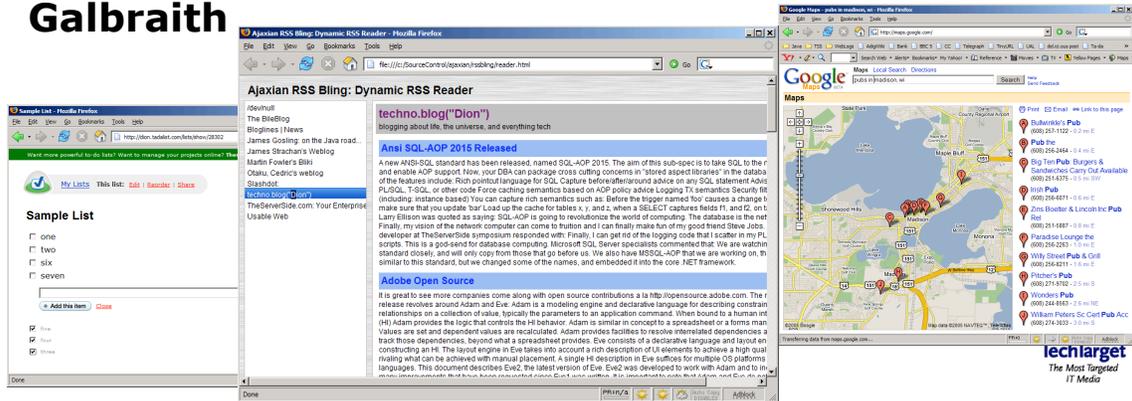


# Cleaning your website with Ajax:

Creating Next-Generation, Highly Dynamic, Off-line Capable  
Web Applications with HTML and JavaScript

**Justin Gehtland, Dion Almaer & Ben  
Galbraith**



## Who am I?

Justin Gehtland

- Founding partner of Relevance
- <http://www.relevancellc.com>
- Author of upcoming "Pragmatic Ajax"
- <http://www.pragmaticprogrammer.com>
- Consultant, speaker, author, dad

## Roadmap

- **What is Ajax?**
  - **History of rich clients on the web**
  - **JavaScript Pain**
  - **XMLHttpRequest (Example)**
- **Who is using this now?**
  - Google Maps
  - Google Suggest
  - Tadalist
  - Generic use cases
- **Ajax Architecture Pieces**
  - Ajax Engine Abstractions
  - Remoting Toolkits
  - UI Toolkits
  - Ajaxian Web Frameworks
- **Ajax Usability**
- **Doing JavaScript Right**
  - Actually a nice language!
  - Unit Testing
  - E4X: No more DOM!
- **RSS Reader Demo**
- **Conclusion / Warnings**



## JavaScript Pain

- **Worked on a dHTML version of WebMail around 1998**
  - **Was not part of the core business**
  - **Were able to enforce the browser (IE 4)**
    - *Without this, it was impossible*
  - **Had a lot of restrictions**
  - **Some powerful hooks (e.g. data binding)**
  - **Very tough to use, and frustrating experience**
- **Learned?**
  - **Painful to use**
  - **JavaScript was a quirky language at the time**
  - ***Should have kept working on that to create GMail!***



This lead to...

## The Myth

Compelling rich UI's can not be delivered with browser technology



## Defining Ajax

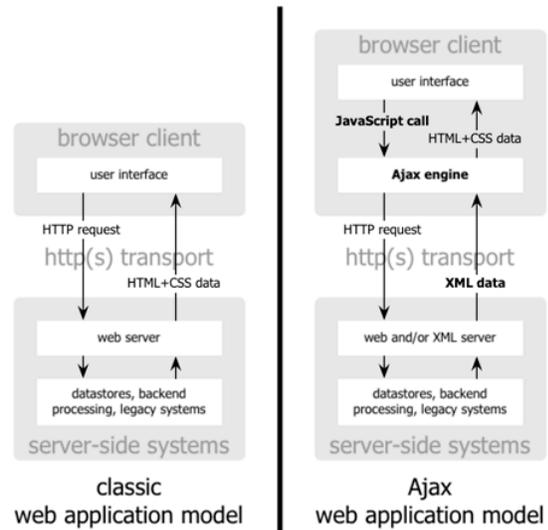
- **Ajax**
  - **standards-based presentation using XHTML and CSS**
  - **dynamic display and interaction using the Document Object Model**
  - **data interchange and manipulation using XML and XSLT**
  - **asynchronous data retrieval using XMLHttpRequest**
  - **and JavaScript binding everything together**

Core New Technology



## Ajax Client Model

- **No more single request/response restrictions**
  - **Have flexibility to go back to the server when we want!**



<http://www.adaptivepath.com/publications/essays/archives/000385.php>



## Server Events Everywhere

- **Web 1.0**
  - **GET via links on text and images**
  - **POST via SUBMIT buttons and type="image"**
- **Web 2.0**
  - **All of the above plus**
  - **Blur**
  - **Key press**
  - **Hover**
  - **Sneeze? ☺**



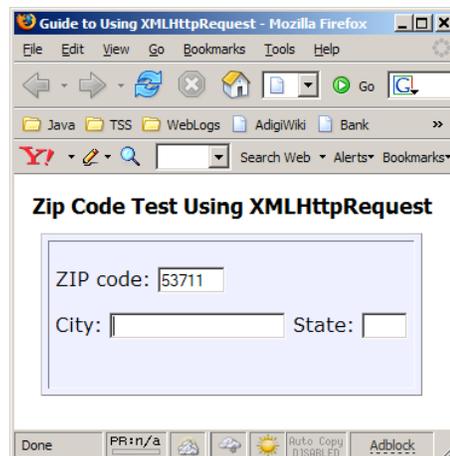
## XMLHttpRequest

- **Asynchronous Processing is here**
  - Allows you to kick off an HTTP request in the background
  - Callbacks kick back into the JavaScript code
  - Supported in various browsers
  
- **Why the big deal?**
  - Changes the request/response paradigm...



