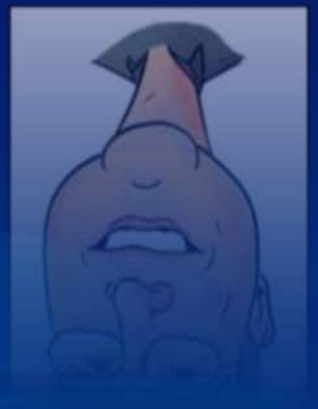
Building rich web applications with ASP.NET AJAX



Mike Ormond

Developer & Platform Evangelism Group, Microsoft Ltd

mike.ormond@microsoft.com

http://blogs.msdn.com/mikeormond

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Agenda

- The Atlas Framework
  - What is Atlas (and why should I care)?
  - ASP.NET 2.0 AJAX Extensions
  - ASP.NET AJAX Control Toolkit
  - Microsoft AJAX Library

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What is “Atlas”?

A framework for building…

…a new generation of richer, interactive, personalized standards-based web applications

- High-productivity platform
- Seamless integration
- Ubiquitous reach and easy deployment
- World-class tools

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What flavours does Atlas come in?

- Announced Monday 11th September, Atlas becomes:
  - Microsoft AJAX Library
  - ASP.NET 2.0 AJAX Extensions
  - ASP.NET AJAX Control Toolkit
- Current Version
  - ASP.NET AJAX 1.0 Beta 2
- Roadmap
  - 1.0 Release around EOY (core features)
  - “Feature” downloads
  - “Orcas” release

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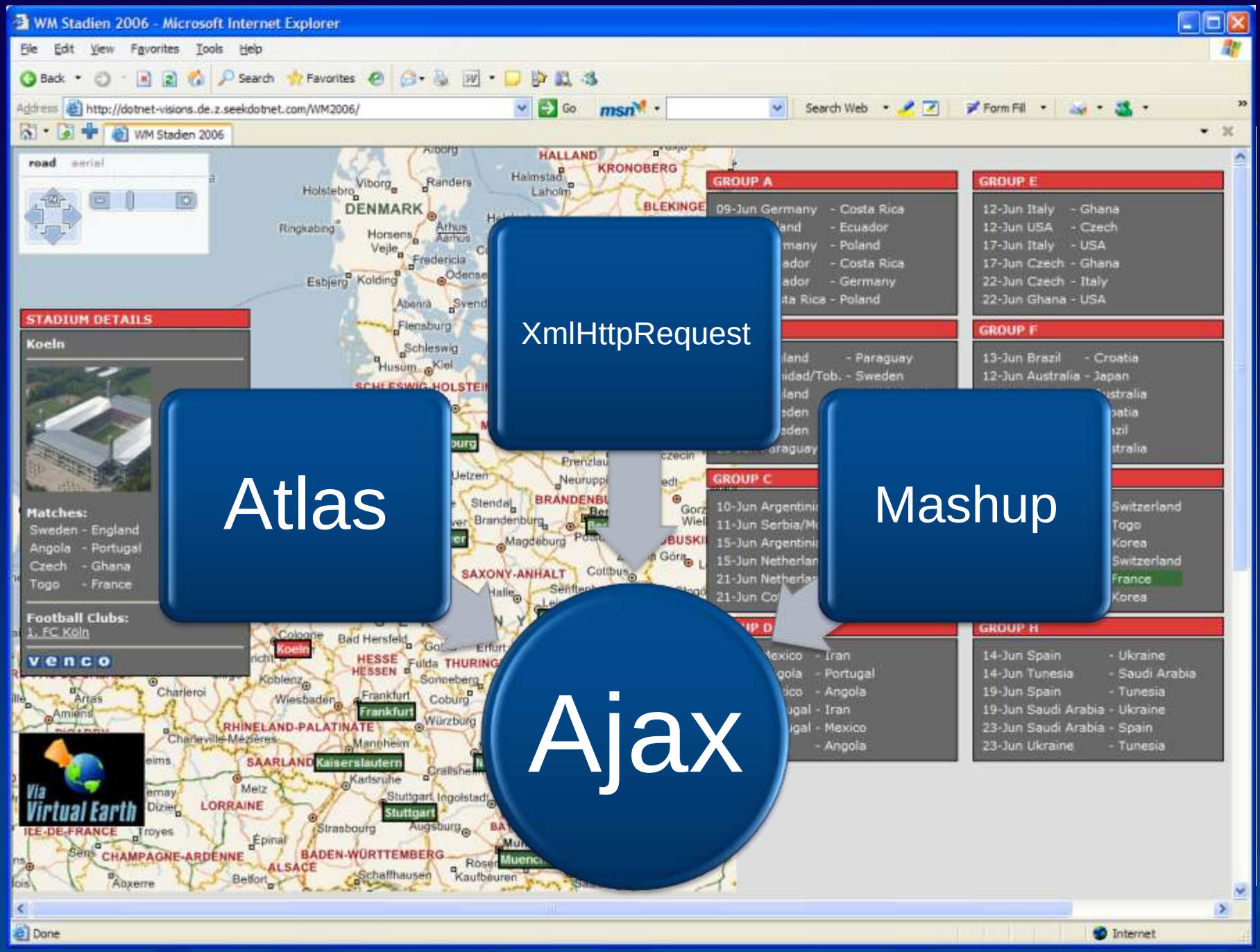
WM Stadien 2006 - Microsoft Internet Explorer
http://dotnet-visions.de.z.seekdotnet.com/WM2006/
WM Stadien 2006
XmlHttpRequest
Atlas
Mashup
Ajax
STADIUM DETAILS
Koeln
Matches:
Sweden - England
Angola - Portugal
Czech - Ghana
Togo - France
Football Clubs:
1. FC Köln
GROUP A
09-Jun Germany - Costa Rica
GROUP E
12-Jun Italy - Ghana
12-Jun USA - Czech
17-Jun Italy - USA
17-Jun Czech - Ghana
22-Jun Czech - Italy
22-Jun Ghana - USA
GROUP F
13-Jun Brazil - Croatia
12-Jun Australia - Japan
GROUP C
GROUP H
14-Jun Spain - Ukraine
14-Jun Tunesia - Saudi Arabia
19-Jun Spain - Tunesia
19-Jun Saudi Arabia - Ukraine
23-Jun Saudi Arabia - Spain
23-Jun Ukraine - Tunesia
Via Virtual Earth
Done
Internet

