

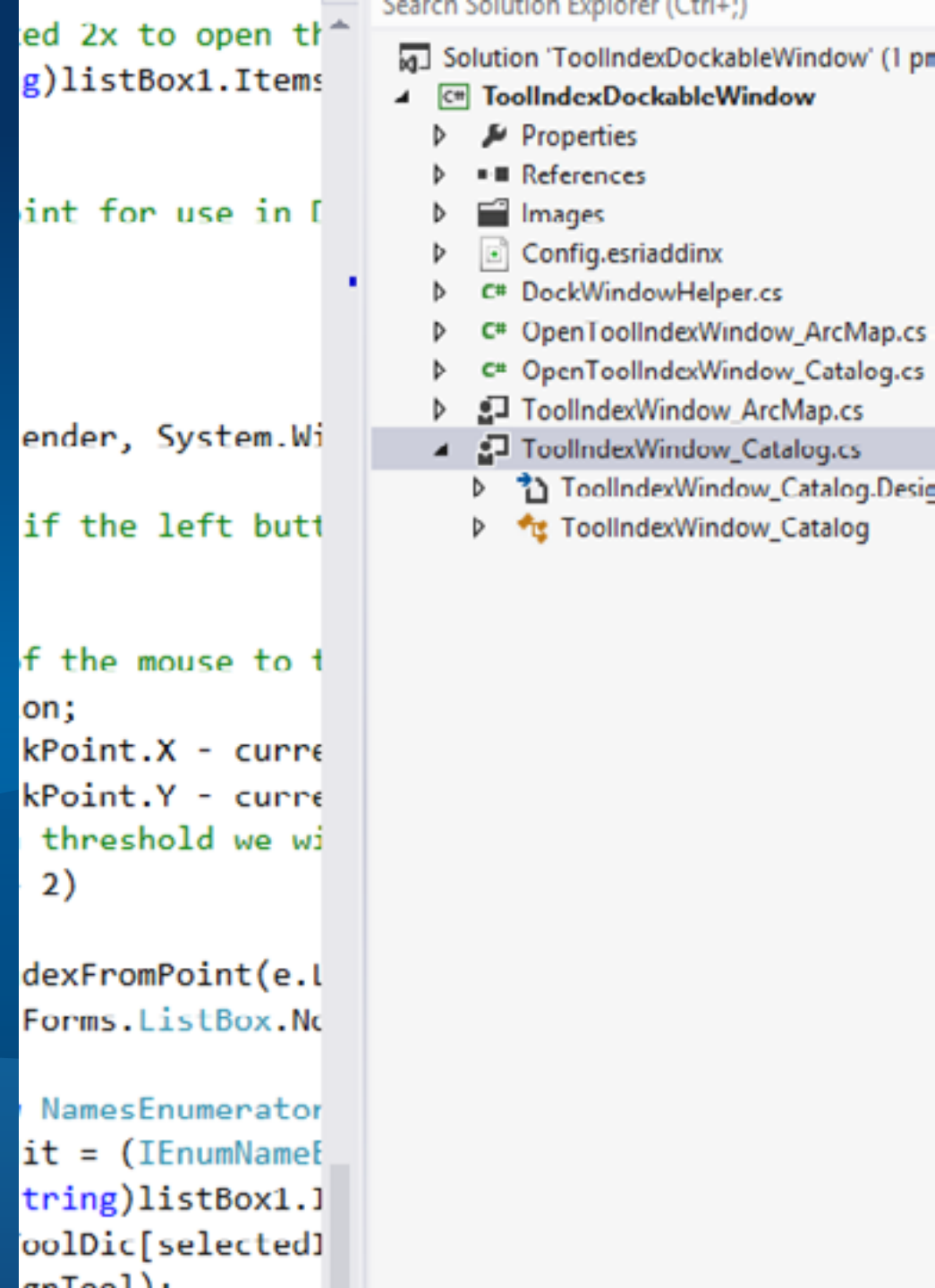


Creating .NET Add-ins for ArcGIS for Desktop

John Hauck and Chris Fox

Technical Workshop

Introduction to .NET



What is .NET?

