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ArcGIS Viewer for Silverlight Advanced Topics

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Agenda

- Add-ins overview
- Tools
- Behaviors
- Controls
- Layouts
- Road ahead

Add-Ins

Adding functionality to the Viewer

Add-Ins – Extending the Viewer

- Application Builder does a lot
  - Map configuration
  - Standard tools
  - Look and feel
  - Branding (title, logo, etc)

- Add-ins enable specific workflows
  - "Add-in" → code module containing functionality
    - Compiled as Silverlight packages (.xap files)
  - Seamlessly plug-in to App Builder configuration
    - Encourages reusability

Add-Ins – Required Software

- Microsoft Visual Studio 2010 SP1
- Microsoft Expression Blend 4 SDK
- Microsoft Silverlight 4 Toolkit
- ArcGIS Extensibility SDK for Silverlight 2.4
  - Visual Studio 2010 template provided

Add-Ins – Development

- Develop using the Extensibility API
  - Included in the Extensibility SDK

- `ESRI.ArcGIS.Client.Extensibility` assembly
  - Lightweight API for Viewer
  - Provides access to map, selected layer, and pop-up
  - Method to easily show UI in dialogs
  - Hooks to store and load add-in configuration

- Use the Visual Studio Template to start

- Any Silverlight library can be referenced

Add-Ins – Extensibility Points

Several types of add-ins:

1. **Tools** → functionality initiated by tool on toolbar
2. **Behaviors** → non-UI logic
3. **Layouts** → custom application "look and feel"
4. **Controls** → UI integrated into application

Demo
Add-In Types

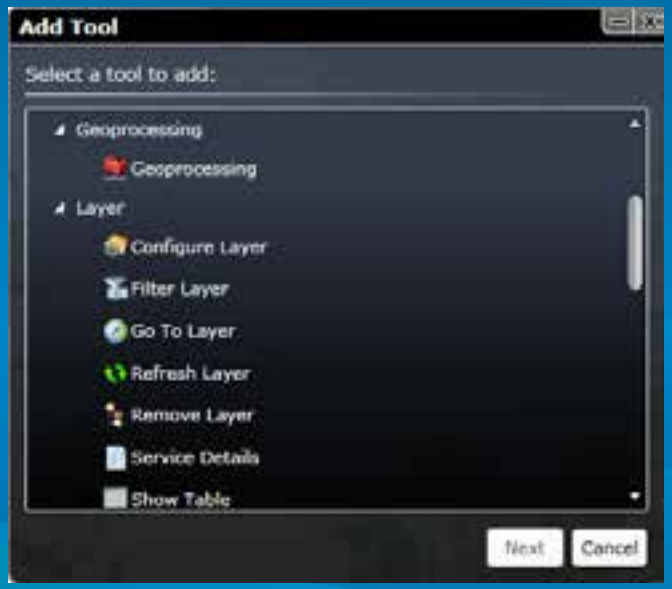
Add-In Types

Tools

Tools – Overview

- Simplest, most common extensibility endpoint
- Logic initiated by user click
- Appear as buttons on toolbars and menus

- Users can add them from Application Builder



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Tools – Implementation

- **Implement ICommand**
  - **Execute – tool logic**
  - **CanExecute – determine whether tool is enabled or disabled**
  - **CanExecuteChanged – raise if enabling/disabling is needed**
- **Add Attributes:**
  - **DisplayName*, Description, Category, DefaultIcon**
  - **Export* (MEF attribute)**

```
14  namespace MyTool
15  {
16      [DisplayName(Name="My First Tool")]
17      [Description(Description="This is a simple example of a tool")]
18      [Category(Category="Category for my tools")]
19      [DefaultIcon(DefaultIcon="/MyTool;component/tool16.png")]
20      [Export(typeof(ICommand))]
21      public class MyCommand : ICommand
22      {
23
24          public bool CanExecute(object parameter)
25          {
26              return true;
27          }
28
29          public event EventHandler CanExecuteChanged;
30
31          public void Execute(object parameter)
32          {
```

***required**

Tools – Extensibility API Hooks

- MapApplication.Current
  - Hook to Viewer properties
  - Always available (static property)

- MapApplication.Current.ShowWindow
  - Show UI in a dialog
  - Displays any FrameworkElement
  - WindowStyle determines whether window appearance matches Application Builder or current Viewer

