

2011 Esri Developer Summit

Palm Springs, CA

**Dev-to-Dev:
The Esri Development Process
Software Configuration Management**

Dar Nielsen



SCM – Tools and Strategies for ArcGIS

For Small, Medium and Large Development Projects

- Source Code Architecture
- Version Control
- Build Management
- Archiving Resources
- Managing and Maintaining Developer Information

Scope of ArcGIS Development

Are we large?

- 200 PEs and Devs working in the codeline daily
- 200 Solutions
- 1200 Projects
- 95,000 Files in build process
- 5 hour build process (Label codeline to create setups)

ArcGIS Source Code

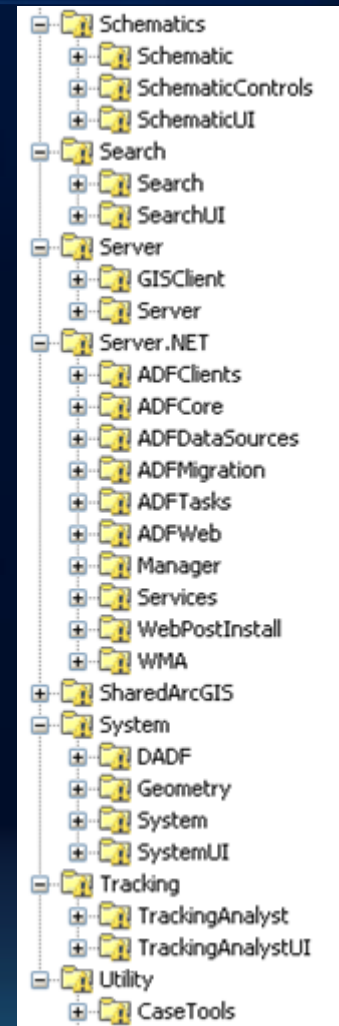
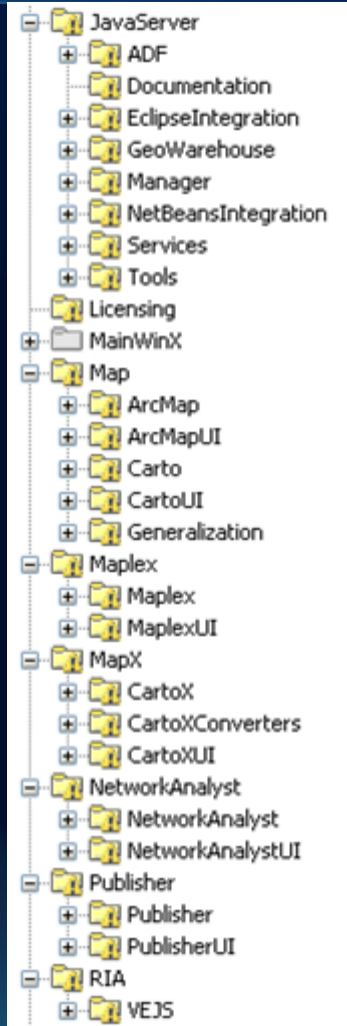
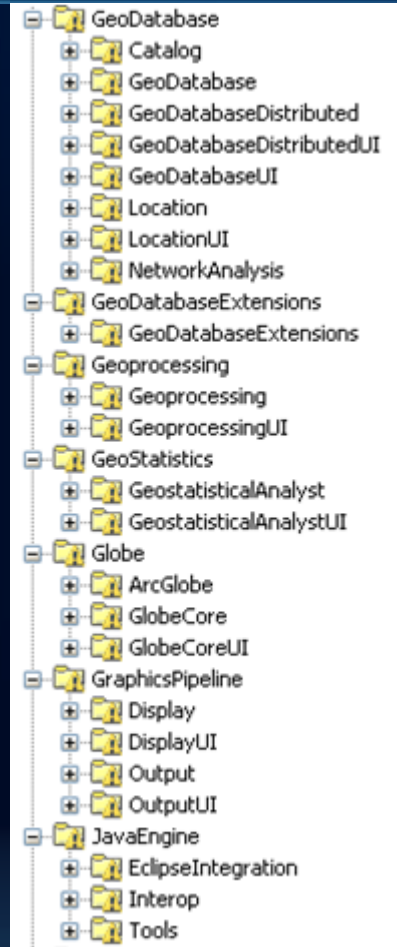
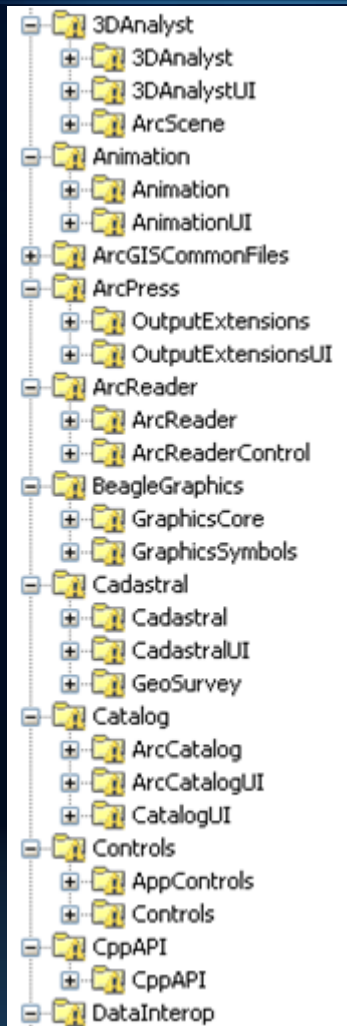
Are we large?