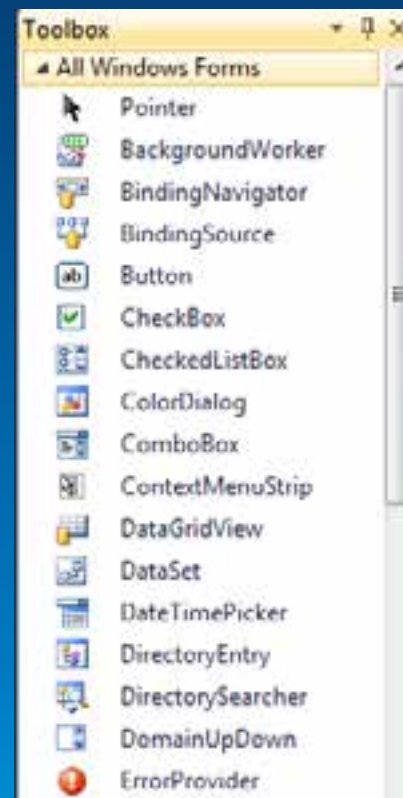
- **Development framework to build applications for the Windows Platform**
- **Key Features**
 - **Common Language Runtime**
 - **Interoperability**
 - **Base Class Library**
 - **Windows Forms**

Base Class Library

- **Coded solutions to common programming problems**
 - **Interacting with databases**
 - **Parsing XML**
 - **File reading and writing**
 - **String manipulation**
 - **Working with collections**

Windows Forms

- **Tools and Controls to build GUIs**
 - Toolbars and Menus
 - Text Box, Combo Box, List View, Button
 - Layout and Data Binding
- **Events driven**



Supported .NET Versions

- **When building your add-in you need to target a specific version of .NET**
- **3.5 is recommended for 10, 10.1 and 10.2**
 - **.NET 3.5 is required for ArcGIS Desktop**
- **4.0 is supported at 10.1 and 10.2**

Selecting a Language

- **VB.NET**
 - Syntax closest to VBA and VB6
- **C#**
 - Syntax similar to C++ & Java
- **No difference in performance**
- **Same access to .NET BCL and ArcObjects API**

