Introduction to ArcGIS API for Microsoft Silverlight

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ESRI

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

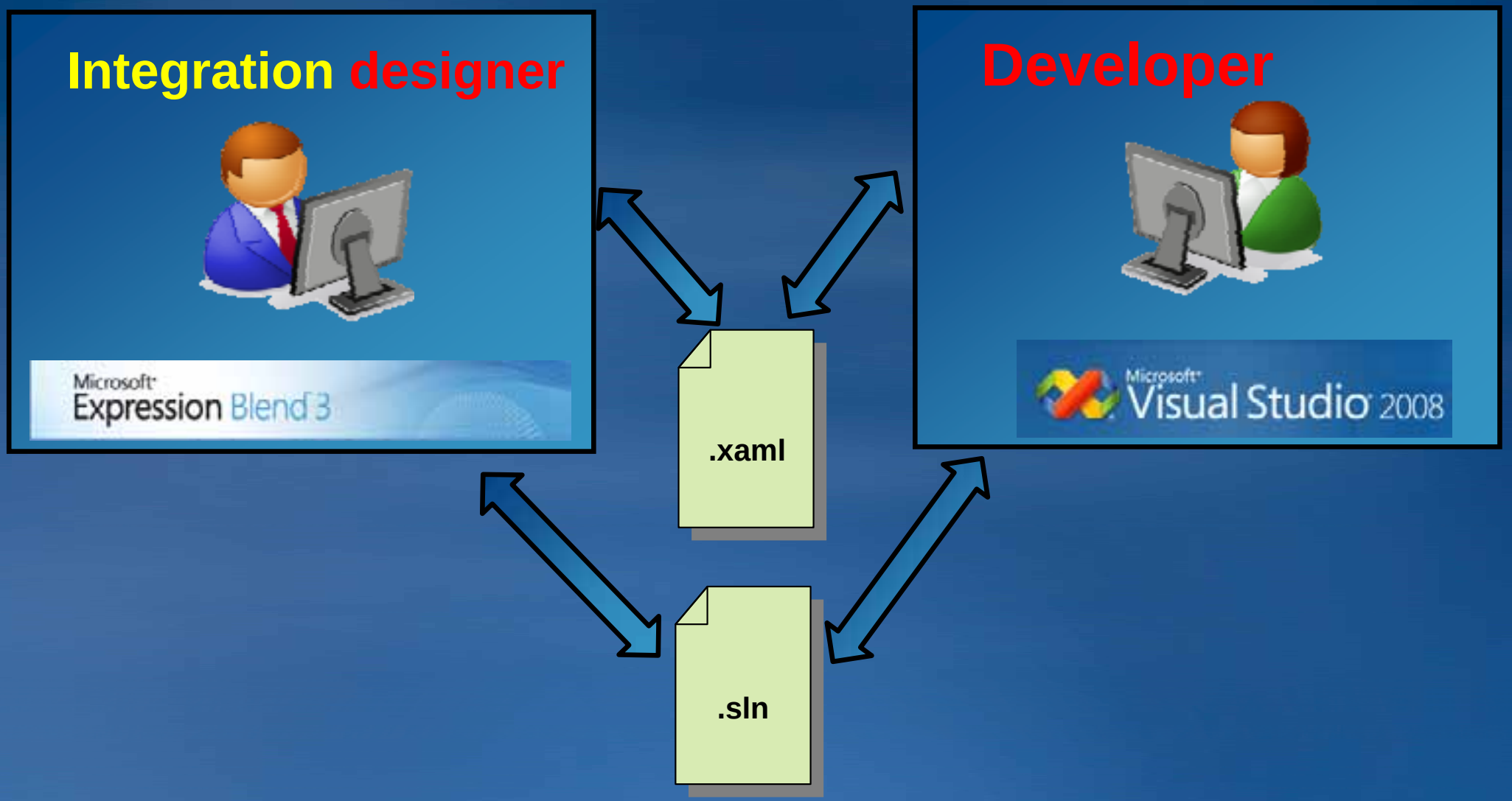
Dictionary of concepts

- 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



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

