



Google App Engine



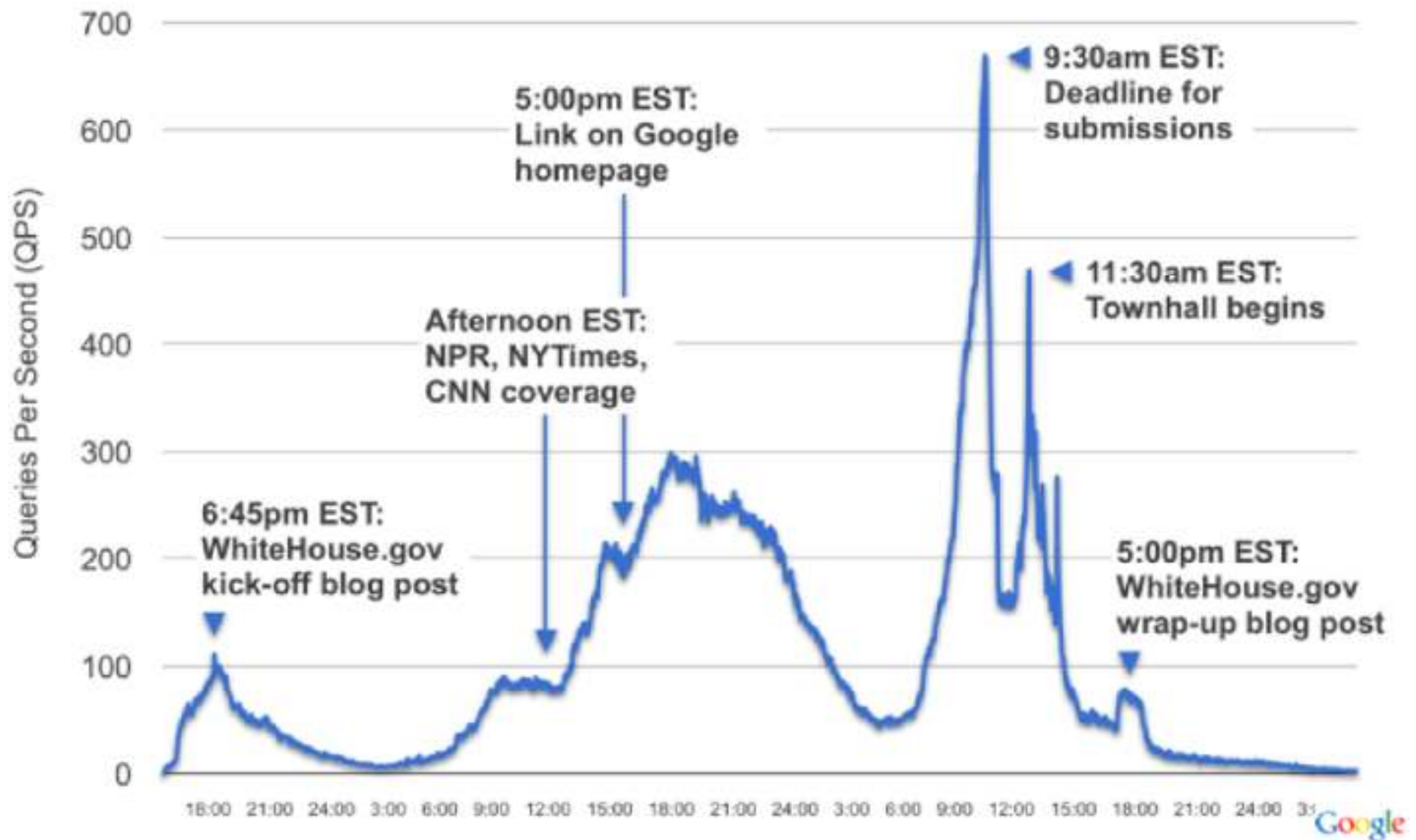
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What is Google App Engine

- ▶ Running and developing web apps (CRUDE)
- ▶ Hosted in Google infrastructure
- ▶ App Engine is a platform PaaS
- ▶ Languages Python, Java
 - ▶ Groovy, Roo, JRuby, Scala, JavaScript
- ▶ Frameworks
 - ▶ Spring, JSF, Grails, Struts, JSF



Web site traffic



App Engine features:

- ▶ dynamic web serving, with full support for common web technologies
- ▶ persistent storage with queries, sorting and transactions
- ▶ automatic scaling and load balancing
- ▶ APIs for authenticating users and sending email using Google Accounts
- ▶ a fully featured local development environment that simulates Google App Engine on your computer
- ▶ task queues for performing work outside of the scope of a web request
- ▶ scheduled tasks for triggering events at specified times and regular



The sandbox

- ▶ Apps run in a secure environment
- ▶ limited access to the underlying operating system.
- ▶ App Engine distributes web requests for the application across multiple servers, and start and stop servers to meet traffic demands.
- ▶ The sandbox isolates your application in its own secure, reliable environment.
- ▶ Independent of the hardware, operating system and physical location of the web server.