	Files	Source	Comment	Both	Blank	Total
9.0	23,048	4,497,987	1,164,112	136,043	1,134,811	6,932,953
9.1	25,302	5,272,188	1,395,981	198,109	1,748,184	8,614,462
9.2	39,262	7,679,735	1,964,784	186,978	1,877,027	11,708,524
9.3	44,381	8,851,827	2,239,888	255,160	2,137,263	13,484,138
10.0	49,429	10,725,328	2,383,965	296,514	2,564,839	15,970,646

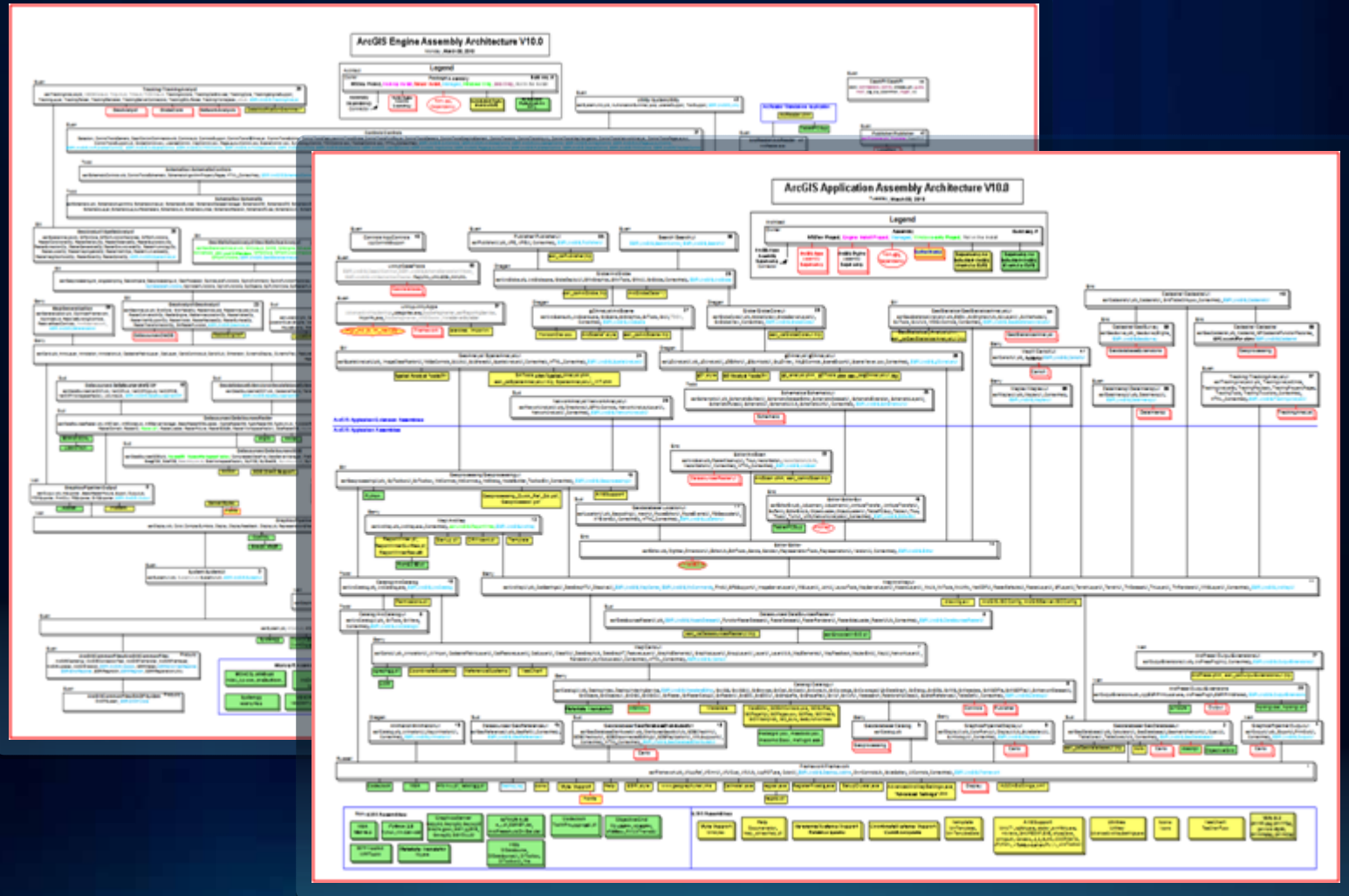
