Tamkang University

Social Media Apps Programming

Google App Engine and Google Maps API

1021SMAP10
TLMXM1A (8687) (M2143) (Fall 2013)
(MIS MBA) (2 Credits, Elective) [Full English Course]
Thu 9,10 (16:10-18:00) V201

Min-Yuh Day, Ph.D.
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Department of Information Management
Tamkang University

http://mail.tku.edu.tw/myday

2013-12-19

Course Schedule (1/3)

Week Date Subject/Topics

- 1 2013/09/19 Mid-Autumn Festival (Day off)
- 2 2013/09/26 Course Orientation and Introduction to Social Media and Mobile Apps Programming
- 3 2013/10/03 Introduction to Android / iOS Apps Programming
- 4 2013/10/10 Double Tenth Day (Day off)
- 5 2013/10/17 Developing Android Native Apps with Java (Eclipse) (MIT App Inventor)
- 6 2013/10/24 Developing iPhone / iPad Native Apps with Objective-C (Xcode)

Course Schedule (2/3)

Week Date Subject/Topics

- 7 2013/10/31 Mobile Apps using HTML5/CSS3/JavaScript
- 8 2013/11/07 jQuery Mobile
- 9 2013/11/14 Create Hybrid Apps with PhoneGap
- 10 2013/11/21 Midterm Exam Week (Midterm Project Report)
- 11 2013/11/28 jQuery Mobile/Phonegap
- 12 2013/12/05 Invited Talk:
  Social, Mobile and Business Model in PIXNET
  [Invited Speaker: Dr. Rick Cheng-Yu Lu]

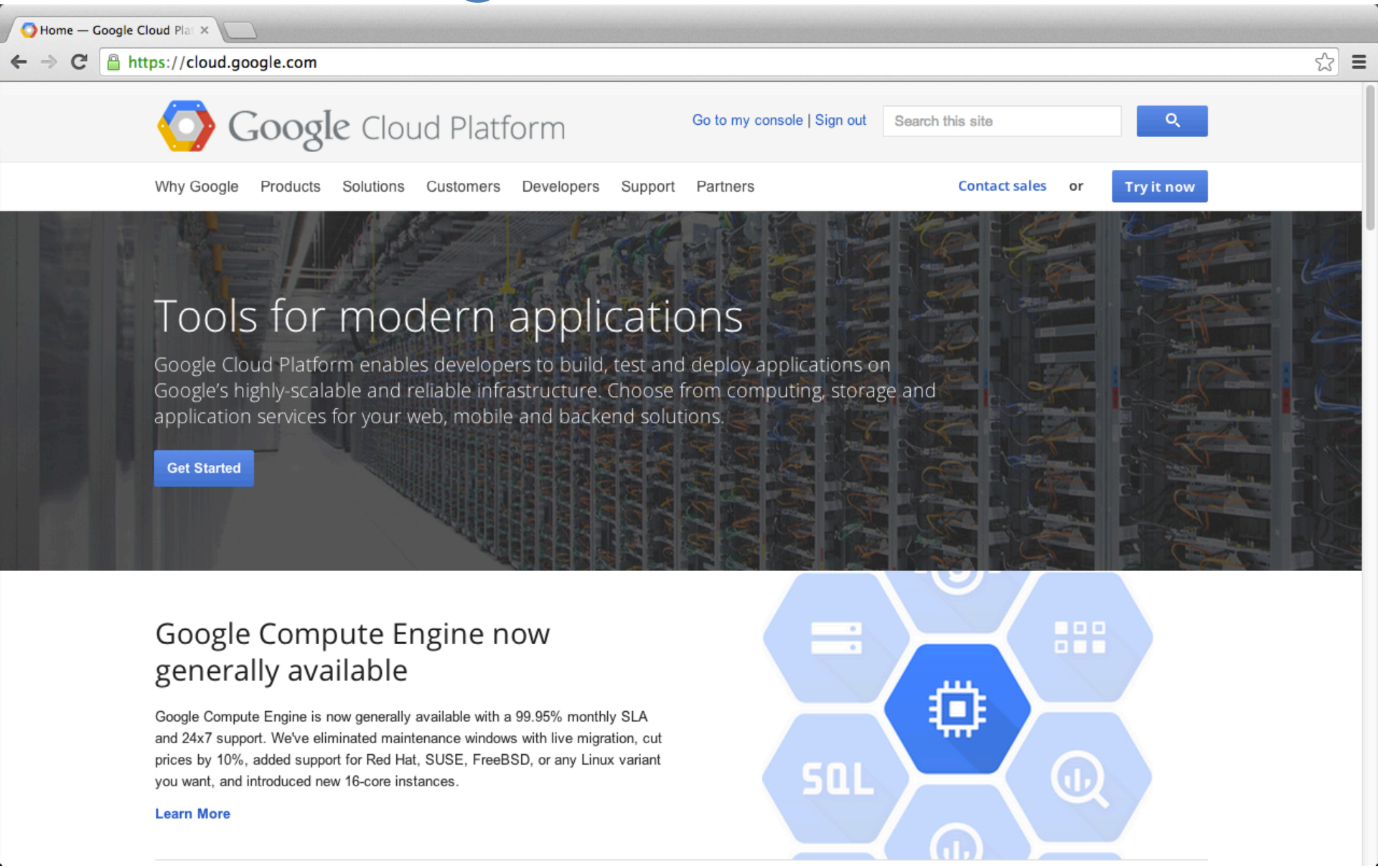
Course Schedule (3/3)

Week	Date	Subject/Topics
• 13	2013/12/12	Case Study on Social Media Apps Programming and Marketing in Google Play and App Store
• 14	2013/12/19	Google App Engine and Google Map API
• 15	2013/12/26	Facebook API (Facebook JavaScript SDK) (Integrate Facebook with iOS/Android Apps)
• 16	2014/01/02	Twitter API
• 17	2014/01/09	Final Project Presentation
• 18	2014/01/16	Final Exam Week (Final Project Report)

Outline

- Google App Engine
  - Google Cloud Platform
  - Google Cloud Datastore
- Google Maps API

Google Cloud Platform



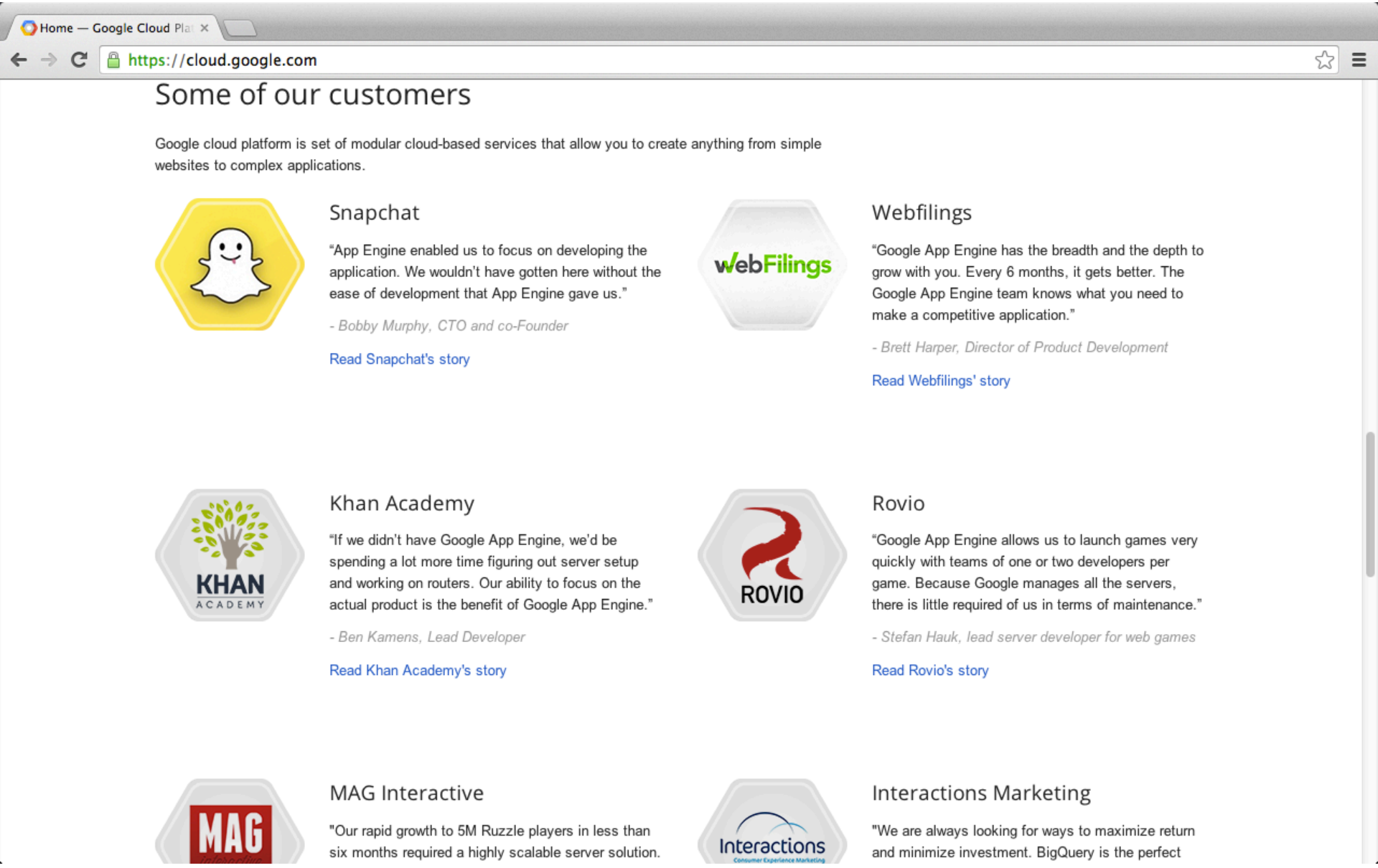
https://cloud.google.com/

Google Cloud Platform

- App Engine
- Compute Engine
- Cloud Storage
- Cloud SQL
- Cloud Datastore
- BigQuery
- Prediction API
- Translate API
- Cloud Endpoints