Example Mash-ups

- http://celeb.local.live.com
- http://www.markovic.com/ebay/search
- http://www.live.com
- My BBC Travel Info Demo Mash-Up
  - Virtual Earth Control
    - (http://dev.live.com/virtualearth/sdk)
  - BBC Travel Info Service
    - (http://backstage.bbc.co.uk/data/TravelFeeds)

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“ASP.NET AJAX” Scenarios

- Server-centric Ajax Web Development
  - Incremental Ajax approach to add UI enrichment for key scenarios
  - Enrich applications without lots of Javascript code required
  - Enable you to keep core UI/Application logic on server (VB/C#)
- Client-centric Ajax Web Development
  - Leverage full power of script/DHTML
  - Provide richer and more interactive user experience
  - Build mash-ups, gadgets and other new immersive experiences

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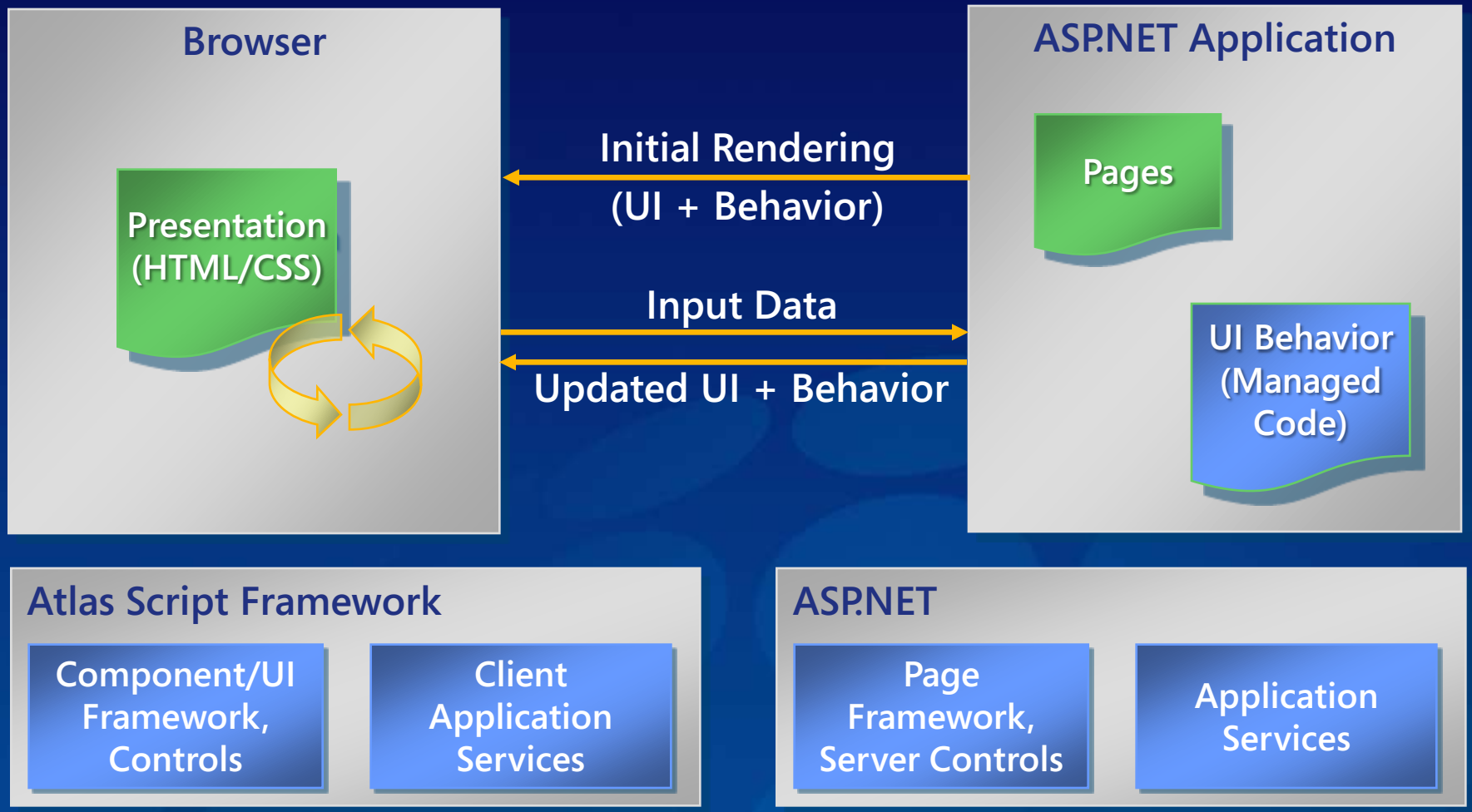
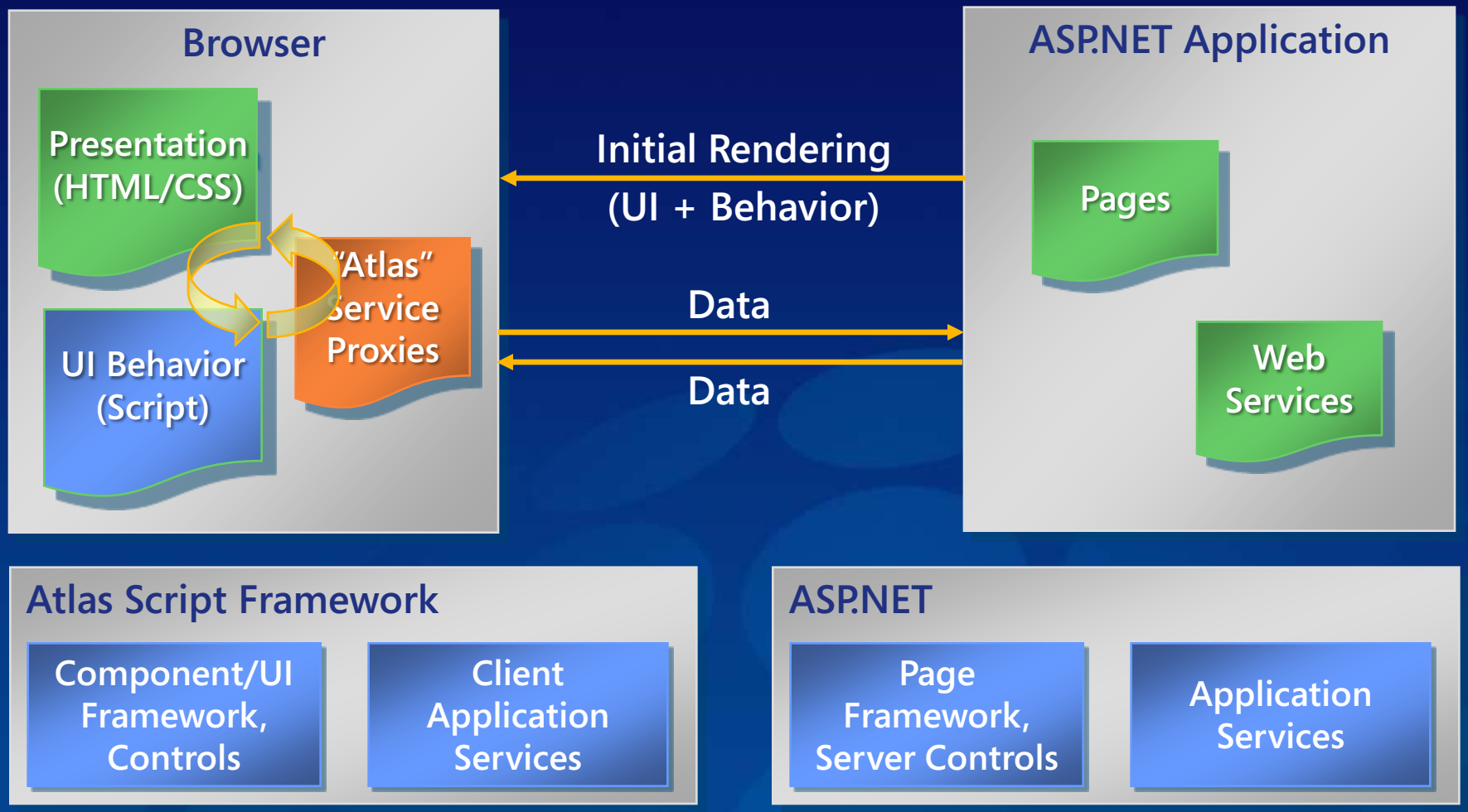
Programming Model

