Introduction to ArcGIS API for Microsoft Silverlight

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What Is Silverlight?

- Browser plug-in for creating rich interactive web applications.
- .NET-based API (subset of full .NET framework)
- XAML-based UI (mostly compatible subset of WPF)
- Microsoft’s response to Adobe Flex
- Available on Windows, Mac OS X, and Linux
History of Silverlight

• Silverlight 1.0 released fall 2007
  – No .NET support- only programmable using JavaScript

• Silverlight 2.0 released fall 2008
  – Added a .NET runtime implementation called CoreCLR to allow logic
coded in any .NET compatible language using a subset of the .NET
Framework Base Class Library

• Silverlight 3.0 is released summer 2009
  – Added GPU hardware graphics acceleration, out-of-browser capability
(similar to Adobe AIR), improved data binding, and much more
  – Backwards compatible with Silverlight 2.0 applications
Dictionary of concepts

- **WPF: Windows Presentation Foundation**
  - Technology for defining UIs in .NET desktop applications using XAML

- **XAML: Extensible Markup Language**
  - XML-based language used by WPF

- **LINQ: Language Integrated Query**
  - SQL-like syntax for querying and manipulating many disparate data sources in .NET: LINQ-to-Objects, LINQ-to-XML, LINQ-to-SQL, etc.

- **WCF: Windows Communication Foundation**
  - .NET framework for creating web services (SOAP, REST, ..)

- **XAP: A ZIP archive containing a Silverlight application**
  - Includes the application assemblies, XAML, manifest and optionally supporting resources. Similar to a Java JAR file.
Getting started with Silverlight

• Visual Studio 2008 SP1

• Microsoft Silverlight 3 Tools for Visual Studio 2008 SP1

• Silverlight Toolkit

• Optional: Microsoft Expression Blend 3 (recommended!)
Expression Blend and Visual Studio

Integration designer

Developer

.xaml

.sln
XAML and Expression Blend

• Basis for all UI in Silverlight is XAML: Extensible Application Markup Language

• XAML is an XML-based markup language originally designed for WPF (Windows Presentation Foundation)

• It is the modern equivalent of Windows Forms
Demo

EXAMPLE APPLICATION
Getting started with the ArcGIS API for Microsoft Silverlight
ArcGIS API for Microsoft Silverlight/WPF

• Built on Silverlight and WPF Platform
  – Combine Rich Interactive Applications with ArcGIS Server and Bing Map Enterprise Services
  – Applications rendered by Microsoft Silverlight plug-in
• Powered by ArcGIS Server REST services
  – Only need URL to access a GIS Server
• Free to use
  – No development or deployment license required for non-commercial use
  – Access the online SDK and download the API library at the ArcGIS API for Microsoft Silverlight/WPF Server Resource Center
Getting Started

1. Download API Setup
2. Reference Assemblies In Visual Studio
3. Open Template In Expression Blend
4. Modify template
5. Write Code
6. Run Application
Features of the API

• Task
  – Find
  – Identify
  – Query
  – Address Locator
    • Geocode
  – Geoprocessing
  – Routing
Silverlight Controls

- **Silverlight toolkit**
  - Data grids
    - Results of query
  - Charts
    - Visualize attributes

- **ESRI toolkit**
  - Navigation
  - Map Tips
  - Toolbar
  - FeatureDataGrid
  - MapProgressBar
Design Time

- Starter Templates
  - Drag & Drop Application Creation Experience
- Builds on the Expression Interactivity SDK
  - Behaviors
  - Actions
  - Triggers
Design-time Interactivity

• **Behaviors**
  – reusable components that can be directly applied to any object on the art-board
  – composed of extensible triggers, extensible actions, and behaviors

• **ESRI delivers over a dozen new Behaviors**
  – Clear Graphics, Maintain/Constrain Extents, Measure, PanTo and Redlining Actions, Spatial Query Actions and more...
Symbol Gallery
It’s time for a DEMO
Compiling Silverlight Applications

- Silverlight code is compiled to a DLL just like a traditional .NET library
- You publish a XAP file: contains application DLL, XAML, manifest, and other supporting assemblies
- A XAP file is simply a ZIP archive with a custom extension

![Diagram of Browser connecting to Web Server over XAP File]
Deploying a Silverlight Application

• The web server must serve out the XAP file with the correct MIME type

• IIS 7 on Windows Server 2008 and Windows Vista SP1 includes correct MIME type by default

• Windows Vista with no service pack or other web servers must add the mapping manually:
  application/x-silverlight-app
Cross-domain access

- Requires a clientaccesspolicy.xml file

```xml
<?xml version="1.0" encoding="utf-8" ?>
<access-policy>
  <cross-domain-access>
    <policy>
      <allow-from http-request-headers="*">
        <domain uri="*"/>
        <domain uri="http://*"/>
      </allow-from>
      <grant-to>
        <resource path="/" include-subpaths="true"/>
      </grant-to>
    </policy>
  </cross-domain-access>
</access-policy>
```

http://services.arcgisonline.com/clientaccesspolicy.xml
Debugging

Introducing Fiddler

What is Fiddler?