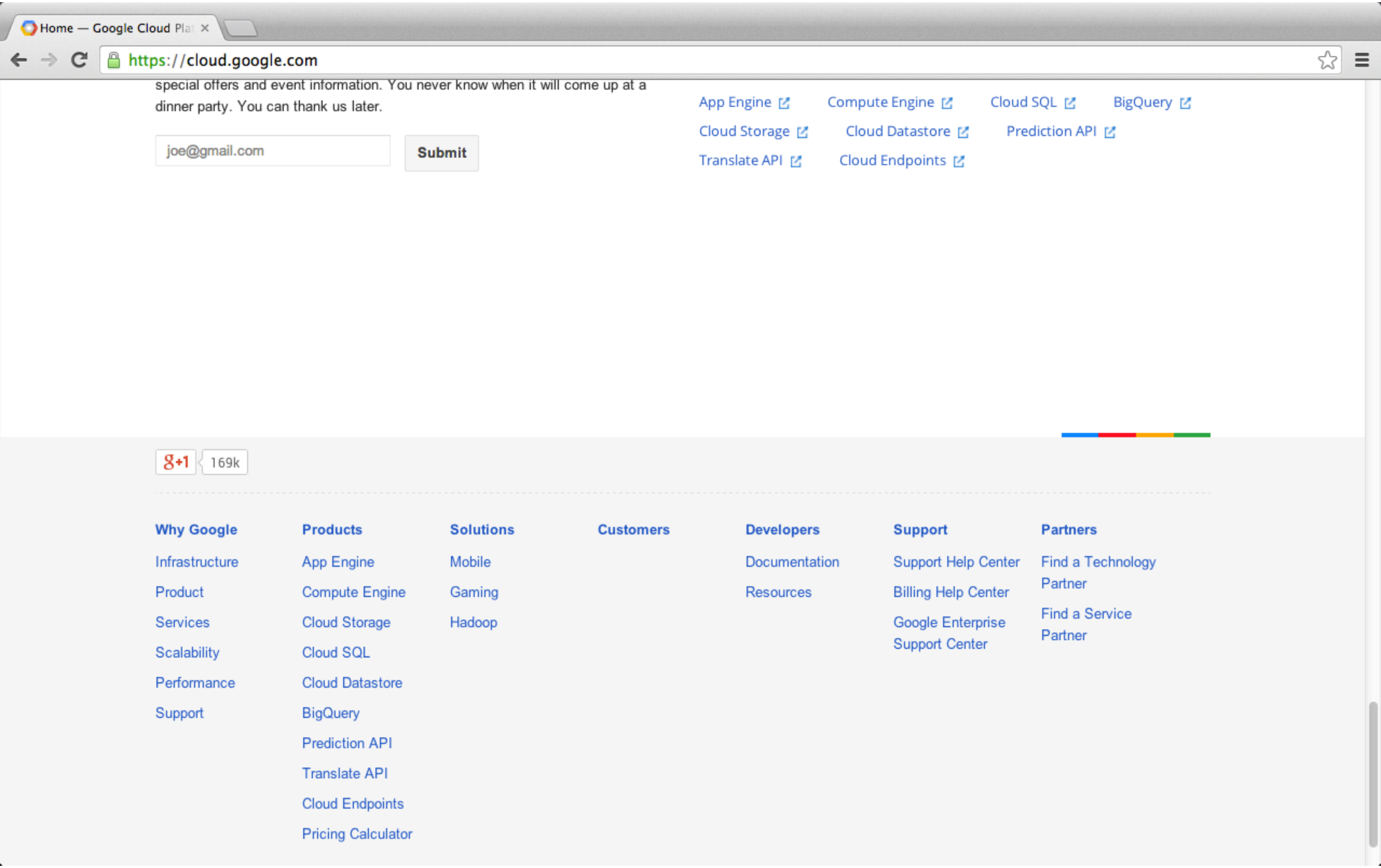
https://cloud.google.com/products/

Google Cloud Platform



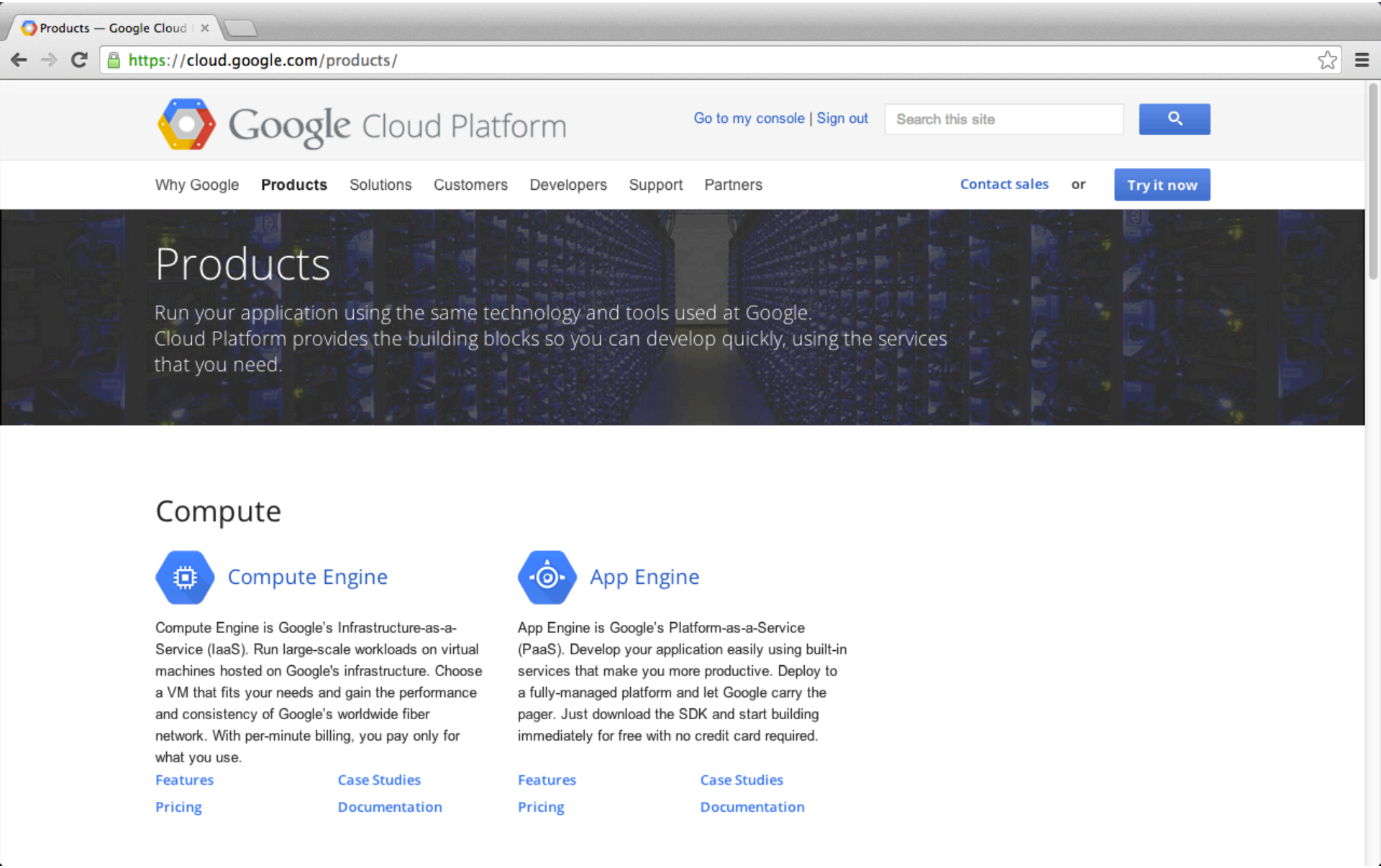
https://cloud.google.com/

Google Cloud Platform



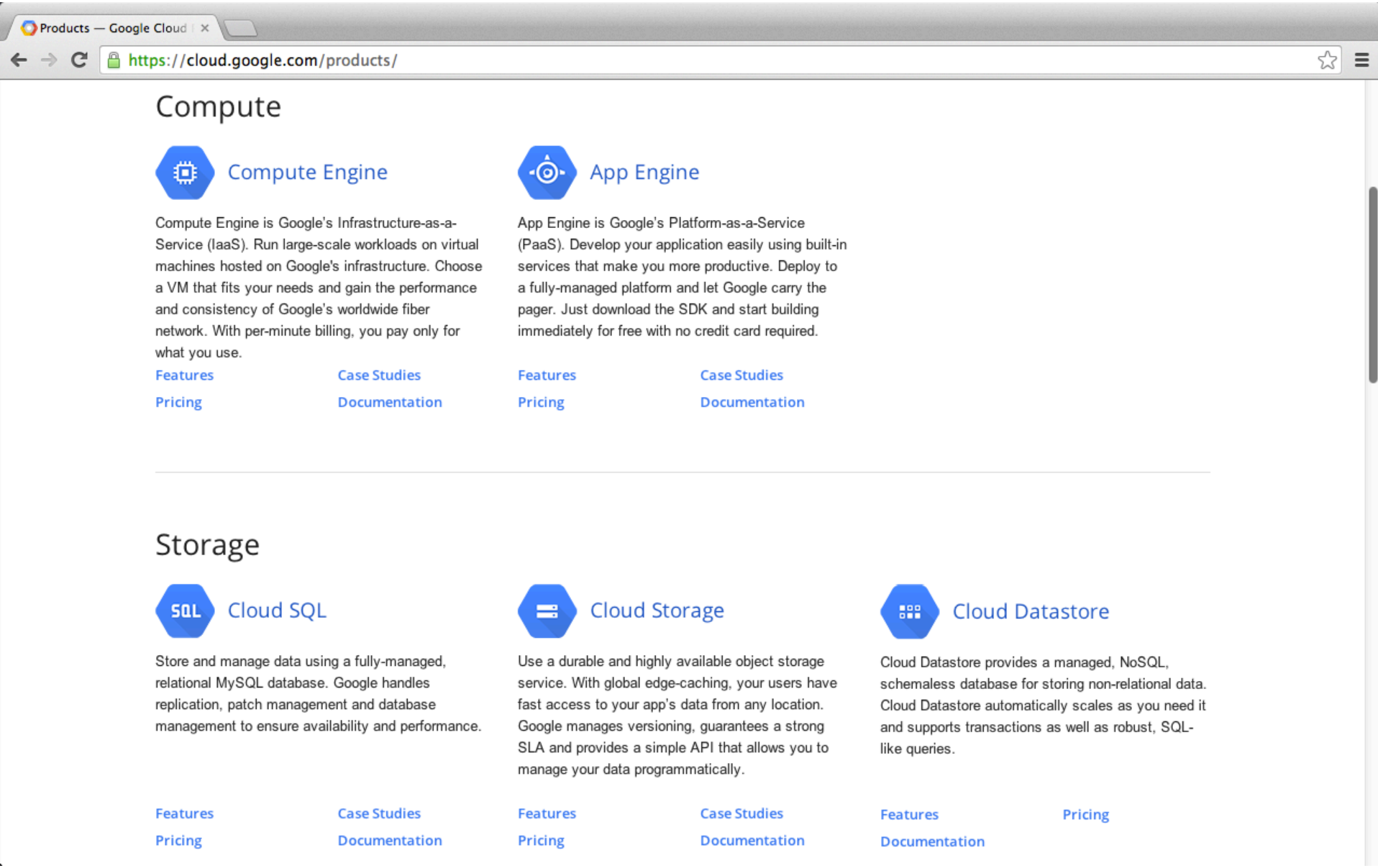
https://cloud.google.com/

Google Cloud Products



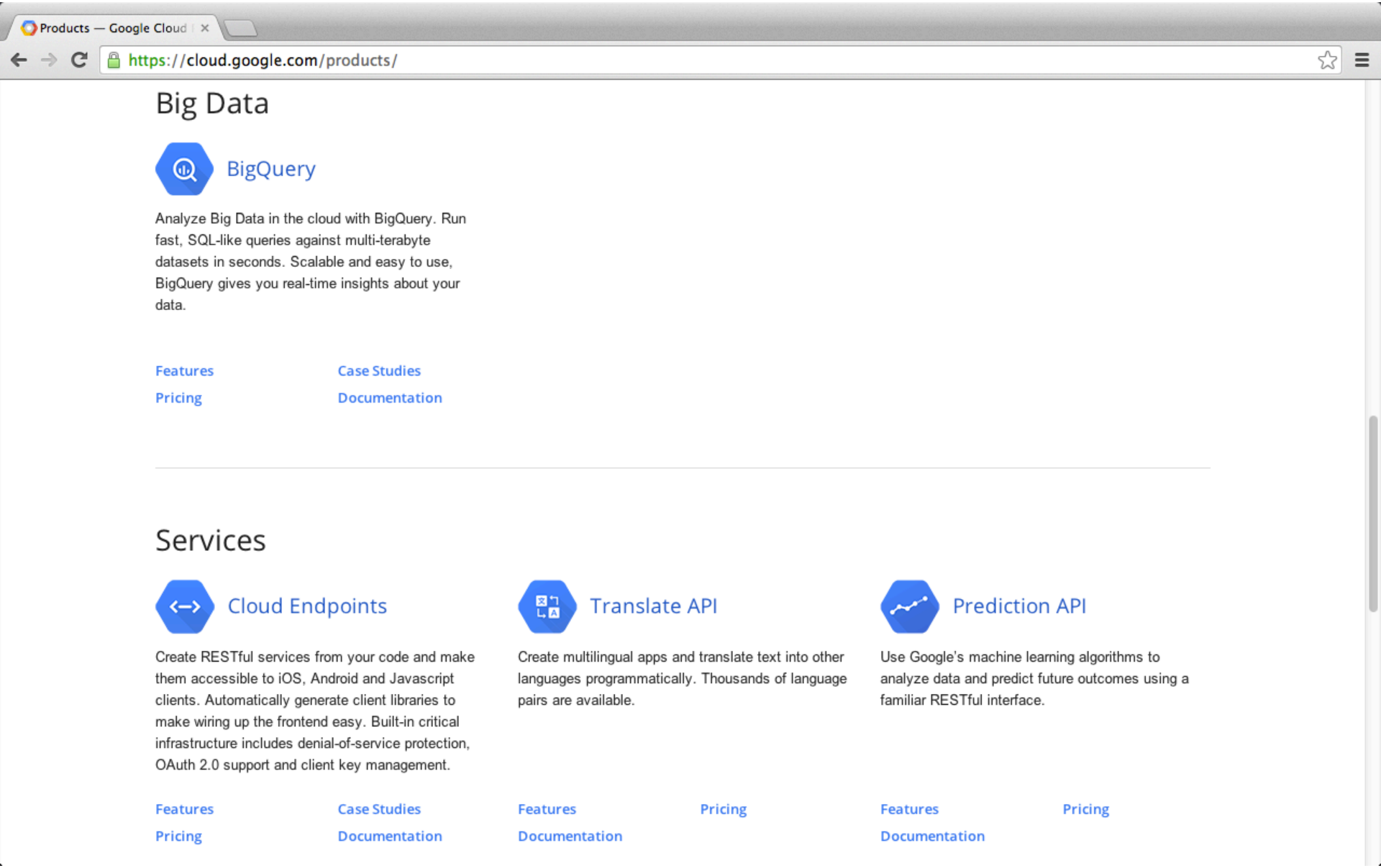
https://cloud.google.com/products/

Google Cloud Products



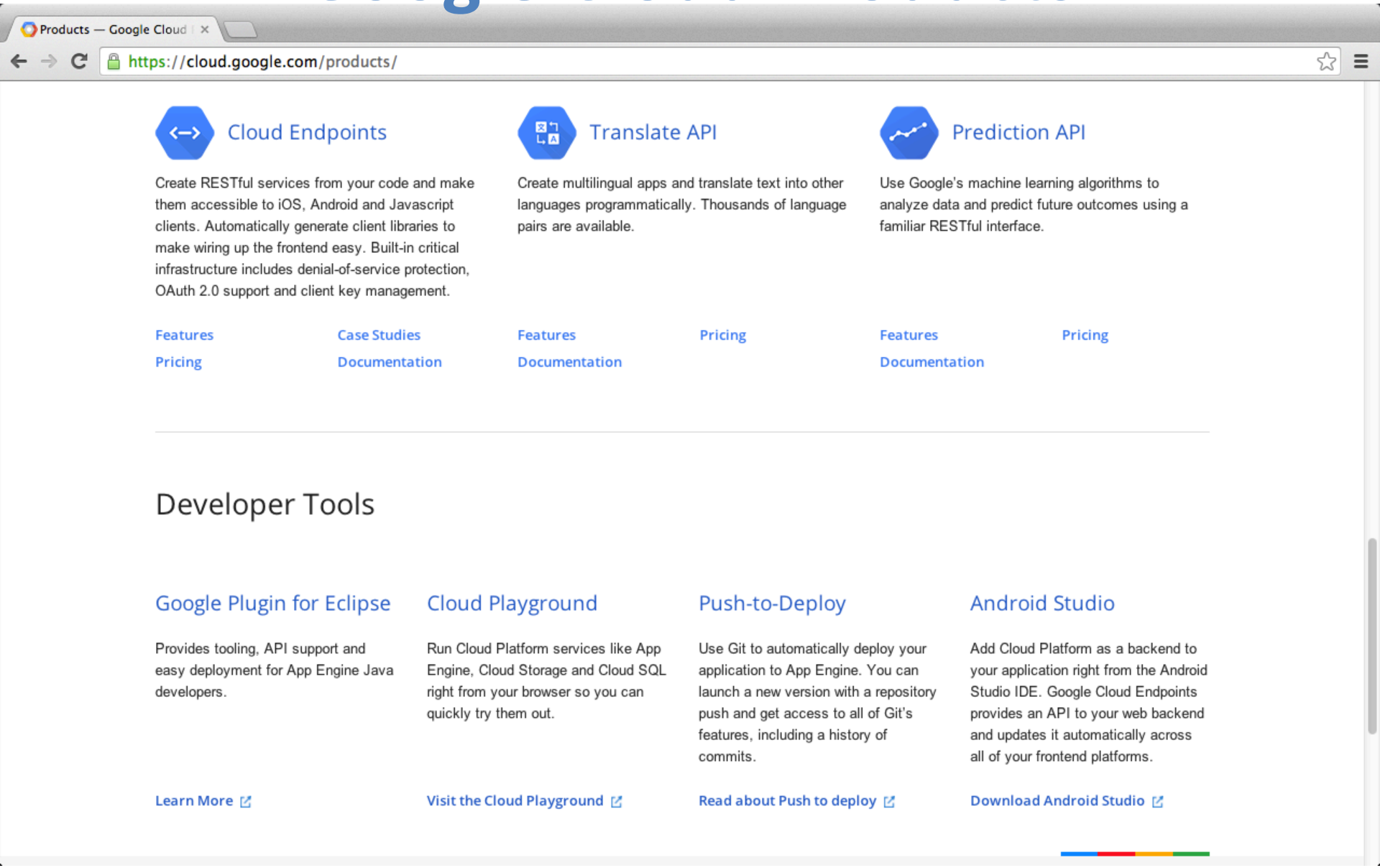
https://cloud.google.com/products/

Google Cloud Products



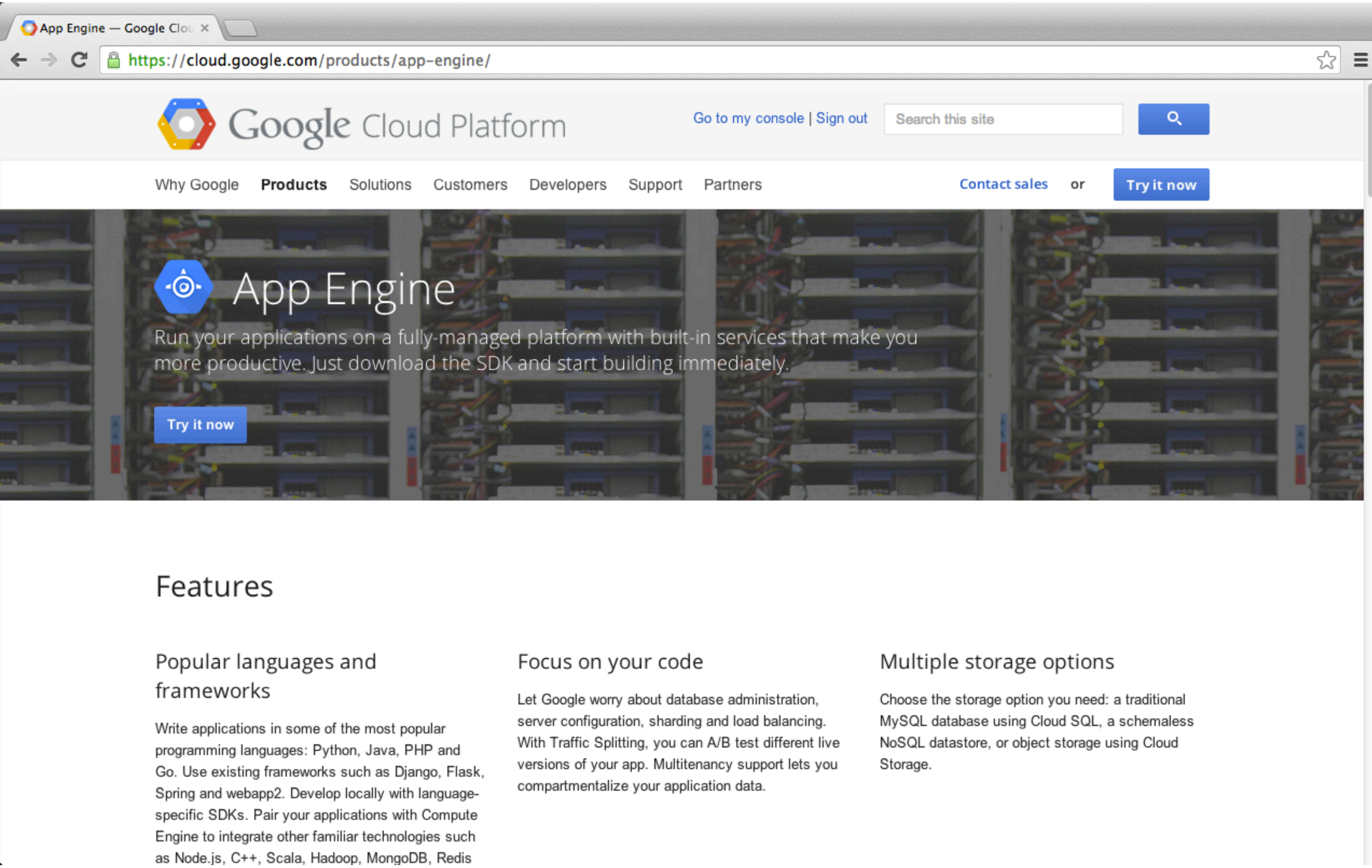
