

Google APIs: Search, Advertising and Commerce

What, Where, When, How, Advertising, Commerce

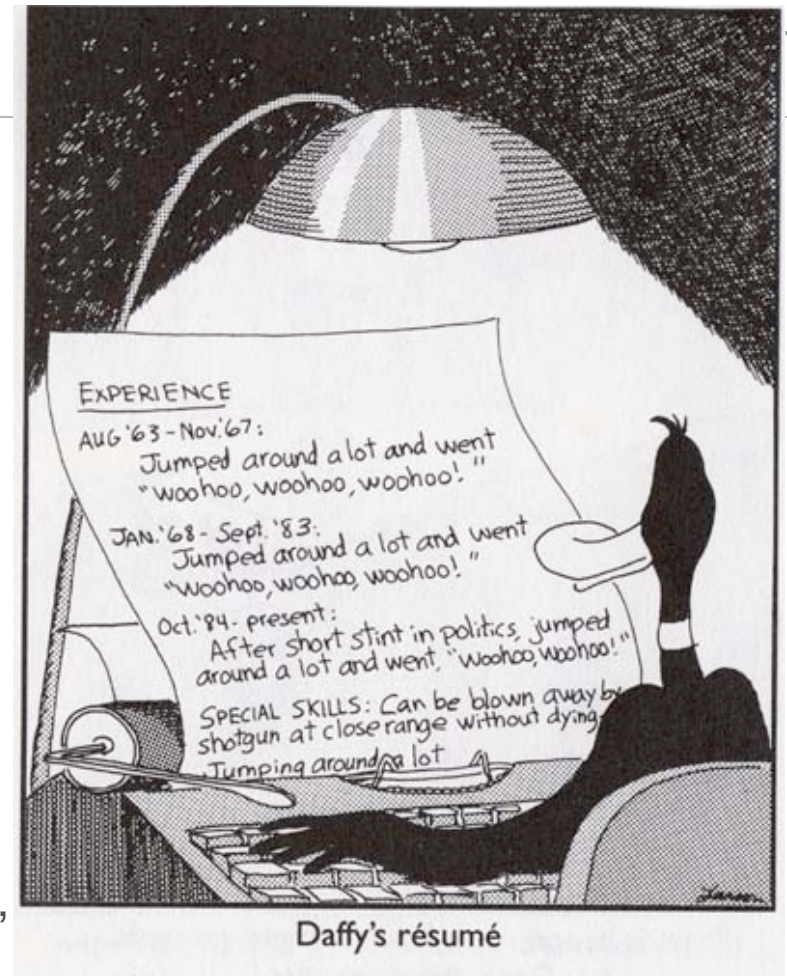


Patrick Chanezon, Google, chanezon@google.com
Checkout API Evangelist

March 14 2007

P@ in a slide

- API Evangelist - Google Checkout
- Software plumber
- Family man: married, 3 kids
- Java geek... in scripting rehab: Ruby, JavaScript, PHP, Python
- Open Source: ROME, AdWords (java, C#, ruby)
- Sun: Blogs, Portals, eCommerce
- Netscape/AOL: LDAP, Calendar, App Servers, CMS, MyNetscape (RSS)
- More on my blog
<http://wordpress.chanezon.com>
- Links at <http://del.icio.us/chanezon/>



- API: Platforms and Bridges
- API technologies: SOAP, REST and Ajax
- What: Google Ajax Search API
- Where: Google Maps API (Ajax)
- When: Google Calendar Data API (REST)
- Advertising: Google AdWords API (SOAP)
- Commerce: Google Checkout API (REST)
- How: Google Web Toolkit (Ajax)

Why are we doing do it?

- Our mission: “Organize the world’s information and make it universally accessible and useful”
 - We can’t organize it all ourselves

26 Google APIs on <http://code.google.com...> and counting! (When I gave that talk in Spring 2006 there were 14)

- | | |
|----------------------|------------------|
| –Google Checkout API | –Gadgets API |
| –Google Data API | –Desktop SDK |
| –5 services | –Enterprise APIs |
| –Maps API | –Homepage API |
| –Ajax Search API | –Related Links |
| –AdWords API | –Sitemaps |
| –Google Web Toolkit | –Talk (XMPP) |
| –Earth (KML) | –Toolbar API |
| | –... |

API Metaphor: Platforms



One stop shop, soup to nuts



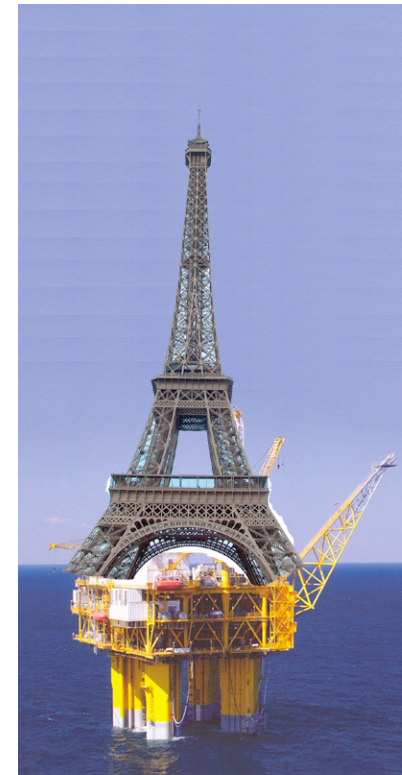
API Metaphor: Platforms

Islands of data



API Metaphor: Platforms

Build tall structures on top



API Metaphor Bridges



User - Search results (Ajax Search)

Ajax

User - Maps (Maps)

User - Data (Gdata)

REST

Buyers - Sellers (Checkout)

Advertiser Ads (AdWords)

SOAP

Publishers - Ads (AdSense)

Build your own bridge (Google Web Toolkit)



API Metaphor Bridges



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REST

SOAP

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REST

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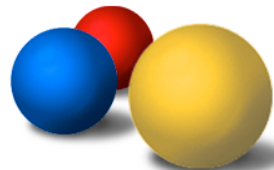
Build your own bridge (Google Web Toolkit)





The Google AJAX Search API

Mark Lucovsky
Technical Director, Engineering
Google Inc.
July 2006



Google AJAX Search API



Easy way to add Google search to your page

Parallel search over Web, Local Listings,
Google Video, and Blogs

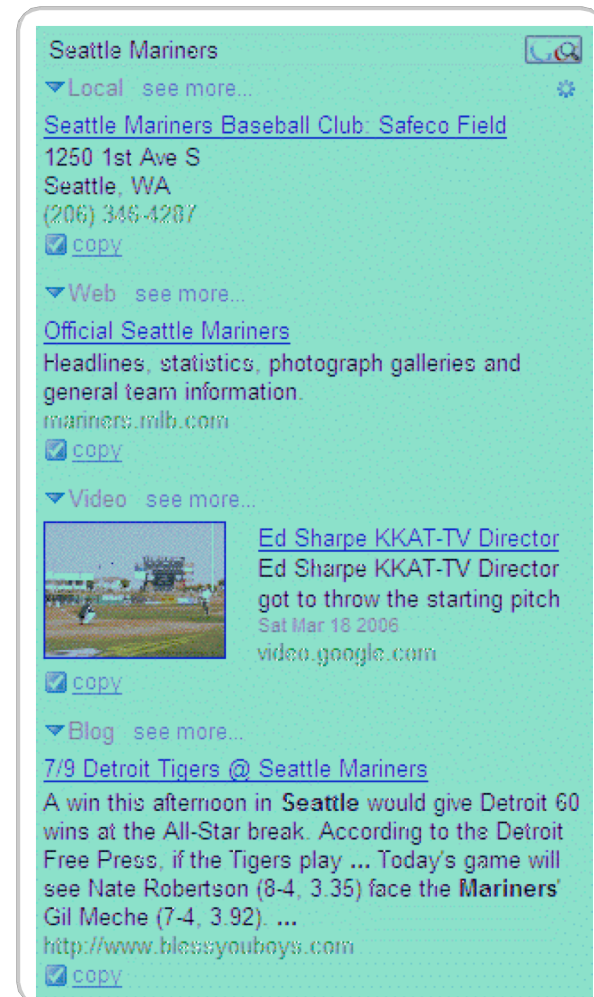
Supports “Clipping” of Search Results

Buzzword Soup Compliant

- AJAX
- JSON
- HTML Microformats...
- Free

Sample to right is:

- ~9 Lines of JavaScript
- ~10 Lines of HTML

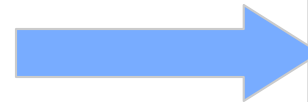


"Hello World"



```
function OnLoad() {  
    var sc = new GSearchControl();  
    sc.addSearcher(new GlocalSearch());  
    sc.addSearcher(new GwebSearch());  
    sc.addSearcher(new GvideoSearch());  
    sc.addSearcher(new GblogSearch());  
  
    sc.draw(searchContainer);  
    sc.execute("Seattle Mariners");  
}
```

```
<body onload="OnLoad()">  
    <div id="searchContainer"/>  
</body>
```



Seattle Mariners


▼ Local see more...

[Seattle Mariners Baseball Club: Safeco Field](#)
1250 1st Ave S
Seattle, WA
(206) 346-4287
☒ [copy](#)

▼ Web see more...

[Official Seattle Mariners](#)
Headlines, statistics, photograph galleries and
general team information.
[mariners.mlb.com](#)
☒ [copy](#)

▼ Video see more...

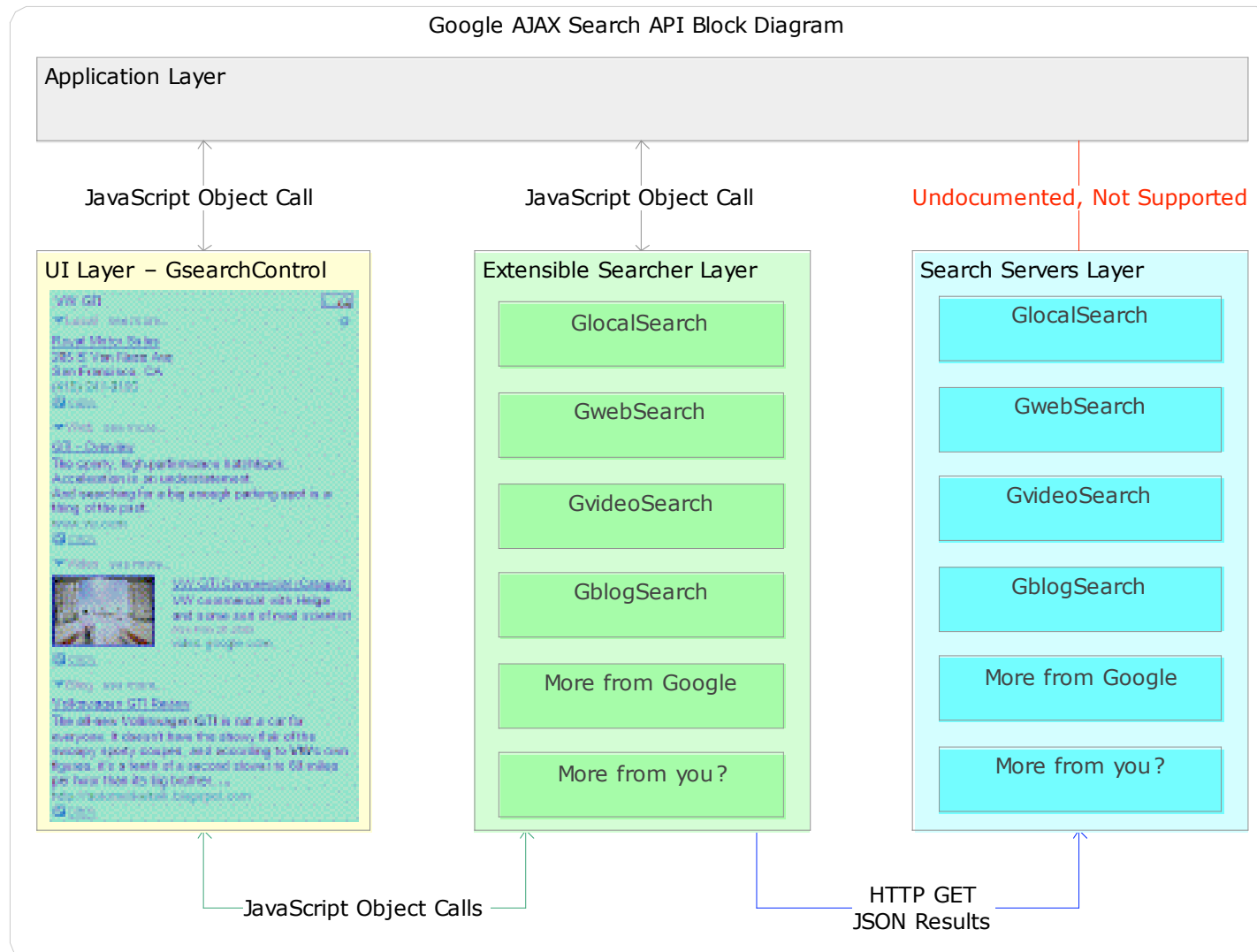


[Ed Sharpe KKAT-TV Director](#)
Ed Sharpe KKAT-TV Director
got to throw the starting pitch
Sat Mar 18 2006
[video.google.com](#)
☒ [copy](#)

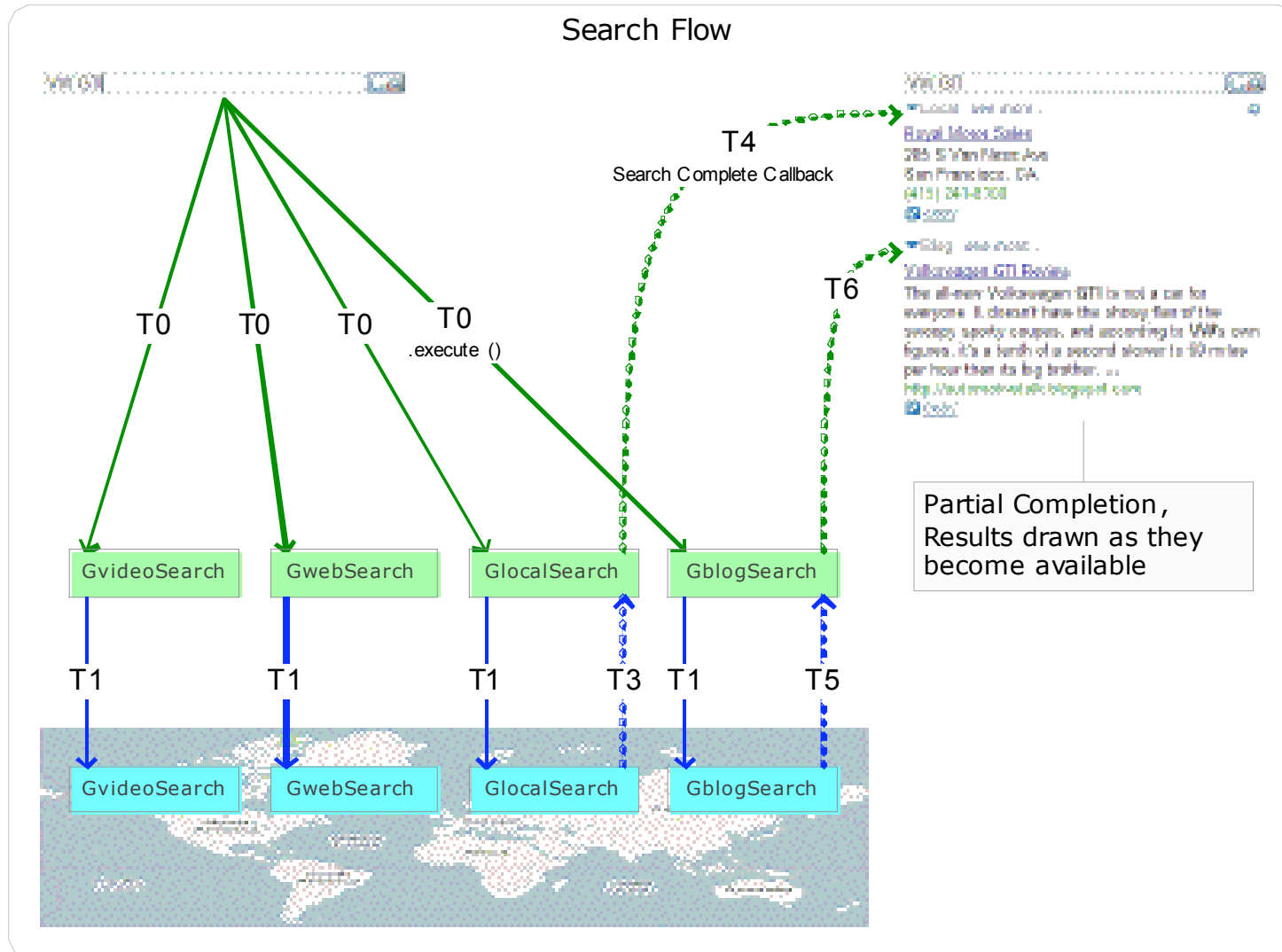
▼ Blog see more...

