

Google App Engine

CS 6030--Cloud Computing Systems--Summer II 2017

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Introduction

- Part of a google cloud.
- Google App Engine (GAE) was first released as a preview version in April 2008 and came out of preview in September 2011.
- A cloud computing Platform as a service (PaaS)platform.
- Developing and
- Hosting web applications.

Key Features

- Scaling & load balancing for web applications.
- Easy to build.
- Easy to maintain.
- Yes, free for up to 1 GB of storage and enough CPU and bandwidth to support 5 million page views a month.
- 10 Applications per Google account.

Sandboxing

- App can only read its own files
- App cannot manipulate environment variables
- App cannot access network facilities
- Distributing request non-deterministically
- Consequence: run multiple apps on the same server, or one app on multiple servers safely

Runtime Environment

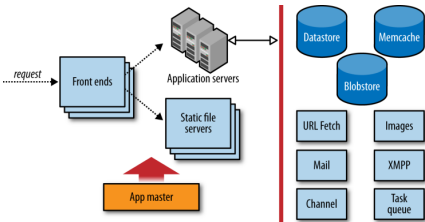
- App Engine application responds to web requests.
- It begins when a client, typically a user's web browser, contacts the application with an HTTP request.
- Identifies from the domain name address or .appspot.com (subdomain).
- Can't access the server on which it is running.
- Read its own files from the filesystem.
- Cannot read files that belong to other applications.
- Cannot access the networking facilities of the server, it can perform networking operations by using services.

Runtime Environment

- Sandboxing also allows App Engine to run multiple applications on the same server without the behavior of one application affecting another.
- Google App Engine provides three possible runtime environments for applications:
 - Java environment,
 - a Python environment,
 - and an environment based on the Go language.

Runtime Environment

- The Java environment runs applications built for the Java 6 Virtual Machine (JVM).
- Any Java technology that functions within the sandbox restrictions can run on App Engine.
- Python environment runs apps in the Python 2.7, using a custom version of CPython, the official Python interpreter.
- Python app uses WSGI, an interface standard.
- Application server model: a request is routed to an app server.



App Engine Architecture

App Engine Architecture

- A load balancer is a dedicated system for distributing requests optimally across multiple machines, routes the request to one of many frontend servers.
- The frontend determines the app for which the request is intended from the request's domain name, either the Google Apps domain and subdomain or the appspot.com subdomain. It then consults the app's configuration to determine the next step.
- The app's configuration describes how the frontends should treat requests based on their URL paths.

App Engine Architecture

- If the URL path for a request does not match anything in the app's configuration, the frontends return an HTTP 404 Not Found error response to the client.
- If the URL path of the request matches the path of one of the app's static files, the frontend routes the request to the static file servers.
- A Blobstore allows applications to serve data objects limited only by the amount of data that can be uploaded or downloaded over a single HTTP connection. These objects are called Blobstore values.

Administration Console

- When an app is ready for public debut.
- Admin account to create and manage the application, view resources, statistics, and message logs.
- Known as Administration Console.
- The Console gives access to real-time performance data about how application is being used, as well as access to log data emitted by the application.
- Console lets you manage the billing account for your application.
- Set up a billing account.
- Sets a budget, a maximum amount of money that can be charged per calendar day.

App Engine Development

- Development model is very simple.
- Create the application.
- Test the application on your system by using the web server software included with the app engine development kit.
- Upload the finished app to the engine.

Lets us try Python App

Setting up the SDK

- <https://dl.google.com/dl/cloudsdk/channels/rapid/GoogleCloudSDKInstaller.exe> (Google Cloud SDK).
- <https://www.python.org/downloads/> (Python SDK).

Create a Python App

- create test.py
- create app.yaml
- create requirements.txt
- gcloud init
- python -m pip install virtualenv
- pip install -r requirements.txt
- dev_appserver.py app.yaml
- gcloud app deploy app.yaml
