{ Mobile

{

Rails 3

Web 2.0

First, what's "web 2.0"

Ajax

It's tightly bound to the tech of Ajax

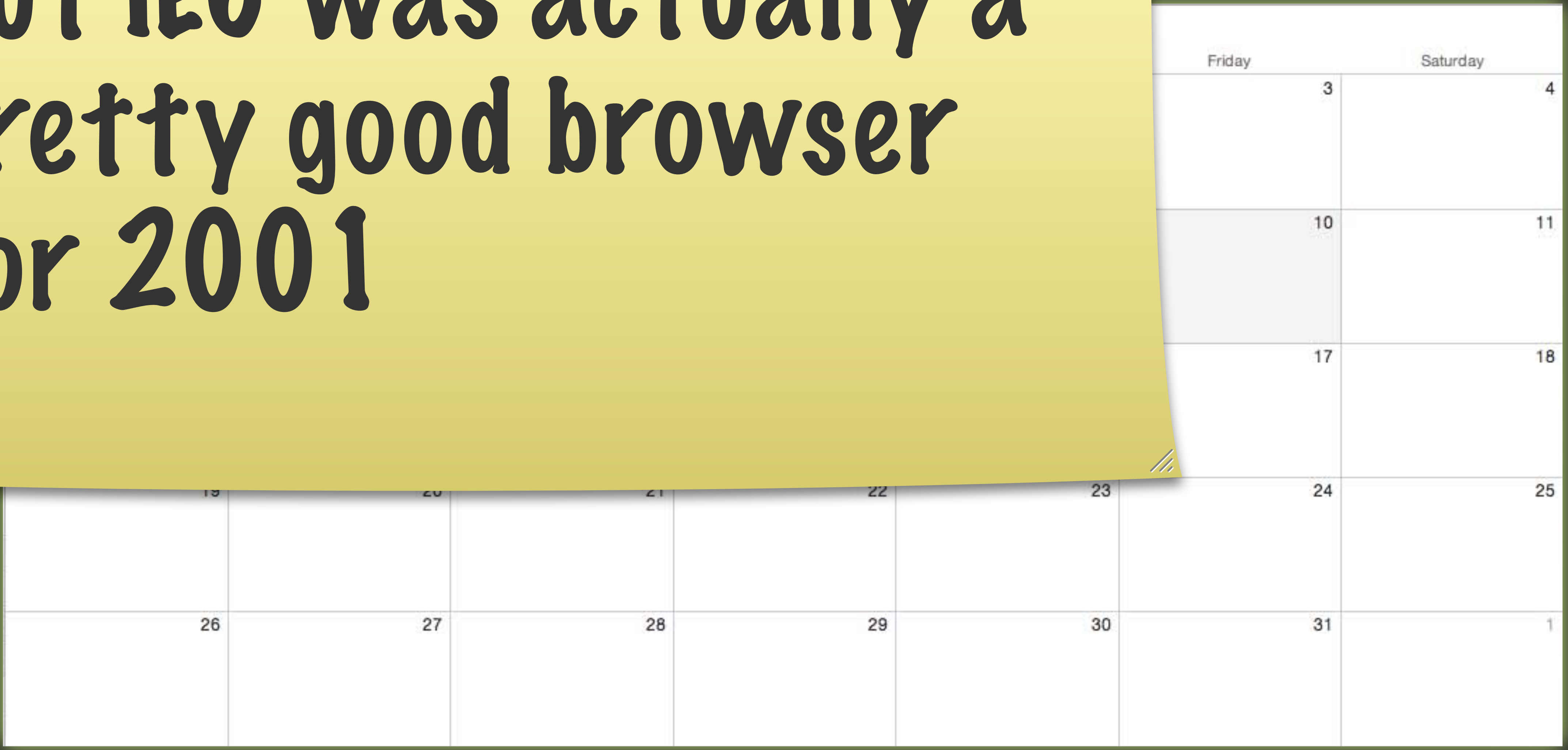
Ajax was released in 1999, in IE5

March 1999

Microsoft®

By Microsoft, in the heydey of the browser wars

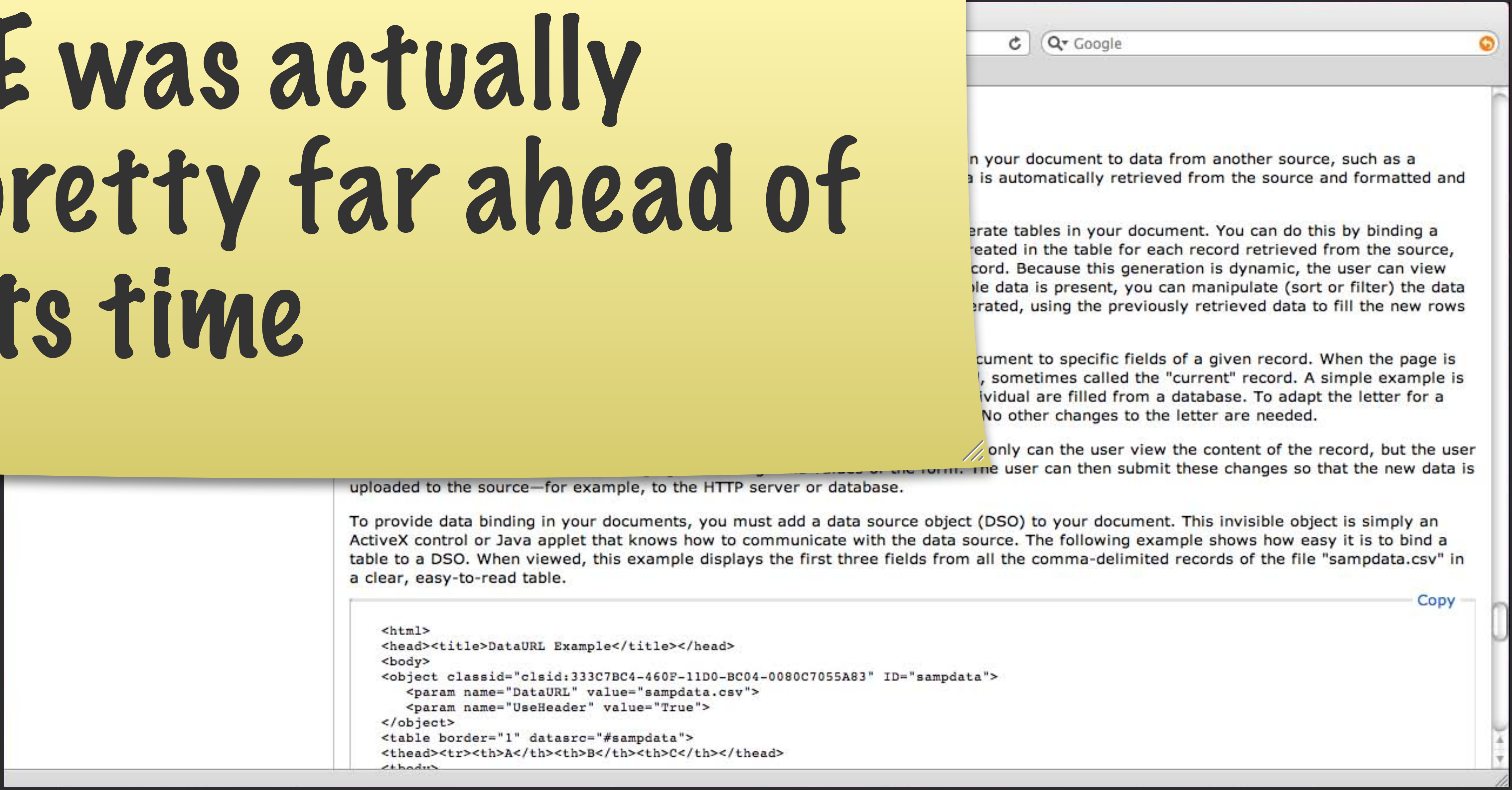
As an aside: We all love to hate IE6... and I indulge in that hate often enough



