



# A JavaScript Outlook: How the Client gets more powerful

*Overview*

# A JavaScript ~~Outlook~~:

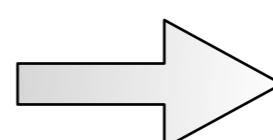
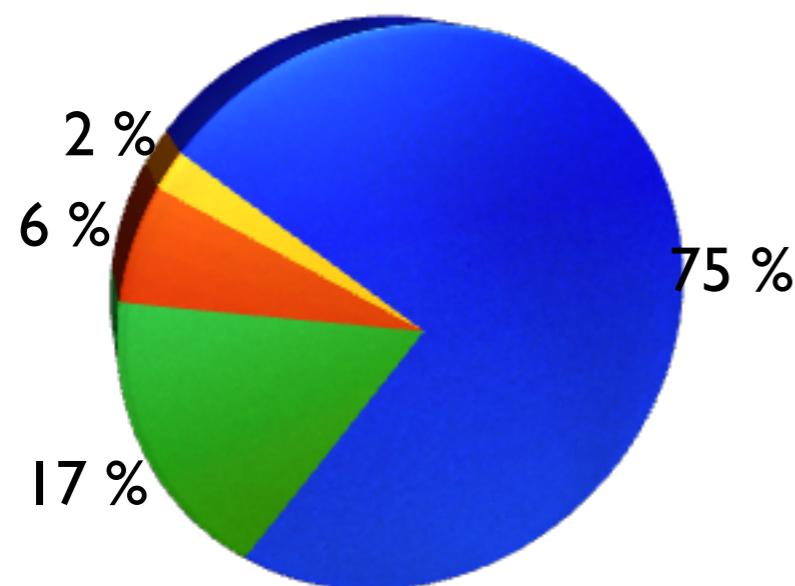
## How the Client gets more powerful

# Agenda

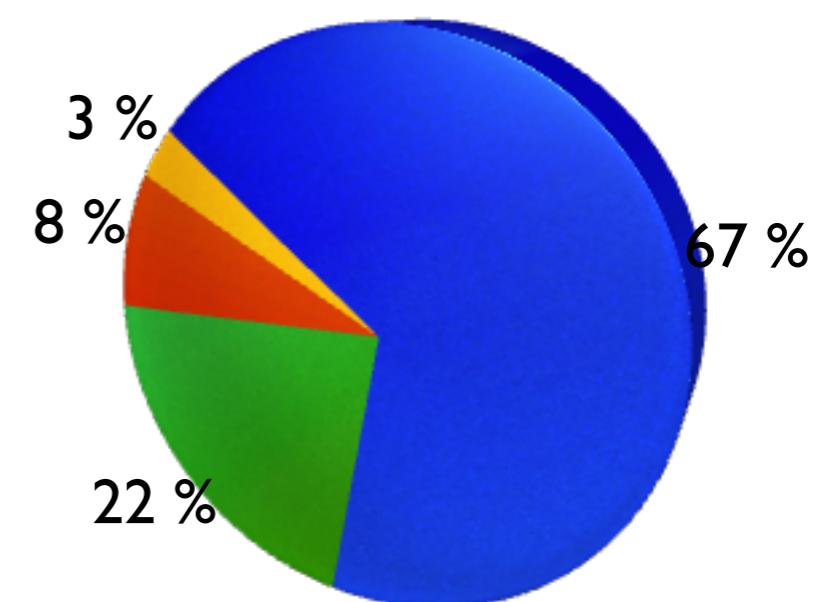
- State of affairs
- Here and now
  - Canvas
  - CSS
  - Storage
  - Worker-Threads
  - Frameworks
- The future ...

# State of affairs

Browsers overall - 02/2008

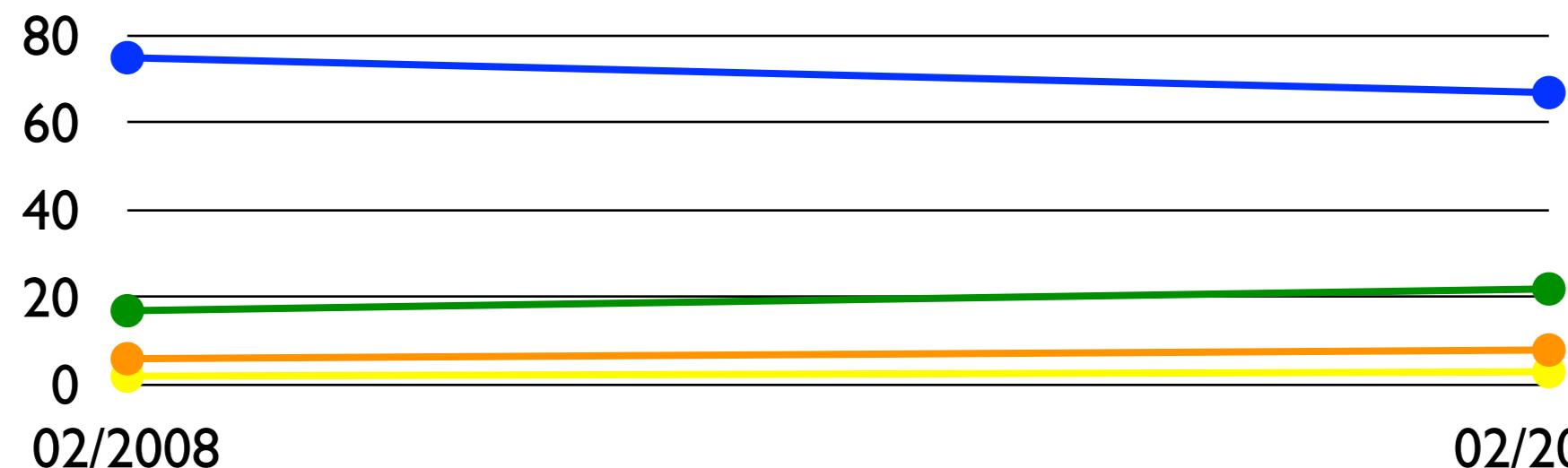


Browsers overall - 02/2009



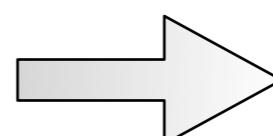
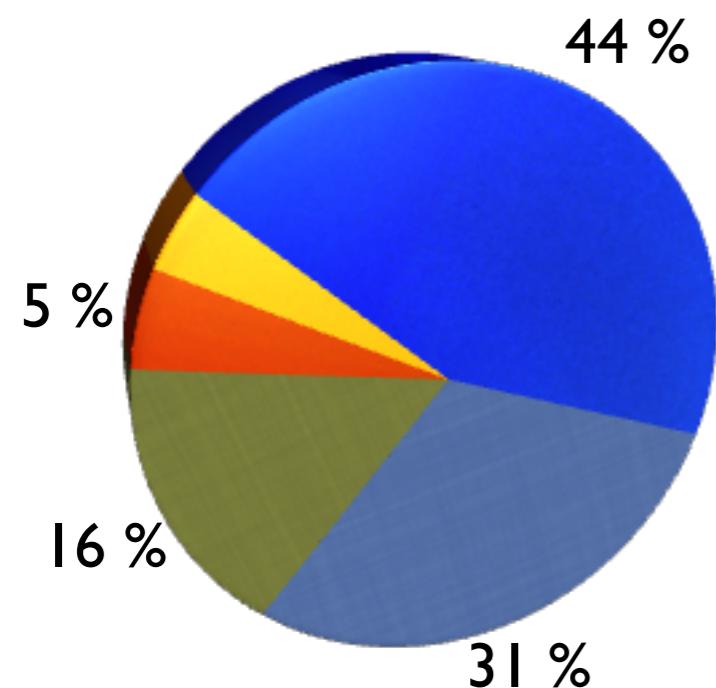
● Internet Explorer ● Firefox ● Safari ● Other