## XMLHttpRequest: Example

- **Asynchronously update fields**



## XMLHttpRequest: Working With Browsers

- **Browser Dependent Code**

- **The old problems never die ☹**

```
function getHTTPObject() {  
    var xmlhttp;  
    /*@cc_on  
    @if (@_jscript_version >= 5)  
    try {  
        xmlhttp = new ActiveXObject("Msxml2.XMLHTTP");  
    } catch (e) {  
        try {  
            xmlhttp = new  
ActiveXObject("Microsoft.XMLHTTP");  
        } catch (E) {  
            xmlhttp = false;  
        }  
    }  
    @else  
        xmlhttp = false;  
    @end */  
    if (!xmlhttp && typeof XMLHttpRequest !=  
'undefined') {  
        try {  
            xmlhttp = new XMLHttpRequest();  
        } catch (e) {  
            xmlhttp = false;  
        }  
    }  
    return xmlhttp;  
}
```

### Cross Browser XMLHttpRequest Code:

Supports: IE, Opera (Gecko built in)  
<http://www.scss.com.au/family/andrew/webdesign/xmlhttprequest/>



## XMLHttpRequest: Make the XMLHttpRequest

- **Handle the response from the server**

- **Setup the HTTP request URL**
- **Configure the callback for the response**
- **Send the async message**

```
function updateCityState() {  
    if (!isWorking) {  
        var zipValue = document.getElementById("zip").value;  
        xmlhttp.open("GET", url + escape(zipValue), true);  
        isWorking = true;  
        xmlhttp.onreadystatechange = handleHttpResponse;  
        xmlhttp.send(null);  
    }  
}
```

`<input size="5" name="zip" id="zip" onblur="updateCityState();" type="text">`



## XMLHttpRequest: Handling HTTP Response

- **Handle the response from the server**
  - **State checking**
  - **Getting response text**
  - **Handling XML DOM returned**

```
function handleHttpResponse() {
  if (xmlhttp.readyState == 4) { ← Magic Numbers :/
    isWorking = false;
    if (xmlhttp.responseText.indexOf('invalid') == -1) {
      var xmlDoc = xmlhttp.responseXML;
      var city = xmlDoc.getElementsByTagName('city').item(0).firstChild.data;
      var state = xmlDoc.getElementsByTagName('state').item(0).firstChild.data;
      document.getElementById('city').value = city;
      document.getElementById('state').value = state;
    }
  }
}
```



## XMLHttpRequest: Methods

- **Methods available on XMLHttpRequest**

Method Name	Description
<code>open("method", "URL" [, asyncFlag [, "userName" [, "password"]]])</code>	Setup a request (note async)
<code>send(content)</code>	Send the request (content = post data)
<code>abort()</code>	Stop any request
<code>getAllResponseHeaders()</code>	Return a Map of headers
<code>getResponseHeader("header")</code>	Return the header value
<code>setRequestHeader("label", "value")</code>	Set headers



## XMLHttpRequest: Properties

### ● Properties set on XMLHttpRequest

Property Name	Description
onreadystatechange	Setup the callback event handler
readyState	Object status integer: 0 = uninitialized 1 = loading 2 = loaded 3 = interactive 4 = complete
responseText	Text value of response
responseXML	XML DOM of response
status	Status code (numeric)
statusText	Status text



## Ajax Return Approaches

### Returning Data

Your own format / XML

Could have the server in web service mode, returning clean XML. The JavaScript client will then use `responseXML`, which gives an XML node back which you can walk with DOM and E4X. Or you could return back your own strings.

### Returning HTML

`responseText` and `innerHTML`

- Use "partial" content on the server side
- JavaScript calls the controller to pass back a partial piece of HTML
- Inject the HTML via `innerHTML`

### Returning JavaScript

`responseText` and `innerHTML`

`eval()`  
 Have the server responsible for returning JavaScript code. The JavaScript client will `eval(http.responseText)` the response.



## Is Flash Ajax?

- **A common question/debate surrounds Flash, and its role**
- **Is Flash Ajax itself?**
  - It does allow you to follow a similar architecture
  - **ActionScript is even *almost* JavaScript**
- **Our View:**
  - **Flash is a fantastic tool in the toolbox for developers**
  - **Now, you can bridge JavaScript from a HTML page, with ActionScript in a Flash component**
  - **Some components are impossible, or very hard to implement with HTML/CSS/JS, and we can fall back to Flash**



The screenshot shows a web browser window displaying an RSS feed from AppleInsider.com. The browser's address bar shows the URL 'feed://www.appleinsider.com/appleinsider.rss'. The page title is 'AppleInsider' and it indicates '15 Total' items. The first article is highlighted with a red circle:

- Apple readies AirPort 4.0 software for AirPort Express launch** Yesterday, 06:00 PM  
Apple Computer, Inc. is rapidly completing the development of AirPort 4.0, a major upgrade to its wi... [Read more...](#)

Other articles listed include:

- An inside look at Safari 1.3 Developer Preview** Yesterday, 04:34 PM  
Exclusive - Apple Computer seeded developers this week with Safari 1.3 Developer Preview 1, which is... [Read more...](#)
- Mac OS X Server "Tiger" features Xgrid, iChat and Blog server** Yesterday, 01:00 PM  
Following the first public demonstration of Mac OS X 10.4 Tiger yesterday, Apple quietly previewed t... [Read more...](#)
- Apple seeds Safari 1.3 DP1, Java 1.5 DP to developers** Yesterday, 11:00 AM  
Apple Computer seeded developers this week with Safari 1.3 Developer Preview 1, which will run on fo... [Read more...](#)
- Apple introduces displays, Mac OS X 10.4 Tiger** Monday, 03:00 PM  
The attendees began taking their seats, the lights dimmed, and the Beatles played in the background... [Read more...](#)
- Apple likely to replay WWDC keynote with delayed webcast [Upd...** Monday, 12:00 PM  
Apple Computer, Inc. will most likely provide a delayed webcast of its World Wide Developers Confere... [Read more...](#)
- Screenshots of Mac OS X 10.4 Tiger?** Sunday, 06:05 PM  
Within 24 hours Apple Computer is expected to unveil the majority of its plans for the next major re... [Read more...](#)
- Hon Hai to manufacture Apple's AirPort Express** Thursday, 12:00 PM  
Hon Hai Industrial Co., Ltd., Taiwan's leading manufacturer of information technology products, has ... [Read more...](#)

At the bottom of the browser window, a status bar shows the command: 'Run script "setDateFilter('1','110260801',null)''

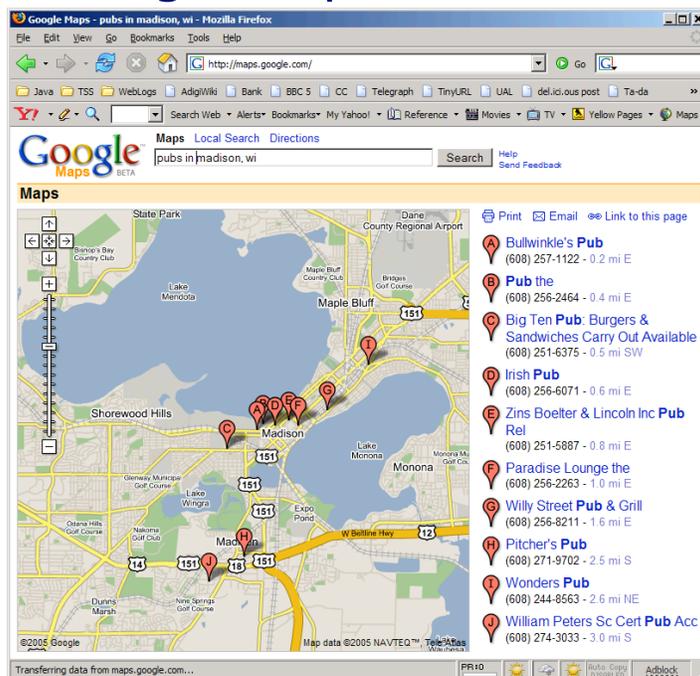


## Roadmap

- What is Ajax?
- **Who is using this now?**
  - **Google Maps**
  - **Google Suggest**
  - **Tadalist**
  - **General Use Cases**
- Ajax Architecture Pieces
- Ajax Usability
- Doing JavaScript Right
- RSS Reader Demo
- Warnings



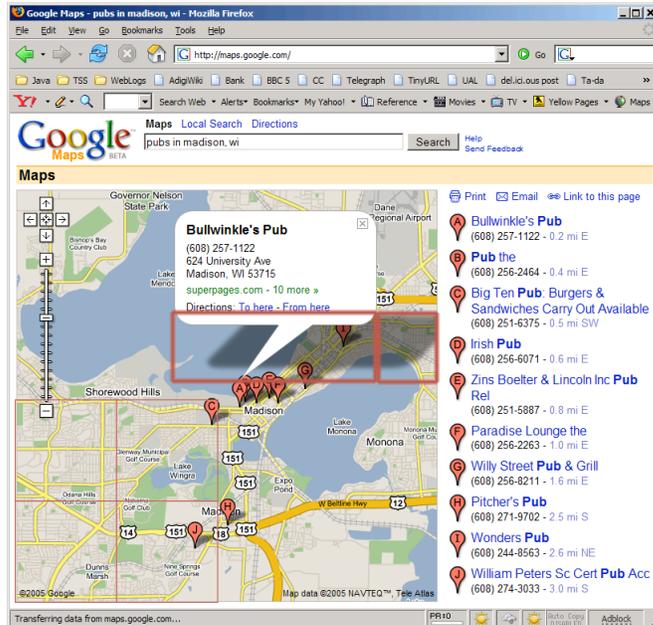
## Google Maps



- Map Pane
- Push Pins
- Shadows
- Scrolling



## Google Maps: Placing items



- Images absolutely placed
- 8 bit alpha channel PNGs
- Shadows
  - Two images
- Scrolling
  - 128x128 panels
  - Infinite scroller



## Google Maps: Talking to Server

- Google Maps keeps talking back to get more panes
  - Fixed URL for caching

```
http://mt.google.com/mt?v=.1&x={x tile index}&y={y tile index}=2&zoom={zoom level}
```

- Google Maps also talks back to do searches via an iframe
  - Why an iframe? Back button saver

```
http://maps.google.com/maps?q=atlanta&z=13&sll=37.062500%2C-95.677068&sspn=37.062500%2C80.511950&output=js
```