But IE6 was actually a pretty good browser for 2001

August 2001

IE was actually pretty far ahead of its time



n your document to data from another source, such as a
a is automatically retrieved from the source and formatted and

erate tables in your document. You can do this by binding a
reated in the table for each record retrieved from the source,
cord. Because this generation is dynamic, the user can view
ble data is present, you can manipulate (sort or filter) the data
erated, using the previously retrieved data to fill the new rows

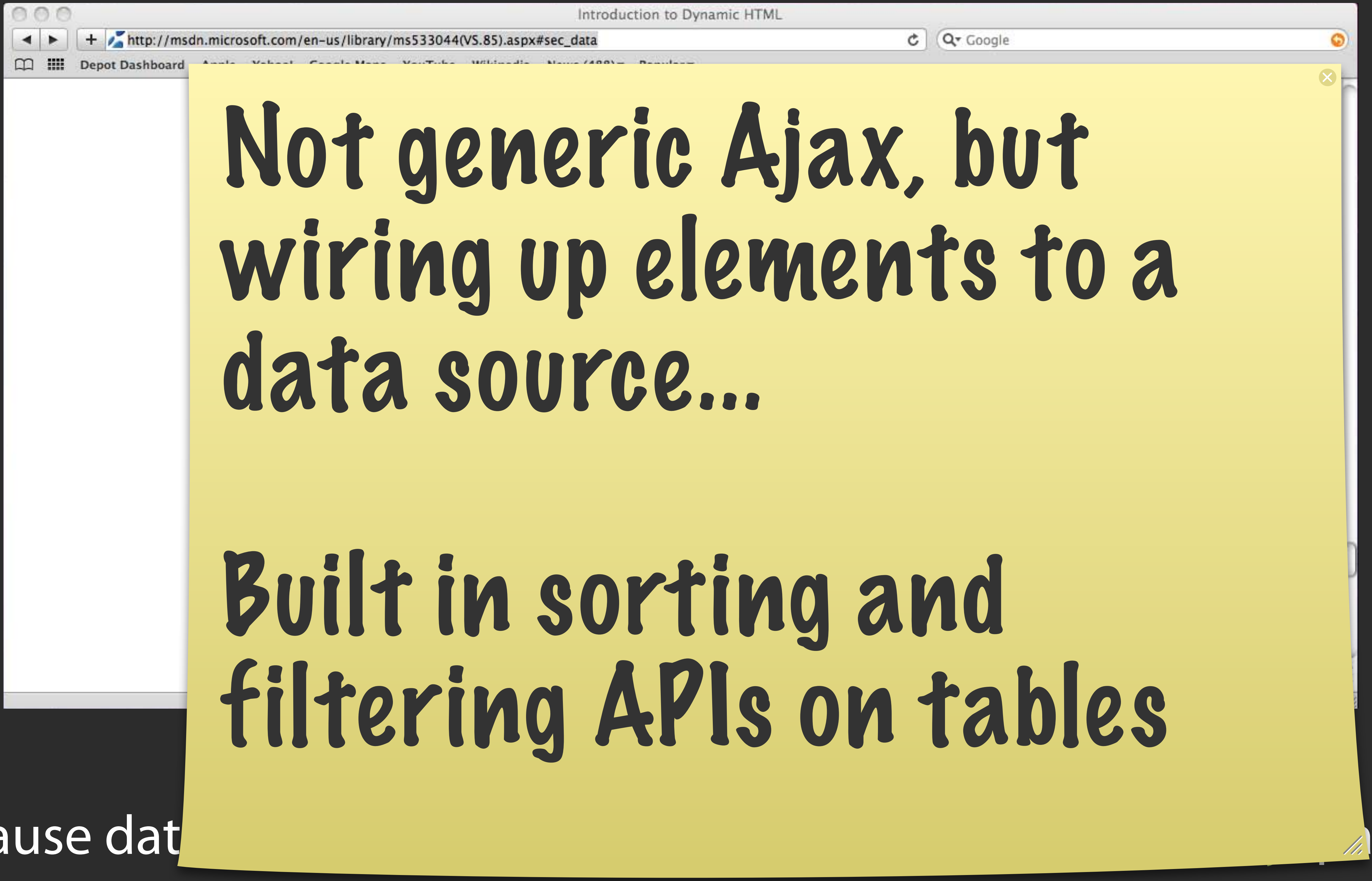
cument to specific fields of a given record. When the page is
, sometimes called the "current" record. A simple example is
ividual are filled from a database. To adapt the letter for a
No other changes to the letter are needed.

only can the user view the content of the record, but the user
The user can then submit these changes so that the new data is
uploaded to the source—for example, to the HTTP server or database.