https://cloud.google.com/products/

Google Cloud Products



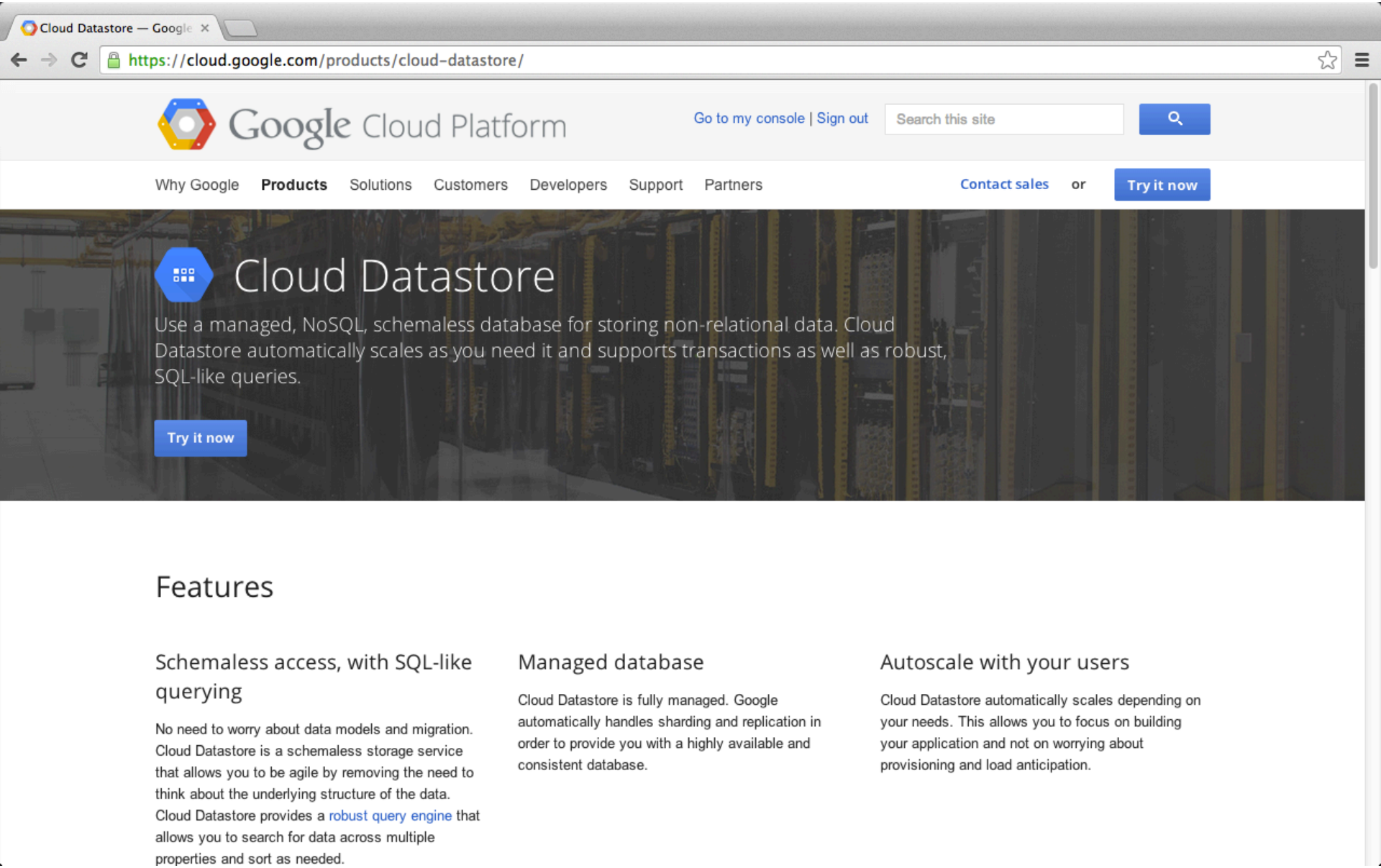
https://cloud.google.com/products/

Google App Engine



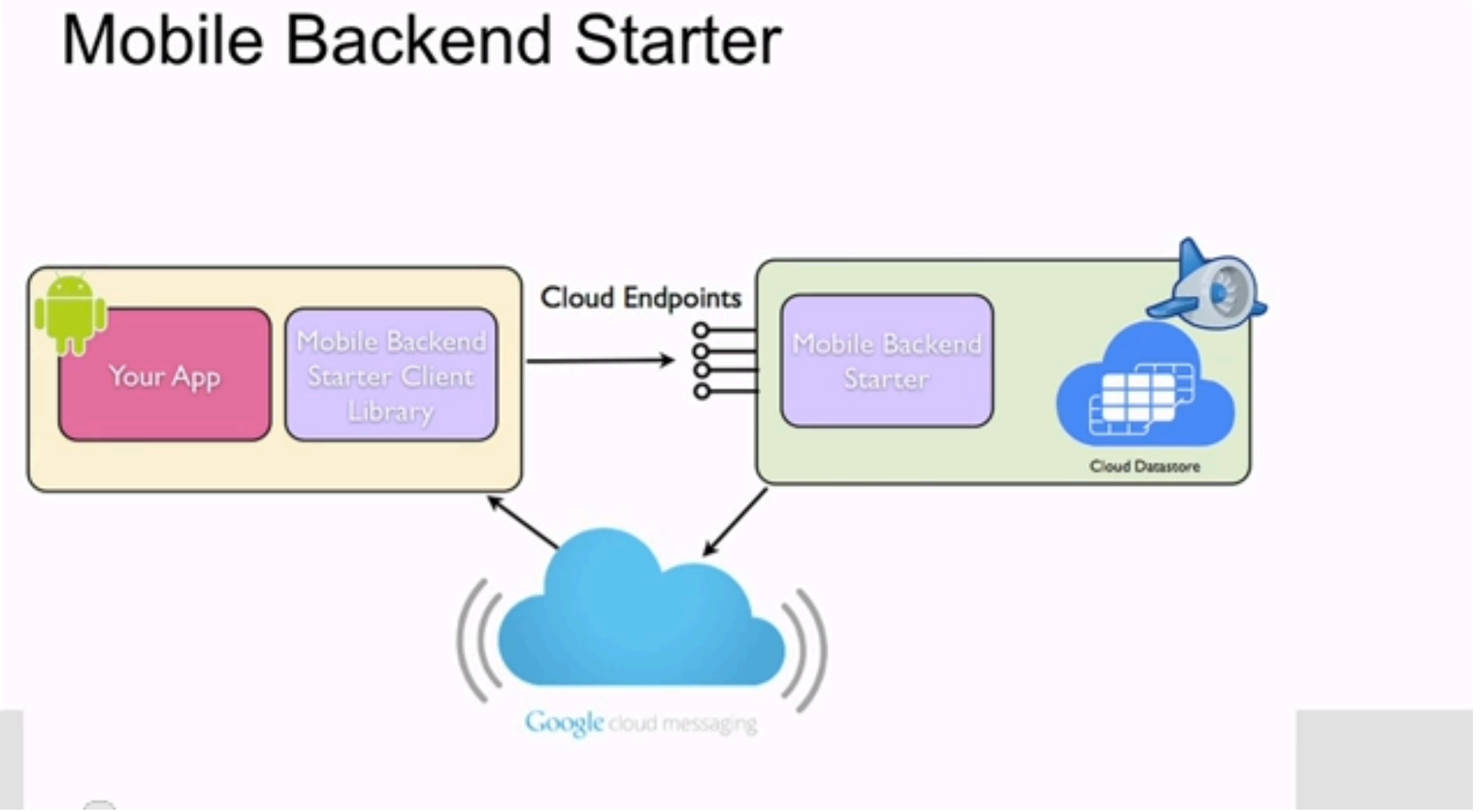
https://cloud.google.com/products/app-engine/

Google Cloud Datastore



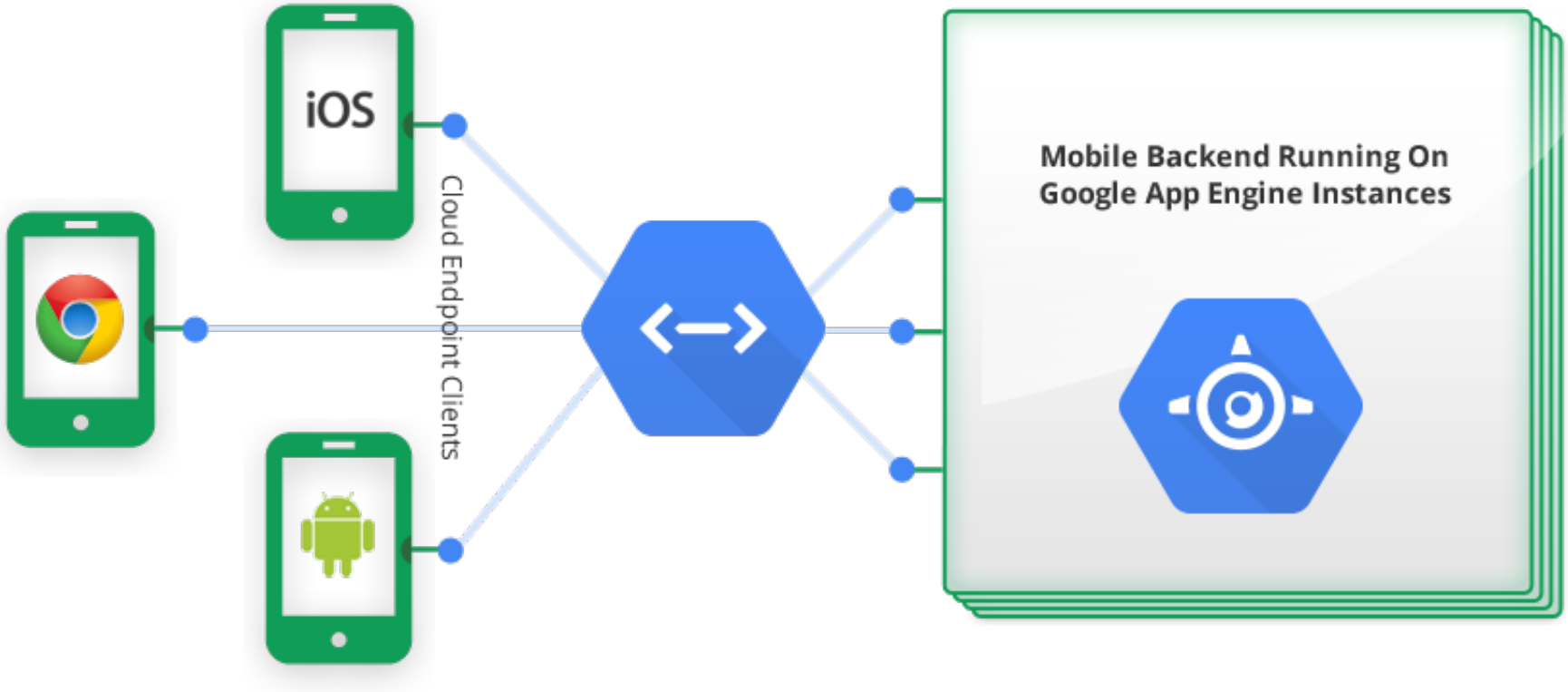
https://cloud.google.com/products/cloud-datastore/

Mobile App, Goolge App Engine, Cloud Datasotre



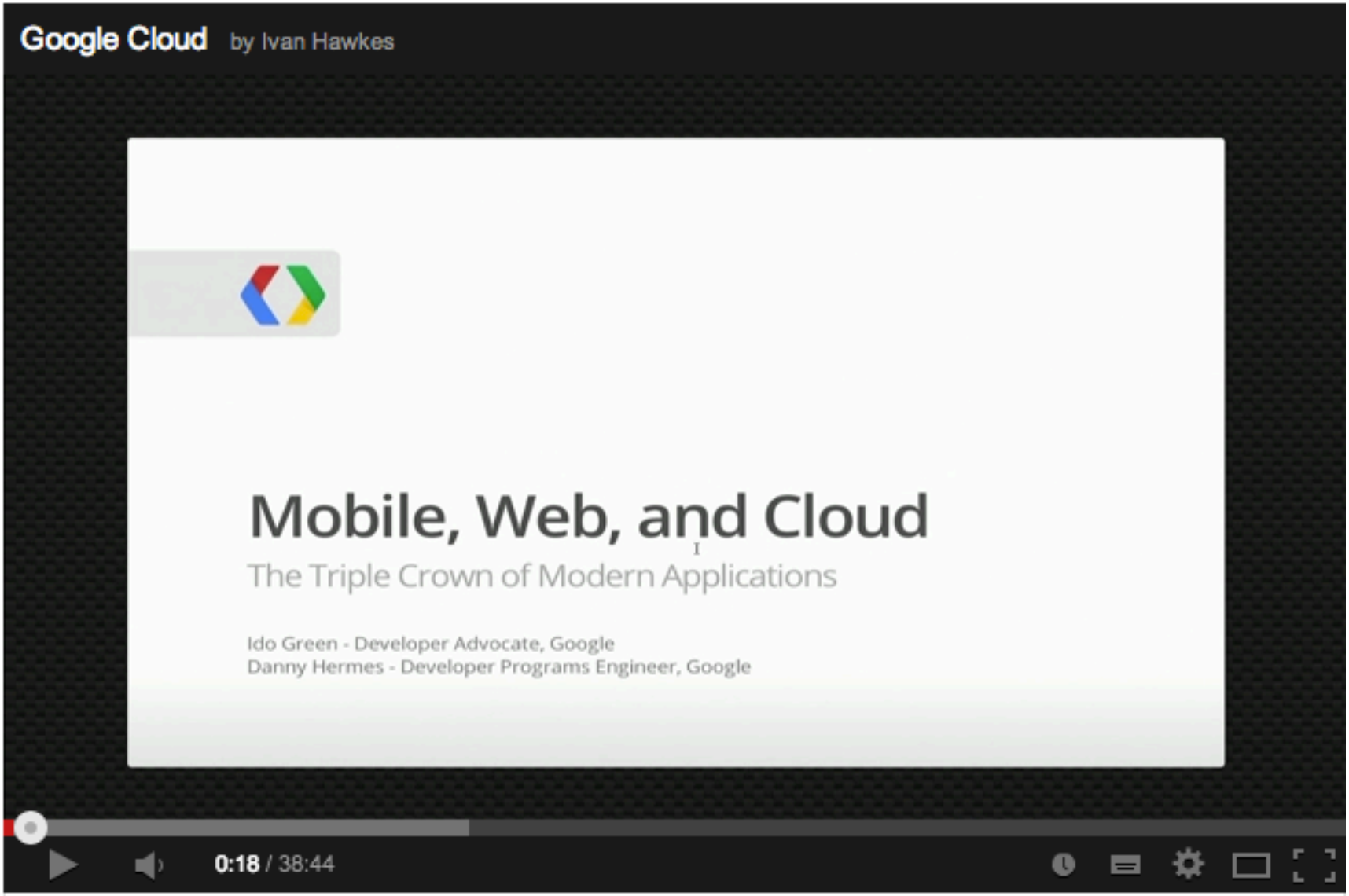
http://www.youtube.com/watch?v=v5u_Owtbfew

