have no servers to maintain, no load balancing to worry about and the same quick and painless scaling. Like App Engine and our other Cloud services, you only pay for what you use.

Source: https://cloud.google.com/endpoints/

Google Cloud Endpoints



Features

One tool, multiple clients

Build client libraries for Android, iOS and web-based clients from one source. Cloud Endpoints wraps your code to build an API server in just a few steps. Cloud Endpoint API libraries are available in Java, Python, Go and PHP. Learn more about Cloud Endpoints in our documentation or just dive in and try our sample Tic Tac Toe web application.

Extending App Engine infrastructure

All of the tools and libraries made available in App Engine are now available to your mobile devices. Access Datastore, Cloud Storage and Task Queues using your App Engine backend with no extra work. Integrate OAuth 2.0 authentication quickly by following our examples.

Low maintenance client-server

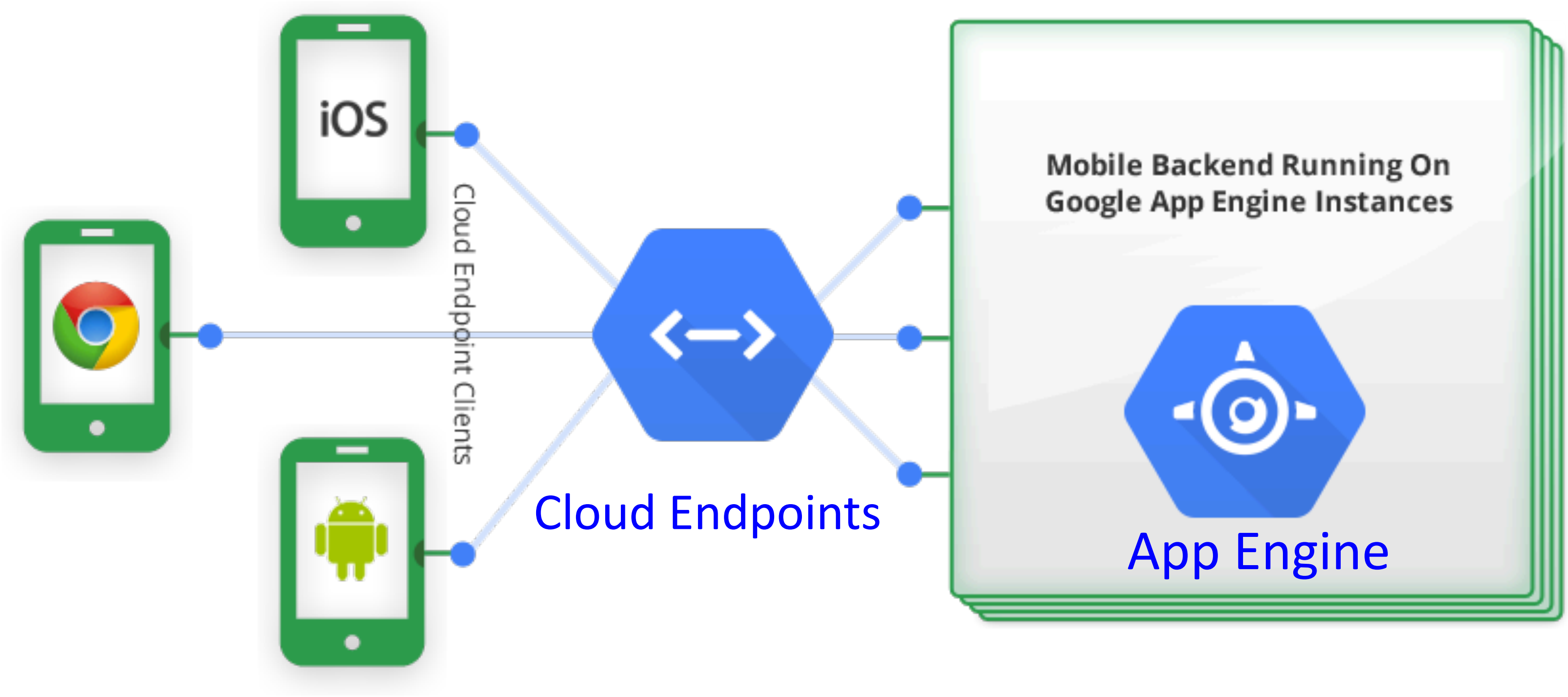
Because Cloud Endpoints is backed by App Engine, you have no servers to maintain, no load balancing to worry about and the same quick and painless scaling. Like App Engine and our other Cloud services, you only pay for what you use.

Flexible client-side integration

Annotate your server-side API and then build your client libraries automatically. Client libraries are built for Android and iOS. Get standard web clients up and running with a minimal JavaScript client library. All of your clients use similar APIs and the same backend, which keeps development time down.

Source: https://cloud.google.com/endpoints/

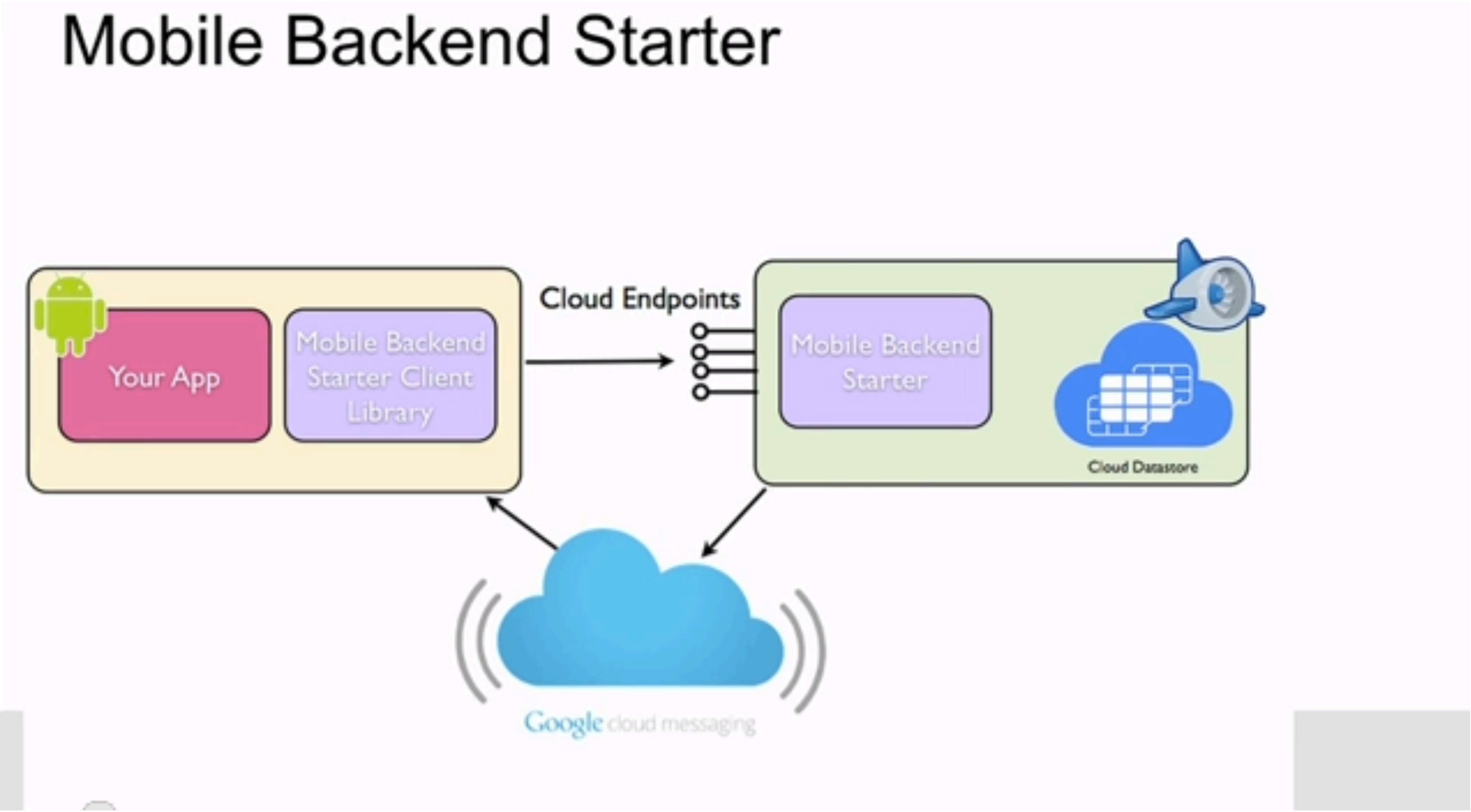
Mobile Apps Backend on Google App Engine



Google Cloud Endpoints Architecture

Source: https://cloud.google.com/appengine/docs/java/endpoints/

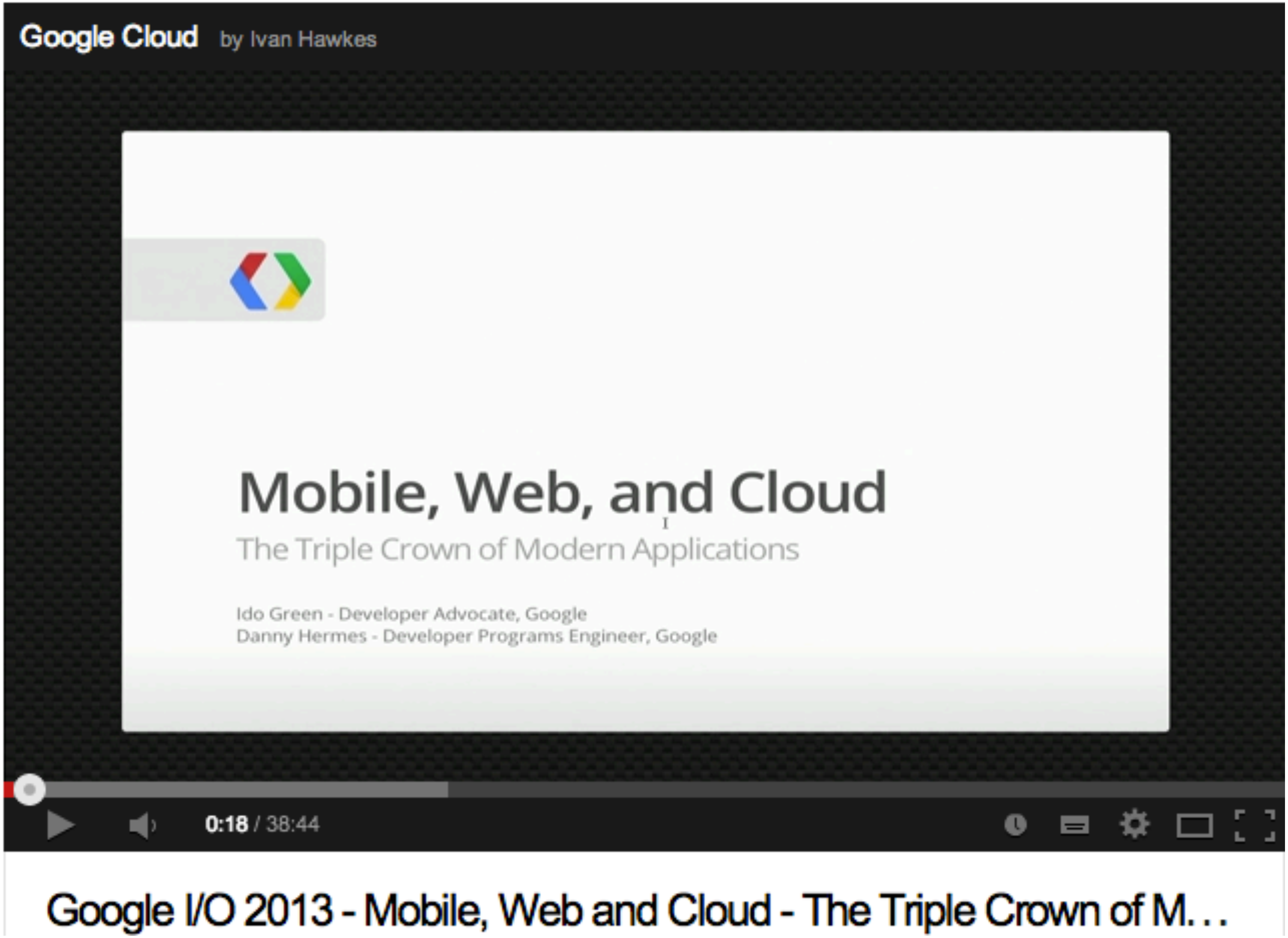
Mobile App, Goolge App Engine, Cloud Datasotre



Mobile Backend Starter

http://www.youtube.com/watch?v=v5u_Owtbfew

Mobile, Web and Cloud



Google Cloud by Ivan Hawkes

Mobile, Web, and Cloud

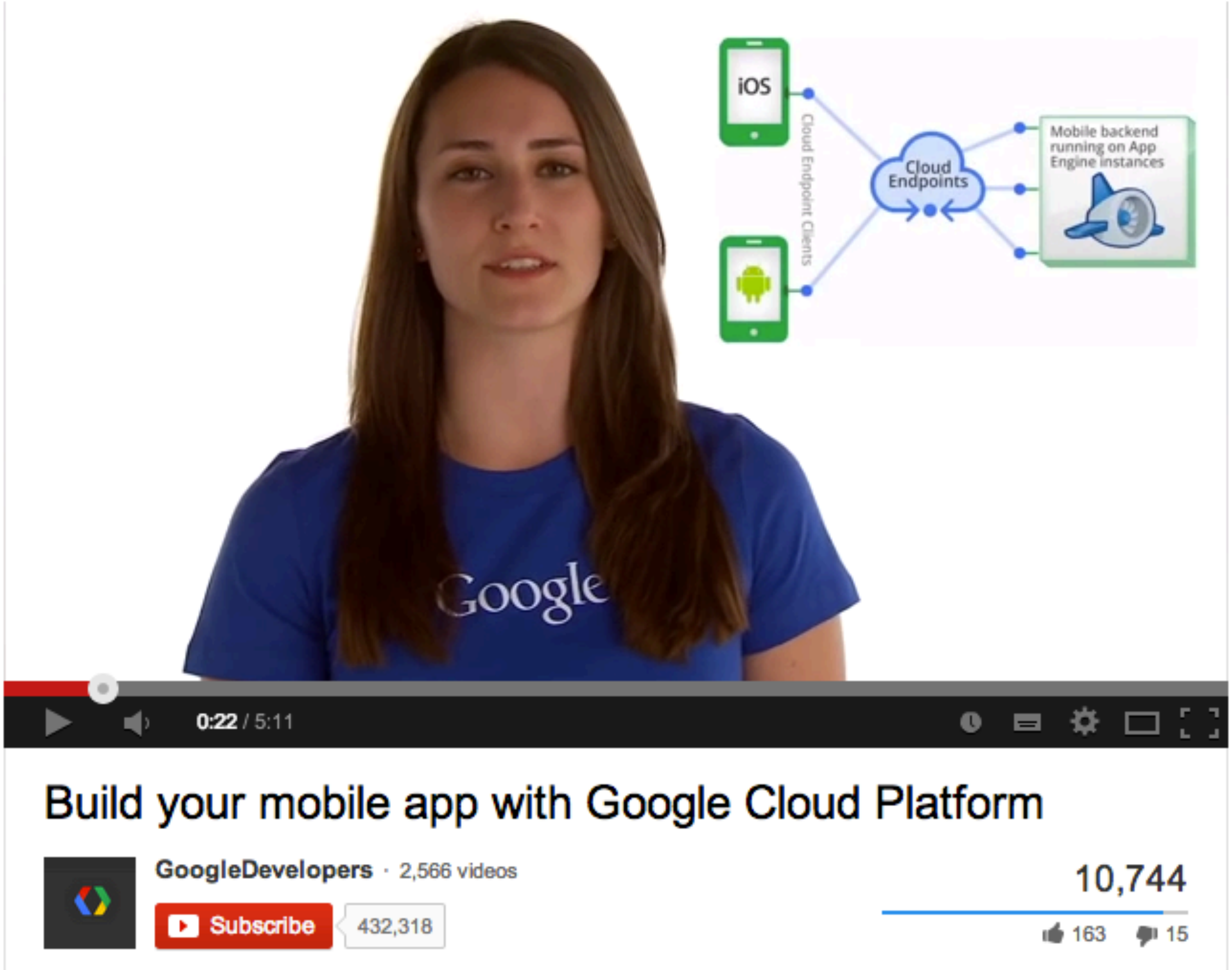
The Triple Crown of Modern Applications

Ido Green - Developer Advocate, Google
Danny Hermes - Developer Programs Engineer, Google

Google I/O 2013 - Mobile, Web and Cloud - The Triple Crown of M…

http://www.youtube.com/watch?v=6_oO9Gwf_do

Build your mobile app with Google Cloud Platform



Build your mobile app with Google Cloud Platform

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163 15

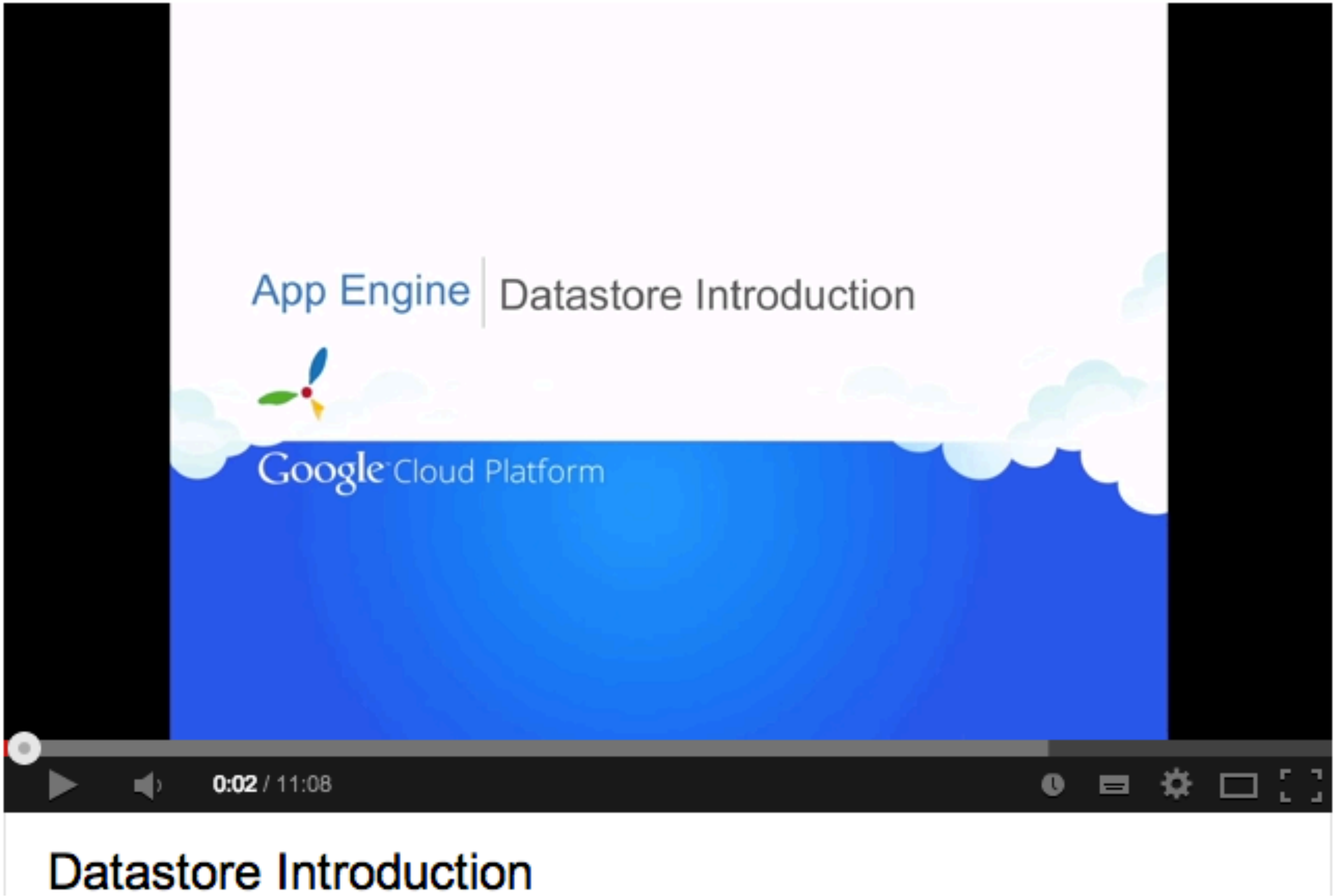
http://www.youtube.com/watch?v=ZZNb1NOPTp8