To provide data binding in your documents, you must add a data source object (DSO) to your document. This invisible object is simply an ActiveX control or Java applet that knows how to communicate with the data source. The following example shows how easy it is to bind a table to a DSO. When viewed, this example displays the first three fields from all the comma-delimited records of the file "sampdata.csv" in a clear, easy-to-read table.

```
<html>
<head><title>DataURL Example</title></head>
<body>
<object classid="clsid:333C7BC4-460F-11D0-BC04-0080C7055A83" ID="sampdata">
   <param name="DataURL" value="sampdata.csv">
   <param name="UseHeader" value="True">
</object>
<table border="1" datasrc="#sampdata">
<thead><tr><th>A</th><th>B</th><th>C</th></thead>
```

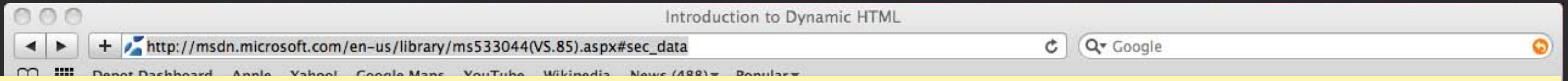
Data binding is a **DHTML feature** that lets you easily bind individual elements in your document to data from another source, such as a database or comma-delimited text file. When the document is loaded, the **data is automatically retrieved** from the source and formatted and **displayed within the element**.


Introduction to Dynamic HTML
http://msdn.microsoft.com/en-us/library/ms533044(VS.85).aspx#sec_data
Google
Depot Dashboard

Not generic Ajax, but wiring up elements to a data source...

Built in sorting and filtering APIs on tables

Because dat ages render quickly and provide immediate interactivity. Once downloaded, the data can be **sorted and filtered** without requiring additional trips to the server



Introduction to Dynamic HTML
http://msdn.microsoft.com/en-us/library/ms533044(VS.85).aspx#sec_data
Google

And not IE6... but IE4...

Just goes to show that we lost a lot in the "nonstandard equals doesn't exist" early part of this century