Server-Centric



Programming Model

Client-Centric



Server Components

- Goal: Easily enhance any ASP.NET web application
  - Application UI and core logic still runs on server
  - Avoid need to master JavaScript and asynchronous programming
- Use AJAX techniques to reduce roundtrips
  - Enable incremental page UI updates (avoid full page refreshes)
  - Scenarios: data navigation and editing, form validation, auto refresh
- Enable richer interactivity for existing ASP.NET controls
  - Use the same controls, object model and events you already know
  - Extenders to add Atlas behaviors to any ASP.NET controls
- New, richer ASP.NET server controls
  - Server wrappers for Atlas client controls
  - Examples: DateTimePicker, RichTextBox, Re-Order List

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<atlas:updatepanel> control

- Container control that enables “updatable” regions in a page
  - Atlas provides a XmlHttp based postback infrastructure

```
Some non-updatable content and controls...
<atlas:UpdatePanel id=“u1” runat=“server”>
    <ContentTemplate>
        This content can be dynamically updated!
        <asp:label id="Lable11” runat=“server”/>
        <asp:button id=“button1” text=“Push Me!”
   runat=“server”/>
    <ContentTemplate>
</atlas:UpdatePanel>
More non-updatable content and controls...
```

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<atlas:UpdatePanel>

Under the Covers

- Atlas intercepts post-back submit actions on client
- Uses XMLHttp to fire postback action to server
- Postback events fire like normal on server
- Only content of updatepanel regions returned
- Changed updatepanel regions replaced on client

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<atlas:UpdatePanel>
Postbacks & Triggers

- Postbacks
  - All post-back actions for controls declared within an updatepanel control will cause Ajax-based post-backs with incremental page refresh
  - Post-back action for controls outside of an updatepanel control will by default cause normal postbacks
- Triggers
  - can be used to associate UpdatePanels on the page with postback controls declared outside of the UpdatePanel
    - <asp:AsyncPostbackTrigger>

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<atlas:UpdatePanel>
Refresh Modes

- Multiple UpdatePanel Controls can be added to a page
  - Sometimes you only want to update one panel…
- UpdatePanel supports two update modes
  - “Always”
  - “Conditional”
- Conditional refreshes can be done via triggers
  - <asp:AsyncPostbackTrigger>
- Conditional refreshes can also be triggered via code
  - UpdatePanel1.Update()

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<atlas:UpdateProgress> control

- Delivers ability to provide “status” UI while waiting on response from a server
- “Ajax” is inherently Asynchronous
  - Need to provide way for users to understand latency
  - Need to provide way for users to cancel requests
- UpdateProgress control can be placed anywhere on page
  - Templated control allows any content (e.g. animated .gif)
  - Can use CSS to position/style anywhere

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<Extender> controls

- Extend existing controls with behaviors
- AutoCompleteExtender
  - Enables textbox auto-complete support
    - Callback to web-service on server for word list
    - Supports both .asmx and WCF based web-services (both using the built-in Atlas JSON bridge)
- DragOverlayExtender
  - Enables dragging a control to a new location
- Other “extender” controls planned
  - Watermark, popup, drag/drop, masked edit, date-time picker, tool tips, etc.

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Demo

ASP.NET 2.0 AJAX Extensions
ASP.NET AJAX Control Toolkit

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Client Components

- Easily develop rich interactive web applications
  - Application UI runs in browser, business logic runs on server
  - HTML/Atlas client accesses data and services from the web
- Scenarios
  - Mash-up applications
  - Composite applications, sites, and gadgets (e.g. Live.com)
- Powerful UI framework and component model for browsers
  - Declarative markup and component model
  - Rich client-side data access and data-binding
- Easily integrated with server application model
  - Easily consume any web service (ASMX, Indigo) from browser
  - Proxy generation, serialization to consume .NET objects in script
  - Script access to ASP.NET application services
  - Server-side bridge to reuse 3rd party services

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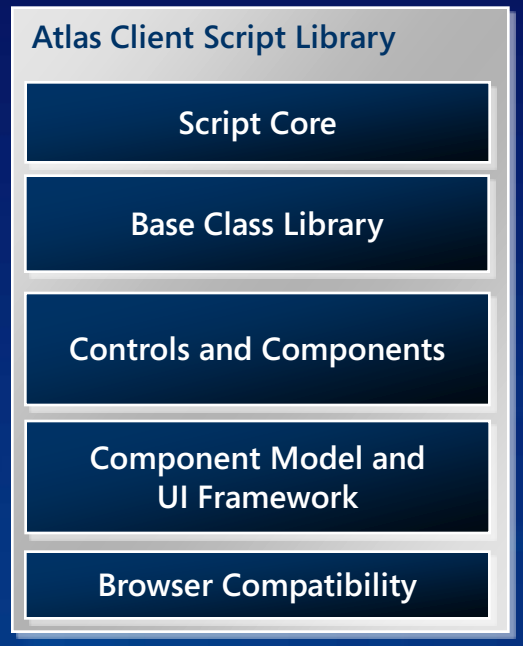
Atlas Client Script Library