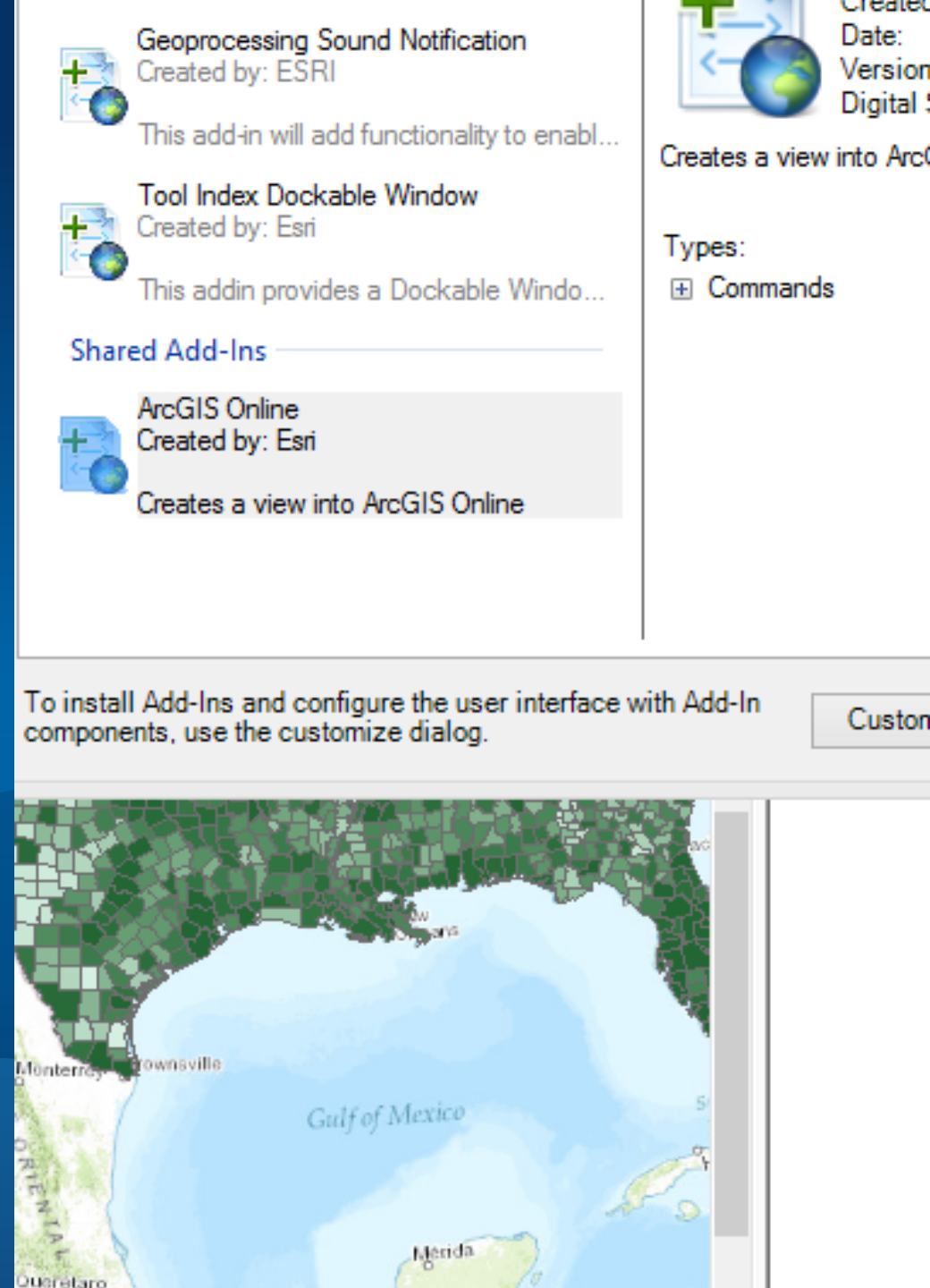
Where to write your code?

- **Integrated Development Environment (IDE)**
 - Source code editor, Debugger
- **Visual Studio**
 - Visual Studio 2008 (10.0)
 - Visual Studio 2010 (10*, 10.1, 10.2)
 - Visual Studio 2012 (10.2, 10.3)
 - **Visual Studio 2013 (10.3)**
 - Free express version is supported
 - *2010 VS Express not supported at 10.0

Visual Studio Key Features

- **One IDE for all .NET projects**
 - Templates
- **Code Editor**
 - Syntax highlighting, code completion
- **Debugger**
- **Windows Forms Designer**
 - Drag/Drop controls

What are Add-Ins?