Fiddler is a Web Debugging Proxy which logs all HTTP(S) traffic between your computer and the Internet. Fiddler allows you to inspect all HTTP(S) traffic, set breakpoints, and "fiddle" with incoming or outgoing data. Fiddler includes a powerful event-based scripting subsystem, and can be extended using any .NET language.

Fiddler is freeware and can debug traffic from virtually any application, including Internet Explorer, Mozilla Firefox, Opera, and thousands more.

Visit the Fiddler Download Page...
Debugging

Firebug integrates with Firefox to put a wealth of web development tools at your fingertips while you browse. You can edit, debug, and monitor CSS, HTML, and JavaScript live in any web page.

Just the way you like it

Firebug is always just a keystroke away, but it never gets in your way. You can open Firebug in a separate window, or as a bar at the bottom
It’s time for a DEMO
ESRI Parts for Microsoft®
SharePoint™
ESRI Parts for Microsoft® SharePoint™

Provides Insight By Letting You:

- Integrate and synthesize datasets in a visual way
- Intuitively discover:
  - Complex Relationships
  - Data Patterns
  - Emerging Trends
- Easily Share your insights with others
Resource Center for SharePoint™ Coming Soon!

- Free for ArcGIS Server and MapIt Users
- Additional Cost for non ESRI users

http://resources.esri.com/sharepoint
ESRI Parts for Microsoft® SharePoint™

• Interactive and **configurable**
  – Map, GeoList, Location Map Field
  – Work with
    • Bing Maps
    • SharePoint List (Excel)
    • Form Libraries (InfoPath)
    • SQL Server tables
  – Configure using a rich, Silverlight desktop experience
ESRI Map Web Part

• **Base Maps**
  – Bing Maps
  – ArcGIS Online
  – ArcGIS Server

• **Work with your data**
  – Add Operational Layers
    • List Views, SQL Tables
  – Configure layers
    • Thematic Maps
    • Points and area
GeoList Web Part

- Interactively work with your lists and the map
- Common tools for viewing your lists and finding nearby items
It’s time for a DEMO
Road ahead 9.4

• Mapping
  – Support for stand-alone tables
  – Expose relationships and ability to query relationships
  – Identify and Find operations support layer definitions

• Editing
  – Feature Service
  – Geometry Service
  – Web API: FeatureLayer, Editing Toolbar & Attribute Inspector
  – Editing Control (configurable out of the box editing solution)
  – Attachments
Road ahead 9.4

• Time
  – Time aware layers
  – Time slider for easy display

• Other
  – Support for Well Known Text Spatial References
  – Support for Network Analyst Closest Facility and Service Area
Learn More

http://www.esri.com/training

• Instructor-Led Training
  – Introduction to ArcGIS Server

• Free Web Training Seminar
  – Getting Started with ArcGIS API for Microsoft Silverlight/WPF

ESRI Training…keep critical skills up to date
It’s time for Questions
Successful Presentation Guidelines

- Additional ESRI presentation resources available on ArcZone
  http://arczone/resources/presentations.cfm

- Remember your target audience

- Keep your slides uncluttered and to the point
  - Only use a key phrase or a few words to reinforce your point
  - 1-5 words per bullet point
  - 3-5 bullet points per page
  - Refrain from using more than two levels of bullet points

- Use several title slides for each section for branding
  - Make it clear where you are going

- Avoid too much animation
  - Keep it simple
Master Template Style Example (24 point white)
Subtitle (16 point yellow italic)

• Bulleted text (20 point with drop shadow)

Body text (20 point with drop shadow)

Closing Statement… (14 point yellow italic)
Advantages of Using the Shared Clip Art Library:

• Instant access to new icons over a shared network.
• Faster to import from clip art pane than by finding the slide in your presentation with the icons on it.
• Same location (clip art pane) for every presentation you work on.

Connect to the Shared Clip Art Collection, “ESRI Diagram Elements”
1. From your PowerPoint document, go to Insert > Clip Art
2. Select “Organize clips...” from the bottom of the Clip Art pane
3. Now go to File > Add Clips to Organizer > On My Own
4. Navigate to \\pizzabox.esri.com\Space\Diagrams\Elements
   In the File of Type box, click “Shared Catalogs”. Select ESRI_Diagram_Elements.mgc

Using the ESRI Diagram Elements
1. If the Clip Art pane is not already visible, go to Insert > Clip Art
2. To browse all icons, select “Shared Collections” in the “Search in:” window.
   You may need to select all subfolders. Click Go.
3. Click the icon to insert it into your presentation.

PowerPoint 2003 Users—Same as Above, except:
1. Access the Clip Art pane by going to Insert > Picture > Clip Art.

If you travel—you can copy the Elements folder to your hard drive. You can then access all the PNG files manually (PowerPoint does not let you add a local copy as a shared catalog.)