



# Strategies for Packaging and Deploying Your ArcGIS Solutions

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# Agenda



- Review of ArcGIS Engine Development Workflow
- How does ArcGIS Engine licensing work
- How to handle copy protection
- Author Setup Programs
- Demonstration

# Developers



- Introductions
- What's your experience with Deploying ESRI Software?

# ArcGIS Engine

Web  
Browsers

GIS Logic  
Embedded in  
Application

Custom  
Applications

GIS  
Desktop

Simple, focused functions

Full GIS functions

# ArcGIS Engine

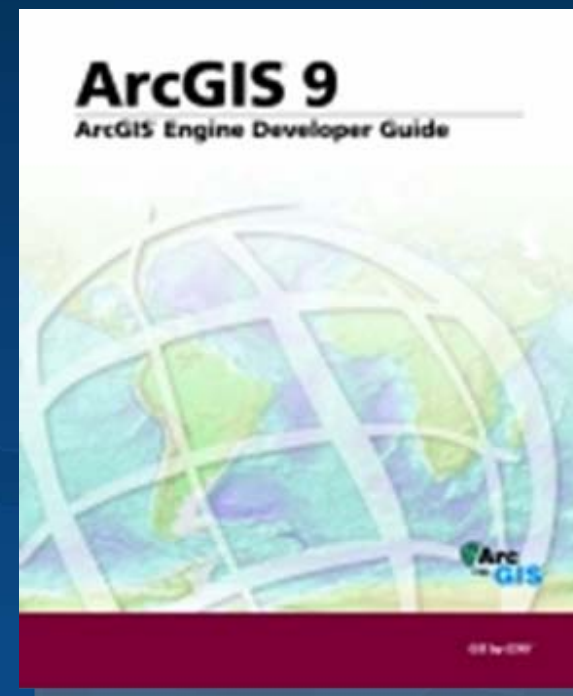


- ArcGIS Engine Developer Kit
  - The toolkit for building and deploying custom desktop ArcObjects-based solutions (VB 6, .NET, Java, C++)
- ArcGIS Engine Runtime
  - The platform for running cross platform custom desktop solutions built with the Engine Developer Kit

# ArcGIS Engine Developer Kit



- Engine ArcObjects support for
  - COM, .NET, Java, and C++
- Developer controls
- Developer resources
  - Help, doc, samples, etc.
- Engine Runtime for testing