This feature requires Microsoft **Internet Explorer 4.0** or later

Ajax

So anyhow Ajax

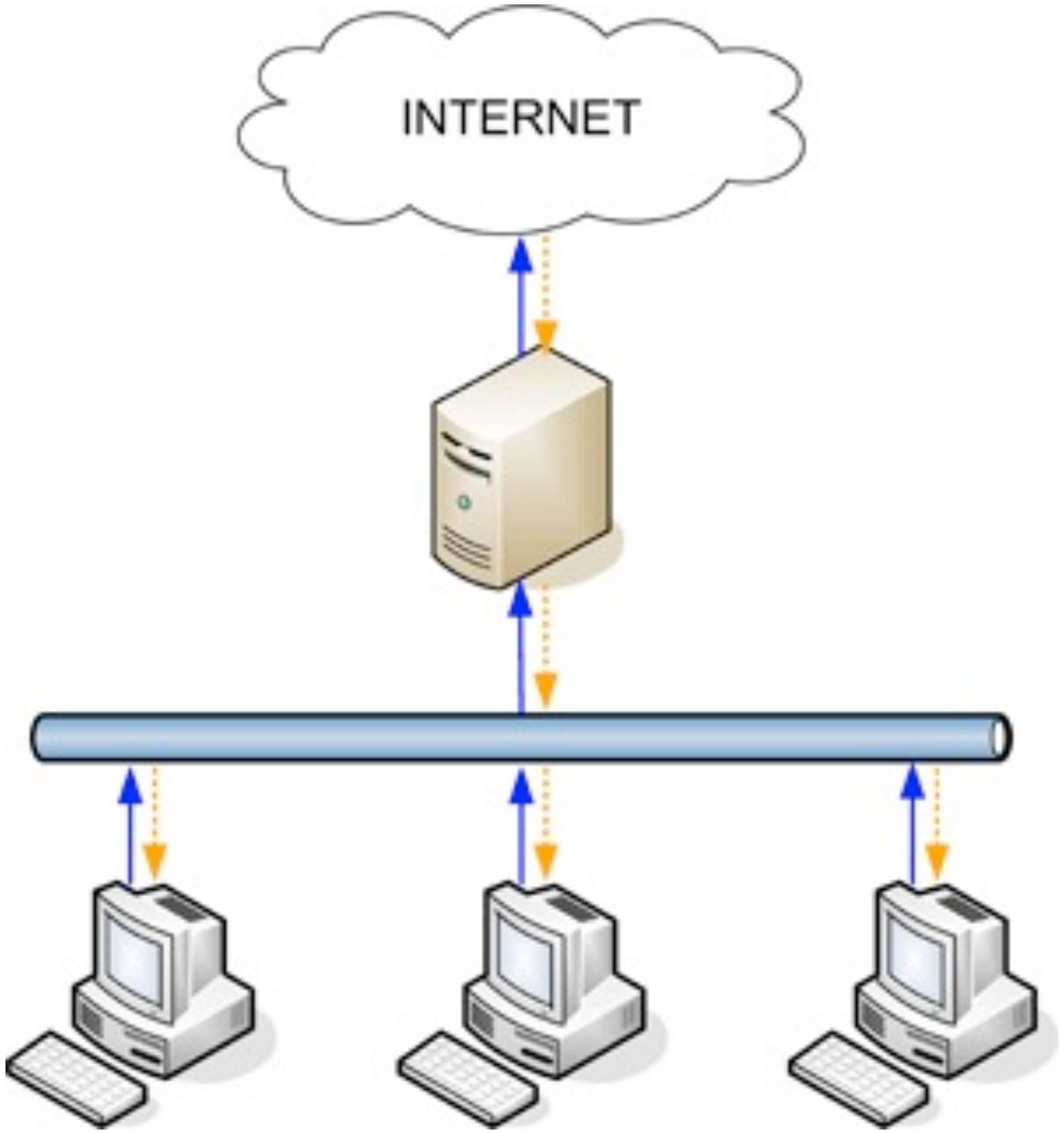
Client

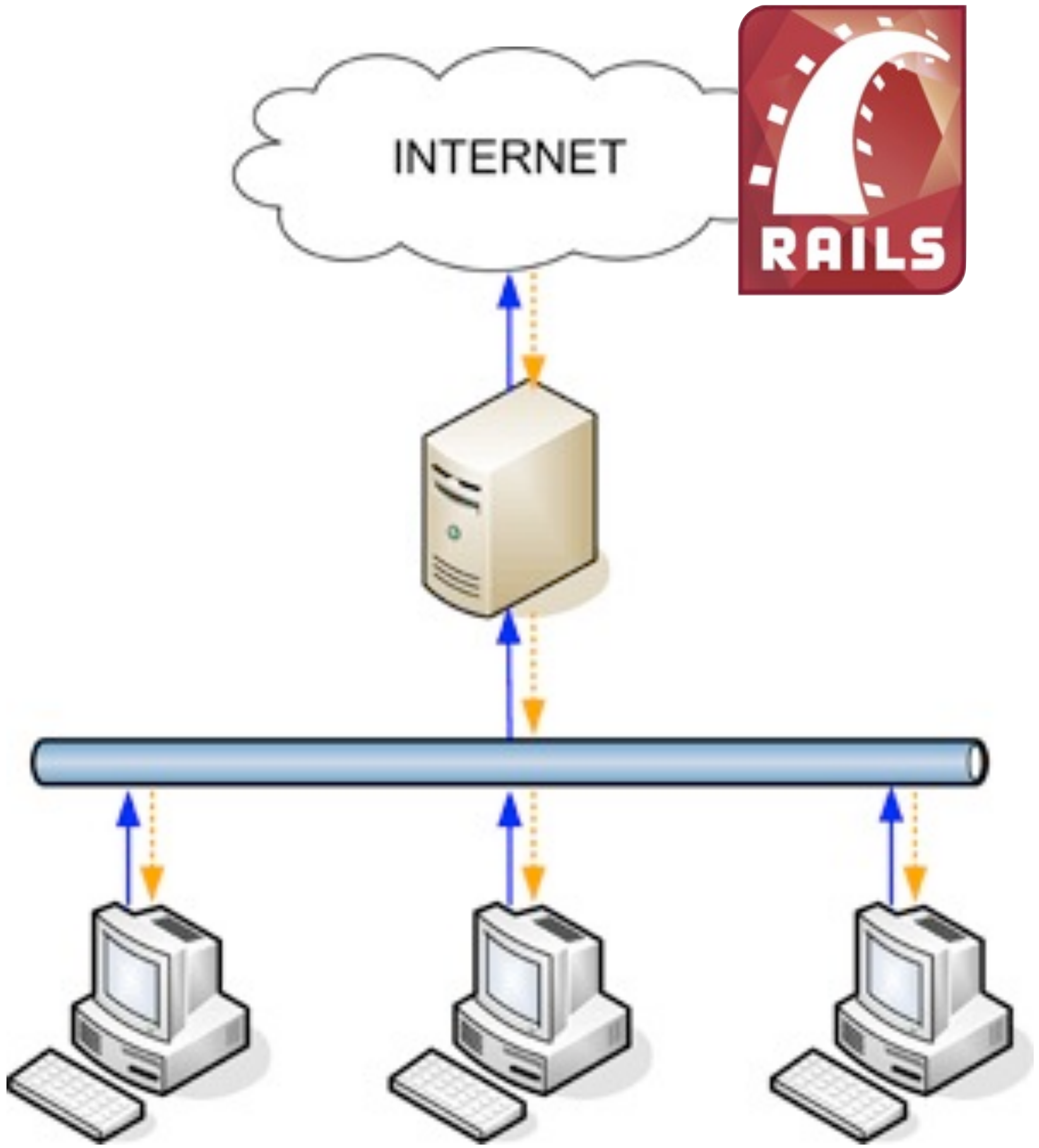
IE4+ Made Clients a Lot Smarter

“Web 2.0” Made Use of the Tech

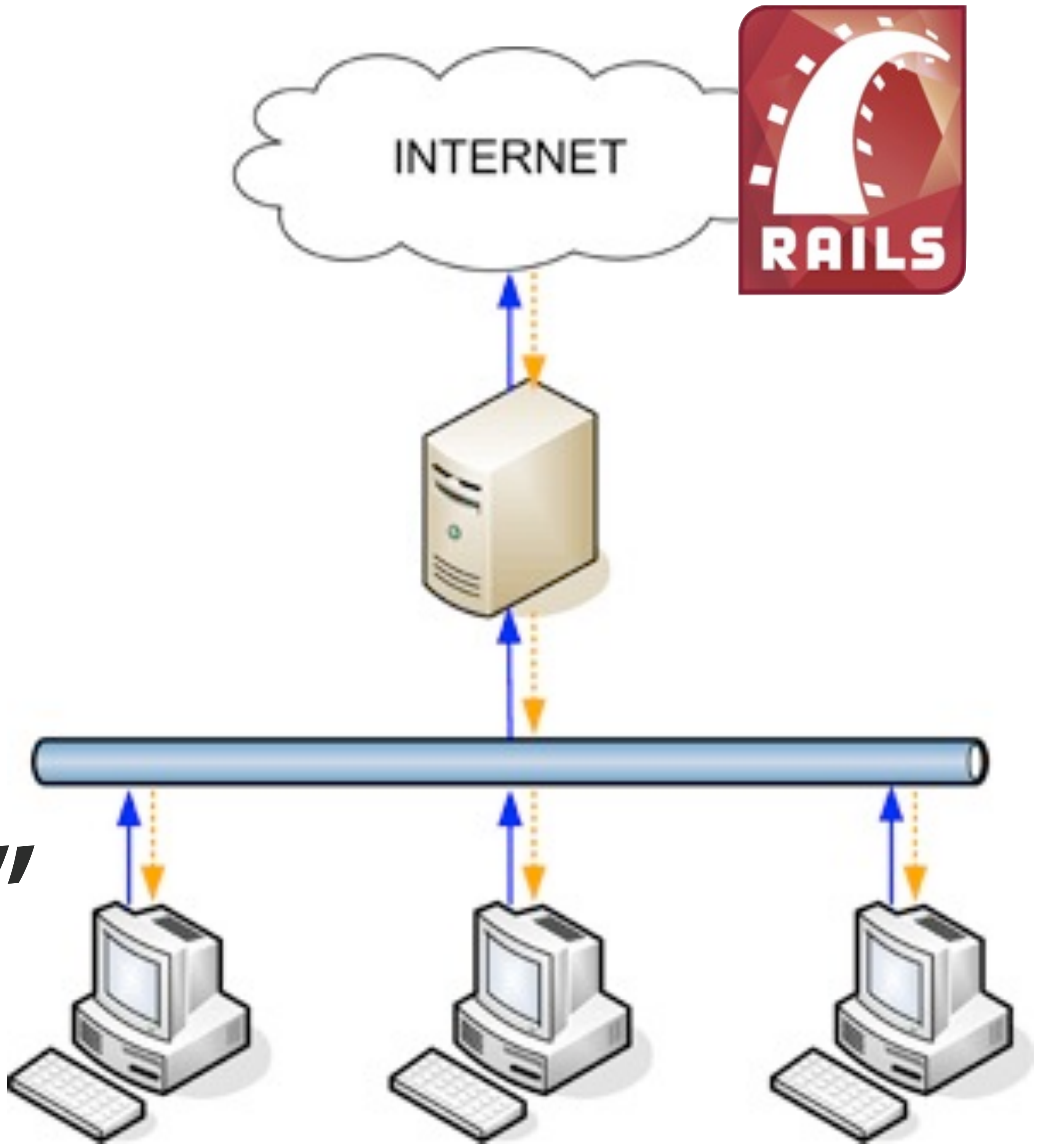
A Decade Later

Evolution of Client-Side Capabilities


INTERNET


INTERNET
RAILS

“client”



Not New

None of this tech came out last week

Newer than Ajax in 2005

Not Enough Explanation

Especially about how to use the tech together

IE6 Factor

IE6 Factor

People

Feel

Burned

“I’ll look at **HTML5** when I can use it...”

“…In 2019”

But this new tech actually isn't vaporware

cingular
10:15 AM
Text
Tuesday
9
Calendar
Photos
Camera
Calculator
Stocks
Maps
Weather
Notes
Clock
Settings
Phone
Mail
Web
iPod

cingular
10:15 AM
Text
Calendar
Photos
Camera
Calculator
Stocks
Maps
Weather
Notes
Clock
Settings
Phone
Mail
Web
iPod

Palm
3:01
(408) 555-1234

cingular
10:15 AM
Text
Calendar
Photos
Camera
Calculator
Stocks
Maps
Weather
Notes
Clock
Settings
Phone
Mail
Web
iPod

Palm
3:01
(408) 555-1234

11:03 PM
Google
Maps
Gallery
YouTube
Market
Phone
Gmail
Browser
Voice
Helping Grandpa Get His Tech On
New York Times
61°

cingular