Line count (C, CPP, CS, H, IDL, JAVA, JS, JSP, RC)

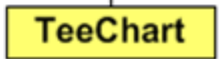
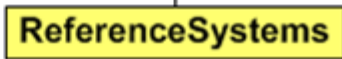
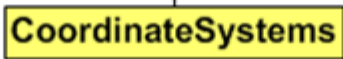
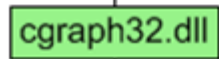
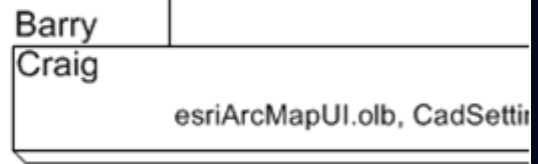
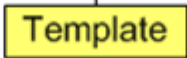
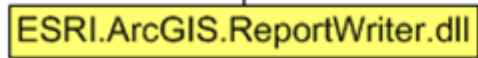
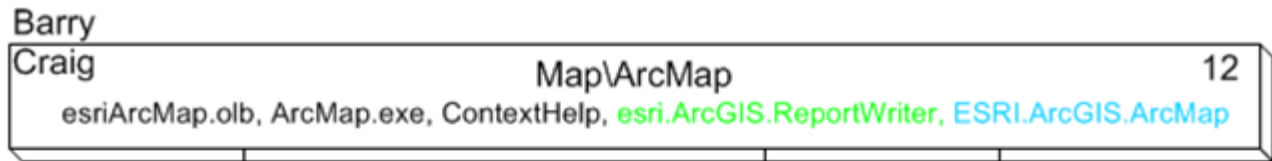
ArcGIS-Gold codeline (95K total files)

