

2011 Esri Developer Summit

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The File Geodatabase API

Craig Gillgrass
Lance Shipman



Schedule

- Cell phones and pagers

Please!
*Turn **OFF** cell phones
and paging devices*



- Please complete the **session survey** – we take your feedback very seriously!

Overview

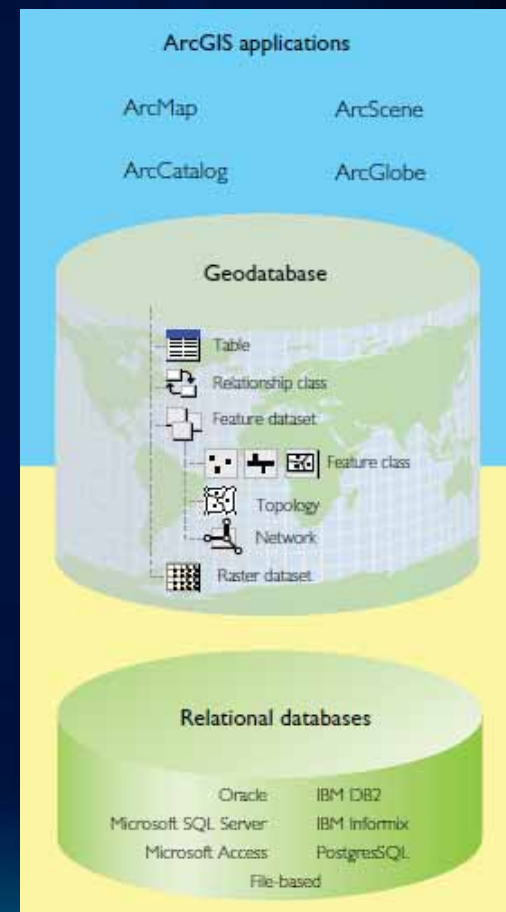
- **File Geodatabase API**
 - **Introduction**
 - **Supported Tasks**
 - **API Overview**
 - **Demo**
 - **What's not supported**

What is the geodatabase?

- **A collection of geographic datasets of various types used for managing spatial and non-spatial data.**
 - **Core ArcGIS data model**
 - **A physical store of geographic data**
 - **A transactional model for managing GIS workflows**

Geodatabase Data Management Approach

- **The geodatabase is built on an extended relational database**
- **Simple features + logic**
 - All geographic data stored as tables in a DBMS
 - Extend functionality and data integrity
 - Functionality is consistent across DBMS'
- **Application logic (software)**
 - Works on standard tables
 - Implements GIS integrity and behavior
 - Business rules, topology, networks



Inside the Geodatabase

- **A geodatabase contains datasets.**
 - **Datasets represent collections of information with a real-world interpretation.**
 - **Types of geographic datasets:**
 - **Tables**
 - **Object classes, feature classes, relationship classes**
 - **Feature datasets**
 - **Networks, Topologies, Raster and cadastral datasets**
- **Datasets have associated information to help manage integrity, behavior, and interpretation**
 - **Domains, Relational integrity, Topology, Metadata**

Inside the Geodatabase ...

