

FRAMEWORKS

2007 CONFERENCE



Making Ajax Easy With Model-Glue

Joe Rinehart
Firemoss, LLC

About the Speaker

- President of Firemoss, LLC, a ColdFusion and Flex consulting company
- Creator of the Model-Glue framework
- Author for ColdFusion Developer's Journal and the Fusion Authority Quarterly Update

What are we doing today?

- Learning a bit about Ajax and its uses
- Discovering two different ways to implement Ajax
- Finding out how Model-Glue can be used in conjunction with Javascript frameworks to make Ajax easy to implement inside of your existing applications

Presentation Structure

- Part I is a slide-based introduction to Ajax technology
- Part II is a slide-based description of two different forms of Ajax
- Part III discusses the mechanics and “plumbing” of Ajax
- Part IV is a combination of lecture and a “live code” workshop in which we’ll take a traditional application and convert it to Ajax

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Part I: What's Ajax?

So, what's Ajax?

- A great way to clean bathtubs, showers, sinks, and floors without leaving scratches.



Seriously...

- The jury's still out. Classically, it means Asynchronous Javascript and XML, but:
- Not many people use asynchronous Javascript with XML (preferring JSON or HTML transport).
- It's oft confused with DHTML and presentation layer effects.

Ajax, defined, for the next 40 minutes.

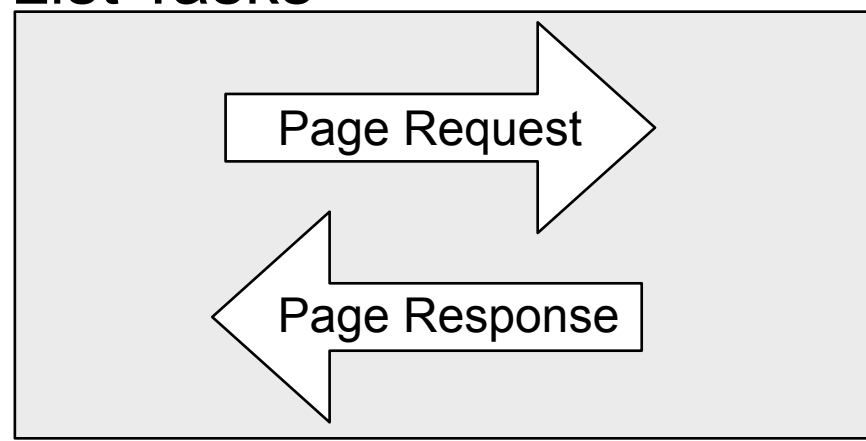
- For the scope of this presentation, Ajax will refer to using Javascript to update information displayed in an HTML page without reloading the entire page.