Architecture of Folder Structure



Architecture Represented Graphically





Shared Source Code

Manage cross-feature build resources

- .h files shared across feature/function areas
- External binary dependencies

Source Code Management

The “heart” of development

- **Version Control – many to choose from**
 - Manage work items along with the source files
 - Good file merge and three-way compare ability
- **Manage all build resources in a single codeline**
- **Separate codelines used for non-build resources**
 - Runtime support files
 - Test
 - Third party source code
 - etc

Source Code Management

Branching... Do you really need a branch?

- **Source code on a developers disk is a branch**
 - Develop and checkin incrementally to main codeline
- **You can develop in the main codeline**
 - New functional areas
- **Research managed independently of the codeline**
 - Is not a branch

Source Code Management

Creating branches...

- **Create branches to protect stability**
 - Protect main codeline from development
 - Protect development from daily code churn
- **Always create a branch for Service Packs**
 - QFE fixes move from main codeline to SP branches
- **Projects with a well defined plan and timeline**
 - Shows team is invested in success of project

Build Management

The “heartbeat” of development

- Automate the entire build processes
 - We use FinalBuilder for Windows builds
- Daily scheduled build, or build “Continuously”
- Report build status dynamically in real time
- If the build breaks...



Archiving Resources

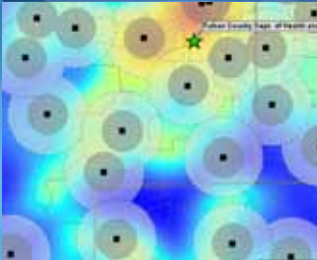
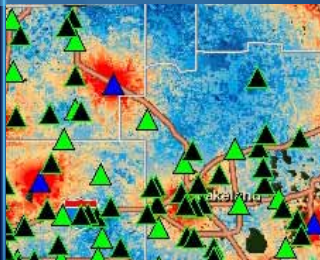
Use a “disk server” to...

- **Maintain the last 30 daily builds:**
 - **Built binaries including .pdb files for SymbolServer**
 - **Setups**
- **Maintain all publically deployed releases permanently**
 - **Built binaries, including .pdb files for SymbolServer**
 - **Setups**

DeKalb County Board

Fulton County Dept. of Health and Wellness/District 3, Unit 3, G

Demo: Developer Central

A screenshot of a software interface, likely a GIS application, showing a list of data items. The list includes columns for Name, Type, and other attributes. The items are organized into a tree-like structure.

Developer Central

This Site: Developer Central

Site Actions

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Lists

- Developer Tools
- 10 BuildErrors
- Internal Presentations
- Third Party Dependencies

Discussions

- General Discussion
- Visual Studio Discussion
- StarTeam Discussion
- Build Discussion
- StarTeam Change Request Discussion
- ArcGIS Developer tools
- Side-By-Side
- Source code Validation - SCV
- Getbuild Discussion
- Error Reports (Crash dumps)
- ArcGIS Server

Surveys

Recycle Bin

ArcGIS Developer Information Site

If you have a questions related to any aspect of the ArcGIS Developer environment, use the appropriate Discussion on the Explorer bar on the left side of this page.

Quick Links - 10.0

- 10.1 Daily Build Page
- 10.1 Source Search
- Source code Validation [Tryo94 Server]
- Crash dumps & Symbol Servers
- ArcSDE Build status
- ArcGIS 10.1 Gold Tree and the War Room Procedures (PPT files)
- Daily Setup Status
- Coding Guidelines 10.1
- Development Branched views site
- 10.0 Architecture (Concordia) site
- 9.2 Architecture (EngineArchitecture View)
- EDN
- VMWare lab manager
- Service Pack build & Release Information
- Change Request/Issue tracking SharePoint site
- Find a Change Request
- Assembly Architecture diagrams
- 3rd Party Dependencies

Add new link

Developer System Setup

Title
10.1 Developer System Setup to Build Mobile.
10.1 Developer System Setup to Build ArcGIS.
10.0 Developer System Setup to Build ArcGIS.
9.4 Server Developer System Setup to Build ArcGIS.
9.4 Developer System Setup to Build ArcSDE.
9.3 Developer System Setup to Build ArcGIS.
9.2 Developer System Setup to Build ArcGIS.