- The geodatabase enhances data and thematic layers by adding rules and behavior

- Spatial and relational integrity rules
- Data validation
- Business logic

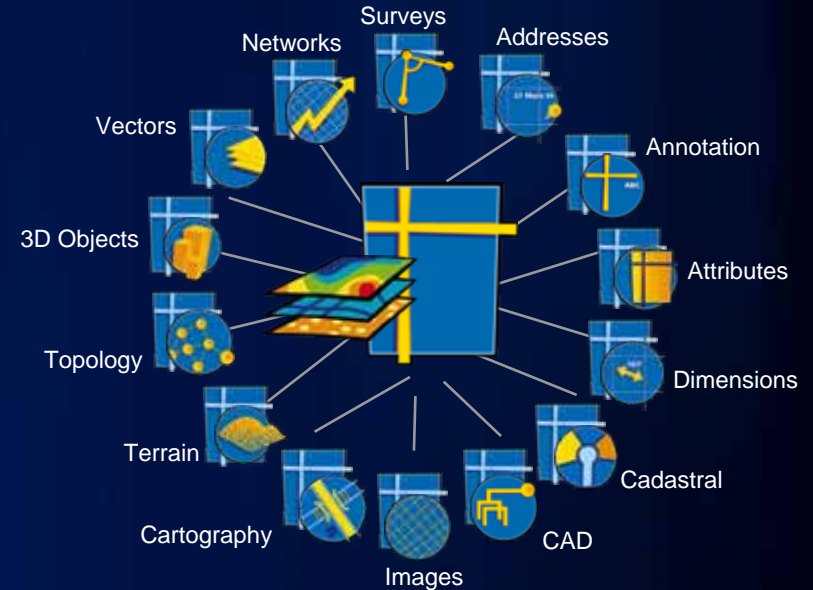
- Create thematic layers with behavior

- Road and utility networks
- Parcel fabrics
- Terrain and 3D surfaces
- Location services




- Extended framework for advanced workflows and editing

- Multiuser editing, Data Replication, Editor tracking, Archiving

Geodatabase Functionality



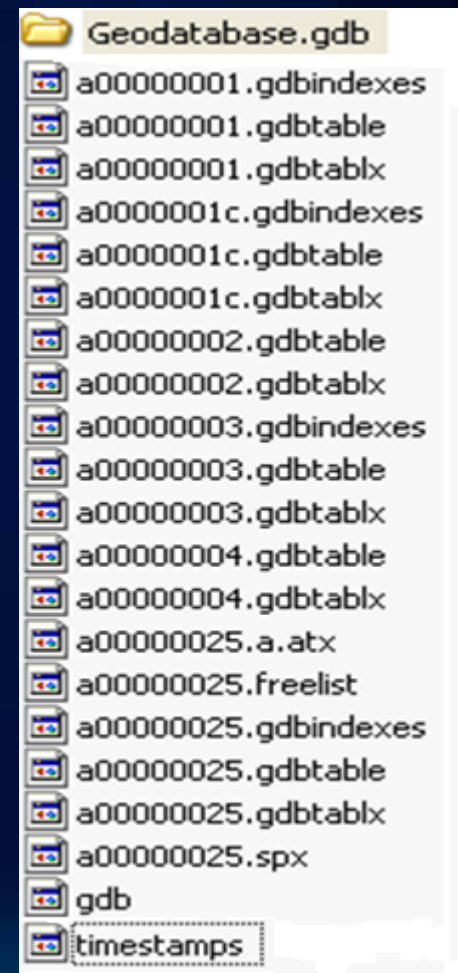
3 Types of Geodatabases...

	Personal GDB 	File GDB 	SDE GDB (3 editions) 
Storage format	Microsoft Access	Folder of binary files	DBMS
Storage capacity	2 GB	1 TB per table*	Depends on edition
Supported O/S platform	Windows	Any platform	Depends on edition
Number of users	Single editor Multiple readers	Single editor Multiple readers	Multiple editors & readers
Distributed GDB functionality	Check out/check in replication	Check out/check in replication	Replication (all types) & versioning

* By default; option to have 256 TB per table

File Geodatabase

- **Stored as a folder of files**
- **High Performance**
- **Reduced memory requirements**
- **Removes database size limits**
- **Works on additional operating systems**



File Geodatabase API

- **Provide a non-ArcObjects means by which advanced developers can work with File Geodatabases**
- **C++ API with coarse grained access to File Geodatabase**
- **Will not replace ArcObjects as the recommended approach to interacting with the File Geodatabase**



File Geodatabase API...

- **Leveraging the work done with simplifying the Geodatabase**
 - Will only support file geodatabases created with 10.0 and newer clients
 - No support for pre-10.0 file geodatabases
- **Target audience**
 - Advanced developers who require access to the File Geodatabase without an ArcObjects license for purposes of interoperability

Coarse-Grained Tasks possible with API

- **Create, Open, Delete file geodatabases**
- **Read the schema of a geodatabase**
 - All content within a geodatabase can be opened for read access
- **Create schema for objects within the simple feature model:**
 - Tables
 - Point, Line, Polygon feature classes
 - Feature datasets
 - Domains
 - Subtypes

Coarse-Grained Tasks possible with API...