ArcGIS Desktop Add-Ins

*A better way to customize and extend
ArcGIS Desktop applications.*

- Easier to build
- Easy to share
- More secure
- C#, VB.NET, Java, and Python



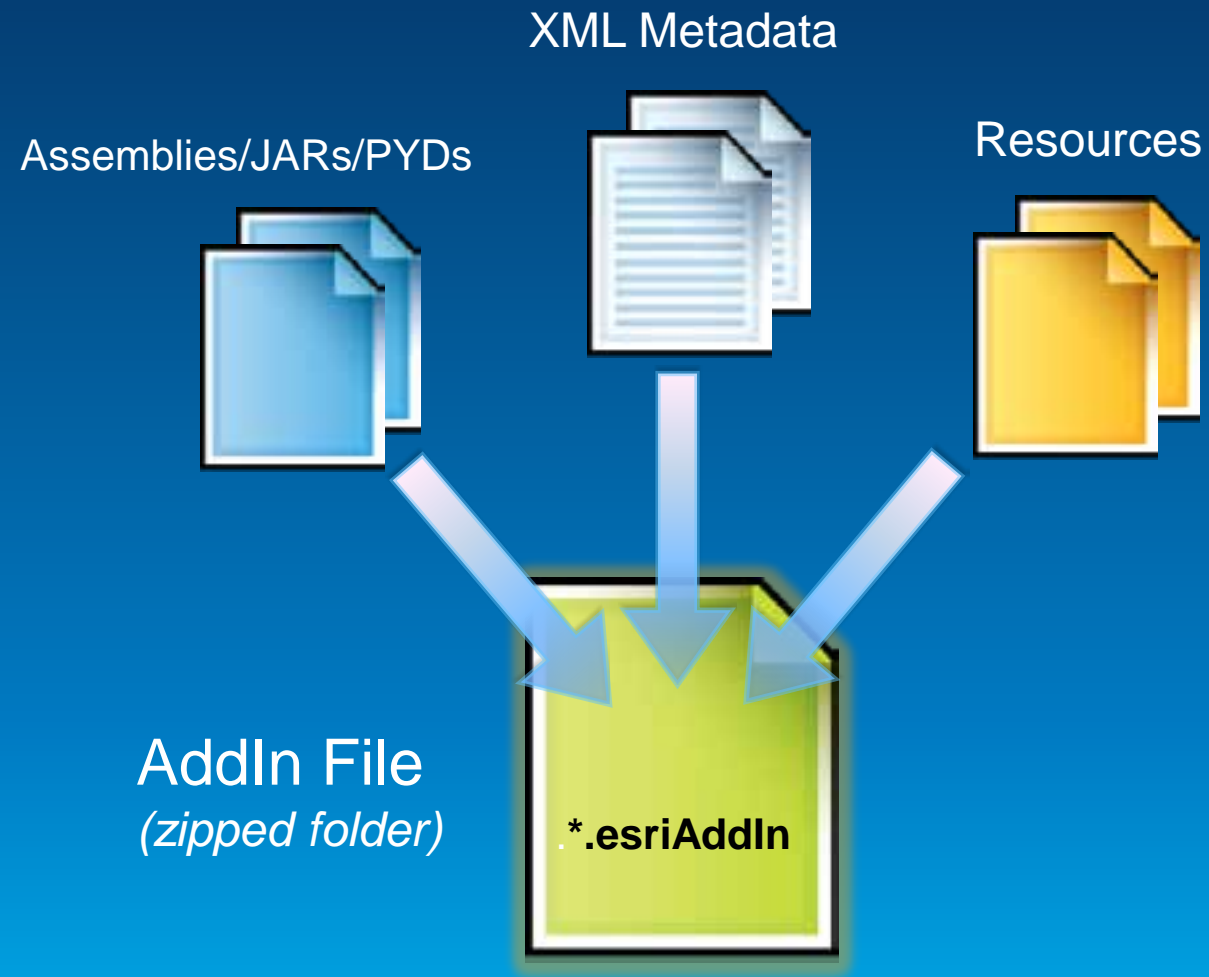
Add-In Types supported at ArcGIS 10.2

- **Buttons**
- **Tools**
- **Combo Boxes**
- **Multi-Items**
- **Menus**
- **Context Menus**
- **Toolbars**
- **Tool Palettes**
- **Dockable Windows**
- **Application Extensions**
- **Editor Extensions**
- **Editor Construction Tools**
- **SOE (Server)**