[7/9 Detroit Tigers @ Seattle Mariners](#)
A win this afternoon in **Seattle** would give Detroit 60
wins at the All-Star break. According to the Detroit
Free Press, if the Tigers play ... Today's game will
see Nate Robertson (8-4, 3.35) face the **Mariners'**
Gil Meche (7-4, 3.92). ...
[http://www.blessyouboys.com](#)
☒ [copy](#)

Architecture Block Diagram



Execution Timeline



“Keep Handling” – How do I do it?



```
function OnLoad() {  
    var sc = new GSearchControl();  
  
    ...  
  
    // establish keep handler  
    sc.setOnKeepCallback(this, MyKeepHandler);  
  
    ...  
}  
  
function MyKeepHandler(result){  
    // clone the .html property  
    var node = result.html.cloneNode(true);  
  
    // append into my document  
    savedResults = document.getElementById("saveArea");  
    savedResults.appendChild(node);  
}
```

Building a “Lead List” using Search



Lead Management Sample - powered by The Google AJAX Search API

A	B	C	D	E	F
	Company	Potential clients	Phone	Lead Date	Physician
1	C Merit Name				
2	Bead James DDS	1315 State St # 2b, Santa Barbara CA	(805) 963-4913	4/3/06	Duncan Douglas MD
4	White Stewart E DDS	15 E Arrellaga St # T, Santa Barbara CA	(805) 962-7441	5/3/06	428 W Micheltorena St Santa Barbara, Ca (805) 969-1546 <input checked="" type="checkbox"/> add to spreadsheet
5	Michael R Cooper Inc	29 W Anapamu St # 501, Santa Barbara CA	(805) 966-6325	5/3/06	Meyorita Medical Clinic
6	California Periodontics	3 W Camillo St # 214, Santa Barbara Co	(805) 962-7144	4/3/06	428 W Micheltorena St Santa Barbara, CA (805) 969-1546 <input checked="" type="checkbox"/> add to spreadsheet
7	Humboldt Marc H MD	9 E Pedregon St, Santa Barbara CA	(805) 969-1628	4/3/06	Wright Peter MD
8	Dr S Puri DDS Inc	126 N.A. St, Oxnard CA	(805) 483-9837	4/3/06	428 W Micheltorena St Santa Barbara, Ca (805) 969-1546 <input checked="" type="checkbox"/> add to spreadsheet
9	Gordon R Gordon DDS MC	126 Decker Ave, Oxnard CA	(805) 983-0717	5/3/06	Duncan Douglas MD
10	Duncan Douglas MD	428 W Micheltorena St, Santa Barbara CA	(805) 963-1546	4/3/06	428 W Micheltorena St Santa Barbara, Ca (805) 969-1546 <input checked="" type="checkbox"/> add to spreadsheet
11	Carron Gerald A MD	115 W Arrellaga St, Santa Barbara CA	(805) 967-0123	4/3/06	Carron Gerald A MD

<http://www.google.com/uds/samples/random/lead.html>

Third Party App, Favorite Places List



Google AJAX Search API Sample - My Favorite Places

This sample application is designed to show how the Google AJAX Search API could be used to construct and share a collection of favorite places.

Local Results

[BMW Auto Parts & Repair](#)
205 E Washington Ave
Sunnyvale, CA
(408) 737-6100
remember this

[Stevens Creek BMW](#)
4343 Stevens Creek Blvd
Santa Clara, CA
(408) 249-9070
remember this

[Lamborghini Palo Alto](#)
3045 Park Blvd
Palo Alto, CA
(650) 324-4488
remember this

[Find on map](#)

Related Results

[Web](#)

[BMW of Mountain View](#)
allison **bmw** home page. no hassle prices and real inventory.
www.allisonbmw.com

[California BMW Triumph Motorcycles: Motorcycle](#)
Order Your Motorcycle Parts and Accessories Online at California **BMW** Triumph ...
Mountain View, California Telephone 650.966.1183 | Fax 650.966.8340 ...
www.calbmwtriumph.com

[San Jose Mercury News | San Jose - - BMW of](#)
Shop online at San Jose stores. Save time and money by shopping from home with San Jose newspaper ads online. Quickly search print ads for jobs, cars, ...
newspaperads.mercurynews.com

[The Unofficial Guide - Businesses](#)
BMW of Mountain View. standard. Address1: 150 E El Camino Real **Mountain View** 94040 Phone: (877) 554-9798 Fax: (650) 943-1064 ...
unofficial.stanford.edu

Map data ©2006 NAVTEQ

My Favorite Places

[BMW of Mountainview](#) [edit](#) [delete](#)
150 E El Camino Real
Mountain View, CA
(650) 943-1000
[clipped from Google - 5/2006](#)
[hide related search result details](#)
[BMW of Mountain View](#)
allison **bmw** home page. no hassle prices and real inventory.
www.allisonbmw.com
[clipped from Google - 5/2006](#)
[delete](#)

[P F Chang's China Bistro](#) [edit](#) [delete](#)
900 Stanford Shopping Ctr
Palo Alto, CA
(408) 991-9078
[clipped from Google - 5/2006](#)
[show related search result details](#)
[Welcome to PF Chang's China Bistro](#)
[PF Chang's China Bistro - Wikipedia, the free encyclopedia](#)

<http://www.google.com/uds/samples/places/index.html>

Google Code

- <http://code.google.com/>

AJAX Search API Documentation and Samples

- <http://code.google.com/apis/ajaxsearch/>
- <http://code.google.com/apis/ajaxsearch/samples.html>

Search API Blog

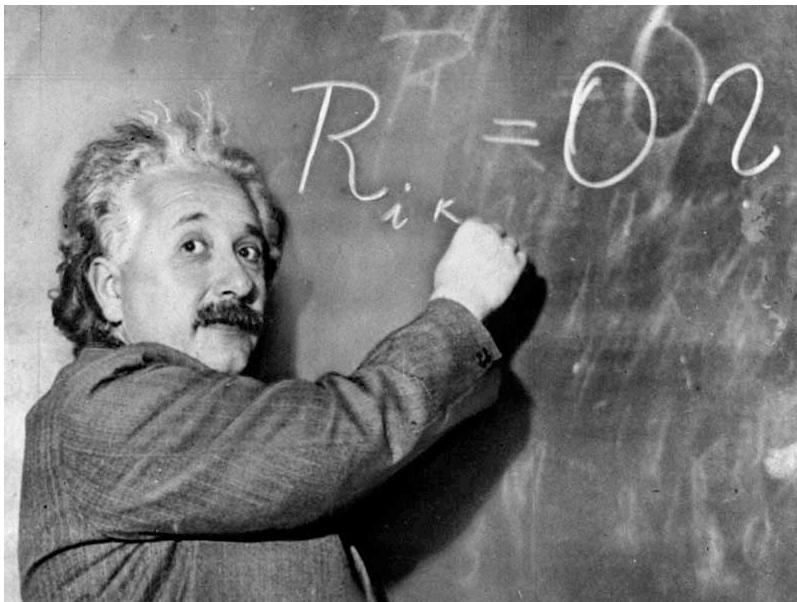
- <http://googleajaxsearchapi.blogspot.com/>

Search API Developer Forum

- <http://groups.google.com/group/Google-AJAX-Search-API>

Space and Time

- 2 important dimensions to organize and present information

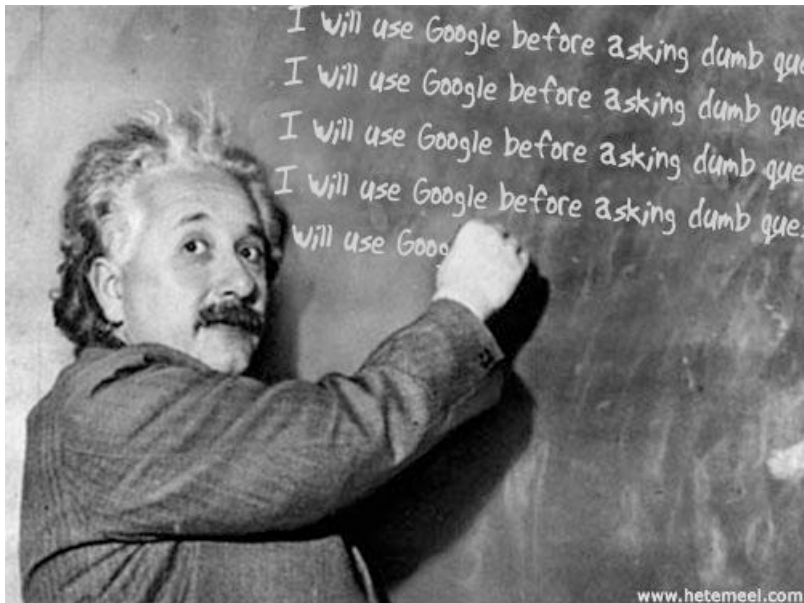


"Space and time are not conditions in which we live; they are simply modes in which we think."

Albert Einstein

This is fine and dandy but how do I use that in my webapp?

- APIs = Plumbing



"If I had my life to live over again, I'd be a plumber."

Albert Einstein

Google Maps API

- Triggered the Ajax revolution
- Now everybody's doing it

Google Maps API

- HTML, JavaScript, (XML)

Google Calendar

- An Ajaxy Calendar

Calendar APIs

- REST is the best: HTTP verbs for the rest of us
- Atom syntax: GET
- Atom Publishing Protocol: POST, PUT, DELETE
- Calendar is the first Google Data API

What's in a name?



AJAX

- Asynchronous
- JavaScript
- XML

... but

- Only the second part (JavaScript) is really used in Google Maps
- All are completely independent
- All existed in browsers for years before Suggest, Gmail, and Maps
- XML? A data format decision that is completely unimportant relative to the other two
- But a bad name is better than no name!
- Ajax is a great Meme: thanks Jesse James Garrett!

What makes an AJAX Application?



Classic web application

- User clicks on a link / submits a form
- HTTP request
- HTTP response **replaces** the document

AJAX web application

- User triggers an event (mouse click, keyboard click, etc)
- Event invokes scripted event handler
- Event handler *may* initiate a data transfer
- Event handler or data transfer callback **updates** the document

Sophisticated user interaction

- Display can be partially updated, modified, or animated
- Complex manipulations of page state and UI are possible

Client-side session state

- Transient session state stored on the client
- Persistent user state stored on the server
- *Enables a much more natural architecture for applications*

DOM – Document Object Model

- API for structured text

CSS – Cascading Style Sheets

- Defines visual layout properties, etc.

JavaScript

- Flexible scripting language that is both powerful and fragile

HTTP

- Transport for background data transfer
- Typically done with IFRAME elements or XMLHttpRequest

Transfer Data Format

- JavaScript object literals (JSON) or XML

Illustration: XML vs. JSON – Text Format



XML

```
<data>  
  <location lon="13.4156" lat="52.5206"/>  
</data>
```

```
var data = {  
  location: {  
    lon: 13.4156,  
    lat: 52.5206  
  }  
};
```

Illustration: XML vs. JSON – API



XML (DOM)

```
var lon =  
datanode.firstChild.getAttribute('lon');
```

XML (E4X)

```
var lon = data.location.@lon;
```

JSON

```
var lon = data.location.lon;
```

But E4X only in Firefox and Flash

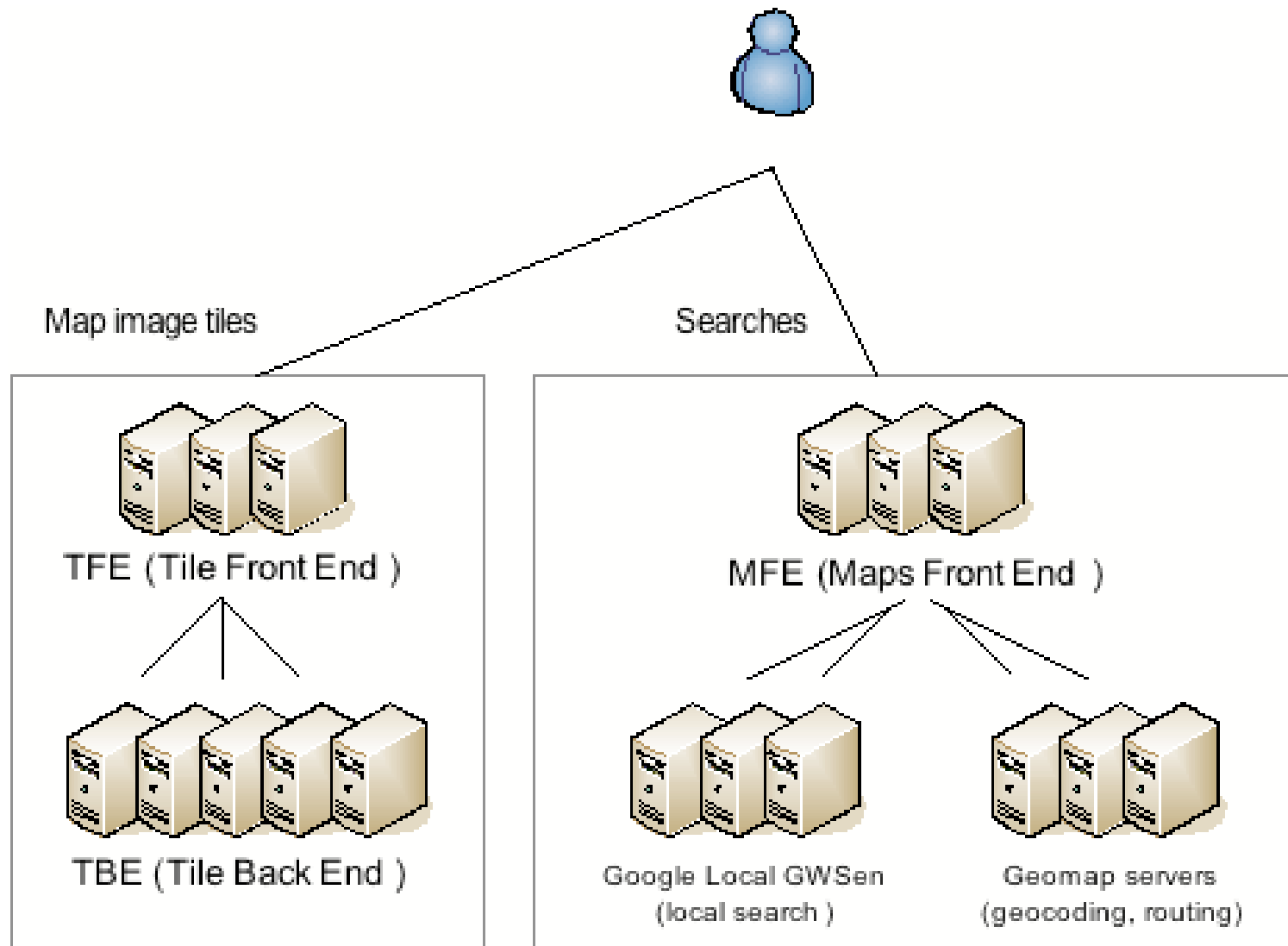
AJAX is a collection of successful technologies being used for things they were never intended for... like the web itself