App Engine Architecture and Services

App Engine Architecture and Services

http://www.youtube.com/watch?v=QJp6hmASstQ

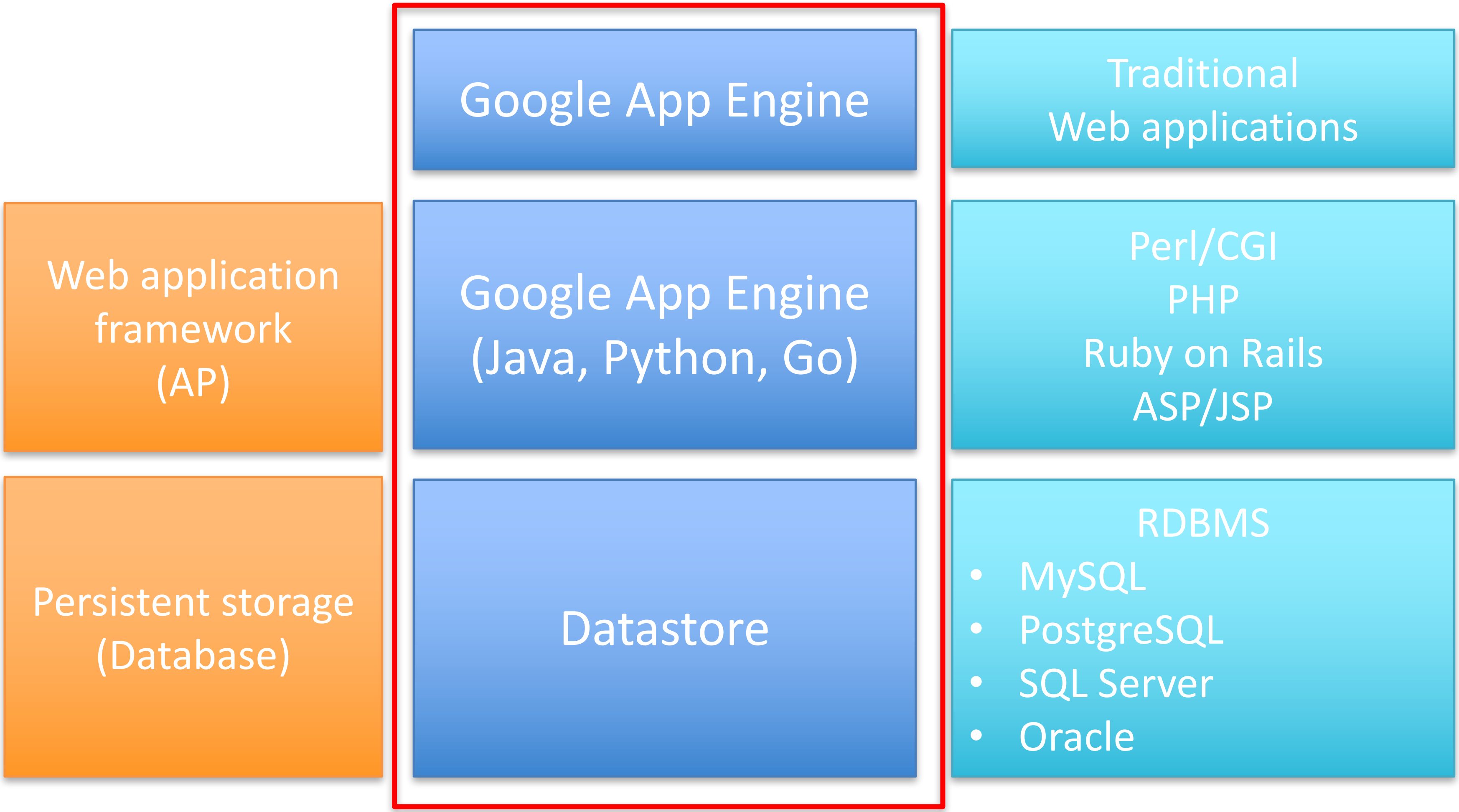
Datastore Introduction



Source: Datastore Introduction, http://www.youtube.com/watch?v=fQazhzcC-rg

Google Cloud Datastore

Datasotre is a database (persistent storage) for App Engine



Google App Engine

Traditional Web applications

Web application framework (AP)

Google App Engine (Java, Python, Go)

Perl/CGI
PHP
Ruby on Rails
ASP/JSP

Persistent storage (Database)

Datastore

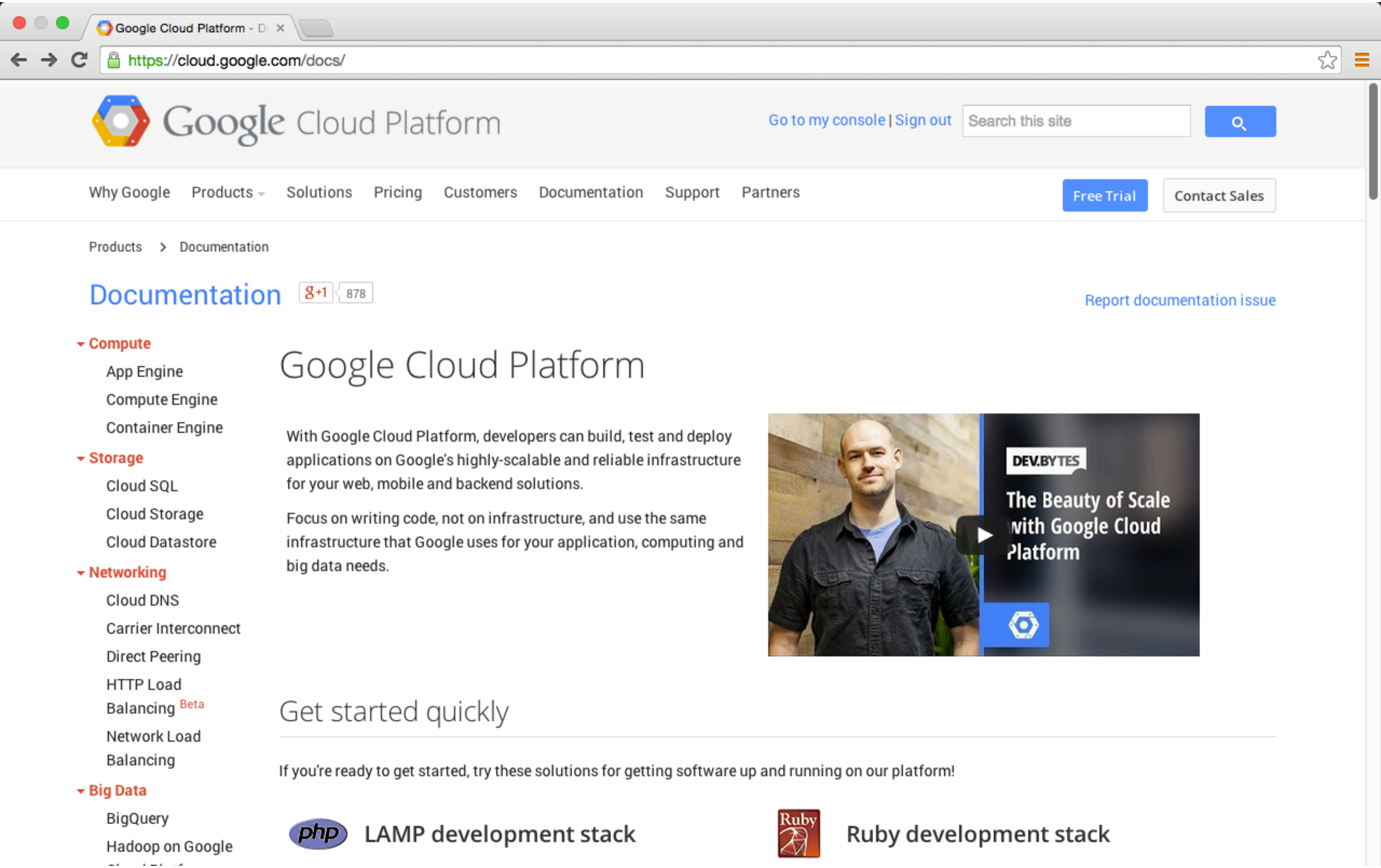
RDBMS

- MySQL
- PostgreSQL
- SQL Server
- Oracle

Source: Datastore Introduction, http://www.youtube.com/watch?v=fQazhzcC-rg

Google Cloud Platform

https://cloud.google.com/docs/



Documentation

Google Cloud Platform

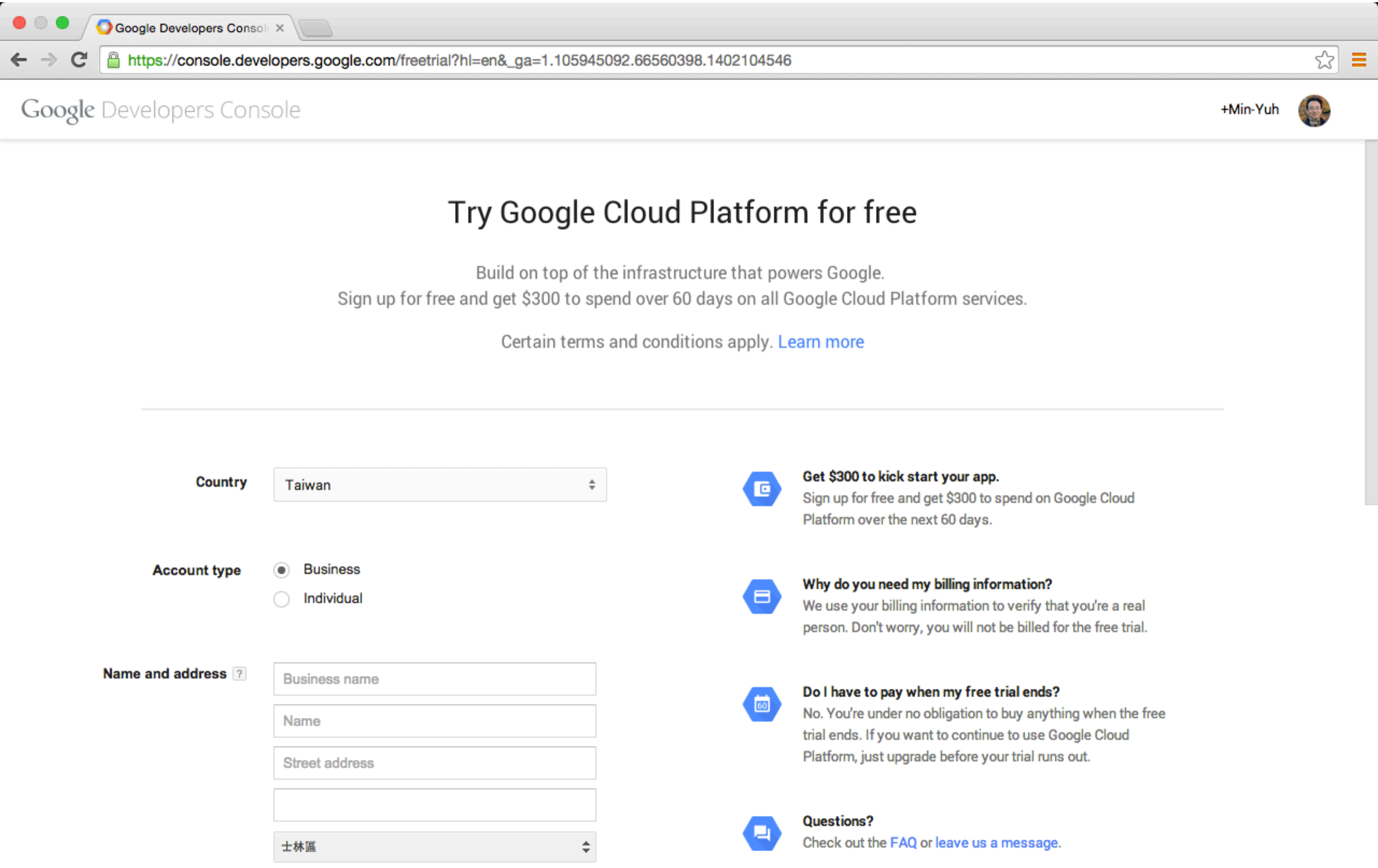
With Google Cloud Platform, developers can build, test and deploy applications on Google's highly-scalable and reliable infrastructure for your web, mobile and backend solutions.

Focus on writing code, not on infrastructure, and use the same infrastructure that Google uses for your application, computing and big data needs.

Get started quickly

If you're ready to get started, try these solutions for getting software up and running on our platform!

Try Google Cloud Platform for free



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Try Google Cloud Platform for free

Build on top of the infrastructure that powers Google.
Sign up for free and get $300 to spend over 60 days on all Google Cloud Platform services.

Certain terms and conditions apply. Learn more

Country Taiwan

Account type ● Business ○ Individual

Name and address ?

Business name

Name

Street address

士林區

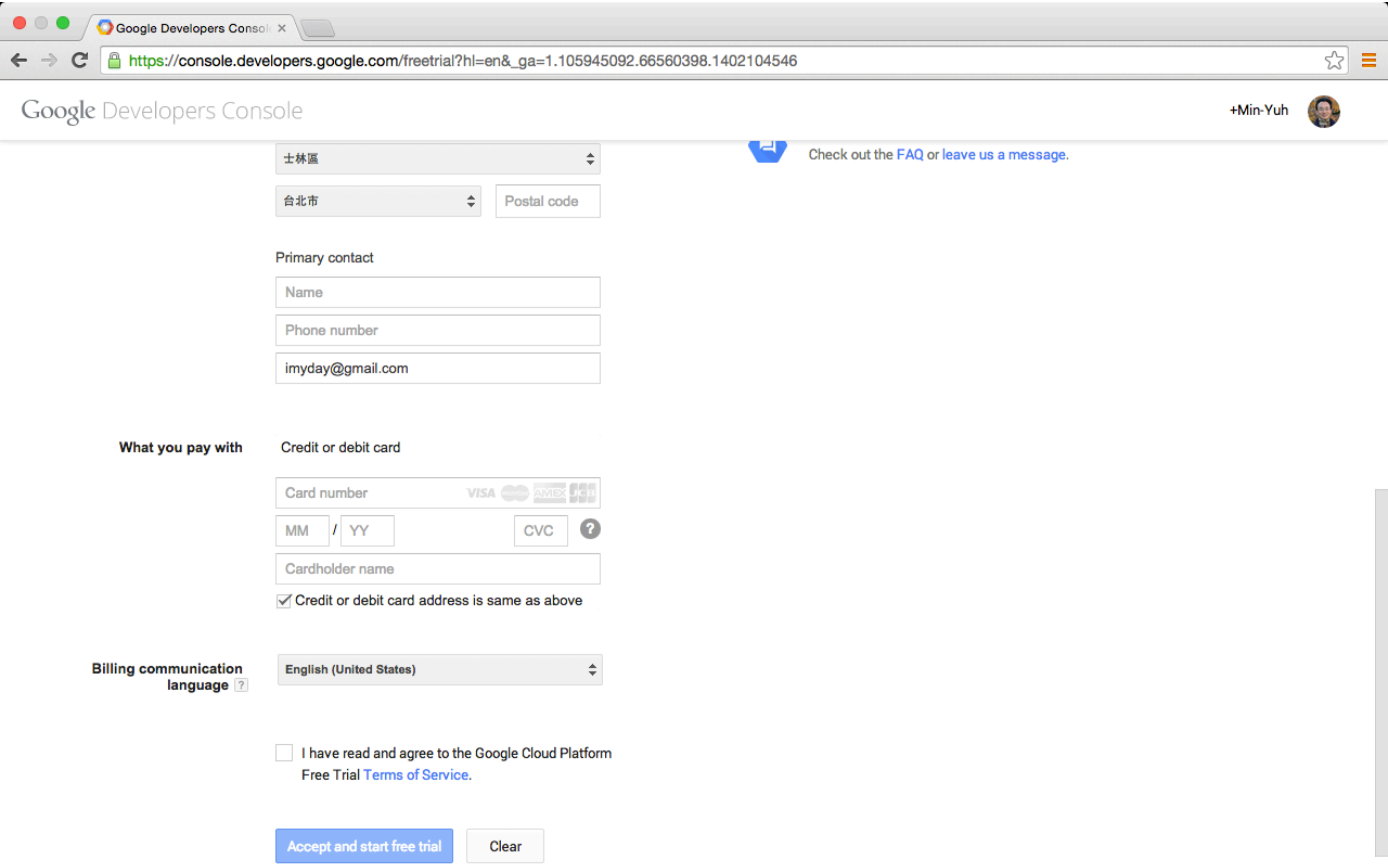
Get $300 to kick start your app.
Sign up for free and get $300 to spend on Google Cloud Platform over the next 60 days.

Why do you need my billing information?
We use your billing information to verify that you're a real person. Don't worry, you will not be billed for the free trial.

Do I have to pay when my free trial ends?
No. You're under no obligation to buy anything when the free trial ends. If you want to continue to use Google Cloud Platform, just upgrade before your trial runs out.

Questions?
Check out the FAQ or leave us a message.

Try Google Cloud Platform for free



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台北市 | Postal code

Check out the FAQ or leave us a message.

Primary contact

Name

Phone number

imyday@gmail.com

What you pay with Credit or debit card

Card number VISA AMEX JCB

MM / YY CVC ?