Add-in Wizard



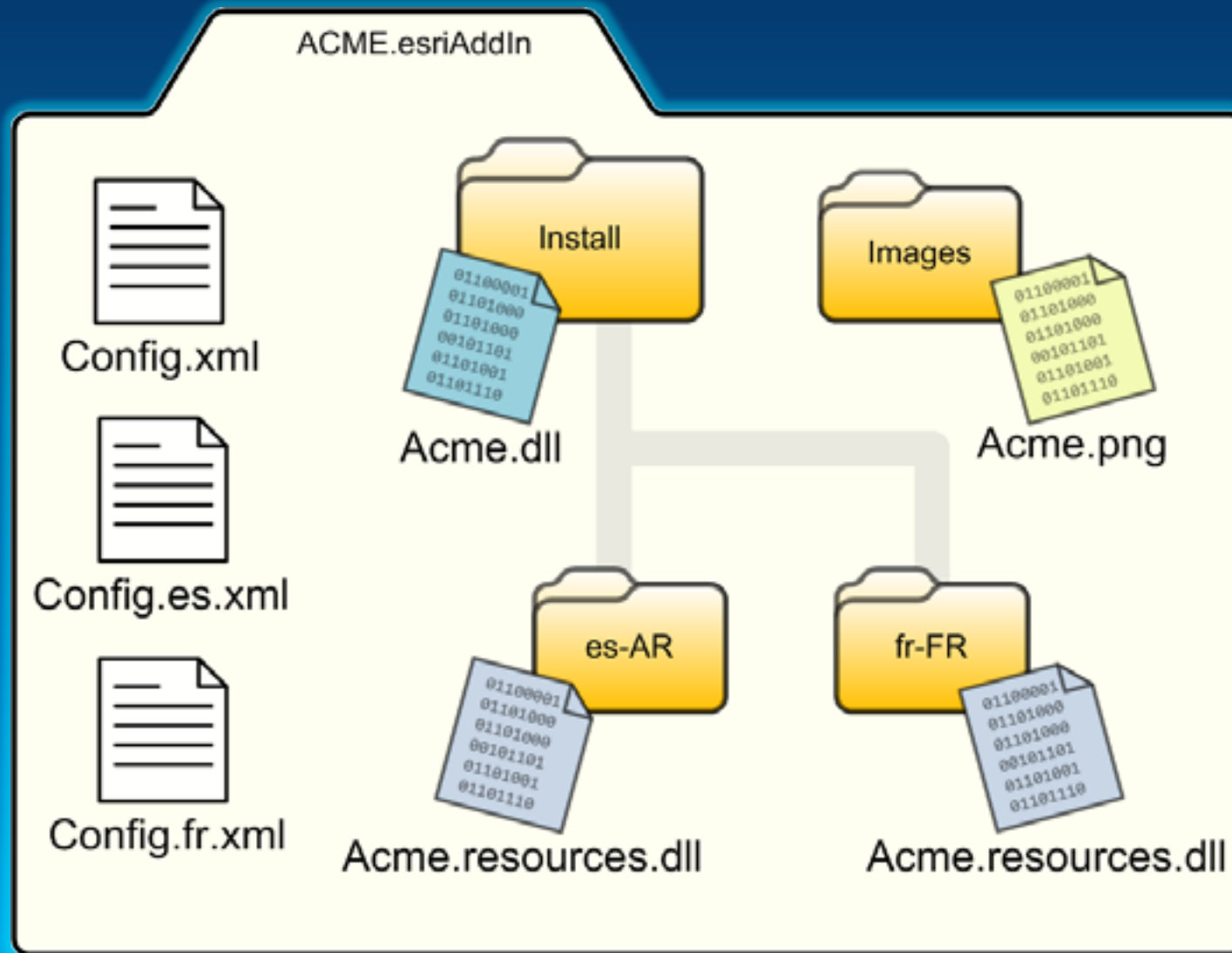
Add-In File Anatomy



Anatomy - Declarative Aspects

```
<DockableWindows>
  <DockableWindow id="ESRI_Example_DockableWindow"
                  class="ExampleDockableWindowClass"
                  caption="Example Dockable Window">
    <InitialPlacement
      height="300" width="300"
      state="pinned" position="right"
      neighbor="esriArcMapUI.TOCDockableWindow" />
  </DockableWindow>
</DockableWindows>
</DockableWindows>
```

Anatomy – Resources & Localization



Anatomy - Programmatic Aspect

```
public class SimpleButton : Button
{
    protected override void OnClick()
    {
        MessageBox.Show("Hello World");
    }
}
```