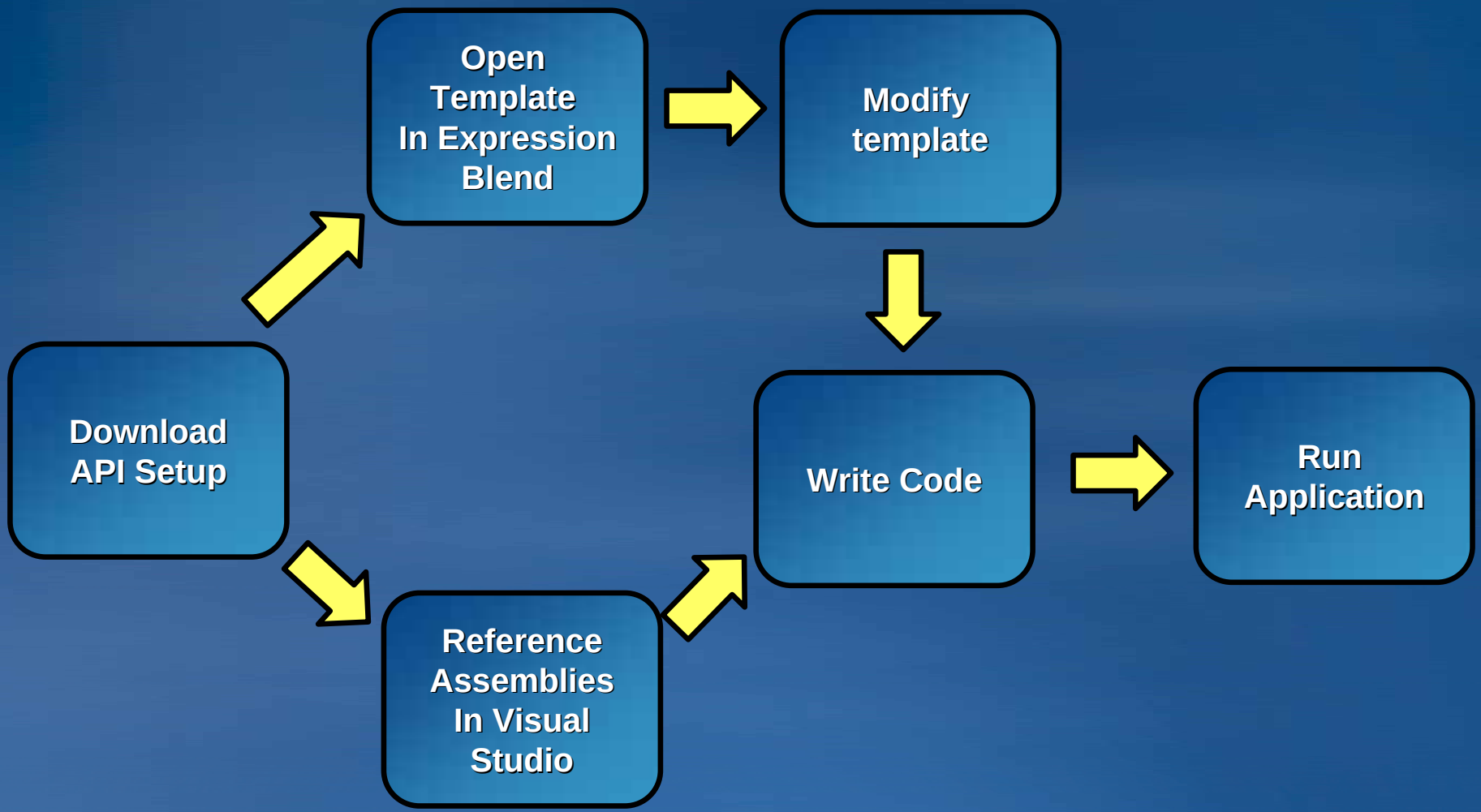
EXAMPLE APPLICATION

Getting started with the ArcGIS API for Microsoft Silverlight

ArcGIS API for Microsoft Silverlight/WPF

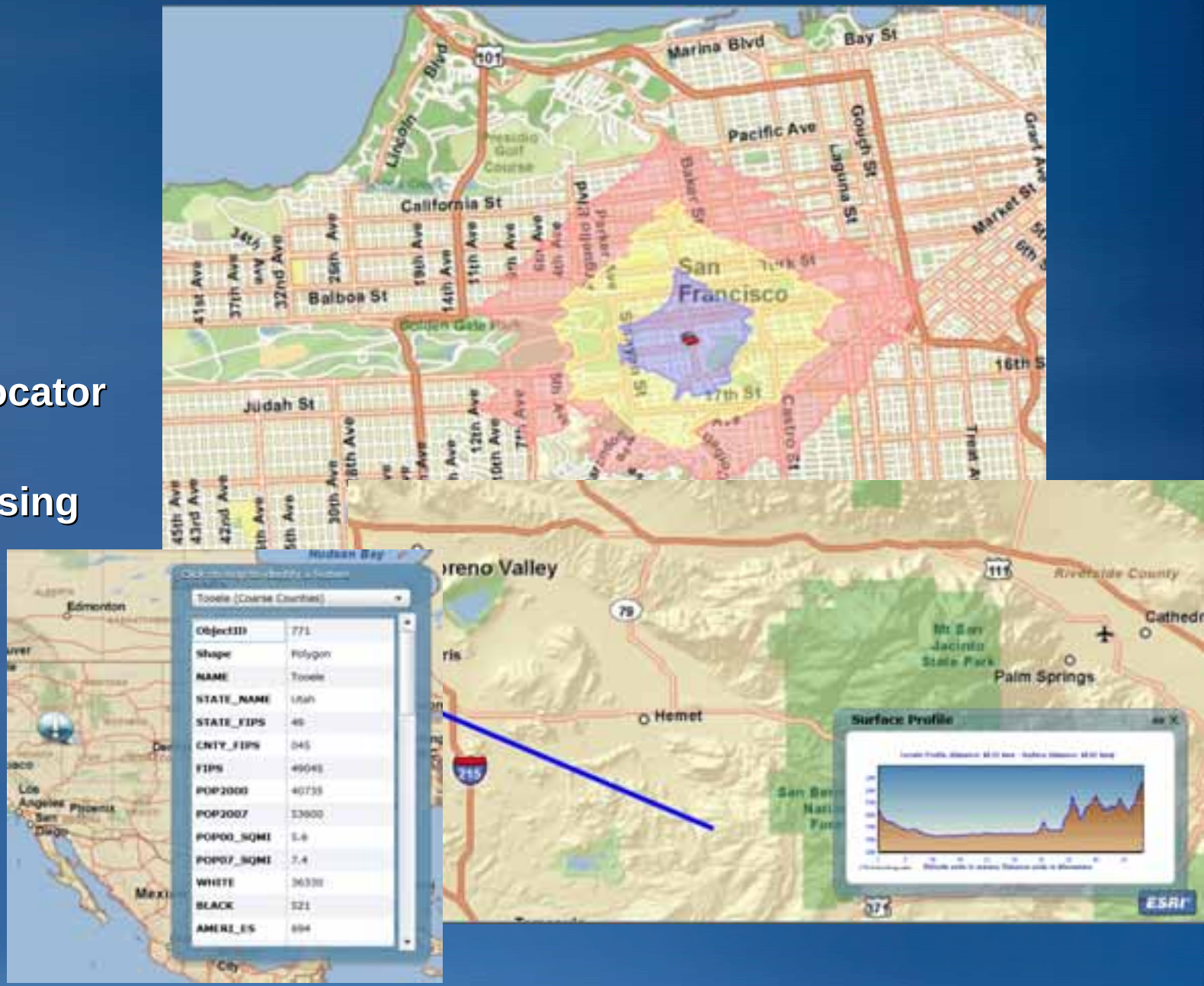
- Built on Silverlight and WPF Platform
  - Combine Rich Interactive Applications with ArcGIS Server and Bing Map Enterprise Services
  - Applications rendered by Microsoft Silverlight plug-in
- Powered by ArcGIS Server REST services
  - Only need URL to access a GIS Server
- Free to use
  - No development 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



Features of the API

- Task
  - Find
  - Identify
  - Query
  - Address Locator
    - Geocode
  - Geoprocessing
  - Routing