● Internet Explorer ● Firefox ● Safari ● Other

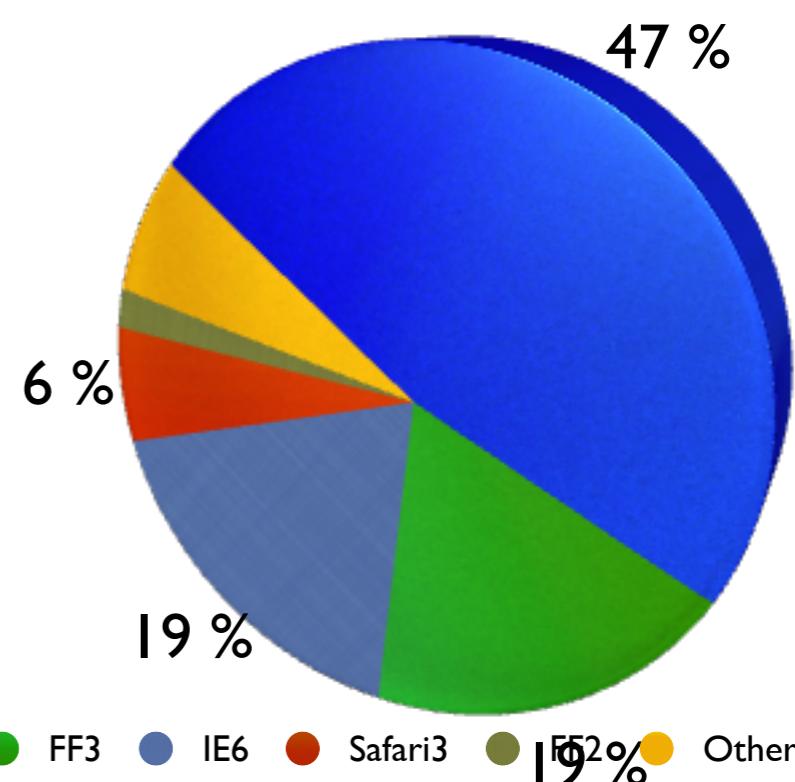


# State of affairs

Browser versions - 02/2008

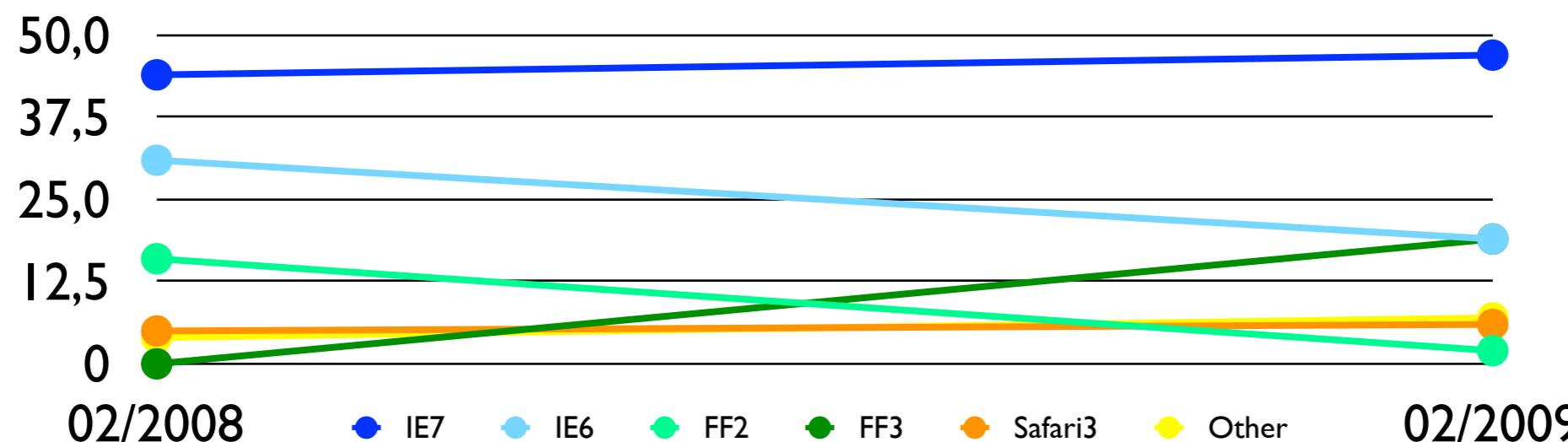


Browser versions - 02/2009

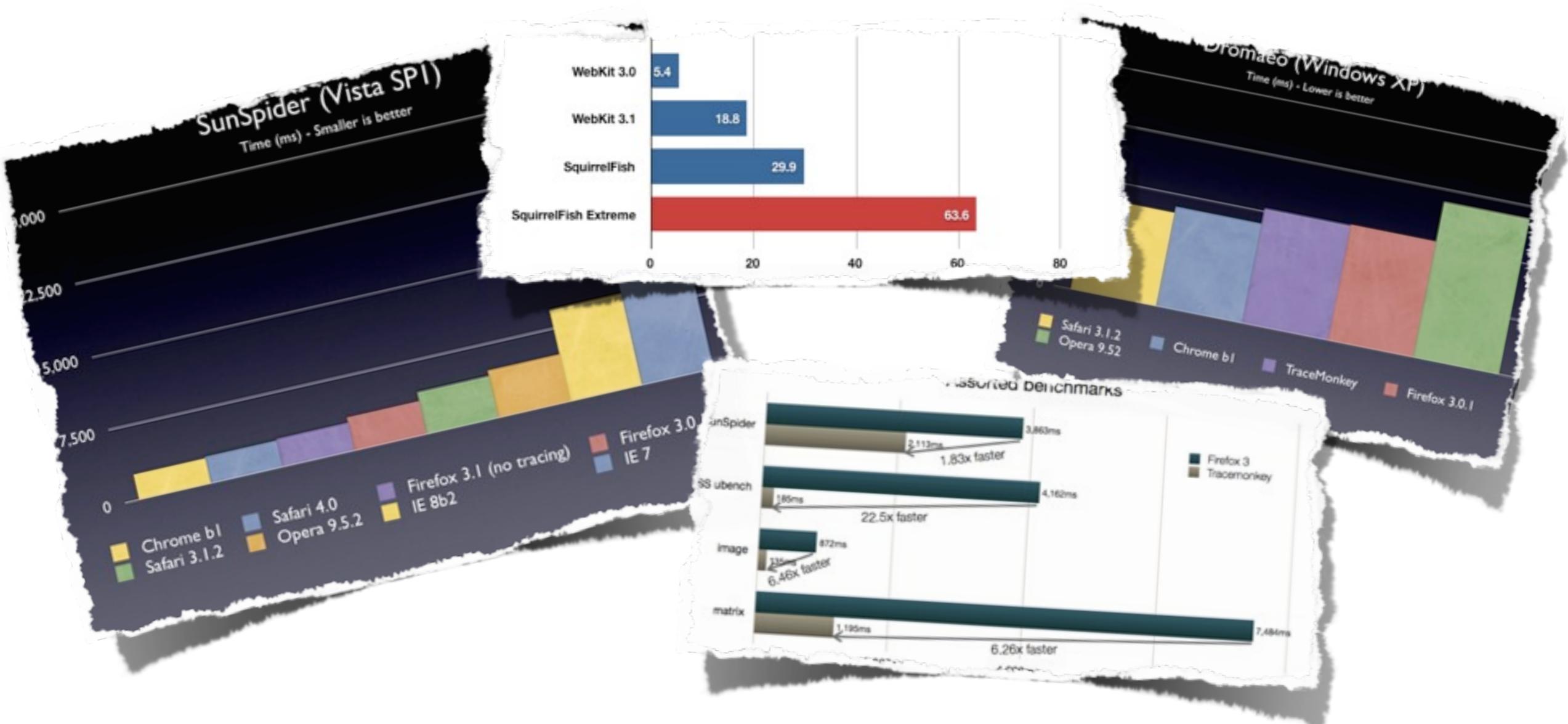


● IE7   ● IE6   ● FF2   ● Safari3   ● Other

● IE7   ● FF3   ● IE6   ● Safari3   ● FF2   ● Other



# State of affairs



- JavaScript gets faster and faster

# What developers can do with current browsers The here and now!



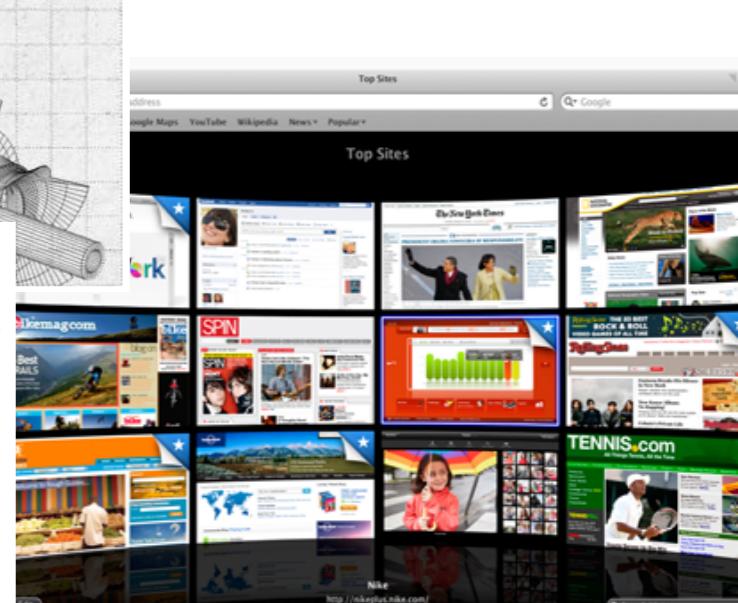
## Firefox 3.5 for developers

The diagram illustrates the performance difference between V8 and other engines. On the left, a developer is shown thinking, with a speech bubble containing the text: "BUT, WHEN YOU HAVE TO DO INTERPRETATION, YOU HAVE TO LOOK AT THE STRUCTURE OF YOUR INTERNAL REPRESENTATION OVER AND OVER AGAIN." Below this, a flowchart shows the V8 compilation process: 1. PARSE (represented by a code icon), 2. COMPILER (represented by a gear icon with the number '01'), and 3. RUN (represented by a computer monitor icon). A blue race car is positioned at the end of the 'RUN' arrow. At the bottom, a horizontal line contains the text: "WHEN YOU INTERPRET ONCE AND COMPILE MACHINE CODE, THEN THAT CODE IS YOUR REPRESENTATION OF THE JAVASCRIPT SOURCE CODE AND IT DOESN'T NEED TO BE INTERPRETED, IT JUST RUNS."

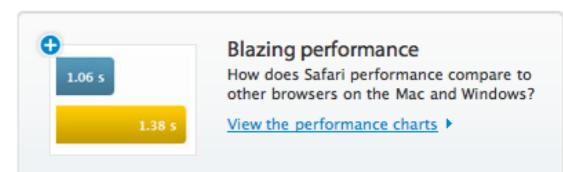
te that this  
ased. See Firefox

web browser, Safari outraces Firefox, Chrome. On even the most demanding sites, Safari delivers blazingly fast performance using the most advanced rendering technologies.

In addition, for example, Safari executes JavaScript faster than Internet Explorer 7 and faster than Firefox 3 based on performance in standard tests: iBench and SunSpider.



In addition to superior JavaScript performance, Safari offers top-flight HTML performance — the best on any platform — loading pages 3 times faster than Internet Explorer 7 and almost 3 times faster than Firefox 3.