- The HTML Document Object Model (DOM) was designed for textual documents, not rich graphical interfaces
- XMLHttpRequest was introduced to Internet Explorer by the Microsoft Outlook team to solve a specific problem for Outlook Web Access

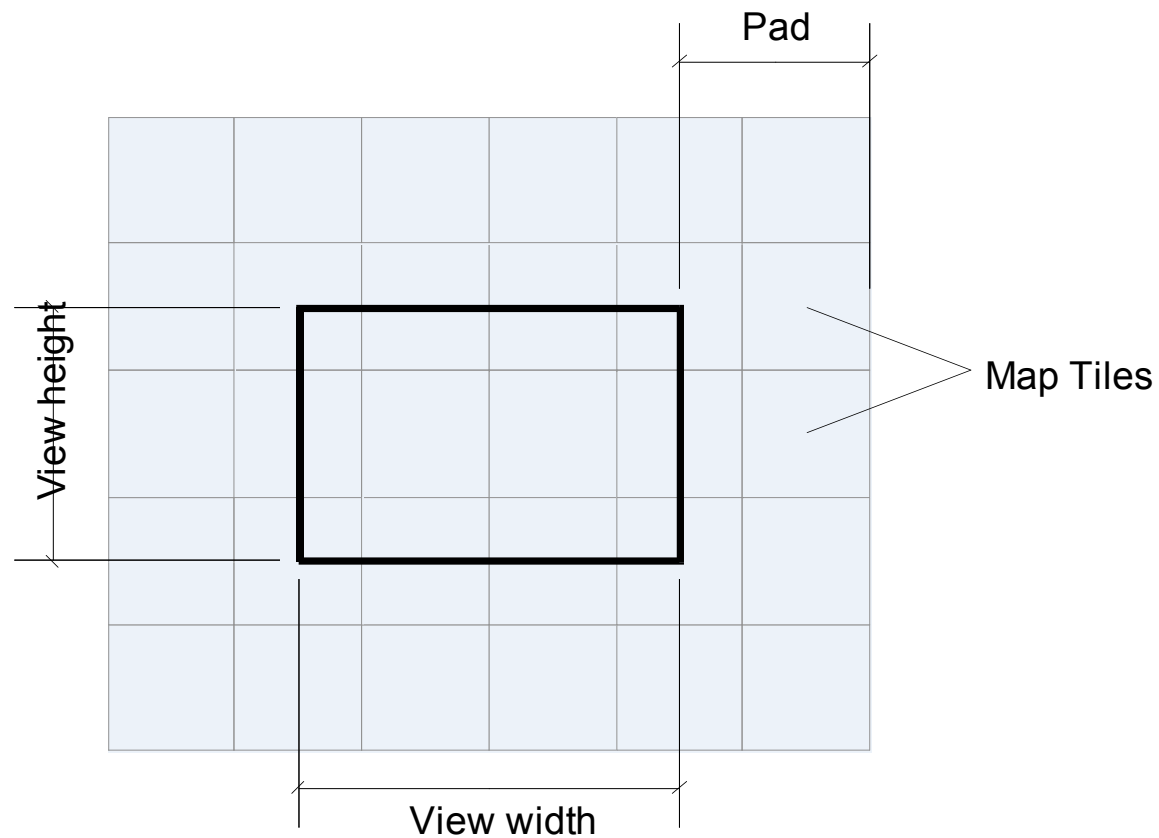
Each component has several implementation differences across browsers and platforms

- AJAX Developer is typically synonymous with PhD in Browser Quirks
- See <http://www.quirksmode.org/>

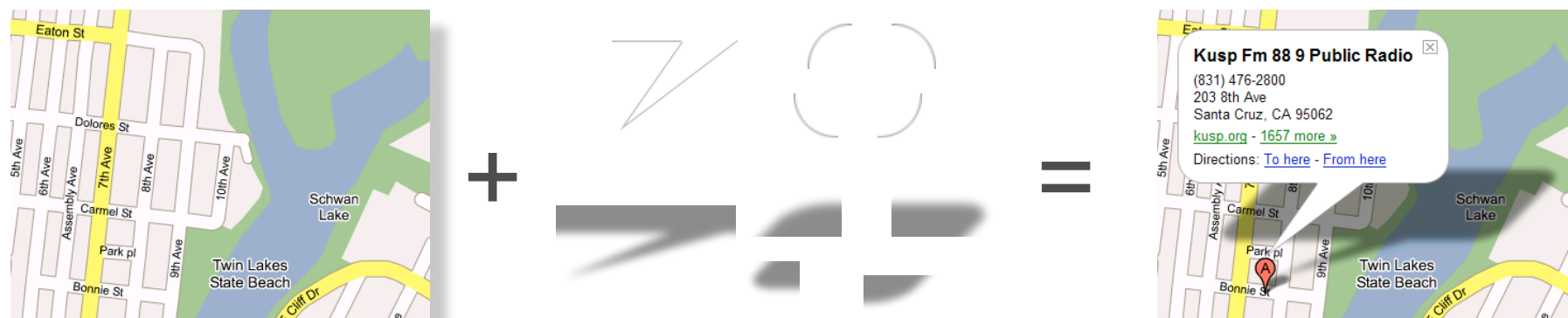
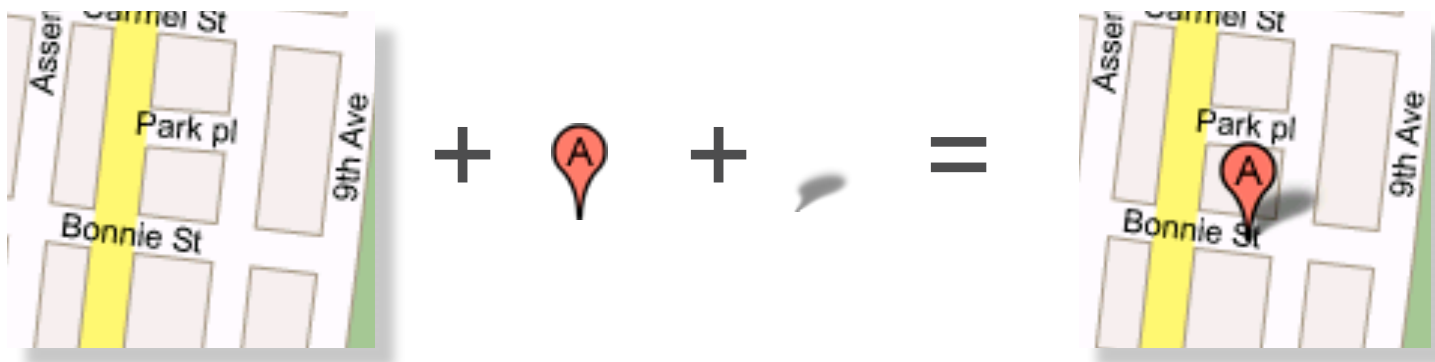
So how does Maps do work?



CSS positioned map tiles with a cropped at the map border



Maps JavaScript architecture



What is it?

- Put Google Maps on your site for free, just like Frappr.com, housingmaps.com and chicagocrime.org
- Overlay custom content, write custom functionality
- Free to all web sites that are free to consumers (including commercial web sites)
- V1 in june 2005, V2 in April 2006

What you can do with the Google Maps API



Switch between maps

- “Map”, “Satellite” and “Hybrid” modes supported by default

Overlays

- Markers
 - Custom icons, shapes, etc
- Polylines
 - e.g., driving directions lines
- Custom overlays

“Info window”, tabbed

- You know, that cool window with the shadow underneath it

Customizability

- Custom map controls, overlays, and map types

Overview map

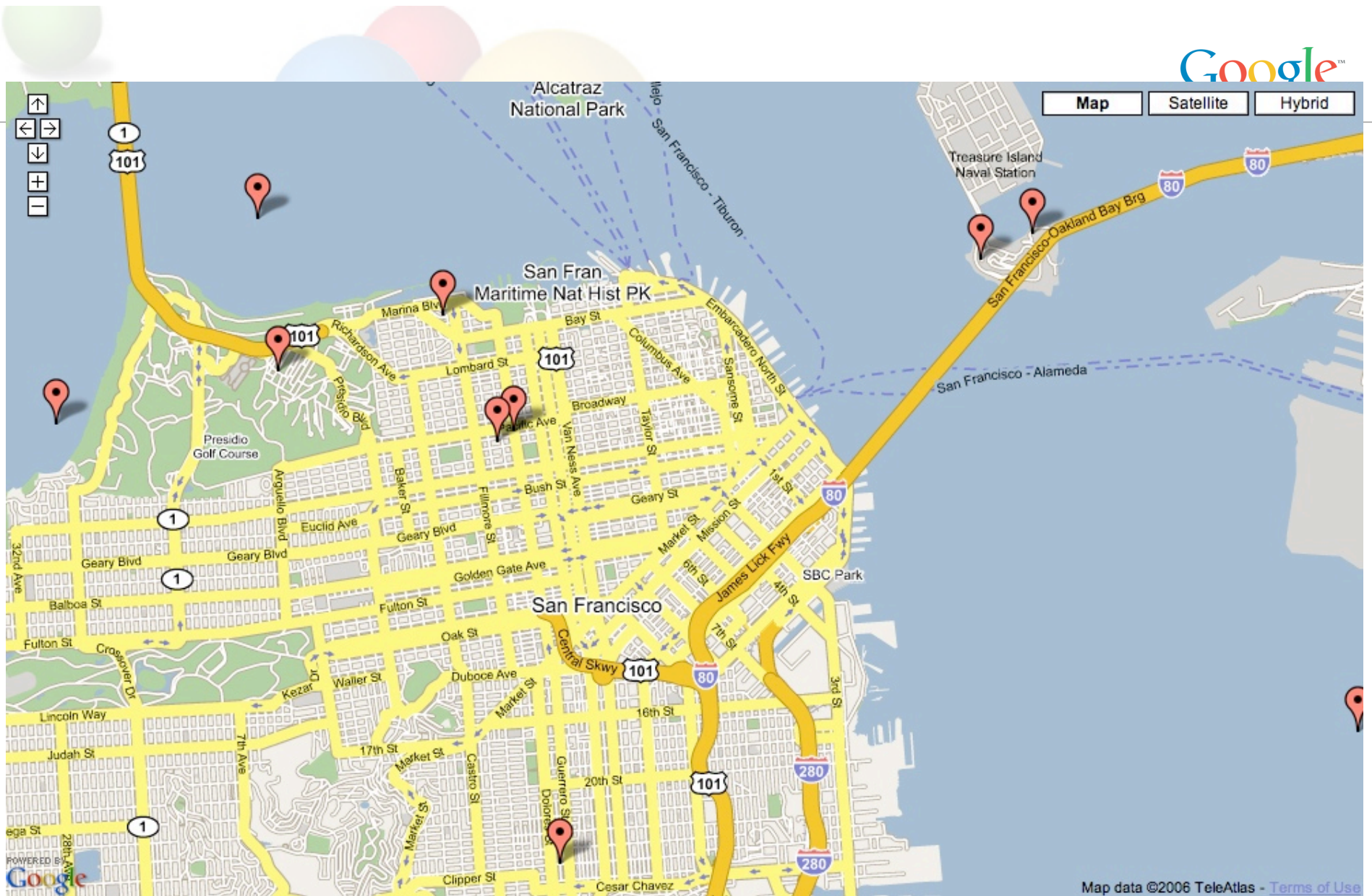
- New `GOverviewMapControl` control displays an attractive and collapsible map in the corner of the screen

Support for a subset of KML (Google Earth data format)

Emphasis on Simplicity



```
// Center the map on Westin Hotel in San Francisco
var map = new GMap2(document.getElementById("map"));
map.addControl(new GSmallMapControl());
map.addControl(new GMapTypeControl());
map.setCenter(new GLatLng(37.787742,-122.408295), 13);
// Add 10 markers to the map at random locations
var bounds = map.getBounds();
var southWest = bounds.getSouthWest();
var northEast = bounds.getNorthEast();
var lngSpan = northEast.lng() - southWest.lng();
var latSpan = northEast.lat() - southWest.lat();
for (var i = 0; i < 10; i++) {
    var point = new GLatLng(southWest.lat() + latSpan * Math.random(),
        southWest.lng() + lngSpan * Math.random());
    map.addOverlay(new GMarker(point));
}
```



A few cool Google Maps applications



Useful/Cool

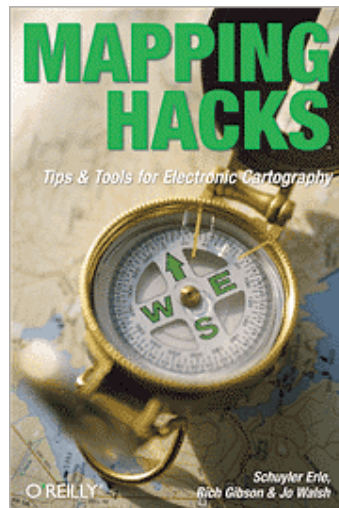
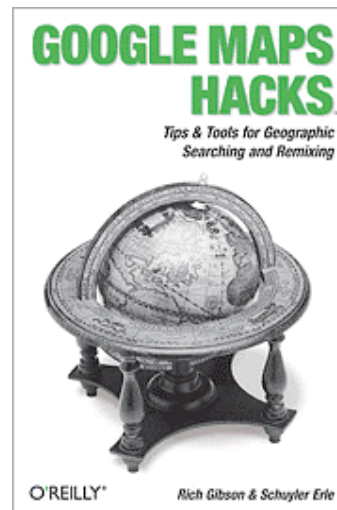
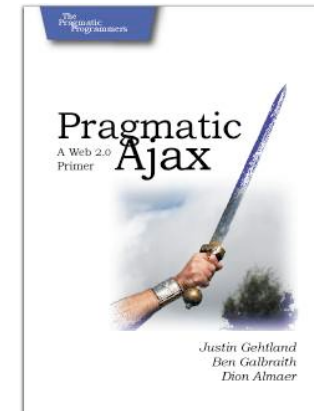
- <http://del.icio.us/chanezon/ajaxian+google+maps+app+cool>