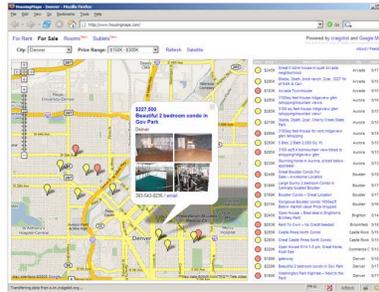
```
function load() {
  if (window.parent && window.parent._load) {
    window.parent._load({big chunk of XML}, window.document);
  }
}
```



## Google Maps: Becomes a platform

- When you get into this world, you are building a platform
- If you are lucky, there will be a **<INSERT PROJECT> Hacks** book on its way
- Now your users, are no longer passive consumers of your service, but they are actively developing on top of it!

<http://www.housingmaps.com>  
<http://libgmail.sourceforge.net>



**Bookmarklets go crazy!**

<http://weblog.infoworld.com/udell/2005/02/28.html#a1186>



## Live Search: Google Suggest

- Aim: Let's you know what people are searching
- Helps with spelling mistakes
- Gets you to popular content
- Uses XHR to call back to server and populates drop down div

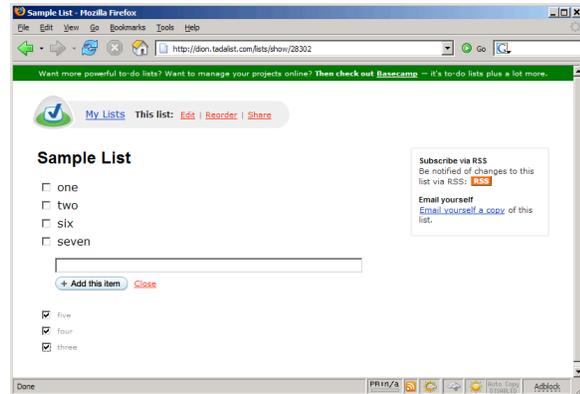


`eval(http.responseText)`



## TadaList

- Todo List manager
- Dynamically moves between states
- Easy in place adding
- Doesn't have in place editing



## TadaList: Toggle Time

```
<tr id="185240">
  <td class="check"><input type="checkbox"
  onClick="toggle_item(this, this.parentNode);"></td>
  <td class="itemtext">
    <span class="movement_control" style="display: none">...
  </td>
</tr>
```

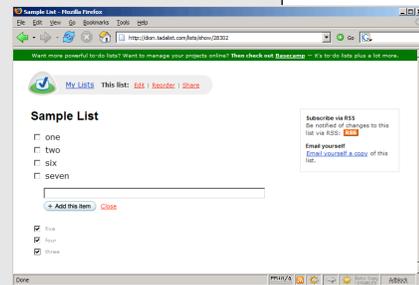
```
function toggle_item(checkbox, item) {
  xml_request(toggle_url + item.id + '?completed=' + (checkbox.checked ? 1 : 0));
  switch_lists(item, checkbox.checked);

  if (movement_controls_on) { toggleMovementControls(); }
  changed_list = true;

  toggle_reorder_link(checkbox.checked);
  toggle_delete_link(checkbox.checked);

  item.children[1].id = 'fade';
  fadeIn(7);

  if (parent_table_of_a_row(item).id == "completed_items") {
    checkbox.checked = true;
  } else {
    checkbox.checked = false;
  }
}
```



## General Solutions

- There are many areas in which Ajax fits in, including:
  - Generally: CRUD on the DOM
  - Feedback messages
  - Admin Features
  - Updating Calculations
  - Portal



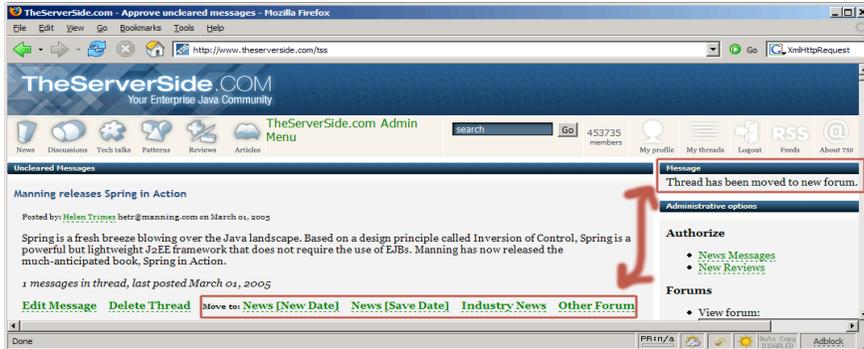
## Feedback messages

- Whenever you want to update something on the server and just say "oh, I did it", why re-render the page that you are on if you don't need too?



## Deleting from the Admin Panel

- When you move something off of your pane (via move/delete) why re-render when you can just delete that element from the DOM?



