

Google™



Google Storage for Developers

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May 19, 2010

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<http://bit.ly/cb1Fua>

Introducing Google Storage

- Cloud-based binary object store
 - Structured as buckets and objects
 - Many buckets, many objects, large objects
- You control your data
 - Private, shared, or public
 - Get your data back out at any time
- For developers
 - RESTful API
 - Many SDKs + tools
 - Integration with other Google services

Google Storage Benefits



High Performance and Scalability
backed by Google infrastructure

Flexible Authentication &
Sharing Models



Get Started Fast with
Google & 3rd Party Utilities

Demo: Get Started In < 1 Minute

- click emailed invitation link
- read & accept Terms Of Service
- start using GS Manager

Google services using Google Storage



Data Liberation



Haiti Relief Imagery



Partner Reporting

Google
BigQuery

Google
Prediction API

Some current users

vmware®

 syncplicity



 APPIRIO™

 SnapABug





 Cloud Sherpas





theguardian

socialwok 

 XYLABS

Google™ 

Partner Demo: U.S. Navy Visual News Service



Damon Moritz, U.S. Navy, Office of Information
May 19, 2010

Technical Overview

Google Storage Overview

- Fast, scalable, highly available object store
 - Objects of any type and practically any size
 - Lots of objects, lots of buckets
 - All data replicated to multiple US data centers
 - Read-your-writes data consistency
- Easy, flexible authentication and sharing
 - Key-based authentication
 - Authenticated downloads from a web browser
 - Sharing with individuals and groups
- Google products and 3rd party tools/services
 - Compatible with many available tools and libraries
 - Getting started toolkit

API Concepts

- RESTful API
 - Verbs: GET, PUT, POST, HEAD, DELETE
 - Resources: identified by URI
- Buckets
 - Flat containers
- Objects
 - Any type, practically any size
- Access Control for Google Accounts
 - Coming soon: Google Groups
- Two Ways to Authenticate Requests
 - Sign request using access keys
 - Web browser login

Sample Signed Request

PUT /mybucket/My/Long/Object/Name HTTP/1.1

Host: commondatastorage.googleapis.com:443

Accept-Encoding: identity

Date: Sat, 08 May 2010 19:04:21 GMT

Content-Length: 28

Content-Type: text/plain

Authorization:GOOG1

GOOG4622809698762217:J+y3mj5GThfI6Ed1MqLi7JpCq5Y=

This is my object's content.

Sharing and ACLs

- Data can be private or shared
- Bucket ACL determines:
 - who can list objects (READ)
 - who can create / delete objects (WRITE)
 - who can read / write bucket ACL (FULL_CONTROL)
- Object ACL determines:
 - who can read objects (READ)
 - who can read / write object ACL (FULL_CONTROL)

Partner Demo: Syncplicity



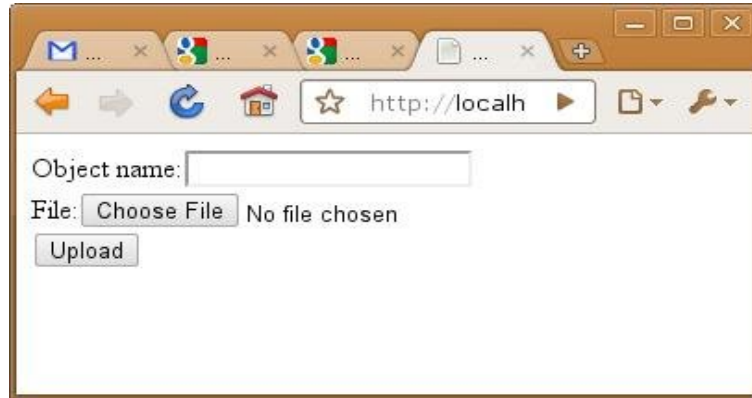
Leonard Chung, CEO
May 19, 2010

Read-Your-Writes Consistency

- Once a write succeeds, all future reads will see a snapshot that includes that write... no matter what replica they talk to
- Once any reader sees a result (even if the write previously appeared to fail) then all future readers will see a snapshot that includes the write

