Ajax

for PHP Developers

Who am I?

Sr. Developer @ Magnani Caruso Dutton

PHP Developer since end of 3.x

JavaScript hacker since '99

Javascript *developer/evangelist* since October '07

Blogger: http://lovemikeg.com/

Speaker: http://lovemikeg.com/talks

Who are you?

Do you code PHP 5 or PHP 4?

Anyone in here *love* JavaScript?

Anyone in here *loathe* JavaScript?

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Ajax Defined

“AJAX”

does not exist.

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Ajax Defined

“AJAX”

The term was originally coined by Jesse James Garret in ‘05 as “Asynchronous JavaScript + XML”

does not exist.

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Ajax Defined

"I needed something shorter than 'Asynchronous JavaScript+CSS+DOM +XMLHttpRequest' to use when discussing this approach with clients."

Jesse James Garret — March 13, 2005

AJAX does not exist.

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Ajax Defined

“AJAX”

Bottom line: Ajax is not a single technology

does not exist.

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Ajax Defined

“AJAX”

Ajax is a group of technologies which make web applications *feel* like desktop applications by eliminating a page refresh.

does not exist.

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Ajax Defined

"AJAX"

Like *all* things web, Ajax has evolved considerably since its incarnation.

... including its definition.

does not exist.

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In other words...

AJAX

is now

Ajax

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"AJAX"

Depends on

AJAX

- XHTML + CSS for Presentation
- DOM for dynamic display and interaction
- XML + XSLT for data interchange and manipulation
- XMLHttpRequest for data retrieval
- JavaScript to glue everything together

Ajax is now

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"Ajax"

AJAX

Offers the same result, without formal requirements.

Ajax is now

Ajax

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"Ajax"

AJAX

This makes Ajax behaviors and patterns available to Flash, desktop applications, etc.

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"Ajax"

AJAX
is now
Ajax

"Ajax" is proper.

Consider "AJAX" deprecated.

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The Sales Pitch

NYPHP: July 22, 2008

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For Developers

The Sales Pitch

Ajax can make your web applications more rich and responsive.

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Ajax for PHP Developers

For Developers

The Sales Pitch

Ajax can reduce server load.

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For Developers

The Sales Pitch

Ajax applications introduce a new approach to web development.

... and is kinda fun to code toward

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For everyone else

The Sales Pitch

Ajax is a buzzword which is here to stay.

making it highly marketable

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For everyone else

The Sales Pitch

Ajax applications tend to be more inviting (and oftentimes more usable) than standard web applications.

Although, not necessarily more accessible...

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For everyone else

The Sales Pitch

Even my parents knew what Ajax was.

"That's that *Google Satellite* thing. Right?"