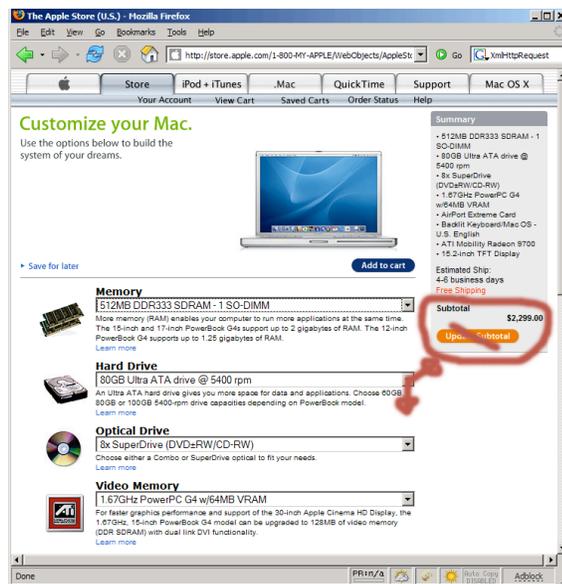
## Recalculate

- Why not re-calculate on the fly?
- Why re-render from the server?



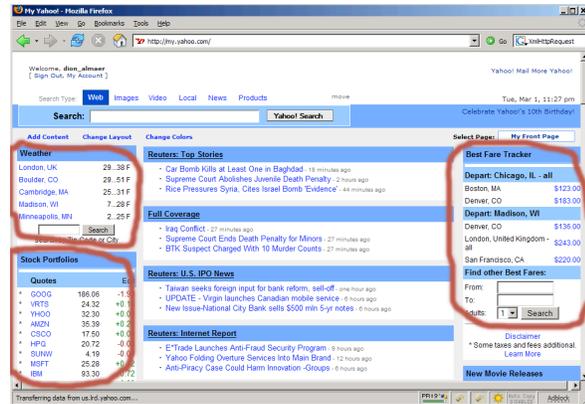
amazon.com

Note: there may be valid reasons!



## Portal / Componentized

- In a portal, really dealing with separate lifecycles for each component.
- Now each component can truly handle its own work without interfering with other pieces.



## Roadmap

- What is Ajax?
- Who is using this now?
- **Ajax Architecture Pieces**
  - **Ajax Engine Abstractions**
  - **Remoting Toolkits**
  - **UI Toolkits**
  - **Ajaxian Web Frameworks**
- Ajax Usability
- Doing JavaScript Right
- RSS Reader Demo
- Conclusion / Warnings



# Ajax Architecture



## Dojo Toolkit

- The Dojo Toolkit has a nice Ajax abstraction

- Handles the back button
- Abstraction above XMLHttpRequest / iframes / etc
- Error handling

```
function divChange() {
    var divToChange =
    document.getElementById("divToChange");
    var lastContent;

    dojo.io.bind({
        url: "/samples/dojoSampleText.txt",
        load: function(type, data, evt){
            divToChange.innerHTML = data;
        },
        error: function(type, error) { alert(error) },
        backButton: function() {
            lastContent = divToChange.firstChild.nodeValue;
            divToChange.innerHTML = 'before change.';
        },
        forwardButton: function() {
            divToChange.innerHTML = lastContent;
        },
        changeURL: true,
        mimetype: "text/plain"
    });
}
```



# DWR: Direct Web Remoting

- DWR is a way of calling Java code on the server directly from Javascript in the browser.
- Speaks to a web app
- Helpful abstractions for the Java and JavaScript side

## HTML

```
Credit Card # :  
<input id="cardnum" type="text" value=""/>  
onchange="checkCardNum()"/>  
<span id="cardnum-error" class="error"></span>
```

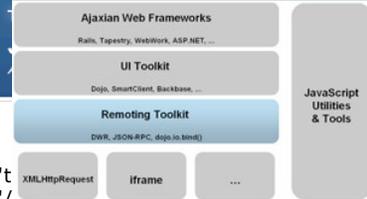
## JavaScript

```
<script type="text/javascript" src="/dwr/dwr/interface/CreditCardValidator.js"></script>  
<script type="text/javascript" src="/dwr/dwr/engine.js"></script>  
<script type="text/javascript" src="/dwr/dwr/util.js"></script>
```

```
function checkCardNum() {  
    CreditCardValidator.isValid(replyCardNum,  
    DWRUtil.getValue("cardnum"));  
}
```

## Servlet: web.xml

```
<servlet>  
    <servlet-name>dwr-invoker</servlet-name>  
    <servlet-class>uk.ltd.getahead.dwr.DWRServlet</servlet-class>  
</servlet>  
<servlet-mapping>  
    <servlet-name>dwr-invoker</servlet-name>  
    <url-pattern>/dwr/*</url-pattern>  
</servlet-mapping>
```



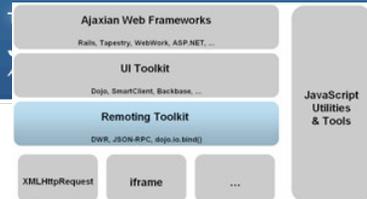
# JSON: JavaScript Object Notation

- JSON (JavaScript Object Notation) is a lightweight data-interchange format.
- Bindings for Java, JavaScript, Ruby, Perl, C, ...
- No parsing required on the JavaScript side
- Built on:
  - Object, Array, String, Number, Boolean, null

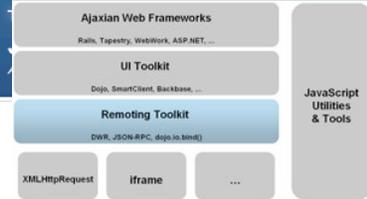
```
[  
  { "name": "Dion Almaer",  
    "age" : 12,  
    "pets": ["sandy", "fluffy"]  
  },  
  { "name": "Ben Galbraith",  
    "age" : 11,  
  }  
]
```

## The X in Ajax: (Not just XML)

HTML  
JavaScript / JSON  
SVG?