Technically interesting

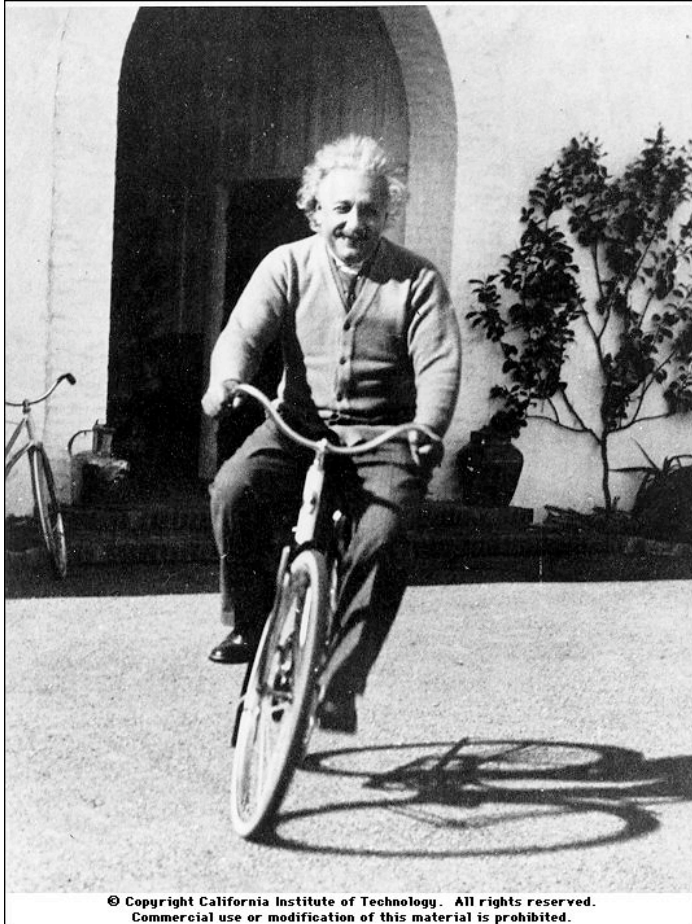
- <http://del.icio.us/chanezon/ajaxian+google+maps+app+tech>

- <http://code.google.com/>
- <http://www.google.com/apis/maps>
- Google-Maps-API Developer Forum:
<http://groups.google.com/group/Google-Maps-API?Ink=li>
- Maps API blog: <http://googlemapsapi.blogspot.com/>
- Mike William's tutorials: <http://www.econym.demon.co.uk/googlemaps/>
- <http://del.icio.us/chanezon/google+maps>

- The Ajaxians book: Pragmatic Ajax
 - implement your own Map UI in a day... then you have to do the server side:-)
- The O'Reilly ones:
 - Google Maps Hacks
 - Mapping Hacks



REST API, Based on Atom and the Atom Publishing Protocol

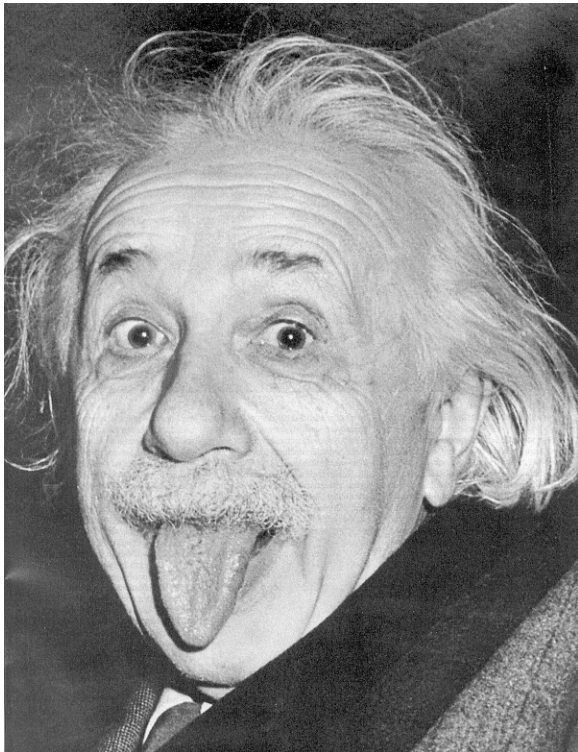


*"The release of atom power
has changed everything
except our way of
thinking..."*

Albert Einstein

GET, POST, PUT, DELETE Calendar Entries

Released in April 2006



"...the solution to this problem lies in the heart of mankind. If only I had known, I should have become a watchmaker."

Albert Einstein

frank mantek (fmantek@google.com)



Adam Bosworth on a bike

“'Google Data APIs Protocol' is a horrible name. You can tell that ex-Microsoft employees had a hand in this effort. :)”

Dare Obasanjo
(Microsoft)

“The benefit is that you'd have a single API that could be used to query, update, and index structured data on the web--anywhere on the web. It's a pretty powerful vision and something I didn't expect to see for a couple more years” - **Jeremy Zawodny (Yahoo)**

ODBC

OLEDB

(P@: In my case JDBC, EJB and Hibernate... but same feeling)

Remoting technologies

XML

SOAP, WSDL

WS_* specs to your hearts content...



Google

- lot of APIs available
- some are SOAP based (AdWords API)
- some are somewhat REST based
- ... all are somehow different

What do we need?

- simple data protocol
- query? Sure, i just love queries...
- updates - there is no point getting data if you can not mess with it....

REST style of design...

- data format should be easy to understand
- easy to consume by existing tools

And the winner is...

- the Syndication format (Atom 1.0 and RSS 2.0).



in the simple case



I just enter a URI, like:

- <http://www.google.com/calendar/user/public/full>
- and get an Atom feed of my calendar data

```
<feed>
  <id>
http://www.google.com/calendar/feeds/user/public/basic
  </id>
  <updated>2006-05-05T14:22:41.000Z</updated>
  <title type="text">Frank Mantek</title>
  <subtitle type="text">Frank Mantek</subtitle>
  <link rel="http://schemas.google.com/g/2005#feed" type="application/atom+xml"
fmantek@gmail.com</email>
  </author>
  <generator version="1.0" uri="http://www.google.com/calendar">Google Calendar</generator>
  <openSearch:itemsPerPage>25</openSearch:itemsPerPage>
</feed>
```



the result, again...



data comes in standard Atom or RSS format

some namespaced extensions are used to identify semantic entities and data items not mappable in Atom and RSS

google extensions are in their own namespace

- [xmlns:gd=http://schemas.google.com/g/2005](http://schemas.google.com/g/2005)

we have **types**

and there are **kinds**

- semantic grouping of types



so, what about types?



types can appear anywhere in the document

they do not have semantic meaning by themselves

e.g. a <who> element can appear in any document, but that
does not make it a contact

The Calendar defines

- Contacts
- Events
- Messages

example: an event



```
<entry xmlns:gd="http://schemas.google.com/g/2005">
  <category scheme="http://schemas.google.com/g/2005#kind" term="http://schemas.google.com/g/2005#event"/>
  <id>http://mycal.example.com/feeds/jo/home/full/e1a2af06df8a563edf9d32ec9fd61e03f7f3b67b</id>
  <published>2005-01-18T21:00:00Z</published>
  <updated>2006-01-01T00:00:00Z</updated>
  <title>Discuss BazMat API</title>
  <content>We will discuss integrating GData with BazMat.</content>
  <author>
    <name>Jo March</name>
    <email>jo@example.com</email>
  </author>
  <gd:when startTime='2005-01-18T21:00:00Z' endTime='2005-01-18T22:00:00Z'>
    <gd:reminder minutes='15'>
  </gd:when>
  <gd:where valueString='Building 41, Room X'>
  <gd:eventStatus value="http://schemas.google.com/g/2005#event.confirmed"/>
  <gd:visibility value="http://schemas.google.com/g/2005#event.public"/>
  <gd:transparency value="http://schemas.google.com/g/2005#event.transparent"/>
</entry>
```

example: an event



```
<entry xmlns:gd="http://schemas.google.com/g/2005">
  <category scheme="http://schemas.google.com/g/2005#kind" term="http://schemas.google.com/g/2005#event"/>
  <id>http://mycal.example.com/feeds/jo/home/full/e1a2af06df8a563edf9d32ec9fd61e03f7f3b67b</id>
  <published>2005-01-18T21:00:00Z</published>
  <updated>2006-01-01T00:00:00Z</updated>
  <title>Discuss BazMat API</title>
  <content>We will discuss integrating GData with BazMat.</content>
  <author>
    <name>Jo March</name>
    <email>jo@example.com</email>
  </author>
  <gd:when startTime='2005-01-18T21:00:00Z' endTime='2005-01-18T22:00:00Z'>
    <gd:reminder minutes='15'/>
  </gd:when>
  <gd:where valueString='Building 41, Room X'/>
  <gd:eventStatus value="http://schemas.google.com/g/2005#event.confirmed"/>
  <gd:visibility value="http://schemas.google.com/g/2005#event.public"/>
  <gd:transparency value="http://schemas.google.com/g/2005#event.transparent"/>
</entry>
```


Did someone say Query?



REST filter model

- categories - part of the path
<http://test.com/-/xtech/talks>
- full text - the **q** parameter
<http://test.com?q=GData>
- author - the **author** parameter
<http://test.com?author=Frank Mantek>
- **updated-min/max** parameter
<http://test.com?updated-min=2006-01-01&updated-max=2006-12-31>

[http://test.com/-
/xtech/talks/2006?author=frank
mantek&q=GData&updated-min=2006-01-
01&updated-max=2006-12-31](http://test.com/-/xtech/talks/2006?author=frankmantek&q=GData&updated-min=2006-01-01&updated-max=2006-12-31)

each entry contains a “self” URI

- `<link rel="self" href="http://test.com/feeds/talks/idforthis"/>`

using that gives you just this entity

Updates are based on the Atom Publishing protocol draft

- <http://www.ietf.org/internet-drafts/draft-ietf-atompub-protocol-11.txt>
Proposed as a standard in May
- Updates are done using optimistic concurrency

Insert a new entry in a feed

- POST to the feed's **service.post** URI

Delete an entry

- DELETE to the entries **edit** URI

Update an entry

- PUT to the entries **edit** URI

just released one property supporting the Data API

- Google calendar was well received since its April 12th launch date
- more Google properties will support this API over time

Language libraries for Java & C#, including documentation

Active community at code.google.com

Support for other languages (PHP, Javascript) is in the works



more quotes...



“I think GData is hot. I'd like us to use this as a building block for some of the developer platform stuff we are doing for Windows Live” - **Dare Obasanjo (Microsoft)**

“The next logical questions, for me at least, are:

1. Will MySQL add native GData support to the server anytime soon?
2. Should Yahoo begin to enable a GData API on our data stores?

I hope the answer to #1 is "yes, they should" and suspect the answer to #2 is "probably--at least for some of them." - **Jeremy Zawodny (Yahoo)**

ClientLogin: Account Authentication for Installed Applications

- programmatic login
- CAPTCHA
- But username/password stored by the application: Bad

AuthSub: Account Authentication Proxy for Web Applications

- Connects the user to a Google service that requests credentials
- The service then returns a token that the web application can use
- Google (rather than the web front end) securely handles and stores the user's credentials.

Outlook sync

- Daniel Tiles, RemoteCalendars

Cell Phone Sync

- Thomas Oldervoll's Gcalsync, J2ME midlet

RDFCalendar XVCD

- By Justsystems Corporation: Google, eventful, upcoming

- <http://code.google.com/>
- <http://code.google.com/apis/gdata/overview.html>
- <http://code.google.com/apis/gdata/calendar.html>
- Google Calendar Data API Developer Forum:
<http://groups.google.com/group/google-calendar-help-dataapi?lnk=li>
- <http://del.icio.us/chanezon/gdata>

AdWords API

- Lets you write software that interacts programmatically with the AdWords service
- Bid management, Reporting/Analytics, Creative generation

SOAP/WSDL web services API

- Standards based
- Tools available for these standards in most languages
- Doc/literal encoding

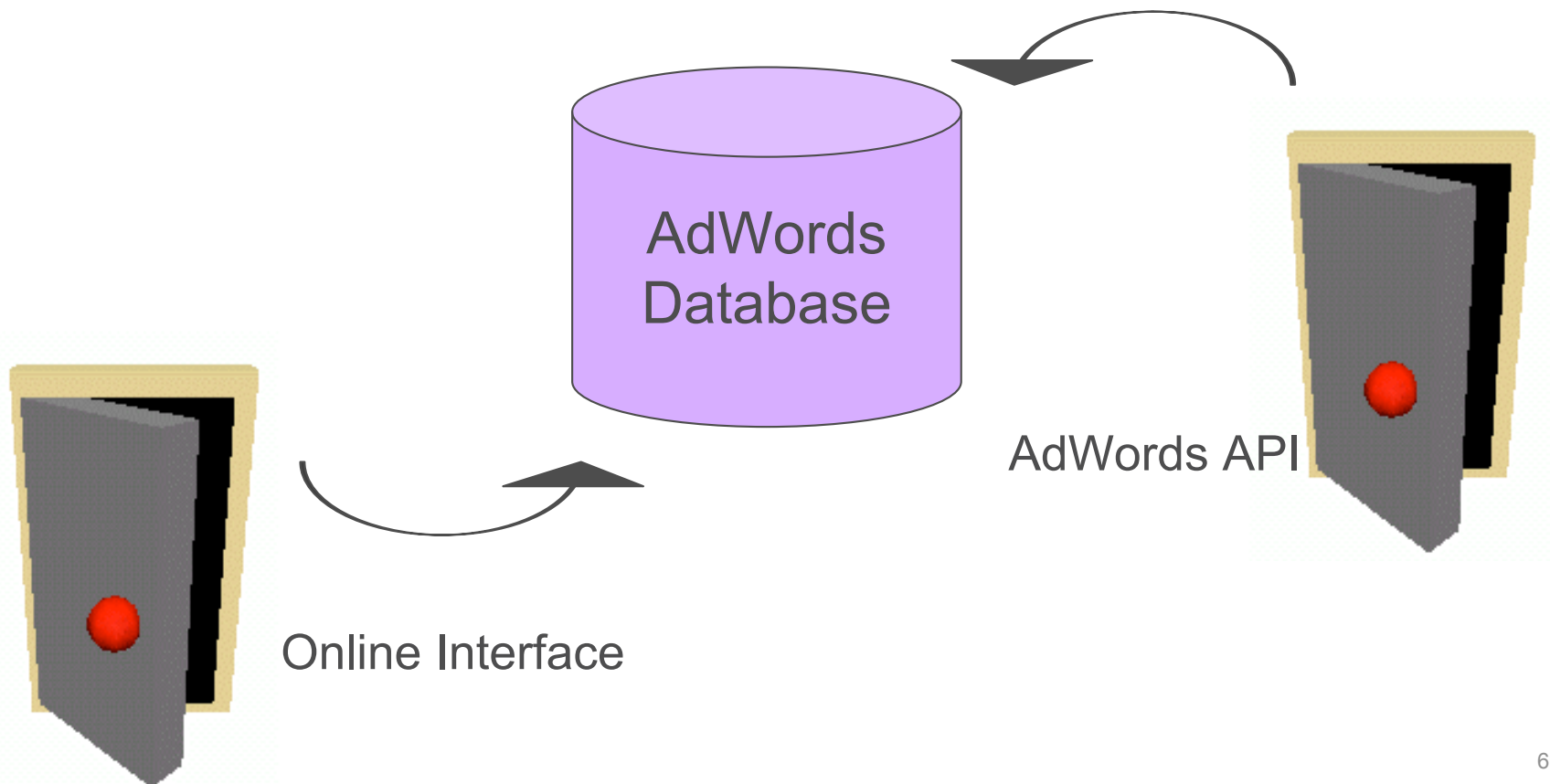
Product overview: AdWords API



What is it?