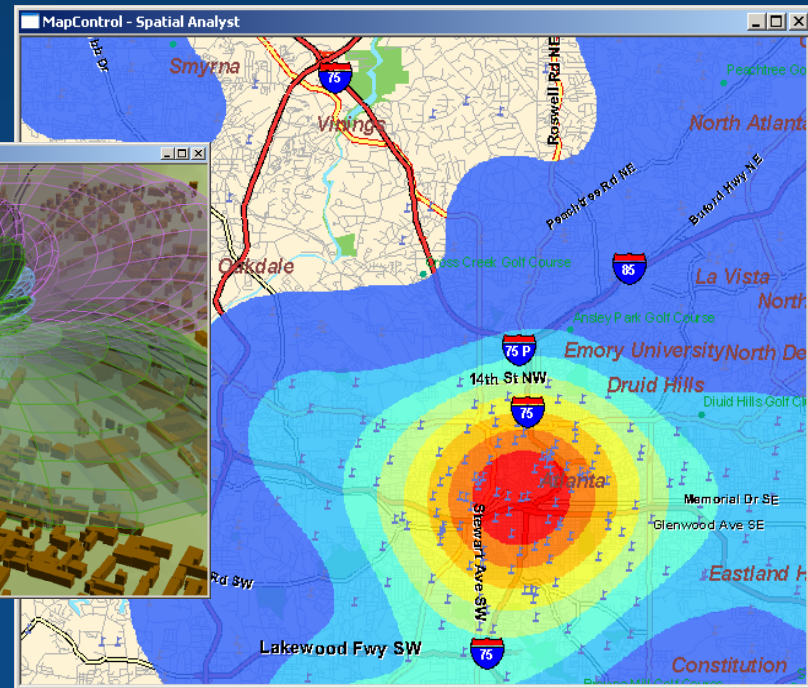
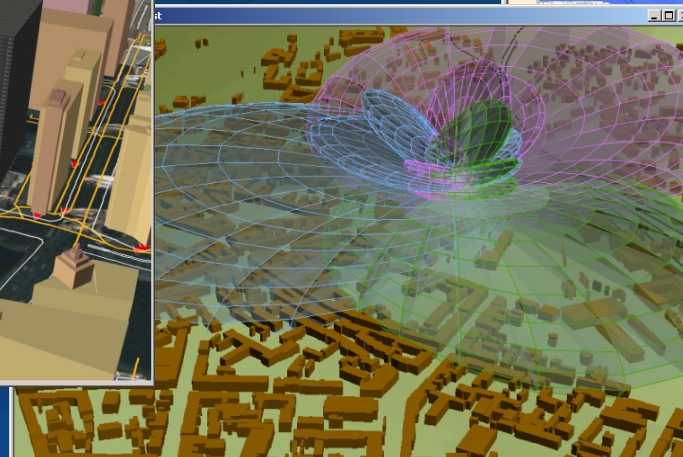
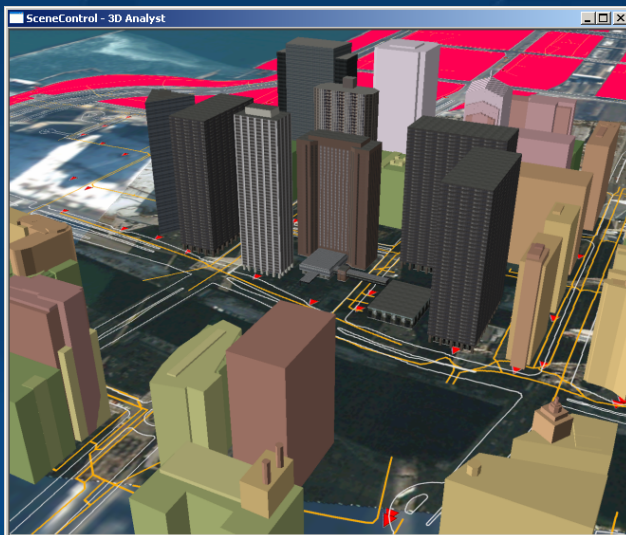


**Product for Developers**

# ArcGIS Engine Development Process



- Create and author data and maps
- Determine the type of application
- Consider licensing as part of your initial design
- Develop the application functionality