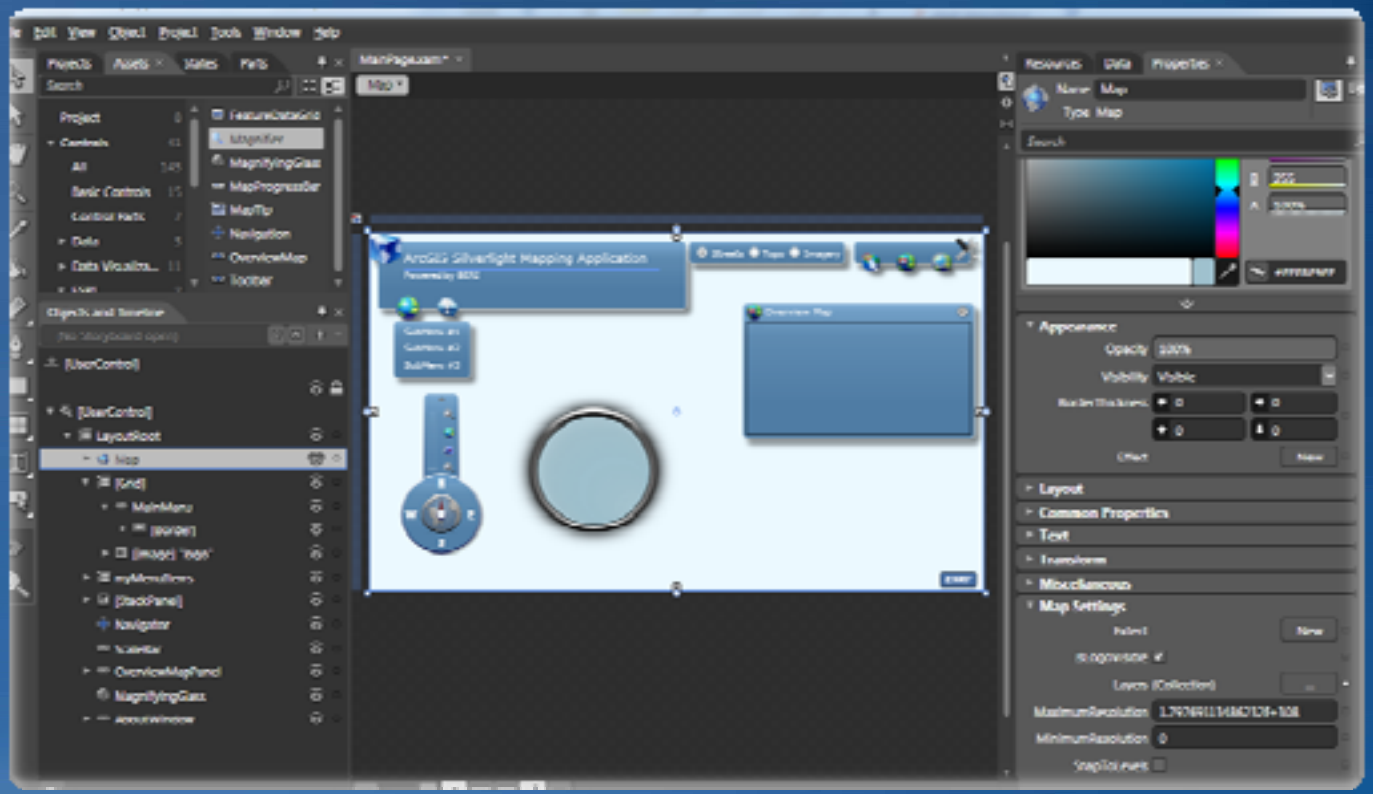


Silverlight Controls

- Silverlight toolkit
  - Data grids
    - Results of query
  - Charts
    - Visualize attributes
- ESRI toolkit
  - Navigation
  - Map Tips
  - Toolbar
  - FeatureDataGrid
  - MapProgressBar