- Script core runtime: a rich type system for JScript
  - Classes, namespaces, inheritance, interfaces
  - Event handlers
  - Object serialization
- Base class library and networking services
  - Helper classes for developers (subset of .NET BCL)
  - Management of asynchronous network operations
- Component model and UI framework
  - Declarative scripting (Atlas XML script definitions)
  - Extensible component and control model
  - Data binding, presentation, and validation
- Atlas components for common scenarios – examples:
  - ListView and DataView for rendering templated data
  - UI behaviors such as drag and drop, tooltips, auto-completion
- Compatibility layer for browsers and platforms
  - Support for IE, Firefox/Mozilla, Safari



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Demo

Microsoft AJAX Library

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Network Callbacks from Script

- Atlas provides easy mechanism for script callbacks
  - Can call a web-service end-point on server
  - Can call a page-method end-point on server
- Atlas provides JSON network serialization support
  - JSON = JavaScript Object Notation
- JSON support for auto-serialization of .NET types
  - e.g. return an array of “Customer” objects
- Advanced network manager features supported
  - Priorities and queuing on network calls
  - Batch invocation of multiple calls in single network request

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Atlas Component and Behaviors

- Components – eg TextBox, Label, Hyperlink…
- Behaviors – PopupBehavior, HoverBehavior, ClickBehavior…
- Atlas provides client JavaScript control + component model
  - Enables control behavior to be associated with html
  - Provides clean OO encapsulation model + control re-use
  - Avoid having to write one-off JavaScript UI repeatedly
- Atlas enables clean developer/designer workflow
  - UI defined using standard XHTML w/ CSS
  - Control behaviors defined and attached separate from html
- Atlas controls can be declared procedurally + declaratively
  - XML declarative markup useful for tool support
- Advanced Atlas Client Control Features:
  - Bi-Directional Databinding, Transformers, Validation

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Data Binding and Templates

- Atlas enables declarative databinding and template customization on the client
- Designers can edit the HTML and use CSS to define a html template for an Atlas Control to populate at runtime
- Developers can use the new Atlas ListView client control to bind data (either one or two way) against the html template

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Mashup Support

- Atlas provides the ability to define service bridges
  - Allow client script to call to local server
  - Local server then proxies request to service
- Avoids cross-domain script call-back issues
  - No security prompts for the browser
  - Avoids having to publish service keys
- Examples:
  - Amazon, FlickR, Virtual Earth, Google Maps, etc
- Helps make writing Mashups easy