# ArcGIS Engine Developer Kit Licensing



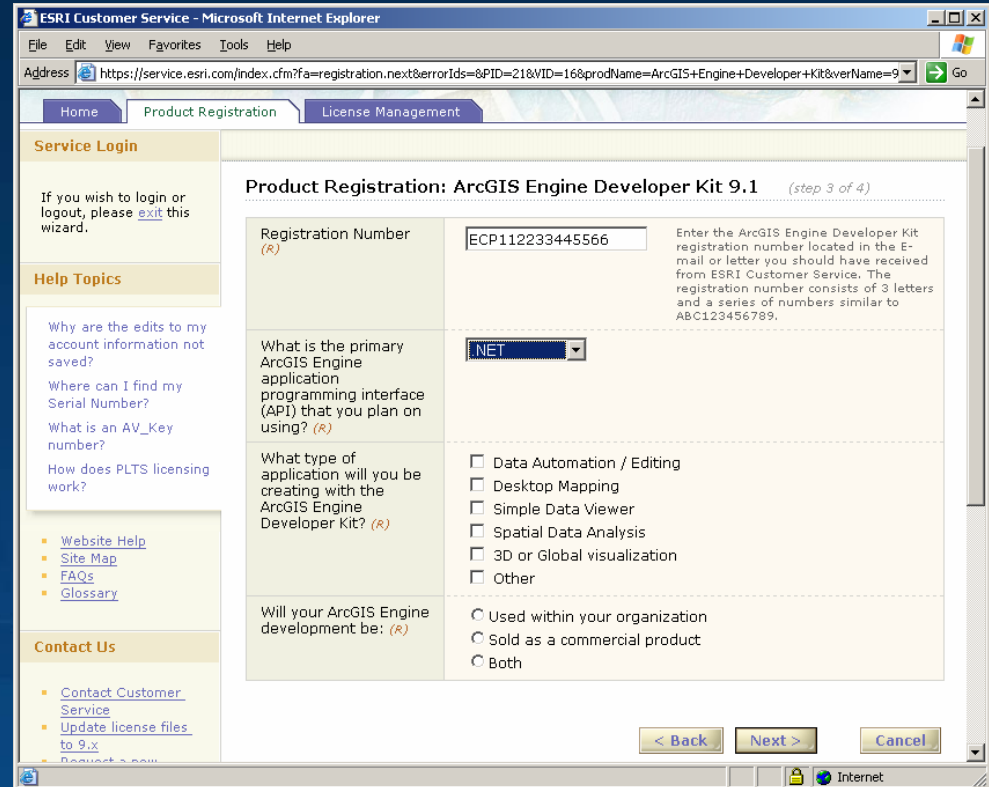
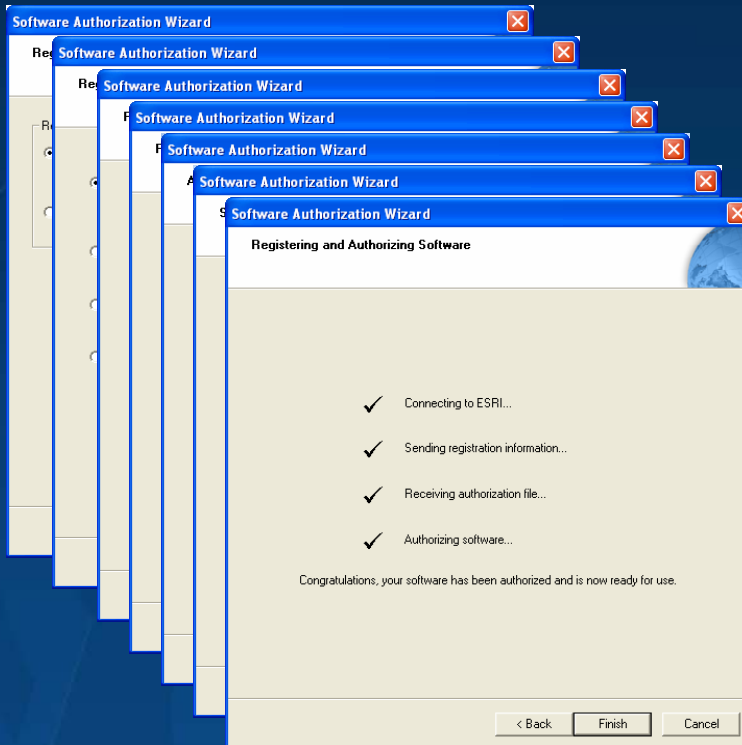
- Licensed and sold per developer
  - Part of EDN
- Single user
- Authorization file required based on product registration number
- No hardware key

# Software Developer Kit Authorization



- ESRI Copy Protection unlocks ArcObjects
- Purchase ArcGIS Engine Developer Kit
  - ECP Registration Number (e-mail or letter)
- Register product with ESRI Customer Service
  - Software Authorization Wizard
  - Customer Service web site
  - Phone or fax

# Authorization Process



service.esri.com

# ArcGIS Engine Copy Protection – Designer License (Design Time License)



- Designer license feature allows you to “design” and “develop” ArcGIS Engine applications
- Codes in the .ecp file
  - designer
  - standardengine
  - gdbedit
  - streetmapengine
  - networkengine
  - spatialengine
  - 3dengine
- All levels of functionality are available for development
- AuthorizationSummary.exe to verify license

Authorization Summary

Your Software Authorization file contains the following features.