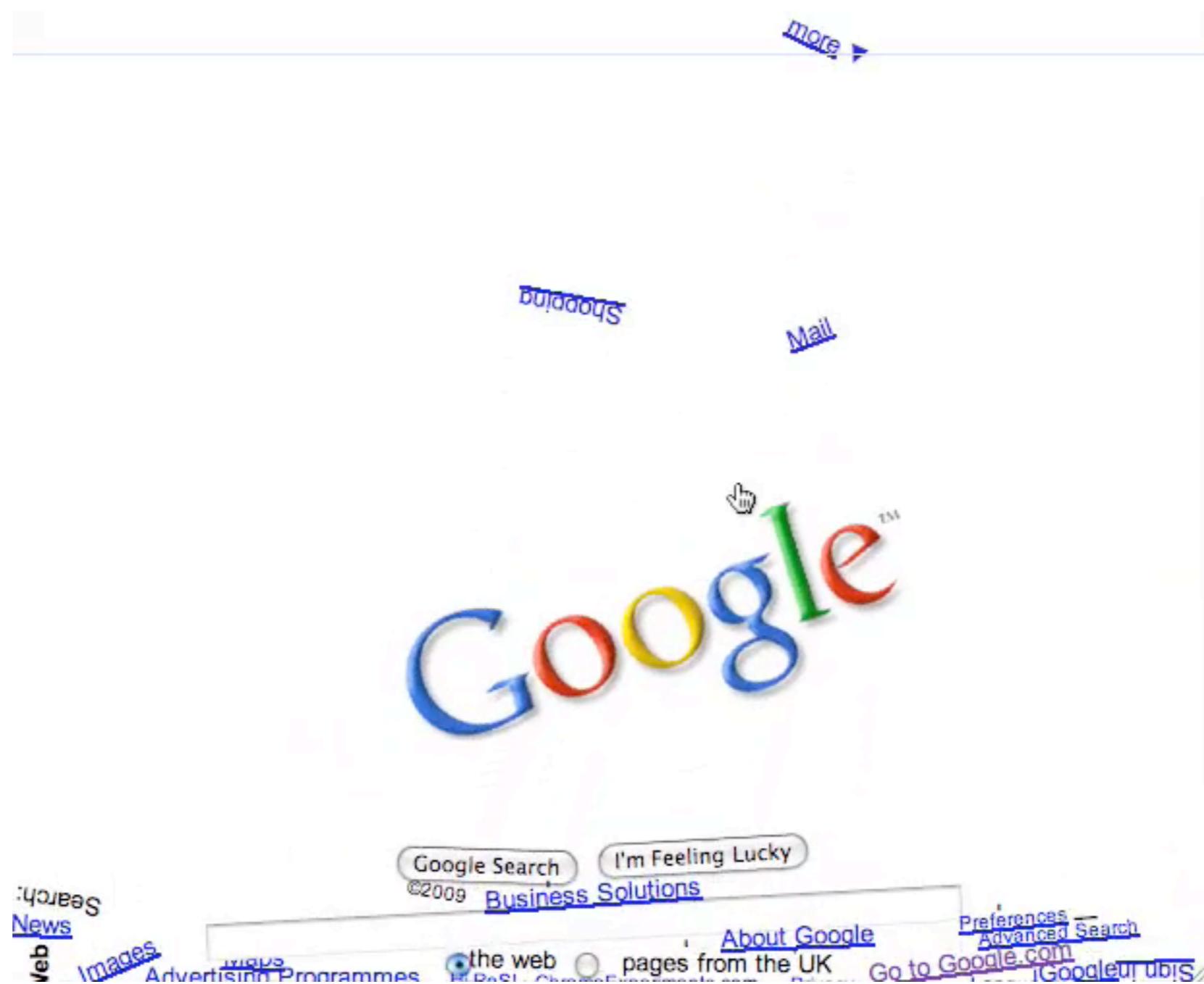


# CSS transformations & animations



<http://www.apple.com/safari/welcome/>

# CSS transformations & animations

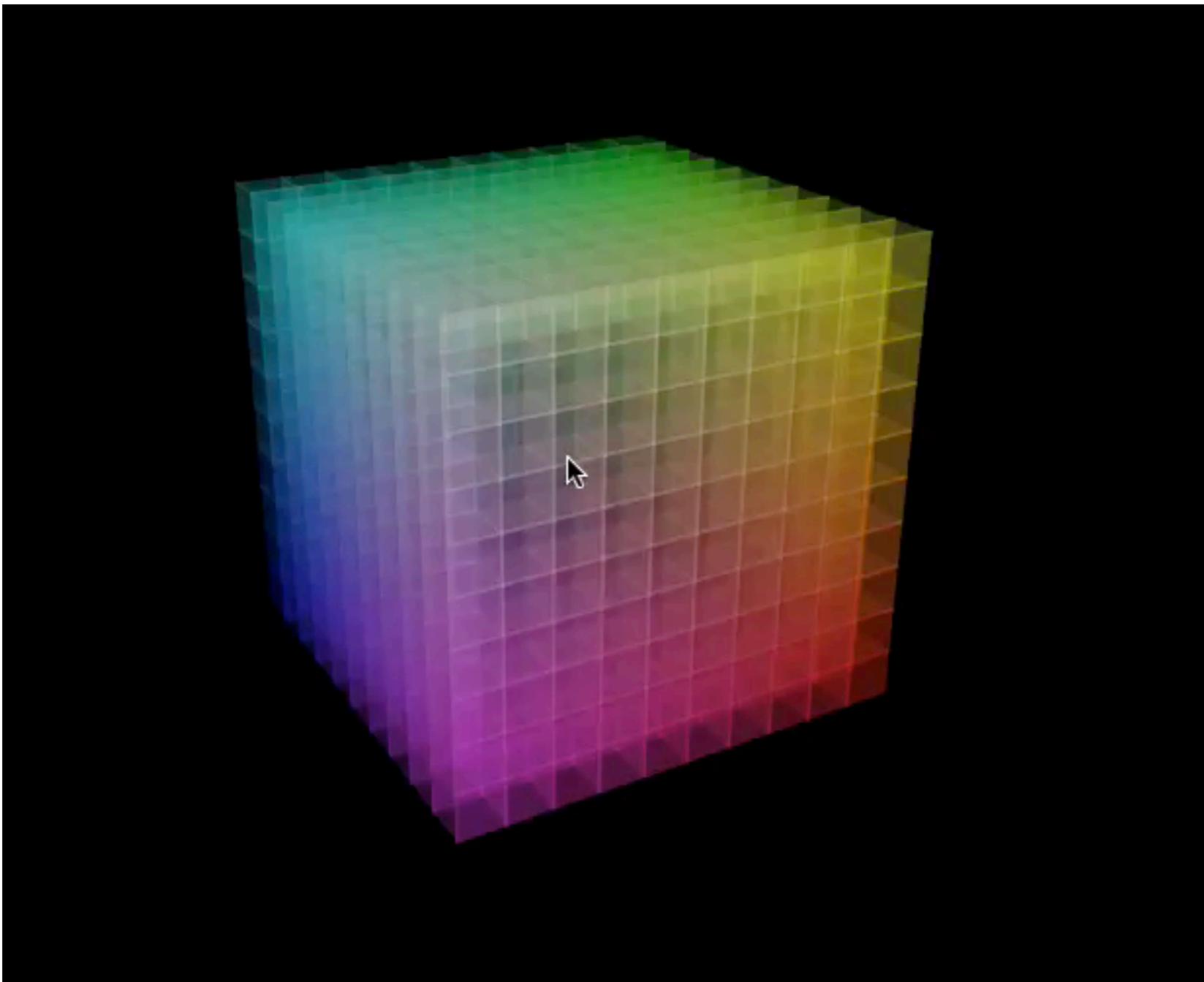


<http://www.chromeexperiments.com/detail/gravity/>

# CSS transformations & animations

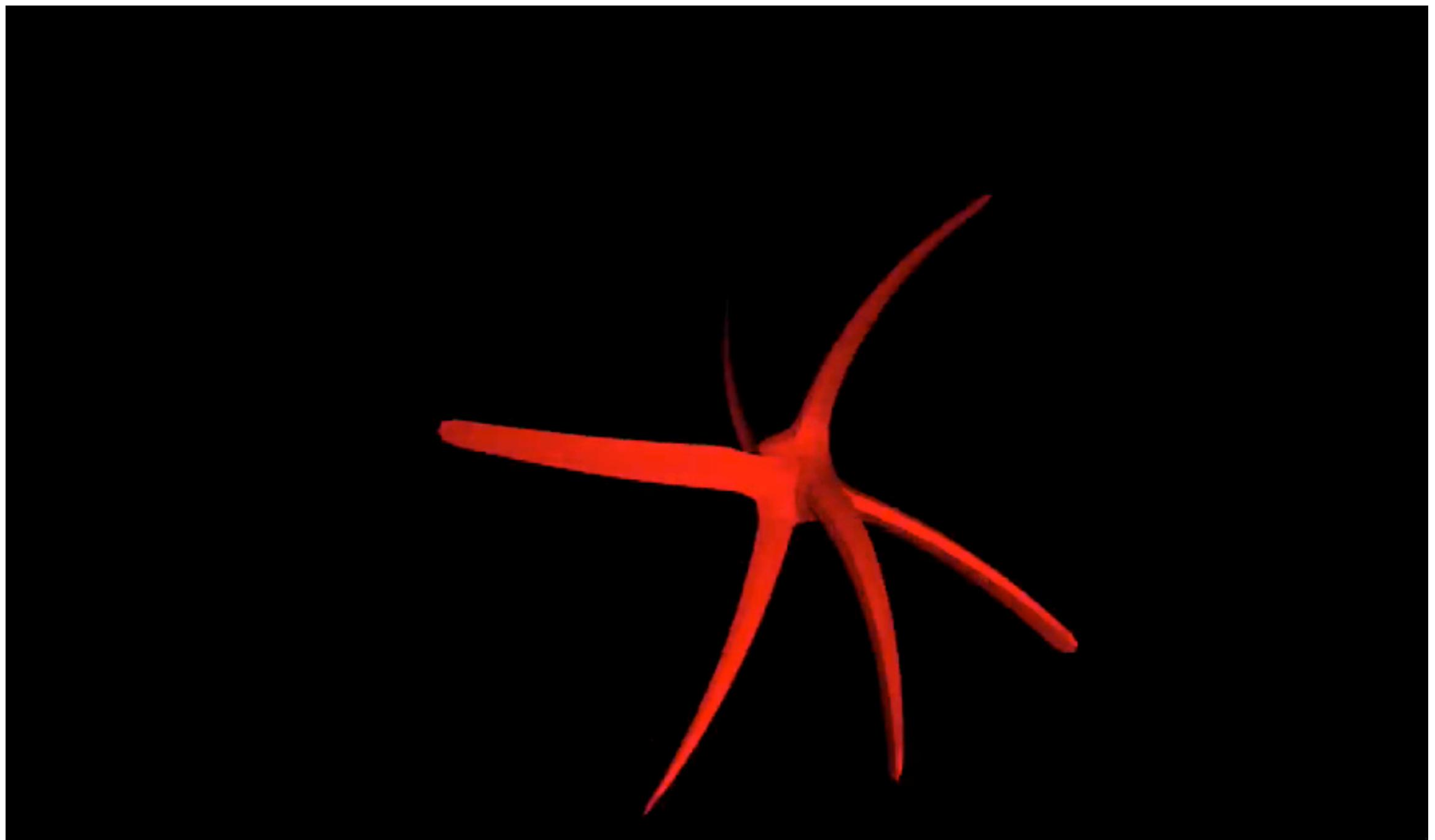
- New technologies to manipulate and animate HTML object with CSS
- Could replace JS calculated animations
- Supports 2d & 3d transformations
  - Scale
  - Translate
  - Rotate
  - Skew
- Supports animations...
  - ... for classical CSS properties like position-opacity
  - ... for the new transformations

# Canvas



<http://www.chromeexperiments.com/detail/colorscube/>

# Canvas

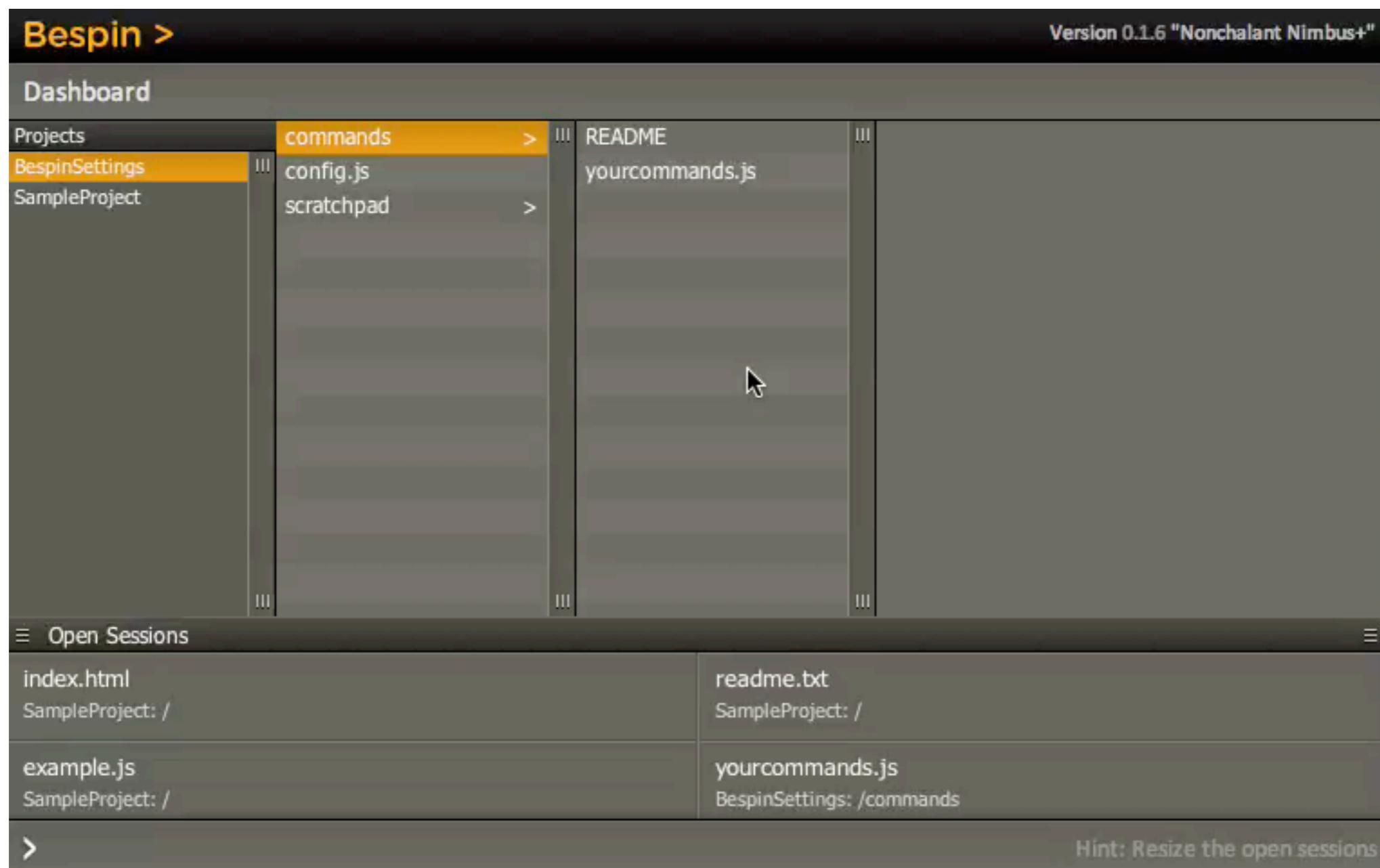


<http://www.chromeexperiments.com/detail/monster/>

# Canvas

- Canvas is a HTML5 2d drawing element
- JavaScript drawing API
- Allows to render anything pixel by pixel
- Already available in every browser (besides IE)