Ajax: Redefining HTML Application Workflow

Browser



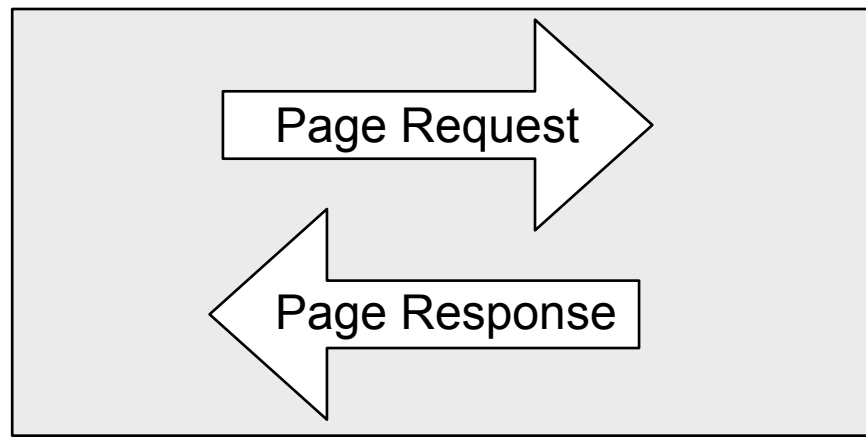
List Tasks



Server



Delete a Task

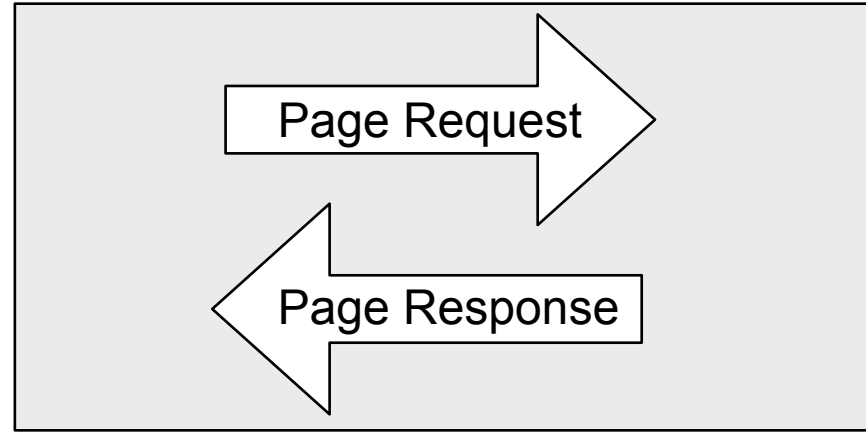


Ajax: Redefining HTML Application Workflow

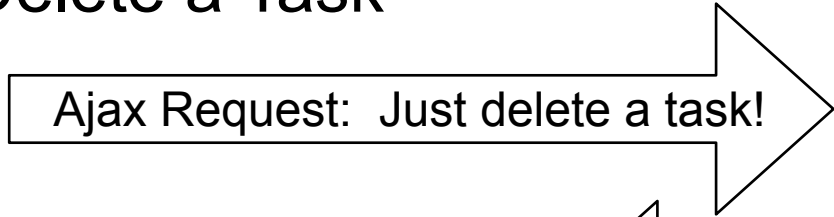
Browser

List Tasks

Server



Delete a Task



Why use Ajax?

- Ajax allows round-trip calls to your ColdFusion server to take place without reloading the page or interrupting user experience
- Upon a response, you can then update the displayed page with new information, such as validation results for a form.

Why **not** to use Ajax:

- It's an addition to the document-based model of the Web page, and implementations across browsers vary.
- In Internet Explorer, Ajax makes use of an ActiveX control, which may have security implications.
- Accessibility and Section 508 concerns abound

Review: Ajax - What and Why?

- Ajax focuses on using Javascript to make ad-hoc requests to a Web server and then using the response to update the current page - without reloading!
- Using Ajax, Web applications can respond more like desktop applications, providing a richer user experience

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Part II: Two “types” of Ajax

Two Types of Ajax

- Ajax implementations tend to fall into two types, each with its own advantages and disadvantages:
 1. Unstructured
 2. Structured

Unstructured Ajax

- In “Unstructured” Ajax, calls made to the server via Javascript do not return structured data
- Instead, they return HTML that’s then used to update a region of content

Benefits of Unstructured Ajax

- It's easy to implement - just write a script to generate HTML, and use Javascript to request the script and state where to place the response.
- Does not require a major change in architecture towards service layers - all we need are scripts that generate HTML!

Problems with Unstructured Ajax

- Unstructured Ajax isn't flexible: the "receiving" page can (typically) only do one thing with the data received, and that's update the contents of a region.
- Similarly, Ajax request "handlers" on the server side tend to be single purpose, returning both data and presentation as an HTML string

Structured Ajax

- Structured Ajax requests don't automatically replace screen regions with request responses.
- Instead, the response only contains data, in a *structured* manner.
- This structure can take on many forms: XML, JSON, or even delimited lists (not a good idea, but I've seen it done).

Benefits of Structured Ajax

- Pure data: no intermingling with presentation. This allows structured Ajax to work well with existing service tiers that are focused on data, not presentation.
- Structured Ajax deals only with data: on the result of a structured Ajax request, the requesting page may take multiple actions based on the same data.

Problems with Structured Ajax

- It's more difficult to implement: knowledge of Javascript and DOM scripting are requisite, and your knowledge of the differences between browsers increases daily!
- There's no standard transport mechanism for the structured data: homebrew XML schemas, SOAP, JSON and now Spry are all common.

Review: Two Types of Ajax

- Unstructured Ajax replaces regions of the current page with rendered HTML returned by Ajax requests
- Structured Ajax requests structured data via Ajax requests, and uses Javascript to manually update regions of the current page

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Part III: Plumbing Ajax

Ajax: Under the Hood

- Through JavaScript, you can make use of the XMLHttpRequest object to make “out of band” requests to a Web server
- XMLHttpRequest’s implementation varies: on IE, it’s an ActiveX control. In Firefox, it’s a member of the internal JavaScript library.

Ajax: Instant Browser Issues

- Just creating an XMLHttpRequest instance is difficult:

```
if (!window.ActiveXObject)
    return new XMLHttpRequest();
else if (navigator.userAgent.toLowerCase().indexOf("msie 5") == -1)
    return new ActiveXObject("Msxml2.XMLHTTP");
else
    return new ActiveXObject("Microsoft.XMLHTTP");
```

Ajax: Repetitive Code seeks Likely Solution

- What we've just seen is that there's boilerplate code involved in dealing with Ajax
- This type of code is best isolated inside of its own libraries that abstract the low-level "plumbing" of an application
- Sounds like a job for a framework!

