

# Ajaxifying Existing Apps with the ASP.NET AJAX Extensions

Paul Litwin  
Deep Training &  
Fred Hutchinson Cancer Research Center

[paul@deeptesting.com](mailto:paul@deeptesting.com)

# Paul Litwin

- **Developer**
  - Focus: ASP.NET, ASP, VB, C#, SQL Server, ...
  - MCSD
  - Microsoft MVP
  - Programming Manger with Fred Hutchinson Cancer Research Center (Seattle)
- **Co-Founder and Senior Trainer**
  - Deep Training
    - [www.deeptraining.com](http://www.deeptraining.com)
- **Conference Chair/Speaker**
  - Chair, Microsoft ASP.NET Connections
  - Member INETA Speakers Bureau
- **Author**
  - Author/co-author of a dozen books, including...
    - *ASP.NET for Developers*
    - *Access Cookbook, 2<sup>nd</sup> edition*
    - *Access 2002 Desktop/Enterprise Dev Handbook*
    - *AppDev SQL Server 2005 Reporting Services Course*

# Updated Slides & Samples Download

- You can download them from:
  - [www.deeptraining.com/litwin](http://www.deeptraining.com/litwin)

# Agenda

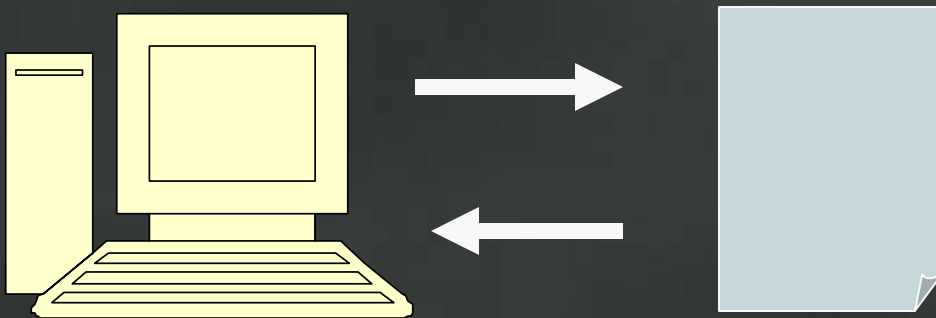
- Brief Intro to AJAX
- Adding AJAX Controls to Existing Apps
- Employing AJAX Toolkit
- Performance Considerations

# Agenda

- Brief Intro to AJAX
- Adding AJAX Controls to Existing Apps
- Employing AJAX Toolkit
- Performance Considerations

# Introduction

AJAX enables you to pass information between a Web browser and Web server without performing a post-back.



# The Technology

- **Internet Explorer**

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

- **Firefox, Opera, Safari**

Use XMLHttpRequest Intrinsic Browser  
Object

# Two Basic Approaches

- With Microsoft AJAX, you can follow two basic approaches
  - AJAX-ify existing apps using Update Panel and AJAX Toolkit to improve user experience
  - Rebuild app from scratch using primarily client-based (i.e., JavaScript calling web services) AJAX
  - **This talk will take the first approach**

# Agenda

- Brief Intro to AJAX
- Adding AJAX Controls to Existing Apps
- Employing AJAX Toolkit
- Performance Considerations

# 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 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

```
<asp:UpdatePanel runat="server" >  
  <ContentTemplate>  
    -- insert content here --  
  </ContentTemplate>  
</asp:UpdatePanel>
```

- Basic demos of UpdatePanel control

# UpdatePanel Properties

- **ChildrenAsTriggers**
  - bool which determines whether child controls will create async post-back
    - default=true
- **UpdateMode**
  - always (default)
    - will update when any sync or async post-back occurs on page
  - 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

```
<asp:UpdatePanel ID="upMovieCommentsGV"  
  runat="server" UpdateMode="conditional">  
  <Triggers>  
    <asp:AsyncPostBackTrigger  
      ControlID="ddlMovie" />  
    <asp:AsyncPostBackTrigger  
      ControlID="fvNewMovieComment"  
      EventName="ItemInserted" />  
  </Triggers>  
  <ContentTemplate>  
    -- content here --  
  </ContentTemplate>  
</asp:UpdatePanel>
```

- Triggers.aspx

# Timer Control

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

# Timer Control Demo

```
<asp:Timer ID="Timer1" Interval="2000" runat="server" />

<asp:UpdatePanel ID="up1" runat="server">
  <Triggers>
    <asp:AsyncPostBackTrigger ControlID="Timer1"
      EventName="Tick" />
  </Triggers>
  <ContentTemplate>
    <asp:Label ID="lblQuote" runat="server" />
  </ContentTemplate>
</asp:UpdatePanel>
```

- 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
- <http://www.ajaxload.info>

# Agenda

- Brief Intro to AJAX
- Adding AJAX Controls to Existing Apps
- Employing AJAX Toolkit
- Performance Considerations