Anatomy - Classic (managed) COM Button comparison

```
namespace ArcMapClassLibrary1
{
    /// <summary>
    /// Summary description for Command1.
    /// </summary>
    [Guid("dfab35ef-96f7-456b-9162-42d36f7a9e57")]
    [ClassInterface(ClassInterfaceType.None)]
    [ProgId("ArcMapClassLibrary1.Command1")]
    public sealed class Command1 : BaseCommand
    {
        #region COM Registration Function(a)
        [ComRegisterFunction()]
        [ComVisible(false)]
        static void RegisterFunction(Type registerType)
        {
            // Required for ArcGIS Component Category Registrar support
            ArcGISCategoryRegistration(registerType);

            //
            // TODO: Add any COM registration code here
            //
        }

        [ComUnregisterFunction()]
        [ComVisible(false)]
        static void UnregisterFunction(Type registerType)
        {
            // Required for ArcGIS Component Category Registrar support
            ArcGISCategoryUnregistration(registerType);

            //
            // TODO: Add any COM unregistration code here
            //
        }

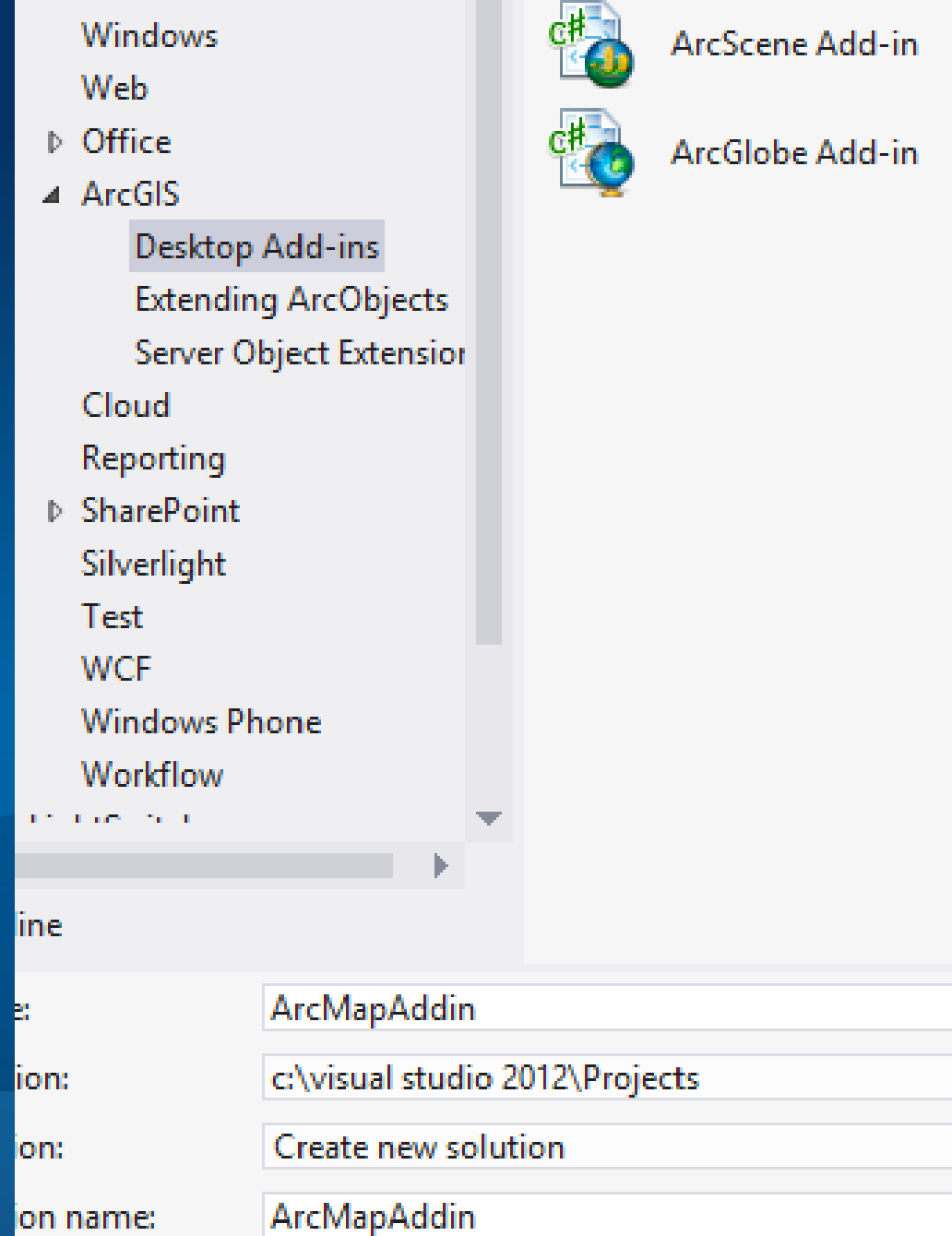
        #region ArcGIS Component Category Registrar generated code
        /// <summary>
        /// Required method for ArcGIS Component Category registration -
        /// Do not modify the contents of this method with the code editor.
        /// </summary>
        private static void ArcGISCategoryRegistration(Type registerType)
```