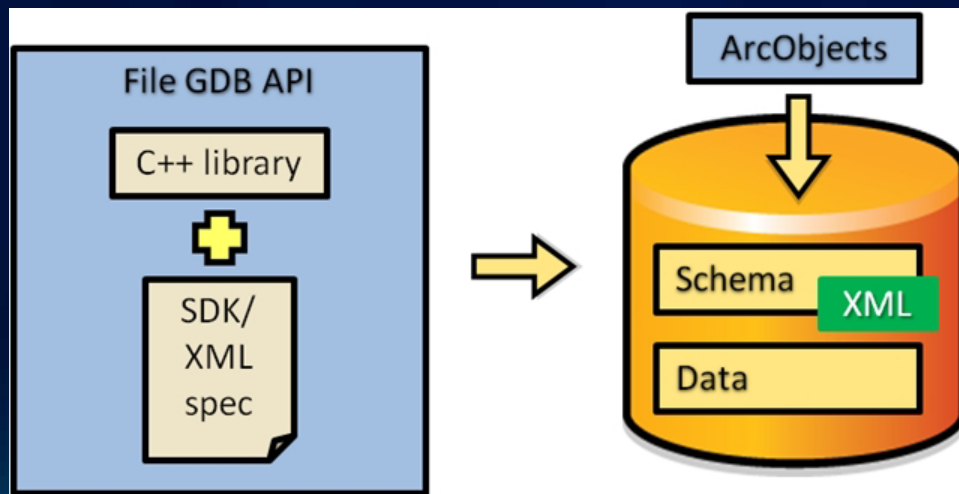
- **Read the contents of datasets in a geodatabase**
 - The majority of dataset content within a geodatabase can be read
 - Some exceptions such as network indexes
- **Insert, Delete and Edit the contents of simple datasets:**
 - Tables
 - Point, Line, Polygon, Multipoint, Multipatch feature classes

Coarse-Grained Tasks possible with API...

- **Perform attribute and (limited) spatial queries on datasets**
 - Spatial queries will be limited to the envelope-intersects operator
- **Spatial References are limited to pre-defined GCS, PCS and Unknown**
 - Custom coordinate systems are not supported
- **Support for a subset of the SQL 92 standard**
 - e.g. Select statements, Order By, Joins

File Geodatabase API Overview

- Single downloadable ZIP file containing:
 - C++ library (single dll, lib, .h) built on Windows and Linux platforms
 - API documentation (html) and Samples
- Freely available from the [Geodatabase Resource Center](#)



Supported Platforms for Windows

- **32-bit and 64-bit:**
 - Windows 2003, 2008 Server SP2
 - Windows 7 and Windows 7 SP2
 - Windows Vista SP2
- **64-bit:**
 - Windows 2008 R2 Server
 - Windows XP SP2
- **32-bit:**
 - Windows XP SP3

Supported Platforms for Linux

- **Minimum supported platforms for Linux 32-bit:**
 - Red Hat Enterprise Linux Release 5
 - SUSE Linux Enterprise Server 10
- **Support for Linux 64-bit in the next release of the API**

Demo

- **Download the API and unzip it**
- **Integrate the API into a C++ project**
- **Show basic API functionality**
- **Importing data into the File Geodatabase**

Features Not Supported

- While the File Geodatabase API supports reading the schema and data of complex geodatabase types, the API does not honor geodatabase behavior on inserts, deletes or updates to the following dataset types:
 - Annotation and Dimension feature classes
 - Relationship Classes
 - Networks (GN and ND)
 - Topologies
 - Terrains
 - Representations
 - Parcel Fabrics

Features Not Supported...

- **Raster Datasets, Raster Catalogs, Mosaic Datasets and Raster Attributes are not supported with the initial release**
- **The API will prevent users from attempting to edit objects with complex behavior in ArcObjects**
- **Spatial queries will be limited to the envelope-intersects operator**
- **Attachments will not be supported**

Road Map

- **Improved Feature Support**
 - **Support for Rasters**
- **Additional Platform Support**
 - **64-bit support on Linux**
- **Additional Software Requirements**
 - **Visual Studio 2010 support**
 - **Provide support for the API with DotNet and Java**

Summary

- **File Geodatabase API**
 - **Provide a C++ non-ArcObjects based means by which advanced developers can work with File Geodatabases**
 - **Does not replace ArcObjects as recommended way to access the File Geodatabase**