Limitations of the secure sandbox


- ▶ Access other computers on the Internet through the provided URL fetch and email services. Other computers connect to the application by making HTTP (or HTTPS) requests on the standard ports.
- ▶ An application cannot write to the file system. An app can read files, but only files uploaded with the application code. The app must use the App Engine datastore, memcache or other services for all data that persists between requests.
- ▶ Application code only runs in response to a web request, a queued task, or a scheduled task, and must return response data within 30 seconds in any case. No shadow tasks (request handler)



The Java Runtime Environment

- ▶ Java Servlet standard
- ▶ Java Server Pages (JSP)
- ▶ Storage Java SDK implements
- ▶ Java Data Objects (JDO) and
- ▶ Java Persistence API (JPA) interfaces
- ▶ java.net HTTP APIs
- ▶ Java Mail API



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- ▶ App Engine also includes low-level APIs for its services to implement additional adapters, or to use directly from the application.
 - ▶ Datastore,
 - ▶ Memcache,
 - ▶ URL fetch,
 - ▶ mail, images
 - ▶ Google Accounts APIs
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Datastore

- ▶ Distributed data storage query engine and transactions
 - ▶ The Master/Slave Datastore
 - ▶ The High Replication Datastore
- ▶ Data are objects, or "entities," have a set of properties
- ▶ The structure of data entities is enforced by app JDO/JPA
- ▶ Strong consistency (consistent read)
- ▶ Optimistic concurrency control (OCC) assumes that multiple transactions can complete without affecting each other, no locking, If conflicting =>rolls back.



Google accounts

- ▶ App Engine supports integrating an app with Google Accounts for user authentication.
- ▶ Users sign in with a Google account, and access the email address and displayable name associated with the account.
- ▶ Google Accounts save you the effort of implementing a user account system for your app.
- ▶ Google Apps - organization wide.
- ▶ Admin registration support easy to implement admin-only areas of your site.



How do I sign in GAE

- ▶ For normal Google Accounts, including Gmail users, you can log into your App Engine account by visiting:
 - ▶ <https://appengine.google.com/>
- ▶ For users with accounts through Google Apps:
 - ▶ <https://appengine.google.com/a/<DOMAIN.COM>>
- ▶ Where <DOMAIN.COM> is the domain that your account is associated with.



App Engine Services

- ▶ Memcache – provides the app with HP in-memory key-value cache that is accessible by multiple instances of your application. Temporary data high speed access.
- ▶ URL Fetch - access resources on the Internet
- ▶ Mail - apps can send and receive email messages
- ▶ Extensible Messaging and Presence Protocol (XMPP) (Jabber), XML-based IM protocol.
- ▶ Images - manipulate images resize, rotate, flip, crop enhance photographs using a predefined algorithm.
- ▶ Google Accounts



App Engine Services

- ▶ **Task Queues** - App Engine apps can perform background processing by inserting tasks (modeled as web hooks) into a queue. App Engine automatically dispatch them for execution.
- ▶ **Blobstore** (Experimental) allows your app to serve data objects, called blobs, that are much larger than the size allowed for objects in the Datastore service. Blobs are created by uploading a file through an HTTP request.
- ▶ **Multitenancy** The Namespaces API in Google App Engine makes it easy to compartmentalize your Google App Engine data. This API is implemented via a new package called the namespace manager, and is
- ▶ incorporated in certain namespace-enabled APIs

GAE Billing

- ▶ No billing enabled => 1 GB of persistent storage
- ▶ CPU and bandwidth for about 5 million page views a month.
- ▶ The Admin Console's Quotas page lists every quota and provides a breakdown of how much your application is consuming per resource.

Resource	Unit	Unit cost
Outgoing Bandwidth	gigabytes	\$0.12
Incoming Bandwidth	gigabytes	\$0.10
CPU Time	CPU hours	\$0.10
Stored Data	Gigabytes/month	\$0.15
High Replication Storage	Gigabytes/month	\$0.45
Recipients Emailed	Recipients	\$0.0001
Always ON	N/A (daily)	\$0.0



GAE Advantages

- ▶ Enterprise quality high availability hosting of web apps
- ▶ No maintenance, high scalability
- ▶ Easy development, PC, easy deployment
- ▶ No upfront cost, free development
- ▶ Constantly improving environment
- ▶ Uses standard JRE and API
- ▶ Quick start, almost no installation



Some limits

- ▶ 30 sec and 10MB
- ▶ Read only file system
- ▶ Limits in threads ...
- ▶ Naked domains
- ▶ Limits in JRE
- ▶ 10 apps per development account
- ▶ Using multiple accounts in tandem is violation of agreement



Google Apps Marketplace

- ▶ Google support for developers
- ▶ Build
- ▶ Integrate
- ▶ Test
- ▶ Promote
 - ▶ Create a listing, send it to Google for approval
 - ▶ Publish press releases, blog posts, tweets, ..
 - ▶ Create a video, YouTube channel
- ▶ Billing



GAE how to start?

- ▶ Register
- ▶ Create an app id
- ▶ Install Eclipse
- ▶ Install GAE (+GWT) plug-in
- ▶ Create a project
- ▶ Program, debug, test
- ▶ Deploy on Google infrastructure
- ▶ Testing and app roll back
- ▶ Administer & Monitor <https://appengine.google.com/>



Integrate to Google Apps

- ▶ Use Single Sign-On to reduce user passwords
- ▶ Add a gadget in Gmail messages, triggered by content
- ▶ Use Google Apps data to make the user's life easier
- ▶ Universal navigation: add yourself to Google's menu



- ▶ Help administrators manage users
- ▶ Use Google Apps as your document repository



App Engine for Business

- ▶ Central Development Management – monitor all app on domain, administration
- ▶ SLA 99.9% availability, support, advanced API
- ▶ Billing for the whole domain (\$8 per user, max \$1000)
- ▶ Hosted SQL
- ▶ ssl



Some links



<http://www.eclub.cvutmedialab.cz/>



Some links



<http://jsedivy.blogspot.com/>