Contacts

Last Name
GetBuild
ArcGIS Builders
StarTeam Administration
Source code Validation - SCV
Error reports (Crash dumps)
Setup Builders

StarTeam Cheat Sheets

- StarTeam Installation Instuctions
- StarTeam GUI Use Tips

Developer Disk Locations

URL	Notes
Current - 10.1 ArcGIS Resources	
Current - ArcGISRuntime Resources	
Daily Build 9.3.1 SP1 Debug	
Daily Build 9.3.1.SP1 Release	
Daily Build 10.0 SP Debug	
Daily Build 10.0 SP Release	
Daily Build 10.1 Debug	
Daily Build 10.1 Release	
Developer Only - Archived ArcGIS	

Daily Build Status

- Build Processes
 - ArcGIS
 - ArcGIS 10.1 Release 32bit
 - ArcGIS 10.1 Debug 32bit
 - ArcGIS 10.1 Release 64bit
 - ArcGIS 10.1 Debug 64bit
 - ArcGIS Java 10.1 Release
 - Explorer
 - Explorer 1500 Release
 - DotNET
 - DotNET 2.0 Release
 - Mobile
 - Mobile 10.0 Release
 - Service Pack
 - ArcGIS 10.0 SP2 Release
 - ArcGIS 10.0 SP2 Debug

Details


Name	Value
Status Overview	Successful
Build	Complete
Build Number	10.1.0.2662
Build Date	Mon, Feb 21, 2011 12:08:34 PM

Status



Solution	Last Built	Status
Prebuild		
Pull Source	Mon, Feb 21, 2011 12:22:08 PM	Successful
Desktop		
System\System	Mon, Feb 21, 2011 12:24:00 PM	Successful
BeagleGraphics\GraphicsCore	Mon, Feb 21, 2011 12:27:03 PM	Successful
System\SystemUI	Mon, Feb 21, 2011 12:27:18 PM	Successful
System\Geometry	Mon, Feb 21, 2011 12:28:51 PM	Successful
BeagleGraphics\GraphicsSymbols	Mon, Feb 21, 2011 12:29:34 PM	Successful
BeagleGraphics\GraphicsPrint	Mon, Feb 21, 2011 12:30:07 PM	Successful
GraphicsPipeline\Display	Mon, Feb 21, 2011 12:31:04 PM	Successful
Server\Server	Mon, Feb 21, 2011 12:31:54 PM	Successful
GraphicsPipeline\Output	Mon, Feb 21, 2011 12:32:35 PM	Successful
Geodatabase\GeoDatabase	Mon, Feb 21, 2011 12:35:54 PM	Successful
Server\GISClient	Mon, Feb 21, 2011 12:36:32 PM	Successful
Server\ArcGISServerStartUp	Mon, Feb 21, 2011 12:36:39 PM	Successful
Datasources\DataSourcesFile	Mon, Feb 21, 2011 12:39:16 PM	Successful
Datasources\DataSourcesGDB	Mon, Feb 21, 2011 12:40:24 PM	Successful
Datasources\DataSourcesOleDb	Mon, Feb 21, 2011 12:40:51 PM	Successful
Datasources\DataSourcesRaster	Mon, Feb 21, 2011 12:45:34 PM	Successful
Datasources\DataSourcesNetCDF	Mon, Feb 21, 2011 12:46:07 PM	Successful
Geodatabase\GeoDatabaseDistributed	Mon, Feb 21, 2011 12:47:12 PM	Successful
GeoDatabaseExtensions\GeoDatabaseExtensions	Mon, Feb 21, 2011 12:48:23 PM	Successful
Map\Carto	Mon, Feb 21, 2011 12:52:33 PM	Successful
Maplex\Maplex	Mon, Feb 21, 2011 12:54:32 PM	Successful
Geodatabase\NetworkAnalysis	Mon, Feb 21, 2011 12:55:09 PM	Successful
Geodatabase\Location	Mon, Feb 21, 2011 12:57:31 PM	Successful
MapX\CartoX	Mon, Feb 21, 2011 01:01:05 PM	Successful
GeoAnalyst\GeoAnalyst	Mon, Feb 21, 2011 01:04:24 PM	Successful
Animation\Animation	Mon, Feb 21, 2011 01:05:00 PM	Successful
Map\Generalization	Mon, Feb 21, 2011 01:05:58 PM	Successful