10:15 AM
Text
Calendar
Photos
Camera
Calculator
Stocks
Maps
Weather
Notes
Clock
Settings
Phone
Mail
Web
iPod

Palm
3:01
(408) 555-1234

11:03 PM
Google
Maps
Gallery
YouTube
Market
Phone
Gmail
Browser
Voice
Helping Grandpa Get His Tech On
New York Times
61°

BlackBerry
12:01
Monday, May 12
space

cingular 10:15 AM
Text
Calendar
Photos
Camera
Calculator
Stocks
Maps
Weather
Notes
Clock
Settings
Phone
Mail
Web
iPod

Palm
3:01
(408) 555-1234

11:03 PM
Google
Maps
Gallery
YouTube
Market
Phone
Gmail
Browser
Voice
Helping Grandpa Get His Tech On
New York Times
61°

BlackBerry
12:01
Monday, May 12
space

N85
NOKIA

cingular
10:15 AM
Text
Calendar
Photos
Camera
Calculator
Stocks
Maps
Weather
Notes
Clock
Settings
Phone
Mail
Web
iPod

Palm
3:01
(408) 555-1234

11:03 PM
Google
Maps
Gallery
YouTube
Market
Phone
Gmail
Browser
Voice
Helping Grandpa Get His Tech On
New York Times
61°

BlackBerry
12:01
Monday, May 12
space

Opera Mini

N85
NOKIA

9:41 AM
iPad
Calendar
Contacts
Notes
Maps
Videos
YouTube
iTunes
App Store
Settings
Safari
Mail
Photos
iPod

People Don’t Use Cell Phones Made in 2001

The mobile space doesn’t have the problem of people who refuse to upgrade forever... so this nice property is probably here to stay