# Canvas



<https://bespin.mozilla.com/>

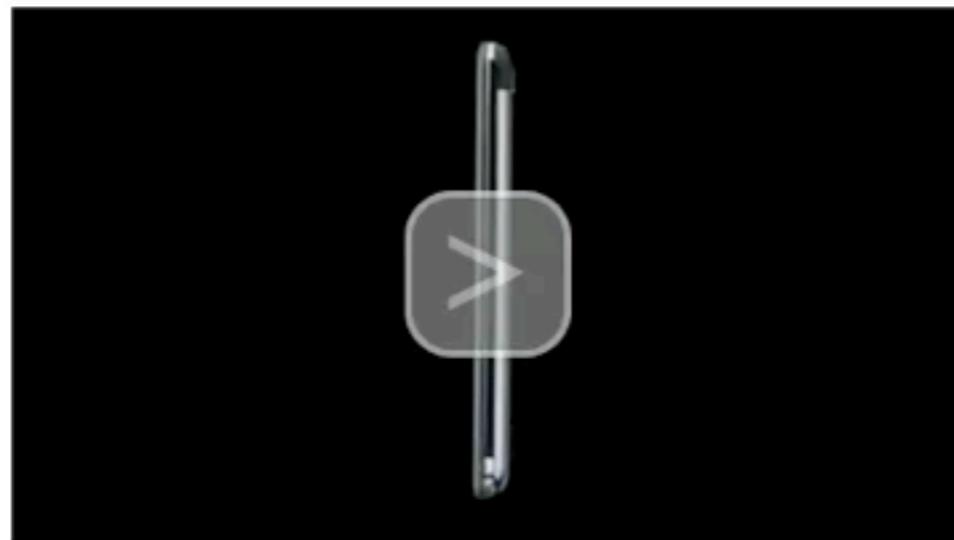
# Canvas

- Bespin
  - Mozilla Labs online text editor
  - Uses Canvas for nearly everything
    - Text rendering
    - Blinking cursor
    - UI rendering
      - Scrollbars
      - Panels
      - List views
      - ...

# HTML video element

supports all formats that QuickTime supports, including installed 3rd party codecs.

The example below uses the 'poster' attribute of the <video> element to display an initial image before the video is loaded, progress events to track loading, and play/pause/ended events to make the overlay button reflect the video's state.



You can follow any responses to this entry through the [RSS 2.0](#) feed. Both comments and pings are currently closed.

## 13 Responses to "HTML5 Media Support"

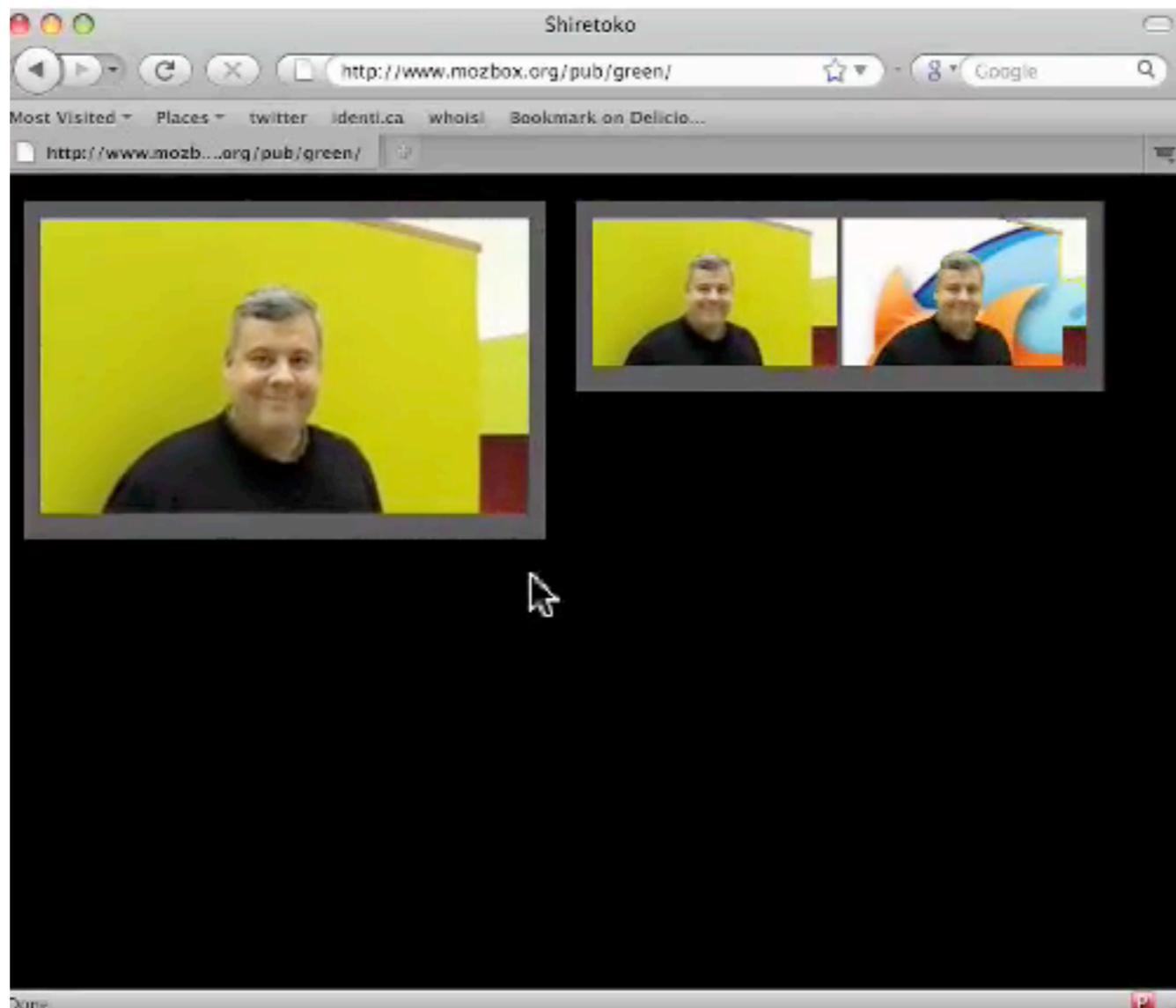
Hendrik.Runte Says:

November 12th, 2007 at 2:48 pm

Thank you so much! This object-and-embed-stuff has been really a PITA, so far. The only workaround, a flash object (flv player), is reliable but not scriptable as your solution. Cheers!

<http://webkit.org/blog/140/html5-media-support/>

# HTML video element



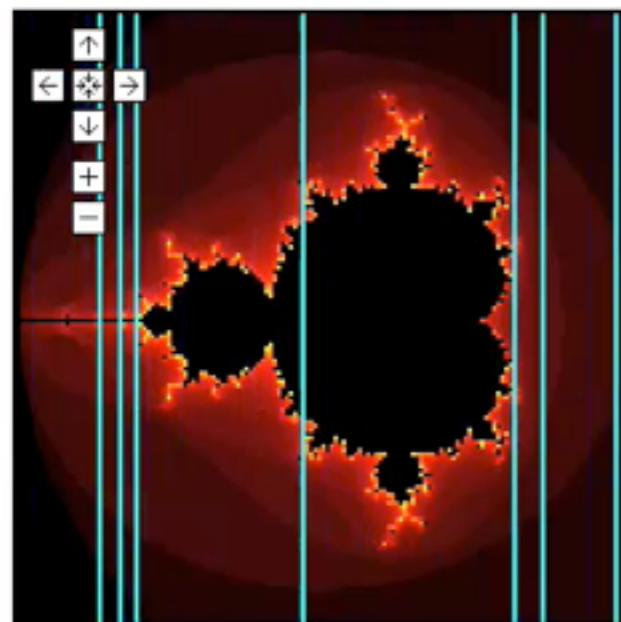
[https://developer.mozilla.org/En/Manipulating\\_video\\_using\\_canvas](https://developer.mozilla.org/En/Manipulating_video_using_canvas)

# HTML video element

- Native HTML elements for audio and video
- JS API
- Canvas API
  - Allows to access video data and work with it on a pixel level

# Workers

## Mandelbrot Demo using Google Gears



Range in Mandelbrot set: (-2,-1.5i) - (1,1.5i)

Interact with UI:

Starting.  
Worker 1 did column 0  
Worker 3 did column 54  
Worker 4 did column 127  
Worker 2 did column 56  
Worker 5 did column 5  
Worker 1 did column 104  
Worker 3 did column 23  
Worker 4 did column 92  
Worker 2 did column 116  
Worker 5 did column 76  
Worker 1 did column 66  
Worker 3 did column 61  
Worker 4 did column 12  
Worker 2 did column 13  
Worker 5 did column 49

[http://n.a.edgar.googlepages.com/  
mandelbrot-gg.html](http://n.a.edgar.googlepages.com/mandelbrot-gg.html)

# Workers

- Like multithreading for JavaScript
  - Background script execution
  - Parallel execution
  - Doesn't freeze the UI
  - Now available via Google Gears
  - Workers will be part of HTML5