Cardholder name

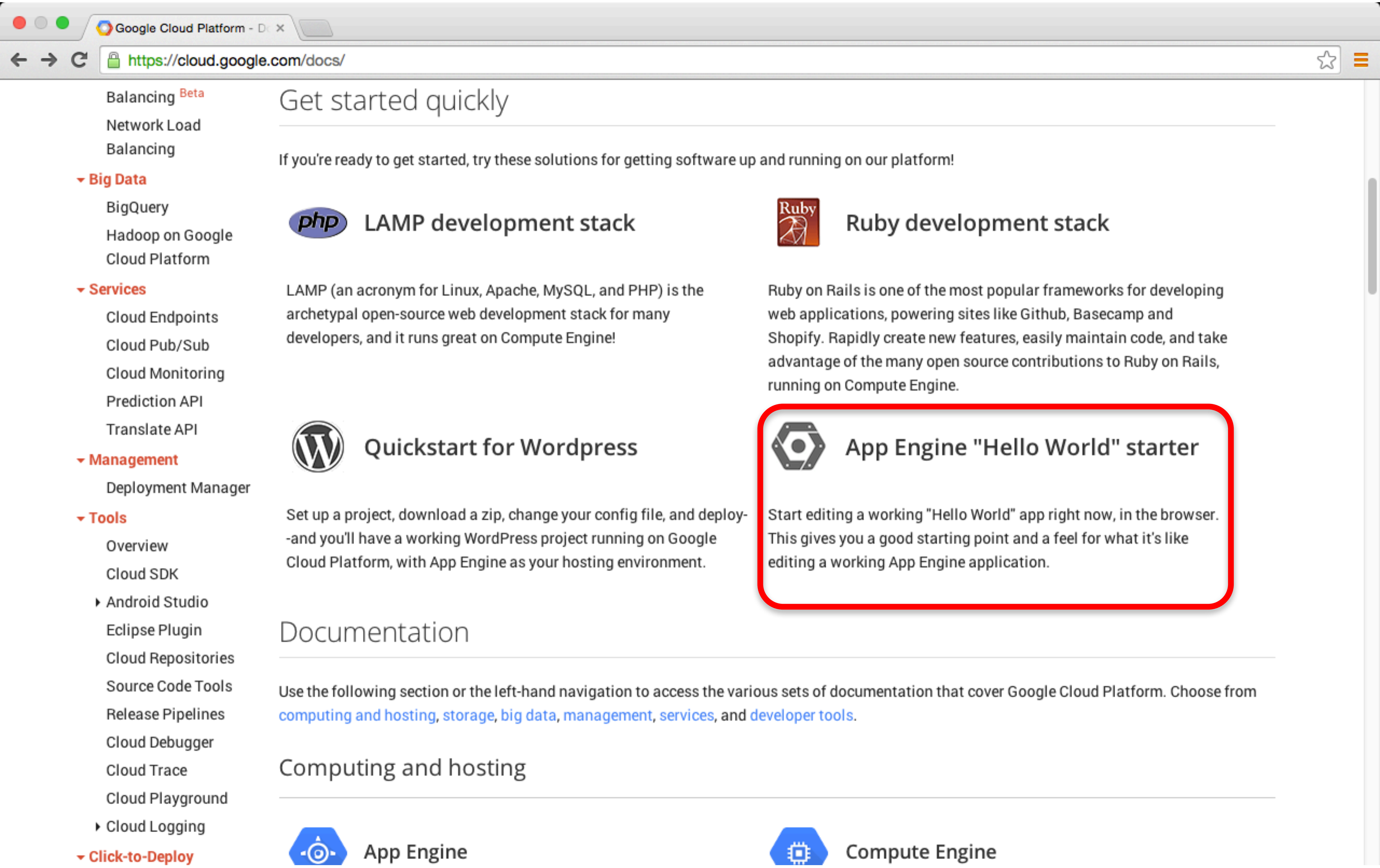
☑ Credit or debit card address is same as above

Billing communication language ? English (United States)

☐ I have read and agree to the Google Cloud Platform Free Trial Terms of Service.

Google Cloud Platform

https://cloud.google.com/docs/



Balancing Beta
Network Load Balancing
Big Data
BigQuery
Hadoop on Google Cloud Platform
Services
Cloud Endpoints
Cloud Pub/Sub
Cloud Monitoring
Prediction API
Translate API
Management
Deployment Manager
Tools
Overview
Cloud SDK
Android Studio
Eclipse Plugin
Cloud Repositories
Source Code Tools
Release Pipelines
Cloud Debugger
Cloud Trace
Cloud Playground
Cloud Logging
Click-to-Deploy

Get started quickly

If you're ready to get started, try these solutions for getting software up and running on our platform!

LAMP development stack

LAMP (an acronym for Linux, Apache, MySQL, and PHP) is the archetypal open-source web development stack for many developers, and it runs great on Compute Engine!

Ruby development stack

Ruby on Rails is one of the most popular frameworks for developing web applications, powering sites like Github, Basecamp and Shopify. Rapidly create new features, easily maintain code, and take advantage of the many open source contributions to Ruby on Rails, running on Compute Engine.

Quickstart for Wordpress

Set up a project, download a zip, change your config file, and deploy--and you'll have a working WordPress project running on Google Cloud Platform, with App Engine as your hosting environment.

App Engine "Hello World" starter

Start editing a working "Hello World" app right now, in the browser. This gives you a good starting point and a feel for what it's like editing a working App Engine application.

Documentation

Use the following section or the left-hand navigation to access the various sets of documentation that cover Google Cloud Platform. Choose from computing and hosting, storage, big data, management, services, and developer tools.

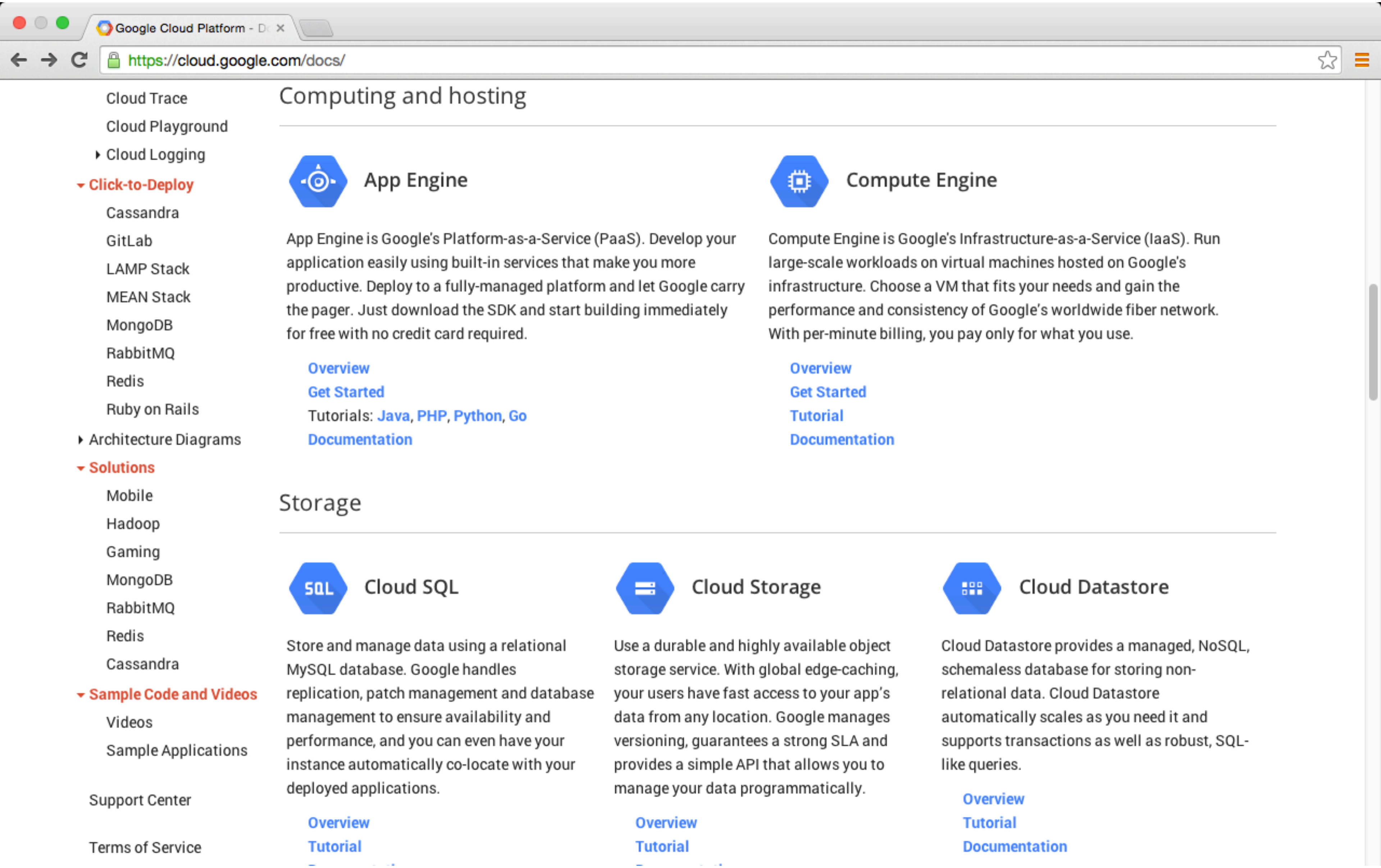
Computing and hosting

App Engine

Compute Engine

Google Cloud Platform

https://cloud.google.com/docs/



- Cloud Trace
- Cloud Playground
- Cloud Logging
- Click-to-Deploy
  - Cassandra
  - GitLab
  - LAMP Stack
  - MEAN Stack
  - MongoDB
  - RabbitMQ
  - Redis
  - Ruby on Rails
- Architecture Diagrams
- Solutions
  - Mobile
  - Hadoop
  - Gaming
  - MongoDB
  - RabbitMQ
  - Redis
  - Cassandra
- Sample Code and Videos
  - Videos
  - Sample Applications
- Support Center
- Terms of Service

Computing and hosting

App Engine

App Engine is Google's Platform-as-a-Service (PaaS). Develop your application easily using built-in services that make you more productive. Deploy to a fully-managed platform and let Google carry the pager. Just download the SDK and start building immediately for free with no credit card required.

Overview
Get Started
Tutorials: Java, PHP, Python, Go
Documentation

Compute Engine

Compute Engine is Google's Infrastructure-as-a-Service (IaaS). Run large-scale workloads on virtual machines hosted on Google's infrastructure. Choose a VM that fits your needs and gain the performance and consistency of Google's worldwide fiber network. With per-minute billing, you pay only for what you use.

Overview
Get Started
Tutorial
Documentation

Storage

Cloud SQL

Store and manage data using a relational MySQL database. Google handles replication, patch management and database management to ensure availability and performance, and you can even have your instance automatically co-locate with your deployed applications.

Overview
Tutorial

Cloud Storage

Use a durable and highly available object storage service. With global edge-caching, your users have fast access to your app's data from any location. Google manages versioning, guarantees a strong SLA and provides a simple API that allows you to manage your data programmatically.

Overview
Tutorial

Cloud Datastore

Cloud Datastore provides a managed, NoSQL, schemaless database for storing non-relational data. Cloud Datastore automatically scales as you need it and supports transactions as well as robust, SQL-like queries.

Overview
Tutorial
Documentation

Google App Engine

App Engine "Hello World" starter

https://console.developers.google.com/start/appengine

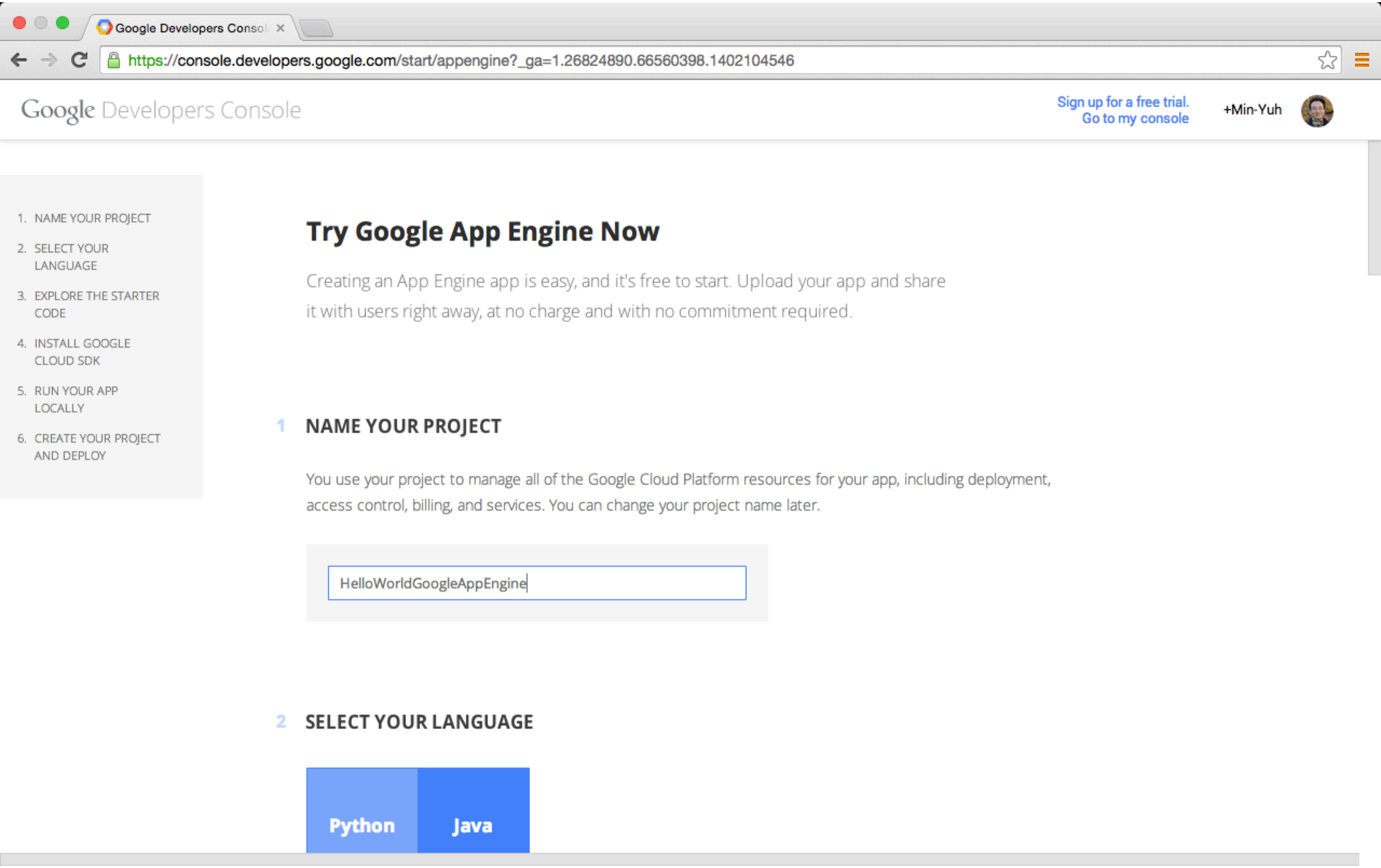
Deploy your first app in five minutes

- Start editing a working "Hello World" app right now, in the browser.
- This gives you a good starting point and a feel for what it's like editing a working App Engine application.

Try Google App Engine Now

1. NAME YOUR PROJECT
2. SELECT YOUR LANGUAGE
3. EXPLORE THE STARTER CODE
4. INSTALL GOOGLE CLOUD SDK
5. RUN YOUR APP LOCALLY
6. CREATE YOUR PROJECT AND DEPLOY

Google App Engine



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1. NAME YOUR PROJECT
2. SELECT YOUR LANGUAGE
3. EXPLORE THE STARTER CODE
4. INSTALL GOOGLE CLOUD SDK
5. RUN YOUR APP LOCALLY
6. CREATE YOUR PROJECT AND DEPLOY

Try Google App Engine Now

Creating an App Engine app is easy, and it's free to start. Upload your app and share it with users right away, at no charge and with no commitment required.

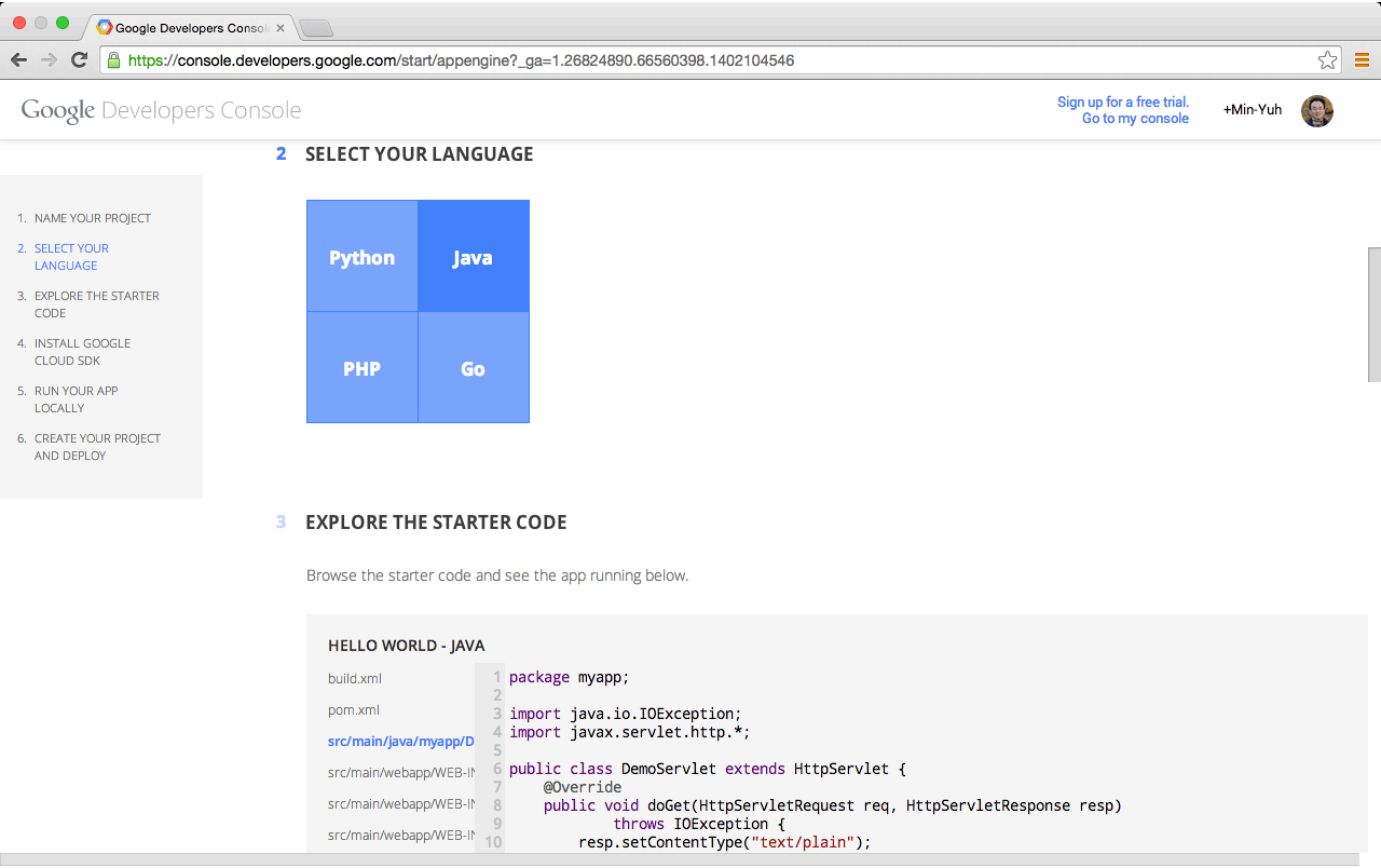
1 NAME YOUR PROJECT

You use your project to manage all of the Google Cloud Platform resources for your app, including deployment, access control, billing, and services. You can change your project name later.

HelloWorldGoogleAppEngine

2 SELECT YOUR LANGUAGE

Google App Engine



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Google Developers Console

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Go to my console

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1. NAME YOUR PROJECT
2. SELECT YOUR LANGUAGE
3. EXPLORE THE STARTER CODE
4. INSTALL GOOGLE CLOUD SDK
5. RUN YOUR APP LOCALLY
6. CREATE YOUR PROJECT AND DEPLOY

2 SELECT YOUR LANGUAGE

Python	Java
PHP	Go

3 EXPLORE THE STARTER CODE

Browse the starter code and see the app running below.