ArcGIS Source Search

Interface

 Advanced Search





Results 1-10 of about 7,168. Your search took 0.14 seconds.

Results by Relevance | [View by Modified Date](#) |  Alert Me |  RSS
 **interface**





file://94testbuild4/searchserver2008_arcgisgold/arcgis/server.net/manager/arcgismanager/manager/app_code/servermanager/interface - 2/21/2011

 **interface**

file://94testbuild4/searchserver2008_arcgisgold/arcgis/server.net/manager/arcgismanager/manager/app_code/applicationmanager/interface - 2/21/2011

 **rastergraphicelements.idl**
... [default] **interface** IUnknown; **interface** IElement; **interface** IElementProperties; interfac ...
file://94testbuild4/searchserver2008_arcgisgold/arcgis/map/carto/apisupport/idl/rastergraphicelements.idl - 7KB - 11/2/2009
 **titusui.idl**
... **interface** for the modify edge task.), hidden] **interface** IModifyEdgeTask : IEditTask { }; ...
file://94testbuild4/searchserver2008_arcgisgold/arcgis/editor/editorext/apisupport/idl/titusui.idl - 18KB - 11/2/2010
 **gmxtools.idl**
... [default] **interface** IUnknown; **interface** IDDDToolbarEnvironment; }; [uuid(88F120E1-A9B ...
file://94testbuild4/searchserver2008_arcgisgold/arcgis/globe/arcglobe/apisupport/idl/gmxtools.idl - 41KB - 1/28/2011
 **sxtools.idl**
... [default] **interface** IUnknown; **interface** IDDDToolbarEnvironment; }; #ifndef _OLB_BUILD_ / ...
file://94testbuild4/searchserver2008_arcgisgold/arcgis/3danalyst/arcscene/apisupport/idl/sxtools.idl - 32KB - 12/22/2009
 **cadannotationlayer.idl**
... [default] **interface** IUnknown; **interface** ICoverageAnnotationLayer; **interface** ICoverageAnnota ...
file://94testbuild4/searchserver2008_arcgisgold/arcgis/map/carto/apisupport/idl/cadannotationlayer.idl - 3KB - 4/19/2010
 **representationeffects.idl**
/* COPYRIGHT © 2006 ESRI TRADE SECRETS: ESRI PROPRIETARY AND CONFIDENTIAL Unpublished material - all rights reserved under the Copyright Laws of the United States and applicable international ...
file://94testbuild4/searchserver2008_arcgisgold/arcgis/graphicspipeline/display/apisupport/idl/representationeffects.idl - 30KB - 6/15/2010
 **representationtools.idl**
... **interface** IRepresentationWindow : IUnknown { [helpcontext(71394), helpstring("Shows t ...
file://94testbuild4/searchserver2008_arcgisgold/arcgis/editor/editor/apisupport/idl/representationtools.idl - 28KB - 12/13/2009
 **Bing Suggestions:**

