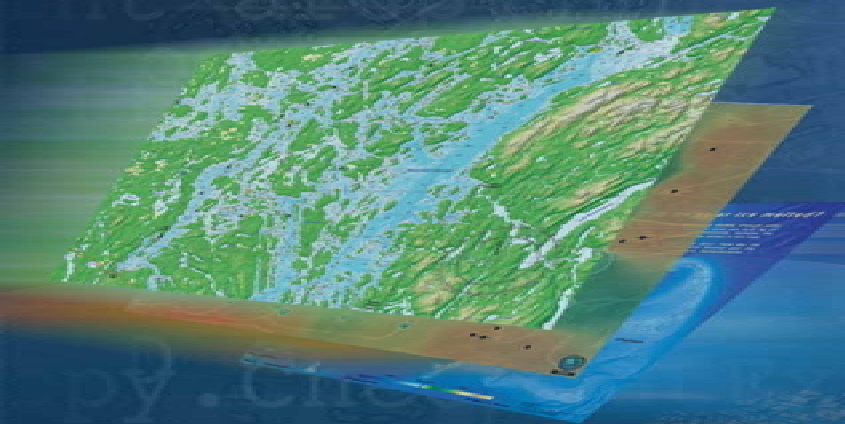


ESRI Developer Summit

March 22–25, 2010
Palm Springs, CA

Developing .NET Applications for ArcGIS Engine

Mary Harvey and Ralf Gottschalk



agenda



.NET ArcGIS Engine applications



Essentials for the ArcGIS 10 Developer



New Development Features



New Deployment Considerations



Summary & Future



Questions

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.NET ArcGIS Engine Applications

- **What is ArcGIS Engine?**
 - GIS components and Developer Resources
- **Why use ArcGIS Engine?**
 - Embed spatial functionality
 - Standalone GIS application
 - Background spatial tasks
- **Leverage the power of ArcGIS Desktop and Server**
 - Author Maps, Models, Geodatabases, Layers, Layer Packages
 - Host base maps and other services to be consumed by Engine

Developing using WinForms?

- **Development at 10.0**
 - Visual Studio 2008 .NET Framework 3.5 SP1
 - Engine or Desktop Runtime
 - New Integrated ArcObjects .NET SDK
 - Engine DeveloperKit License (single use)
- **Resources**
 - Visual Studio 2008 IDE Integration
 - Walkthroughs, Samples and Help
 - Resource Centres & Blogs



What about WPF?

- **Engine Controls are supported with WPF**
- **Core Differences:**
 - Host the Engine Control in the WindowsFormsHost
 - Set Engine Control properties programmatically
 - Wire up Events manually



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Essentials for the ArcGIS 10 Developer

- Bind and License
- Coding Practices
- Code Migration Analyzer

Essentials for the ArcGIS 10 Developer

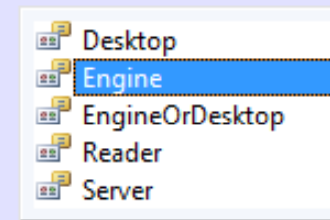
- Engine applications need a Desktop or Engine Runtime
- At 10.0 these Runtimes live in different install directories
- Service pack Engine and Desktop Runtimes independently
- **ESRI.ArcGIS.RuntimeManager**
 - InstalledVersions → RuntimeCollection
 - RuntimeInfo → Path, Product & Version
 - Bind – application to a Runtime
 - ActiveRuntime



Essentials for ArcGIS 10 Executables - Bind

- At 10.0 an application must **BIND** to a Product before calling any other ArcObjects

```
ESRI.ArcGIS.RuntimeManager.Bind(ProductCode.
```

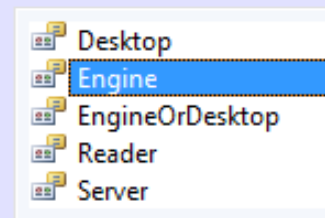


- Purpose of **BIND**
 - Specify the exact Product
 - Provide a customer focused message
 - If an application needs Desktop assemblies – Bind(Desktop)
 - If an application can use either – Bind(EngineOrDesktop)
 - If an application should use Engine only – Bind(Engine)

3 Options to Bind and License

1. Bind and place LicenseControl onto form
2. Bind and call AoInitialize
3. BindLicense

```
RuntimeManager.BindLicense(ProductCode.);
```



Essential Coding - Practices

- Set the executable project **Target Platform to x86**
 - ArcObjects are 32-bit
 - Not safe to run on 64-bit process
- Set ESRI assemblies **Specific Version** property
 - No policy files
 - Encourage develop to a specific version



- How to migrate ArcGIS 9.3 Desktop and Engine stand-alone applications to ArcGIS 10