Feature description	Feature name	Expiration date	Version	Registration number	Authorization code
ArcGIS Engine 3D	3dengine	30-sep-2005	91	ecp351947083	9TJDFAX\$TLJLRTAD211
ArcGIS Engine Develo...	designer	30-sep-2005	91	ecp226004192	S08LJALHPELSLGTRE098
ArcGIS Engine Runtime	standardeng...	30-sep-2005	91	ecp100002456	KGF750NHM7KJ455N0187
ArcGIS Engine Spatial	spatialengine	30-sep-2005	91	ecp315913863	TRC4Z*KEJ3Y5E2CAH106
ArcGIS Engine StreetM...	networkengi...	30-sep-2005	91	ecp676050365	9TJGMH4Z10YJ2ZLN113
ArcGIS Server	arcgisserver	30-sep-2005	91	ecp568023618	2K0RHK6Z4M9F5BPNR081
ArcGIS Server 3D	3dserver	30-sep-2005	91	ecp459920460	3M20E7TL06PSAP544109
ArcGIS Server Spatial	spatialserver	30-sep-2005	91	ecp423966646	2K0LZ0PCIMNH8F2L006
ArcGIS Server StreetM...	networkserver	30-sep-2005	91	ecp694040362	3M1RLDZS*EPJYB1TR123
Geodatabase Read/AW...	gdbedit	30-sep-2005	91	ecp172022683	D7LJPPHEG58HAA7PE004

Refresh Close



# ArcGIS Engine Runtime



- Runtime needed for all custom applications built with Engine Developer Kit
- Core set of ArcObjects
- No ArcGIS Desktop applications in the Engine Runtime
- Provides a GIS platform

# ArcGIS Engine Runtime (cont.)



- Standard Engine Runtime
  - Data access, map authoring, analysis, and simple feature editing
- Engine Runtime Extensions
  - 3D (Scene and Globe)
  - Spatial
  - Geodatabase Update
  - Network
  - StreetMap USA (part of standard Engine Runtime at 9.1)
  - 9.2: Tracking, datainterop, maplex, schematics