Consistency: Why It Matters

Customer's web browser



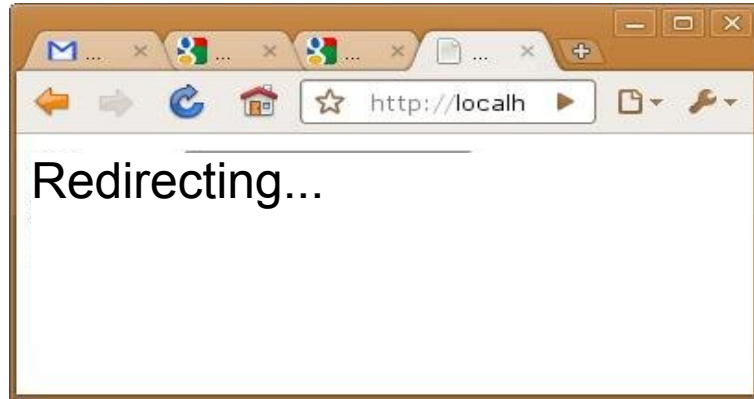
HTTP
POST



Your web app's form
does a POST upload to a
cloud storage service

Consistency: Why It Matters

Customer's web browser



302
Redirect

GET

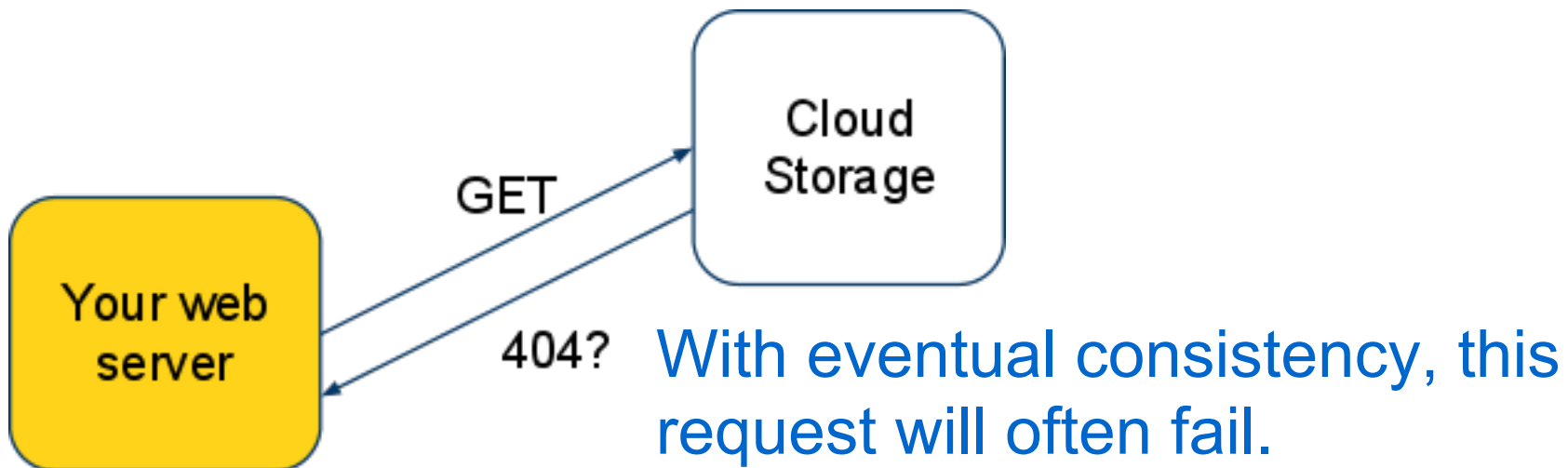


Your form specifies a redirect to your site on upload completion.



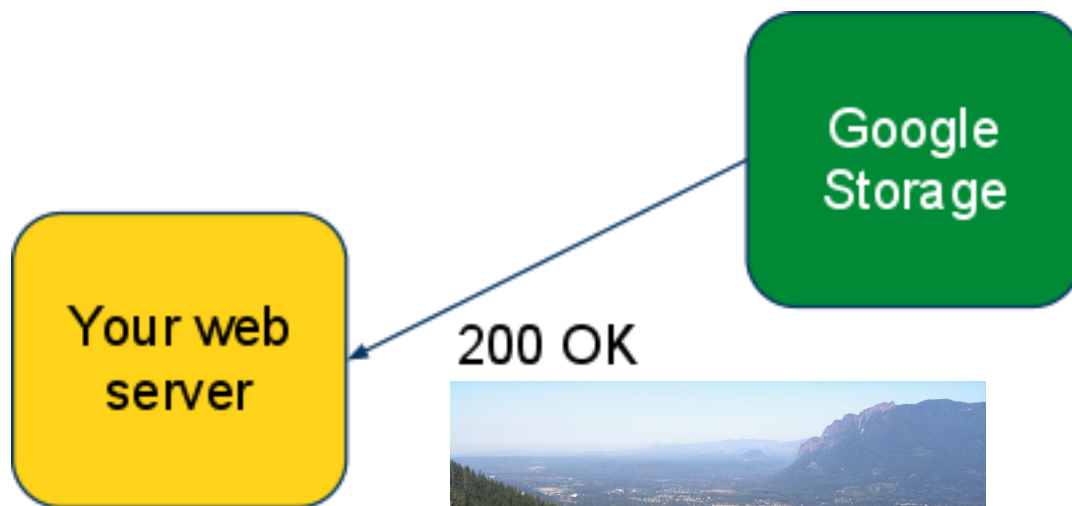
Consistency: Why It Matters

Your web server requests the newly uploaded data, perhaps in another location.