- ▣ [Interface Security Systems](#)
- ▣ [Interface Commercial Carpet](#)
- ▣ [Interface Electronics](#)

 **Bing:**
 **Interface Global**
Interface, Inc. is the world's largest manufacturer of modular carpet, which it markets under the InterfaceFLOR, FLOR, and Bentley Prince Street brands. Bentley ...
<http://www.interfaceglobal.com/>
 **Interface (computing) - Wikipedia, the free encyclopedia**
In the field of computer science, an interface refers to a point of interaction between components, and is applicable at the level of both hardware and software.
[http://en.wikipedia.org/wiki/Interface_\(computer_s...](http://en.wikipedia.org/wiki/Interface_(computer_s...)
 **Interface - Wikipedia, the free encyclopedia**
Technical journals. Interfaces (operations research) Journal of the Royal Society Interface; Science and technology, Biointerface; Interface (chemistry), boundary surface
<http://en.wikipedia.org/wiki/Interface>
 [More results ...](#)

ESRI Development Wiki

Welcome **AVWORLD\dar**

Concordia

Welcome to the Concordia Software Development Wiki

If you are new to Wiki, read [OneMinuteWiki](#) or [VisitorWelcome](#).

- [→ Show Changes](#)
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History

8/20/2008 2:54:16 PM
AVWORLD-nach5567
8/20/2008 12:27:37 PM
AVWORLD-nach5567
8/20/2008 12:27:22 PM
AVWORLD-nach5567

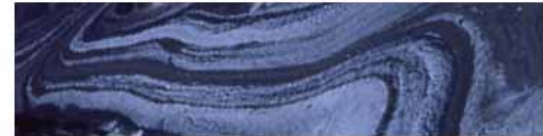
Coding Guidelines

Page Type: **Design**

Page Status: **Proposed**

Author: **Dar, Craig, Nachiket**











[Concordia Home](#) > [Concordia](#) > [Development Process](#) > [Coding Guidelines](#)



The purpose of this site is to coordinate and document coding guidelines. The coding guidelines are here to help you develop to the ArcGIS standards. These standards will change over time. The coding standards are written and maintained by many people who have a vested interest in these areas. If you have questions regarding the content of a page or if you feel that additions or changes should be made to a page, you should post your comments on [Coding Guidelines Discussion Forum](#) and you must coordinate those changes with the page's author.

Coding Guidelines Contents

ArcGIS Coding Guidelines

-  Introduction
-  Coding Standards
 -  Overview
 -  C++
 -  .NET
 -  Java
 -  COM
 -  IDL
-  Cross Platform
-  I18N (Internationalization)
 -  Overview
 -  Internationalizing the Code
 -  Making the Code Localizable

Derived View

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- General Discussion

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Recycle Bin

ArcGIS Derived View Information Site

Contains information about creating and working in a Derived View (Development Branch)

How to:

- Creating and Working in a Derived view
- Requesting a Development View
- Creating a Build for the Development View
- Merging the Development view back to Gold

OffCycleRelease

Project Name	Project Documentation	Dev Lead	Builder	CR Owner	QA Lead
FileGDB_API	http://devinfo/Software%20Releases/ArcGIS94/GroupSites/GeoData/FileGDB_OpenAPI/Project%20Phases/File%20GDB%20API%20Project%20Plan.doc	David Sousa	David Sousa	Lance Shipman	Lance Shipman

Add new item

Current Development Projects derived from Gold (10.0)