Entry Points for Customization

- Add-In Wizard creates static classes depending on your type of customization.

```
public class SimpleButton : Button
{
    protected override void OnClick()
    {
        ArcMap.Application.Caption = "Hello";
        ArcMap.Document.ActiveView.Refresh();
    }
}
```

Authoring an Add-In Demo



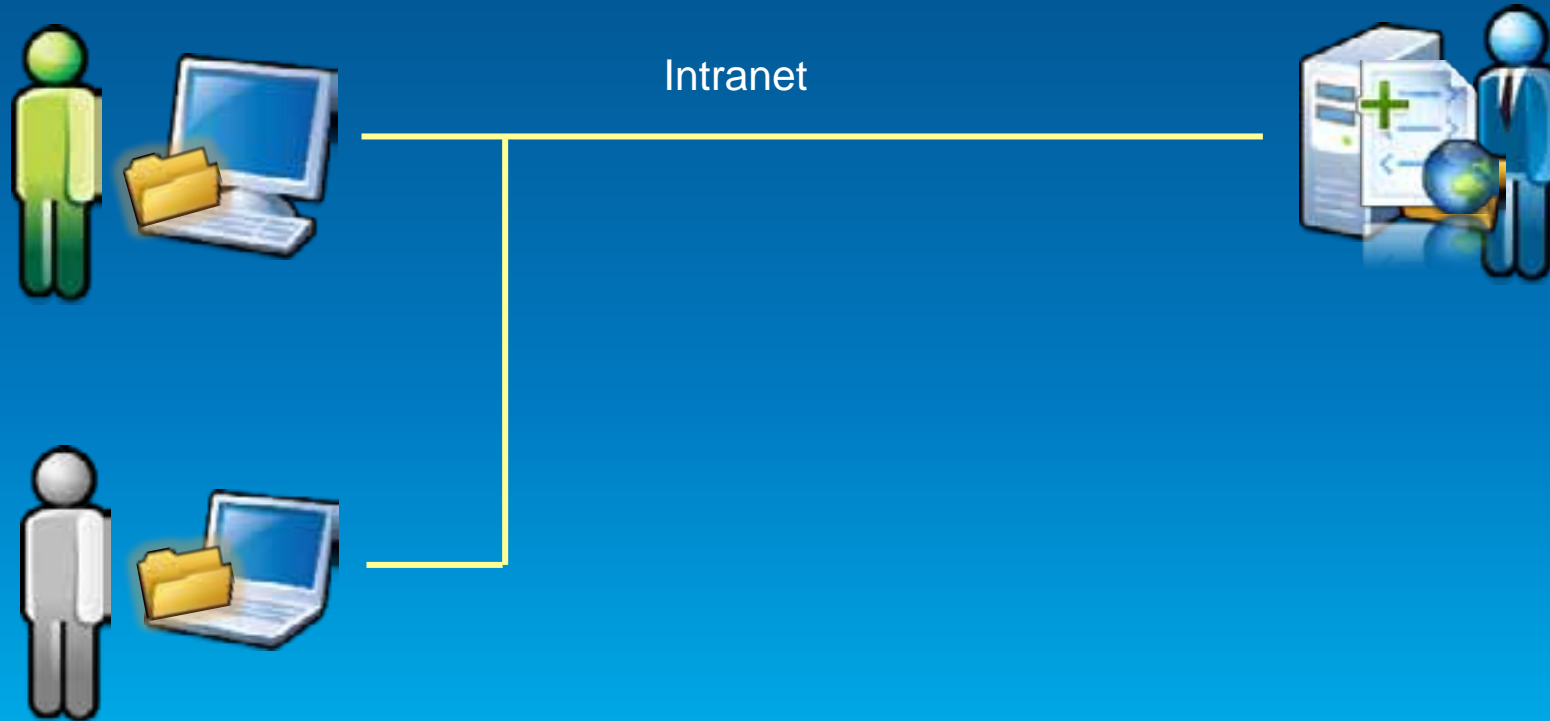
Add-In File Discovery & Sharing

- Add-In files are automatically discovered in well known local folders and incorporated into the Desktop applications at runtime.
- Folders are per user and per ArcGIS version
%UserProfile%\My Documents\ArcGIS\AddIns\Desktop10.2



Add-In File Discovery & Sharing

- Administered network shares
- Simplifies Updates



Installation Utility

- Double-click “Install”
- Customize - Add From File
- XCOPY



Add-In Versioning Policy