HELLO WORLD - JAVA

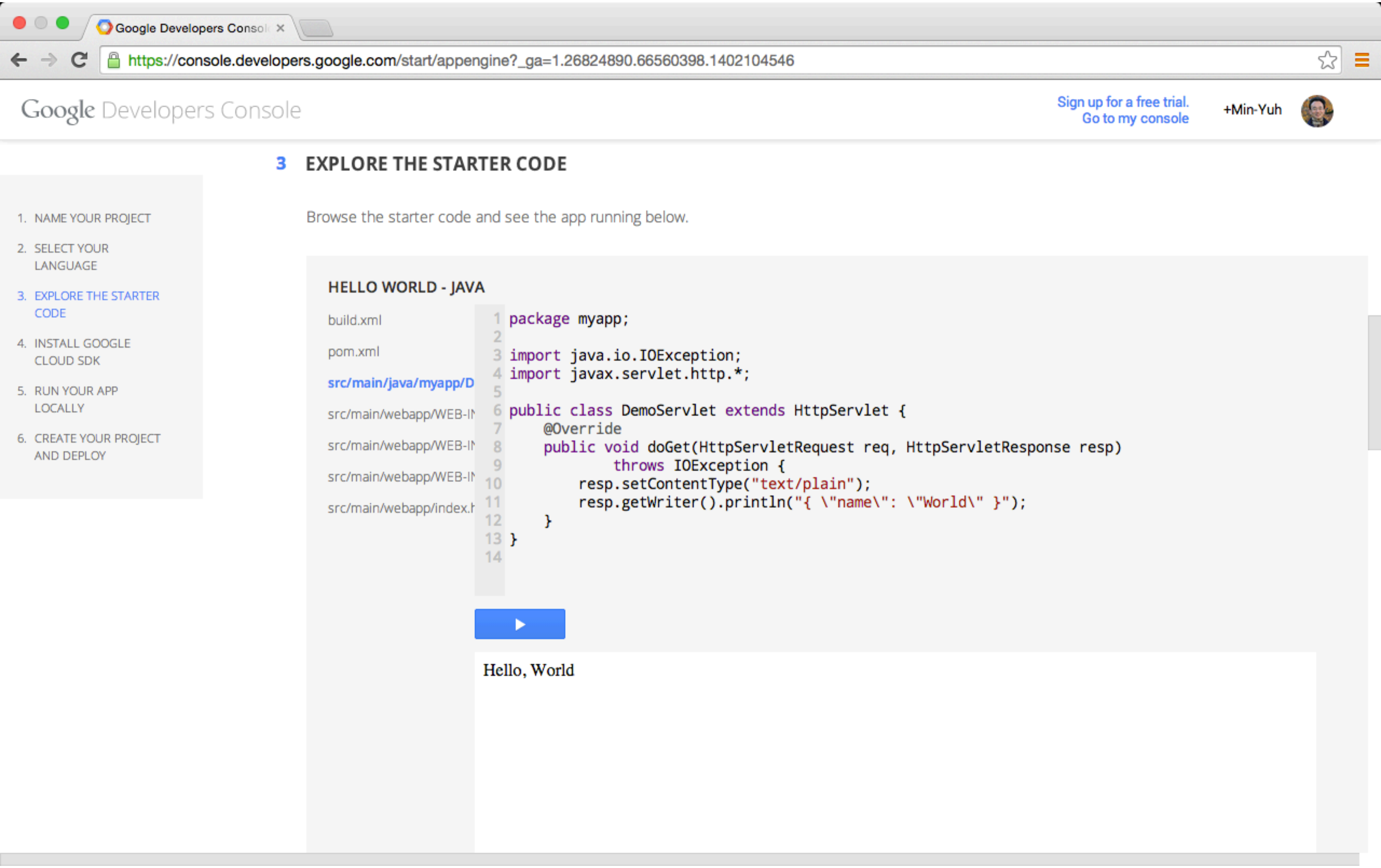
build.xml
pom.xml
src/main/java/myapp/D
src/main/webapp/WEB-I
src/main/webapp/WEB-I
src/main/webapp/WEB-I

```
package myapp;

import java.io.IOException;
import javax.servlet.http.*;

public class DemoServlet extends HttpServlet {
    @Override
    public void doGet(HttpServletRequest req, HttpServletResponse resp)
            throws IOException {
        resp.setContentType("text/plain");
```

Google App Engine



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3 EXPLORE THE STARTER CODE

Browse the starter code and see the app running below.

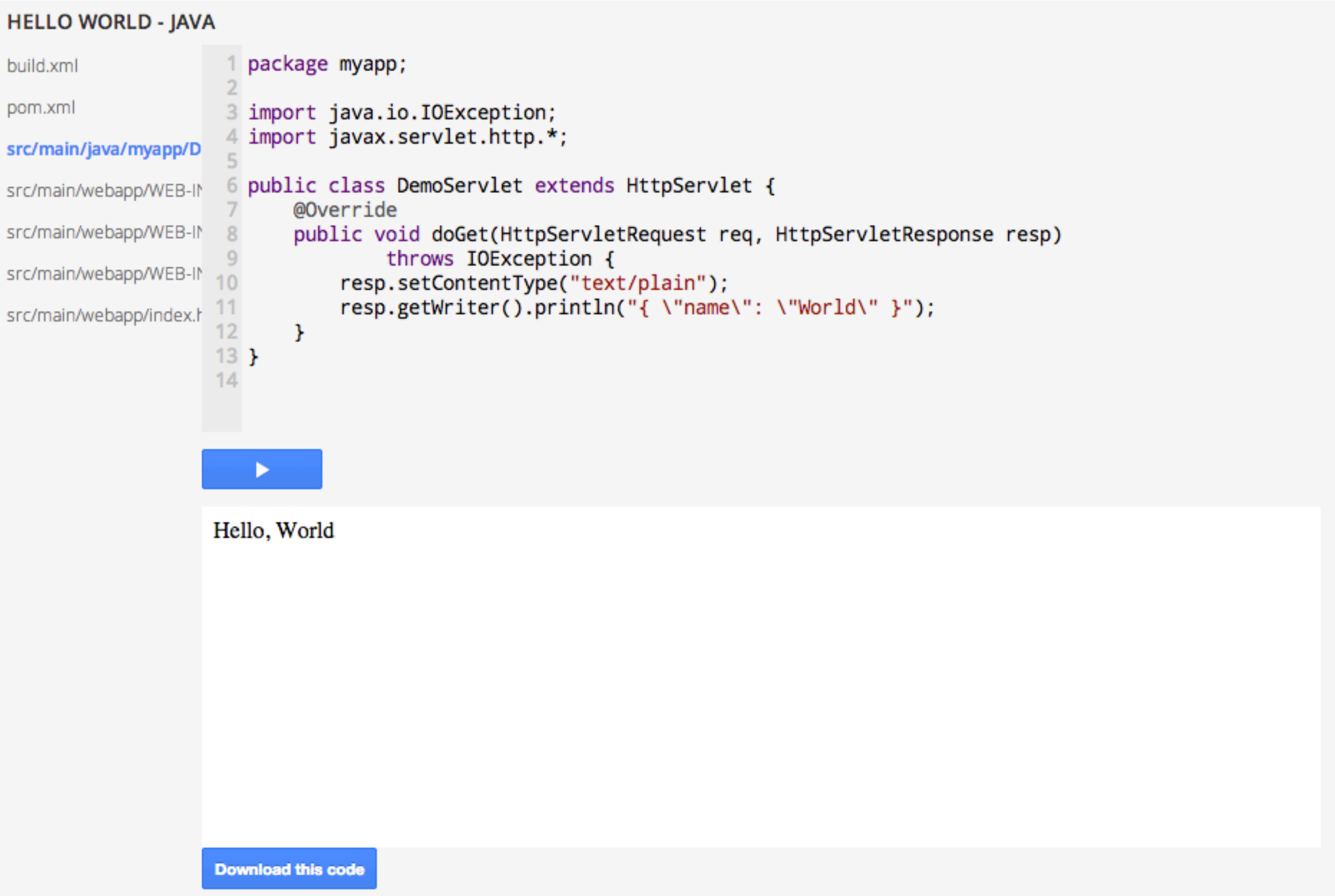
HELLO WORLD - JAVA

- build.xml
- pom.xml
- src/main/java/myapp/D
- src/main/webapp/WEB-I
- src/main/webapp/WEB-I
- src/main/webapp/WEB-I
- src/main/webapp/index.h

```java
package myapp;

import java.io.IOException;
import javax.servlet.http.*;

public class DemoServlet extends HttpServlet {
    @Override
    public void doGet(HttpServletRequest req, HttpServletResponse resp)
            throws IOException {
        resp.setContentType("text/plain");
        resp.getWriter().println("{ \"name\": \"World\" }");
    }
}

```

```
Hello, World
```

Google App Engine



HELLO WORLD - JAVA

```java
package myapp;

import java.io.IOException;
import javax.servlet.http.*;

public class DemoServlet extends HttpServlet {
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    }
}
```
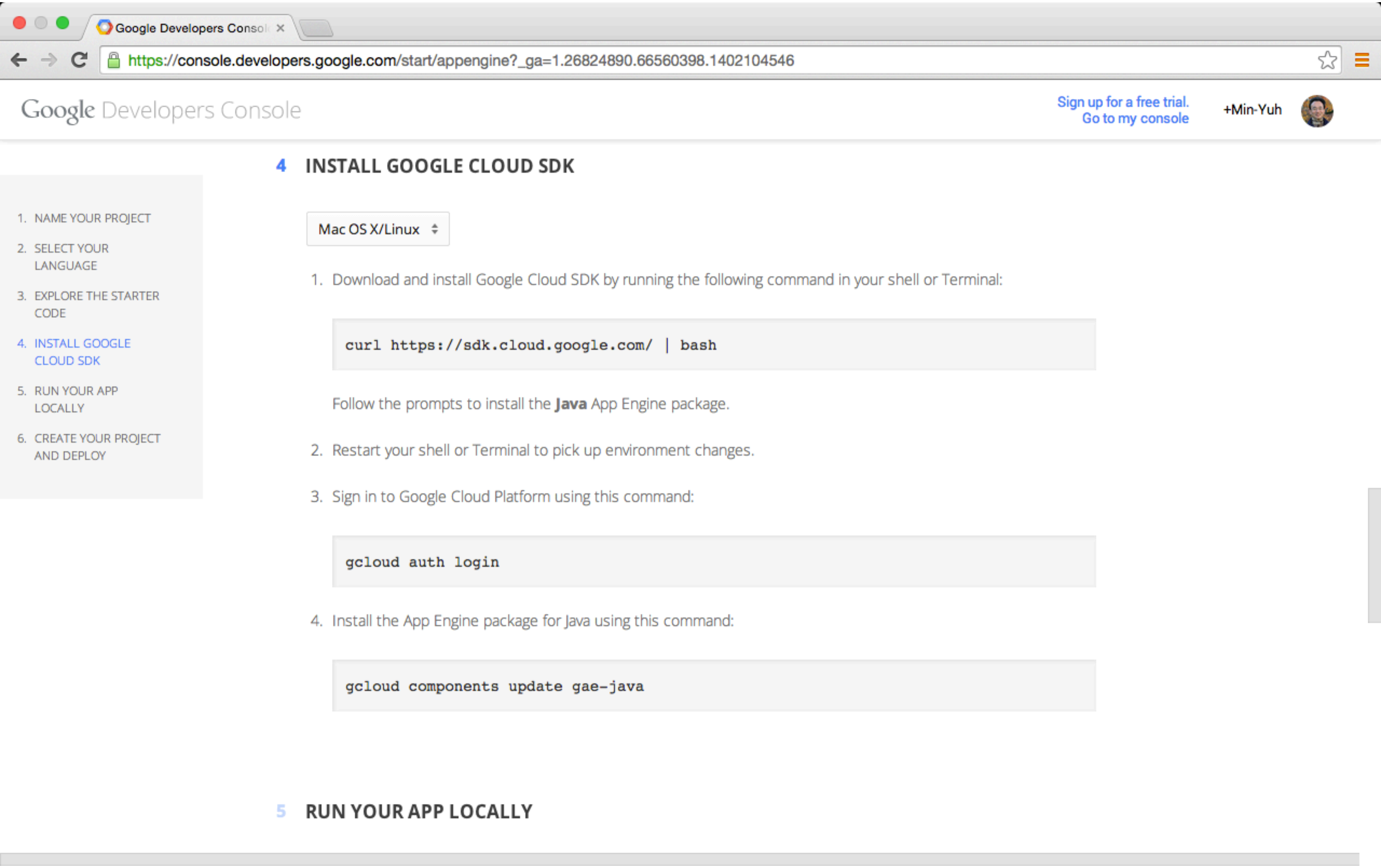

```
Hello, World
```

Google App Engine



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4 INSTALL GOOGLE CLOUD SDK

Mac OS X/Linux

1. Download and install Google Cloud SDK by running the following command in your shell or Terminal:

```
curl https://sdk.cloud.google.com/ | bash
```

Follow the prompts to install the **Java** App Engine package.

2. Restart your shell or Terminal to pick up environment changes.
3. Sign in to Google Cloud Platform using this command:

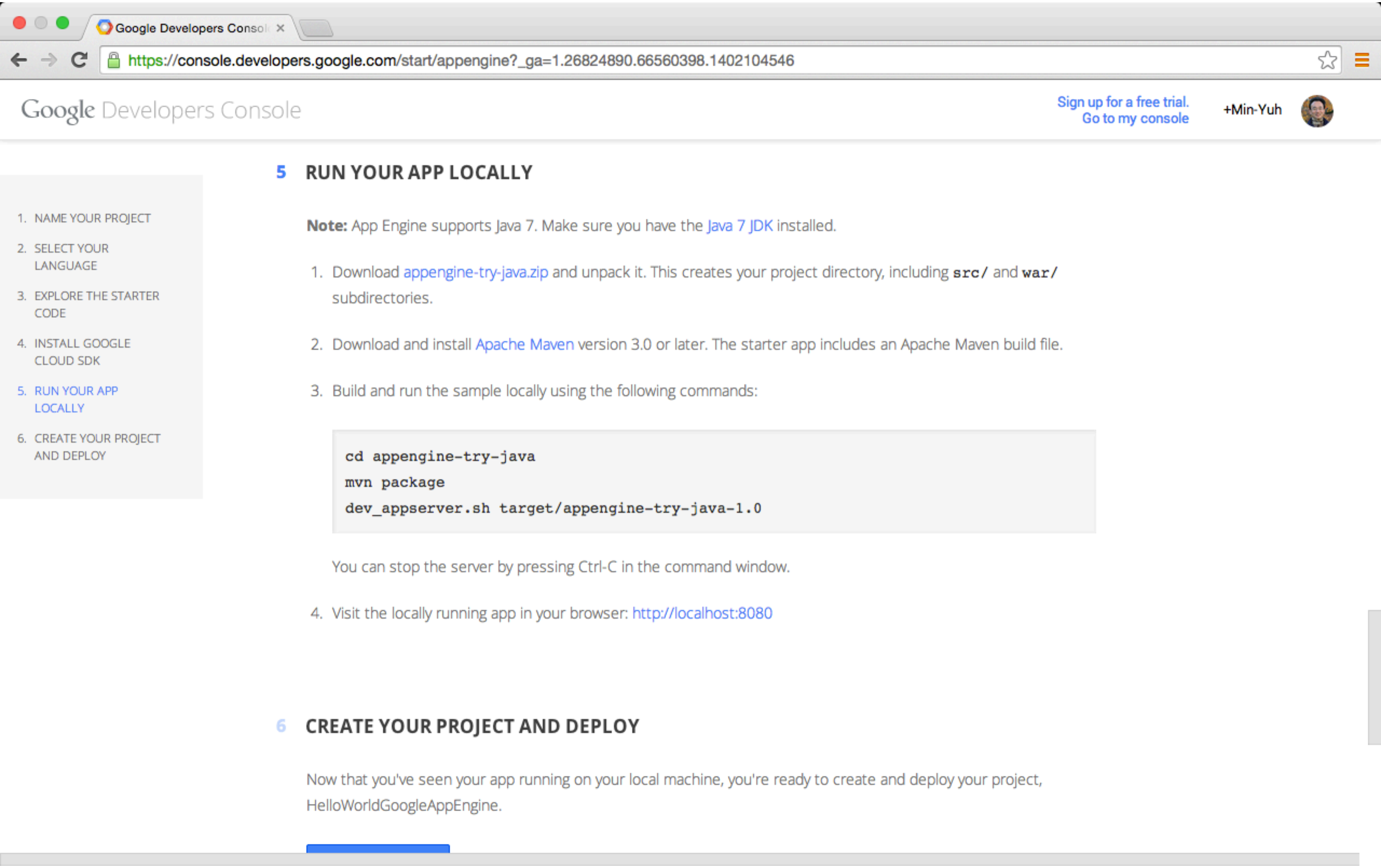
```
gcloud auth login
```

4. Install the App Engine package for Java using this command:

```
gcloud components update gae-java
```

5 RUN YOUR APP LOCALLY

Google App Engine



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5 RUN YOUR APP LOCALLY

Note: App Engine supports Java 7. Make sure you have the Java 7 JDK installed.

1. Download appengine-try-java.zip and unpack it. This creates your project directory, including `src/` and `war/` subdirectories.
2. Download and install Apache Maven version 3.0 or later. The starter app includes an Apache Maven build file.
3. Build and run the sample locally using the following commands:

```
cd appengine-try-java
mvn package
dev_appserver.sh target/appengine-try-java-1.0
```

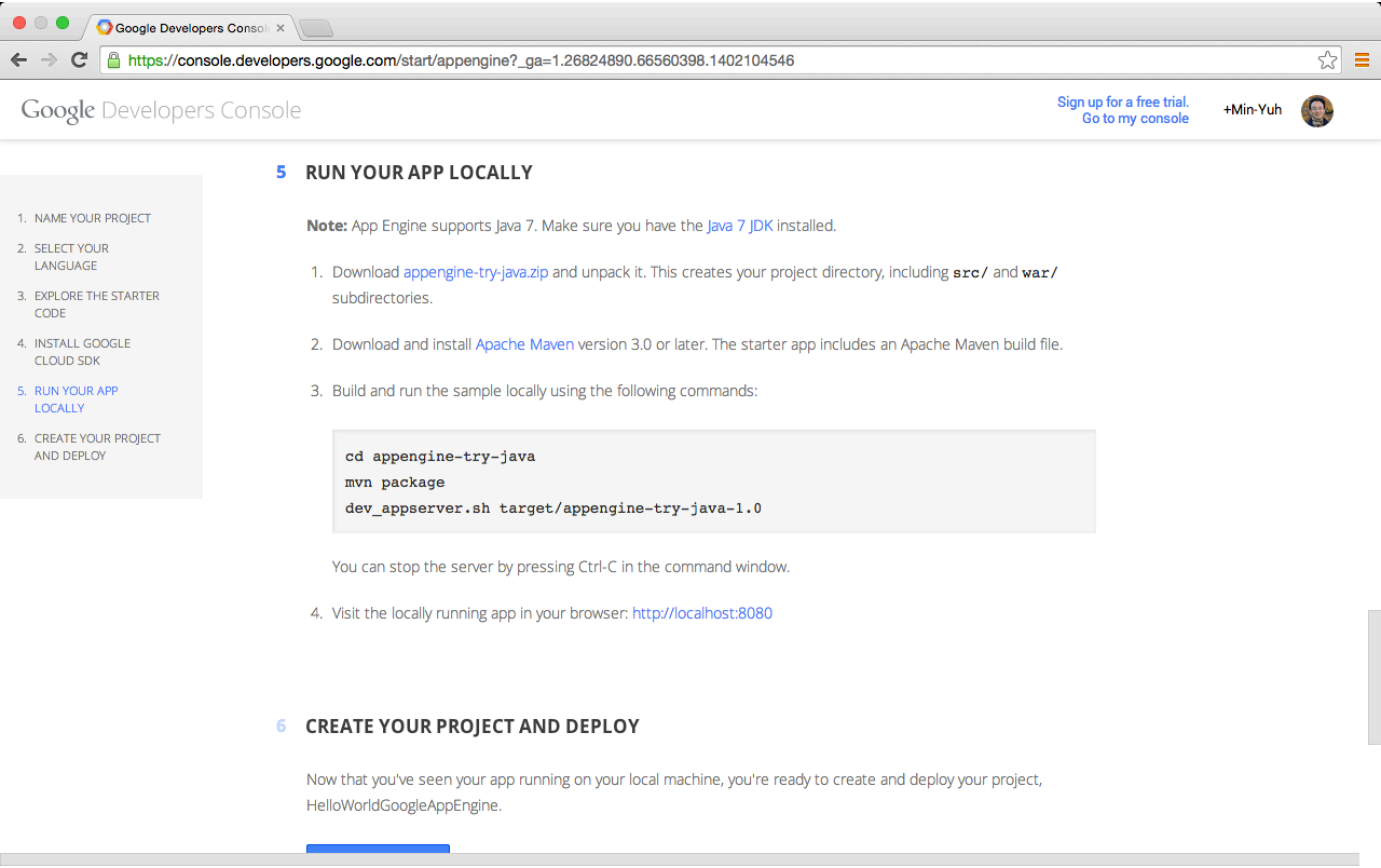
You can stop the server by pressing Ctrl-C in the command window.