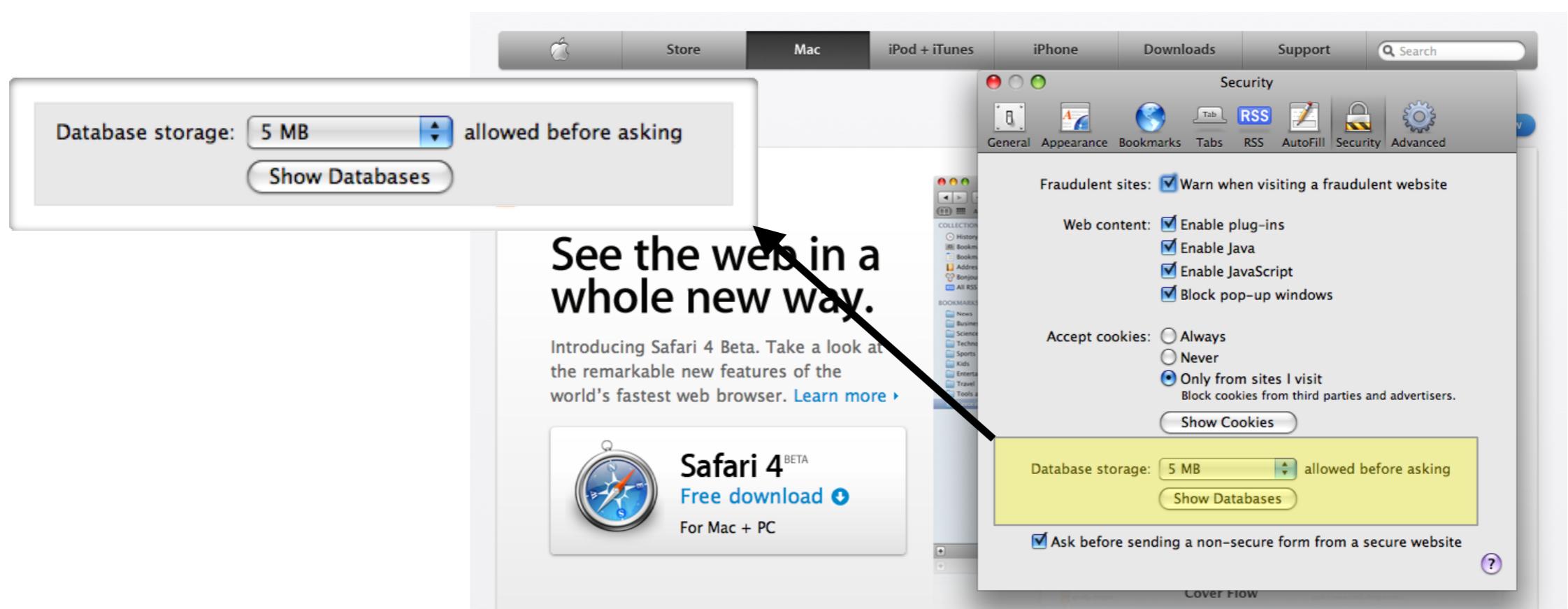
# Storage

The screenshot shows the Gmail interface. At the top, there's a navigation bar with links for Gmail, Calendar, Documents, Photos, Reader, Web, and more. The user's email address, st.schuster@gmail.com, is displayed along with a green checkmark icon and a gear icon. Below the navigation bar is the Gmail logo and the word "BETA". On the left, a sidebar lists Compose Mail, Inbox (which is selected and highlighted in blue), Starred (with a star icon), and Chats. The main area shows a search bar, a "Status: Synchronizing..." message, and a download count of 404 messages. A message list is visible, showing an email from "auto-confirm@amazon.c. (2)" with the subject "Your Order with Amazon.co.uk - Amazon.co.uk Thanks". The message has a checkbox next to it and a "Show actions" link.

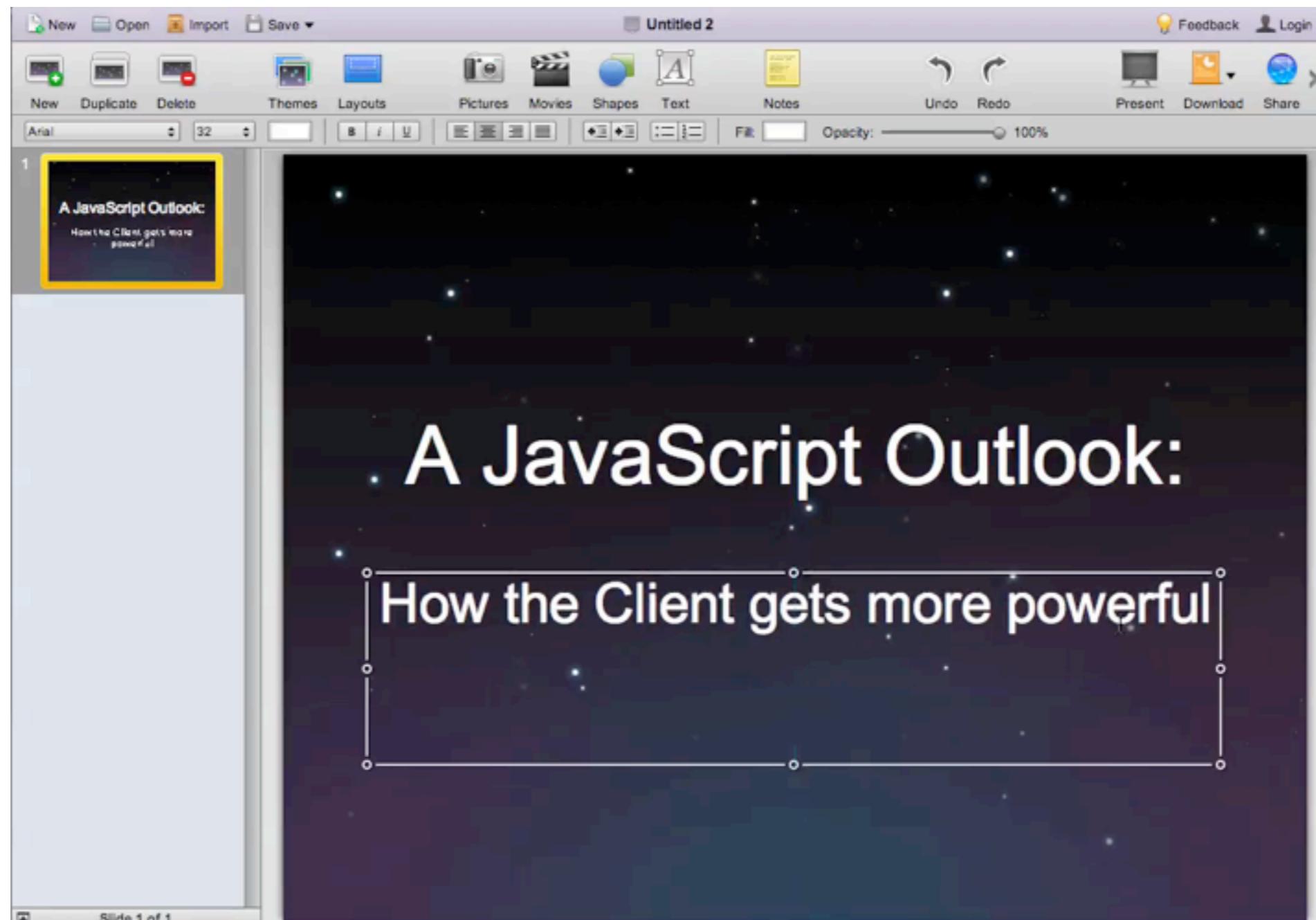
<http://mail.google.com>

# Storage

- Client-Side storage for
  - JS API for a relational database
  - Introduced with Gears
  - Also available in HTML5



# Frameworks



<http://280slides.com/>

# Frameworks

- **Objective-J**
  - Object-oriented syntax enhancement for JavaScript
  - Like Objective-C for C (also same syntax)
  - JS interpreter
- **Cappuccino**
  - Application & UI framework written in Objective-J
  - Like Cocoa for Objective-C



<http://cappuccino.org/>

## Code snippets:

```
var myPerson = [[Person alloc] init];
[myPerson setName: "John"];
```

```
[myPerson setJobTitle: "Founder" company: "280 North"];
```

# Frameworks

## Cappuccino allows higher level programming

“Cappuccino is built on top of standard web technologies like JavaScript, and it implements most of the familiar APIs from GNUstep and Apple's Cocoa frameworks. When you program in Cappuccino, you don't need to concern yourself with the complexities of traditional web technologies like HTML, CSS, or even the DOM. The unpleasantries of building complex cross browser applications are abstracted away for you.”

Main Page   Related Pages   Classes   Files  
Class List   Class Members

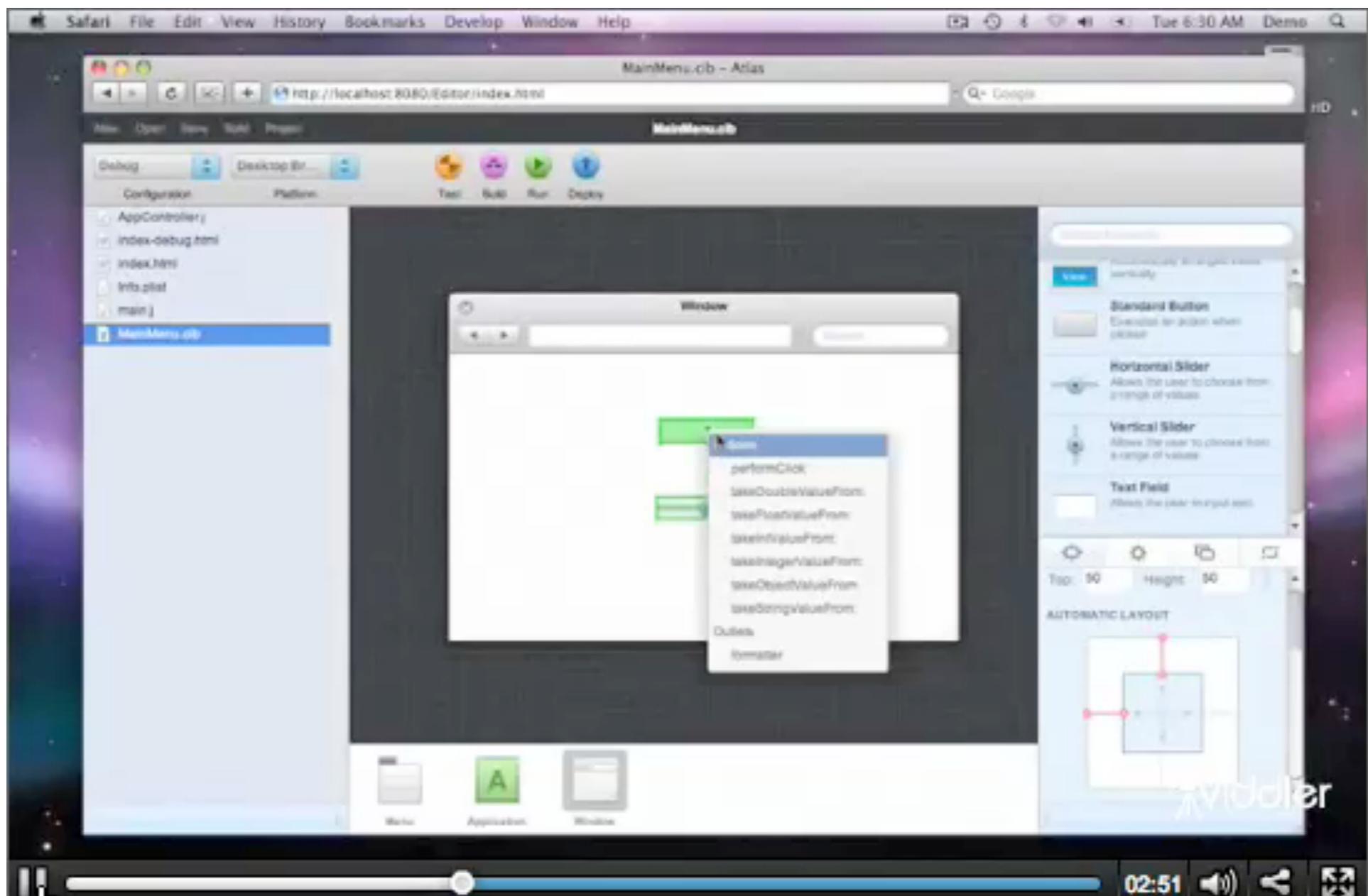
### CPWindow Class Reference

List of all members.

