

Introduction to ASP.NET AJAX

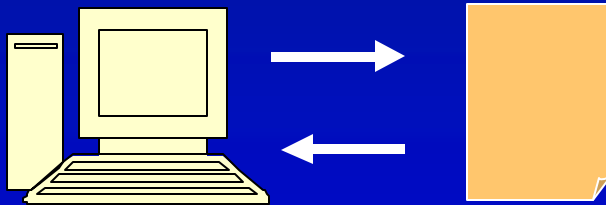
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Next CDS Brownbag

- ◆ Scheduled for Wed, Feb 20, 11:30
- ◆ Test-Driving the ASP.NET MVC Framework
 - Brian Henderson

Introduction

AJAX enables you to pass information between a Web browser and Web server without posting to the Web server.



Ingredients for AJAX BUZZ

- ◆ **Nifty Name**

AJAX = Asynchronous JavaScript and XML
(Jesse James Garrett)

- ◆ **Cross Browser Support**

Internet Explorer, Firefox and Opera

- ◆ **Inspiring Sample Application**

Google Suggest, Outlook Web Access, etc.

Ajax Frameworks

- ◆ Dojo – www.DojoToolkit.org
- ◆ Qooxdoo – www.Qooxdoo.org
- ◆ YUI – developer.Yahoo.com/yui
- ◆ GWT – Google Web Toolkit
- ◆ Script# -- C# response to GWT
- ◆ Prototype
- ◆ Dean Edward's Base
- ◆ Sarissa
- ◆ Hijax
- ◆ Scriptaculous
- ◆ Lollygag
- ◆ ASP.NET AJAX Extensions

The Technology

- ◆ **Internet Explorer**

Uses Microsoft.XmlHttp ActiveX Object
(IE 7 uses intrinsic object)

- ◆ **Firefox, Opera, Safari**

Use XMLHttpRequest Intrinsic Browser
Object

ASP.NET Ajax Support

- ◆ ASP.NET AJAX Extensions
 - downloadable for VS 2005
 - built into VS 2008
- ◆ ASP.NET AJAX Control Toolkit
 - codeplex project
<http://www.codeplex.com/AtlasControlToolkit>
- ◆ ASP.NET Futures
 - unsupported preview

ASP.NET AJAX Extensions

- ◆ ScriptManager
- ◆ ScriptManagerProxy
- ◆ UpdatePanel
- ◆ Timer
- ◆ UpdateProgress

ScriptManager

- ◆ Injects two JavaScript scripts into page
 - MicrosoftAjax.js
 - base Ajax library
 - MicrosoftAjaxWebForms.js
 - supports partial page rendering (UpdatePanel)
- ◆ ScriptManagerProxy
 - used when ScriptManager in Master page

UpdatePanel Control

- ◆ The big kahuna of ASP.NET Ajax
- ◆ Controls placed inside of this control support async calls (partial rendering)
- ◆ Hijacks post-backs and reroutes them as async calls

UpdatePanel Control

- ◆ Basic demo of the UpdatePanel control
- ◆ Demos
 - Hello.aspx
 - CascadingDropDownNoAjax.aspx
 - CasasdingDropDownAjax.aspx

UpdatePanel Properties

- ◆ ChildrenAsTriggers
 - bool which determines whether child controls will create async post-back
 - default=true
- ◆ UpdateMode
 - always (default)
 - will update when any UpdatePanel on page does async post-back
 - conditional
 - only updated by child controls, triggers or Update method

Triggers

- ◆ Sometimes you wish to trigger a async call from outside of an UpdatePanel control
- ◆ Makes async calls more efficient
- ◆ Two types of triggers
 - Aysnc postback
 - performs async post-back – this is the one you want to use 99% of time
 - Postback
 - don't use unless you want a sync post-back

Triggers Demo

- ◆ Demo of triggers
 - Triggers.aspx

Timer Control

- ◆ Performs `window.setInterval()`
- ◆ Can be used inside or outside of `UpdatePanel` control

Timer Control Demo

- ◆ Timer.aspx

UpdateProgress Control

- ◆ Displays progress during long-running async call
- ◆ Properties
 - DisplayAfter
 - time in milliseconds to wait before displaying progress indicator
 - by default = 500 (half second)
 - DynamicLayout
 - display:none or display:hidden
 - AssociatedUpdatePanelId

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Server-Side Page Execution Life Cycle

- ◆ These events occur for both sync and async post-backs
 - PreInit
 - Init
 - Load
 - PreRender
- ◆ `ScriptManager.IsInAsyncPostBack`
 - Use to detect async post-back

Client-Side Page Execution Life Cycle

- ◆ Events
 - initializeRequest
 - beginRequest
 - pageLoading
 - pageLoaded
 - endRequest
- ◆ Canceling and aborting requests
 - use initializeRequest event handler

Multiple Async Postbacks

- ◆ UpdatePanel doesn't support multiple async postbacks
- ◆ By default, last postback will abort previous postbacks

Client-Side Page Execution Life Cycle Demos

- ◆ UpdatePanelCancel.aspx
 - demonstrates how to cancel last postback
- ◆ UpdatePanelAbort.aspx
 - demonstrates how to cancel a pending postback