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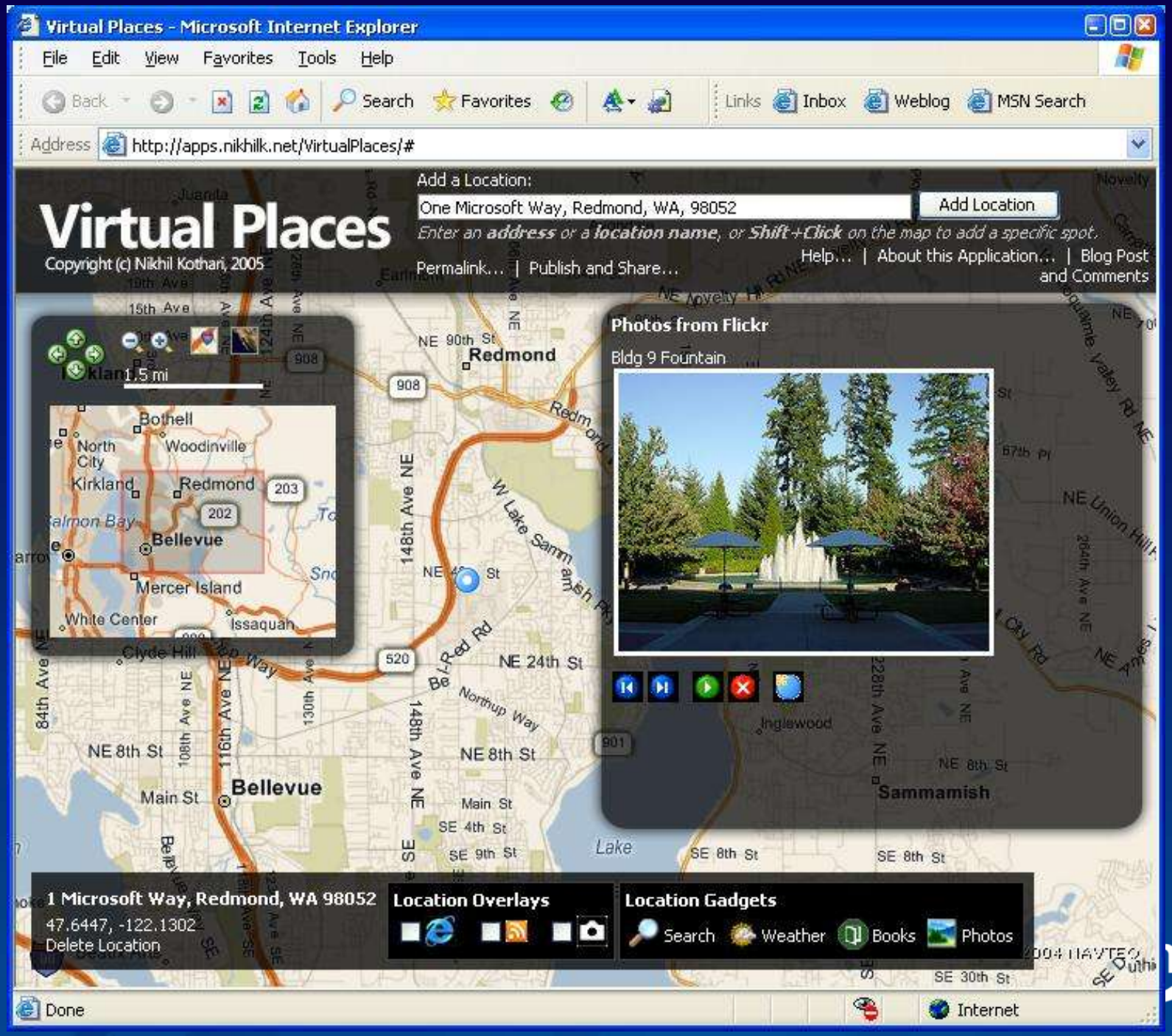
Virtual Places - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Links Inbox Weblog MSN Search
Address http://apps.nikhilk.net/VirtualPlaces/#
Virtual Places
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Add Location
Enter an address or a location name, or Shift+Click on the map to add a specific spot.
Permalink... | Publish and Share...
Help... | About this Application... | Blog Post and Comments
Photos from Flickr
Bldg 9 Fountain
Redmond
Bellevue
Kirkland
Woodinville
Bothell
Mercer Island
Issaquah
Sammamish
Inglewood
1 Microsoft Way, Redmond, WA 98052
47.6447, -122.1302
Delete Location
Location Overlays
Location Gadgets
Search Weather Books Photos
Done
Internet

Gadget Support

- Gadgets are a new Ajax extensibility model
  - Supported by www.live.com
  - Supported by new Windows Side-Bar