- An Application Programming Interface to AdWords

How does it work?

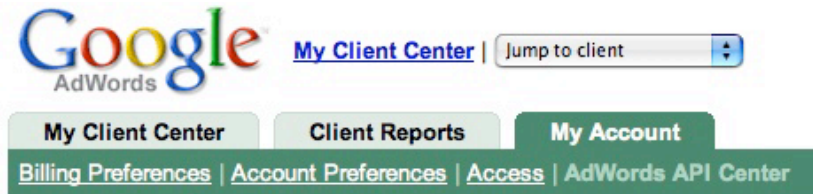


The AdWords API enables anyone to integrate and extend the functionality of AdWords

Users can write programs and applications to perform functions in each of these five areas:

- **Account management** – change user preferences such as email address, password and more at the account level
- **Campaign management** – manage bids, update creative and other campaign operations
- **Reporting** – generate reports to integrate directly into local databases
- **Traffic estimation** – receive traffic estimates for individual keywords
- **Keyword generation** – generate keywords from a base keyword or a web page

Product overview: AdWords API Center



AdWords API Center

API Usage		Show usage in:	Oct	2006	Go
Quota units used:	0				
Purchasable quota units remaining:	250,000				
Usage data is not in real time (updated daily).					

Rate and Budget [edit]	
Rate:	USD \$0 per 1000 quota units
Monthly budget:	\$1.00

Your Developer Token [reset]	
abcdefghijklmnopqrstuvwxyz	

Your Application Tokens [add] [label]	
abcdefghijklmnopqrstuvwxyz	
Details	

Developer Details [edit]	
Company information:	Independent software developer Google http://google.com 501+ employees chanezon@gmail.com

Each API user is assigned a unique developer token which is linked to the user's My Client Center account.

Quota costs \$0.25/1000 quota units, billed to a developer token

Application token is specific to the application you develop

Users can access information about their API usage via the AdWords API Center under "My Account" tab within My Client Center.

In the AdWords API Center, users can:

Generate, view, or reset their developer token

Check their quota allocation and quota units consumed

Resources: AdWords API



The AdWords API is designed to be a do-it-yourself program.* Using the Developer Website, developers can find valuable resources to help them create applications.



Key components:

Developer's Guide

Developer Forum

Frequently Asked Questions

Sample Code

Blog

<http://www.google.com/apis/adwords>

* AdWords API is available globally, but sign-up and documentation is in **English only**

Open Source client libraries and samples

PHP, Java, .NET, Ruby, Perl, OCAML (!)

Samples only: Python

See <http://www.google.com/apis/adwords/samplecode.html>

Getting started with the AdWords API



Register for a developer token

- You will need to create a MCC account

Get your credentials ready

- developerToken: provided during registration, quota attached to it
- applicationToken: specific to an application
- User agent: a String you provide in your program
- Login email: of your MCC account
- Password: of your MCC account
- clientEmail: (optional) of your customers

Coding to the API: How to sign up



Production

- Go to <http://www.google.com/apis/adwords/>
- Enter your account email address and password.
- Your “umbrella” MCC account will be created.
- Developer and application tokens will be generated. These tokens are used in each API call to Google.
- Set a limit for API quota: you pay for quota.
- Visit the [API website](#) to view more information including documentation, sample code, and the Developer Forum.
- You’re all set! You can access your AdWords account with the API immediately.

Sandbox

- For development create a sandbox account
- No quota cost there

Client libraries have an option to dump the xml

- Can be useful in case of issues

```
<?xml version="1.0" encoding="utf-8" ?>
<env:Envelope xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  xmlns:env="http://schemas.xmlsoap.org/soap/envelope/"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <env:Header>
    <developerToken env:mustUnderstand="0">your_dev_token
  </developerToken >
    <applicationToken env:mustUnderstand="0">your_app_token
  </applicationToken >
    <useragent env:mustUnderstand="0">P@ playing with the API from PHP
  </useragent>
    <password env:mustUnderstand="0">your_password
  </password>
    <email env:mustUnderstand="0">toto@example.com
  </email>
  </env:Header>
  <env:Body>
    <estimateKeywordList xmlns="https://adwords.google.com/api/adwords/v4">
      <keywordRequests>
        <maxCpc>50000</maxCpc>
        <text>flowers</text>
        <type>Broad</type>
      </keywordRequests>
    </estimateKeywordList>
  </env:Body>
</env:Envelope>
```

Anatomy of an AdWords API SOAP Response



```
<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <soapenv:Header>
    <responseTime soapenv:actor="http://schemas.xmlsoap.org/soap/actor/next"
soapenv:mustUnderstand="0"
xmlns="https://adwords.google.com/api/adwords/v4">1999</responseTime>
    <operations soapenv:actor="http://schemas.xmlsoap.org/soap/actor/next"
soapenv:mustUnderstand="0" xmlns="https://adwords.google.com/api/adwords/v4">1</operations>
    <units soapenv:actor="http://schemas.xmlsoap.org/soap/actor/next"
soapenv:mustUnderstand="0" xmlns="https://adwords.google.com/api/adwords/v4">25</units>
    <requestId soapenv:actor="http://schemas.xmlsoap.org/soap/actor/next"
soapenv:mustUnderstand="0"
xmlns="https://adwords.google.com/api/adwords/v4">e701e5123f82cd5888f611eb97230579</requestId>
  </soapenv:Header>
  <soapenv:Body>
    <estimateKeywordListResponse xmlns="https://adwords.google.com/api/adwords/v4">
      <estimateKeywordListReturn>
        <id>-1</id>
        <lowerAvgPosition>7.0</lowerAvgPosition>
        <lowerClicksPerDay>111.112045</lowerClicksPerDay>
        <lowerCpc>50000</lowerCpc>
        <upperAvgPosition>10.0</upperAvgPosition>
        <upperClicksPerDay>167.89006</upperClicksPerDay>
        <upperCpc>50000</upperCpc>
      </estimateKeywordListReturn>
    </estimateKeywordListResponse>
  </soapenv:Body>
</soapenv:Envelope>
```

Java and .NET excellent: all code generated, interception structure to log and transform requests, mature

- Gotcha: <valueType>Specified = true necessary for value types in .NET

Ruby: soap4r doc/lit support used to be buggy but many improvements this year.

- Still difficult to map to our own package, but hack in adwords4r

PHP:

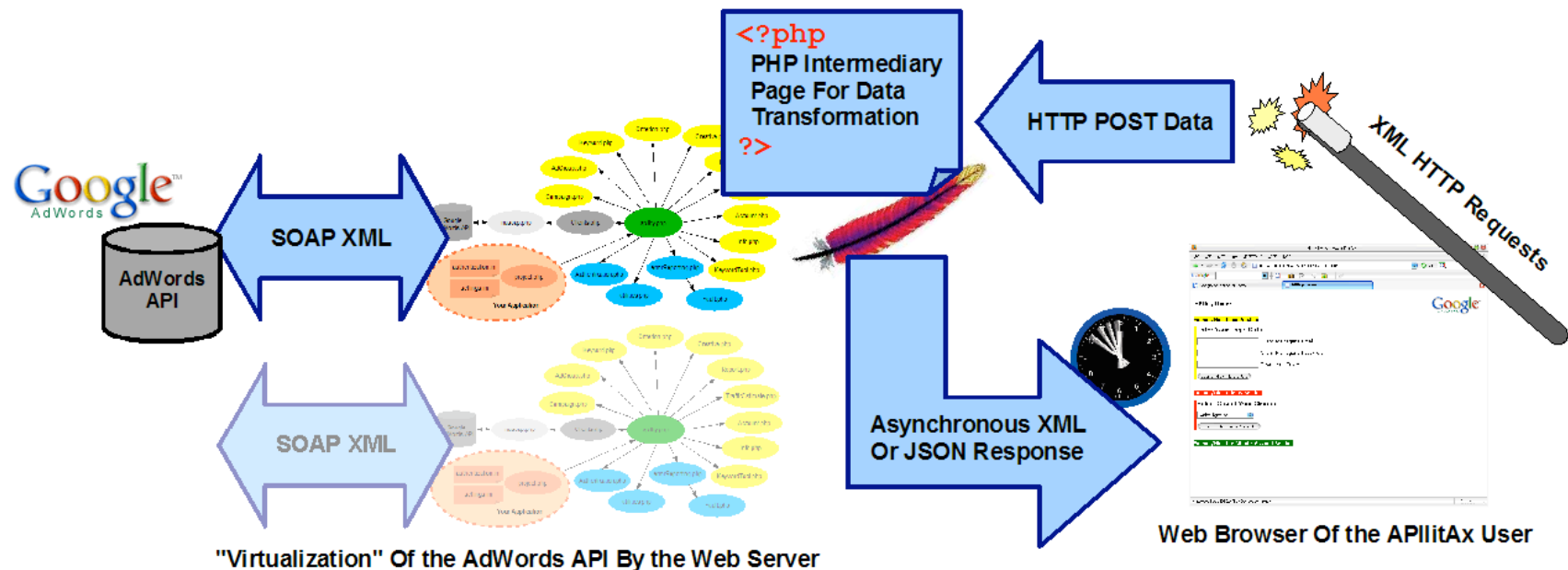
- PHP4 NuSoap: slow, manual xml, but deployed everywhere
- PHP5 Pear: native, fast, but PHP 5 only
- APllity uses NuSoap

Perl:

- waiting for new release of SOAP::Lite from Byrne Reese
- CPAN module, not complete yet

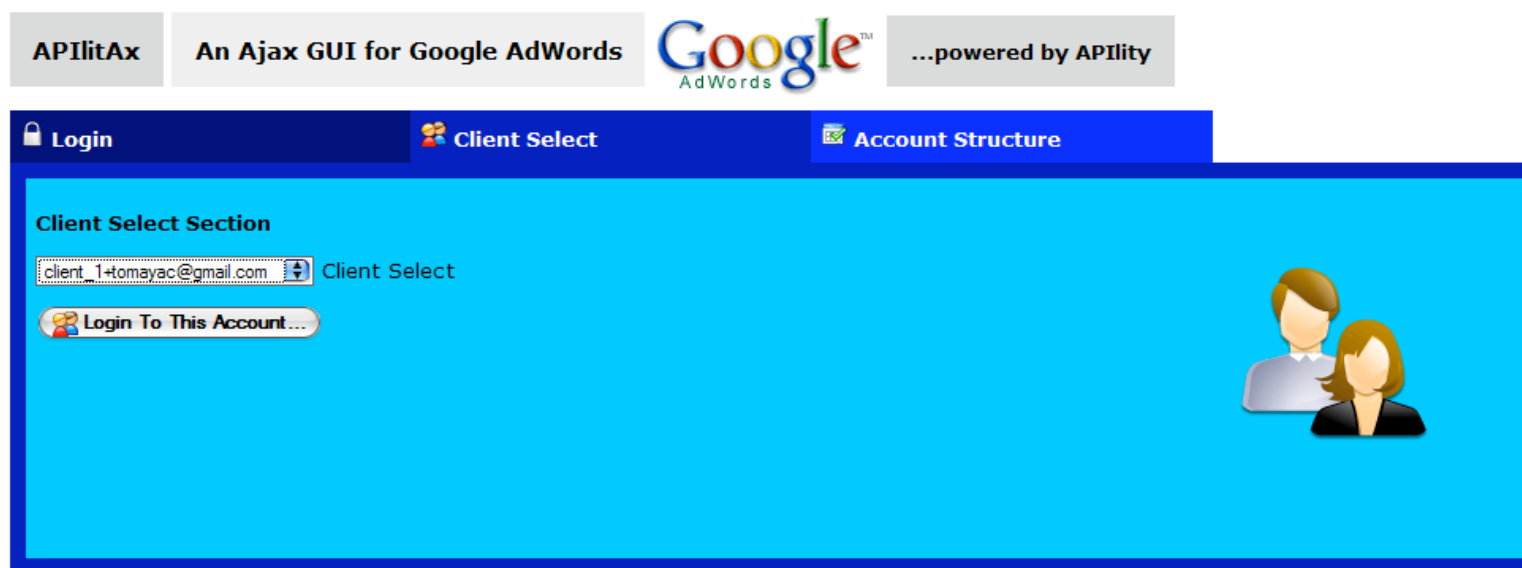
Principle

- JavaScript XML HTTP requests from a web application access intermediate local PHP files communicating via HTTP POST data
- PHP files make the APIItax API calls, running on the local server
- Asynchronous responses are translated back into JavaScript



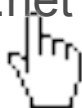
What does it look like?

– Client Select section:



APIlitaX is an open source project released under the [BSD license](#). It is hosted on [SourceForge](#) and provided "as is" without any warranty. Graphics based on Everaldo's [Crystal icon theme](#).

→ <http://apilitax.sourceforge.net>



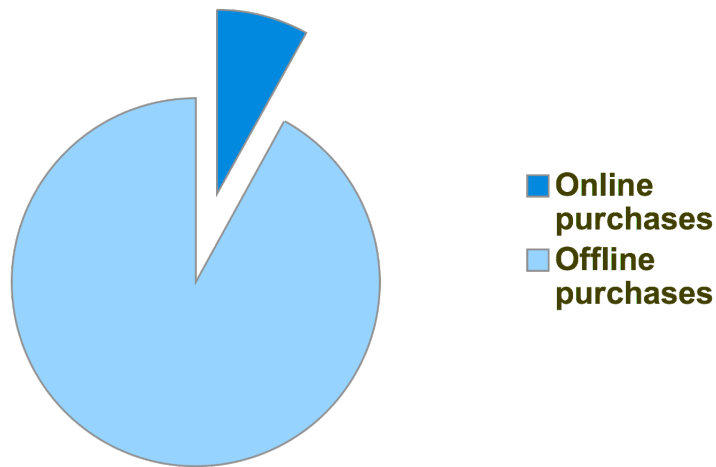


Fast, secure checkout across the Web



Only 8% of all retail purchases are expected to occur online in 2006*

2006 Consumer Purchases by Channel



* 2006 State of Retailing Online, Shop.org/Forrester

Problem: Discovery, Checkout

- Difficult to find trustworthy sellers
- Long, repetitive, checkout processes
- 63% of shopping carts are abandoned after beginning checkout*

* Online Customer Experience Survey, Allurent, February 2006

Opportunity: Search, Convenience

- 37% of online purchases start with search*
- 25% of search queries result in a purchase directly related to the query**
- Fast checkout can improve conversion

* 2005 Online Holiday Mood Study, Shop.org/BizRate Research

** The Role of Search in Consumer Buying, comScore/Google

Google Checkout is an alternative checkout process that provides a fast, secure way to buy and sell online.

Shoppers

- Easily identify Checkout merchants on Google with the Checkout badge
- Conveniently make purchases with a single login/password
- Review and manage purchases from various merchants in one central location

Merchants

- Acquire more leads by displaying the Checkout badge
- Convert more sales by offering a streamlined checkout process
- Lower costs with free transaction processing based on your AdWords spend

retailco

(fictitious company used for illustrative purposes)

Search...Find...Buy...



Shoppers use Google to **search** for items to buy.



Shoppers look for the Google Checkout badge to **find** merchants to buy from.

