Geodatabase: An Introduction

Rudy Prosser
Jim Gough
Getting started
Geodatabase: An Introduction
Working with geodatabases
Demonstration
Overview
What is the geodatabase?

Overview

Collection

Scalable

Programmable
Types of geodatabases

Overview

File System

RDBMS

File*

Enterprise

Single Editor

Multiple Editor
Geodatabase workflow

Overview

Update

Plan

Create

Populate

Data models
Information models

ArcGIS Pro
ArcMap

Desktop
Portals
Mobile
Creating a geodatabase Demonstration
Basic Functionality
Basic Geodatabase Functionality

Data
- Table
- Feature Class
- Raster

Rules
- Subtype
- Domain
- Relationship
- Feature dataset
Table (Object)
Basic Geodatabase Functionality - Data

- Rows are unique objects
- Rows have same fields
  - Number
  - Text
  - Date
  - BLOB
- No spatial field

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Feature class
Basic Geodatabase Functionality - Data

• Collection of features
  - Same geometry type
  - Same spatial reference
  - Same attribute fields
    Geometry   BLOB
    Number     Object ID
    Text       Global ID
    Date       Raster

• Extended functionality
  - Multi-part features
  - Z and M values
  - Annotation / Dimension
Raster
Basic Geodatabase Functionality - Data

• Cell / Pixel-based data
  - Discrete / Continuous data
  - Multiple formats

• Geodatabase
  - Raster dataset
    - Manage single raster
  - Mosaic Dataset
    - Manage multiple rasters
    - Store as a catalog, view as a mosaic
    - Advanced querying and processing
Subtype
Basic Geodatabase Functionality - Rules

• Define categories / classes
• Set rules for each field by category
  - Default values
  - Domains
  - Behaviors
• Property of table or feature class

Subtype code (Integer)

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Subtype description
Domain
Basic Geodatabase Functionality - Rules

- Specify valid values
  - List of valid values
  - Min and max value
- Apply to multiple attribute fields
- Property of geodatabase

Coded Value Domain
FRC_DESC in (“Freeway or Other Major Road”, “Other Major Road”, ...)

Range Domain -
FRC between 0 and 5
Relationship class
Basic Geodatabase Functionality - Rules

• Define association between geodatabase objects
• 1:1, 1:M, M:N cardinalities
• Simple or composite
• Apply rules and attributes
• Edit across relationship
Feature dataset

Basic Geodatabase Functionality - Rules

- Collection of spatial datasets
- Specifies spatial reference
- Treated as a single object
- Necessary for
  - Networks
  - Topologies
  - Terrains
- Not a folder

Subdivision

- ParcelCorner
- Parcel
- ParcelAnno
- LotLines
- Parcel_Topo
- LotDimensions
- BoundryLines
Exploring a geodatabase Demonstration
Extended Functionality
Extended geodatabase functionality

Data
- Attachments
- Topology

Models
- Geometric Network
- Network Dataset
- Parcel Fabric
Attachments
Extended geodatabase functionality - Data

• Associate 1 or more files with a geographic feature
  - Stored within the geodatabase
• Accessible throughout the ArcGIS platform
  - Open files types recognized by OS
  - Download others
• Specialized implementation of a relationship class
Geodatabase topology
Extended geodatabase functionality - Data

• Manage shared geometry
  - Within a feature class
  - Between feature classes

• Rules-based
  - Select rules based on spatial relationships
  - Apply rules by validating data
  - Make corrections or mark exceptions
Networks
Extended geodatabase functionality - Models

- Geometric and Utility Networks
  - Use edges and junctions to model connectivity
    - Resources are constrained by network
    - Connectivity based on geometric coincidence
    - Define connectivity rules

- Network Datasets
  - Use edges and junctions to model transportation networks
    - Resources make decisions on the network
    - Include travel time, speed, turns
    - Supports multimodal scenarios
Parcel Fabric
Extended geodatabase functionality - Models

• Model and manage cadastral data
• Integrated data structure
  - Control data
  - COGO dimensions
  - Parcel identification information
  - Survey plans
Extending a geodatabase

Demonstration
Conclusion
Geodatabase: An Introduction

Conclusion

Overview

- What is a geodatabase?
- Types of geodatabases
- Geodatabase workflow
- Geodatabase tools

Geodatabase

- Attachments
- Geodatabase topology
- Geometric / Utility networks
- Network datasets
- Parcel fabric

Extended

- Data structures
  - Table
  - Feature class
  - Raster

Basic

- Rules and relationships
  - Subtype
  - Domain
  - Relationship class
  - Feature dataset
Resources

Conclusion

- **Technical Workshops**
  (Search agenda for “geodata”)
  - Managing Your Distributed Geodatabase
  - Planning an Enterprise Geodatabase
  - Editing Multiuser Geodatabases: An Introduction
  - Geodatabase Best Practices
  - Geodatabase Administration: An Introduction

- **Esri Showcase**
  - Spatial Data Management
  - Hands-On Learning Lab

- **GeoNet**
  - UC2017 Technical Workshop – Geodatabase: An Introduction
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