- Gadgets enable re-usable functionality to be published and shared at no cost to developer/publisher
- Atlas enables developers to develop Gadgets hosted on their servers, and for end-users to add the Gadgets into their home-page or Windows Sidebar
- Provides more touch with customers and opens up interesting new business model opportunities for developers and web-sites

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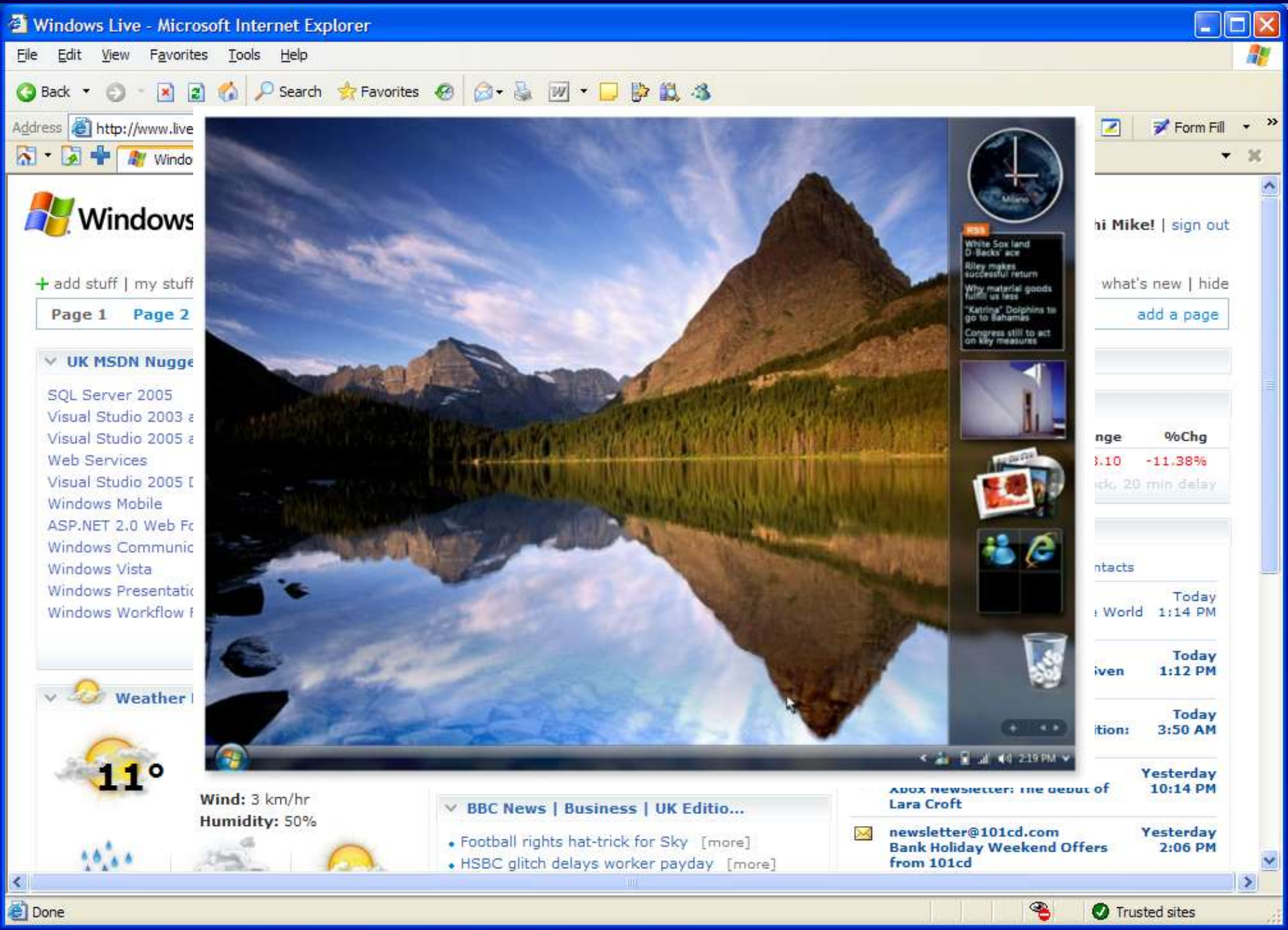
Windows Live - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address http://www.live
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Windows Workflow F
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Wind: 3 km/hr
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ition: 3:50 AM
Yesterday
10:14 PM
Lara Croft
newsletter@101cd.com
Yesterday
2:06 PM
Bank Holiday Weekend Offers
from 101cd
Done
Trusted sites