Demo
A Simple Tool

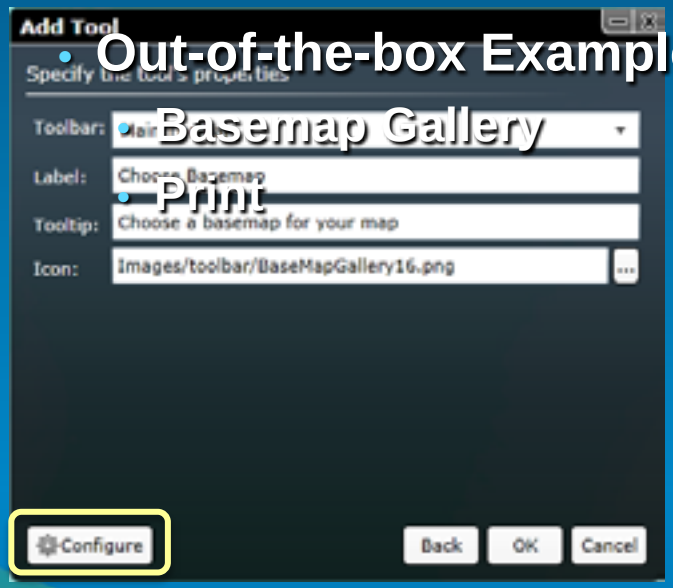
Tools – More Extensibility API Hooks

- MapApplication.Current.Map
  - Current Viewer's map
- MapApplication.Current.SelectedLayer
  - Currently selected layer in Map Contents
  - Useful for tools designed for the layer context menu
- MapApplication.GetLayerName/SetLayerName
  - Gets or sets name shown in Map Contents
- PopupInfo
  - Always passed to Execute for tools on Pop-up toolbar
  - Can retrieve from MapApplication.Current.GetPopup
  - Contains info about field and pop-up configuration

Demo
Extensibility API

Tools – Configuration

- Can implement configurability for Application Builder
  - Gives designer flexibility in how a tool works
  - Reusability
    - Out-of-the-box Examples
      - Basemap Gallery
      - Print



Built-in UI

Custom UI

Tools – Implementing Configuration

- ISupportsConfiguration
  - Configure – fired when user wants to configure tool
  - SaveConfiguration – serialize tool config
  - LoadConfiguration – deserialize tool config and initialize

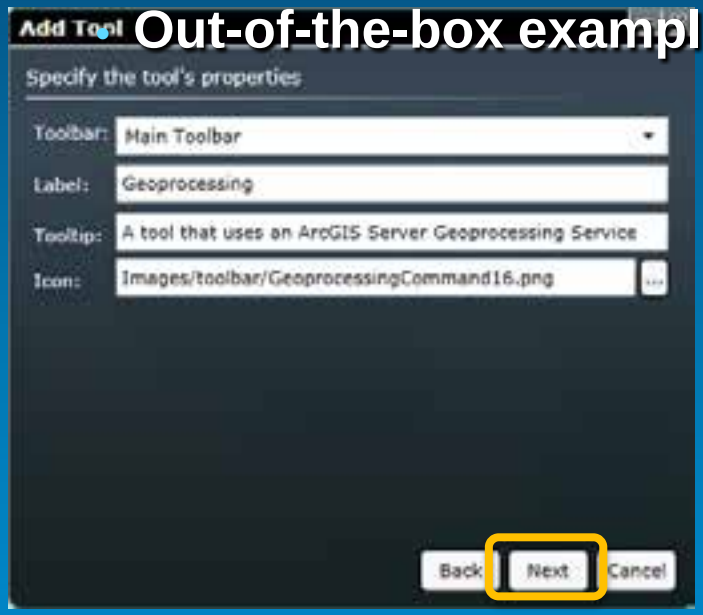
```
#region ISupportsConfiguration members

public void Configure()
{
    // Configuration logic
}

public void LoadConfiguration(string configData)
{
    // Load the saved configuration
}

public string SaveConfiguration()
{
    // Serialize the configuration to a string
}

#endregion
```

Demo

Tool Configuration

Tools – Integrated Configuration

- Can show tool configuration UI within Add Tool wizard
- Seamless integration with built-in UI
- Out-of-the-box example - Geoprocessing



Built-in UI

Custom UI

Tools – Implementing Wizard Configuration

- ISupportsWizardConfiguration
- Same members as ISupportsConfiguration, plus:
  - Pages – pages shown for configuring the tool
  - DesiredSize – how much space you want for your UI
  - CurrentPage – the page currently being shown
  - PageChanging – called by host when page is about to change
  - OnCompleted – called by host on wizard completion
  - OnCancelled – called by host on wizard cancellation