4. Visit the locally running app in your browser: http://localhost:8080

6 CREATE YOUR PROJECT AND DEPLOY

Now that you've seen your app running on your local machine, you're ready to create and deploy your project, HelloWorldGoogleAppEngine.

Google App Engine



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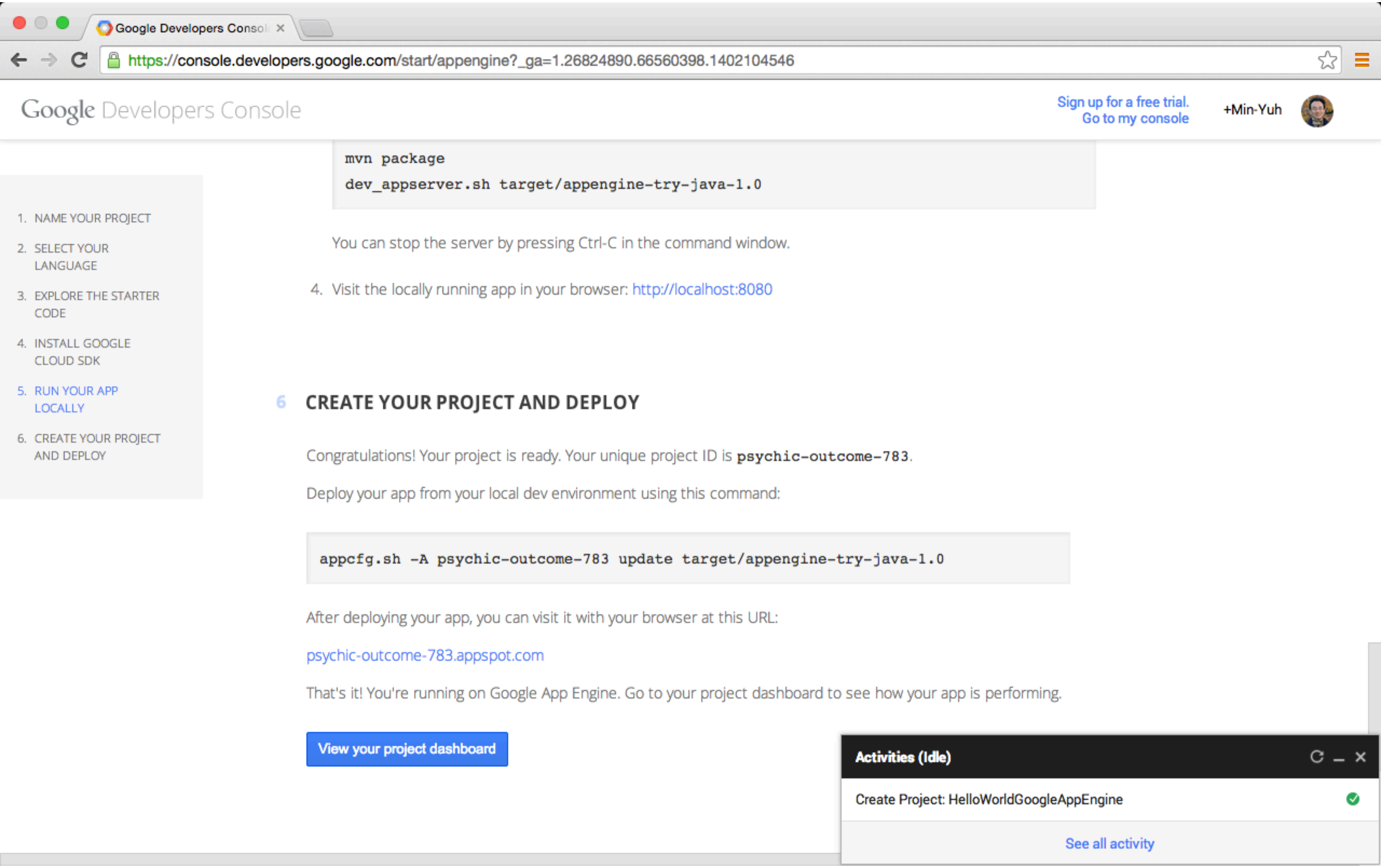
Google App Engine



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```
mvn package
dev_appserver.sh target/appengine-try-java-1.0
```

You can stop the server by pressing Ctrl-C in the command window.

4. Visit the locally running app in your browser: http://localhost:8080

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6 CREATE YOUR PROJECT AND DEPLOY

Congratulations! Your project is ready. Your unique project ID is **psychic-outcome-783**.

Deploy your app from your local dev environment using this command:

```
appcfg.sh -A psychic-outcome-783 update target/appengine-try-java-1.0
```

After deploying your app, you can visit it with your browser at this URL:

psychic-outcome-783.appspot.com

That's it! You're running on Google App Engine. Go to your project dashboard to see how your app is performing.

Create Project: HelloWorldGoogleAppEngine ✓

Google App Engine
Build an App Engine Application using Python

Creating a Guestbook

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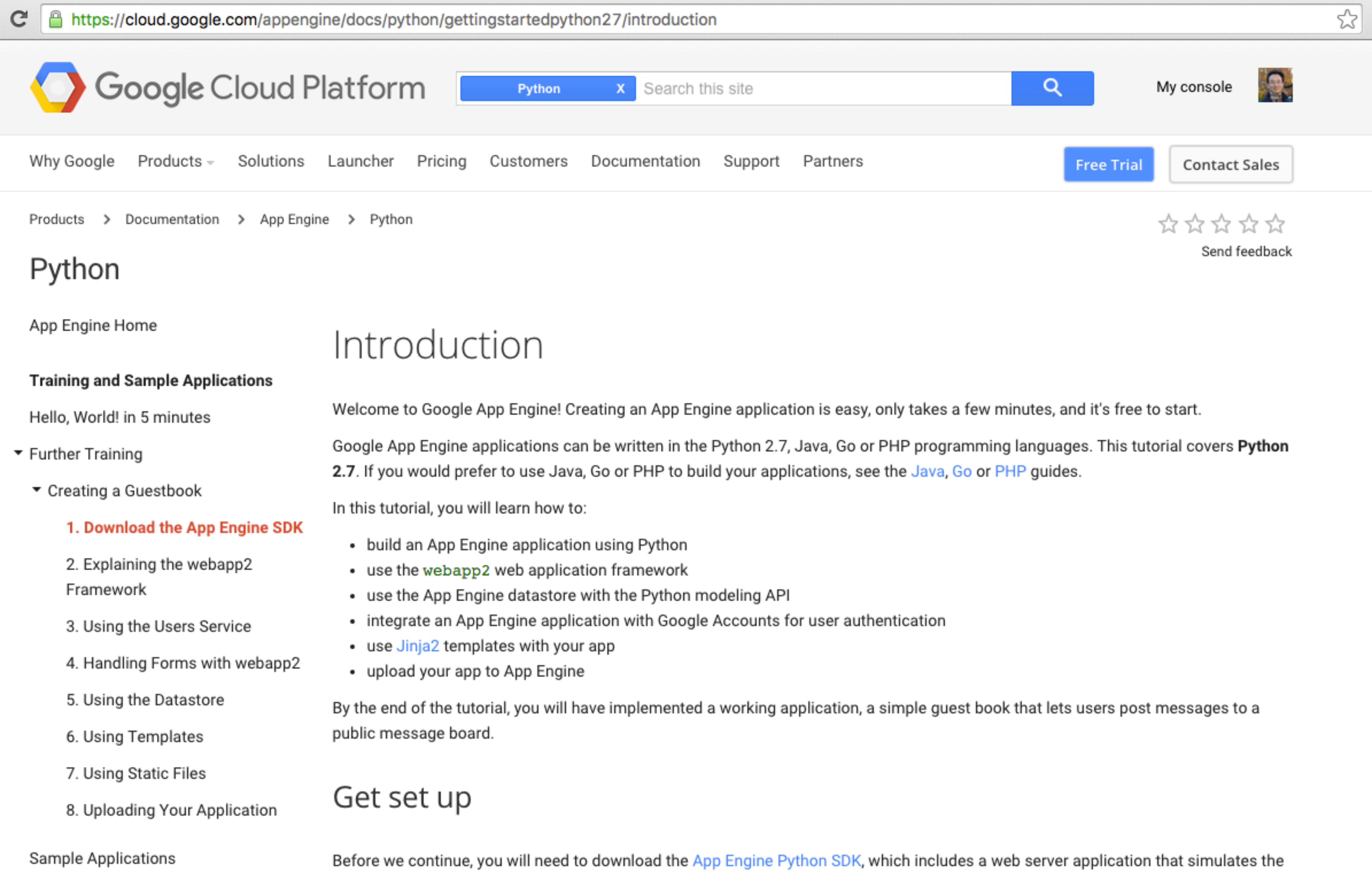

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Introduction

Welcome to Google App Engine! Creating an App Engine application is easy, only takes a few minutes, and it's free to start.

Google App Engine applications can be written in the Python 2.7, Java, Go or PHP programming languages. This tutorial covers **Python 2.7**. If you would prefer to use Java, Go or PHP to build your applications, see the Java, Go or PHP guides.

In this tutorial, you will learn how to:

- build an App Engine application using Python
- use the `webapp2` web application framework
- use the App Engine datastore with the Python modeling API
- integrate an App Engine application with Google Accounts for user authentication
- use Jinja2 templates with your app
- upload your app to App Engine

By the end of the tutorial, you will have implemented a working application, a simple guest book that lets users post messages to a public message board.

Get set up

Before we continue, you will need to download the App Engine Python SDK, which includes a web server application that simulates the

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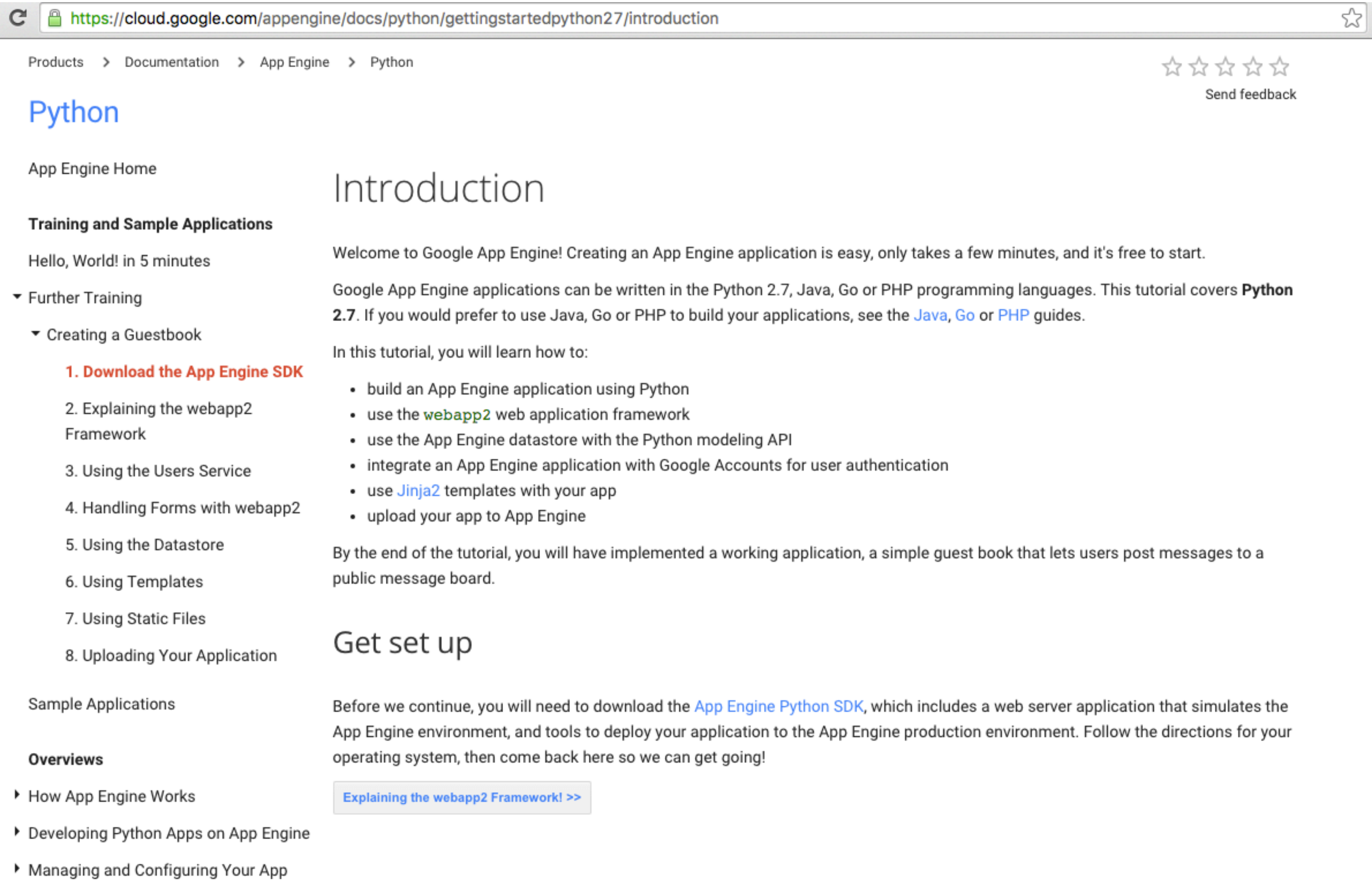

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- Managing and Configuring Your App

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By the end of the tutorial, you will have implemented a working application, a simple guest book that lets users post messages to a public message board.

Get set up

Before we continue, you will need to download the App Engine Python SDK, which includes a web server application that simulates the App Engine environment, and tools to deploy your application to the App Engine production environment. Follow the directions for your operating system, then come back here so we can get going!

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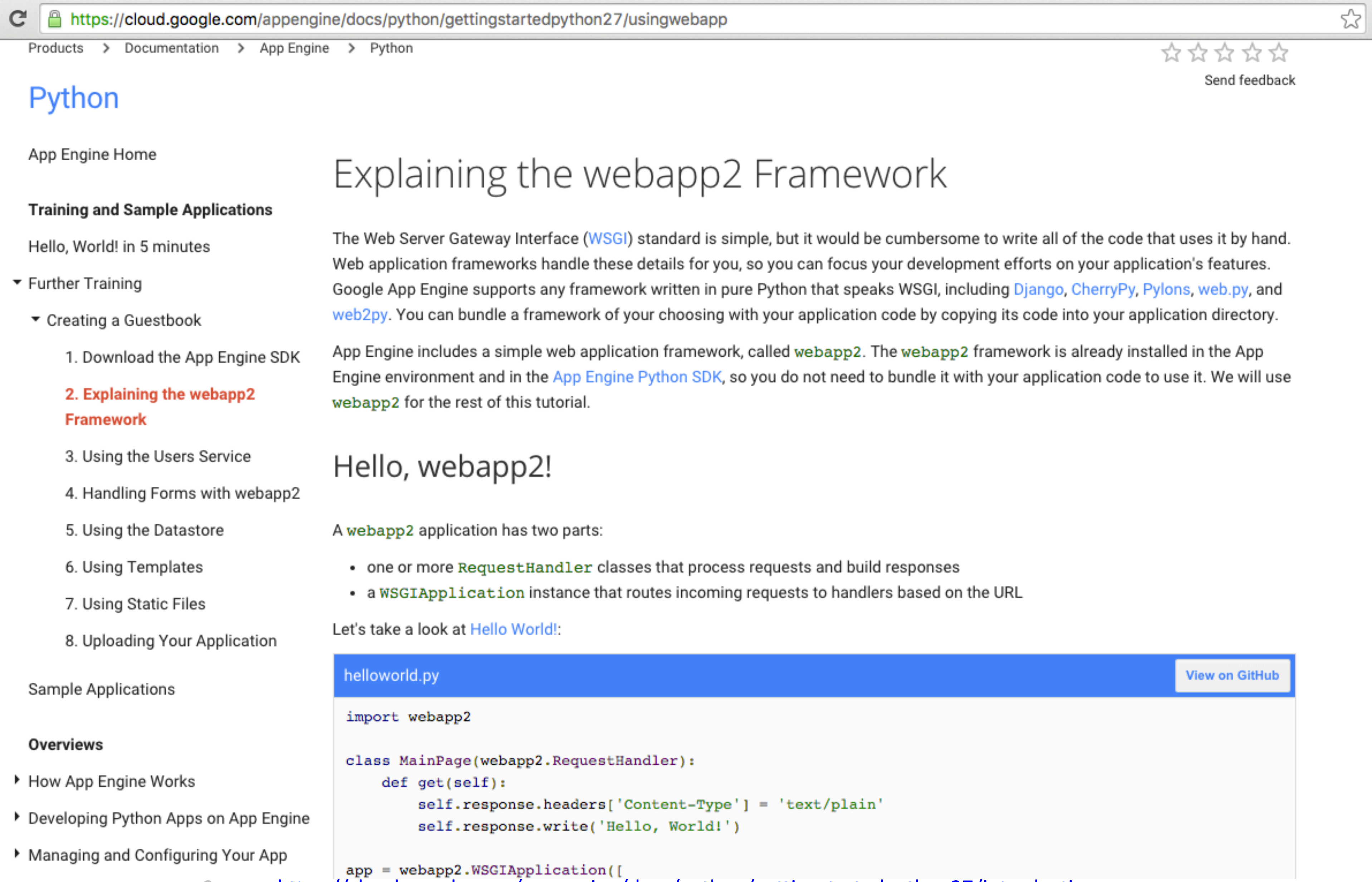

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Explaining the webapp2 Framework

The Web Server Gateway Interface (WSGI) standard is simple, but it would be cumbersome to write all of the code that uses it by hand. Web application frameworks handle these details for you, so you can focus your development efforts on your application's features. Google App Engine supports any framework written in pure Python that speaks WSGI, including Django, CherryPy, Pylons, web.py, and web2py. You can bundle a framework of your choosing with your application code by copying its code into your application directory.

App Engine includes a simple web application framework, called `webapp2`. The `webapp2` framework is already installed in the App Engine environment and in the App Engine Python SDK, so you do not need to bundle it with your application code to use it. We will use `webapp2` for the rest of this tutorial.

Hello, webapp2!

A `webapp2` application has two parts:

- one or more `RequestHandler` classes that process requests and build responses
- a `WSGIApplication` instance that routes incoming requests to handlers based on the URL

Let's take a look at Hello World!:

helloworld.py

View on GitHub