# JSON-RPC



- Think XML-RPC but with JSON instead of XML ☺
- Java ORB available

```
function onLoad() {
    jsonrpc = new JSONRpcClient("/jsonrpc/JSON-RPC");
}

function clickHello() {
    var whoNode = document.getElementById("who");
    var result = jsonrpc.hello.sayHello(whoNode.value);
    alert("The server replied: " + result);
}
```



# UI Toolkit



- JavaScript Widgets have been around for a long time:
  - ActiveWidgets  
(<http://www.activewidgets.com/grid/>)
  - Backbone  
(<http://www.backbase.com>)
  - SmartClient  
(<http://www.smartclient.com>)
  - Dojo (again)  
(<http://dojotoolkit.org>)

Ticker	Company Name	Market Cap	\$5
1 MSFT	Microsoft Corporation	314,571,156	32,187
2 ORCL	Oracle Corporation	62,615,266	9,519
3 SAP	SAP AG (ADR)	40,986,328	8,296
4 CA	Computer Associates Inter	15,606,335	3,164
5 ERTS	Electronic Arts Inc.	14,490,895	2,503
6 SFTBF	Softbank Corp. (ADR)	14,485,840	



## UI Toolkit

- Low level effects have been encapsulated in libraries:
- Scriptaculous:
  - <http://script.aculo.us/visual-effects>
  - Builds on Prototype effects
- Drag and Drop encapsulated for us



```
new Effect.Fade('id_of_element');
new Effect.Fade('id_of_element',
  { transition: Effect.transitions.wobble })
```

this is the first list

- Item 1 from first list.
- Item 2 from first list.
- Item 3 from first list.

and now the second list

- DRAG HERE Item 1 from second list.
- DRAG HERE Item 2 from second list.
- DRAG HERE Item 3 from second list.



## Web Frameworks

- Java Web Frameworks have a chance to offer a clean wrapper on the server-side
- Components:
  - Now components in the web frameworks can understand Ajax (JSON, or XML, or ...)
- The various frameworks have a chance to help out developers working with the new medium



# How does this fit in with Java web frameworks?



- This is happening right now:
  - **JavaServer Faces**
    - Ajaxian components to be released
    - Creator announced new components at JavaOne
    - AjaxFaces (<http://www.ajaxfaces.com>)
  - **WebWork2**
    - Top support for server-side validation via Ajax
    - Pub/Sub functionality, and much more
    - *Runs on top of DWR*
  - **Tapestry**
    - Ajaxian components released
    - TACOS: <http://tacos.sourceforge.net/>
    - Focus for Tapestry 4.1
  - **Struts/Shale**
  - **Echo2:** Heavily Ajax Based
  - **ASP.NET**
    - Has had support for Ajaxian components for awhile now
    - Microsoft Atlas Announced



# JavaScript Utilities



- There are many tools that you need to make life barable in JavaScript land:
  - **JavaScript Munging**
    - Jazmin / JavaScript Minifier (<http://www.crockford.com/javascript/jsmin.html>)
    - Obfuscator ([http://www.shaneng.bobos.ca/#iso\\_description](http://www.shaneng.bobos.ca/#iso_description))
  - **Debugging**
    - Ajax Debugging Tool (<http://blog.monstuff.com/archives/000252.html>)
    - IE Leak Detector (<http://blog.monstuff.com/archives/000252.html>)
    - DOM Inspector (built into Mozilla, need to grab IE plugins)
    - TrimBreakpoint (<http://trimpath.com/project/wiki/TrimBreakpoint>)
  - **XML Munging**
    - Google AJAXSLT (<http://goog-ajaxslt.sourceforge.net>)
    - JSXML (<http://sourceforge.net/projects/jsxml>)
    - E4X
  - **Misc**
    - JSDoc (<http://jsdoc.sourceforge.net/>)
    - JsLint (<http://www.crockford.com/javascript/lint.html>)
  - **Unit Testing**
    - JsUnit (<http://sourceforge.net/projects/jsunit>)
    - Selenium (<http://selenium.thoughtworks.com>)



# JsUnit: Testing in the client

- The Test First/Driven folks will be happy to know that they can write a few thousand lines of unit test code for their JavaScript too

```

<script language="javascript" src="jsUnitCore.js"></script>
<script language="javascript" src="myJsScripts.js"></script>

<script language="javascript">
function testWithValidArgs() {
    assertEquals("2 times 3 plus 5 is 11", 11, multiplyAndAddFive(2, 3));
    assertEquals("Should work with negative numbers", -15,
multiplyAndAddFive(-4, 5));
}
function testWithInvalidArgs() {
    assertNull("A null argument should result in null",
multiplyAndAddFive(2, null));
    assertNull("A string argument should result in null",
multiplyAndAddFive(2, "a string"));
}
function testStrictReturnType() {
    assertNotEquals("Should return a number, not a string", "11",
multiplyAndAddFive(2, 3));
}
function testWithUndefinedValue() {
    assertNull("An undefined argument should result in null",
multiplyAndAddFive(2, JSUNIT_UNDEFINED_VALUE));
}
</script>

```

### Selenium:

- New open source project
- Test runner in your browser



## Roadmap

- What is Ajax?
- Who is using this now?
- Ajax Approaches
- **Ajax Usability**
  - Graceful failback
  - Better UI
- JavaScript Right
- RSS Reader Demo
- Conclusion