#### Public Member Functions

(id) - [initWithContentRect:styleMask: \[implementation\]](#)  
(id) - [initWithContentRect:styleMask:bridge: \[implementation\]](#)  
(unsigned) - [styleMask \[implementation\]](#)  
(CGRect) - [contentRectForFrameRect: \[implementation\]](#)  
(CGRect) - [frameRectForContentRect: \[implementation\]](#)  
(CGRect) - [frame \[implementation\]](#)  
(void) -  [setFrame:display:animate: \[implementation\]](#)  
(void) -  [setFrame: \[implementation\]](#)  
(void) -  [setFrameOrigin: \[implementation\]](#)  
(void) -  [setFrameSize: \[implementation\]](#)  
(void) -  [trackMoveWithEvent: \[implementation\]](#)  
(void) -  [trackResizeWithEvent: \[implementation\]](#)  
(void) -  [orderFront: \[implementation\]](#)  
(void) -  [orderBack: \[implementation\]](#)  
(void) -  [orderOut: \[implementation\]](#)  
(void) -  [orderWindow:relativeTo: \[implementation\]](#)  
(void) -  [setLevel: \[implementation\]](#)  
(int) -  [level \[implementation\]](#)  
(BOOL) -  [isVisible \[implementation\]](#)  
(BOOL) -  [showsResizeIndicator \[implementation\]](#)  
(void) -  [setShowsResizeIndicator: \[implementation\]](#)  
(CGSize) -  [resizeIndicatorOffset \[implementation\]](#)  
(void) -  [setResizeIndicatorOffset: \[implementation\]](#)  
(void) -  [setContentView: \[implementation\]](#)  
(CPView) -  [contentView \[implementation\]](#)  
(void) -  [setBackgroundColor: \[implementation\]](#)  
(CPCColor) -  [backgroundColor \[implementation\]](#)  
(void) -  [setMinSize: \[implementation\]](#)  
(CGSize) -  [minSize \[implementation\]](#)  
(void) -  [setMaxSize: \[implementation\]](#)  
(CGSize) -  [maxSize \[implementation\]](#)  
(BOOL) -  [hasShadow \[implementation\]](#)  
(void) -  [setHasShadow: \[implementation\]](#)

# Frameworks



<http://280north.com/blog/2009/02/announcing-atlas/>

# Frameworks

- 280 North even announced a visual Cappuccino IDE
  - Written in Cappuccino
  - Like Interface Builder for Cocoa



<http://280atlas.com/>

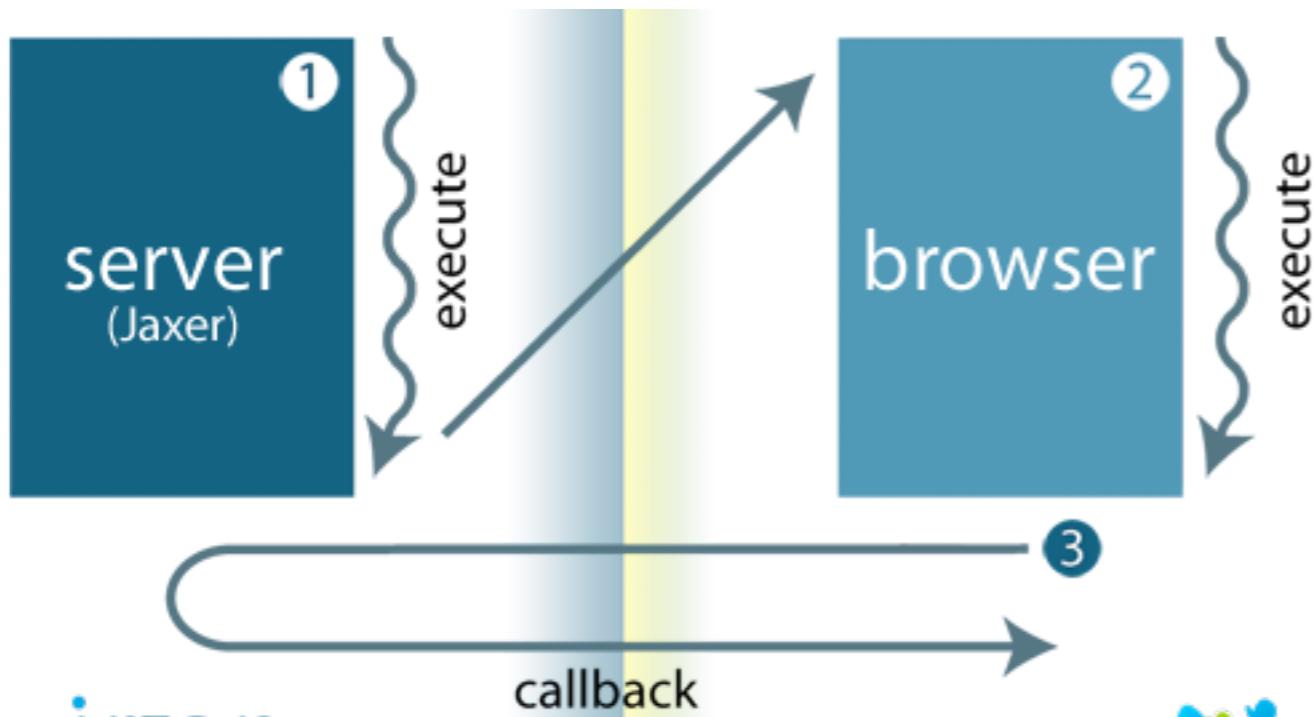
# JS-Environments



**Jaxer** The world's first Ajax server

- Use your Ajax, HTML, JavaScript and DOM skills server-side
- Integrate with databases, file systems, networks and more
- Just tag your JavaScript code to run on the server, the client, or both
- Easily deploy your Jaxer apps to Aptana Cloud from within Studio

[Download Now](#) Free, open source software



- ① Page executes on server and resulting page is sent to browser
- ② Browser executes resulting page
- ③ Browser calls server asynchronously for new information

# JS-Environments

- JavaScript on the server
  - Whole application is written in JavaScript
  - Multipass JavaScript execution
    - Server processes the JS first
    - Then it's sent to the client
    - Developer can decide which script blocks run on the server, which on client, or even both
  - <http://www.aptana.com/jaxter>

# JS-Environments

```
<script runat="server">
    var resultSet = Jaxer.DB.execute("SELECT * FROM myTable");
    var newPrice = resultSet.rows[0].price;
</script>
```

```
<script runat="both">
    function validateCreditCard(number) {
        if (!...) throw new Error("...");
    }
</script>
```

```
<script runat="client">
    function uptime() {
        $('#ajaxSpinner').show();
        runUptime.async(updateProcessOutput);
    }
    function updateProcessOutput(res) {
        $('#processOutput').append(res);
        $('#ajaxSpinner').hide();
    }
</script>
```

# JS-Environments



Get Adobe AIR

[Download now >](#)

Download applications  
built for Adobe AIR >



[Download Titanium Preview Release 3 \(PR 3\)](#)

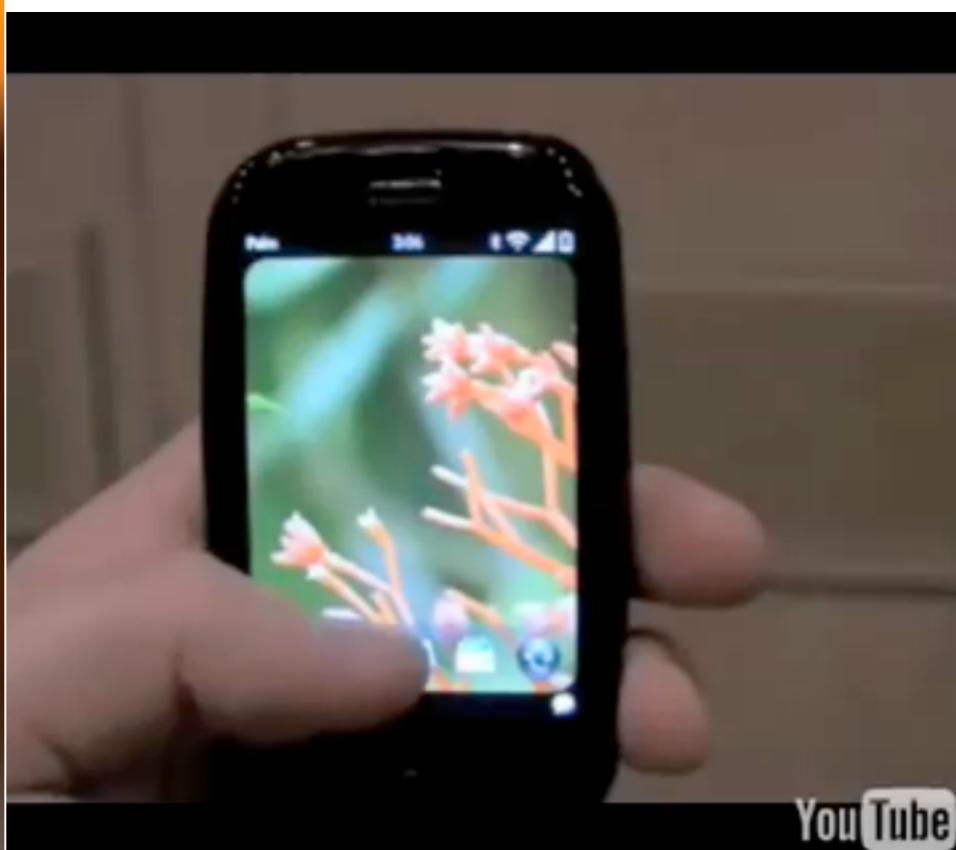
A screenshot of the eBay interface. The top navigation bar includes 'Search ebay...', 'Search', 'Home', 'Find', 'My Items', 'BidBuy', 'Favs', and 'Settings'. On the left, there's a sidebar with 'Recent Searches' (listing items like 'wii', 'xbox 360', 'webkit', etc.) and 'My Categories'. The main area shows a category tree under 'Main Category Listing' (Consumer Electronics) and a search result for 'coins' showing various gold coins and banknotes.

A screenshot of the Tweetanium application window. It features a Twitter login form with fields for 'Twitter Username' and 'Twitter Password', a 'Remember Me' checkbox, and a 'Sign-in' button. The background shows a file browser window on the right and a dock at the bottom with icons for various Mac OS X applications.