Design Time

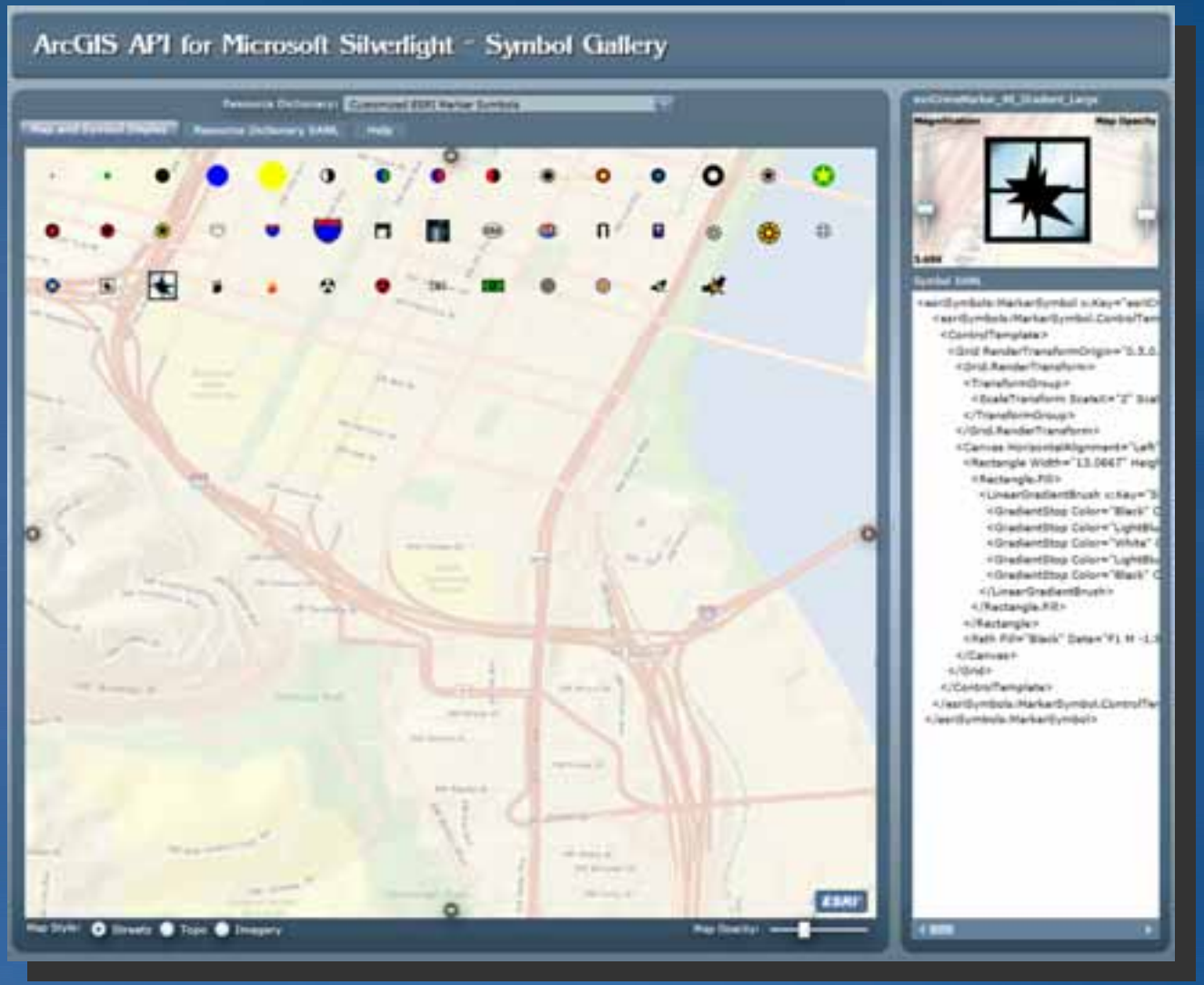
- Starter Templates
  - Drag & Drop Application Creation Experience
- Builds on the Expression Interactivity SDK
  - Behaviors
  - Actions
  - Triggers



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

Building and Debugging

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

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 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

Fiddler Web Debugger - A free web debugging tool - Windows Internet Explorer
http://www.fiddler2.com/fiddler2/
fiddler
Favorites
Suggested Sites
Web Slice Gallery
Page
Safety
Tools
Video Tutorials
Fiddler
Web Proxy
Get Fiddler!
Addons
Help & Documentation
Developer Info
Discuss
Contact
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...
Fiddler QuickStart Video 8min; 9mb WMV

Debugging

Firebug - Web Development Evolved - Windows Internet Explorer
http://getfirebug.com/
Favorites
Firebug - Web Development Evolved
Page
Safety
Tools
Firebug
web development evolved
Inspect
h1.siteTitle
Console
HTML
CSS
Script
DOM
Net
Style
Layout
Done
(Click the tabs above to see screenshots of each)
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.
INSTALL FIREBUG 1.4
FOR FIREFOX
Firebug Evolved:
Future and Past Releases
for newer and older Firefox
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**