Demo

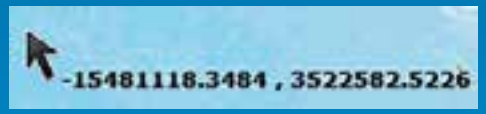
Wizard Configuration

Add-In Types

Behaviors

Behaviors – Overview

- Functionality without user interaction
- Examples
  - Introductory/terms of use dialog
  - Initialize extent from query string
  - Show coordinates
  - Constrain extent



Behaviors - Implementation

- Inherit from Behavior<Map>
  - Override OnAttached and OnDetached
- Optionally implement ISupportsConfiguration
  - Configure, LoadConfiguration, SaveConfiguration
- Add attributes for DisplayName, Category
  - Don’t forget MEF Export attribute!

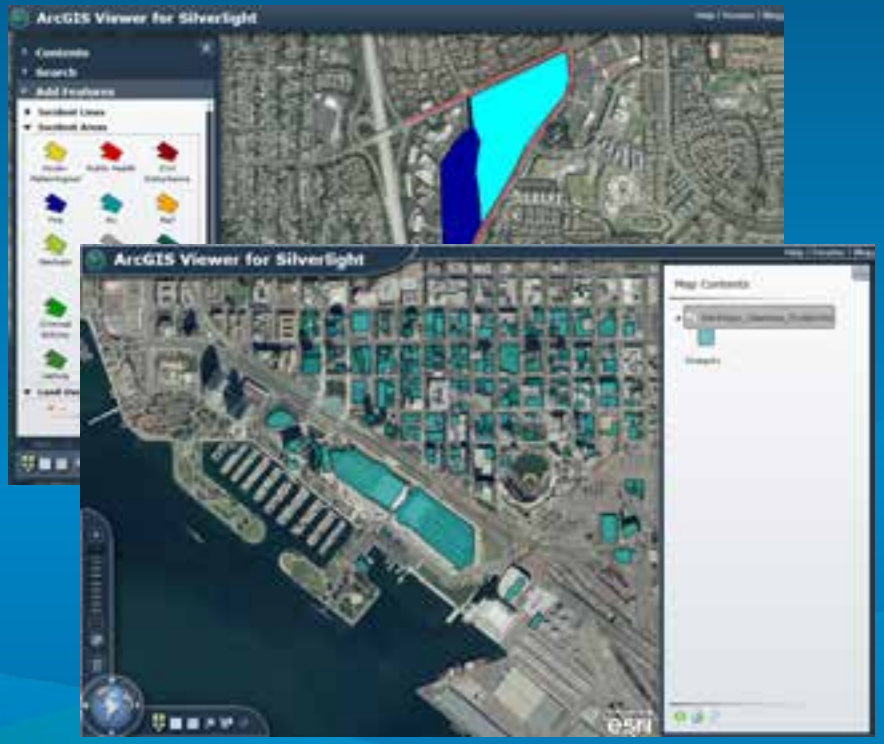
```
[Export(typeof(Behavior<Map>))]
[DisplayName("My Behavior")]
public class MyBehavior : Behavior<Map>, ISupportsConfiguration
{
```

Demo
Behaviors

Add-In Types
Layouts

Layouts – Overview

- Define application look and feel
- Loose xaml files – all markup, no code
- Position of viewer elements
  - Side panel
  - Navigation control
  - Scalebar
  - Title, logo, links
  - More
- Styles used by Viewer
  - Tool buttons
  - Pop-ups
  - Navigation control
  - More