+’s

Best Distribution System

No Approval Process

Instant Updates

Opera Mini

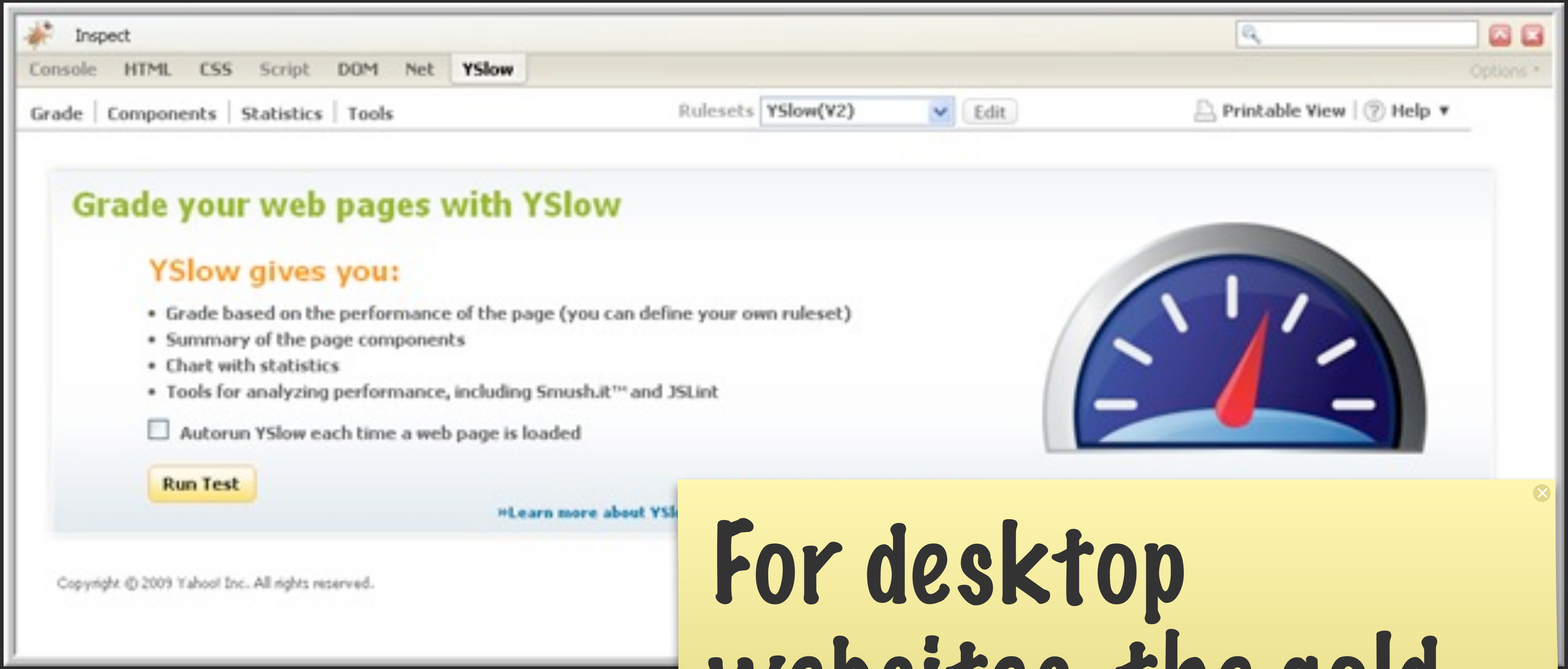
Start

Caring

<u>Now</u>

Mobile

Very Different Constraints



Grade your web pages with YSlow

YSlow gives you:

- Grade based on the performance of the page (you can define your own ruleset)
- Summary of the page components
- Chart with statistics
- Tools for analyzing performance, including Smush.it™ and JSLint

☐ Autorun YSlow each time a web page is loaded

For desktop websites, the gold standard is YSlow!

Fast, Reliable Connections

HTTP Overhead Dominates Small Assets

Hard Disks

HTTP Caches Persist "Forever"

Lowest Common Denominator?

2001

2006?

Powerful Processor

Unlimited “Battery”

Prefer New Download to Stale Data

YSlow!

One Large JS or CSS File

```
:cache => true }
```

Spriting

```
.fanta {
  background: sprite-image("bottles/fanta.png");
}

.seven-up {
  background: sprite-image("bottles/seven-up.png");
}

.coke {
  background: sprite-image("cans/coke.png") no-repeat;
}
```

Expires Header

```
  #   # We use cached-busting location names
#   # with the far-future expires
#   # headers to ensure that if a file does
#   # change it can force a new
#   # request.
```

}

ETags

```ruby
  def show
  @article = Article.find(params[:id])

  fresh_when(
    :etag => @article,
    :last_modified => @article.created_at.utc,
    :public => true
  )
end
```

25K Components

Lots Still Applies

Some Missing Information

Mobile Constraints

Poor HTTP Caching

Flaky and Offline Connections

Long Downloads Can Get Dropped

Lowest Common Denominator?

HTML5 Offline

In fact, these specs were written with this use case in mind by the vendors!