The screenshot shows a Google search results page for the query "black handbags". The search bar at the top contains the text "black handbags" and a "Search" button. Below the search bar, the results are displayed in a grid format. The first result is "Handbags at Coach.com" with a link to "www.Coach.com". The second result is "All the Handbags" with a link to "www.AlltheBrands.com". The third result is "Black Purses & Handbags from Sophie Bags" with a link to "www.sophiebags.com". The fourth result is "Black Handbags" with a link to "www.blackhandbags.com.au/". The fifth result is "black : handbags shop by color: women's : JCPenney" with a link to "www.jcpenney.com/products/C033523.jsp". The sixth result is "Handbags Purses - Designer Handbags Discount" with a link to "www.alternative-beautv.com/handbags/black.html". On the right side of the page, there are two columns of "Sponsored Links". The first column includes "Designer Handbags Online" with a link to "Zappos.Com", "Black Purses" with a link to "PriceGrabber.com", and "Find the Perfect Black Handbag" with a link to "www.RetailCo.com". The second column includes "Women's Handbags" with a link to "www.AnnTaylorLoft.com" and "Find the Perfect Handbag" with a link to "www.eBags.com". A large, semi-transparent watermark is overlaid on the page, reading "Find the Perfect Black Handbag Fabulous & Unusual Styles. Great Customer Service & Free Shipping! www.RetailCo.com".

Google Web Images Groups News Froogle Local more »
black handbags Search Advanced Search Preferences

Web Results 1 - 10 of about 18,500,000 for **black handbags**. (0.24 seconds)

Handbags at Coach.com
www.Coach.com Find New & Stylish Coach Designs. Online Now at the Official Site

All the Handbags
www.AlltheBrands.com All the Handbags. All the Savings. Start Here.

Black Purses & Handbags from Sophie Bags
Sophie Bags has a large selection of black purses and handbags. ... Sophie Bags carries a variety of black purses and handbags. ...
www.sophiebags.com/

Black Handbags
My name is Stacey Leigh **Black**, I am 27 and live in Bredbo NSW. Like most girls, I have a deep obsession for **handbags**, which I change as often as my shoes. ...
www.blackhandbags.com.au/ - 7k - Cached - Similar pages

black : handbags shop by color: women's : JCPenney
Women's, **Handbags** Shop By Color, **Black**. ... 'Call Me' Leather **Handbag** · St. John's Bay Woven Double Handle Shopper · St. John's Bay Woven Double Handle ...
www.jcpenney.com/products/C033523.jsp - 46k - Cached - Similar pages

Handbags Purses - Designer Handbags Discount
Black Handbags, leather **handbags**, designer purses and designer wallets inspired by top designers like Louis Vuitton, Prada, Coach, Gucci and more! ...
www.alternative-beautv.com/handbags/black.html - 30k - Cached - Similar pages

Sponsored Links

Designer Handbags Online
All Major Brands. Huge Selection. Free Shipping. Order Now!
Zappos.Com

Black Purses
Compare Prices on a Wide Variety of Apparel and Save Money.
PriceGrabber.com



Find the Perfect Black Handbag
Fabulous & Unusual Styles. Great Customer Service & Free Shipping!
www.RetailCo.com

Women's Handbags
Spring Sale: Up To 50% Off Select Styles and \$5 Standard Shipping.
www.AnnTaylorLoft.com

Find the Perfect Handbag
Fabulous & Unusual Styles. Great Customer Service & Free Shipping!
www.eBags.com

To **buy**, shoppers need only click Google Checkout and enter their username/password.

The screenshot shows the 'retailco' shopping bag page. At the top, there's a red header with 'retailco' and links for 'myaccount', 'shoppingbag', and 'help'. Below this is a red bar that says 'Review Your Shopping Bag'. A table lists the items in the bag:

Product Description	Price	Qty	Total	Remove
 Kate Landry Fur-Trim Footed Bag	\$29.50	1	\$29.50	

Below the table, the subtotal is \$31.93 and tax is \$2.43. At the bottom, there's a link to 'Go back and continue shopping.', a red 'Checkout' button, and a 'Google Checkout' button with the text 'Fast checkout through Google'.

A sign-in form with the heading 'Or sign in' and the text 'If you already have a Google Account'. It contains fields for 'Email:' and 'Password:', a 'Sign in and continue' button, and a link for 'Forgot your password?'.

The screenshot shows the 'retailco' Google Checkout page. It has a header with 'retailco' and 'Google Checkout'. The main section is titled 'Review and place order' and shows the order details for 'RetailCo, Inc.' with a table of items:

Qty	Item	Price
1	Kate Landry Fur-Trim Footed Bag	\$29.95

Below the table, it shows 'Shipping & handling (CA)' as \$1.49, 'Tax (CA)' as \$2.47, and a 'Total' of \$33.46. There are checkboxes for 'Keep my email address confidential' and 'I want to receive promotional email from retailco.com'. The shipping address is 'Todd Jackson' and the payment method is 'Visa xxx-1234'. At the bottom, there's an 'Edit order' link and a 'Place your order now \$33.46' button.

Google Checkout users can easily **manage** all of their purchases in a central location.

**Purchase History**

Default shipping address
Todd Jackson
Google Inc
1600 Amphitheatre Pkwy
Mountain View, CA 94043
[Edit shipping addresses](#)

Default payment method
Visa xxx-1234
Expires 04/07
Todd Jackson
1600 Amphitheatre Pkwy
Mountain View, CA 94043
[Edit payment methods](#)

[See all sellers I've rated](#)

Orders					1 - 20 of 35 orders	Next »
Order Date	Item	Seller	Status	Amount		
May 30, 2006	Kate Landry Fur-Trim Footed Bag	retailco.com	In progress	\$99.16		
May 18, 2005	Alice in Wonderland Book	Bill's Books	In progress	\$2.45		
Sep 14, 2005	Chocolate Chip cookies	Jane's Cookies	Ready for pickup	\$1.50		
Sep 2, 2005	Michael Jackson	Google Video	Credit card declined	\$27.34		
Sep 2, 2005	Tiger Woods highlights	Google Video	Completed - Rate this seller	\$5.95		
Dec 14, 2004	Tree landscape	Smith Photography	Cancelled Refund - Dec 15, 2003	\$15.34 (\$15.34)		
Dec 14, 2004	Fruit in bowl still life	Smith Photography	Shipped	\$47.50		

1 - 20 of 35 orders

[Next »](#)

Product Benefits



① Search

② Find

③ Buy

For Buyers...

Convenience

- Google Checkout badge helps identify merchants to buy from
- One place to track purchases

Speed

- Single log in for easy buying across the web

Confidence

- Credit card number concealment
- Fraud protection
- Email forwarding

For Merchants...

More Leads

- Google Checkout badge helps attract more customers

More Conversions

- Streamlined checkout process increases conversions

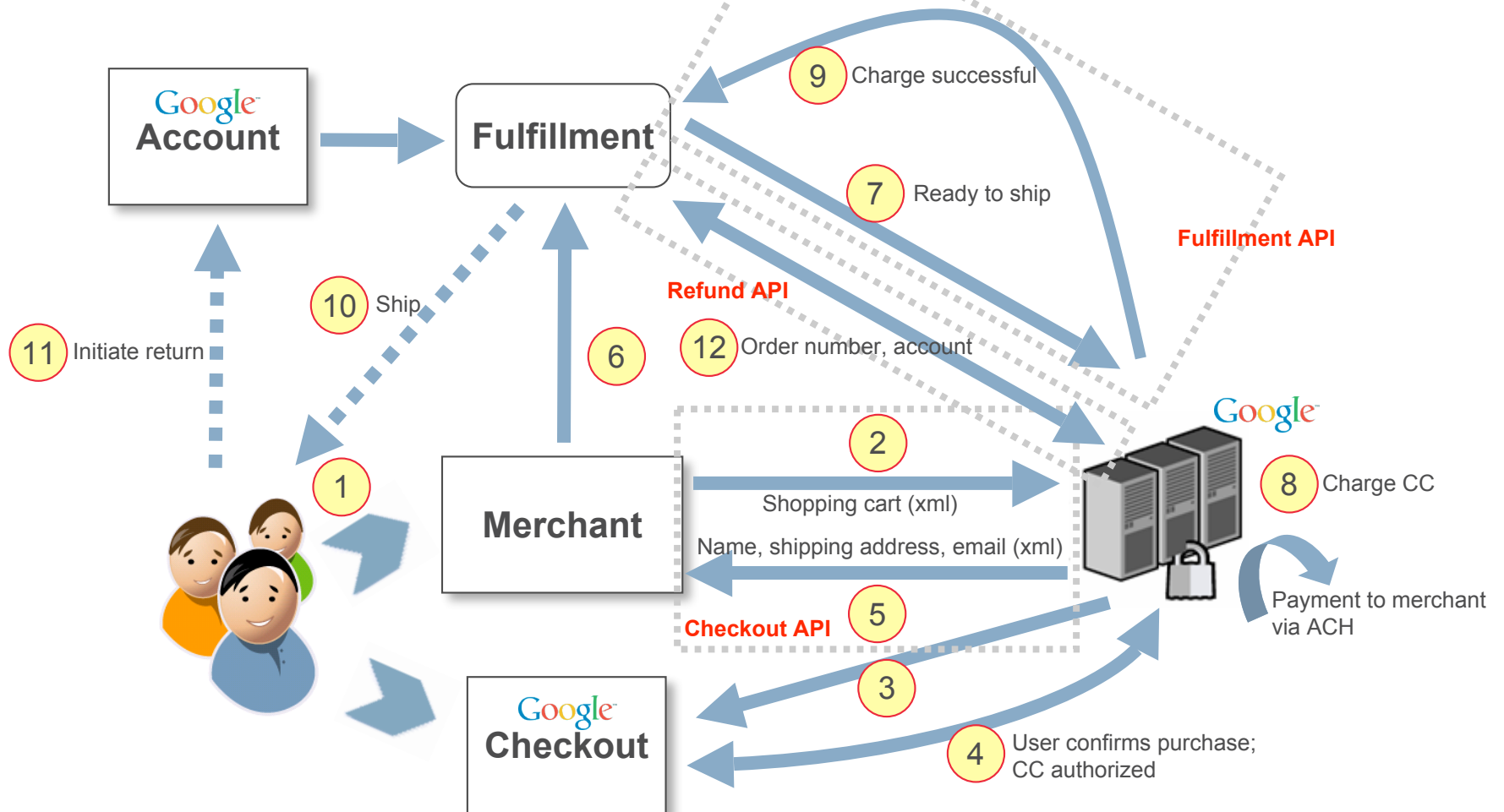
Lower Costs

- Free transaction processing for sales up to 10X AdWords spend
- Low 2% + \$0.20 per transaction fee for all other sales
- Fraud protection

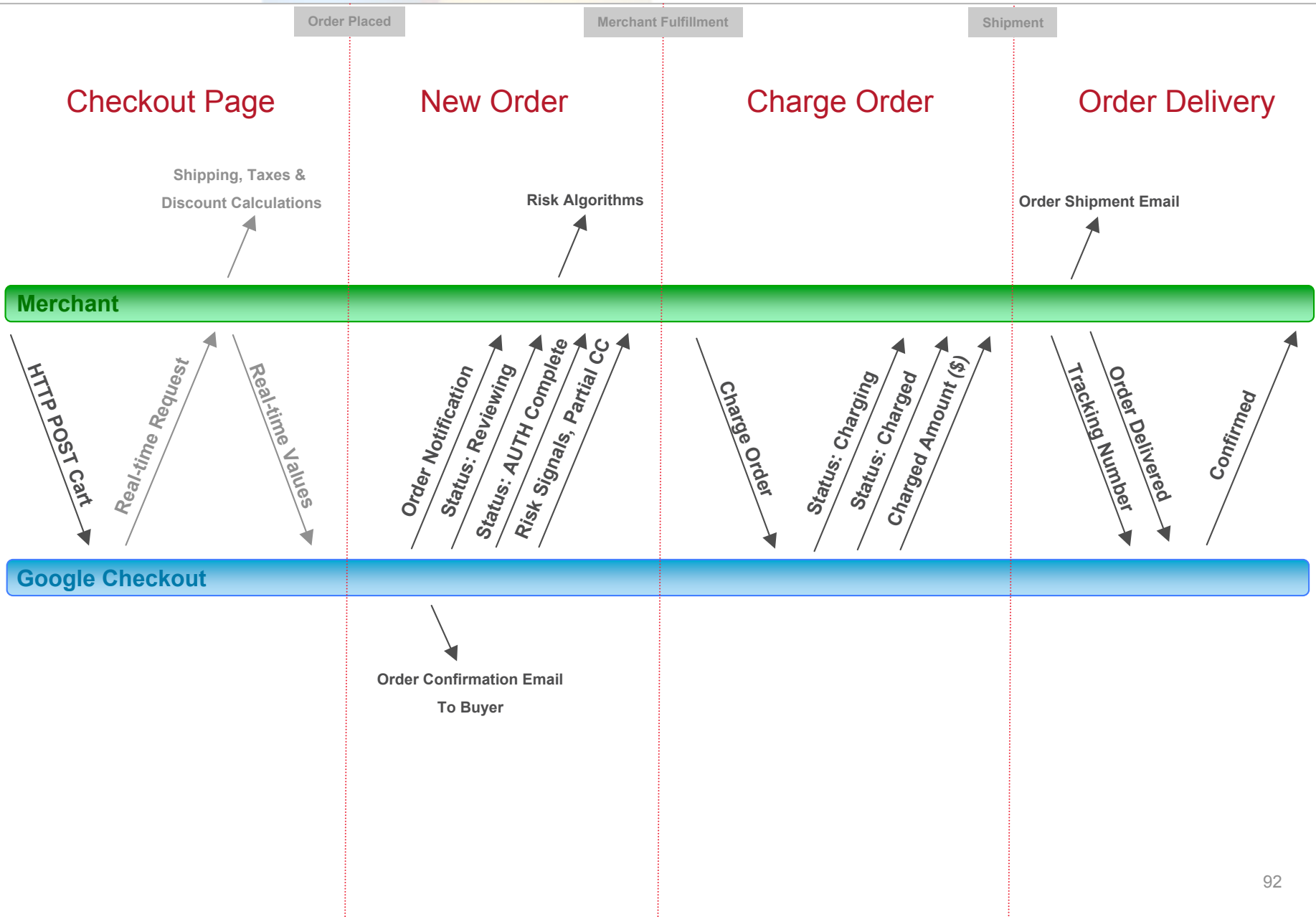
AdWords and Google Checkout work together to increase sales and lower costs.



Google Checkout Transaction Flow



Order Flows: Typical



Google Checkout Integration Options

- Buy Now buttons
- e-commerce partners
- HTML (Name/Value) pair API
- Google Checkout XML API
- Systems Integrators specialized in Checkout

<http://checkout.google.com/seller/developers.html>

For Developers: bonuses for bringing Google Checkout to your merchants

https://services.google.com/inquiry/checkout_ecommerce

Promotions

- Free processing for merchants in 2007

Four overlapping circles in light green, light blue, light red, and light yellow are located at the top left of the slide, behind the title.