- **Add-ins built for previous version will load automatically in newer versions**
 - **No need to rebuild or reinstall**
- **Backward compatibility within a major version**

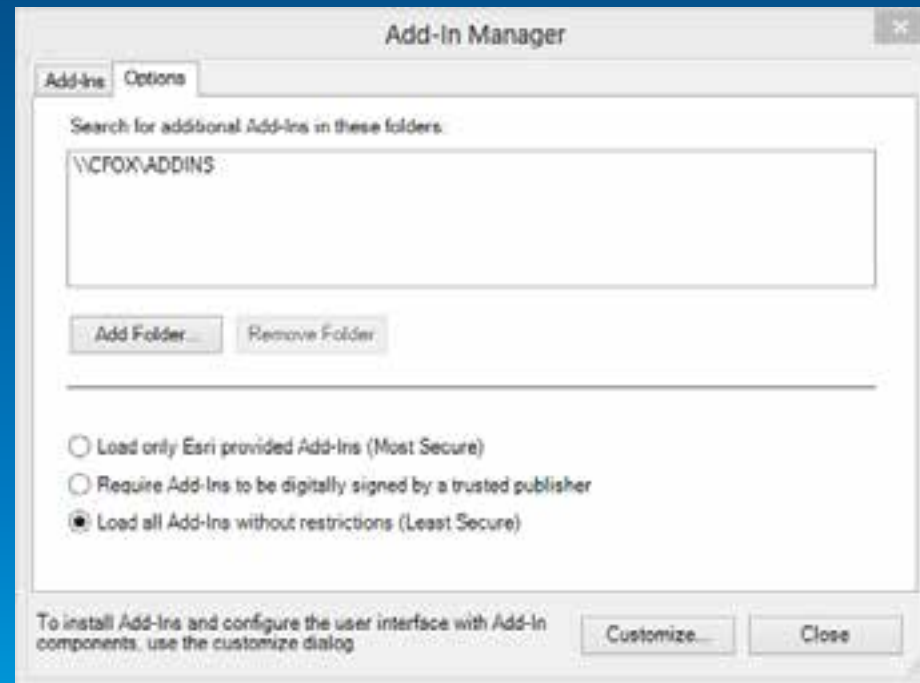
Add-In Manager Dialog

- Shows detailed information on all installed Add-Ins
- Mine vs. Shared
- Deleting Add-Ins



Sharing & Security

- Custom search folders
- Security Settings



Additional Security Settings

- **Admin Controls**
 - **Do not load any add-ins**
 - **Load from administrator folders only**
 - **Admin security level lock**

Digitally Signing Add-Ins

- IETF/WC3 XML-DSig standard (within OPC archive)
- Trust
 - Source Traceability
 - Tampering
- ESRI SignAddin Utility



Thank you...

- **Please fill out the session survey:**

First Offering ID: 1331

Second Offering ID: 1429

Online – www.esri.com/ucsessionsurveys

Paper – pick up and put in drop box



Understanding our world.