Application Cache

Local Storage

Prefer Stale Data to a New Download

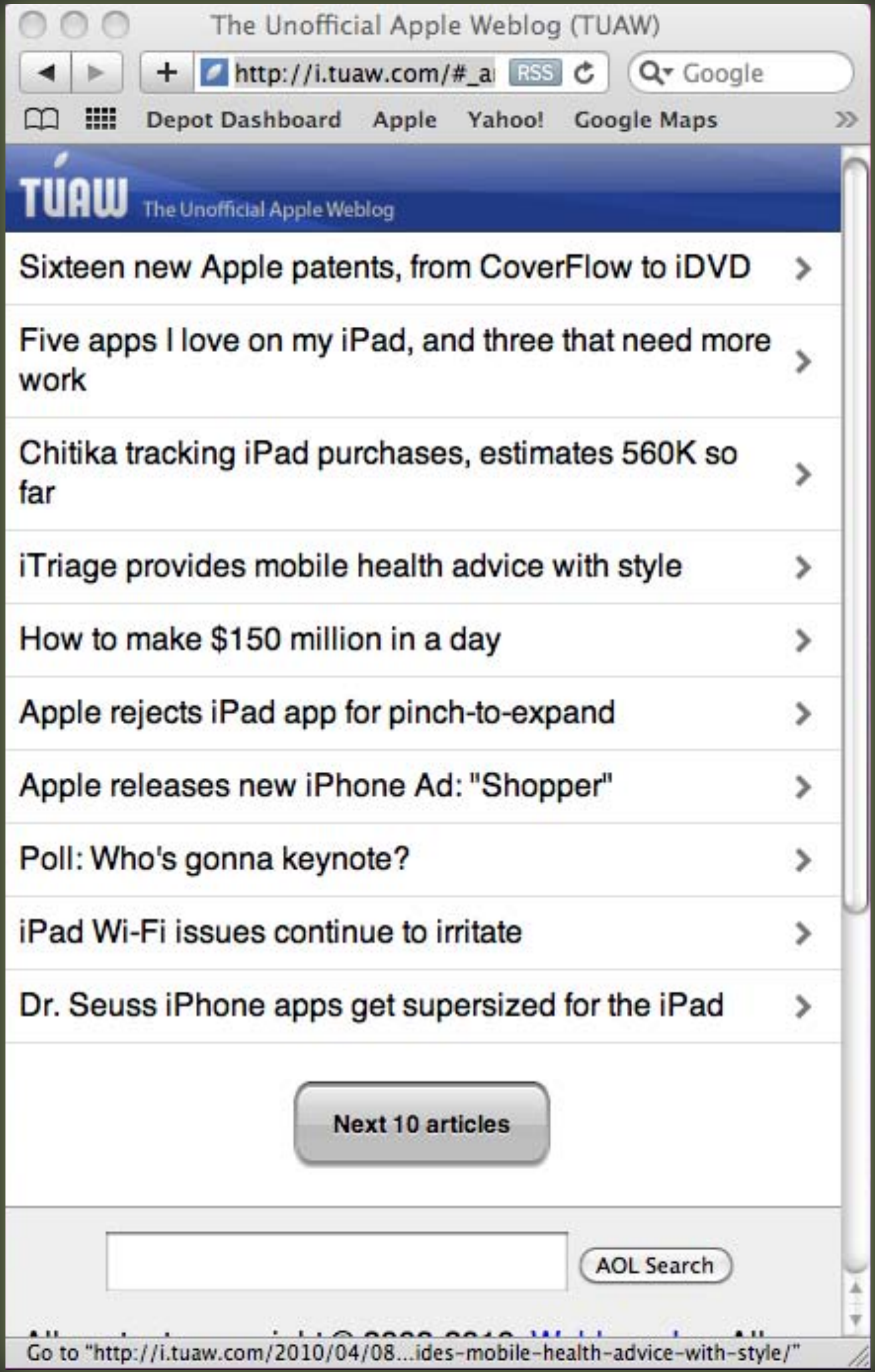
Some People Pay Per kb

Limited Battery, Limited CPU

Revisit Orthodoxy

Priority

Download Data Only Once



The Unofficial Apple Weblog (TUAW)

http://i.tuaw.com/#_a

Depot Dashboard Apple Yahoo! Google Maps

TUAW The Unofficial Apple Weblog

Sixteen new Apple patents, from CoverFlow to iDVD

Five apps I love on my iPad, and three that need more work

Chitika tracking iPad purchases, estimates 560K so far

iTriage provides mobile health advice with style

How to make $150 million in a day

Apple rejects iPad app for pinch-to-expand

Apple releases new iPhone Ad: "Shopper"

Poll: Who's gonna keynote?

iPad Wi-Fi issues continue to irritate

Dr. Seuss iPhone apps get supersized for the iPad

Next 10 articles

AOL Search

Go to "http://i.tuaw.com/2010/04/08...ides-mobile-health-advice-with-style/"

Home Page
Read Story
Back Button

Home Page

6k

Read Story

16k

Home Page

6k

Slow Connections

With a slow connection, this constant downloading is going to take FOREVER

Offline

When offline, you can't see something you *just* saw because you're in a tunnel

Incremental Rendering

Rendering the page incrementally actually costs CPU and battery resources

Cache Cleared on a Dime

16k?!

```
<script language="JavaScript" type="text/javascript">
var sns_checked = false;
var current_tab = "blogsmith";
function tabTo(tab)
{
  document.getElementById('formerrors').innerHTML = '';

  document.getElementById('cmtuinfo_email').style.display='none';
  document.getElementById('cmtuinfo_blogsmith').style.display='none';
  document.getElementById('cmtuinfo_sns').style.display='none';
  document.getElementById('cmtuinfo_'+tab).style.display='block';

  document.getElementById('cmtutab_email').className='';
  document.getElementById('cmtutab_blogsmith').className='';
  document.getElementById('cmtutab_sns').className='';
  document.getElementById('cmtutab_'+tab).className='currenttab';

  if (!sns_checked && tab == 'sns')
  {
    image1 = new Image();
    image1.src = "http://www.blogsmithmedia.com/framework.weblogsinc.com/media/
loading.gif";
    sns.init('ch1ga1KvP7TotwTC');
    sns_checked = true;
  }

  current_tab = tab;
```

```html
<div id="replyindicator"></div>
<div>

  <label for="Comments">Your comments:</label>
  <textarea name="Comments" id="Comments" rows="8" style="width:98%"></textarea>
</div>
<div class="cmtchecks">
  <input type="checkbox" checked="checked" id="RememberMeYes" name="RememberMe" />
  <label for="RememberMeYes">Remember me</label>
</div>

<div class="cmtchecks">
  <input type="checkbox" checked="checked" id="EmailMe" name="EmailMe" />
  <label for="EmailMe">E-Mail me when someone replies to this comment</label>
</div>

<div id="cmtbuttons">
  <input type="submit" id="addCommentButton" value="Add Comment" />
</div>
<input type="hidden" name="Form" value="Comments" /><input type="hidden"
name="ButtonSave" value="Save" />

<input type="hidden" id="sourceID" name="SourceID" value="" />
<input type="hidden" id="postID" name="PostID" value="" />
```

Two Problems

1. Boilerplate

2. Structural

```
There are also some more technical patents for
iChat video encoding and error adjustments on
touchscreens, as well as overall patents for the
MacBook Air SuperDrive and iDVD. It seems like the
USPTO is just cleaning out Apple's old patents --
most of these were filed back in 2007. Now, maybe
they can set the legal patent team up <a
href="http://tuaw.com/tag/ipad">on newer
accomplishments</a>.

<p class="posttags" style="clear:both;">
  <strong>Tags:</strong>
  <a href="http://i.tuaw.com/tag/apple/">
    apple</a>,
  <a href="http://i.tuaw.com/tag/error/">
    error</a>,
```

Ideal

Download Boilerplate HTML Once

Download HTML Templates <u>Once</u>

Use Lightweight Transport for Data

Download Data Prospectively

App Should Work Without a Connection

(with stale data)

App Should Work While Making a Connection

(with stale data)

Applications Should Avoid Incremental Rendering

Arch?

REST

HTML

==

Static Asset

Updatable, But Caching Semantics

Semantic HTML

Native Protocol

For performance, we're going to want to leverage what the browser knows

HTTP

Rack

=

This means that we can use all of the HTTP stuff in Rack for free

Native Representation

JSON

JSON is also very small, so it satisfies many of the other constraints

```
render :json => @article
```

}

```ruby
class PostsController
  respond_to :json

  def index
    @articles = Article.all

    respond_with @articles
  end
end
```

Treat the Browser Like an API Client

Wait!

Poor HTTP Caching, Right?

Right!