```
import webapp2

class MainPage(webapp2.RequestHandler):
    def get(self):
        self.response.headers['Content-Type'] = 'text/plain'
        self.response.write('Hello, World!')

app = webapp2.WSGIApplication([
```

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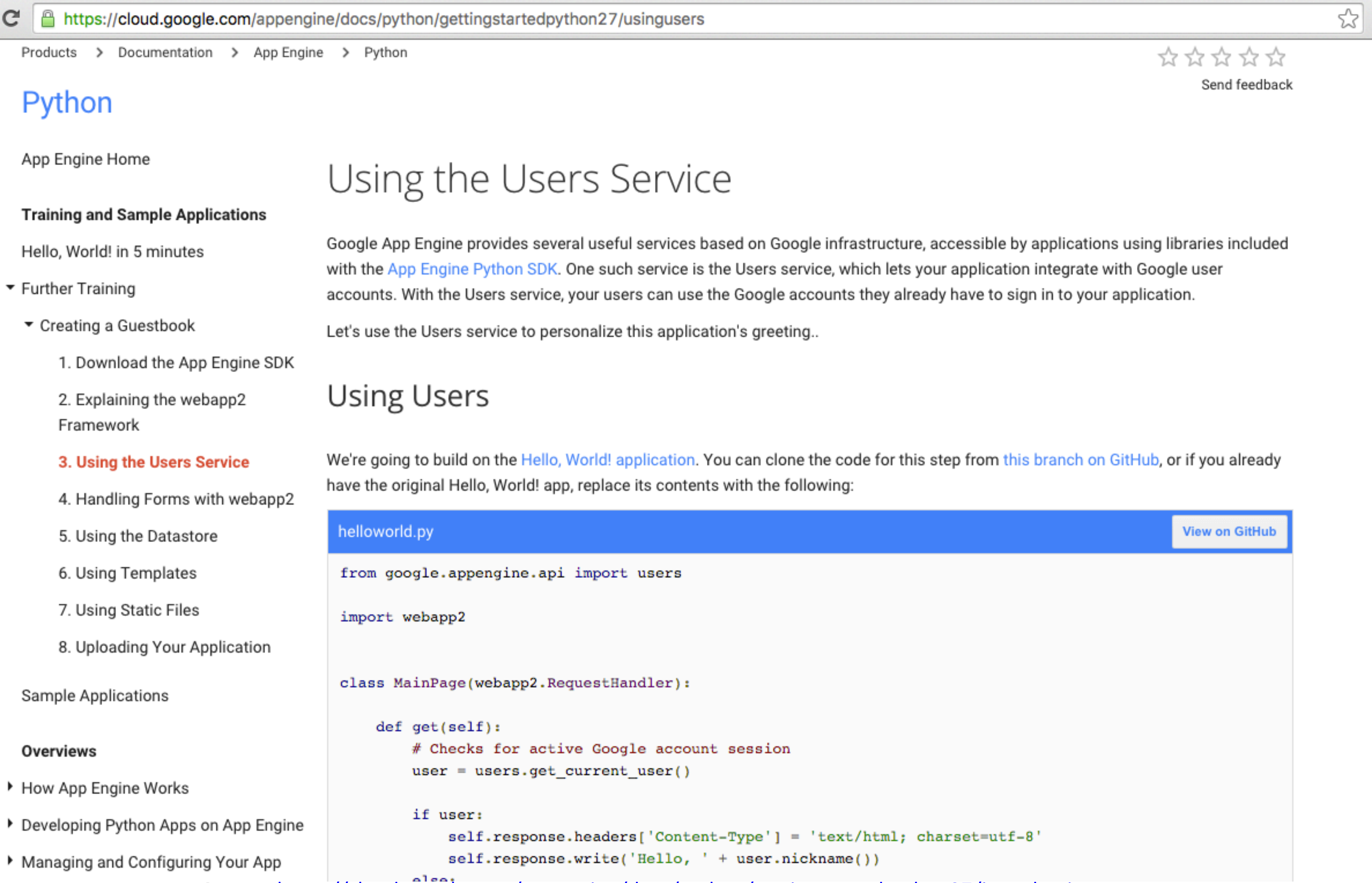

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Using the Users Service

Google App Engine provides several useful services based on Google infrastructure, accessible by applications using libraries included with the App Engine Python SDK. One such service is the Users service, which lets your application integrate with Google user accounts. With the Users service, your users can use the Google accounts they already have to sign in to your application.

Let's use the Users service to personalize this application's greeting..

Using Users

We're going to build on the Hello, World! application. You can clone the code for this step from this branch on GitHub, or if you already have the original Hello, World! app, replace its contents with the following:

helloworld.py   View on GitHub

```python
from google.appengine.api import users

import webapp2


class MainPage(webapp2.RequestHandler):

    def get(self):
        # Checks for active Google account session
        user = users.get_current_user()

        if user:
            self.response.headers['Content-Type'] = 'text/html; charset=utf-8'
            self.response.write('Hello, ' + user.nickname())
        else:
```

Source: https://cloud.google.com/appengine/docs/python/gettingstartedpython27/introduction

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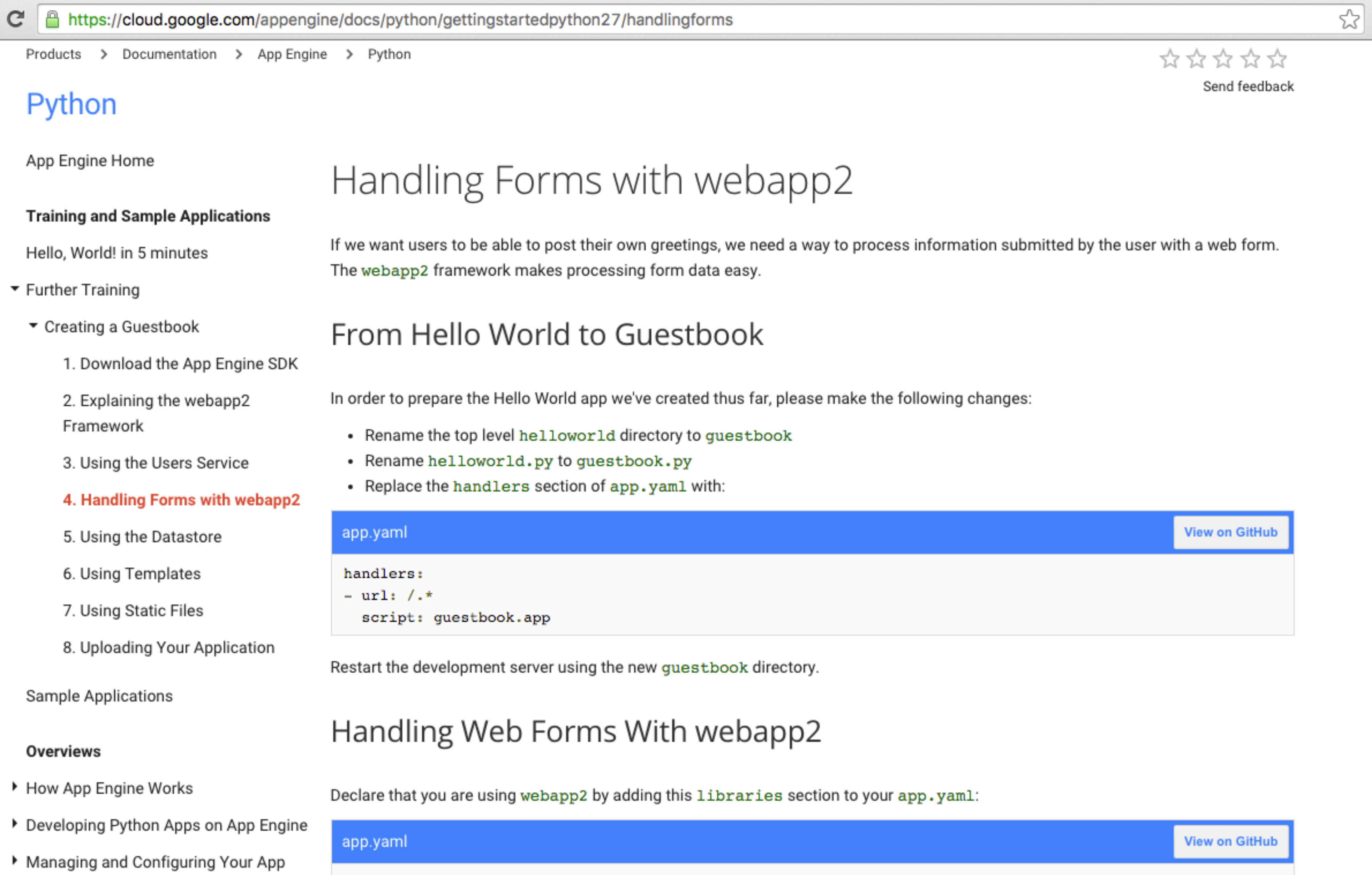

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Handling Forms with webapp2

If we want users to be able to post their own greetings, we need a way to process information submitted by the user with a web form. The `webapp2` framework makes processing form data easy.

From Hello World to Guestbook

In order to prepare the Hello World app we've created thus far, please make the following changes:

- Rename the top level `helloworld` directory to `guestbook`
- Rename `helloworld.py` to `guestbook.py`
- Replace the `handlers` section of `app.yaml` with:

app.yaml — View on GitHub

```
handlers:
- url: /.*
  script: guestbook.app
```

Restart the development server using the new `guestbook` directory.

Handling Web Forms With webapp2

Declare that you are using `webapp2` by adding this `libraries` section to your `app.yaml`:

app.yaml — View on GitHub

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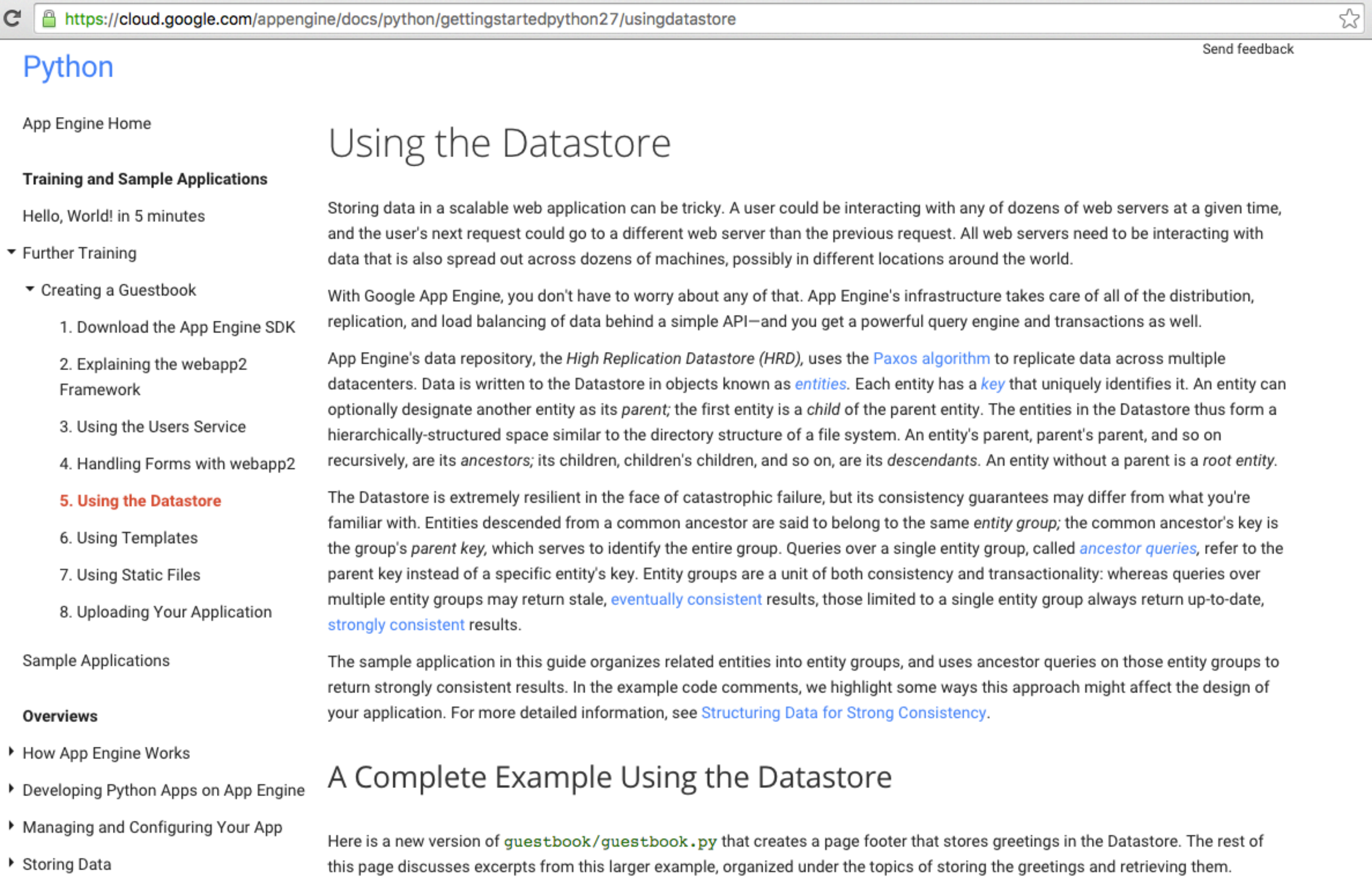
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Storing Data

Using the Datastore

Storing data in a scalable web application can be tricky. A user could be interacting with any of dozens of web servers at a given time, and the user's next request could go to a different web server than the previous request. All web servers need to be interacting with data that is also spread out across dozens of machines, possibly in different locations around the world.

With Google App Engine, you don't have to worry about any of that. App Engine's infrastructure takes care of all of the distribution, replication, and load balancing of data behind a simple API—and you get a powerful query engine and transactions as well.

App Engine's data repository, the *High Replication Datastore (HRD)*, uses the Paxos algorithm to replicate data across multiple datacenters. Data is written to the Datastore in objects known as *entities*. Each entity has a *key* that uniquely identifies it. An entity can optionally designate another entity as its *parent;* the first entity is a *child* of the parent entity. The entities in the Datastore thus form a hierarchically-structured space similar to the directory structure of a file system. An entity's parent, parent's parent, and so on recursively, are its *ancestors;* its children, children's children, and so on, are its *descendants*. An entity without a parent is a *root entity*.

The Datastore is extremely resilient in the face of catastrophic failure, but its consistency guarantees may differ from what you're familiar with. Entities descended from a common ancestor are said to belong to the same *entity group;* the common ancestor's key is the group's *parent key*, which serves to identify the entire group. Queries over a single entity group, called *ancestor queries*, refer to the parent key instead of a specific entity's key. Entity groups are a unit of both consistency and transactionality: whereas queries over multiple entity groups may return stale, eventually consistent results, those limited to a single entity group always return up-to-date, strongly consistent results.

The sample application in this guide organizes related entities into entity groups, and uses ancestor queries on those entity groups to return strongly consistent results. In the example code comments, we highlight some ways this approach might affect the design of your application. For more detailed information, see Structuring Data for Strong Consistency.

A Complete Example Using the Datastore

Here is a new version of `guestbook/guestbook.py` that creates a page footer that stores greetings in the Datastore. The rest of this page discusses excerpts from this larger example, organized under the topics of storing the greetings and retrieving them.

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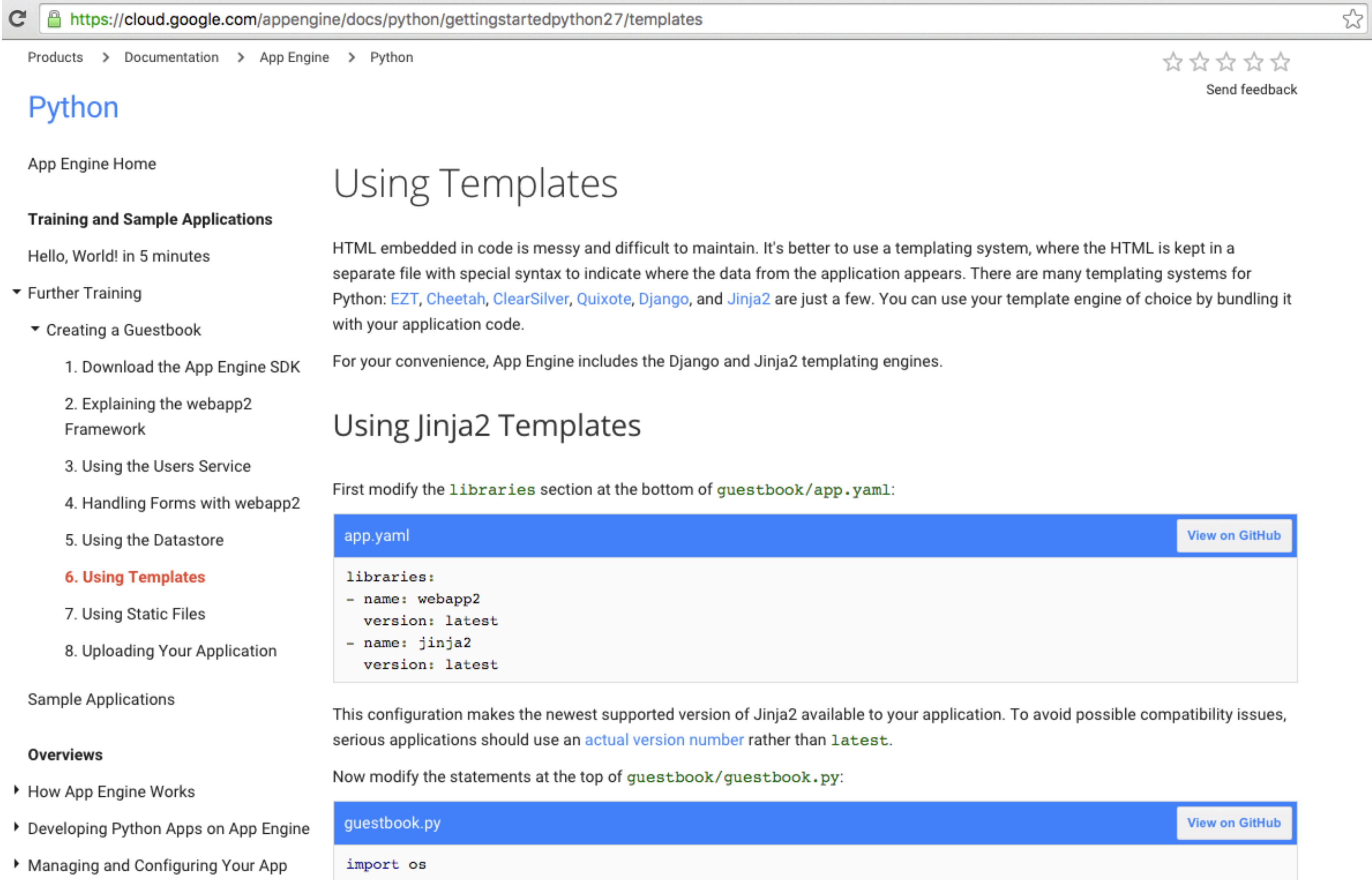
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Using Templates

HTML embedded in code is messy and difficult to maintain. It's better to use a templating system, where the HTML is kept in a separate file with special syntax to indicate where the data from the application appears. There are many templating systems for Python: EZT, Cheetah, ClearSilver, Quixote, Django, and Jinja2 are just a few. You can use your template engine of choice by bundling it with your application code.

For your convenience, App Engine includes the Django and Jinja2 templating engines.

Using Jinja2 Templates

First modify the `libraries` section at the bottom of `guestbook/app.yaml`:

app.yaml