Google Checkout API

2 levels of integration

- Level 1: post shopping carts (taxes, shipping, coupons)
- Level 2: merchant calculations, order management, 2 ways API

REST API

- XML over HTTP
- XML Schema
- Synchronous / Asynchronous (notifications)
- HMAC-SHA1 for signature, Basic auth over SSL
- Samples and Libraries in many environments
 - PHP, Java, Windows Classic ASP (COM), .NET
 - OsCommerce, ZenCart

Google Checkout API Level 1

Easy Static Checkout Buttons



Form with hidden fields

```
<form method="POST"
action="https://sandbox.google.com/cws/v2/Merchant/12
34567890/checkoutForm"
  accept-charset="utf-8">
  <input type="hidden" name="item_name_1"
value="Peanut Butter"/>
  <input type="hidden" name="item_description_1"
value="Chunky peanut butter."/>
  <input type="hidden" name="item_quantity_1"
value="1"/>
  <input type="hidden" name="item_price_1"
value="3.99"/>
  <input type="hidden" name="_charset_" />
  <input type="image" name="Google Checkout"
alt="Fast checkout through Google"

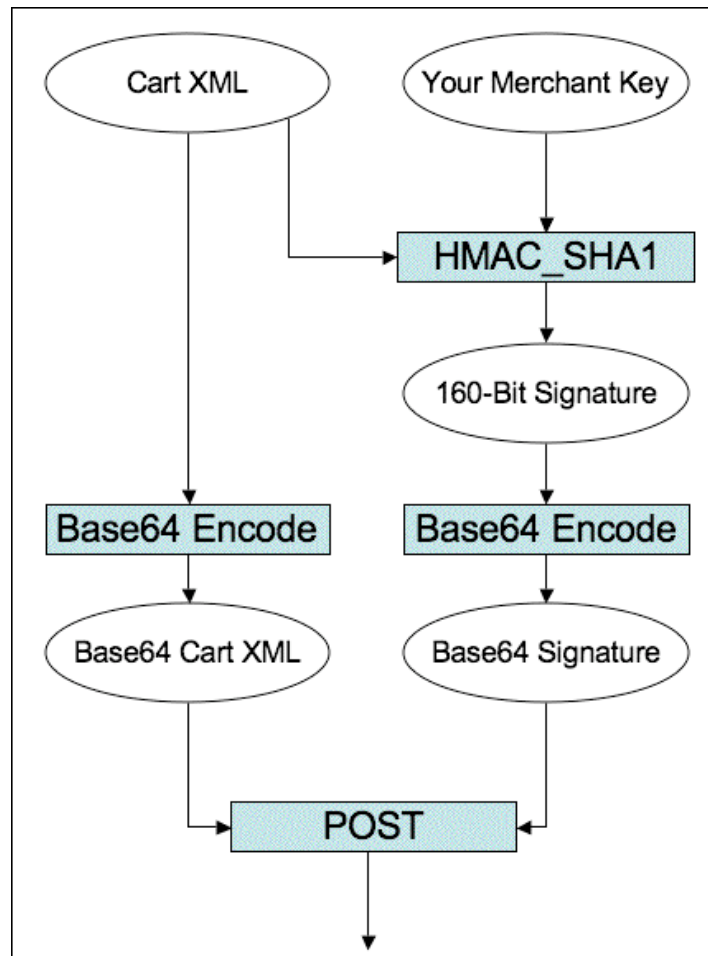
src="http://sandbox.google.com/buttons/checkout.gif?m
erchant_id=1234567890

&w=180&h=46&style=white&variant=text&loc=en_US"
height="46" width="180"/>
</form>
```

Google Checkout API Level 1



Post Cart XML + Signature



- Main site: <http://checkout.google.com>
- Google Checkout Video / Demo:
<https://checkout.google.com/seller/demo.html>
- Places to Shop: <http://www.google.com/buy/m.html>
- Developers Center:
<https://checkout.google.com/seller/developers.html>
- Google Checkout API Center:
<http://code.google.com/apis/checkout/>
- Developer's Guide:
<http://code.google.com/apis/checkout/developer/index.html>

Demo

Fully Buzzword Compliant:-)

- PHP, SOAP, REST, Ajax, Business Mashup, Google

Agua Biz: shows how to integrate AdWords and Checkout in your PHP online store

Open Source

http://google-apility.sourceforge.net/agua_biz.html

SOAP vs REST



	+	-
SOAP	<p>Client toolkits: most code can be generated from WSDL</p> <p>Batch support: you batch inside of request</p>	<p>Doc/Lit support uneven</p>
REST	<p>url for resources</p> <p>Can use http libraries, no need SOAP client lib</p> <p>Caching</p> <p>Can load balance without parsing xml based on url components (like checkout API does)</p>	<p>Less code generation: xsd -> lang OK but still need to do http work</p> <p>No agreement on batch (cf Atom PaceBatch discussion)</p>

“S for Simple”: Recent blog thread summarized by Tim Bray

- <http://www.tbray.org/ongoing/When/200x/2006/11/16/WS-Socratic>

“Why SOAP sucks” Nelson Minar, ex-Google, designer of early Google APIs SOAP Search and AdWords

- <http://www.somebits.com/weblog/tech/bad/whySoapSucks.html>

“There's an amusing dialogue floating around about how simple SOAP is. As someone who bears some past responsibility for well used SOAP services (Google's APIs for search and AdWords) let me say now I'd never choose to use SOAP and WSDL again. I was wrong.”

“Truly, none of this protocol fiddling matters. Just do something that works.”

Verbose: in order to update a field you must PUT the whole entry

Batch semantics controversial (Google rolled its own)

Tool support OK but less mature than SOAP

Google Web Toolkit

What, Why, and How



Joel Webber
Google, Inc.



Ajax State of the Art?

The Google Web Toolkit

High-Performance Ajax

Integration with Existing Web Technologies

Parting Thoughts

The Slippery Slope of Ajax



Product management and engineering decide to add script...

I begin experimenting with JavaScript

- Cool! The boss loves it – and it's fun!
- Maybe I'll get a raise!

The salespeople love it...

We're an Ajax shop?

Oh yeah, we can't just support Internet Explorer

Wait...this is hard

I hate browsers with all my heart

I quit – find another sucker to maintain this spaghetti

The world of Ajax is crazy and nigh unmanageable

You need regexs to list all the technologies on one page

- HTTPS?, [DX]?HTML (3.2|4.0), CSS[1-3]
- DOM Level[0-3]
- (Java|ECMA|J|VB)Script
- (X|VR?|Math)ML
- SVG, Canvas, Flash
- JSONP?, SOAP, XML-RPC

Poor interoperation and consistency across browsers

JavaScript is too flexible for big projects and team projects

Yet browsers are a great way to distribute apps

Hello? Software Engineering?



Hey, what happened to all that software engineering stuff we figured out in the last few decades?

Static type checking?

Design patterns?

Unit testing?

Code reuse?

IDEs?!?!

Debugging?!?!

How can we restore some sanity?

Ajax features with web usability

Use the Java language, developers and technologies

Debugging, JUnit, findbugs, profiling, coverage, javadoc

Eliminate browser-specific coding with very low overhead

Simple reuse via jars

Rich remote procedure call (RPC) semantics

Minimum size and maximum speed, especially at startup

Great scalability

Basically: the impossible...

Unless you compile Java into JavaScript :-)

Ajax State of the Art?

The Google Web Toolkit

High-Performance Ajax

Integration with Existing Web Technologies

Parting Thoughts

What is Google Web Toolkit (GWT)?



What is GWT?

- A set of tools for building AJAX apps in the Java language
- Open Source (Apache 2.0 license)

What makes GWT interesting?

- Write, run, test, and debug everything in Java, both client-side UI code and server-side business logic

Isn't that called an applet?

- No JVM required
- GWT converts your working Java source into pure JavaScript

GWT is a compiler?

- GWT's Java-to-JavaScript compiler is a big part of it, but there's really a lot more to the story than that...

Without further ado...

```
public class Hello implements EntryPoint {  
  
    public void onModuleLoad() {  
        Button b = new Button("Click me", new ClickListener() {  
            public void onClick(Widget sender) {  
                Window.alert("Hello, AJAX");  
            }  
        });  
  
        RootPanel.get().add(b);  
    }  
}
```

Demo

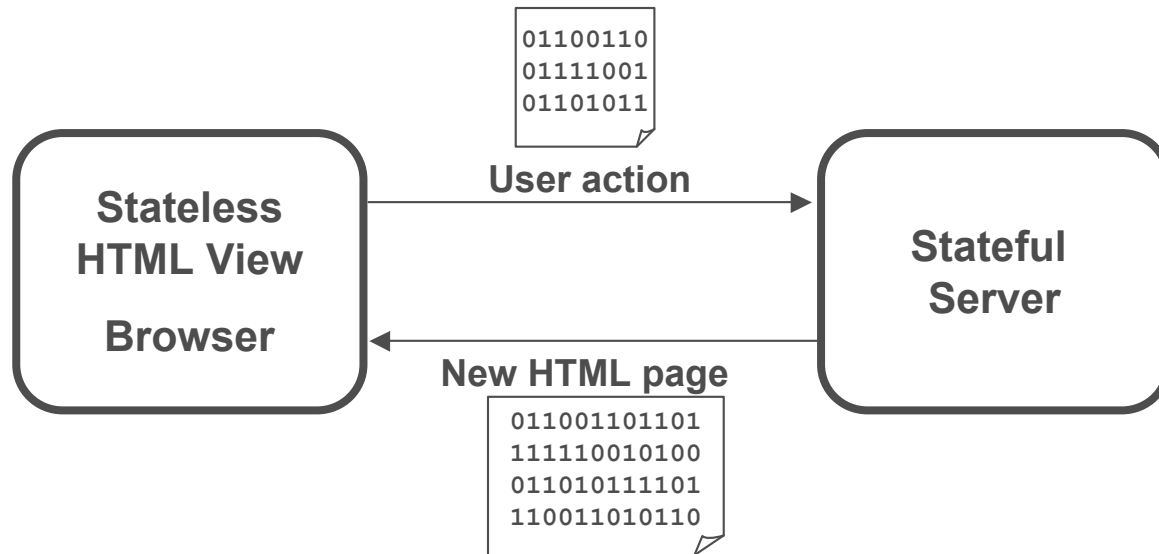
Hello, AJAX



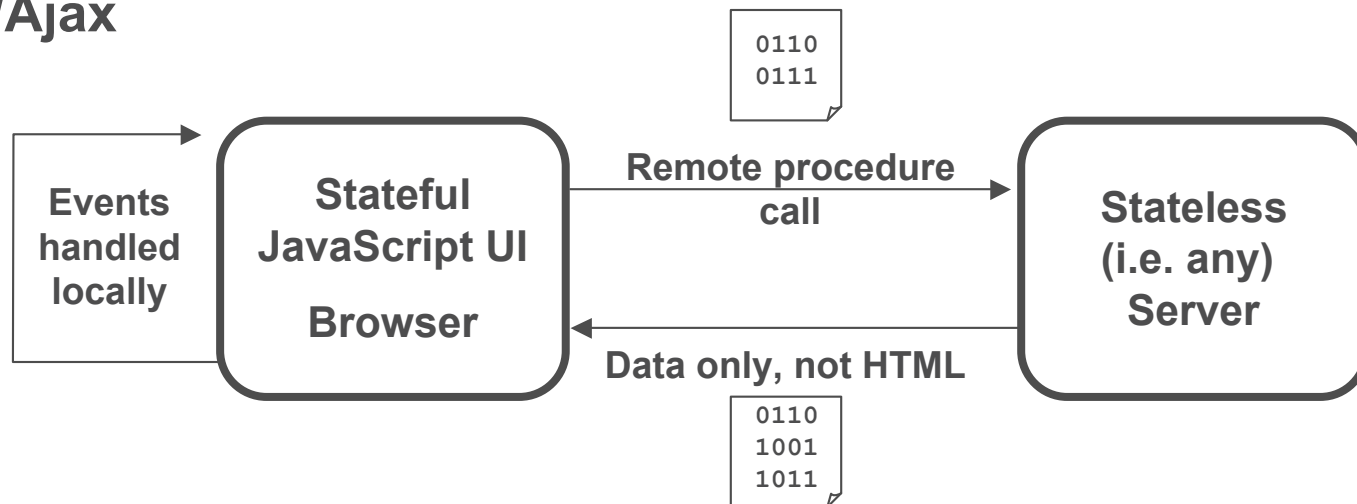
Traditional HTML vs. GWT/Ajax



Traditional HTML



GWT/Ajax



Redefining the problem has been fruitful

Session state? All client...not a server issue

UI event handling? All client...no round trips

Deployment? Use any web server...just copy compiled JS

Leverage for the biggest Ajax headaches

- Mantra: Solve the problem once & wrap it in a class
- History? Create a History class
- Cross-browser? Create a DOM class
- RPC? Create an all-Java RPC mechanism

Build cross-browser widgets in straight Java

Constraint-based layout with panels

Create new widgets from existing ones

- `public class InboxWidget extends Composite {`
- `private EmailList list = new EmailList();`
- `private EmailPreview pvw = new EmailPreview();`
- `// combine them together in a simple panel to`
- `// create a new, reusable composite widget`
- `}`

Styled with CSS!

Many solutions out there (JSON, XML-RPC, ...)

A pure Java RPC interface sure is nice!

- `interface SpellService extends RemoteService {`
- `String[] suggest(String word)`
- `}`

Client and server can speak the same language

Inner classes make it easy to deal with asynchronous RPCs

```
SpellServiceAsync spell = GWT.create(SpellService.class);

spell.suggest("compnent", new AsyncCallback() {

    void onSuccess(Object result) {
        String[] alts = (String[])result;
        if (alts.length > 0)
            showSuggestionsInGui(alts);
    }

    void onFailure(Throwable e) {
        reportProblemInGui(e);
    }

});
```

Demo

Google Checkout Buttons Generator



Ajax State of the Art?

The Google Web Toolkit

High-Performance Ajax

Integration with Existing Web Technologies

GWT Internationalization

Parting Thoughts

Tough decision not to support reflection and class loading

And I'm so glad! Three words: Whole program optimization

For example, type tightening to eliminate polymorphism

```
- Shape s = new Circle(2); // radius of 2  
- double a = s.getArea();
```

- becomes

```
- Circle s = new Circle(2); // radius of 2  
- double a = (s.radius * s.radius * Math.PI);
```

Inlining lets us discard the entire `getArea()` method!