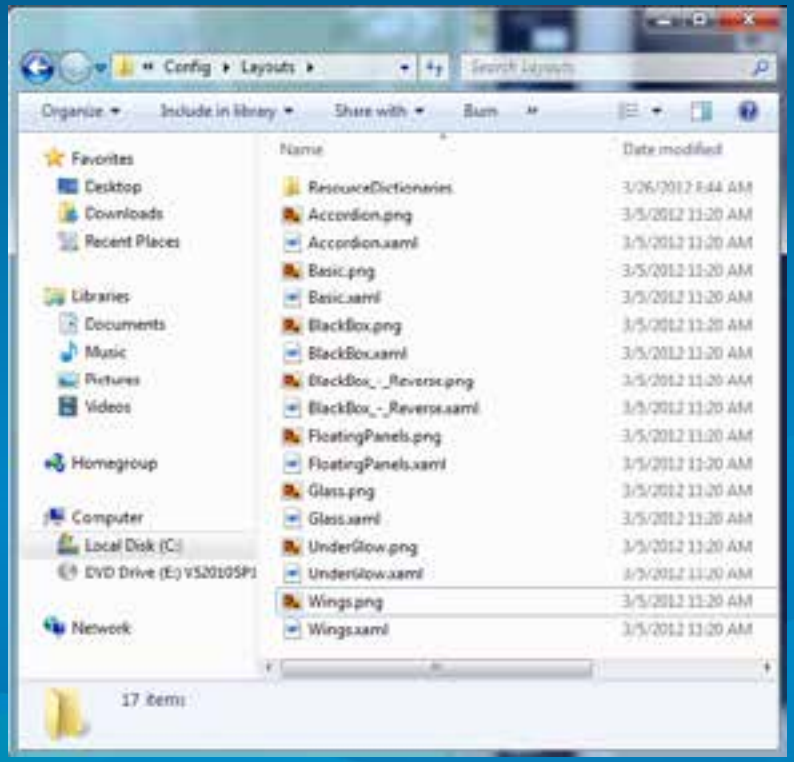
Layouts – Implementation

- Start with copy of an existing layout
- Open-ended
  - Anything that can be declared in XAML
- Some well-known elements expected by Viewer
  - If it has an x:Name, don't remove it

```
<ContentControl x:Name="ScaleBarContainer"
                                Margin="40,0,0,2"
                                HorizontalAlignment="Left"
                                HorizontalContentAlignment="Stretch"
                                VerticalAlignment="Bottom"
                                Foreground="WhiteSmoke">
    <ContentControl.Effect>
        <DropShadowEffect BlurRadius="10" ShadowDepth="2" Opacity="1" Direction="300" />
    </ContentControl.Effect>
</ContentControl>

<ContentControl x:Name="AttributionDisplayContainer"
                HorizontalAlignment="Right" VerticalAlignment="Bottom"
                Margin="0,0,20,10"/>
```

Layouts – Deployment

- Copy to Builder\Templates\Default\Config\Layouts
- Create preview image
  - Name the same as xaml file
  - Ideal size is 580 x 359
- Tip - clear browser cache



Demo
Layouts

Add-In Types

Controls

Controls – Overview

- Pieces of UI that are “built-in”
- Included in layout
- Can implement a tool to toggle on/off
- Out-of-the-box examples
  - Map
  - Navigation control
  - FeatureDataGrid (attribute table)

Controls – Implementation

- Implement Silverlight Control or UserControl
- Add to layout
- Define element name (x:Name)
- Make configurable (optional)
  - Implement ISupportsConfiguration
  - In layout, set ElementExtensions.IsConfigurable to true

Demo
Controls

Summary

- The Viewer is configurable, but lots for devs, too
  - Devs are the bridge from generic to specific
- Many ways to make the Viewer do what you need
- Add-Ins are inherently reusable
  - Make them more reusable by implementing conguration
- Easy, flexible, rich development environment

Road Ahead

Road Ahead

- Next release coming soon!
  - Version 3.0
  - Expected Q3
- Improvements
  - Printing using 10.1 print service
  - Search is configurable
    - Specify other locator services
  - Measure tool
  - Bookmarks

Demo

3.0 Enhancements

Road Ahead – for Developers

- Built on version 3.0 of the ArcGIS API for Silverlight
- Leverages Silverlight 5
- New tools are shared-source
  - Measure and Bookmarks already on ArcGIS.com
- Portal property added to MapApplication

Road Ahead – Beyond 3.0

- Add capabilities from the Flex Viewer and ArcGIS Manager Web Mapping Application
  - Query
  - Relationships
- Surface new Server capabilities
  - Editor tracking
  - Ownership-based access
- Develop using the Extensibility API
  - Make it better by using it ourselves
  - Share the source code with you

Related UC sessions

- **Creating Web Applications with ArcGIS**
  - **Fri 9:00 AM Room 8**

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- My UC Homepage >
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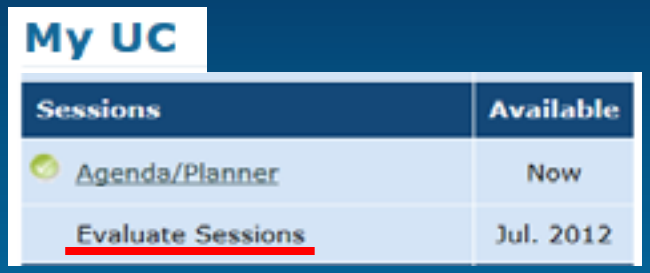

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