```
libraries:
- name: webapp2
  version: latest
- name: jinja2
  version: latest
```

This configuration makes the newest supported version of Jinja2 available to your application. To avoid possible compatibility issues, serious applications should use an actual version number rather than `latest`.

Now modify the statements at the top of `guestbook/guestbook.py`:

guestbook.py

```
import os
```

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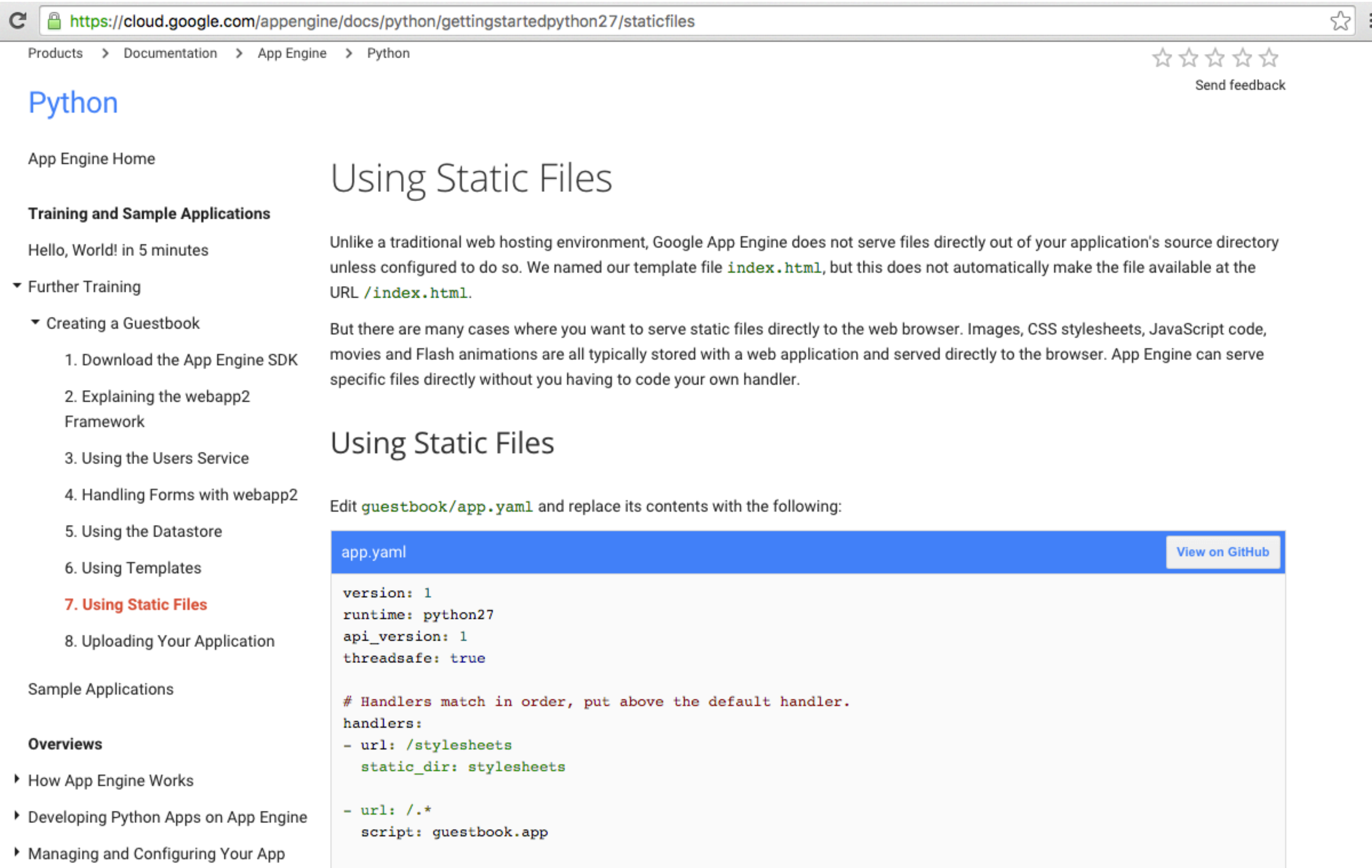

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Using Static Files

Unlike a traditional web hosting environment, Google App Engine does not serve files directly out of your application's source directory unless configured to do so. We named our template file `index.html`, but this does not automatically make the file available at the URL `/index.html`.

But there are many cases where you want to serve static files directly to the web browser. Images, CSS stylesheets, JavaScript code, movies and Flash animations are all typically stored with a web application and served directly to the browser. App Engine can serve specific files directly without you having to code your own handler.

Using Static Files

Edit `guestbook/app.yaml` and replace its contents with the following:

app.yaml

```
version: 1
runtime: python27
api_version: 1
threadsafe: true

# Handlers match in order, put above the default handler.
handlers:
- url: /stylesheets
  static_dir: stylesheets

- url: /.*
  script: guestbook.app
```

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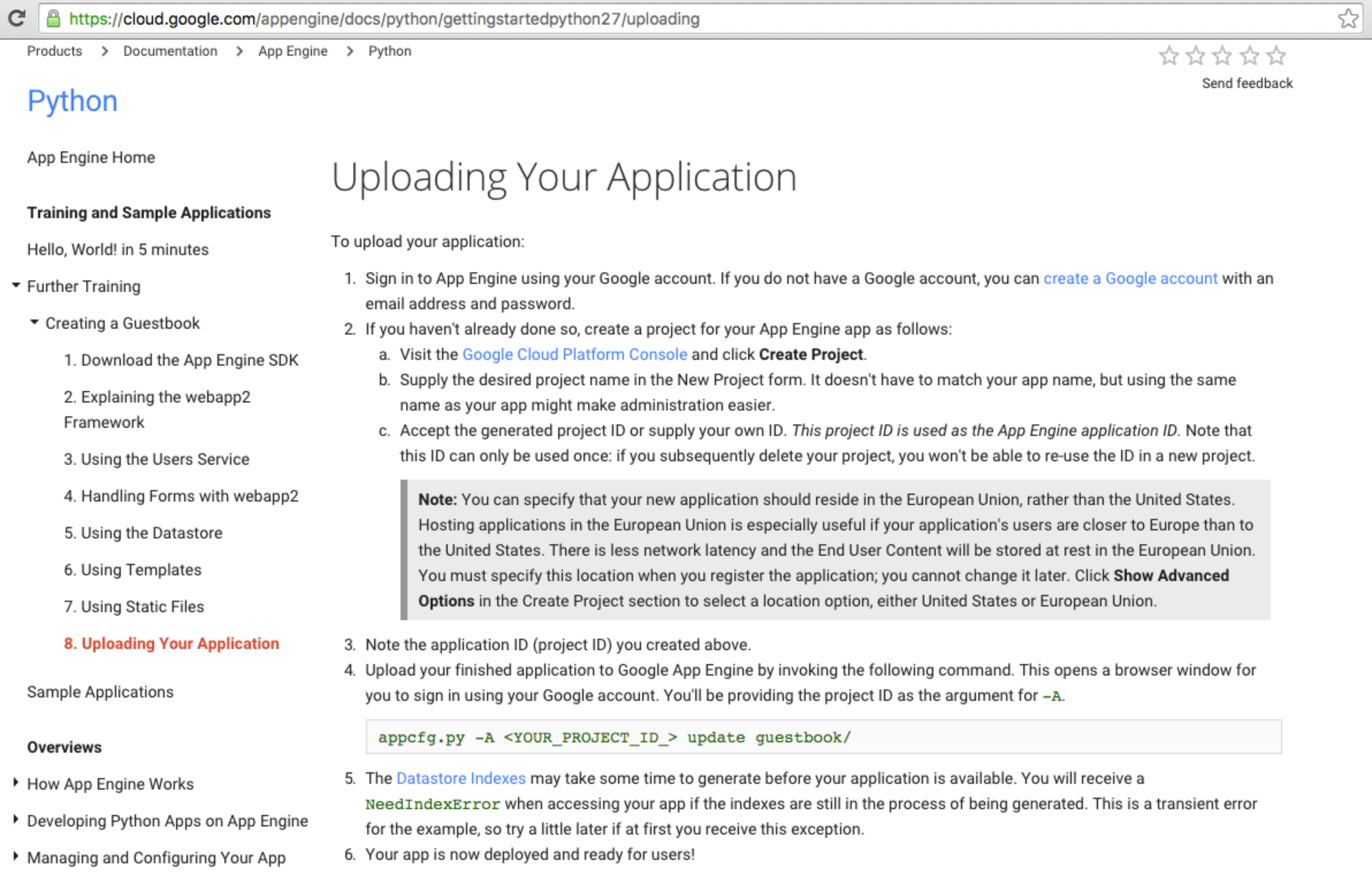
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Uploading Your Application

To upload your application:

1. Sign in to App Engine using your Google account. If you do not have a Google account, you can create a Google account with an email address and password.
2. If you haven't already done so, create a project for your App Engine app as follows:
   a. Visit the Google Cloud Platform Console and click **Create Project**.
   b. Supply the desired project name in the New Project form. It doesn't have to match your app name, but using the same name as your app might make administration easier.
   c. Accept the generated project ID or supply your own ID. *This project ID is used as the App Engine application ID.* Note that this ID can only be used once: if you subsequently delete your project, you won't be able to re-use the ID in a new project.

> **Note:** You can specify that your new application should reside in the European Union, rather than the United States. Hosting applications in the European Union is especially useful if your application's users are closer to Europe than to the United States. There is less network latency and the End User Content will be stored at rest in the European Union. You must specify this location when you register the application; you cannot change it later. Click **Show Advanced Options** in the Create Project section to select a location option, either United States or European Union.

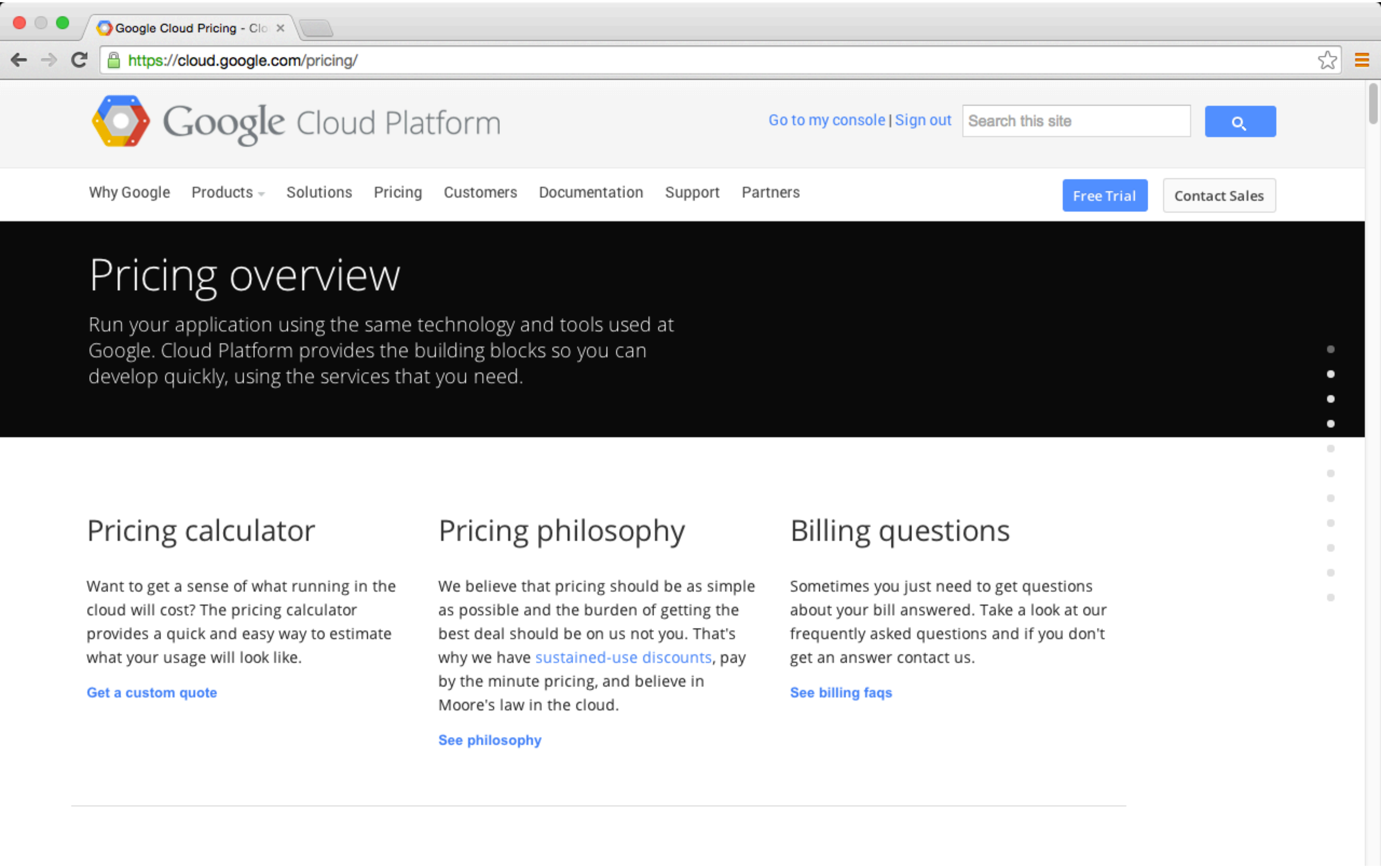
3. Note the application ID (project ID) you created above.
4. Upload your finished application to Google App Engine by invoking the following command. This opens a browser window for you to sign in using your Google account. You'll be providing the project ID as the argument for `-A`.