Essential Coding – Architectural Changes

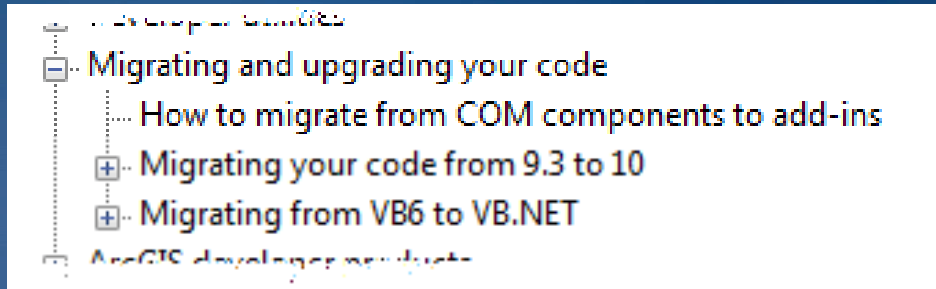
- Engine Controls all in **ESRI.ArcGIS.AxControls**
- **ESRI.ArcGIS.ArcWeb** – removed
- **ESRI.ArcGIS.ADF** – replaced with **ESRI.ArcGIS.ADF.Local**
- **HKEY_LOCAL_MACHINE\SOFTWARE\ESRI** keys changed
- **Schematics** commands in **ESRI.ArcGIS.SchematicControls**



- How Migrating your code from ArcGIS 9.3 to ArcGIS 10.0
- Type changes between ArcGIS 9.3 and ArcGIS 10.0

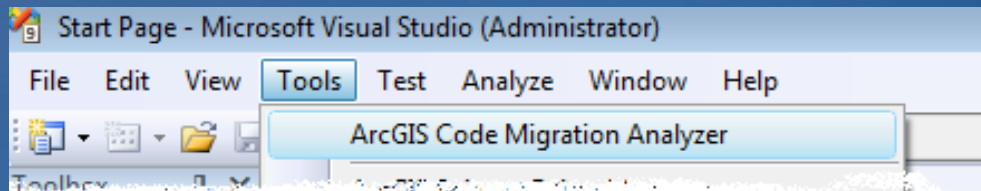
Essentials – Code Migration

1. ArcObjects .NET SDK



2. Visual Studio 2003/2005 to Visual Studio 2008

3. Code Migration Analyzer



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New Development Features

- User Interface and Commands**
- GraphicTracker**
- Background Geoprocessing**

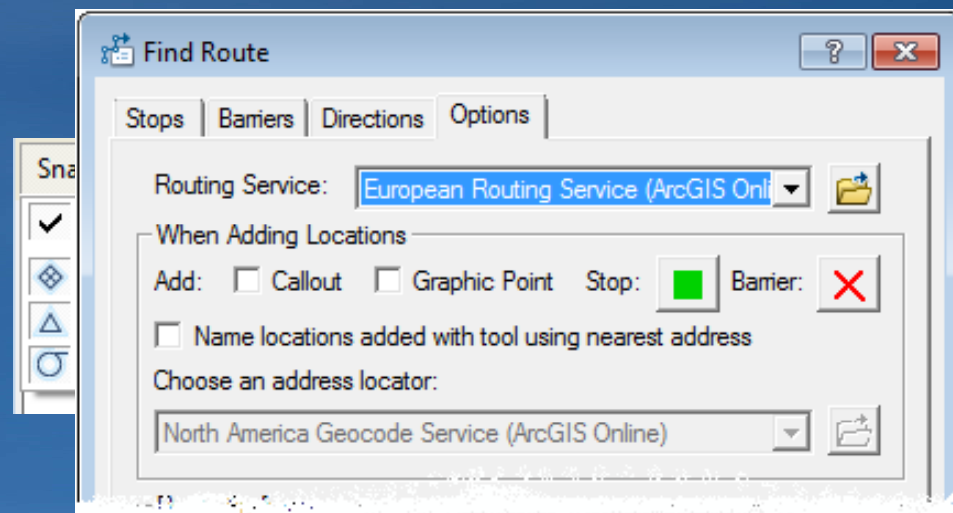
New Features – UI and Commands

- **Commands have higher quality icons**
 - ArcGIS 10.0 supports new PNG image formats



- Available in ArcGIS\DeveloperKit10.0\icons

- **New Commands**
 - Snapping Commands
 - Find Route



Background Geoprocessing

- **Geoprocessing**
 - Engine can utilize the Toolboxes, Tools, Models and Scripts
 - Provided with the Desktop product
 - Created by the Desktop user
 - Within the limits of Licensing
- **Why use Geoprocessing**
 - Cuts down code duplication
 - Why reinvent the wheel?
- **How to run Geoprocessing**
 - IGeoProcessor2 or Geoprocessor

New Features – Background Geoprocessing

- **Perfect for GUI driven applications**
 - Allows the UI to remain responsive while process is running
- **Run Geoprocessing tools in a separate process**
- **Great alternative to multithreaded applications**
- **ArcObjects is difficult to work with in Multithreading environment**
 - Sometimes its not worth it
- **GP Tools are not thread safe**