Consistency: Why It Matters

Strong consistency means you can immediately read the data from any Google Storage data center.



*Rattlesnake Ledge,
near Seattle*

Interoperability Gives You Choice

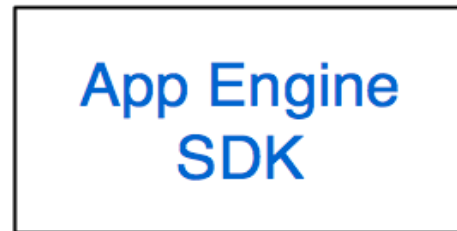
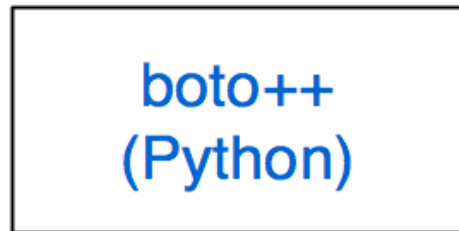
- Data Liberation
 - You shouldn't be locked in by your choice of storage provider
- Choice of tools
 - You should be able to use the same tools to manage your data, regardless of where you keep it

Demo: Using Google Storage

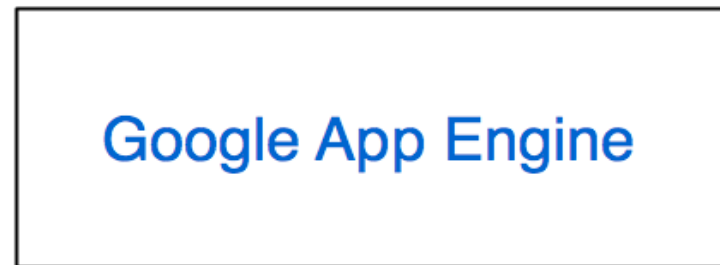
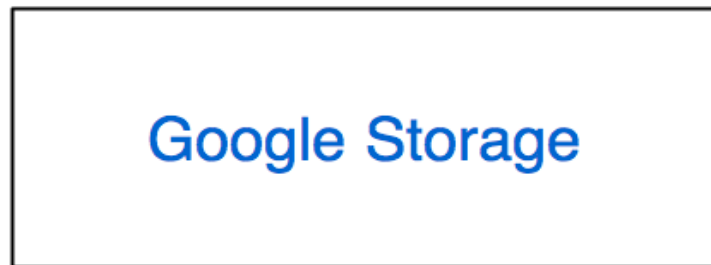
Tools



SDKs



Service



Computing in the Cloud: App Engine Sample

```
os.environ['BOTO_CONFIG'] = 'boto.cfg'
from boto import storage_uri
# <other imports omitted>

class MainPage(webapp.RequestHandler):
    def get(self):
        self.response.out.write('<html><body>')
        uri = storage_uri('gs://pub/shakespeare/rose.txt')
        poem = uri.get_contents_as_string()
        self.response.out.write('<pre>' + poem + '</pre>')
        self.response.out.write('</body></html>')

def main():
    application = webapp.WSGIApplication([('/', MainPage)])
    run_wsgi_app(application)

if __name__ == "__main__":
    main()
```

Pricing and Availability

- Pay as you go pricing
- Storage - \$0.17/GB/month
- Network
 - Upload data to Google
 - \$0.10/GB
 - Download data from Google
 - \$0.15/GB for Americas and EMEA
 - \$0.30/GB for APAC
- Requests
 - PUT, POST, LIST - \$0.01 per 1,000 Requests
 - GET, HEAD - \$0.01 per 10,000 Requests
- Free storage (up to 100GB) during preview period
 - No SLA
- <http://code.google.com/apis/storage>

What's Coming Up

- Service Level Agreement
- Support
- Available to Premium Apps Customers
- Technical Features:
 - Group support in ACLs
 - Resumable uploads
 - Additional regions

Get Your Google Storage Account Now

Request an invitation: <http://bit.ly/dbOB1f>

- Write “I/O Session” in Additional Information section
- Check your email for invitation

Questions

via Google Wave:

<http://bit.ly/cb1Fua>