Imagine those sorts of optimizations across your entire app

In JavaScript, reducing size and increasing speed are complementary goals, which makes optimizations *really* fun

Absolutely crucial

- Should be measured in milliseconds
- If startup time isn't acceptable, nothing else matters

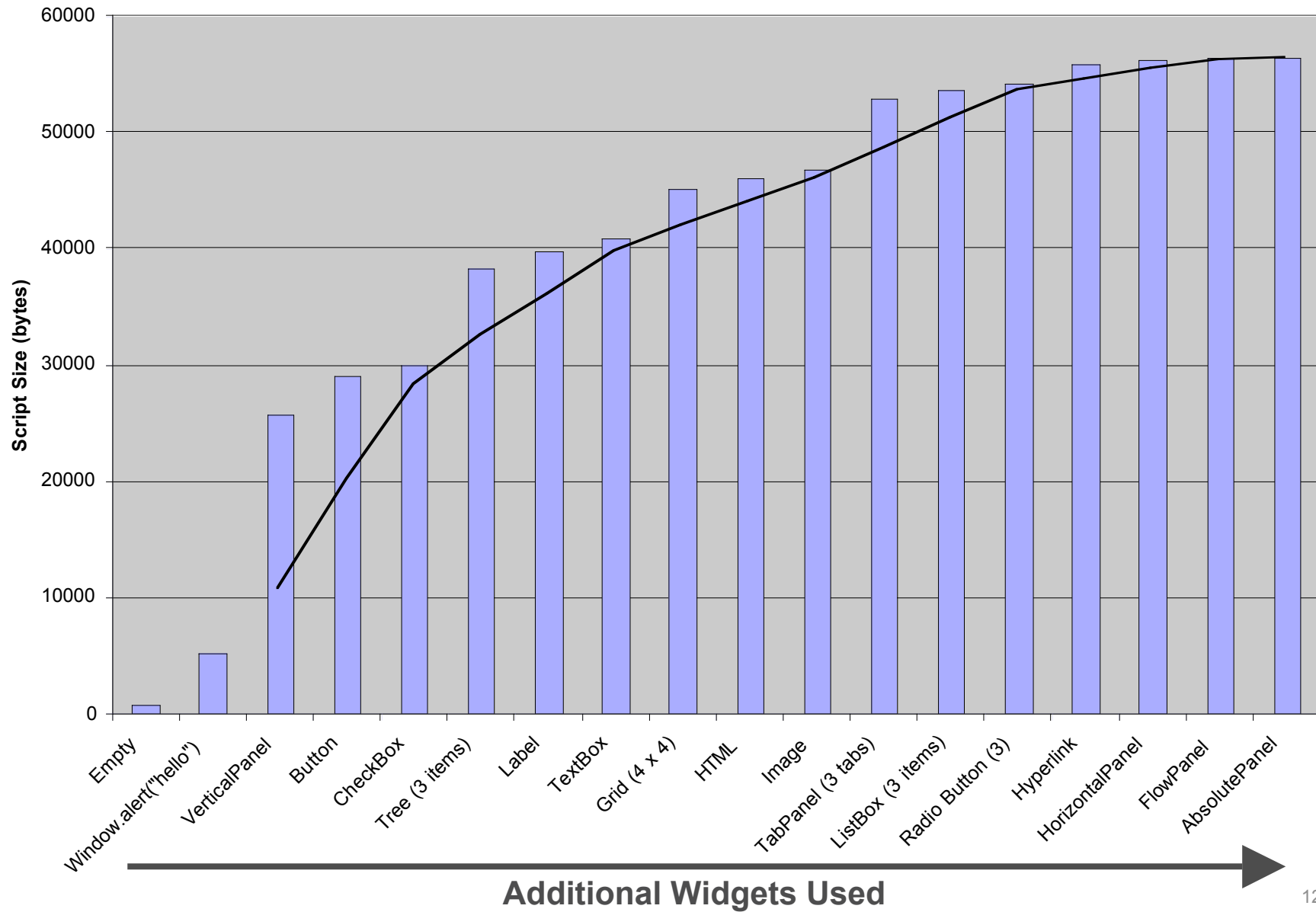
Very hard to do well

- Loading code with synchronous XHR is out of the question
- `<script>` tags serialize HTTP requests
- GZip your script ahead of time? Good idea, but...
- Some versions of IE6 fail on gzipped .js files
- Script versioning vs. cacheability

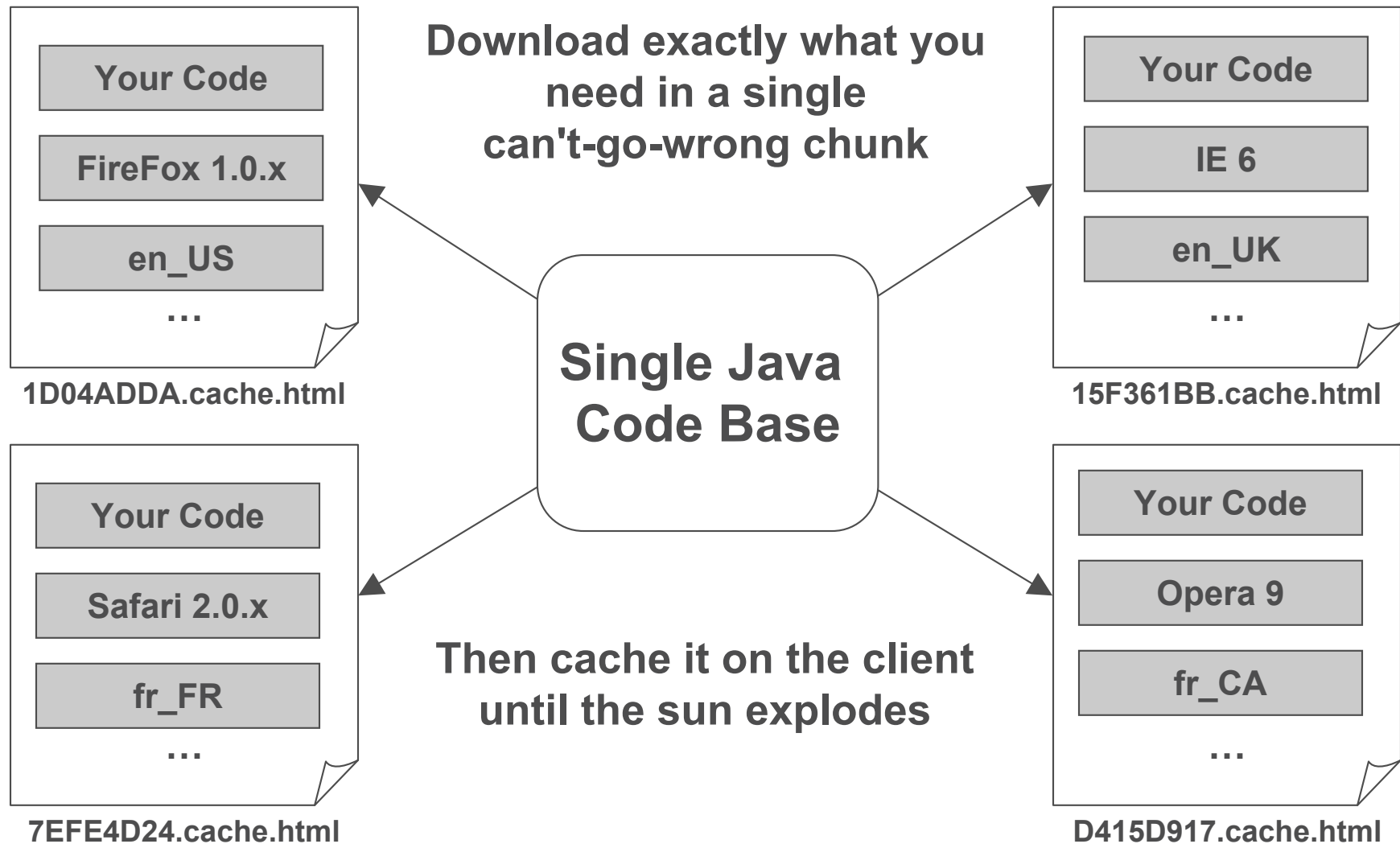
GWT gives you leverage

- Compiled output includes only what a particular user needs
- Output is JS wrapped in HTML, which is safely gzip'able
- Loads code in an `<iframe>` in parallel with the page
- Scripts are named uniquely and are perfectly cacheable

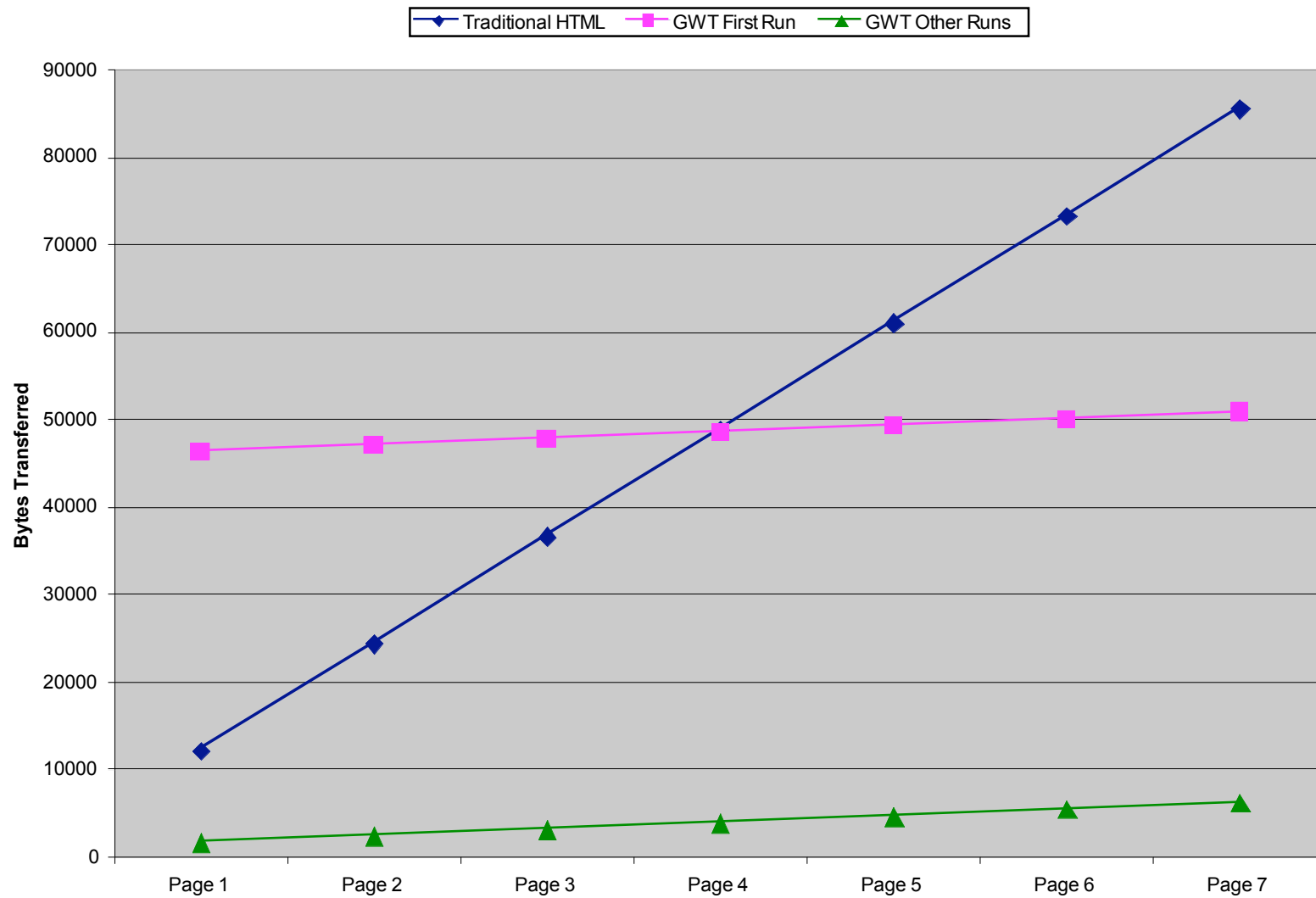
Compilation: Only Pay for What You Use



Compilation: Optimized Per Client



Less Bandwidth: Lower Costs and Faster Apps



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Parting Thoughts

No installation

- Every application is just a URL away
- No such thing as "DLL Hell" – it just works
- Capable of super-fast startup time

Simple usability

- Pages have a simple, friendly look and feel
- Not much to learn: back, forward, buttons, links, URLs

History is the first thing to go in most AJAX apps

Excruciating hidden `<iframe>` and/or timer tricks

Different solutions work best in each browser

Solve it once and reuse

- `History.addHistoryListener(myController) ;`

History support leads to bookmark support

- `http://google.com/gulp.html#beta_carroty`

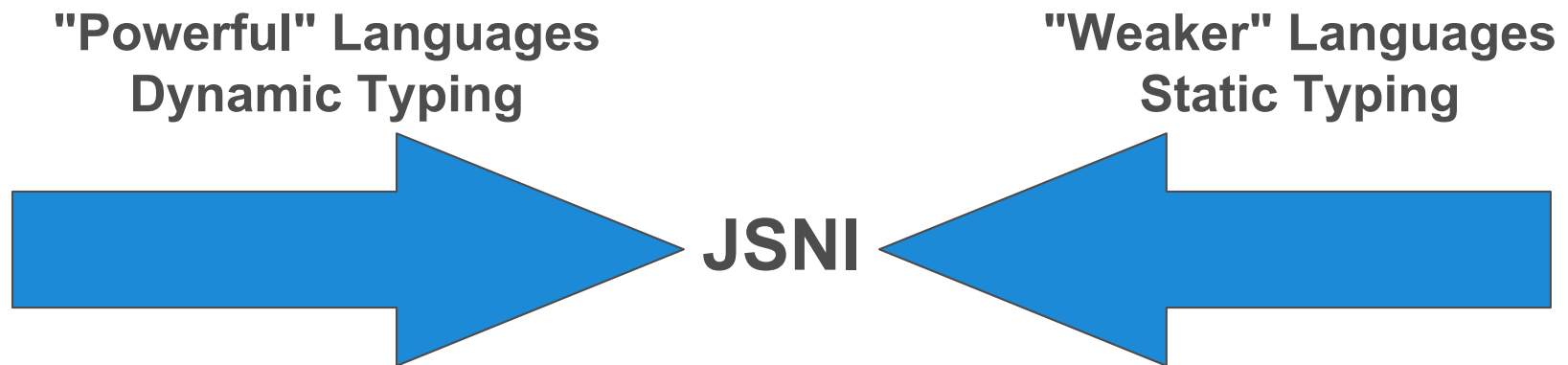
GWT does not force you to start over!
Attach code to existing pages with a <meta> tag

```
<html>  
...<meta name="gwt:module" content="..." />  
...<h1>Welcome to GWTravel Services</h1>  
...<div id="reservationWizard">  
...</div>  
...</html>
```

Your Java source is loosely-coupled

```
Panel p = RootPanel.get("reservationWizard");  
Wizard wiz = new ReservationWizard();  
p.add(wiz);
```

Works with any HTML-generating server approach



Include JavaScript directly in your Java source!

- And you can still debug
- Write no-compromise JS and make it reusable
- Expose existing JavaScript libraries into Java projects

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I18N

- Properties file, Java Interface to use in your code
- `FeelingLuckyMessages.properties`, `public interface FeelingLuckyMessages extends Messages {`
- GWT Designer JUnit integration
- Works in hosted mode (i.e. debuggable Java)
- Work in web mode (i.e. tests the compiler output)

Automatic, dynamic dependency inclusion

- Slurp in external CSS
- Slurp in external JS

Wire-format libraries

- XML and JSON for integration with existing servers

Community and Support

- Over 6500 members on the developer forum and growing
- Books and articles
- Meta-sites (e.g. gwtPowered.org)

Libraries and Applications

- GWT Widgets on SourceForge
- 43 projects on Google Code Project Hosting
- Diverse products built completely with GWT
- JetBrains' JET markup framework for GWT

Tools, Tools, Tools

- IntelliJ IDEA support for GWT built into Version 6.0
- Instantiations GWT Designer
- WindowBuilderPro GUI designer for GWT
- VistaFei for GWT
- Googlipse, an open source Eclipse plug-in for GWT

Ajax is a lot of work...

Make sure to build a code base you're glad to own

Lots of rewards, lots of risks

Leverage is needed to use Ajax well with minimum risk

PhD in browser quirks is no longer an Ajax prereq

Turn Ajax hacking into software engineering

We will share our best work and ideas with you, and we hope you will return the favor

Much more to come... see you online!

Many bridges, using different technologies

- No new SOAP API planned
- REST for data and message APIs
- Ajax to surface customizable controls
- Google Web Toolkit to build your own Ajax applications easily

Exposing many Google services... and more to come: give it a try!

- What: Ajax Search
- Where: Maps
- When: Calendar
- Advertising: AdWords
- Commerce: Checkout
- How: Google Web Toolkit

This presentation is a mashup of presentations by many Googlers

Mark Lucovsky

Technical Director, Engineering, Ajax Search

Bret Taylor

Product Manager, Maps, GWT

Steffen Meschkat

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Checkout API support

Joel Webber

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