New Features – GraphicTracker

- Simple to use API
- You provide the coordinate feed
- Use the provided API to move features on the map
- When used in conjunction with Base Maps provides a powerful easy to develop option
- Just works in 2D, 3D, and Dynamic Display mode



Tracking Dynamic Objects – other Options

- **Dynamic Display**
 - Not a Plug-and-play solution
 - Requires heavy customizations
 - Not a traditional GIS solution
 - Open GL
- **Tracking Analyst and Tracking Server**
 - Tracking Analyst Extension
 - Tracking Server
 - Temporal Layer
- **Custom Layer**
 - Requires heavy customizations

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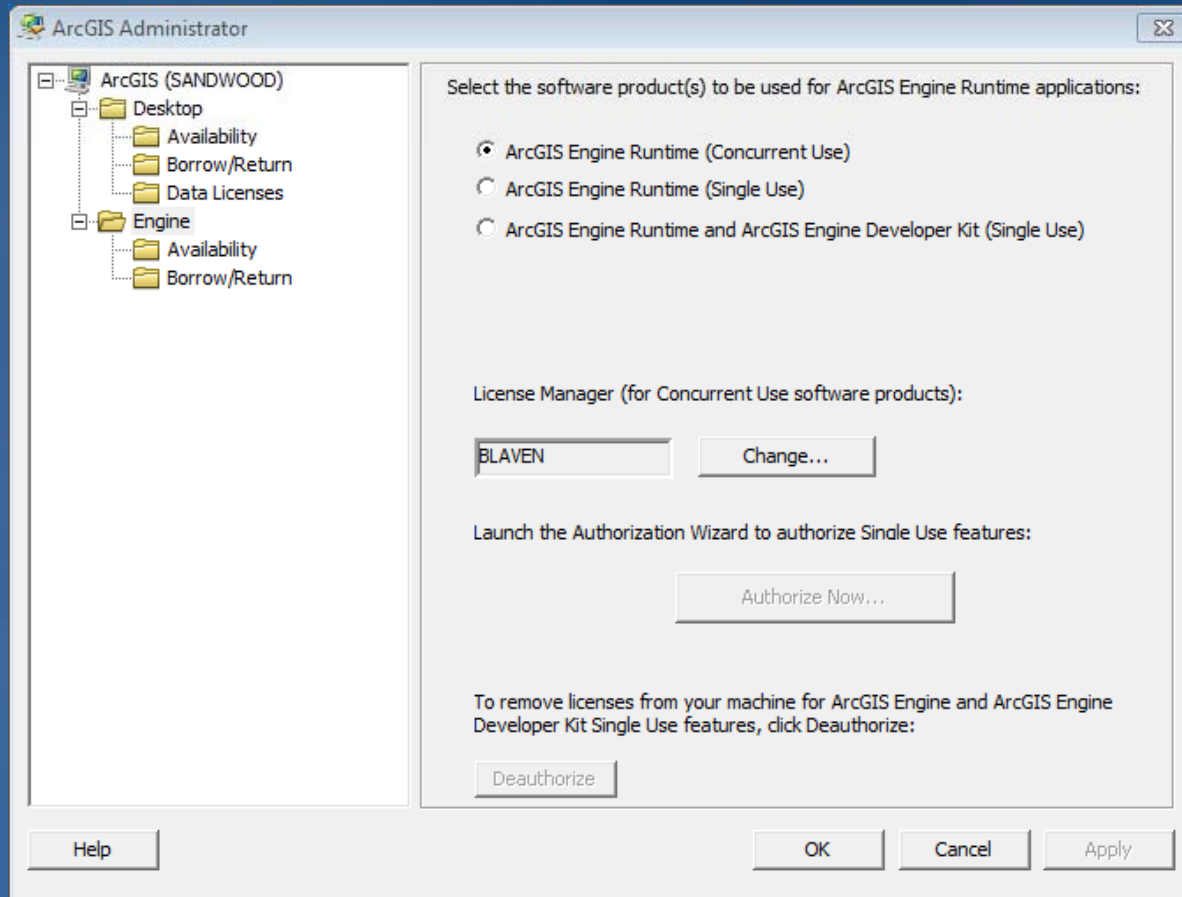


New Deployment Considerations

- Concurrent Runtime Licenses**
- Smaller Engine Runtime**

New Deployment Considerations

- Concurrent Engine Licensing – ArcGIS Administrator



New Deployment Considerations

- **Smaller Engine Runtime Footprint**
 - **Data Interoperability is now an optional extension with a separate install**

Miscellaneous

- **ArcGIS Online & Bing Maps**
- **BaseMaps**
- **Localization – IArcGISLocale**
- **API Evaluator**

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