



IBM Emerging Technologies

JavaScript and AJAX Accessibility

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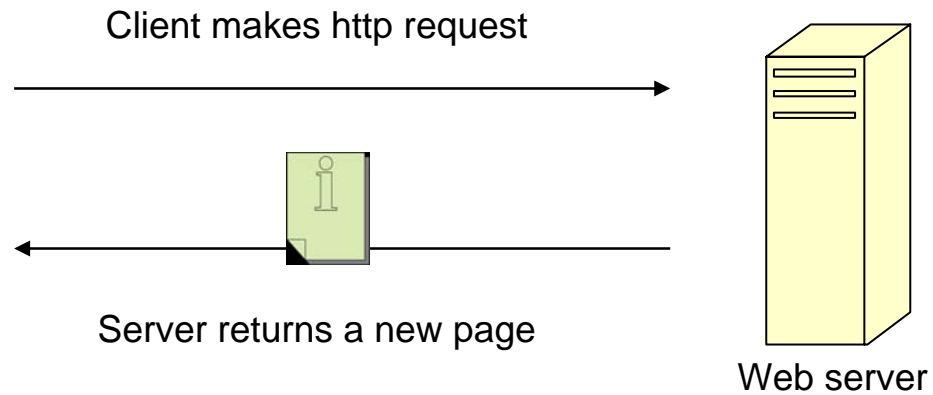
Agenda

- **What is AJAX and why do I care?**
- **What are the Issues with AJAX?**
- **How do I make my AJAX applications Accessible?**
 - Using HTML Techniques
 - Using DHTML Accessibility Techniques
- **Demonstration of techniques**
- **Summary**

What is AJAX?

- **AJAX = Asynchronous JavaScript and XML**
- **Allows incremental update of Web pages.**
- **Built using standard web technologies - HTTP, (X)HTML, CSS, JavaScript, Document Object Model (DOM), XML**
- **Used by many popular internet companies.**
- **Examples:**
 - Google Suggests, Google & Yahoo! Maps
 - Amazon A9 Search
 - Flickr, BaseCamp, Kayak
 - Yahoo! AJAX Library

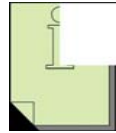
Traditional Web Interaction



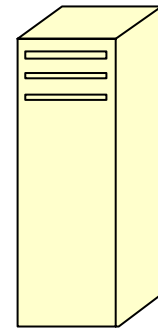
How AJAX works



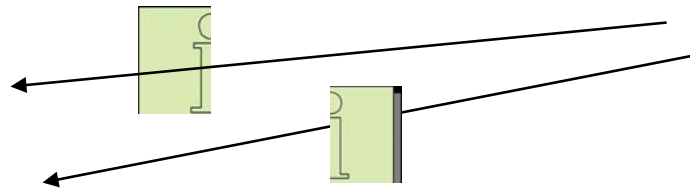
Client makes http request for specific information



Server returns the requested information



Web server



Multiple requests are served

Why Do I Care About AJAX?

- **Enables building Rich Internet Applications (RIA)**
- **Allows dynamic interaction on the Web**
- **Improves performance**
- **Real-time updates**
- **No plug-ins required**

What are the Issues with AJAX?

- **User does not know updates will occur.**
- **User does not notice an update.**
- **User can not find the updated information.**
- **Unexpected changes in focus.**
- **Loss of Back button functionality*.**
- **URIs can not be bookmarked*.**

*These issues will not be discussed as they are not specific to accessibility.

Specific Accessibility Issues

- **Assistive Technology users are not aware of updates**
 - Updates occur on a different section of the page than the user is currently interacting with.
 - Clicking a link updates a different section of the page.
 - Auto-complete fields or generated options not available to assistive technology.
 - User has no idea how to find new or updated content
 - Changes in focus prohibit complete review of the page
 - Changes in focus cause disorientation and additional navigation.

Informing the User

- **Explain the interaction to the user**
 - Before accessing the AJAX enabled page
 - Within the AJAX enabled page
- **Where possible, provide a manual update option**
 - Necessary for WCAG 2.0 Guideline 2.2
- **Save the user's update preference**

Make updates Noticeable

- **Change the background color of updated data**
 - Use a subtle color
 - Change only for a few seconds
 - Best for small areas of the page
- **Briefly blink the updated data**
 - Blink for 3 seconds or less (WCAG 2.0 Guideline 2.2)
 - Avoid the flash threshold (WCAG 2.0 Guideline 2.3)

Help Users Find Updated Information

- **Provide option for updates via an Alert**
- **Provide option to set focus to new data.**
- **Use HTML header tags to mark sections with updated content.**
- **Use DHTML Accessibility Alert role in conjunction with a floating pop-up box.**
- **Use DHTML Accessibility Description role to describe new content.**

DHTML Accessibility Techniques and AJAX

- **DHTML Accessibility allows the creation of desktop style widgets on the web**
- **Full keyboard navigation without excessive use of the tab key**
- **Allows easy navigation from component to component and to updated content.**
- **Allows non-intrusive notification of updated content via Alert**

DHTML Accessibility Overview

- **Add keyboard event handling**
- **Add role and state information**
- **Make items focusable via tabindex attribute**
- **Update state information dynamically**

DHTML Accessibility Overview (continued)

- **Works in HTML or XHTML**

- XHTML

- Uses XHTML 1.x role attribute
- Uses namespaces to add state attributes

- HTML

- Embeds role and state information into class attribute
- Accessibility Script library sets the role and state using DOM apis

Example using XHTML

```
<html lang="en" xml:lang="en" xmlns="http://www.w3.org/TR/xhtml2"  
xmlns:wairole="http://www.w3.org/2005/01/wai-rdf/GUIRoleTaxonomy#"  
xmlns:waistate="http://www.w3.org/2005/07/aaa">
```

.....

```
<span id="slider" class="myslider myselector2"  
role="wairole:slider"  
waistate:valuemin="0"  
waistate:valuemax="50"  
waistate:valuenow="33">  
</span>
```

Example Using HTML

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN"
"http://www.w3.org/TR/html4/loose.dtd" >
<html lang="en">
<head>
<b>script type="text/javascript" src="enable.js"</b></script>
</head>
.....
<span id="slider" tabindex="0"
class="myslider myselector2
axs slider valuemin-0 valuemax-50 valuenow-33
```

Technique described at:

<http://www.w3.org/WAI/PF/adaptable/HTML4/embedding-20060318.html>

Summary

- **AJAX is a powerful technology for making dynamic web applications.**
- **AJAX applications can present Accessibility barriers.**
- **Simple changes to application design can make AJAX usable for all.**
- **DHTML Accessibility Techniques fit well with AJAX**

Questions?