New Tools

HTML5 Offline APIs

(§6.6)

Application Cache

Local Storage (HTML5 Web Storage Spec)

Gives Us
Power Back

We Need to be More Explicit

App Cache

```
<html manifest="app.manifest">
```

```
CACHE MANIFEST

javascripts/jquery.js
media/logo-tuaw-iphone-v3.png
media/favicon-v9-1.png
```

```
Content-Type:
text/cache-manifest
```

Rack::Offline

```
run Rack::Offline.new {
  cache "stylesheets/style.css"
  cache "images/masthead.jpg"
  cache "javascripts/application.js"
  cache "javascripts/jquery.js"

  network "/"
}
```

```ruby
manifest = Rack::Offline.new {
  cache "stylesheets/style.css"
  cache "images/masthead.jpg"
  cache "javascripts/application.js"
  cache "javascripts/jquery.js"

  network "/"
}

match "/app.manifest" => manifest
```

Rails::Offline

```
match "/app.manifest" => Rails::Offline
```

}

You'll Always Get One Stale

The constraint is that the browser can serve up the HTML fast and wait for a connection, so you'll get one stale hit after update

```
$(applicationCache)
  .bind("updateready", displayReload);
```

Web Storage

KVS

```
localStorage.article = "Hello!"
```

}

5MB Limit

Ask For More

Overwriting a Key Will Reclaim

```
delete localStorage["article47"]
```

}

```
for(prop in localStorage)
```

}

Safari, not Firefox

Basic Strategy:

Sip, Don’t Gulp

Rails

Adapt Techniques for Building APIs

```ruby
class Post < ActiveRecord::Base
  scope :recent, limit(10).
                 order("created_at desc")

  # or

  def self.recent(amount)
    limit(amount).order("created_at desc")
  end
end
```

```ruby
class PostsController < ApplicationController
  respond_to :html, :json, :atom

  def index
    @posts = Post.recent
    respond_with @posts
  end
end
```

ActionDispatch and Rack are Very Robust

In Real Life...

Auth(z)

Rate Limiting

External Sources

Process Updates in Background

Caching

Payments?

API Integration

All Things Rails Handles Well

Plus...

Traditional Web App w/ Same Backend

Client-Side Strategy

First Time

First Time

Download HTML

First Time

Download HTML

Async: Download Application Cache

First Time

Download HTML

Async: Download Application Cache

Display “Loading”

First Time

Download HTML

Async: Download Application Cache

Display “Loading”

Kick off Request for JSON

First Time

- Download HTML
- Async: Download Application Cache
- Display “Loading”
- Kick off Request for JSON
- Store JSON in localStorage

First Time

Download HTML

Async: Download Application Cache

Display “Loading”

Kick off Request for JSON

Store JSON in localStorage

Populate Template

First Time

- Download HTML
- Async: Download Application Cache
- Display “Loading”
- Kick off Request for JSON
- Store JSON in localStorage
- Populate Template
- Remove Loading

Subsequent Times

Subsequent Times

HTML Retrieved from App Cache

Subsequent Times

HTML Retrieved from App Cache

Async: Check for App Cache Updates

Subsequent Times

HTML Retrieved from App Cache

Async: Check for App Cache Updates

Find Stale Resources in localStorage

Subsequent Times

HTML Retrieved from App Cache

Async: Check for App Cache Updates

Find Stale Resources in localStorage

Populate Template

Subsequent Times

HTML Retrieved from App Cache

Async: Check for App Cache Updates

Find Stale Resources in localStorage

Populate Template

Display “Loading”

Subsequent Times

HTML Retrieved from App Cache

Async: Check for App Cache Updates

Find Stale Resources in localStorage

Populate Template

Display “Loading”

Kick off Request for JSON

Subsequent Times

- HTML Retrieved from App Cache
- Async: Check for App Cache Updates
- Find Stale Resources in localStorage
- Populate Template
- Display “Loading”
- Kick off Request for JSON
- Continue as Before

Download Application Cache

```
<html manifest="app.manifest">
```

Download Application Cache

```
manifest = Rack::Offline.new {
  cache "stylesheets/style.css"
  cache "images/masthead.jpg"
  cache "javascripts/application.js"
  cache "javascripts/jquery.js"

  network "/"
}

match "/app.manifest" => manifest
```

Display Loading

```
$("#loading").show();
```

Kick Off Request for JSON

```
$.getJSON("/stories.json", updateStories)
```

Store JSON in localStorage

```
localStorage.articles =
JSON.stringify(json)
```

Populate Template

```
git://github.com/jquery/
jquery-tmpl.git
```

Populate Template

```
  <script type="text/html" id="article">
    {{each(article) articles}}
    <div class="article">
      <h1><a href="${article.url}">
      ${article.title}
    </a></h1>
    ${article.intro}
    <a href="${article.url}#comments">
      Comments
    </a>
  </div>
  {{/each}}
</script>
```

Populate Template

```
var articles =
  template.render(json.articles)

// Single DOM insertion
$("#list").empty().append(articles);
```

```
<script type="text/x-mustache" id="article">
  {{#articles}}
  <div class="article">
    <h1><a href="{{url}}">{{text}}</a></h1>
    {{intro}}
    <a href="{{url}}#comments">Comments</a>
  </div>
  {{/articles}}
</script>
```

Populate Template (Mustache)

```
<script type="text/x-mustache" id="article">
  {{#articles}}
  <div class="article">
    <h1><a href="{{url}}">{{text}}</a></h1>
    {{intro}}
    <a href="{{url}}#comments">Comments</a>
  </div>
  {{/articles}}
</script>
```

Populate Template (Mustache)

```
var template = $("#article").html()

var articles =
  Mustache.to_html(template, json.articles)

// Single DOM insertion
$("#list").empty().append(articles);
```

Remove Loading

```
$("#loading").hide()
```

}

Second Time

Find Stale Resources in localStorage

```
var articles = localStorage.articles;
```

}

Populate Template

```
var articles = localStorage.articles;

if(articles) {
  updateStories(JSON.parse(articles));
}
```

Display Loading

```
$("#loading").show()
```

Continue as Before

jquery-offline

```
$.retrieveJSON("/stories", function(json) {
  var html = template.render(json.articles);
  $("#list").empty().append(html);
});

$("#loading").ajaxStart(function() {
  $(this).show();
}).ajaxStop(function() {
  $(this).hide();
});
```

```
$.retrieveJSON("url",
  function(json, status, follow) {
    // json == JS Object
    // status == "success" || "cached"
    // follow == { cachedAt: originalTime,
    //   retrievedAt: timeRetrieved }
  });
```

Same Process for Secondary Pages

<u>Tip:</u> Avoid Navigation for Secondary Pages

3d Accelerated Transforms

CSS is a Whole Other Topic

Questions?

June 29 Webinar

Evan Phoenix

Rubinius 1.0

Optional EY Cloud Demo