Google Cloud Endpoints



https://developers.google.com/appengine/docs/java/endpoints/

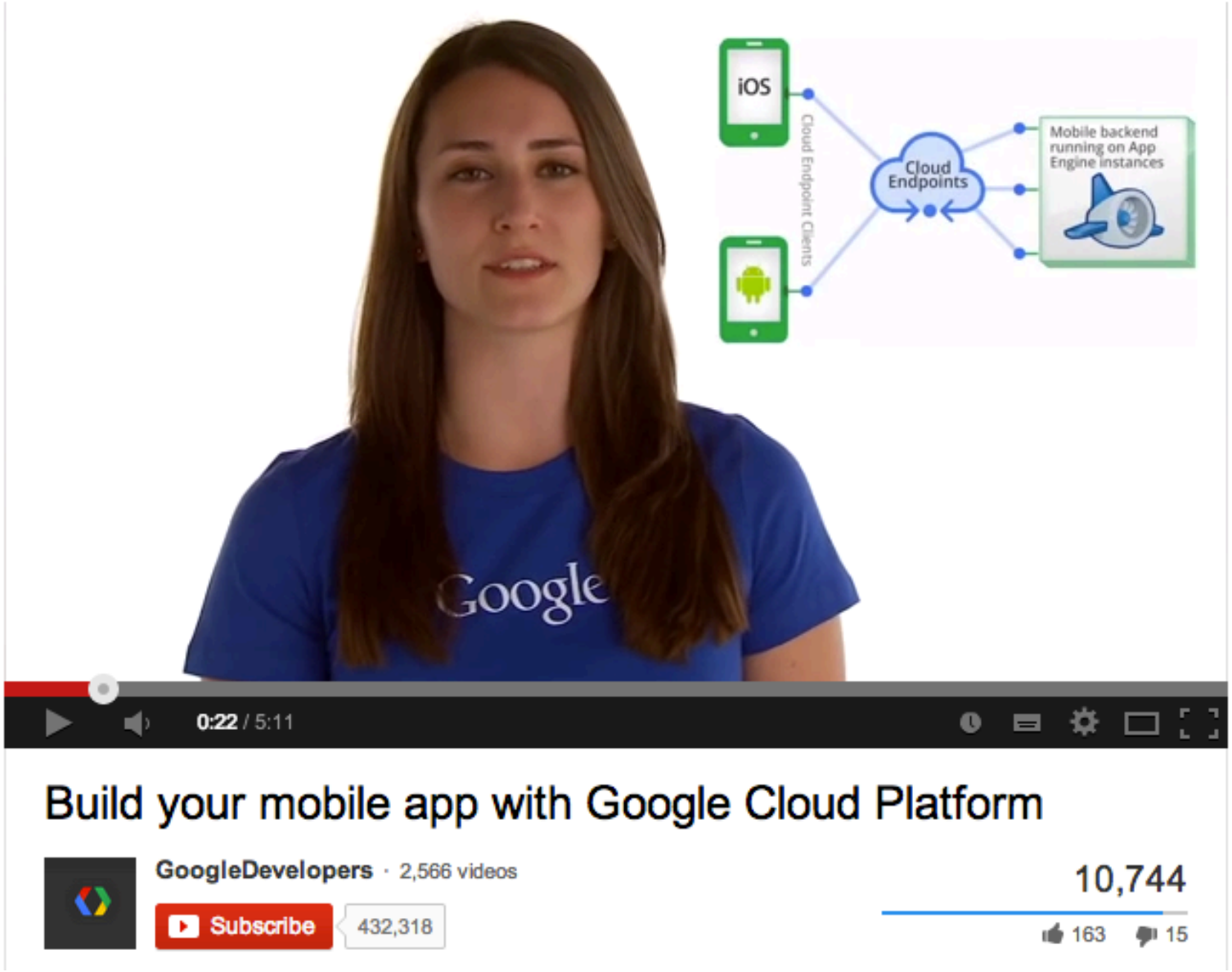
Mobile, Web and Cloud



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

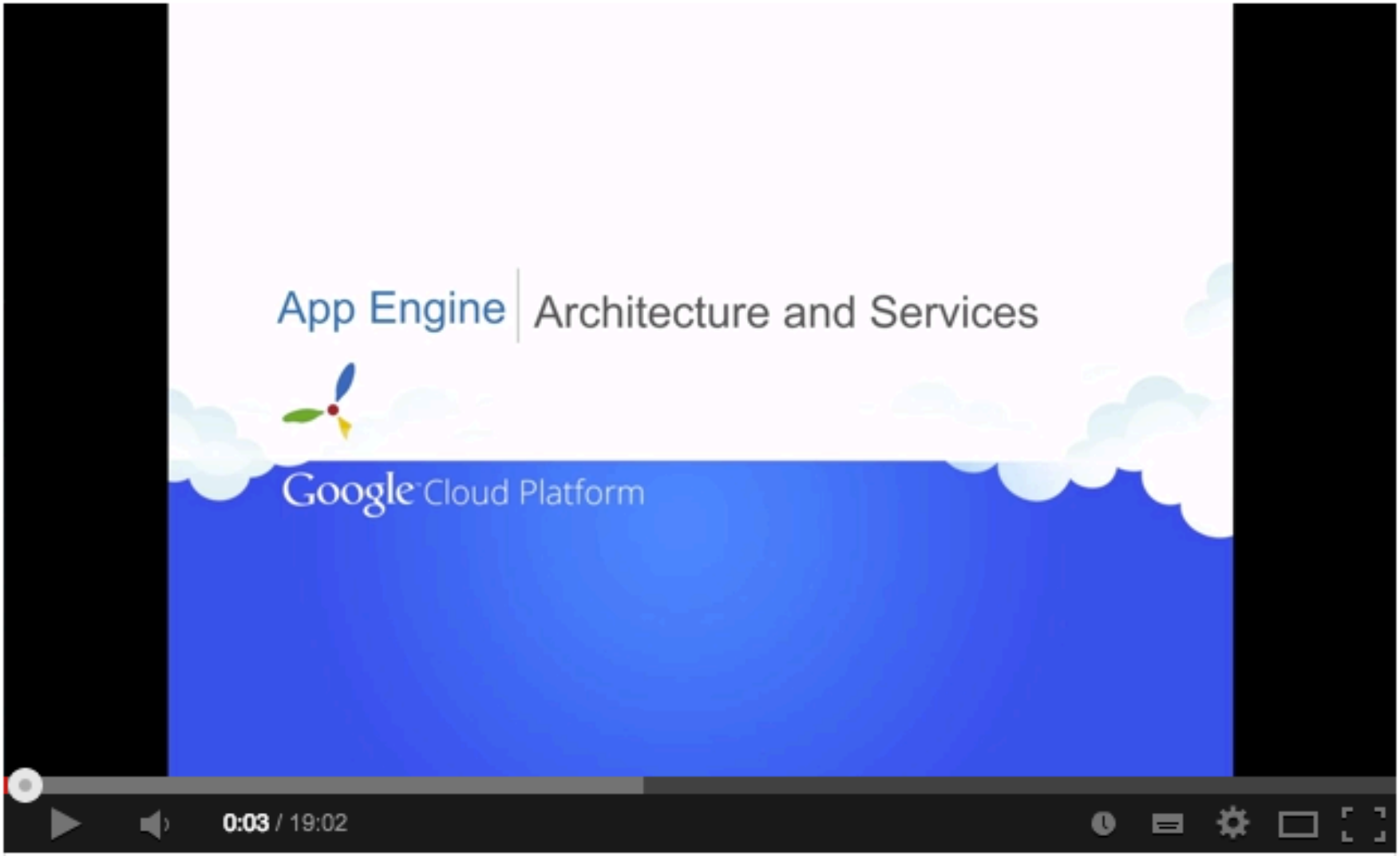
http://www.youtube.com/watch?v=6_oO9Gwf_do

Build your mobile app with Google Cloud Platform



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

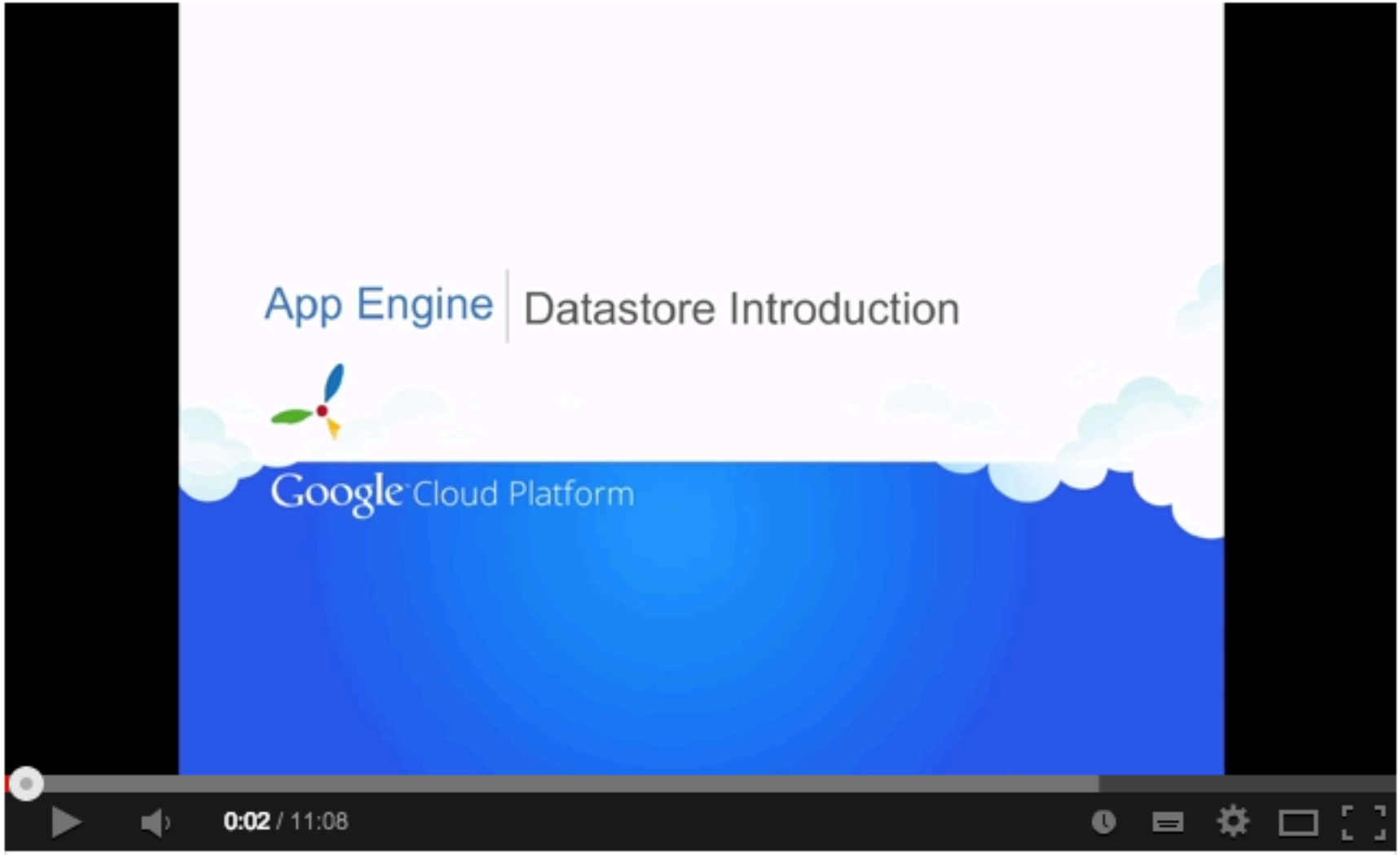
App Engine Architecture and Services



App Engine Architecture and Services

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

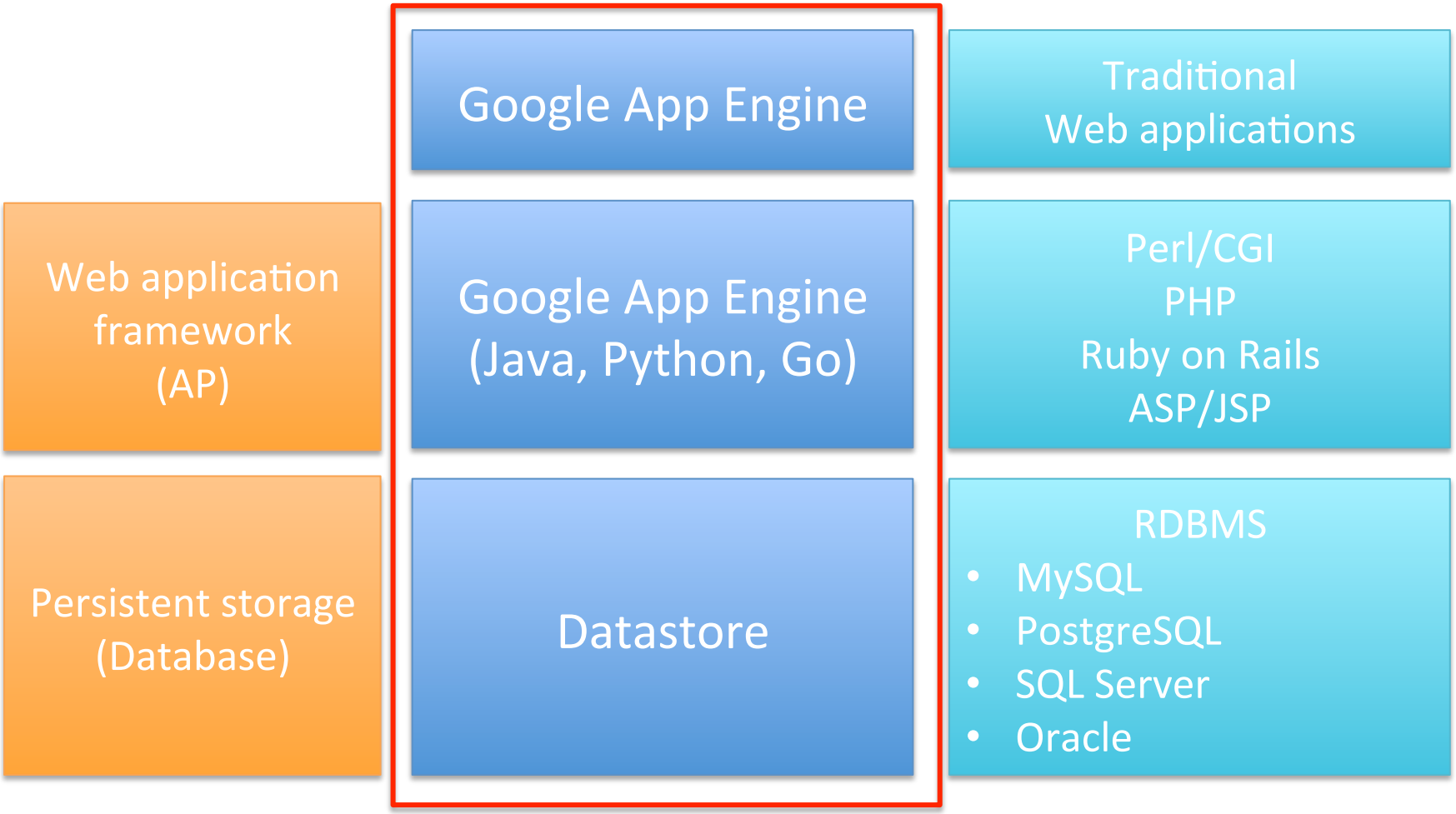
Datastore Introduction



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

Google Cloud Datastore

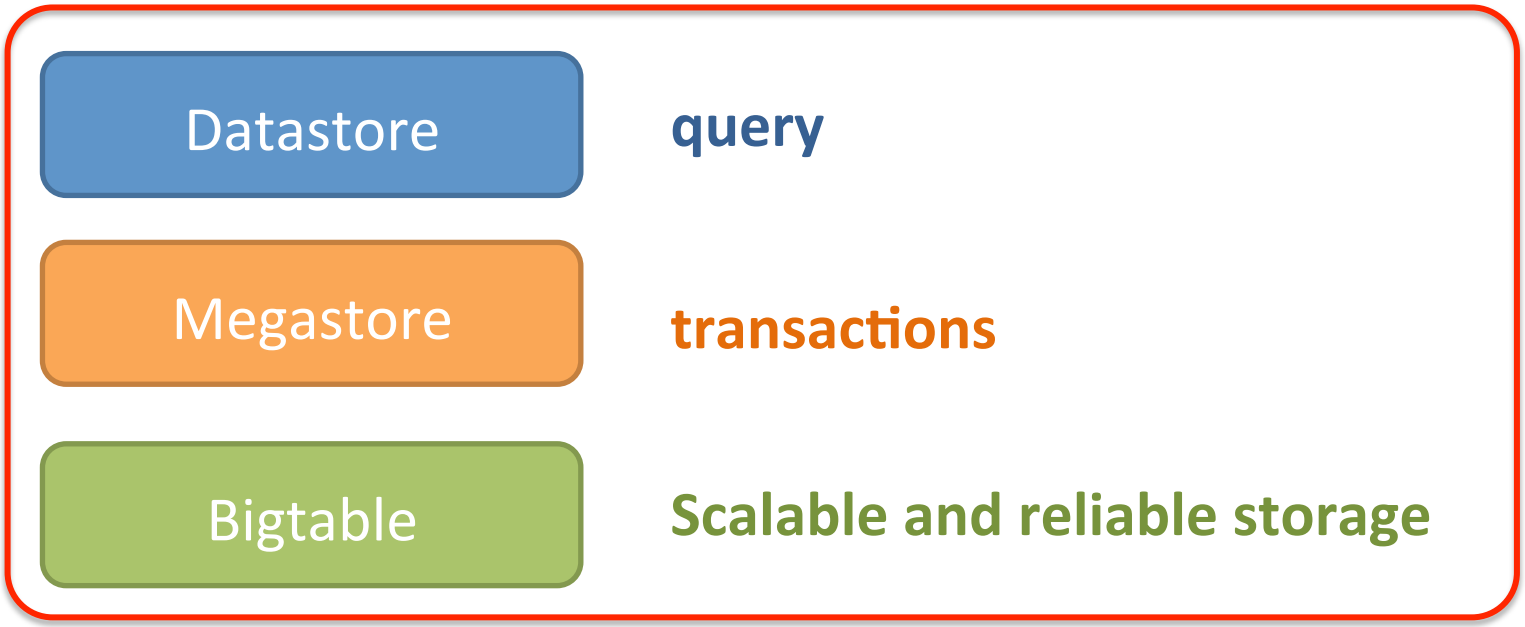
Datasotre is a database (persistent storage) for App Engine



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

Datastore Internals

- Based on Bigtable
  - high scalability
  - High availability
    - synchronous writes on multiple datacenters



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

What is Bigtable?