# 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 (v 1.0.20229 & 3.5.20820)

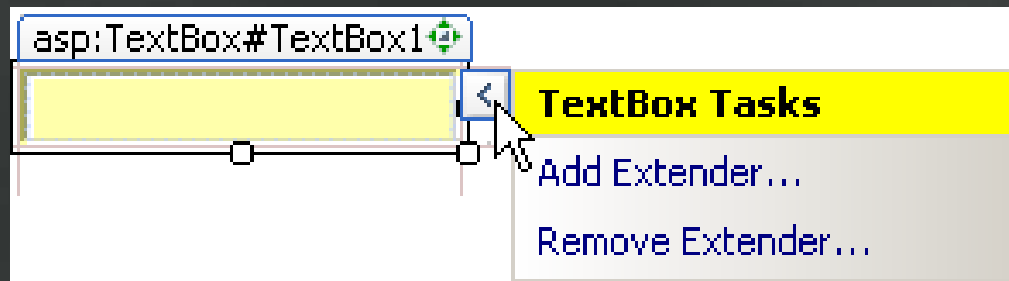
- Accordion
- AlwaysVisibleControl
- Animation
- AutoComplete
- Calendar
- CascadingDropDown
- CollapsiblePanel
- ConfirmButton
- DragPanel
- DropDown
- DropShadow
- DynamicPopulate
- FilteredTextBox
- HoverMenu
- ListSearch
- MaskedEdit
- ModalPopup
- MutuallyExclusiveCheckBox
- NoBot
- NumericUpDown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

# Toolkit Tip

- 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

# Extending ASP.NET Web Controls

- Many Toolkit controls extend existing ASP.NET Web controls



# Toolkit: MaskedEdit (1 of 3)

- Provides input mask and optional validator to TextBox controls

```
<ajax:MaskedEditExtender
  TargetControlID="txtSSN"
  Mask="9{3}-9{2}-9{4}"
  ErrorTooltipEnabled="true"
  MessageValidatorTip="true" />
<ajax:maskededitvalidator
  ControlToValidate="txtSSN"
  ControlExtender="meeSSN"
  Display="Dynamic"
  IsValidEmpty="false"
  EmptyValueMessage="SSN is a required field."
  EmptyValueBlurredText="*" />
```

## Toolkit: MaskedEdit (2 of 3) Mask Characters

- 9 - Only a numeric character
- L - Only a letter
- \$ - Only a letter or a space
- C - Only a custom character (case sensitive)
- A - Only a letter or a custom character
- N - Only a numeric or custom character
- ? - Any character
- / - Date separator
- : - Time separator
- . - Decimal separator
- , - Thousand separator
- \ - Escape character
- { - Initial delimiter for repetition of masks
- } - Final delimiter for repetition of masks

## Toolkit: MaskedEdit Example (3 of 3)

- MaskedEdit.aspx

## Toolkit: ModalPopup (1 of 1)

- Displays content in a modal manner which prevents user from interacting with page until the popup is put away.

```
<cc1:modalpopupextender  
TargetControlID="lbFeedback"  
PopupControlID="pnlFeedback"  
BackgroundCssClass="modalBackground"  
OkControlID="cmdOk"  
CancelControlID="cmdCancel"  
DropShadow="true" />
```

- Example: [ModalPopup.aspx](#)

## Toolkit: ListSearch (1 of 1)

- Overlaps AutoComplete functionality
- Provides ability to type multiple characters to do incremental search within a ListBox or DropDownList control
- `<ajaxToolkit:ListSearchExtender  
    TargetControlID="ControlToExtend"  
    PromptText="prompt text"`
- Example: ListSearch.aspx

# Toolkit: AutoComplete (1 of 2)

- `<ajaxToolkit: AutoCompleteExtender  
TargetControlId="ControlToExtend"  
ServiceMethod="WebServiceMethod"  
CompletionCount=#  
MinimumPrefixLength=#/>`
- **ServiceMethod**
  - Can be page method or web service (if using web service need to also specify ServicePath)

```
[System.Web.Services.WebMethod]  
public static string[] WSMethod( string  
prefixText, int count)
```

# Toolkit: AutoComplete (2 of 2)

- AutoComplete.aspx
- Uses PageMethod to supply list

# Agenda

- Brief Intro to AJAX
- Adding AJAX Controls to Existing Apps
- Employing AJAX Toolkit
- Performance Considerations

# Performance Considerations

- Use Fiddler or Firebug to Examine Server/Client Conversation
- Whole-page execution life-cycle executes unless you use `ScriptManager.IsInAsyncPostBack` property
- Don't forget about ViewState

# 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

## 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

# Performance Demos

- ViewStateEnabled.aspx and ViewStateDisabled.aspx
  - Use Fiddler/Firebug 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

# Summary

- You can use AJAX Controls and AJAX Toolkit to *ajaxify* existing ASP.NET applications
- Need to consider performance when employing AJAX
- Download updated slides & samples from
  - [www.deeptraining.com/litwin](http://www.deeptraining.com/litwin)

Questions?

# Thank You!

- Please complete evaluation forms
- Contact: [paul@deeptraining.com](mailto:paul@deeptraining.com)
- Download updated slides & samples from
  - [www.deeptraining.com/litwin](http://www.deeptraining.com/litwin)