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Example applications

in the Real World

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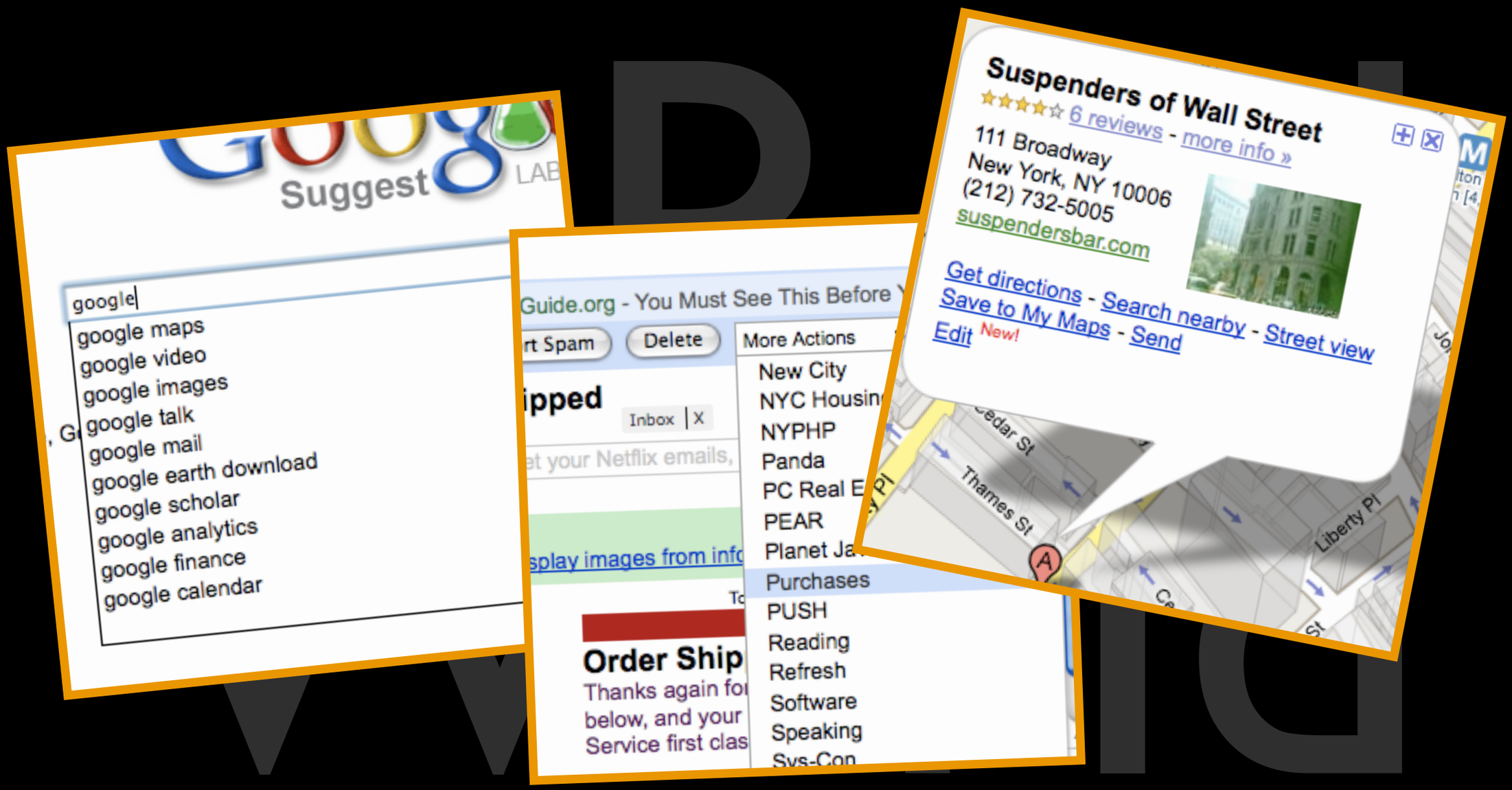
Google