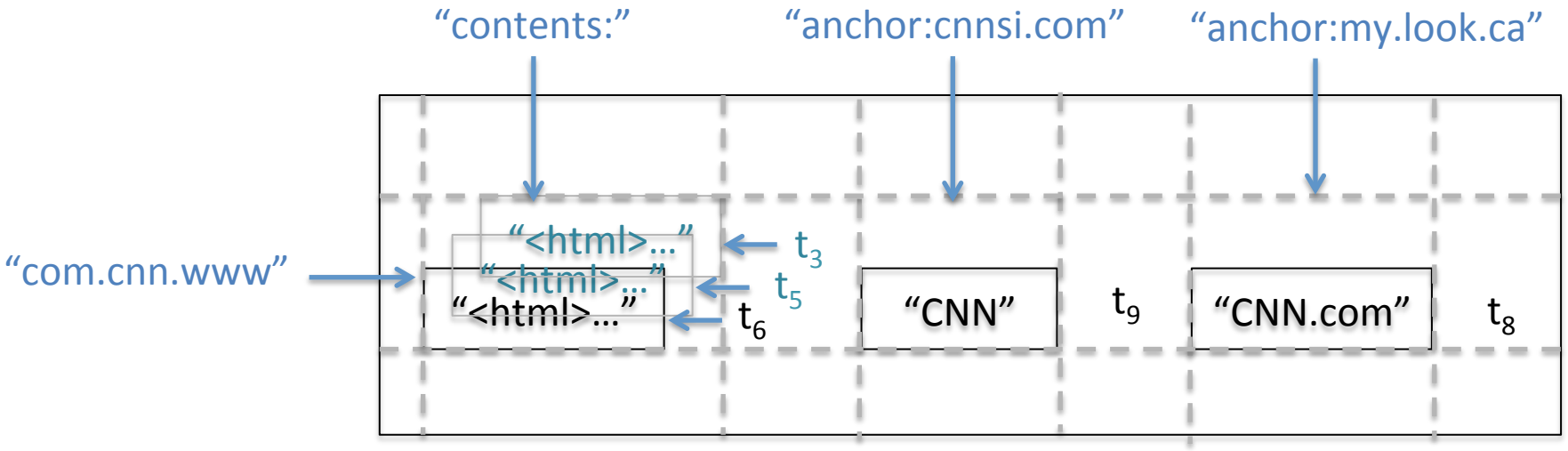
- Scalable, distributed, highly-available and structured storage
  - Bigtable is not database by itself (it doesn't support query)
- Google usage
  - In production since April 2005
  - Web Search, YouTube, Earth, Analytics

Scalable and reliable storage

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

Bigtable Data Model

- A row has a Key and Columns
- Sorted by Key
  - In lexical order
  - Enables range query by application



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

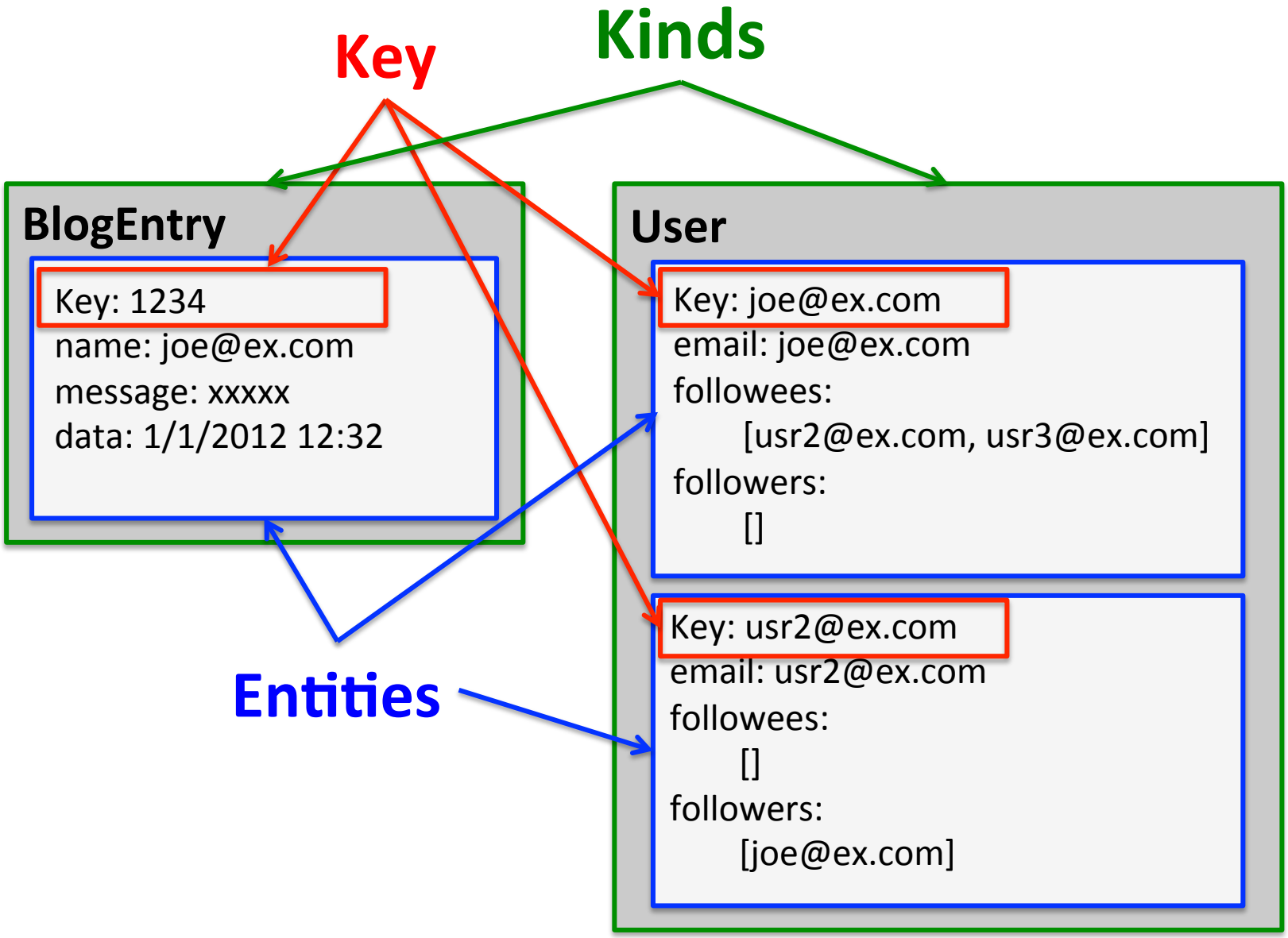
Google Datastore Basic Operation

Different terms for corresponding concepts

	Google Datastore	Relational Database Management System (RDBMS)
Category of object	Kind	Table
One entry/object	Entity	Row
Unique identifier of data entry	Key	Primary Key (PK)
Individual data	Property	Field

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

Kind, Entity and Key

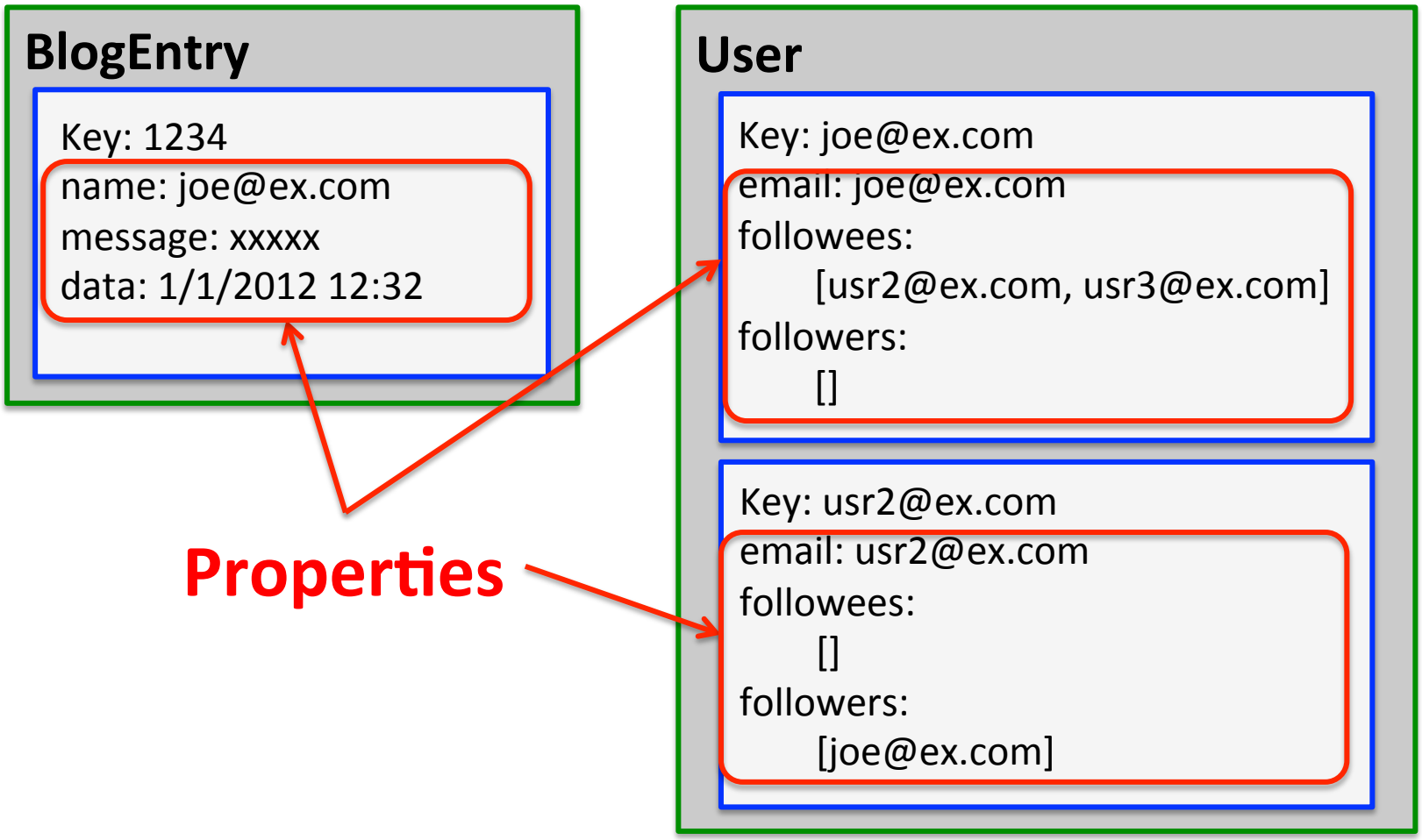


Source: Datastore Introduction, http://www.youtube.com/watch?v=fQazhzcC-rg

Properties and Data Types

Each entity has one or more **named properties**

- Variety of datatypes (int, float, boolean, Sring, Date,…)
- Can be multi-valued



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

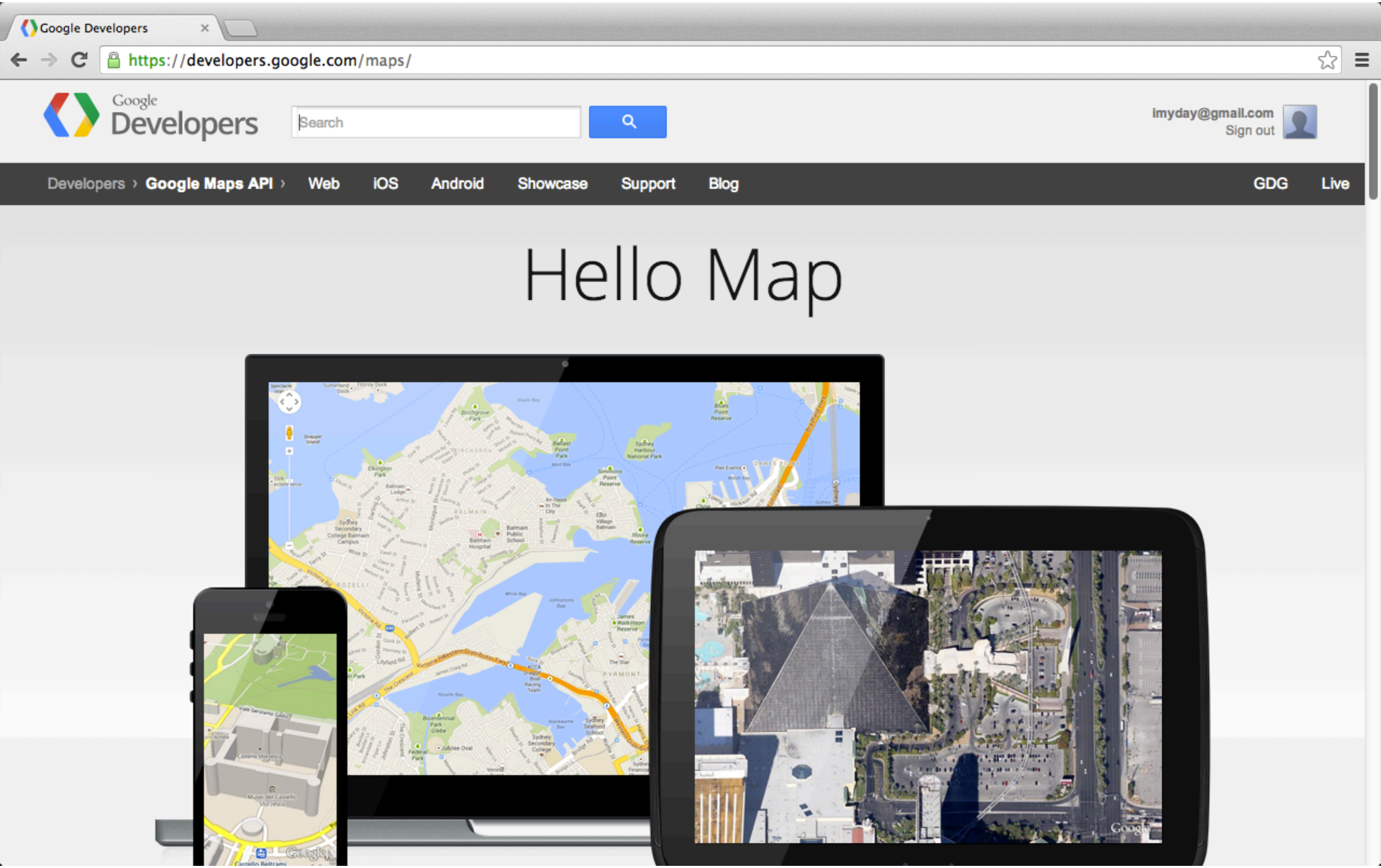
Creating an Entity with Java Low-level API

```
DatastoreService datastore =
DatastoreServiceFactory.getDatastoreService();


Entity employee = new Entity("Employee");
employee.setProperty("name", "Antonio Saliery");
employee.setProperty("hireDate", new Date());
employee.setProperty("attendedHrTraining", true);
datastore.put(emploee);
```