# Custom Engine Applications

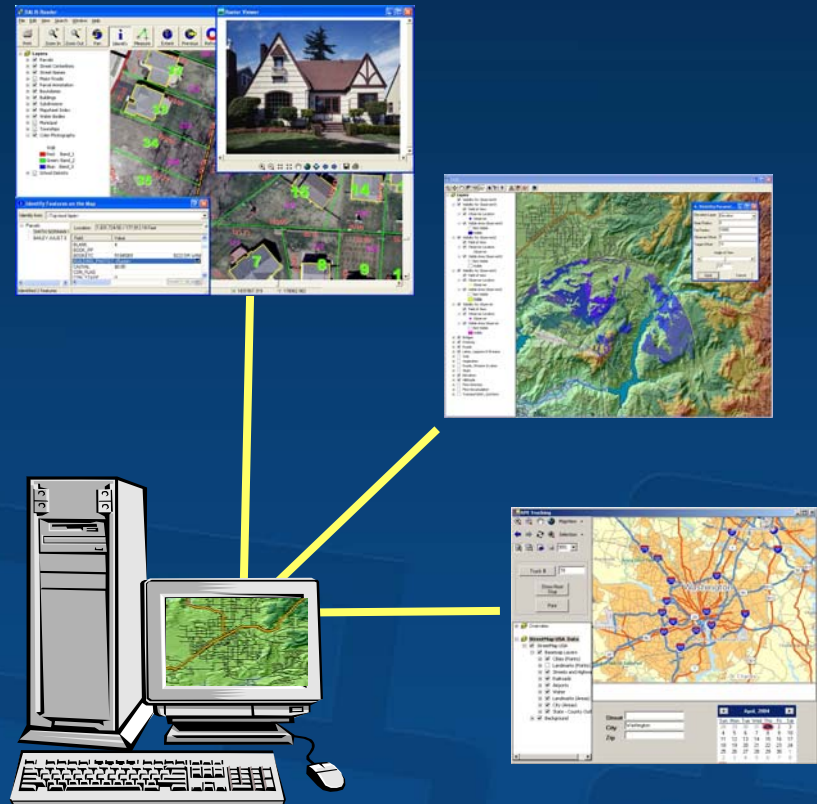


- An Engine application built with Engine Developer Kit runs on
  - Existing ArcGIS Desktop 9 license
  - ArcGIS Engine Runtime license
- Application Developer has control over what license is required to run an application

# Engine Runtime Licensing



- One Engine Runtime per machine
- Runtime can support multiple applications





# Licensing ArcGIS Engine Applications

# ArcGIS Product Licensing Model



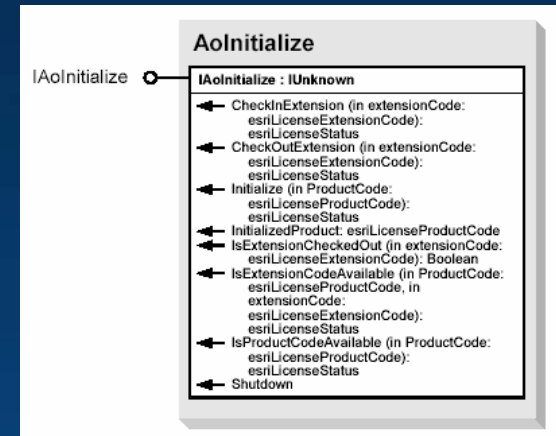
- ArcGIS Engine and Desktop are functionally similar
- Two levels of licensing
  - Product
    - ArcView, ArcEditor and ArcInfo
    - Engine standard and GDB Update
  - Extension
    - Spatial, 3D, Network, ...

	Desktop	Engine Runtime
<b>Standard</b>	ArcView	Standard Engine
<b>ArcSDE Edit</b>	ArcInfo ArcEditor	Geodatabase Update Option
<b>Extensions</b>	3DAnalyst...	3D...

# ArcGIS Engine Runtime Copy Protection



- All applications must initialize a product license at runtime
- LicenseControl
- Use `esriSystem::AoInitialize`
- Product codes available
  - ArcView
  - ArcEditor
  - ArcInfo
  - Engine
  - EngineGeoDB



```
[STAThread]
static void Main()
{
    //ESRI License Initializer generated code.
    m_pLicenseInitializer.InitializeApplication(new esriLicenseProductCode[]
        { esriLicenseProductCode.esriLicenseProductCodeEngine },
        new esriLicenseExtensi

Application.Run(new frmMai

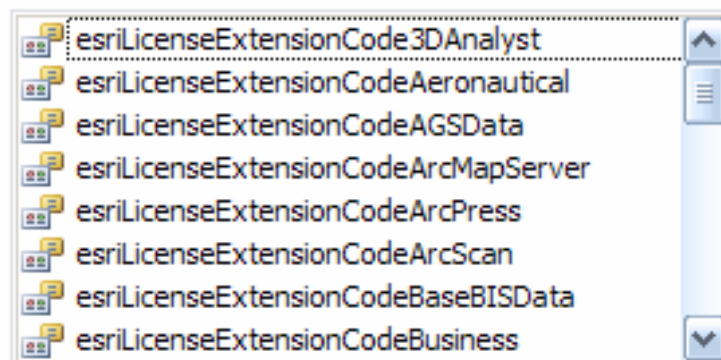
//ESRI License Initializer
//Do not make any call to
m_pLicenseInitializer.ShutdownApplication();
}
```



