Tip of the Day

• Hidden Gems for your Toolbars
The Geodatabase

What is a Geodatabase?

Advantages of Using a Geodatabase – Why Use It?

The Organization of a Geodatabase

How to Create a Geodatabase
A. What Is A Geodatabase?

- ESRI’s preferred method for representing geographic features.
  - Considered the “Core” Data Model

- Conceptually: replaces / augments “stand-alone” spatial data files (shapefiles and rasters) with a collection of geographic representations that reside together in one place and that can be more logically ordered.

- The spatial data files you are used to working with as independent files have a greater degree of integration / dependence upon one another
  - Vector data lives inside
  - Raster data lives inside
  - Tables live inside
  - Other “stuff”
    - Annotation
    - Dimensions
    - Topology
    - Custom Tools
A. What Is A Geodatabase? cont’d

**BORG**: An alien culture that snatched up other civilizations’ people and technologies, "assimilating" them into a giant collective consciousness where individuality was nonexistent and bits and pieces of hardware and software were meshed with live creatures to form hive-like automatons, serving the common good. Once the Borg set their sites on a target, the eventual takeover was a foregone conclusion, as the Borg had the advantage of massive resources, advanced technologies lifted and adapted from everywhere.
The Geodatabase Supports All Spatial Data Types

- Features
- Cadastral Datasets
- Dimensions
- Domains, Subtypes Relationships
- Annotation
- Attribute Tables
- Terrain
- Address Locators
- 3D Objects
- Networks
- Rasters
- Topology
Three Types of GDBs

1) **Personal GDB**
   - Microsoft Access (.mdb)
   - 2 GB limit
   - Windows only
   - Single User Editor

2) **File GDB**
   - Stored as a folder containing binary files (.gdb)
   - 1 TB per dataset
   - Any platform
   - Single editor

3) **ArcSDE GDB (Enterprise)**
   - Stored in RDBMS (Oracle, SQL Server)
   - No size limit
   - Uses ArcSDE
   - Versioning (multi-user editing)
### What Windows Sees

#### File and Folder Tasks
- Rename this file
- Move this file
- Copy this file
- Publish this file to the Web
- E-mail this file
- Delete this file

#### Other Places
- gisdata
- My Documents
- Shared Documents
- My Computer
- My Network Places

#### Details

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B. What are the Advantages of a Geodatabase?

- A single file contains ALL your spatial data
- Greater “Intelligence”
- Simultaneous Users
- Industry/Application specific “Data Models”
Advantage #1
A Single File Contains ALL Your Data

- C:\gisdata\rhodeisland.gdb (file geodatabase)
  or
- C:\gisdata\rhodeisland.mdb (personal geodatabase)

- Your spatial data files and tables are not scattered all over your hard drive.

- You don’t have to worry about which folder contains which shapefile.

- Share one file that contains all your data, all your symbology, all your tools……
You can make features depend on one another

- Examples:
  - Water Lines and Fire Hydrants
  - Building footprints have to be inside a parcel
  - “Connectivity”

You can specify the valid entries for an attribute

- “Domain”
  - Specific values (1, 10, 15, 80) (Elm, Oak, Willow, Juniper)
  - Range (anything between 1 – 100)

- Domains can be shared

- An Attribute Default value can be specified

  - E.g. make all road widths 30’ unless manually overridden.
Advantage #2
Greater “Intelligence” (cont’d)

• Features (points, polylines, polygons) can have “subtypes” – grouped attributes

  – Example: Some Land Parcels have right-of-ways, others do not.

• Feature Linked Annotation

  – Example: Road Names

• You can create “relationship classes” in place of joins

  – Example: parcels (feature class) and mydata (table)
  – Is persistent until you manually remove it from the geodatabase
  – Exists in the gdb as an entity (not in the .mxd)
Advantage #2
Greater “Intelligence” (cont’d)

• Representations
  • Cartographic symbology, but with rules
  • Allow you to create maps without changing the underlying data
Multiple representations – To do cartography and mapping

- Feature Class (Roads)
- Cartographic Representation (Clearer roads)
- 2nd Cartographic Representation (Special roads)

Symbol Finishing

- Town Plan map 1:50,000
- Leisure map 1:25,000

- Bridges
- Rotated Orchard Fill
- Transit Station Annotation
Advantage #2
Greater “Intelligence” (cont’d)

• You can specify rules that must be followed between layers – “topology”
  – Example: building footprints cannot intersect parcel boundaries
  – Example: the boundary of a sub basin must be coincident and equal to the boundary of a basin

• Area and Length will automatically update their values when data changes!

• Support for advanced geometry (e.g. bezier curves)
Advantage #2
Greater “Intelligence” (cont’d)

- You can create “Mosaic Datasets”
  - Create Mosaic Dataset from ArcCatalog
  - Load rasters into the Mosaic Dataset

- Allows you to store, manage, view, and query small to vast collections of raster and image data
Mosaic Dataset
Advantage #3
Industry / Application Specific “Data Models”

• Pre-Existing Templates with Standardized Rules / Relationships / Data Requirements
  – Local Government
  – Homeland Security
  – Geology
  – Transportation
  – Hydro
  – etc……..

• Provides consistency
  – Example: Pawcatuck Borderlands Project
  – Time savings