## Graceful Failback?

- There is a lot of discussion on handling graceful failback
  - As always, it is a balance!
  - Are you using Ajax to do a few subtle things?
  - Are you building a crazy rich framework?
- Some helpful techniques
  - Sam Pullara has an interesting solution to try to help out
    - XPath + Ajax
  - CSS Selectors
    - <http://ripcord.co.nz/behaviour/>
  - HTTP 204

```
BAD
<li>
<a onclick="this.parentNode.removeChild(this)" href="#">
    Click me to delete me
</a>
</li>
```

```
BETTER
<ul id="example">
<li>
<a href="/someurl">Click me to delete me</a>
</li>
</ul>

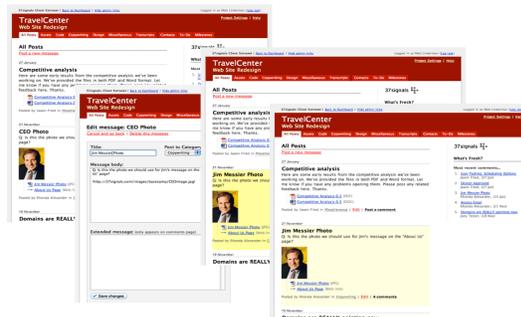
var myrules = {
'#example li' : function(el) {
el.onclick = function(){
    this.parentNode.removeChild(this);
}
};

Behaviour.register(myrules);
```



## Better Usability: Yellow Fade Technique

- This is an example of how you can make better usability



37 Signals pattern:  
<http://www.37signals.com/svn/archives/000558.php>



## Denoting Server Access



- Web users are trained to expect server access at certain points
- To help usability we need to give feedback when a piece of the page is hitting the server

Summary:  
More video footage of the puppies.

Snippet:  
"...on from last week's film, here's another video of the puppies arsing about on the lawn. This time I got my iMovie HD import..."

Stats: 67 words, 1 image      Posted: 2 months, 2 weeks ago

NAVIGATION → NV | BM | BR\*

Home      Contact  
Archive      Reading  
Colophon      Syndicate

pu

TOP 9 SEARCH RESULTS

Term: 'pu'

- Another short film of the puppies in the garden (52)
- A short film of the puppies in the garden (25)



## Roadmap

- What is Ajax?
- Who is using this now?
- Ajax Architecture Pieces
- Ajax Usability
- **Doing JavaScript Right**
  - The language
  - Treating it right
- RSS Reader Demo
- Conclusion / Warnings



## JavaScript isn't as bad as you think

- JavaScript got a bad rap
  - Buggy implementations
  - Copy `n` paste reuse
  - Web hacking versus "programming"
- JavaScript is OO
  - Prototype-based OO versus class based
  - Everything is an object
  - Even functions
- Spend the time to grok it

```
Number.prototype.toColorPart = function() {  
    var digits = this.toString(16);  
    if (this < 16) return '0' + digits;  
    return digits;  
}
```



## Treating JavaScript as a first class citizen

- JavaScript doesn't get treated like our other programming assets on projects
- We need to change this:
  - Testing matters
  - Having releases of JavaScript matters
- I even created a Maven plugin that lets me define JavaScript dependencies

```
<dependency>  
  <groupId>ajaxian</groupId>  
  <artifactId>ajaxian-permissions</artifactId>  
  <version>0.1</version>  
  <type>js</type>  
</dependency>
```



## ECMAScript for XML (E4X)

- **Sick of DOM?** `xmlDocument.getElementsByTagName('city').item(0).firstChild.data;`
- **ECMAScript for XML == first class citizenship for XML**

### Create a DOM

```
var order = <order>
  <customer>
    <firstname>John</firstname>
    <lastname>Doe</lastname>
  </customer>
  <item>
    <description>Big Screen
Television</description>
    <price>1299.99</price>
    <quantity>1</quantity>
  </item>
</order>
```

### Walk the XML tree a la XPath

```
// Construct the full customer name
var name = order.customer.firstname + "
" + order.customer.lastname;

// Calculate the total price
var total = order.item.price *
order.item.quantity;
```



## JavaScript Templates

- Now the browser is doing a lot of work... how about using templates?

```
Hello ${customer.firstName|default:"Mr."} ${customer.lastName}<br/>
Your recent orders are:
<ul>
  {for order in customer.getRecentOrders()}
  <li>${order.orderNum} - ${order.status|capitalize}:
  ${order.grandTotal}
  {if order.requestedShipDate < new Date().getTime() &&
order.status != "shipped"}
  Please contact customer service.
  {/if}
  </li>
  {forelse}
  <li>You have no orders yet. </li>
  {/for}
</ul>
```



## AOP?

- Now we know that JavaScript is cool ;)

```
<script language="text/javascript">
Aspects.addBefore(this, "makeGreeting", aopizeAdvice);
alert(makeGreeting("world")); // Hello AOP world!

Aspects.addAfter(this, "makeGreeting", shoutAdvice);
alert(makeGreeting("world")); // HELLO AOP WORLD!

Aspects.addAround(this, "makeGreeting", ciaoAdvice);
alert(makeGreeting("world")); // Bye-bye!
</script>
```

```
Aspects = new Object();

Aspects.addBefore = function(obj, fname, before) {
    var oldFunc = obj[fname];
    obj[fname] = function() {
        return oldFunc.apply(this, before(arguments, oldFunc, this));
    };
};

Aspects.addAfter = function(obj, fname, after) {
    var oldFunc = obj[fname];
    obj[fname] = function() {
        return after(oldFunc.apply(this, arguments), arguments, oldFunc, this);
    };
};

Aspects.addAround = function(obj, fname, around) {
    var oldFunc = obj[fname];
    obj[fname] = function() {
        return around(arguments, oldFunc, this);
    };
};
```