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Flickr

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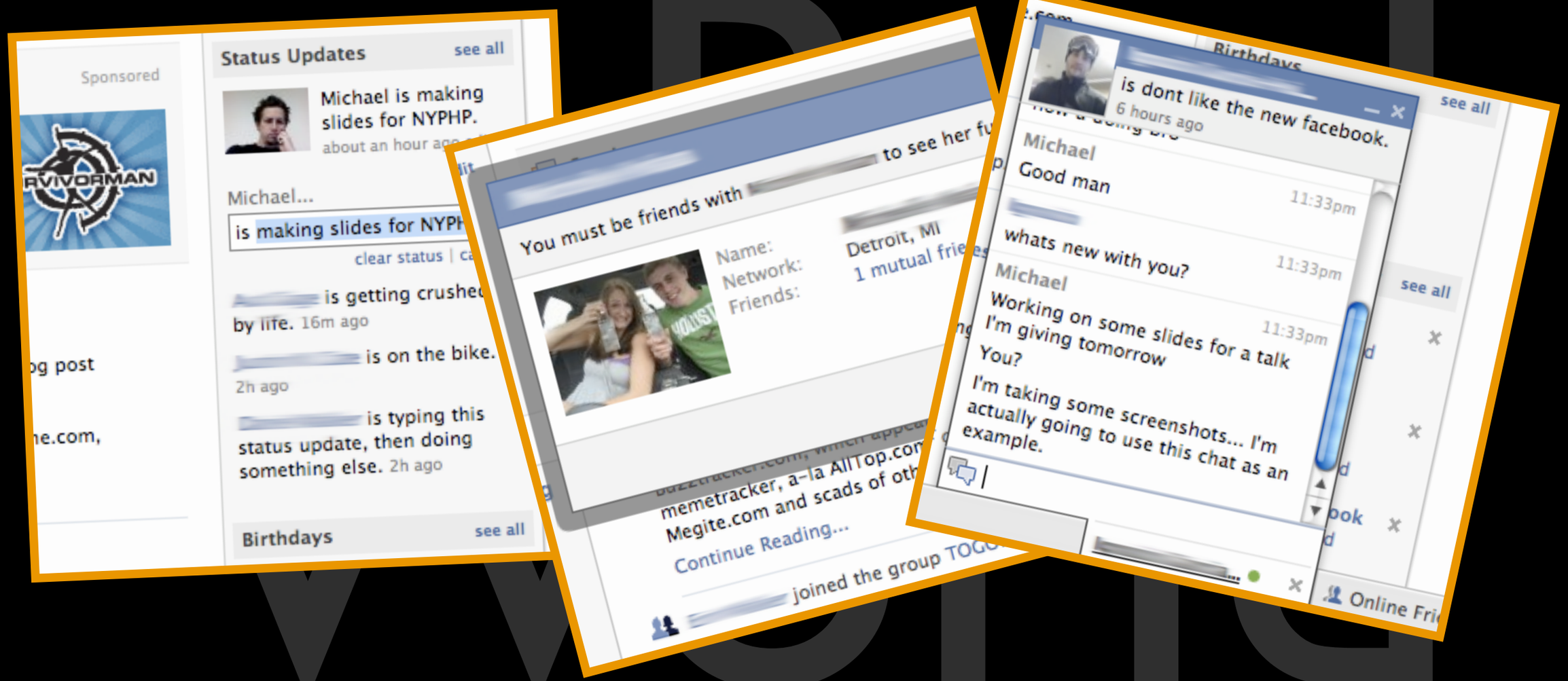
Facebook



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The Ajax Workflow

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Step-by-step

1. Instantiate the XMLHttpRequest Object
2. Configure the connection
3. Tell it what to do as its state changes
4. Send the request

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Step-by-step

```
// Instantiate
xhr = new XMLHttpRequest;

// Configure
xhr.open('GET', uri, true);

// What to do when as it changes state
xhr.onreadystatechange = stateChangeCallback;

// Send the request
xhr.send(null);
```


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1. Instantiate

Looks simple enough

... but don't forget about IE 6 (more on that later)


```
// Instantiate
xhr = new XMLHttpRequest;
```


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The Full XHR Interface

```
interface XMLHttpRequest {
  readyState    : Number;
  responseText  : String;
  responseXML   : Document;
  status        : Number;
  statusText    : String;

  onreadystatechange : EventListener;

  open (method, uri, async)      : void;
  send (data)                    : void;
  abort()                        : void;
  setRequestHeader(name, value) : void;
  getResponseHeader(name)        : String;
  getAllResponseHeaders()        : String;
};
```

2. Configure

Tell the instance:

- What request method to use
- Where to go
- Whether or not to go there asynchronously

```
// Configure
xhr.open('GET', uri, true);
```


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3. When state changes

Possible readyState values:

0: Unsent

1: Opened

2: Headers have been received

3: Loading

4: Done


```
// What to do when as it changes state
xhr.onreadystatechange = stateChangeCallback;
```


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4. Send the Request

With [semi] optional data:

- Only required if sending POST data
- GET requests need null (only in IE)

```
// Send the request
xhr.send(null);
```


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Live Demo

(Code Download)

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Differences Between Browsers

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Browser Inconsistencies

Differences Between Browsers

Believe it or not, XMLHTTP was a Microsoft technology

Via an ActiveXObject instance

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Browser Inconsistencies

Differences Between Browsers

Later on the W3 standardized the object now known as XMLHttpRequest

- Via a direct XMLHttpRequest instance

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Browser Inconsistencies

Differences Between Browsers

Up until IE7, Microsoft used an ActiveX control to instantiate the XHR object.