# JS-Environments

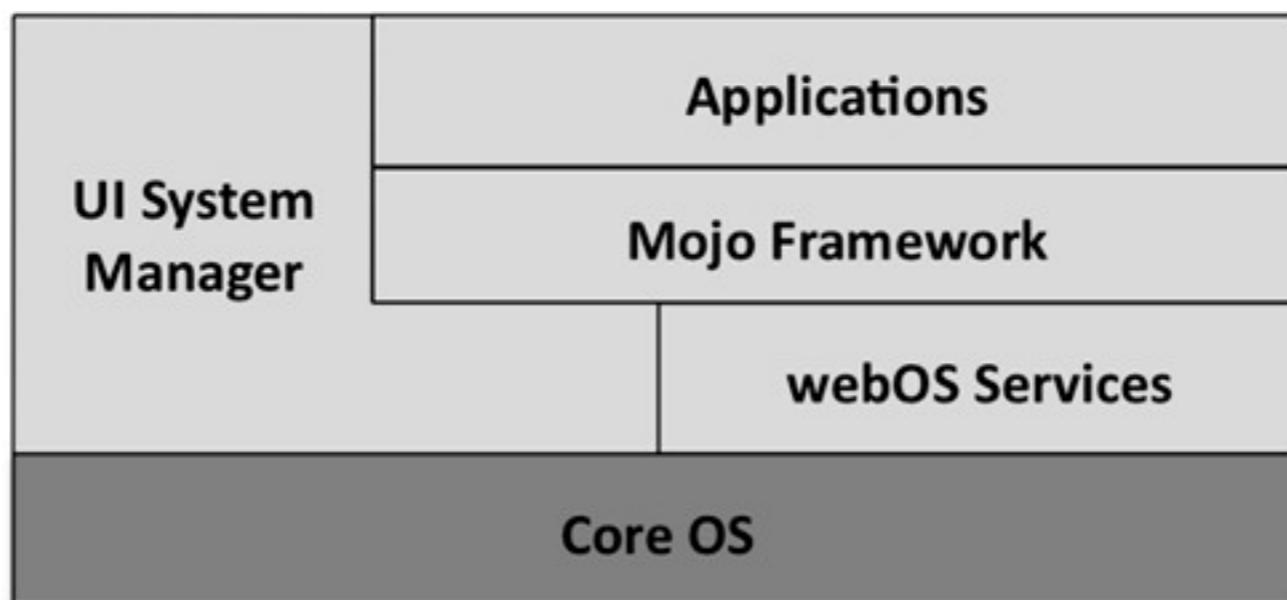
- JavaScript on the desktop
  - Runtime environments for everything that would run in a browser
  - Enhanced JS APIs
    - File-Access
    - OS integration
      - Notifications
      - Statusbar
      - UI
  - Adobe Air
    - <http://www.adobe.com/products/air/>
  - Titanium
    - <http://titaniumapp.com/>

# JS-Environments



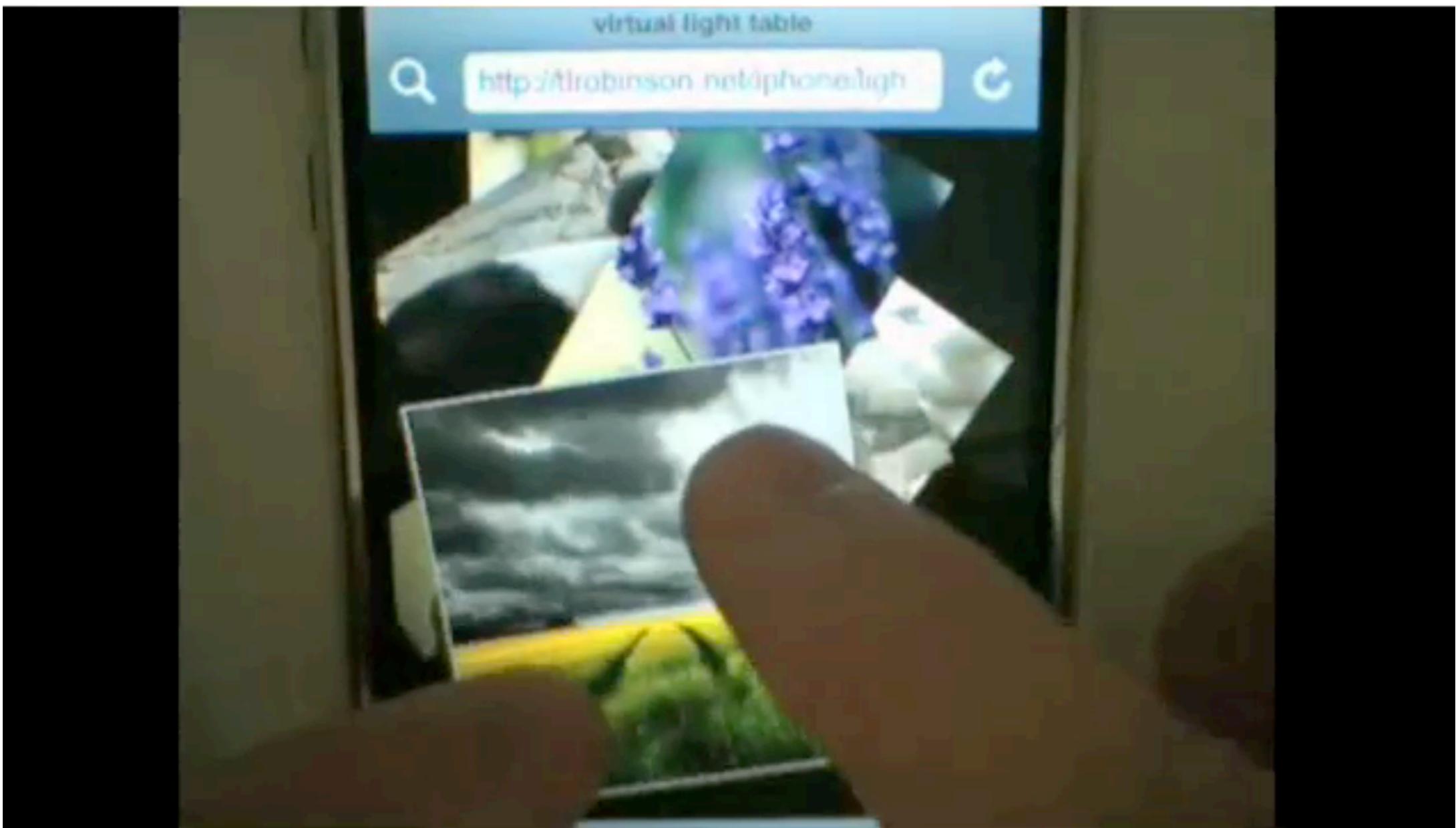
# JS-Environments

- JavaScript on the phone
  - Palm Pre features webOS and the Mojo Application Framework
    - “Palm webOS applications are easy to write using Mojo, a new application framework based on the HTML5, CSS, and JavaScript standards that web developers already know and love.”



<http://developer.palm.com/>

# JS Environments



# Summary

- Lots of enhancements to browser functionality
- New JS APIs which make JS more powerful
- Better JS interpreters which make more complex applications possible
- ~~Browser~~ becomes an application platform

**HTML/CSS/JavaScript**

- Already now very powerful combinations are possible
  - Number crunching (workers) graphically complex (canvas, css) applications, dealing with huge amounts of data (storage)

# The future

- A lot of the things planned for this section already have been shown in “Here and now”
- But there is still some more
  - HTML5
  - JS
  - Development Tools
  - ...

# HTML5

- Besides ...
  - Canvas
  - Storage
  - Workers
  - Audio/Video
- ... there are even more nice additions...

# HTML5

- New form elements
  - Date & Time
  - URL / E-mail
  - Color
  - ...
- New section elements
  - section
  - article
  - ...
- New misc. elements
  - meter
  - progress
  - ...
- Web fonts

# JS.next

- The JavaScript scripting language got standardized under the name ECMAScript
- The last update to ECMAScript (3rd edition) was in 1999
- ECMAScript 4 draft was around for quite a while
- ActionScript (Adobes Flash/Flex scripting language) is heavily influenced by ECMAScript 4
- But: ECMAScript 4 as it was drafted got abandoned

# ECMAScript 4

- ES4 was planned as a major update to ES3
  - Introduced namespaces
  - Introduced optional typing
  - Introduced real classes
- ES4 really would have made JS another language
- There have been conflicts within the standards committee whether or not this was the right way to go
- Then there was Harmony

# Harmony

The Ecma TC39 **meeting** in **Oslo** at the end of July was very productive, and if we keep working together, it will be seen as seminal when we look back in a couple of years. Before this meeting, I worked with John Neumann, TC39 chair, and ES3.1 and ES4 principals, especially Lars Hansen (Adobe), Mark Miller (Google), and Allen Wirfs-Brock (Microsoft), to unify the committee around shared values and a common roadmap. This message is my attempt to announce the main **result** of the meeting, which I've labeled "**Harmony**".

