Working with geodatabases

Demonstration
Overview
What is the geodatabase?

Overview

Collection

Scalable

Programmable
Why use a geodatabase?

Overview

Customizable

Functionality

Platform

Simple

Integration
Types of geodatabases

Overview

File System

File*

Single Editor

RDBMS

Enterprise

Multiple Editor
Geodatabase workflow
Overview

- Plan
- Create
- Update
- Populate

Data models
Information models

ArcGIS Pro
ArcMap

Desktop
Portals
Mobile
Geodatabase tools

Overview

ArcGIS Pro

ArcMap

Portal for ArcGIS

ArcGIS Online

APIs

SDKs

Apps
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
  - Object ID
  - Global ID
  - Raster
  - No spatial field

ArcGIS-defined ID

User-defined ID
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)

<table>
<thead>
<tr>
<th>Road Type</th>
<th>Road Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Freeway or Other Major Road</td>
</tr>
<tr>
<td>1</td>
<td>Major Road Less Important than a Freeway</td>
</tr>
<tr>
<td>2</td>
<td>Other Major Road</td>
</tr>
<tr>
<td>3</td>
<td>Secondary Road</td>
</tr>
<tr>
<td>4</td>
<td>Local Connecting Road</td>
</tr>
<tr>
<td>5</td>
<td>Important Local Road</td>
</tr>
</tbody>
</table>
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
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
Conclusion
Geodatabase: An Introduction

Conclusion

Overview

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

Geodatabase

- Attachments
- Geodatabase topology
- Data models
  - 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**
- UC2018 Technical Workshop – Geodatabase: An Introduction