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Browser Inconsistencies

Differences Between Browsers

Other clients just did what the W3 told them.

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Browser Inconsistencies

Differences Between Browsers

You *have to* code for this.

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Cross Browser XHR

Step 1: Code a function for W3 XHR

Differences

```
var getW3XHR = function () {
  return new XMLHttpRequest;
};
```

Browsers

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Cross Browser XHR

Step 2: Code a function for Explorer XHR

```
var getExplorerXHR = function () {
  var xhr, axo, ex;
  var objects = ['Microsoft', 'Msxml2', 'Msxml3'];
  for (var i = 0; i < objects.length; i++) {
    axo = objects[i] + '.XMLHTTP';
    try {
      xhr = new ActiveXObject(axo);
      return xhr;
    } catch (ex) {};
  }
  throw "Unable to create XHR object.";
};
```


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Cross Browser XHR

Step 3: Code a single getXHR function

Differences Between Browsers

```
var getXHR = function () {
  if (window.XMLHttpRequest) {
    return getW3XHR;
  }
  else if (window.ActiveXObject) {
    return getExplorerXHR;
  }
}();
```


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XHR Gotchas

Differences Between Browsers

It's not cross browser.

At least while IE6 is widely used.

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XHR Gotchas

Differences Between Browsers

IE doesn't properly interpret `this` in onreadystatechage.

Reference an external variable instead.

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XHR Gotchas

Differences Between Browsers

IE messes with the response headers.

use headerValue.match(/something/) to detect the value you want.

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XHR Gotchas

Differences Between Browsers

Aborting XHR's is a pain

Make sure you unset onreadystatechange because it will fire on abort()

IE doesn't like it when you null the event, instead you have to set it to an empty function

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Browser Inconsistencies

Helpful Hints

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Use JSON

Helpful

"JavaScript Object Notation"

Considerably lighter than XML

Generally much quicker too

Hints

Security concerns can be mitigated by using JSONRequest.

http://json.org

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Avoid XML

See previous slide.

Plain text and HTML (set via innerHTML) are ridiculously fast.

Non-IE browsers register text nodes as siblings... very annoying.

Don't forget to send as text/xml... otherwise it gets stuffed into responseText

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Avoid XML

Helpful Hints

If you must use XML

You didn't try hard enough

foo.getElementsByTagName('bar') is your friend

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Don't forget Accessibility

Helpful Hints

Ask yourself, "Is Ajax really necessary?"

Ajax should *progressivly enhance* an already established UX... not create it.

If you suck at disciplined development, always "Phase Two" the Ajax.

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Don't forget Security

If you're eval'ing JSON, run it through a RegExp first.

Blindly setting innerHTML is silly too: inline event handlers are a bad thing.

Just because you don't see it, doesn't mean there's any extra security.

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Links

Helpful

Mozilla Developer Center: Ajax

developer.mozilla.org/en/docs/AJAX

Quirksmode XMLHTTP Articles

Hints

quirksmode.org/blog/archives/coding_techniques/xmlhttp/index.html

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Links

Helpful

Wikipedia: Ajax

en.wikipedia.org/wiki/AJAX

Hints

Ajax: A New Approach to Web Applications

adaptivepath.com/ideas/essays/archives/000385.php

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Links

Helpful

W3 XMLHttpRequest Recommendation

w3.org/TR/XMLHttpRequest/

Explorer XMLHttpRequest Documentation

Hints

msdn.microsoft.com/en-us/library/ms535874(VS.85).aspx

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Questions?

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Thanks!

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