<https://mail.mozilla.org/pipermail/es-discuss/2008-August/006837.html>

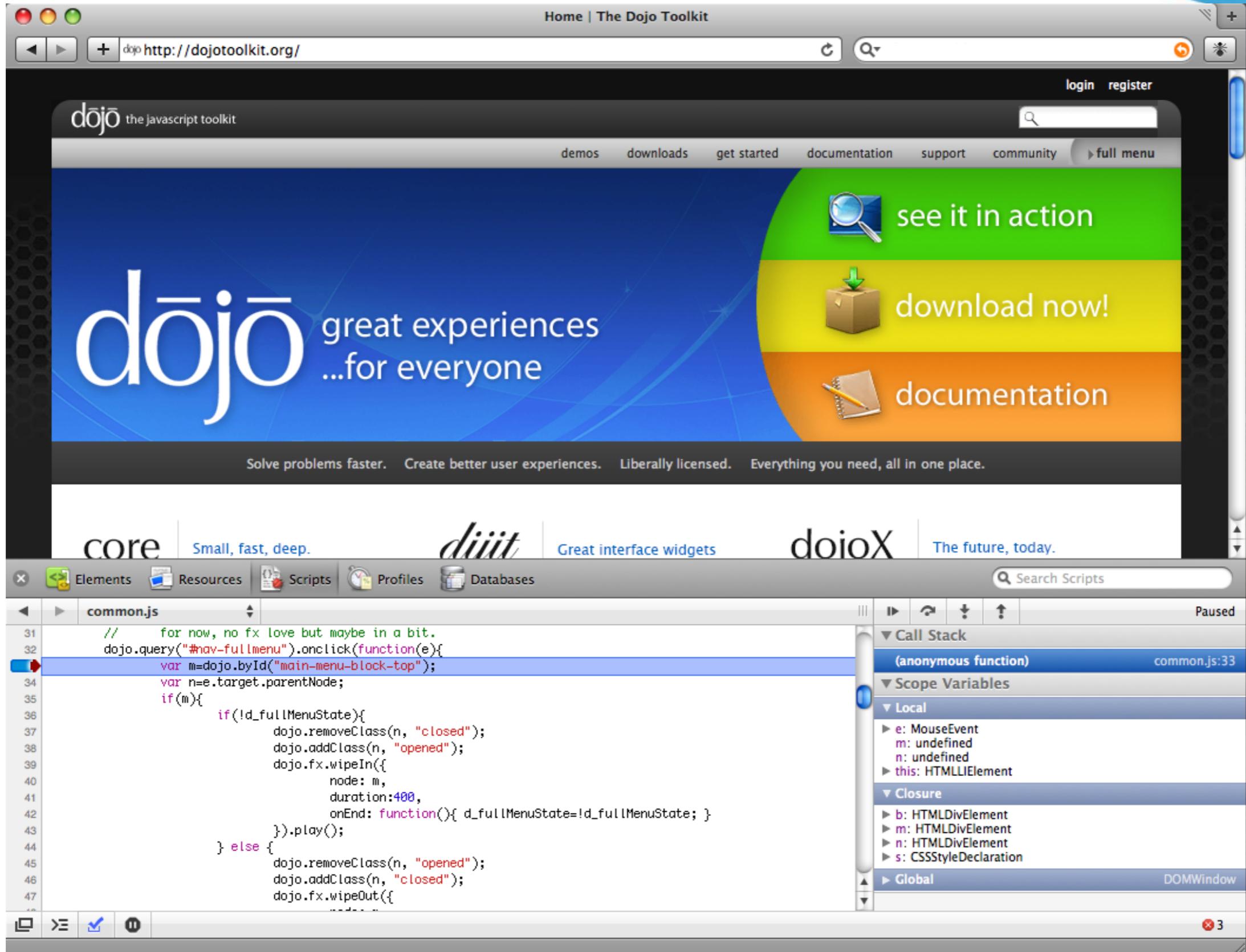
# Harmony

1. **Focus** work on **ES3.1** with full collaboration of all parties, and target two interoperable implementations by early next year.
2. Collaborate on the **next step beyond ES3.1**, which will include syntactic extensions but which will be **more modest** than ES4 in both semantic and syntactic innovation.
3. Some **ES4 proposals** have been deemed **unsound for the Web**, and are off the table for good: packages, namespaces and early binding. This conclusion is key to Harmony.
4. **Other goals** and ideas **from ES4** are being **rephrased** to keep consensus in the committee; these include a notion of classes based on existing ES3 concepts combined with proposed ES3.1 extensions.

<https://mail.mozilla.org/pipermail/es-discuss/2008-August/006837.html>

# Development Tools

- Finally also the development tools are getting better (in every browser)



The screenshot shows a web browser window with the Dojo Toolkit homepage loaded at <http://dojotoolkit.org/>. The browser's toolbar includes standard icons for back, forward, search, and refresh. The address bar shows the URL. A menu bar at the top of the page lists various categories like Disable, Cookies, CSS, Forms, Images, Information, Miscellaneous, Outline, Resize, Tools, View Source, Options, and a Help icon.

The main content area features the Dojo logo and tagline "great experiences...for everyone". To the right, there are three large buttons: "see it in action" (with a magnifying glass icon), "download now!" (with a download icon), and "documentation" (with a notebook icon). Below the main content, a banner states: "Solve problems faster. Create better user experiences. Liberally licensed. Everything you need, all in one place."

At the bottom of the screen, the Firebug developer tools are open. The "Script" tab is selected, showing the code for "common.js". The code is as follows:

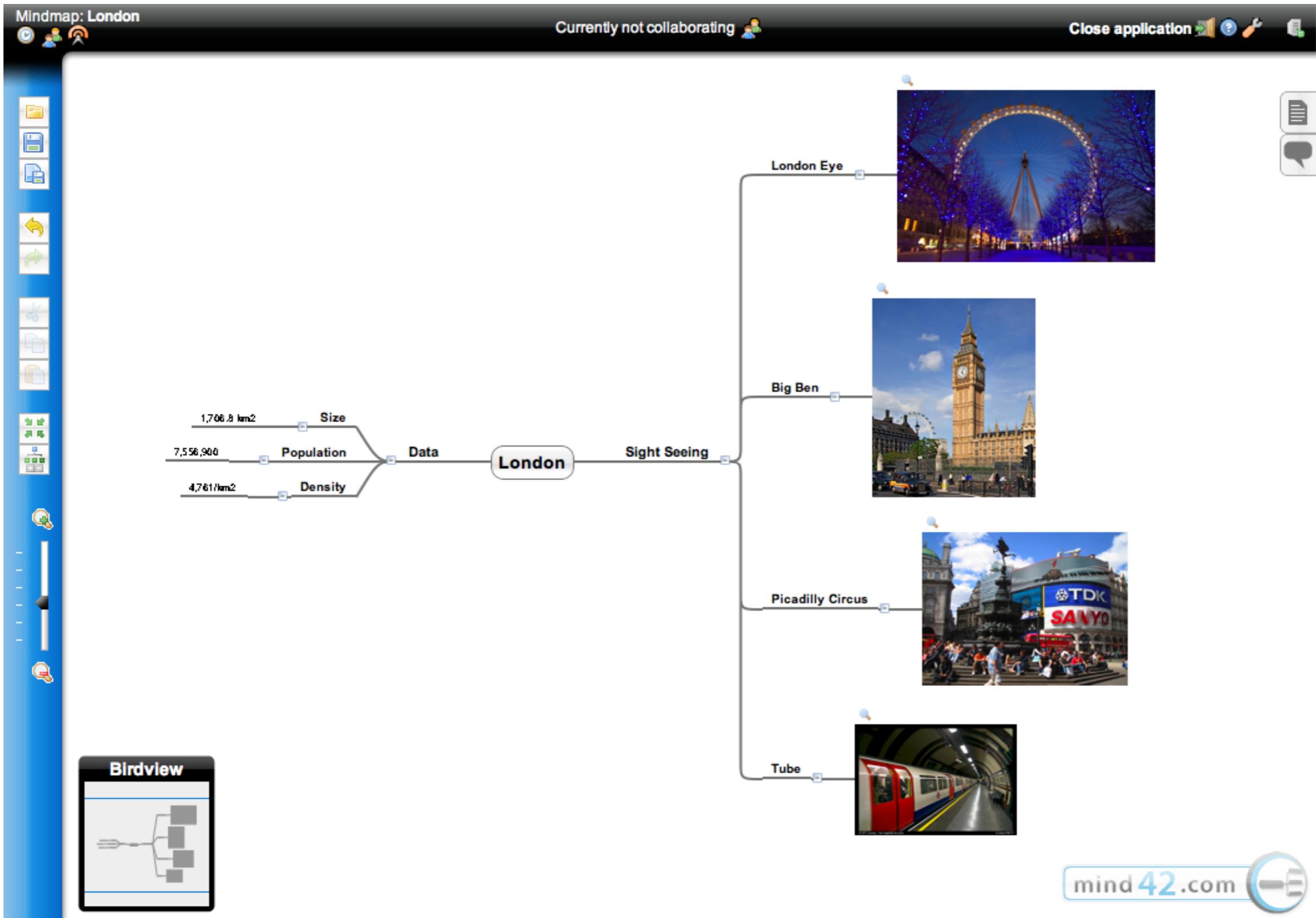
```
25 if(b){  
26     dojo.addClass(dojo.byId("nav-fullmenu"),"closed");  
27     b.parentNode.insertBefore(n, b);  
28  
29     //      hook up the full menu button  
30     //      for now, no fx love but maybe in a bit.  
31     dojo.query("#nav-fullmenu").onclick(function(e){  
32         var m=dojo.byId("main-menu-block-top");  
33         var n=e.target.parentNode;  
34         if(m){  
35             if(!d_fullMenuState){  
36                 dojo.removeClass(n, "closed");  
37                 dojo.addClass(n, "opened");  
38                 dojo.fx.wipeIn({  
39                     node: m,  
40                     duration:400,  
41                     onEnd: function(){ d_fullMenuState=!d_fullMenuState; }  
42                 }).play();  
43             }  
44         }  
45     });  
46 }  
47  
48 // close the menu  
49 dojo.query("#nav-fullmenu").onblur(function(e){  
50     var m=dojo.byId("main-menu-block-top");  
51     if(m){  
52         if(d_fullMenuState){  
53             dojo.removeClass(m, "opened");  
54             dojo.addClass(m, "closed");  
55             dojo.fx.wipeOut({  
56                 node: m,  
57                 duration:400,  
58                 onEnd: function(){ d_fullMenuState=!d_fullMenuState; }  
59             }).play();  
60         }  
61     }  
62 });  
63  
64 // close the menu  
65 dojo.query("#nav-fullmenu").onblur(function(e){  
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86             dojo.addClass(m, "closed");  
87             dojo.fx.wipeOut({  
88                 node: m,  
89                 duration:400,  
90                 onEnd: function(){ d_fullMenuState=!d_fullMenuState; }  
91             }).play();  
92         }  
93     }  
94 });  
95  
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101            dojo.removeClass(m, "opened");  
102            dojo.addClass(m, "closed");  
103            dojo.fx.wipeOut({  
104                node: m,  
105                duration:400,  
106                onEnd: function(){ d_fullMenuState=!d_fullMenuState; }  
107            }).play();  
108        }  
109    }  
110 });  
111  
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720 // close the menu  
721 dojo.query("#
```

The screenshot shows a Microsoft Internet Explorer window displaying the Dojo Toolkit homepage (<http://dojotoolkit.org/>). The page features a large blue header with the Dojo logo and the tagline "great experiences...for everyone". Below the header are three main calls-to-action: "see it in action" (with a magnifying glass icon), "download now!" (with a download icon), and "documentation" (with a pencil icon). The browser's address bar shows the URL <http://dojotoolkit.org/>. The developer tools are open, specifically the "Skript" (Script) tab, which displays the source code for a script named "common.js". The code is written in JavaScript and includes logic for handling menu events and transitions. To the right of the script editor is a "Lokale Variablen" (Local Variables) table, which lists various variables with their names, values, and types. The table includes entries like "e" (DispCEventObj), "clientX" (936), "clientY" (69), and "keyCode" (0).

Name	Wert	Typ
e	{...}	DispCEventObj
[Methods]		
altKey	false	Boolean
altLeft	false	Boolean
behaviorCookie	0	Number
behaviorPart	0	Number
bookmarks	null	IHTMLBookmarkCollection
boundElements	{...}	DispHTMLElementCollection
button	0	Number
cancelBubble	false	Boolean
clientX	936	Number
clientY	69	Number
constructor	{...}	Object
contentOverflow	false	Boolean
ctrlKey	false	Boolean
ctrlLeft	false	Boolean
data	--	String
dataId	--	String
dataTransfer	null	IHTMLDataTransfer
fromElement	null	IHTMLElement
keyCode	0	Number
nextPage	--	String
offsetX	524	Number
offsetY	8	Number
origin	--	String
propertyName	--	String

# Inside Irian

- We're working with bleeding edge JS/CSS/HTML techniques for years now
  - Running service: Mind42 (<http://www.mind42.com>)
  - New platform: Spaaze (<http://www.spaaze.com>)
- Mind42
  - JS-SPA (JavaScript Single Page Application)
  - Rendering is done client side
  - Uses CSS/HTML/Canvas for drawing



# Spaaze.com

- Spaaze.com will be our new service platform and playground for these kind of applications
  - MindSpaaze (former Mind42)
  - TodoSpaaze (Todo management application)
  - ProjectSpaaze (Project management application)
- Don't even try to navigate to spaaze.com yet
  - Just starting right now
  - Except: todo.spaaze.com





Thank you for your attention