Ajax Frameworks

- To help with taming Ajax, a few frameworks have been written:

`XMLHttpRequest`

Ajax Frameworks

- To help with taming Ajax, a few frameworks have been written:

Spry

Dojo

CFAjax

AjaxCFC

XMLHttpRequest

Prototype + Script.aculo.us

sajax

Rico

turbogears

AjaxLIB

Plex

Ajax Frameworks

xajax

zoop

- To help with taming Ajax, a few frameworks have been written:

MochiKit

zoad

JSMX

Wick

Echo

BackBase

Spry

Dojo 2

FlexibleAjax

WebORB

CFAjax

AjaxCFC

Rialto

XMLHttpRequest

Taco

Yahoo's Toolkit

BitCraft

Prototype + Script.aculo.us

ThinkCap

Google's Toolkit

Microsoft Atlas

MagicAjax

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Part IV: Implementing Ajax with Model-Glue

For Today: Unstructured Ajax

- While it's not always as flexible, it's a great way to get started with Ajax.
- I wanted to be able to do live coding of an Ajax demonstration for this presentation, and I didn't want to spend your time debugging my own DOM scripting mistakes.

Let's meet our frameworks...

- To use Ajax in Model-Glue, we're going to make use of three frameworks.

Meet Prototype

- It's an unstructured Ajax developer's best friend.
- It hides the implementation of XMLHttpRequest, and provides many helper functions for making Ajax requests.
- It **does** have a structured Ajax features, but it's custom to Prototype and relies on a special HTTP header indicating a JSON-formatted response.

The logo for the Prototype JavaScript framework, featuring the word "prototype" in a lowercase, sans-serif font. The letter "o" is stylized with a blue dot above it and a blue dot below it, and the letter "t" is blue. The rest of the letters are in a lighter blue color.

Meet script.aculo.us

- It's an "add-on" to Prototype
- Provides effects, drag and drop, controls, unit testing, and (sigh) an effect that can be used to emulate the `<blink>` tag.
- Thankfully, I can't find a way to make things blink in Keynote. I bet Powerpoint can do it, though.

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Meet Model-Glue

- Model-Glue provides an easy framework for developing HTML-based applications that use ColdFusion Components for their business logic



Our Ajax Frameworks and Model-Glue

- Model-Glue works seamlessly with these Ajax frameworks
- First, Prototype hides the actual implementation of “Ajax requests,” which really use browser-specific implementations of what’s known as an XMLHttpRequest
- Second, Prototype is focused on unstructured Ajax, relying on rendered HTML being returned by the XMLHttpRequest. If there’s one thing Model-Glue is great for, it’s rendering HTML: a match made in heaven!

Meet “To-Do”

- It's a Model-Glue 2.0 application that contains a master list and detail view of “tasks,” each with a title and completion status.
- The master list filters to either show all tasks or only incomplete tasks
- It's a traditional, non-Ajax'd application

What can we “Ajaxify” in To-Do?

- Simple: Deleting existing items
- More complicated: Adding more tasks
- Really fun: Inline item editing
- In the 1-hour version of this presentation, we'll just be doing the “simple.”

Simple: Ajax Delete

- First, we'll create an event handler that deletes a task but returns nothing.
- Then, we'll include our Ajax frameworks and add some Javascript to call this event handler in an asynchronous manner, using Prototype
- Third, we'll use `script.aculo.us` to make the row fade out.
- Fourth, we'll add semantic visual clues indicating we're now in an Ajax application

Simple: Ajax Delete Conclusion

- We first created an event, using Model-Glue's `<event-handler>` tag, that deletes a task
- Then, we used Prototype to create a new `Ajax.request()` call to the event's URL
- Last, we used `script.aculo.us` to fade out the UI's presentation of the task

What We've Accomplished

- We've learned a bit about Ajax and its definition
- We've heard about two different types of Ajax
- We've seen that Model-Glue can be used in conjunction with existing Ajax frameworks to make Ajax implementation fairly easy

Going Further

- These techniques are applicable not just to Model-Glue, but all ColdFusion presentation frameworks, including Fusebox and Mach-II
- Time check: If we have more than ten minutes, I'd like to demo a bit of a simple structured Ajax idea Ray Camden told me about this morning over breakfast.

Thanks! Questions?

- Thank you for attending!
- I'd like to open up to questions.
- I'll answer as many as I can in the time allotted, but I'll also stay after (here or in the hallway) to discuss Ajax and Model-Glue as long as you'd like.