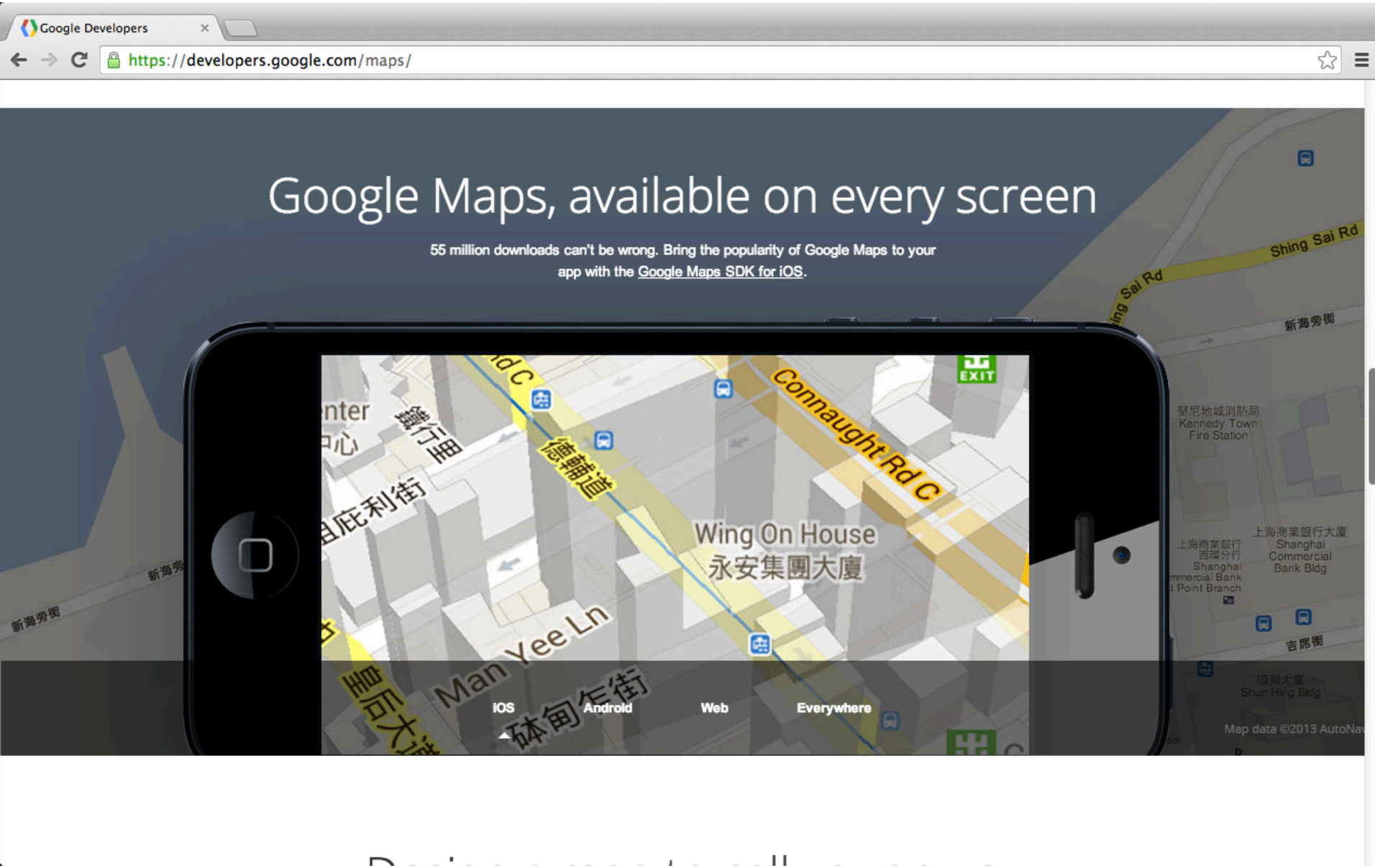
Source: Datastore Introduction, http://www.youtube.com/watch?v=fQazhzcC-rg

Google Maps API



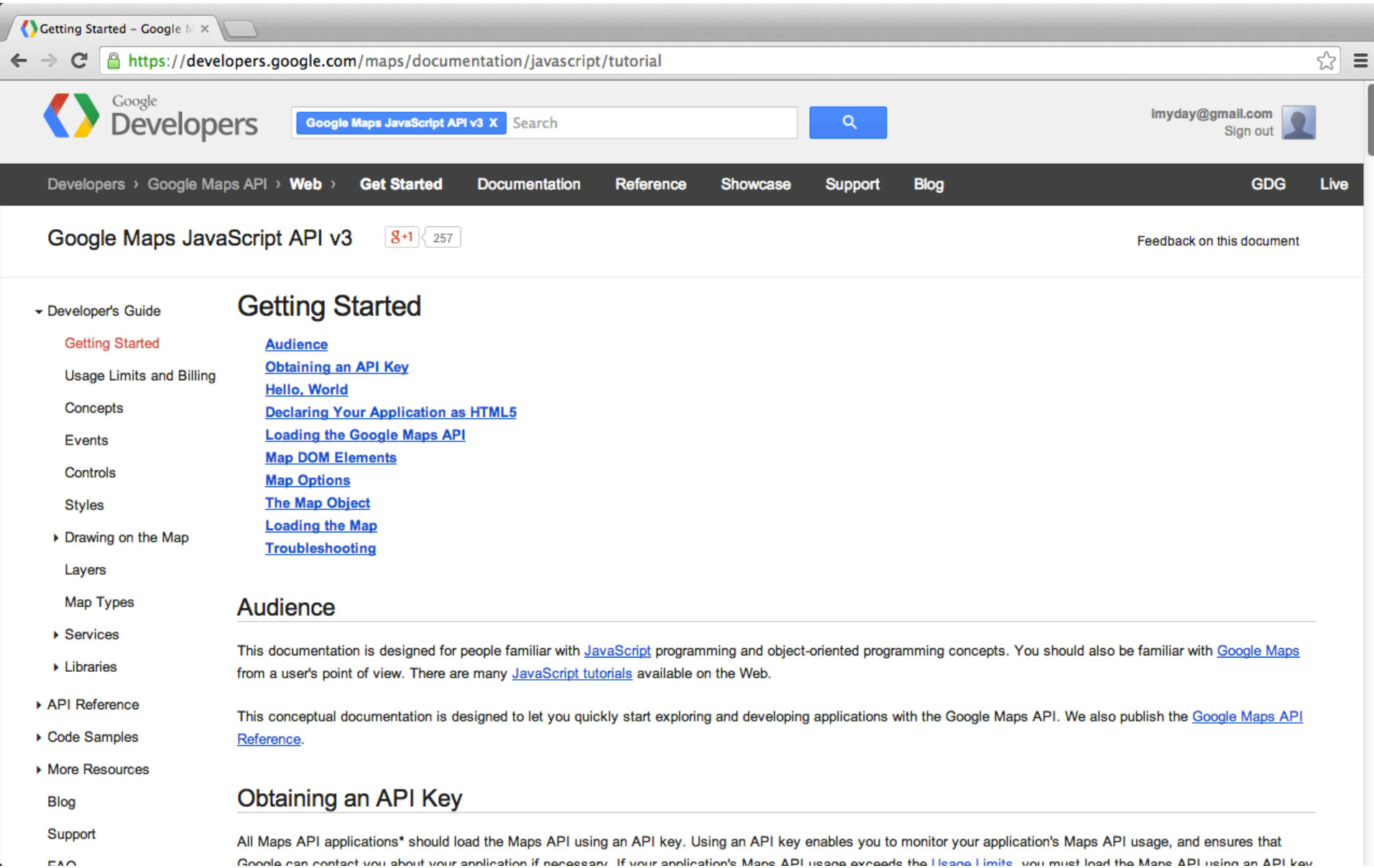
https://developers.google.com/maps/

Google Maps API



https://developers.google.com/maps/

Google Maps JavaScript API



https://developers.google.com/maps/documentation/javascript/tutorial

Obtaining an Google Maps API Key

Getting Started - Google M

https://developers.google.com/maps/documentation/javascript/tutorial

- Blog
- Support
- FAQ

- Google Maps API for Business
- Maps API Web Services
- Google Places API
- Static Maps API
- Street View Image API
- Earth API
- Deprecated APIs

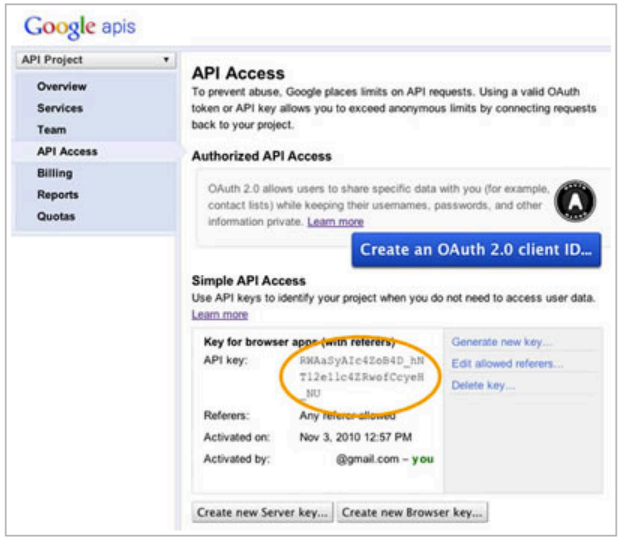
Obtaining an API Key

All Maps API applications* should load the Maps API using an API key. Using an API key enables you to monitor your application's Maps API usage, and ensures that Google can contact you about your application if necessary. If your application's Maps API usage exceeds the Usage Limits, you must load the Maps API using an API key in order to purchase additional quota.

> * **Google Maps API for Business** developers must *not* include a key in their requests. Please refer to Loading the Google Maps JavaScript API for Business-specific instructions.

To create your API key:

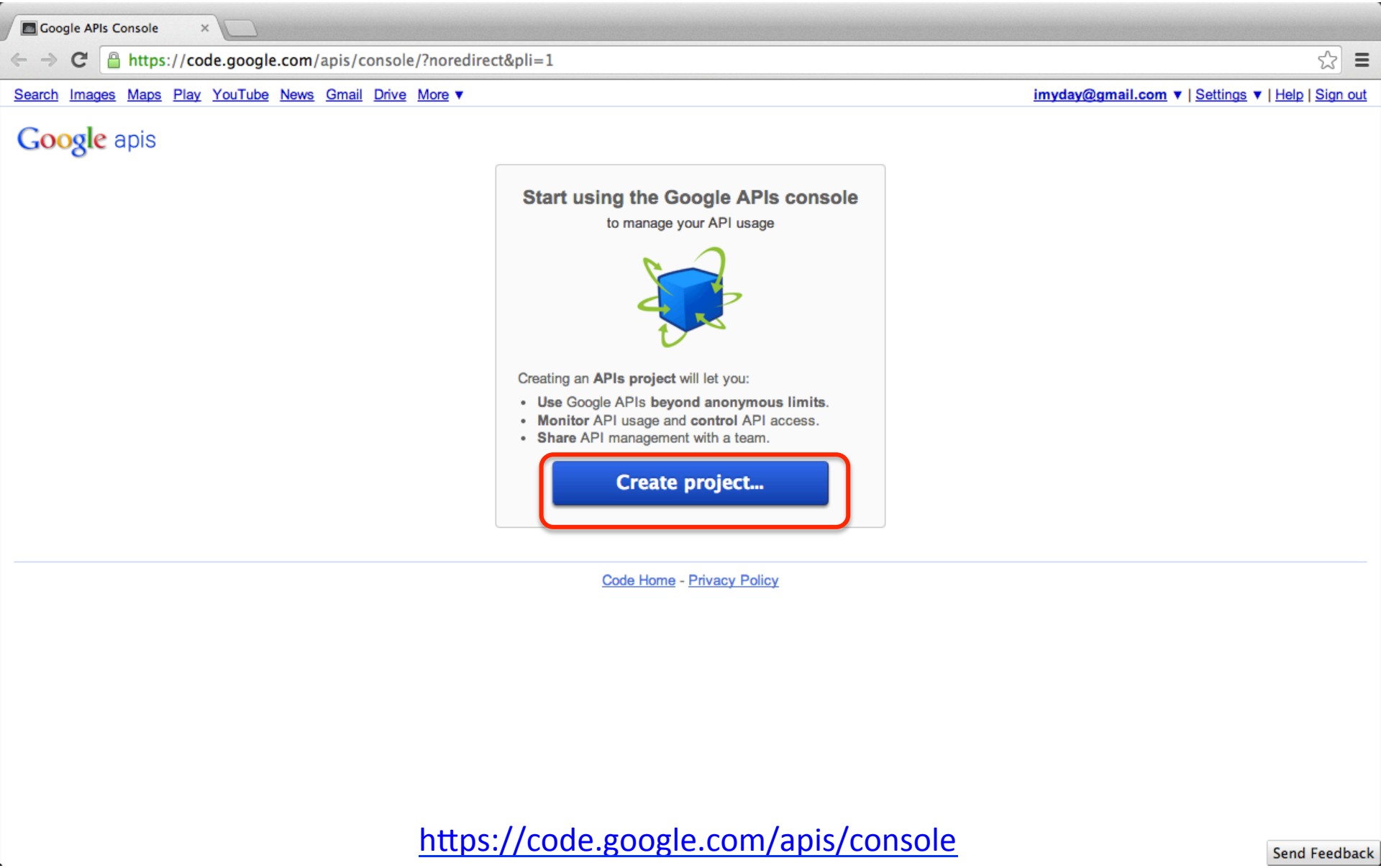
1. Visit the APIs Console at https://code.google.com/apis/console and log in with your Google Account.
2. Click the **Services** link from the left-hand menu.
3. Activate the **Google Maps API v3** service.
4. Click the **API Access** link from the left-hand menu. Your API key is available from the **API Access** page, in the **Simple API Access** section. Maps API applications use the **Key for browser apps**.