Performance Considerations

- ◆ ViewState
- ◆ Whole-page execution life-cycle executes unless you use `ScriptManager.IsInAsyncPostBack` property
- ◆ Consider using pure client-side Ajax

Handy Ajax Debugging Tools

- ◆ Fiddler (<http://fiddler2.com>)
 - works with IE, Firefox, etc.
 - Tip: Add dot (.) after localhost so that fiddler sees the page
 - E.g., <http://localhost.:8345/mypage.aspx>
- ◆ Firebug (<https://addons.mozilla.org/en-US/firefox/addon/1843>)
 - Firefox only

Performance Demos

- ◆ ViewStateEnabled.aspx and ViewStateDisabled.aspx
 - Use fiddler and SQL Profiler to see data being passed around
 - See table on next slide

Measuring Bandwidth Usage with Fiddler: An Example

Operation	No UpdatePanels; ViewState Enabled		Four UpdatePanel controls with ViewState Enabled		Four UpdatePanel controls with ViewState Disabled	
	Request Bytes	Response Bytes	Request Bytes	Response Bytes	Request Bytes	Response Bytes
Selecting a record	7,922	17,654	7,718	16,552	2,132	11,813
Saving unchanged parent record	7,785	17,994	7,686	8,972	2,618	3,889
Saving unchanged child record	7,693	16,870	7,719	9,549	2,481	4,786

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ASP.NET Ajax Toolkit

- ◆ 34 Controls
- ◆ Updated every couple of months or so
- ◆ Source-code available
- ◆ A community project
 - hosted on CodePlex
 - Not an officially-supported Microsoft product (though Microsoft is heavily involved)

ASP.NET Ajax Toolkit

- ◆ Most of toolkit controls are **extender** controls
- ◆ An extender is a control which extends the functionality of another control
- ◆ VS 2008 integrates extender controls into IDE designer

Toolkit Controls (2007-11-19 release)

- ◆ Accordion
- ◆ AlwaysVisibleControl
- ◆ Animation
- ◆ AutoComplete
- ◆ Calendar
- ◆ CascadingDropDown
- ◆ CollapsiblePanel
- ◆ ConfirmButton
- ◆ DragPanel
- ◆ DropDown
- ◆ DropShadow
- ◆ DynamicPopulate
- ◆ FilteredTextBox
- ◆ HoverMenu
- ◆ ListSearch
- ◆ MaskedEdit
- ◆ ModalPopup
- ◆ MutuallyExclusiveCheckBox
- ◆ NoBot
- ◆ NumericUpDown
- ◆ PagingBulletedList
- ◆ PasswordStrength
- ◆ PopupControl
- ◆ Rating
- ◆ ReorderList
- ◆ ResizableControl
- ◆ RoundedCorners
- ◆ Slider
- ◆ SlideShow
- ◆ Tabs
- ◆ TextBoxWatermark
- ◆ ToggleButton
- ◆ UpdatePanelAnimation
- ◆ ValidatorCallout

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Toolkit

- ◆ You can download VS 2005 and VS 2008 versions with or without source code
- ◆ To add toolkit to toolbox
 1. On toolbar, Add Tab
 2. Choose Items...
 3. Browse... to
`SampleWebSite\bin\AjaxControlToolkit.dll`
- To get easy access to docs
 - Point share to `SampleWebSite` folder

Client-Side Ajax

- ◆ SOAP vs. JSON
- ◆ SOAP = Simple Object Access Protocol
 - XML is not simple and not concise
- ◆ JSON = JavaScript Object Notation
 - lightweight data-interchange format
 - lean and mean

Client-Side Ajax

- ◆ Calling services from the client using JSON
- ◆ Web Methods
 - Web services
 - Page methods
- ◆ Application Services
 - Authentication service
 - Role service (VS 2008 only)
 - Profile service

Registering a Service Reference for a Web Service Call

```
<asp:ScriptManager ID="ScriptManager1"
  runat="server">
  <Services>
    <asp:ServiceReference
      Path="~/Services/QuotationService.asmx" />
  </Services>
</asp:ScriptManager>
```

Calling Web Service from Client

[ScriptService]

```
public class QuotationService : System.Web.Services.WebService  
{...
```

```
<script type="text/javascript">  
function pageLoad()  
{  
    QuotationService.GetQuote(getQuoteSuccess, getQuoteFail);  
}  
function getQuoteSuccess(result)  
{  
    $get("spanQuote").innerHTML = result;  
}  
function getQuoteFail(error)  
{  
    alert(error.get_message());  
}  
</script>
```

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Registering a Service Reference for a Page Method Call

```
<asp:ScriptManager ID="ScriptManager1"  
  EnablePageMethods="true"  
  runat="server />
```

Calling Page Method from Client

```
[System.Web.Services.WebMethod]  
public static string GetQuote()  
{...
```

```
<script type="text/javascript" >  
function pageLoad()  
{  
  PageMethods.GetQuote(getQuoteSuccess, getQuoteFail);  
}  
function getQuoteSuccess(result)  
{  
  $get("spanQuote").innerHTML = result;  
}  
function getQuoteFail(error)  
{  
  alert(error.get_message());  
}  
</script>
```

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Thank You!

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- ◆ I will post the lecture demos after workshop at
 - <http://cds.fhcrc.org/downloads.aspx>