## SOAP Access?

```
search="Word"
xmlhttp.open("POST", "http://api.google.com/search/beta2", true);
xmlhttp.onreadystatechange=function() {
    if (xmlhttp.readyState==4) {
        alert(xmlhttp.responseText)
    }
}
xmlhttp.setRequestHeader("Man", "POST http://api.google.com/search/beta2
HTTP/1.1")
xmlhttp.setRequestHeader("MessageType", "CALL")
xmlhttp.setRequestHeader("Content-Type", "text/xml")

xmlhttp.send("<?xml version='1.0' encoding='UTF-8'?>"+ "\n\n"<SOAP-
ENV:Envelope"+
    ' xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/"'+
    ' xmlns:xsi="http://www.w3.org/1999/XMLSchema-instance"'+
    ' xmlns:xsd="http://www.w3.org/1999/XMLSchema">'+
    '<SOAP-ENV:Body><ns1:doGoogleSearch'+
    ' xmlns:ns1="urn:GoogleSearch"'+
    ' SOAP-ENV:encodingStyle="http://schemas.xmlsoap.org/soap/encoding/"'+
    '<key xsi:type="xsd:string">GOOGLEKEY</key> <q'+
    ...
    '</ns1:doGoogleSearch>'+
    '</SOAP-ENV:Body></SOAP-ENV:Envelope>')
```



- REST fits in nicely 😊 SOAP is possible :/



## JavaScript Survival Tips

- You will miss your IDE(A)
  - Code completion etc
- Packaging as source only
  - GoogleBrowser will offer a binary version? ☺
- Debugging: tougher
  - Use debugging tools in Firefox / MS debugger
  - Watch out for misspelling variable names
- Packaging of libraries
  - Leads to hacking and many foo.js `libraries`
  - Be wary of namespace
- innerHTML property will well-form any bad HTML



## JavaScript Limitations: Signing Code

- Limitation: “Can’t request other resources on the web”
  - WRONG: You can, as long as you sign your code
  - Mozilla is anal about this security
  - IE? Not so much ☺

**Limitation: “But I want to read from the file system!”**

**WRONG: You can, as long as you sign your code**

**Limitation: “But I want to write to the file system!”**

**WRONG: You can, as long as you sign your code**



## JavaScript Limitations: Ugly Security Code

- Need to get permission in every function
  - Mozilla reverts your priv when it comes out of the function

```
try {  
  if (netscape.security.PrivilegeManager.enablePrivilege) {  
    netscape.security.PrivilegeManager.enablePrivilege('UniversalBrowserRead');  
  }  
} catch (ex) { // eat it  
}
```

```
function applyPriviledge(priviledge, functionCallback) {  
  try {  
    if (netscape.security.PrivilegeManager.enablePrivilege) {  
      netscape.security.PrivilegeManager.enablePrivilege(priviledge);  
    }  
  } catch (ex) { // eat it  
  }  
  functionCallback()  
}
```

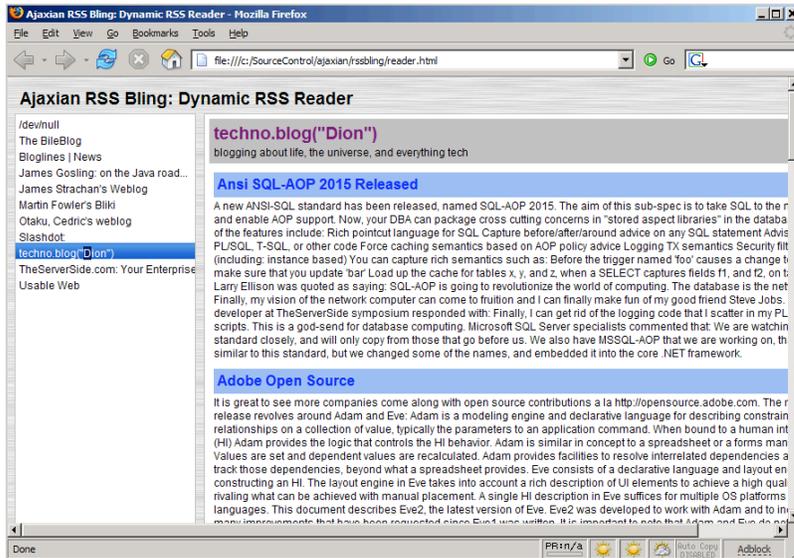


## Roadmap

- What is Ajax?
- Who is using this now?
- Ajax Approaches
- Doing JavaScript Right
- Ajax Usability
- **RSS Reader Demo**
- Conclusion / Warnings



## RSS Bling



## Roadmap

- What is Ajax?
- Who is using this now?
- Ajax Approaches
- Doing JavaScript Right
- Ajax Usability
- RSS Reader Demo
- **Conclusions / Warnings**
  - **Issues we found**



## Conclusion

- Don't use for the technologies sake
- Understand usability testing
  - We have been trained with the SUBMIT button
  - Can't redefine the way a UI works, has to be natural
- Understand restrictions
  - Implicit JavaScript restrictions
  - Programming constructs that you wish you had
- Still in creative mode
  - Many frameworks coming out there
  - Will take time to work out the better solutions
- Still learning



## ajaxian.com

- Ajax is changing at a rapid rate
- Ben and Dion try to keep you up to date at:

# Ajaxian.com

Dion and Ben's AJaX Mission