Project Name	Project Documentation	Dev Lead	Builder	CR Owner	QA Lead	Dev Alias	View Name	View ID
ArcGISMobile		Frederic Aubry	Frederic Aubry	Jeff Shaner	Jeff Shaner		ArcGISMobile	M...
Geronimo	http://devinfo/Software%20Releases/ArcGIS94/GroupSites/Core/3D/default.aspx	Dragan Petrovic	Ernest J Moran	Nathan Shephard	Deepinder Deol		943Development	M...
Aurora	http://devinfo/sites/dotnetadf/Aurora/Home.aspx	Art Haddad	Wilbur Hughes	Rex Hansen	Anne Reuland		Aurora	N...
Discovery	http://devinfo/Software%20Releases/ArcGIS94/GroupSites/Server/agisServer/discovery/default.aspx	Peter DSouza	Peter DSouza	David Cordes	David Cordes		Discovery	V...
FileGDB_API	http://devinfo/Software%20Releases/ArcGIS94/GroupSites/GeoData/FileGDB_OpenAPI/Project%20Phases/File%20GDB%20API%20Project%20Plan.doc	David Sousa	David Sousa	Lance Shipman	Lance Shipman		FileGDB_API	
Explorer 1500		Paul Pilkington	Dar Nielsen	Dara Burlo	Dara Burlo		Explorer 1500	A...
3DDevelopment	http://devinfo/Software%20Releases/ArcGIS94/GroupSites/Core/3D/default.aspx	Dragan Petrovic	Ernest J Moran	Nathan Warmerdam	Nathan Warmerdam		3DDevelopment	A...

Development Projects Merged and Closed (10.0)

Project Name	Project Documentation	Dev Lead	Builder	CR Owner	QA Lead	Dev Alias	View Name	View ID
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[Home](#)

Developer Central > Visual Studio Discussion

Visual Studio Discussion

[View All Site Content](#)**Documents**



- Shared Documents

Pictures**Lists**

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- ArcGIS Server

Surveys [Recycle Bin](#)New Actions Settings View: **Subject** 

Subject	Created By	Replies	Last Updated
Controlling intellisense	Julio Andrade	0	5/7/2010 4:29 PM
VS2010 breaks debugging MFC in VS2008	Dar Nielsen	0	4/26/2010 7:10 AM
unordered_map file missing after setting up a new developer system	Dar Nielsen	0	4/6/2010 8:37 AM
How can I avoid stepping into petty functions (such as smart pointer methods) while debugging?	Sergey Ivanenko	1	12/2/2008 5:33 AM
When solutions/projects take too long to load or appear to be hung ...	Sivabalan Muthukrishnan	0	9/8/2008 11:37 AM
Purify Integration with MS VS 2008	Sanjay Magal	0	9/2/2008 2:47 PM
Double clicking to open solution files on vista does not work	Sivabalan Muthukrishnan	0	8/1/2008 10:25 AM
Windows SDK Configuration tool	Sivabalan Muthukrishnan	0	6/30/2008 2:43 PM
What is the shortcut keys to build a solution?	Dar Nielsen	0	
What is the shortcut key to show breakpoints?	Dar Nielsen	0	
How can I get F7 to build the selected project?	Dar Nielsen	0	
Where is Class Wizard or how to added message handlers?	Dar Nielsen	0	
Where is a list of all the shortcut keys?	Dar Nielsen	0	
My custom build step is failing, is there a fix?	Dar Nielsen	1	
How do I fix an unknown error in hash.h?	Dar Nielsen	0	
What are the changes in ATL / MFC?	Dar Nielsen	0	
What is new in Visual Studio?	Dar Nielsen	0	
Where can I get information about WTL?	Dar Nielsen	0	
How do I setup a developer machine?	Dar Nielsen	0	
Where can I get Dependency walker?	Dar Nielsen	0	
Can I add TODO, HACK, or UNDONE to the task list window?	Dar Nielsen	0	
Can I add custom keywords to the task list window?	Dar Nielsen	0	
Can I store more than one item on the clipboard?	Dar Nielsen	0	
How can I get a summary view of code in a file?	Dar Nielsen	0	
Can I word wrap?	Dar Nielsen	0	

Recommended Reading

- **“Software Configuration Management Patterns”,
Stephen P. Berczuk with Brad Appleton**