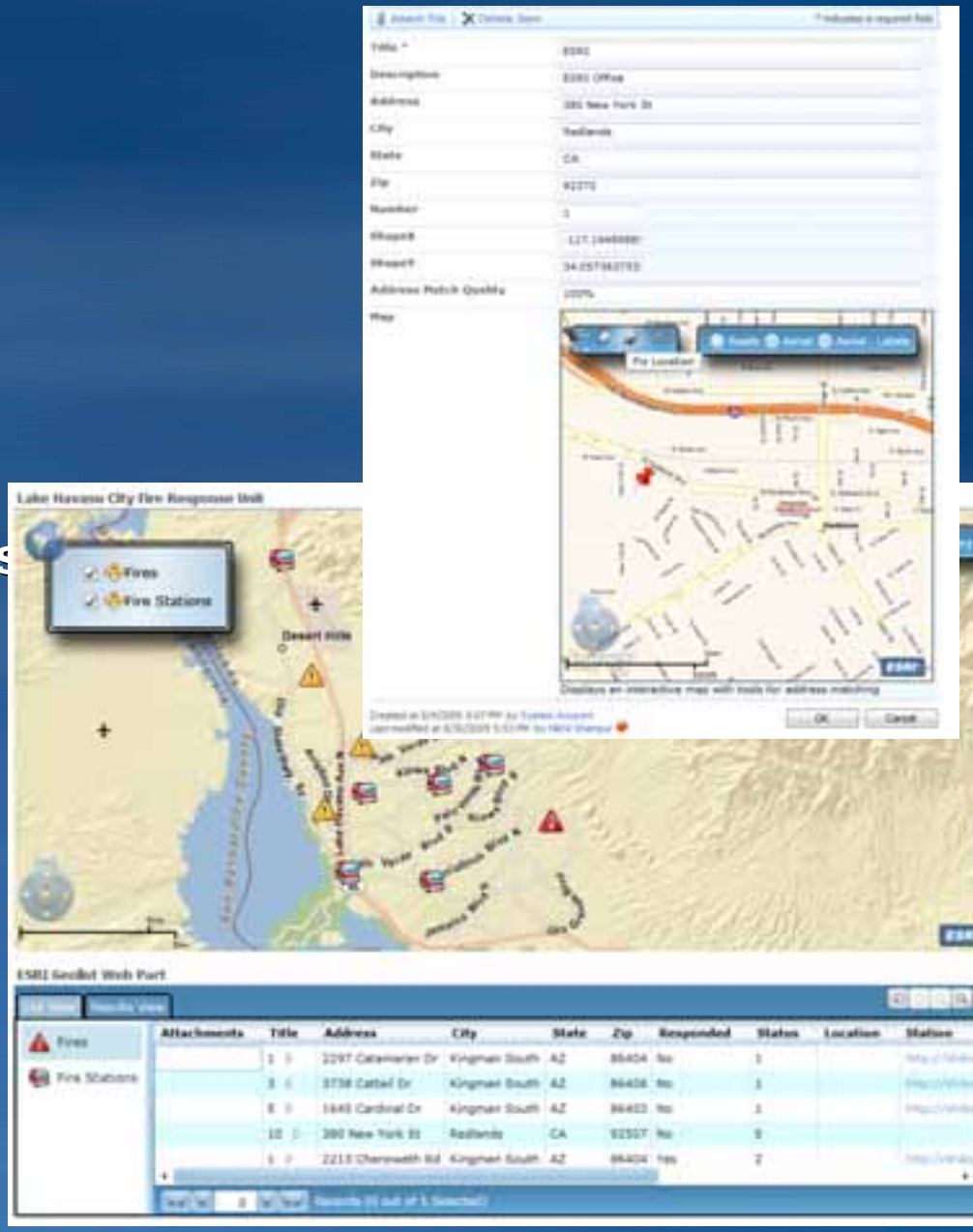
Resource Center for SharePoint™ Coming Soon!