# ArcGIS Engine Runtime Licensing: Extensions

- Applications can also initialize an extension license
- Extension codes available
  - 3DAnalyst, SpatialAnalyst, Network, etc

```
static void Main()
{
    //ESRI License Initializer generated code.
    m_pLicenseInitializer.InitializeApplication(new esriLicenseProduct
        new esriLicenseExtensionCode[] {
            esriLicenseExtensionCode. });
}
```



# Consuming ArcGIS Engine or Desktop Licenses



- Applications can initialize an ArcGIS Engine or Desktop license
- Use `IAoInitialize::IsProductCodeAvailable`
- May want to prompt the user ...

```
' Try to check out Engine license first
If m_pAoInitialize.IsProductCodeAvailable(esriLicenseProductCodeEngine) =
  esriLicenseAvailable Then

  m_pAoInitialize.Initialize esriLicenseProductCodeEngine

' Try to check out Desktop license next
ElseIf
  m_pAoInitialize.IsProductCodeAvailable(esriLicenseProductCodeArcView) =
    esriLicenseAvailable Then

  m_pAoInitialize.Initialize esriLicenseProductCodeArcView

End If
```

# Licensing Rules



- License initialization must occur before any ArcObjects code executes
- A product license can be checked out only once for the duration of the application
- Extension licenses can be checked in and out as necessary
- Cannot combine or mix product and extension licenses
  - Engine RT must match Engine Extensions
- Always attempt to consume the lowest level of licensing possible



# Development and Deployment Steps



1. Develop the application
2. License the application
3. Build a setup and deployment program
4. Install and authorize

# Deployment Scenarios



1. End user does not have ArcGIS Engine Runtime
2. End user has ArcGIS Desktop installed

# End User Does Not Have ArcGIS Engine Runtime



- Deployment options:
  1. Your install prompts user to contact ESRI to purchase Runtime
  2. You install the runtime for them
- End user still needs to authorize software
  - Contact ESRI to register the runtime
  - Authorize the software with the .ecp file
  - Updates C:\Program Files\ESRI\License\sysgen\keycodes
- Notes
  - Economical and easiest methodology for developers
  - End user will have to purchase the correct runtime license and extension

# End user has ArcGIS Desktop installed



- Still required to install ArcGIS Engine Runtime
- Your application will have to check out an ArcGIS Desktop license
- Different licenses available
  - Concurrent license
  - Single-seat license
- Your application may be limited by the product license available
  - ArcView: Cannot update ArcSDE databases
- Notes:
  - Checking out desktop licenses can be expensive



# What if I don't want my customers to have to contact ESRI to get a License?

- Your setup or application can automatically install and authorize the ArcGIS Engine Runtime
- Methods
  1. Install program can call  
`SoftwareAuthorization.exe /LIF <LicenseFile.ecp>`
  2. Use AuthorizeLicense coclass and pass in a license code
- Requirements to redistribute a license:
  - Must have an OEM agreement with ESRI
  - Requires that you are a business partner with ESRI
- Contact
  - ESRI Business Partner Group or your International Distributor
- Under no circumstances can you distribute the .ecp file

# Planning for a setup program



- Some things to keep in mind when deploying the Engine Runtime setup
  - ArcGIS products all install to a common installation location.
  - The first product installed dictates the installation location for all subsequent products. It is important to allow the user to select the installation location.
  - Do not allow your setup program to uninstall the Engine Runtime
  - Users should be instructed to manually uninstall Engine Runtime if they no longer require it.

# Planning for a setup program



## Some other things to keep in mind ...

- Engine Runtime can be deployed with User Interaction or using command line parameters.
- Microsoft does not support nested MSIs where an MSI setup program includes another MSI setup program.
- You can only deploy or redistribute the entire setup, you can not bundle resources from Engine Runtime
- Command line and Engine Runtime deployment information available in Appendix D of the Developer's Guide.