https://developers.google.com/maps/documentation/javascript/tutorial

Demo:
Integrate
Google Maps JavaScript API
with
jQuery Mobile

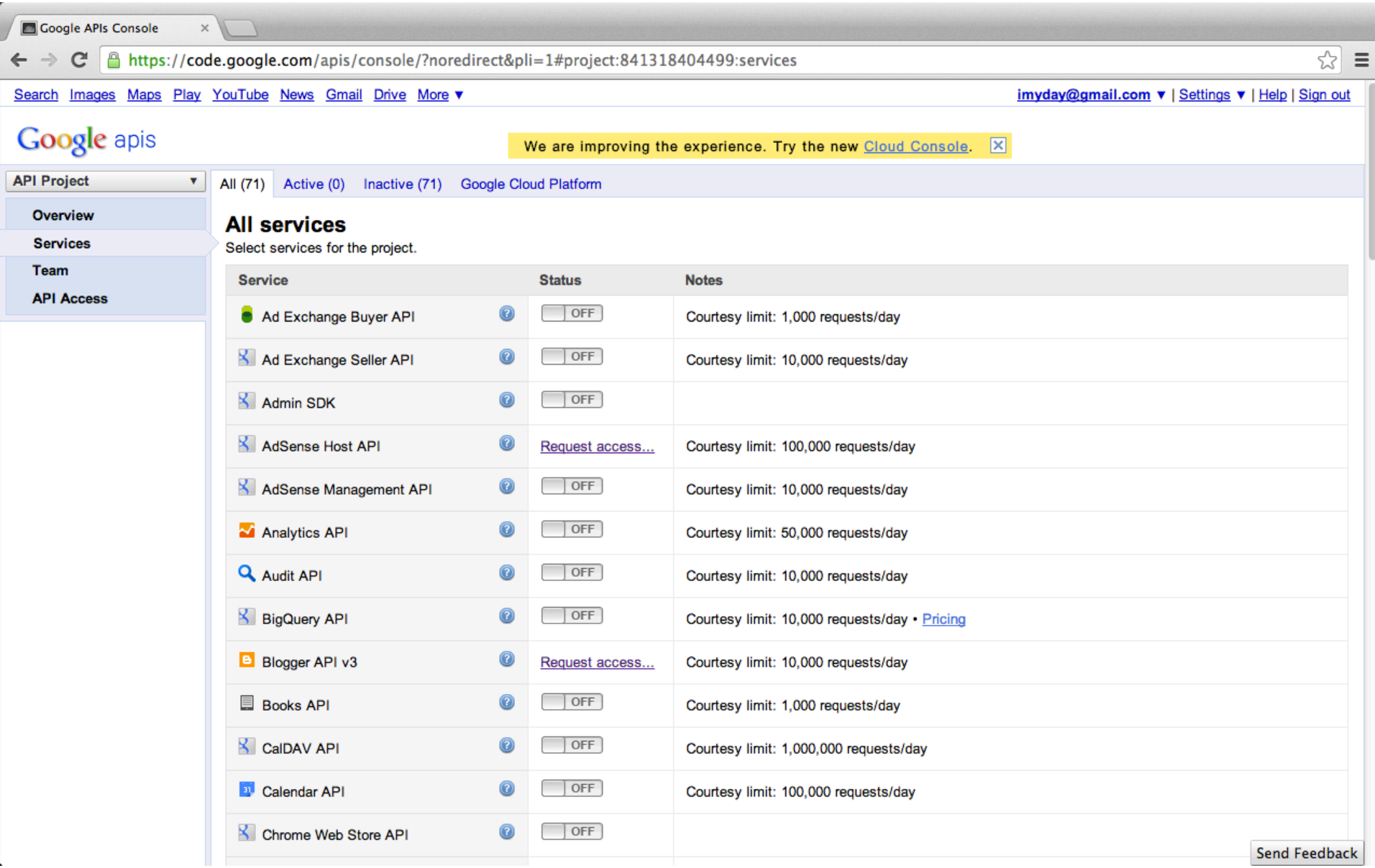
Start using the Google APIs console



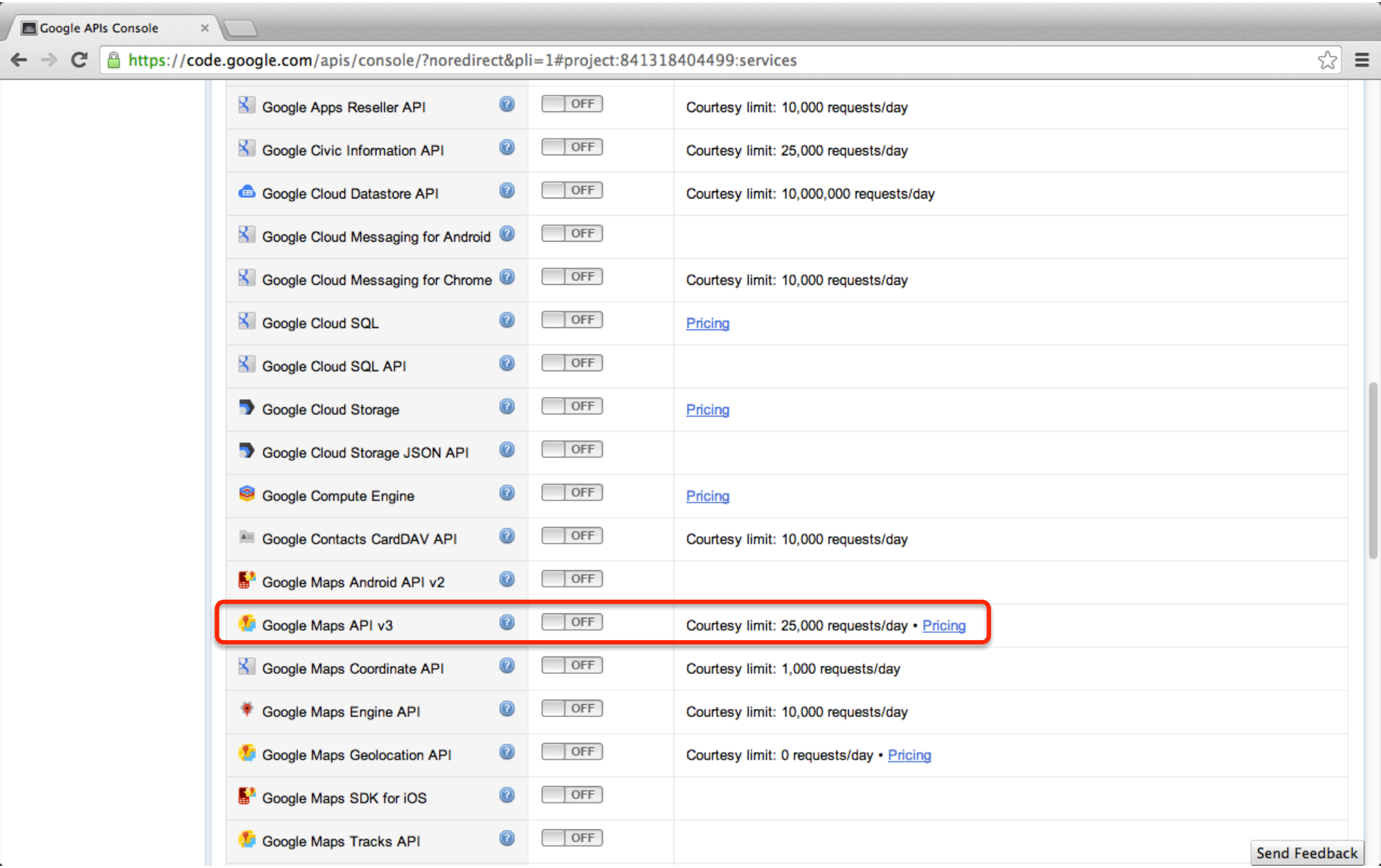
https://code.google.com/apis/console

https://code.google.com/apis/console/?noredirect&pli=1

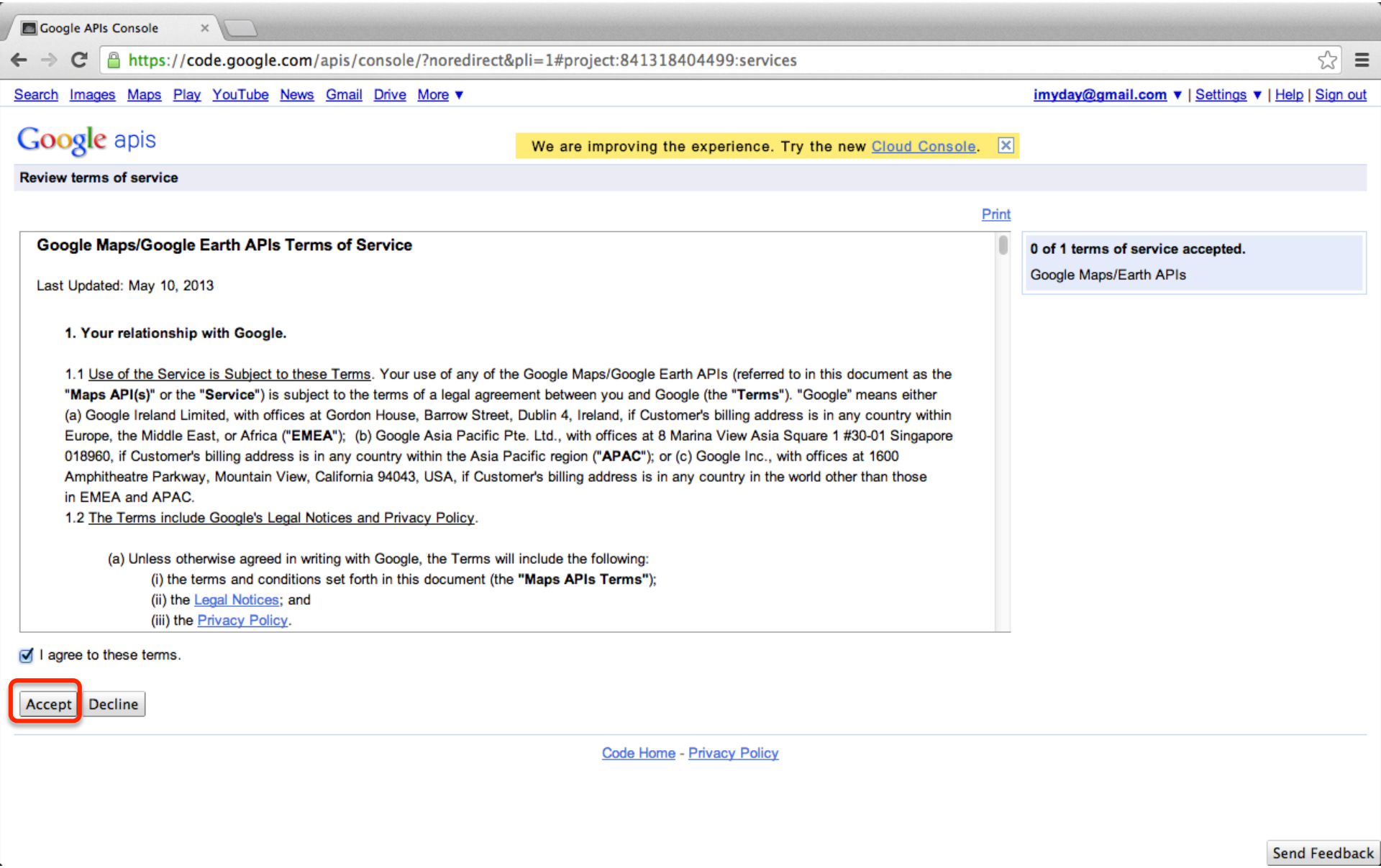
Google APIs Console



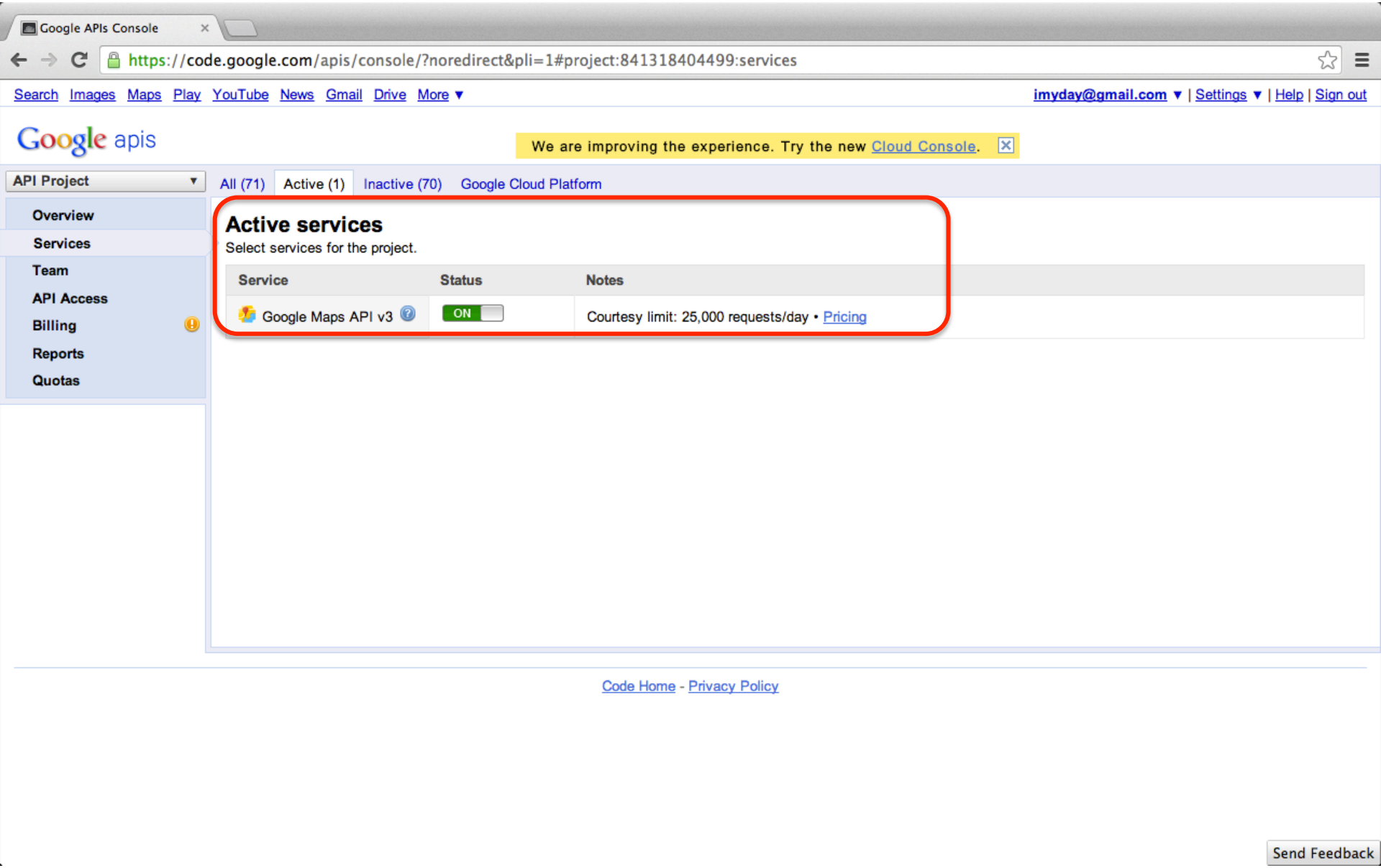
Google APIs Console



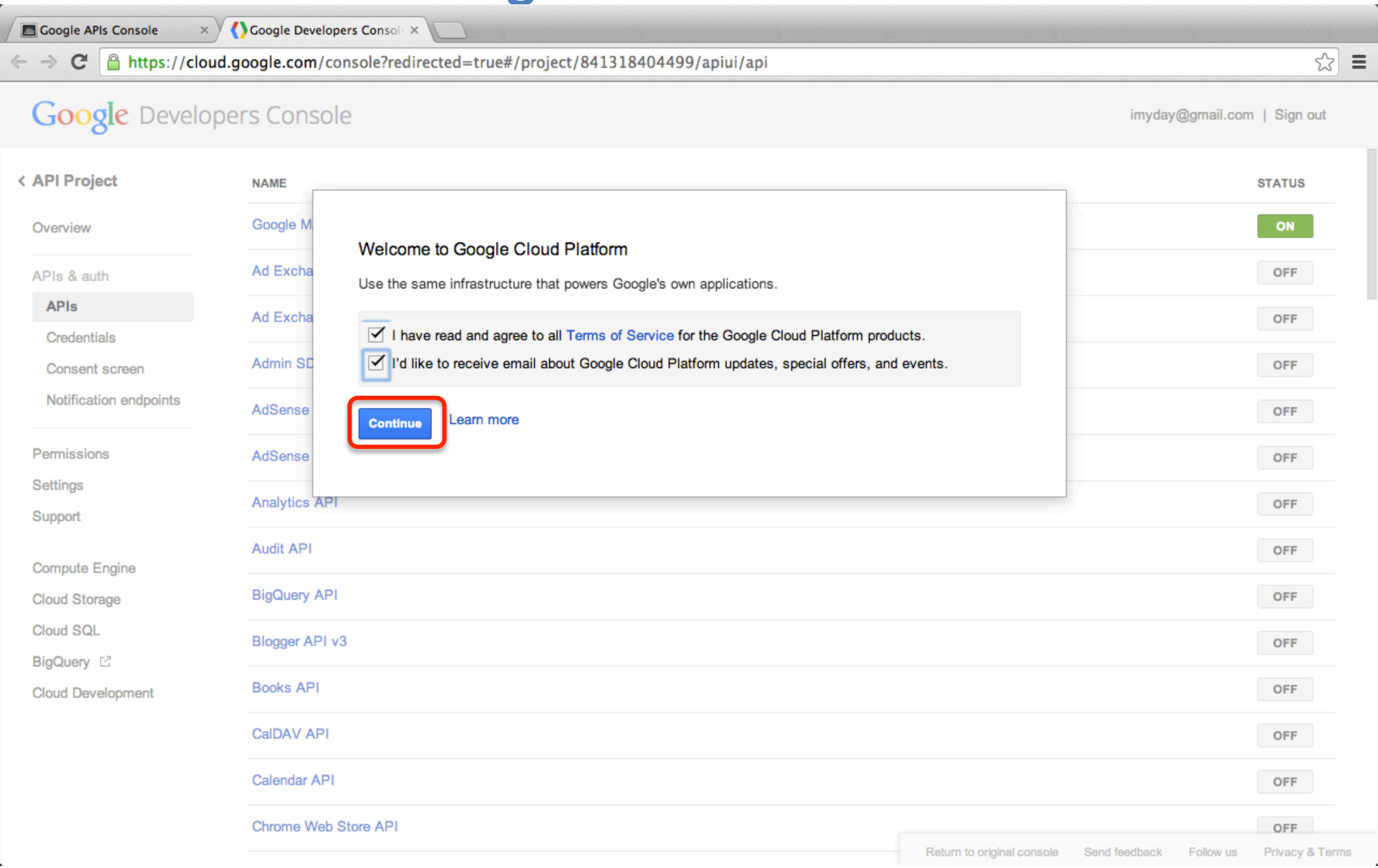
Google APIs Console



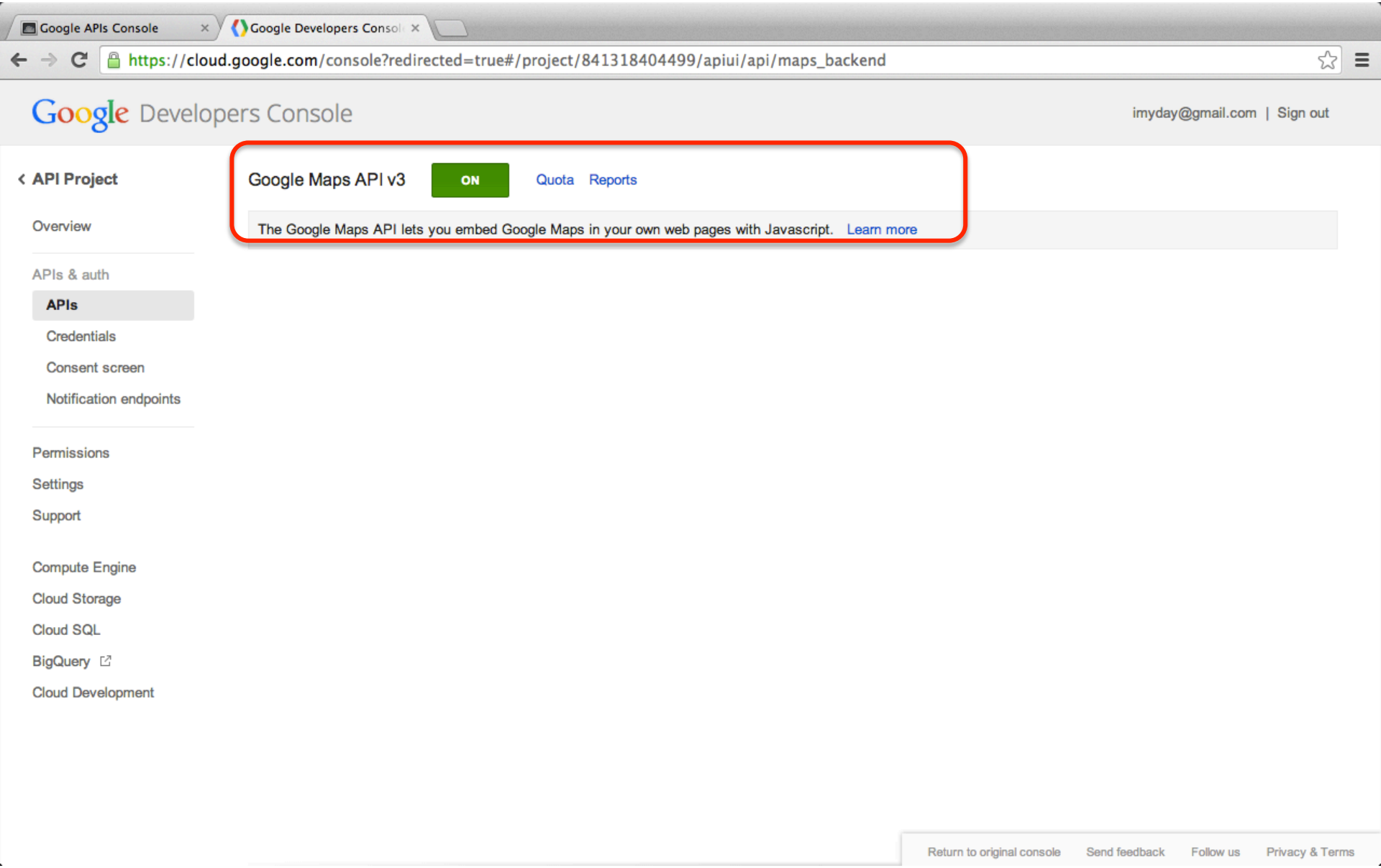
Google APIs Console



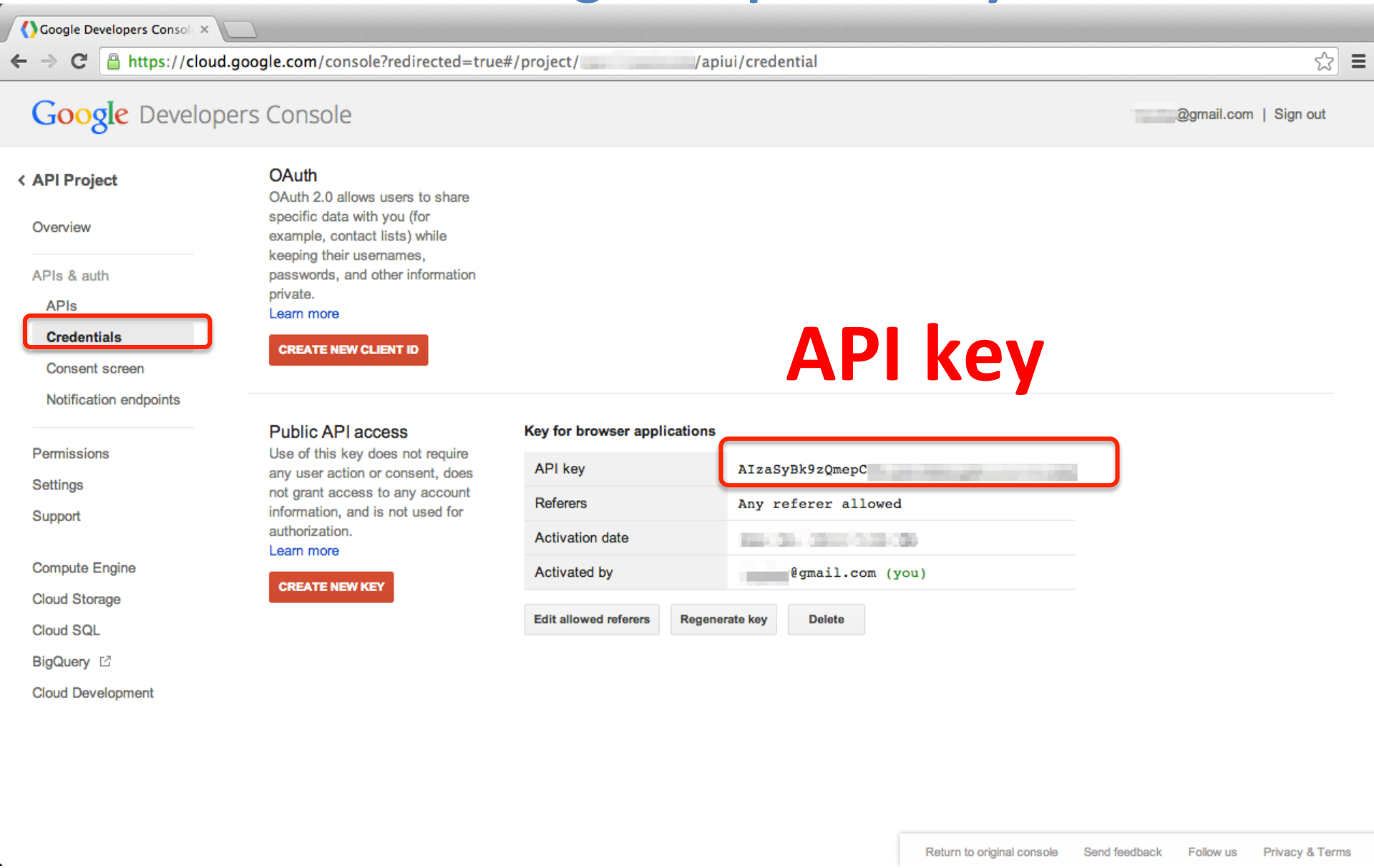
Google Developers Console
Google Cloud Platform



Google Maps API v3



Credentials: Public API access
Get Google Maps API Key



Google Map JavaScript API
Hello, World

Getting Started - Google M

https://developers.google.com/maps/documentation/javascript/tutorial

Hello, World

The easiest way to start learning about the Google Maps API is to see a simple example. The following web page displays a map centered on Sydney, New South Wales, Australia:

```
<!DOCTYPE html>
<html>
  <head>
    <meta name="viewport" content="initial-scale=1.0, user-scalable=no" />
    <style type="text/css">
      html { height: 100% }
      body { height: 100%; margin: 0; padding: 0 }
      #map-canvas { height: 100% }
    </style>
    <script type="text/javascript"
      src="https://maps.googleapis.com/maps/api/js?key={API_KEY}&sensor=SET_TO_TRUE_OR_FALSE">
    </script>
    <script type="text/javascript">
      function initialize() {
        var mapOptions = {
          center: new google.maps.LatLng(-34.397, 150.644),
          zoom: 8
        };
        var map = new google.maps.Map(document.getElementById("map-canvas"),
            mapOptions);
      }
      google.maps.event.addDomListener(window, 'load', initialize);
    </script>
  </head>
  <body>
    <div id="map-canvas"/>
  </body>
</html>
```

View example (map-simple.html)

Even in this simple example, there are a few things to note:

https://developers.google.com/maps/documentation/javascript/tutorial

Google Map JavaScript API

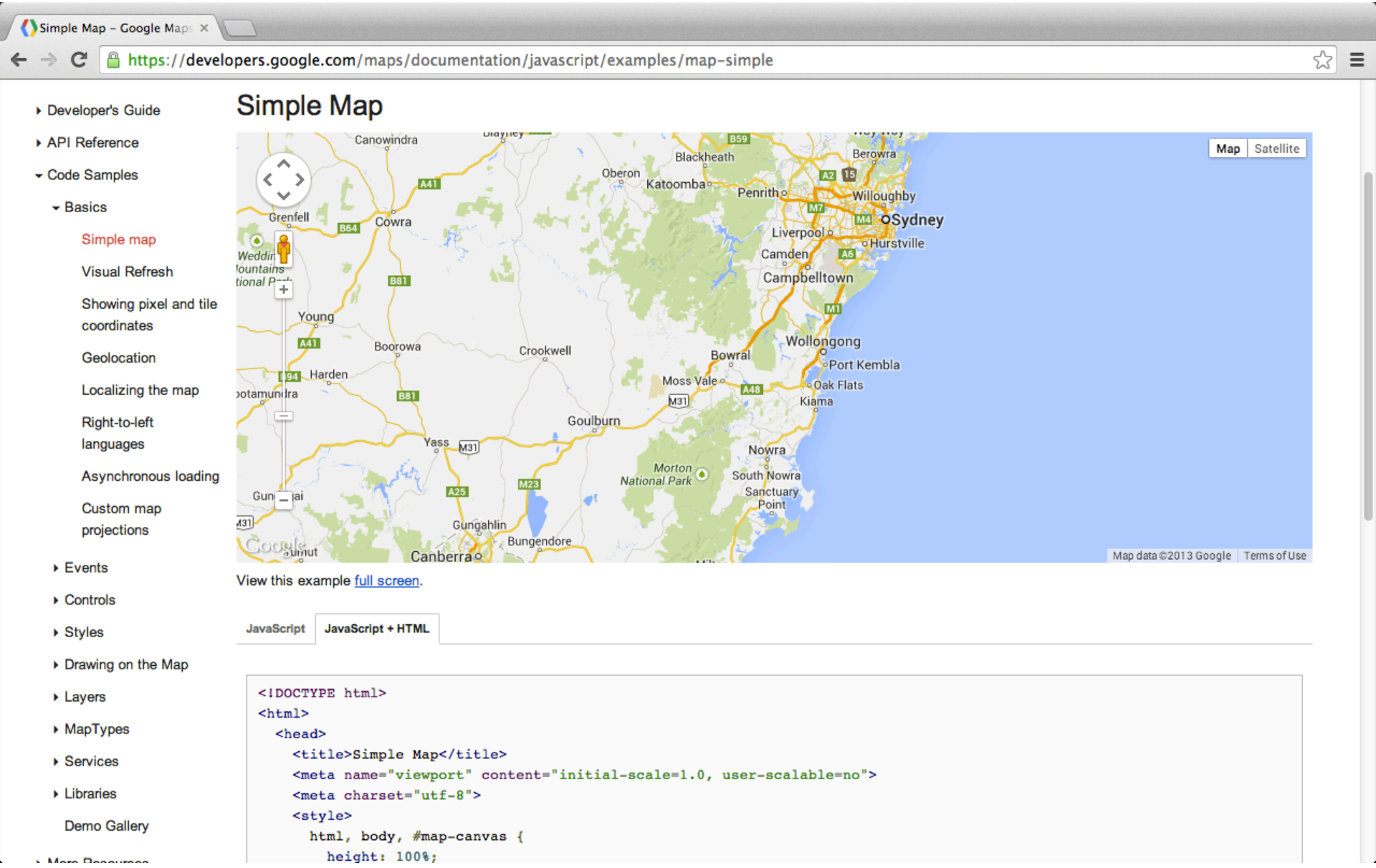
Hello, World

```
<!DOCTYPE html>
<html>
 <head>
  <meta name="viewport" content="initial-scale=1.0, user-scalable=no" />
  <style type="text/css">
   html { height: 100% }
   body { height: 100%; margin: 0; padding: 0 }
   #map-canvas { height: 100% }
  </style>
  <script type="text/javascript"
   src="https://maps.googleapis.com/maps/api/js?key=API_KEY&sensor=SET_TO_TRUE_OR_FALSE">
  </script>
  <script type="text/javascript">
   function initialize() {
    var mapOptions = {
     center: new google.maps.LatLng(-34.397, 150.644),
     zoom: 8
    };
    var map = new google.maps.Map(document.getElementById("map-canvas"),
       mapOptions);
   }
   google.maps.event.addDomListener(window, 'load', initialize);
  </script>
 </head>
 <body>
  <div id="map-canvas"/>
 </body>
</html>
```

API key

https://developers.google.com/maps/documentation/javascript/tutorial

Google Maps JavaScript API: Simple Map



https://developers.google.com/maps/documentation/javascript/examples/map-simple

Google Maps JavaScript API Example
JavaScript + HTML

```
<!DOCTYPE html>
<html>
  <head>
    <title>Simple Map</title>
    <meta name="viewport" content="initial-scale=1.0, user-scalable=no">
    <meta charset="utf-8">
    <style>
      html, body, #map-canvas {
        height: 100%;
        margin: 0px;
        padding: 0px
      }
    </style>
    <script src="https://maps.googleapis.com/maps/api/js?v=3.exp&sensor=false"></script>
    <script>
var map;
function initialize() {
  var mapOptions = {
    zoom: 8,
    center: new google.maps.LatLng(-34.397, 150.644)
  };
  map = new google.maps.Map(document.getElementById('map-canvas'),
      mapOptions);
}

google.maps.event.addDomListener(window, 'load', initialize);

    </script>
  </head>
  <body>
    <div id="map-canvas"></div>
  </body>
</html>
```

https://developers.google.com/maps/documentation/javascript/examples/map-simple

```
<div style="position:absolute; height:100%; width:100%;">
    <div id="map-canvas"></div>