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

- http://resources.esri.com/sharepoint

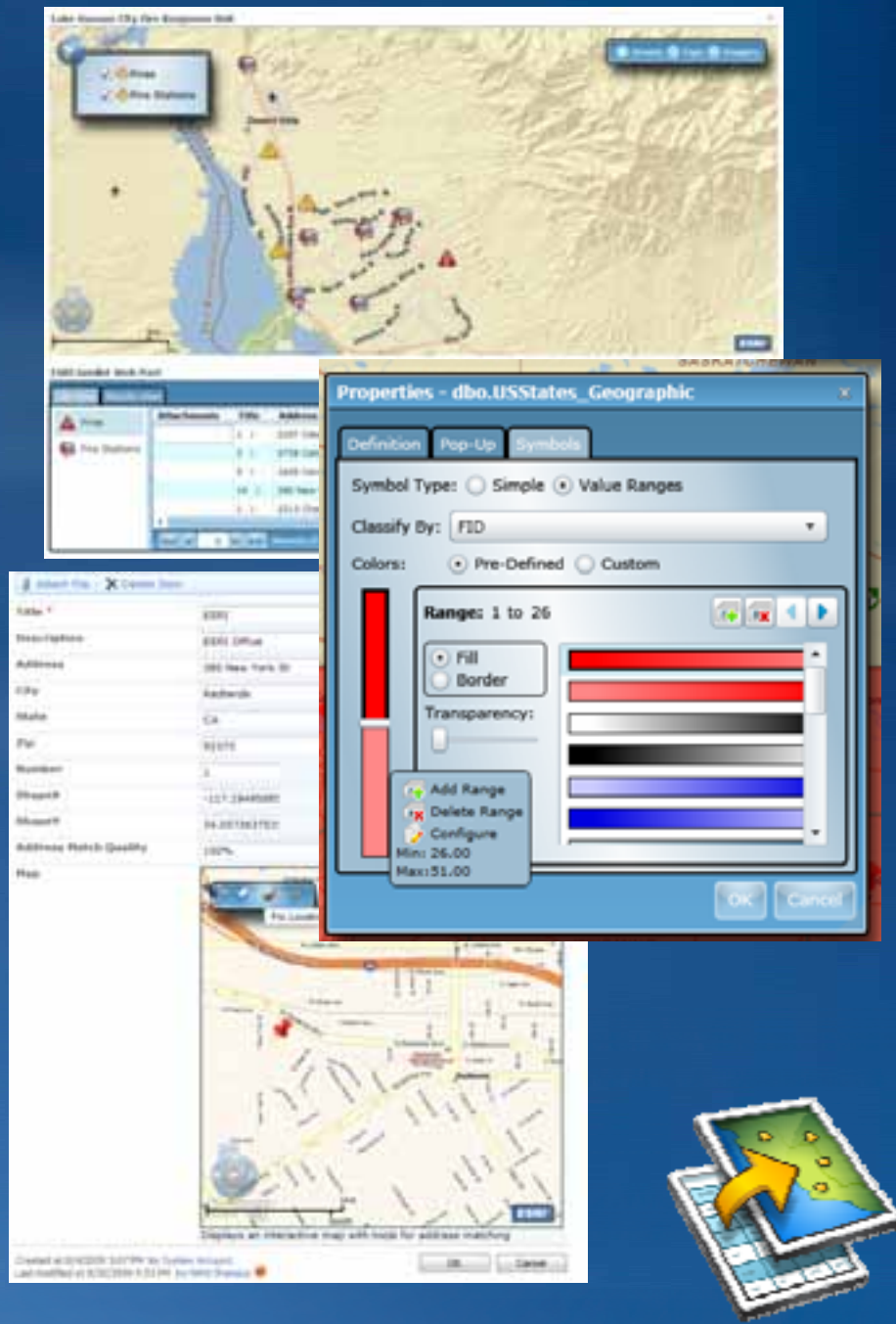
ESRI Parts for Microsoft® SharePoint™

- 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 des
    time 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