Summary

- Atlas provides a rich Ajax programming framework
- Rich built-in integration with ASP.NET
  - Server Controls
  - Web and Application Services
- Rich client-side JavaScript framework model
  - Build rich mashups and gadgets
- Rich extensibility model for component developers

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IIS7

What's new for developers?

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IIS 7 Developer Features

- Structure and Security
- Request Processing Architecture
- Configuration & Management

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Structure & Security

- IIS 6 - Big step forward
  - Secure by design, default, deployment
- IIS 7 - Next big step
  - Componentised architecture
  - Not required, not installed
  - Security, scalability, patching

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Server Architecture

- HttpModule
  - Fits into HTTP pipeline
  - Can inspect/modify requests on the way in
  - Can inspect/modify responses on the way out
- HttpHandler
  - Executes rendering process
  - Each type of content has exactly one handler
  - Defined in config

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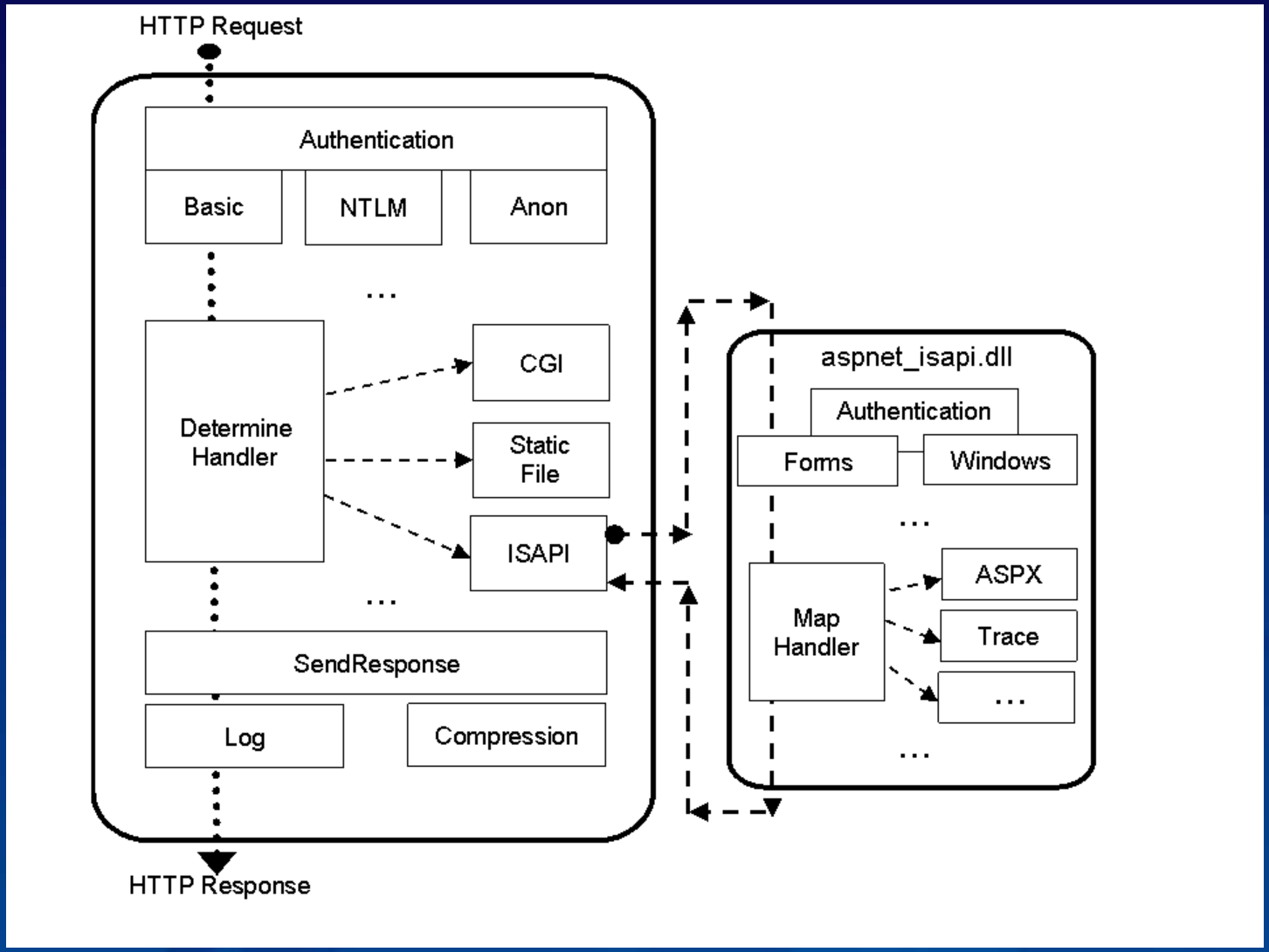
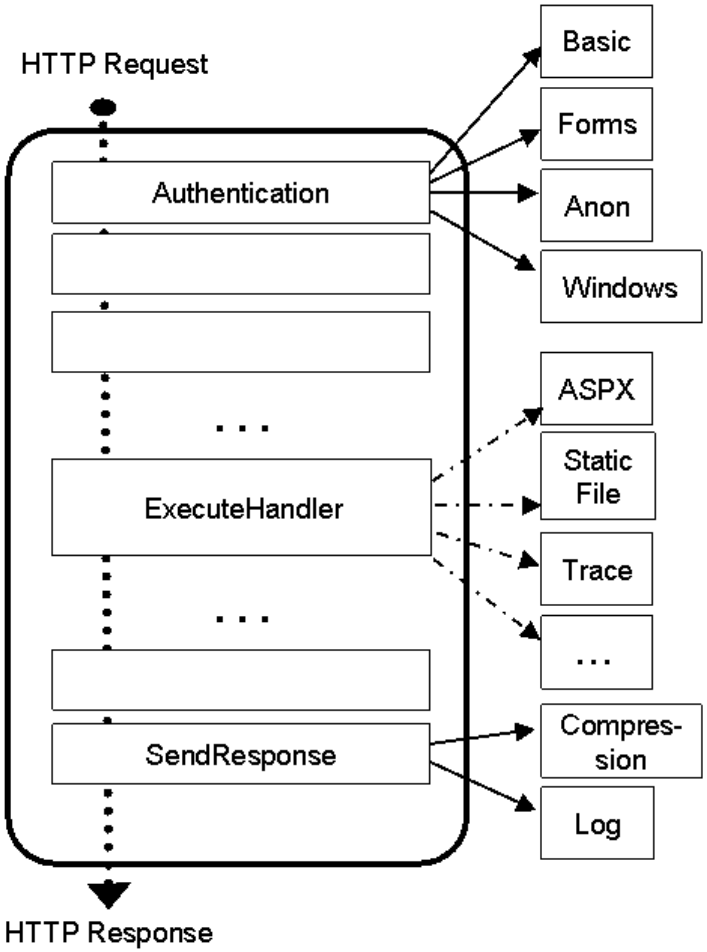
IIS6 ASP.NET Integration



IIS7 ASP.NET Integration



IIS7 Managed Modules

- Can use HttpModules at all pipeline stages
- Can be used with all types of content
- Modules listed in IIS admin tool
- Enabled/disabled per-application
- Access to HttpContext in HttpModule
  - Context data that used to be read-only can potentially be written to

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Configuration & Management

- New management UI
- Configuration stored in XML config files
- Web.config
  - system.web
  - system.webServer
- Portable format for both ASP.NET and IIS

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Further Information

- Atlas
  - http://ajax.asp.net
  - http://weblogs.asp.net/scottgu
  - http://msdn.microsoft.com/asp.net
  - http://www.nikhilk.net
  - http://blogs.msdn.com/mikeormond
- IIS
  - http://www.asp.net
  - http://www.iis.net

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