```
appcfg.py -A <YOUR_PROJECT_ID_> update guestbook/
```

5. The Datastore Indexes may take some time to generate before your application is available. You will receive a `NeedIndexError` when accessing your app if the indexes are still in the process of being generated. This is a transient error for the example, so try a little later if at first you receive this exception.
6. Your app is now deployed and ready for users!

Source: https://cloud.google.com/appengine/docs/python/gettingstartedpython27/introduction

Google Cloud Platform



Pricing overview

Run your application using the same technology and tools used at Google. Cloud Platform provides the building blocks so you can develop quickly, using the services that you need.

Pricing calculator

Want to get a sense of what running in the cloud will cost? The pricing calculator provides a quick and easy way to estimate what your usage will look like.

Get a custom quote

Pricing philosophy

We believe that pricing should be as simple as possible and the burden of getting the best deal should be on us not you. That's why we have sustained-use discounts, pay by the minute pricing, and believe in Moore's law in the cloud.

See philosophy

Billing questions

Sometimes you just need to get questions about your bill answered. Take a look at our frequently asked questions and if you don't get an answer contact us.

See billing faqs

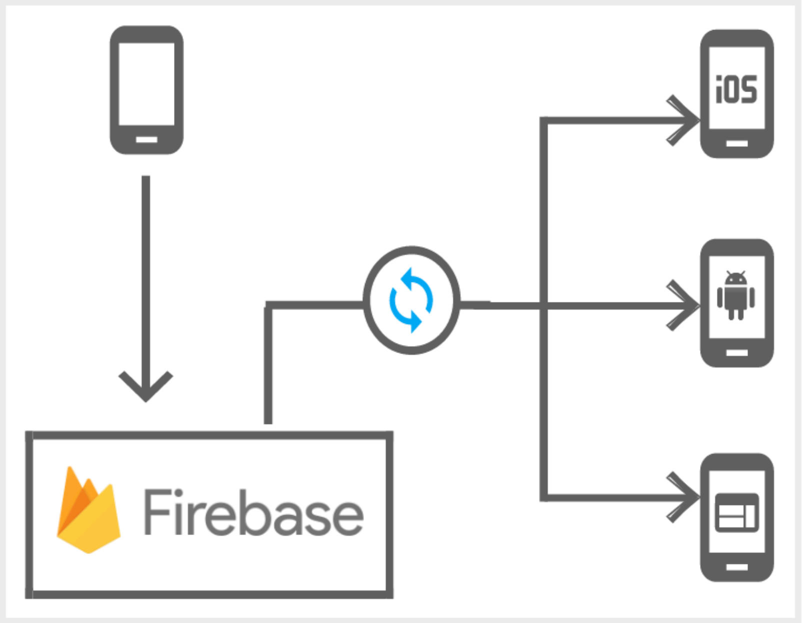
Google Cloud Platform

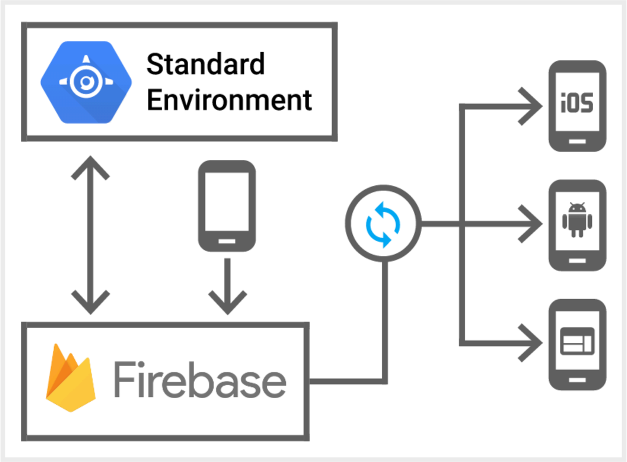
- Google Cloud Platform is a set of modular cloud-based services that allow you to create anything from simple websites to complex applications.

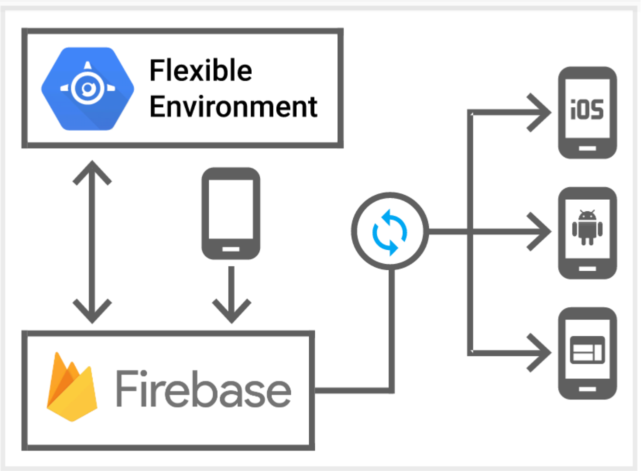
Google Cloud Platform

Source: https://cloud.google.com/

Mobile App Backend Services





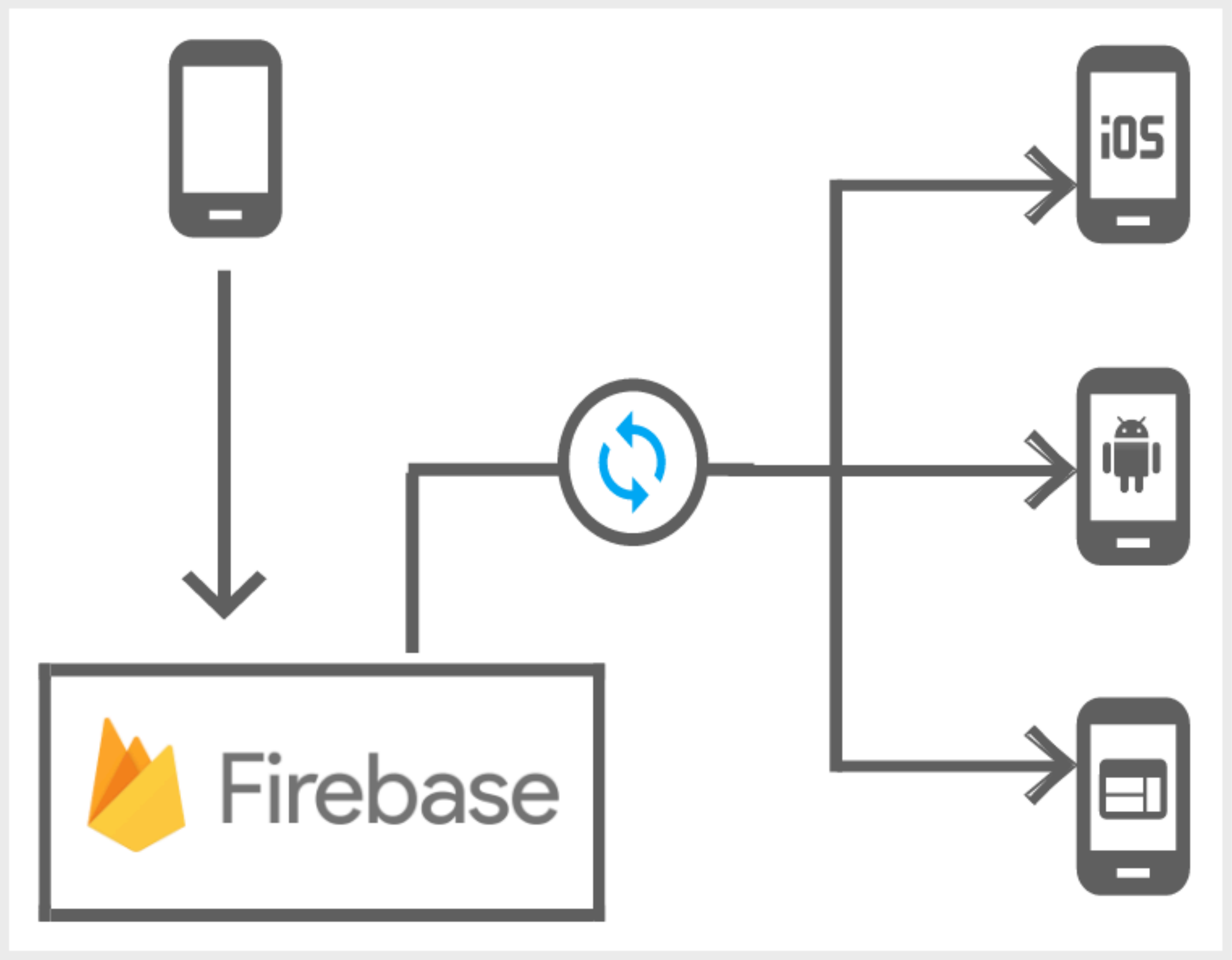


Source: https://cloud.google.com/solutions/mobile/mobile-app-backend-services

Firebase: Backend as a Service (BaaS)

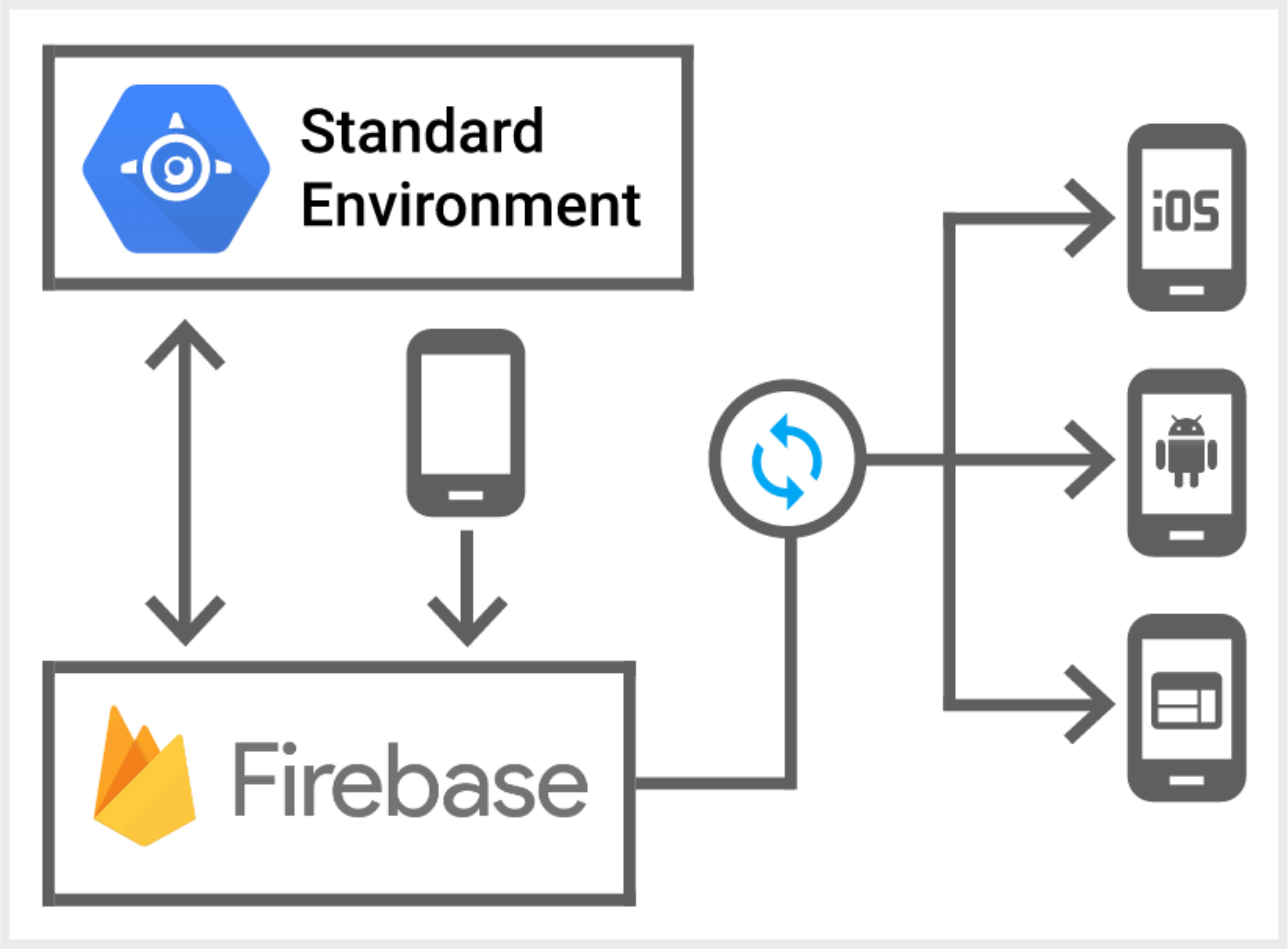
Source: https://firebase.google.com/

Mobile App Backend Services



Source: https://cloud.google.com/solutions/mobile/mobile-app-backend-services

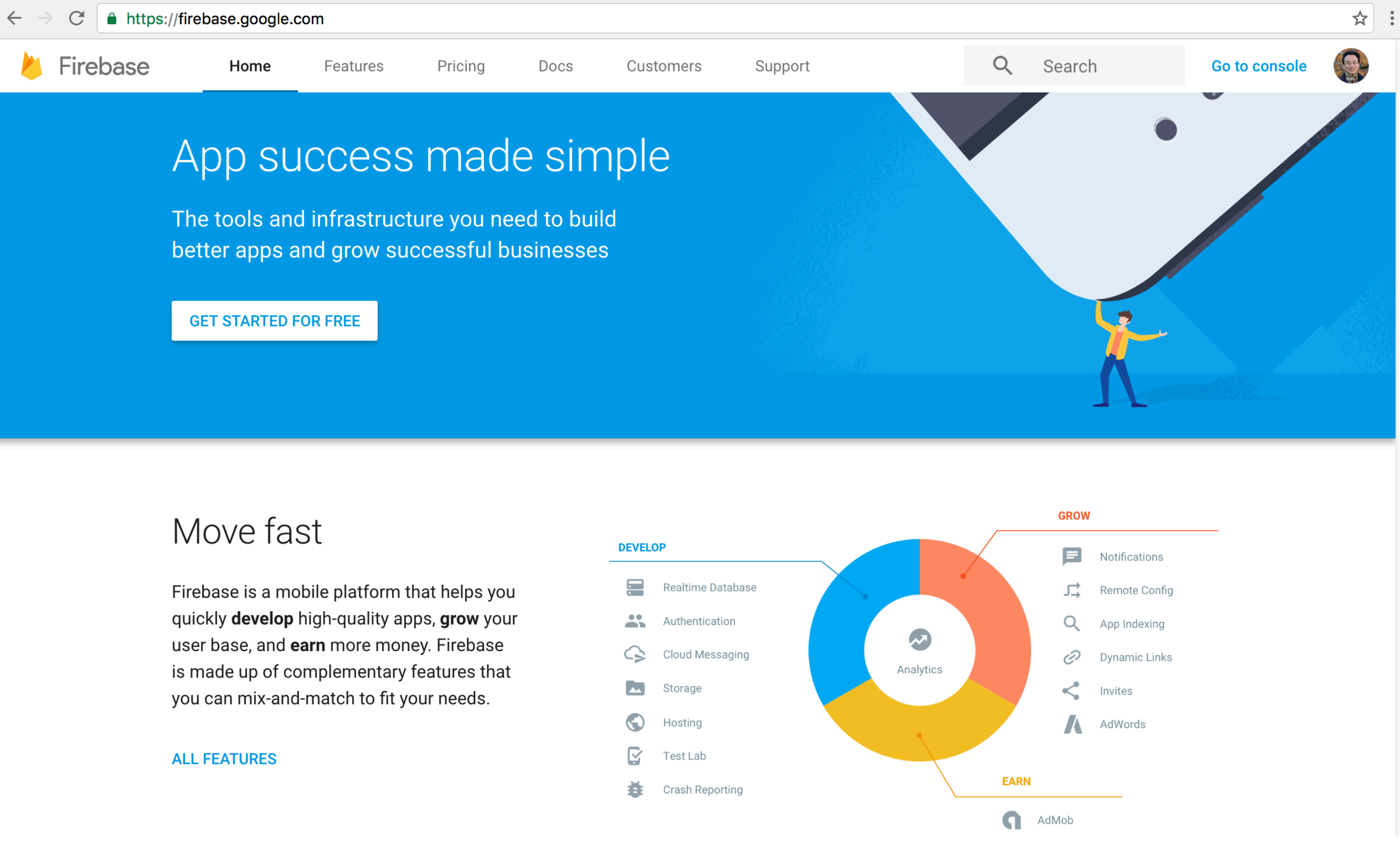
Mobile App Backend Services



Source: https://cloud.google.com/solutions/mobile/mobile-app-backend-services

Firebase

Firebase



https://firebase.google.com

App success made simple

The tools and infrastructure you need to build better apps and grow successful businesses

Move fast

Firebase is a mobile platform that helps you quickly **develop** high-quality apps, **grow** your user base, and **earn** more money. Firebase is made up of complementary features that you can mix-and-match to fit your needs.

Source: https://firebase.google.com/

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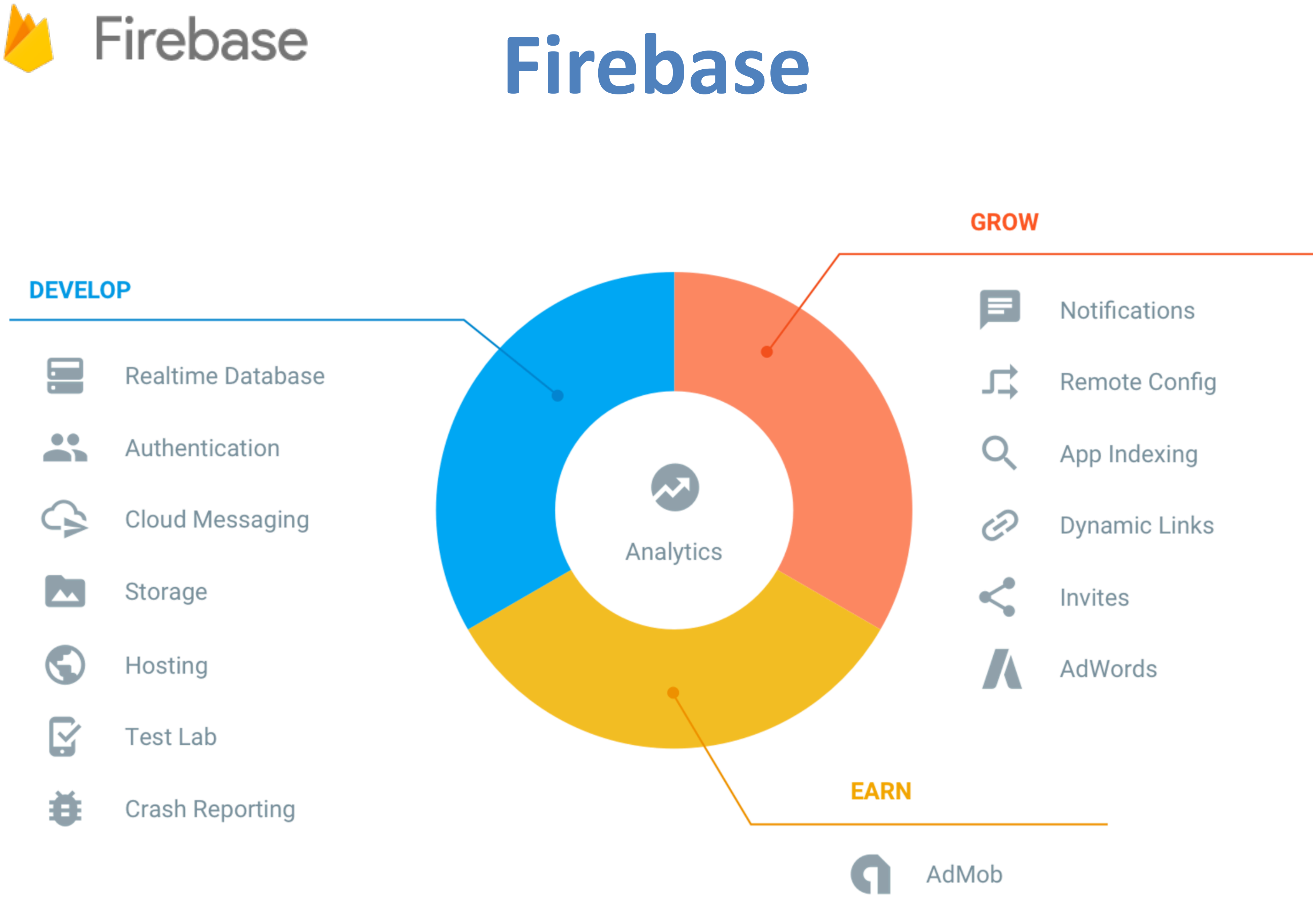
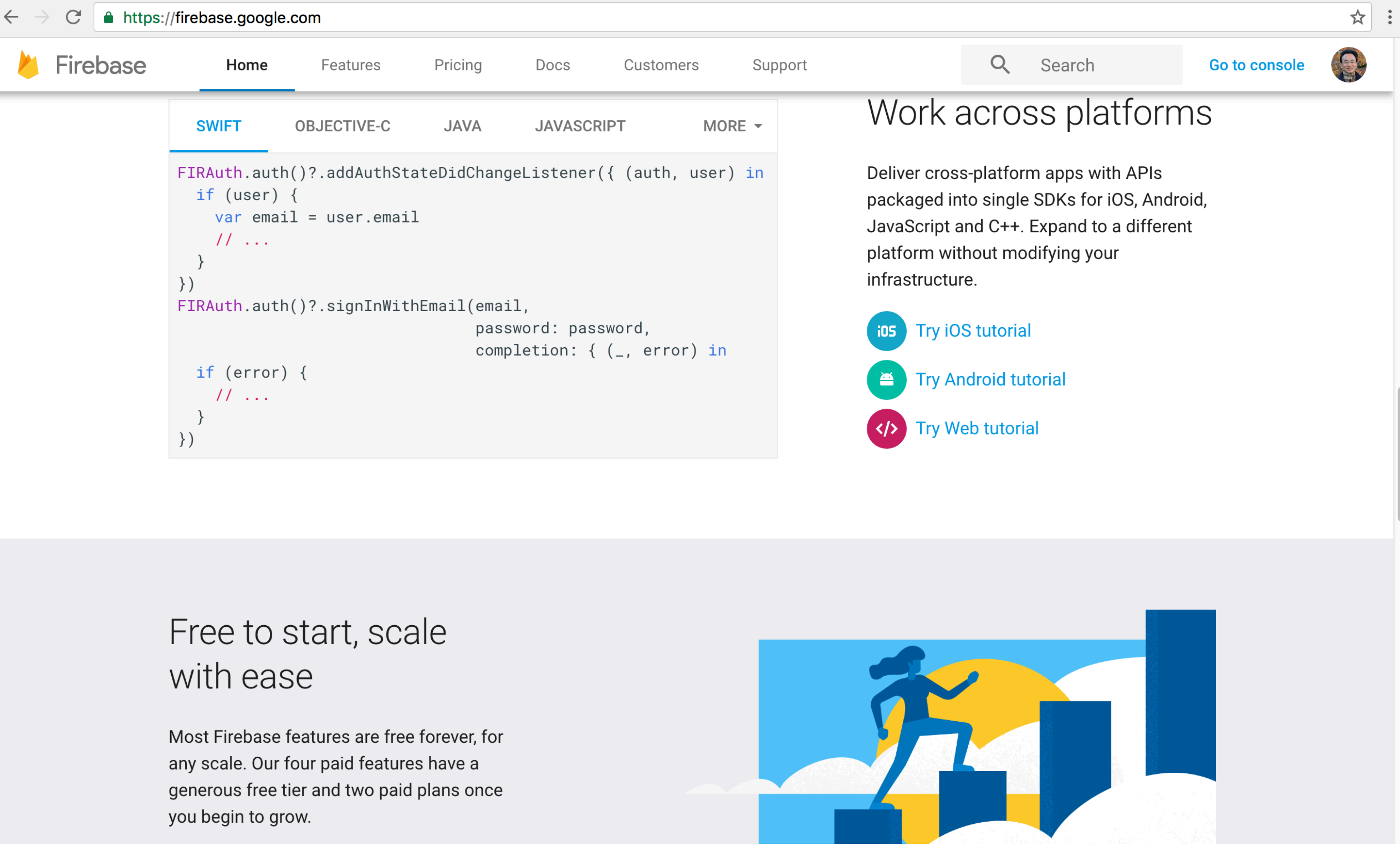
Firebase



Source: https://firebase.google.com/

Firebase



https://firebase.google.com

```
FIRAuth.auth()?.addAuthStateDidChangeListener({ (auth, user) in
  if (user) {
    var email = user.email
    // ...
  }
})
FIRAuth.auth()?.signInWithEmail(email,
                                password: password,
                                completion: { (_, error) in

  if (error) {
    // ...
  }
})
```

Work across platforms

Deliver cross-platform apps with APIs packaged into single SDKs for iOS, Android, JavaScript and C++. Expand to a different platform without modifying your infrastructure.

- Try iOS tutorial
- Try Android tutorial
- Try Web tutorial

Free to start, scale with ease

Most Firebase features are free forever, for any scale. Our four paid features have a generous free tier and two paid plans once you begin to grow.

Source: https://firebase.google.com/

Summary

- Google Cloud Platform
  - Google App Engine
  - Google Cloud Datastore
  - Google Cloud Endpoints
- Firebase
- Mobile App with Google Cloud Platform

References

- Google Cloud Platform, https://cloud.google.com/
- Google App Engine, https://cloud.google.com/appengine/
- Google Cloud Datastore, https://cloud.google.com/datastore/
- Google Cloud Endpoints, https://cloud.google.com/endpoints/
- Google Firebase https://firebase.google.com/