ArcGIS Desktop Authors

ArcGIS Servers

GIS Users

Geodatabase

Web Users

Web GIS

Raster Files

Desktop

Desktop

Desktop

Mobile

Mobile

Mobile

Mobile

Mashups

Explorer

ArcGIS Server

ArcGIS Online

Map

Map

Map

Web Map

Mashups

Browser

Browser

Web Blog

Web Blog

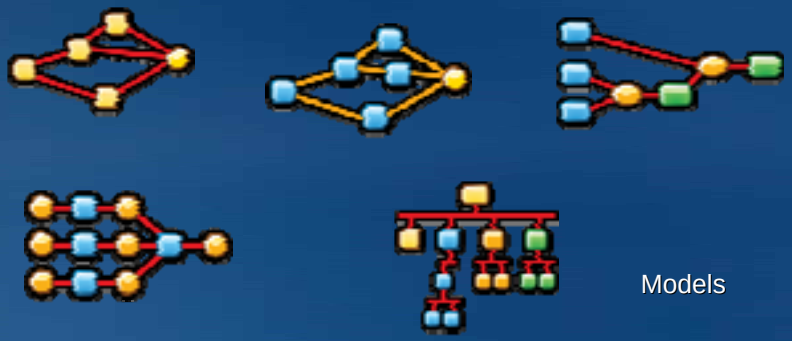
Web Map

Web Map

Open Standards

Web Map

Designing & Planning



Models

Layers

Professional Services

Professional Services

Situational Awareness

Education

Education

Tech Support

Tech Support

Business Partner

Files
Documentation
Internet
Data Appliance
CD/DVD
GIS
GIS
ArcGIS
ArcGIS
Database
ArcGIS
ArcGIS
ESRI
Satellite
Satellite

Title/Section Title

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)

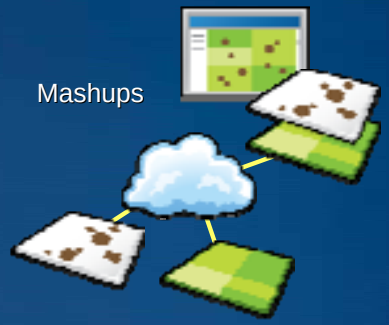
ArcGIS Servers

GIS Users

Geodatabase

Web Users

Web GIS



ArcGIS Server

ArcGIS Online

Open Standards

ArcGIS Desktop Authors

Web Blog

Web Blog

Mashups

Mashups

Browser

Browser

Browser

Browser

Web Map

Map

Web Map

Map

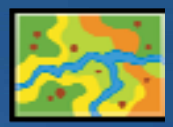
Web Map

Map

Raster Files

Raster Files

Web Map


Map

Web Map

Map

Web Map

Map

Web Map

Map

Web Map

Map

Explorer

Web Map

Globes

Layers

Database

Files

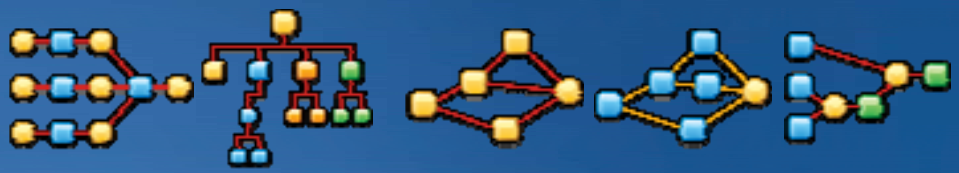
Files

Files

CD/DVD

Internet

Models

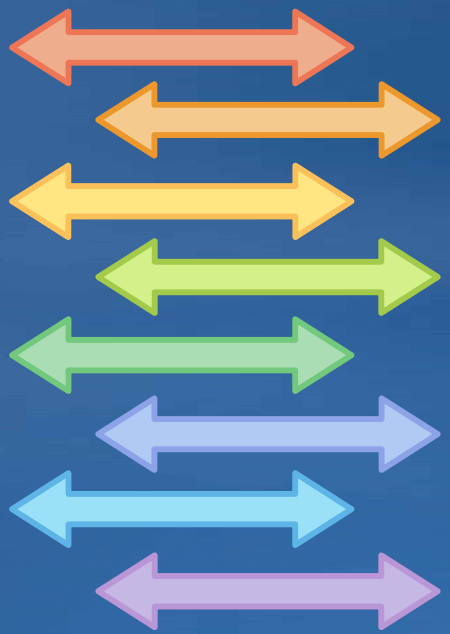


Models

Data Server
Mobile
Data Appliance
Desktop
Designing & Planning
Situational Awareness
Professional Services
Tech Support
Satellite
Satellite
Windmill
Professional Services
Education
Business Partner
Mobile GIS User
GIS User

ArcGIS ArcGIS ArcGIS ArcGIS ArcGIS ArcGIS ArcGIS

ArcGIS ArcGIS ArcGIS ArcGIS ArcGIS ArcGIS ArcGIS



ESRI ArcGIS

ESRI

ESRI ArcGIS

Alternative Method of Accessing ESRI Icons Via Clip Art

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.)