</div>
```

http://mail.tku.edu.tw/myday/app/map.html

Google Maps JavaScript API

```
<style>
    #map-canvas {
      height: 100%;
      margin: 0px;
      padding: 0px
    }
  </style>

  <script>
    function initialize() {
      var mapOptions = {
        zoom: 15,
        center: new google.maps.LatLng(25.174738, 121.450381)
      };

      var map = new google.maps.Map(document.getElementById('map-canvas'),
          mapOptions);
    }

    function loadScript() {
      var script = document.createElement('script');
      script.type = 'text/javascript';
      script.src = 'https://maps.googleapis.com/maps/api/js?v=3.exp&sensor=true&callback=initialize';
      document.body.appendChild(script);
    }

    window.onload = loadScript;
  </script>
```

http://mail.tku.edu.tw/myday/app/map.html

```
<!DOCTYPE html>
<html>
 <head>
    <title>Google Maps</title>
    <meta charset=utf-8 />
    <meta name="viewport" content="width=device-width, initial-scale=1" />

    <script src="js/jquery.js"></script>
    <link type="text/css" href="css/jquery.mobile-1.3.2.min.css" rel="stylesheet" />
    <script type="text/javascript" src="js/jquery.mobile-1.3.2.min.js"></script>

    <!--PhoneGap-->
    <link rel="stylesheet" type="text/css" href="css/index.css" />
    <!--
    <script type="text/javascript" src="phonegap.js"></script>
    -->
    <script type="text/javascript" src="js/index.js"></script>
    <!--/PhoneGap-->
    <script type="text/javascript">
        app.initialize();
    </script>

   <style>
    #map-canvas {
      height: 100%;
      margin: 0px;
      padding: 0px
    }
   </style>

   <script>
      function initialize() {
        var mapOptions = {
          zoom: 15,
          center: new google.maps.LatLng(25.174738, 121.450381)
        };

        var map = new google.maps.Map(document.getElementById('map-canvas'),
            mapOptions);
      }

      function loadScript() {
        var script = document.createElement('script');
        script.type = 'text/javascript';
        script.src = 'https://maps.googleapis.com/maps/api/js?v=3.exp&sensor=true&callback=initialize';
        document.body.appendChild(script);
      }

      window.onload = loadScript;
   </script>

 </head>
```

```
 <body>

     <div data-role="page" id="googlemaps" data-theme="b">
       <div data-role="header" data-position="inline" data-theme="b">
          <a data-icon="back" data-rel="back" back-btn="true">Back</a>
          <h1>Google Maps</h1>
        <a href="index.html#MyHome" rel="external" data-icon="home">Home</a>
       </div><!-- /header -->

       <div style="position:absolute; height:100%; width:100%;">
        <div id="map-canvas"></div>
       </div>

       <div data-role="footer" data-position="fixed" data-theme="b">
          <div data-role="navbar">
            <ul>
            <li><a href="index.html#MyHome" rel="external" class="ui-btn-active ui-state-persist"
data-transition="fade" data-icon="home">Home</a></li>
            <li><a href="index.html#Research" rel="external" class="ui-btn-active ui-state-persist"
data-transition="fade" data-icon="star">Research</a></li>
            <li><a href="index.html#Teaching" rel="external" class="ui-btn-active ui-state-persist"
data-transition="fade" data-icon="check">Teaching</a></li>
            <li><a href="index.html#More" rel="external" class="ui-btn-active ui-state-persist"
data-transition="fade" data-icon="bars">More</a></li>
            <li><a href="index.html#About" rel="external" class="ui-btn-active ui-state-persist"
data-transition="fade" data-icon="grid">About</a></li>
            </ul>
          </div>
       </div><!-- /footer -->
     </div><!-- /page Google Map-->
 </body>
</html>
```

map.html

http://mail.tku.edu.tw/myday/app/map.html

Google Maps JavaScript API + jQuery Mobile

http://mail.tku.edu.tw/myday/app/map.html

Summary

- Google App Engine
  - Google Cloud Platform
  - Google Cloud Datastore
- Google Maps API

References

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- Google App Engine, https://cloud.google.com/products/app-engine/
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