# Planning for a setup program



- The ESRI installation team uses Wise for Windows Installer (WFWI) 6.2 for setup authoring.

# Methods to deploy Engine Runtime



1. End user runs Engine Runtime setup directly from the CD.
2. Developer includes Engine Runtime setup with their application's setup program.

# End user installs Engine Runtime from CD



- Developer can include Engine Runtime on their CD.
- Additional Engine Runtime CDs can be obtained from ESRI Customer Service.

# Developer includes Engine Runtime



- Engine Runtime can be run silently using standard msixexec commands.
- Engine Runtime can be run with the GUI.
- Use registry keys to check for existing installation of Engine Runtime.
- Use registry keys to check for optional DotNetRuntime feature.

# Methods to include Engine Runtime



- Launch with your MSI-based setup.
- Launch within a scripted setup.
- Launch within a batch file.

# Testing Guidelines



- Test on all supported platforms.
- Test on machines with little or no other products installed such as Office, Visual Studio.
- Ensure that all conditions are tested (such as if Engine Runtime 9.2 is required, test with Engine Runtime 9.1 on the machine, etc).
- Test installation and uninstallation. Check that all installed files are removed.

# Demonstration



- The demonstration covers the scenario of deploying Engine Runtime, authorizing it and installing a third party developed application for .NET for internal deployment.
- The deployment of Engine Runtime will be in User Interface mode so the user can select the installation target location.

# Authoring a Setup Program



1. Create the setup project
  - Product Summary information
  - Registry Keys
  - Features (optional)
2. Launch Conditions
  - Components required for the setup to run – such as .NET Framework, Engine Runtime, etc.
3. Prerequisites
  - Engine Runtime, your setup.exe would install it if not found. (your setup.msi would not run without it)
4. Add your solution files to the setup project.

# Launch Condition Error Example



The screenshot shows the Windows Registry Editor window. The left pane displays the tree structure, with the path `HKEY_LOCAL_MACHINE\SOFTWARE\ESRI` expanded. The right pane shows a list of registry values. A red circle highlights the values from `(Default)` to `SourceDir`.

Name	Type	Data
(Default)	REG_SZ	(value not set)
BuildNumber	REG_SZ	09.20.00.01146
InstallDate	REG_SZ	3/16/2006
InstallDir	REG_SZ	C:\Program Files\ArcGIS'
Installer	REG_SZ	mita
InstallTime	REG_SZ	8:13:54
InstallType	REG_SZ	Typical
MainDir	REG_SZ	C:\Program Files\ArcGIS'
ProductName	REG_SZ	ArcGIS Engine Runtime
RealVersion	REG_SZ	9.2 Beta 2
Software Authorization	REG_SZ	TRUE
SourceDir	REG_SZ	C:\PGIS\setup\FILEPATH

An "Installer Information" dialog box is overlaid on the bottom right, containing the following text:

The PlanetGIS setup requires ArcGIS Engine Runtime with .NET support feature installed.

OK

# Summary



- Four basic steps to deployment
  1. Develop the application
  2. License the application
  3. Test with the “test” ecps
  4. Deploy to end users (they license the machine)
- MSI is freely deployable
- ArcGIS Engine Runtime is required on all deployment machines

# Resources



- Appendix D of the Developer's Guide
- Chapter 5 Licensing and Deployment of the Developer's Guide
- EDN website (<http://edn.esri.com>)
- ESRI Support website (<http://support.esri.com>)
- Important Registry Keys mentioned
  - HKLM\Software\ESRI\ArcGIS Engine Runtime
    - InstallDir
    - RealVersion
    - .NET\_Support
  - HKLM\Software\Microsoft\NETFramework\Policy\V2.0
    - 50727

# Session Evaluations Reminder



Session Attendees:  
Please turn in your session evaluations.

*... Thank you*