Automating Geodatabase Creation with Geoprocessing

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Esri International User Conference
San Diego, California

Technical Workshops | July 26, 2012
Assumptions

- Geodatabase fundamentals
- Experience with geoprocessing
- Understanding of geodatabase design
Why are we here today?

- Create a geodatabase with core ArcGIS tools
- Modify existing geodatabases
- Scheduling
- Documenting your geodatabase
- Tips and tricks for:
  - Model builder
  - Python tools
What is schema?
Schema

- Information collected to meet business needs
- It tells your story
- Real world ‘things’ that you want to understand
Geodatabase Schema represents the real world

- Feature classes
- Tables
- Relationship classes
- Topology
- Geometric networks
- Network datasets
- Terrains
- Domains
- Subtypes
Schema Creation Options
Creating and modifying geodatabase schema

Lots of options.
1. ArcMap/ArcCatalog wizards
2. Templates (data models)
3. UML
4. XML workspaces
5. Geoprocessing
ArcCatalog wizards

**ArcCatalog** – Templates – UML – XML – Geoprocessing

- **Pro:**
  - Create any supported dataset type
  - Modify schema in place
  - Familiar environment

- **Con:**
  - Non-repeatable
  - No scheduling
  - No documentation
Templates

ArcCatalog – Templates – UML – XML – Geoprocessing

• Pro:
  - Design work has been done by industry experts
  - Well documented
  - Map & Apps samples

• Cons:
  - Generic
    - Need to customize?
  - Not available for every use case/industry
UML

ArcCatalog – Templates – UML – XML – Geoprocessing

• Pro:
  - Documentation
  - Visualization
  - May be required to share with other (non-GIS) departments

• Con:
  - Specialized skillset
    - understand both the language/concepts and the application
  - Does not support all data types
XML

ArcCatalog – Templates – UML – XML – Geoprocessing

- Really just an interchange format.
- Many of the other options use XML as the method of creating a geodatabase
- Not useful for modification or creation from scratch
Geoprocessing

ArcCatalog – Templates – UML – XML – Geoprocessing

- **Pros:**
  - GIS pro’s are comfortable with gp
  - One environment for creation, loading, analysis
  - Customizable/flexible

- **Cons:**
  - Limited diagramming
  - Difficult to share with non GIS
What is geoprocessing?

- **Suite of tools**
  - Over 700 tools and functions
  - Analysis
  - Data conversion
  - Dataset creation

- **Framework**
  - Link tools together
  - Share
  - Script and customize
Geodatabase Tools

• Schema creation tools in the Data Management toolset.

• Many tools to create geodatabase objects
New at ArcGIS 10.1

• Highlights:
  - Create Enterprise Geodatabase
  - Create Geometric Network
  - Enable Attachments
  - Create Database View
  - Add topology rules to versioned data
  - Create Versioned View
  - Sort Coded Value Domain

• Need your help
Ways to use tools

• **System tools**
  - Perform a specific task

• **Model tools and Script tools**
  - Perform a group of tasks over and over
  - Utilize like system tools
Model tools

- Convert models into tools
  - Build custom tools without writing code
  - Reduce redundant info
  - Reduce clutter

- Examples:
  - ‘Create Point Feature Class’
  - ‘Create enterprise database and connection’
  - ‘Create range domain with valid range’
Script Tools

• Make Python available in Model Builder.
  - Cursors
  - Programming logic
  - arcpy functions

• Look for:
  - Redundant info
  - Tools running multiple times
Demo: Geoprocessing Framework

Creating Models
Creating Model Tools (sub models)
Working With Script Tools
Two key workflows discussed in this session

• **Create New Schema**
  - Design in place
  - Need to create everything

• **Modify Existing Schema**
  - Schema in place
  - New requirements
  - Modify data model
Demo: Create New Geodatabase

Create new geodatabase
Model tools as sub models
Template feature classes
Two key workflows discussed in this session

• **Create New Schema**
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  - Modify data model
Schema Changes

- **Geoprocessing makes it easy**
  - Change documentation
  - Gather information
    - Report on dependencies
  - Schedule changes via scripting
Demo: Modifying Geodatabase

Use python to plan
Identify dependencies
Script and schedule changes
Geodatabase Documentation

- **Model Builder**
  - Provides a visual representation

- **Python**
  - Generate reports
  - Data dictionary
Demo: Documenting your data

Use Python to:
Document your schema
Report on GDB content
Considerations for enterprise databases

- All concepts presented will work for all geodatabases
- Create users and roles
- Change privileges
- Create versions
- Create replicas
- Enterprise specific schema changes
  - Unregister as versioned
  - Register as versioned
  - Adding global id’s
Demo: Enterprise Considerations
Limitations

• Create Network Datasets
• Parcel Fabrics
• Create Annotation
• Create Schematic Dataset
• Enable Archiving
Final Thoughts

- Evaluate your options
- Geoprocessing can create full featured geodatabases
- Model tools and python tools
- Schema changes are easy and trackable
- Python can be used to report
Other Sessions
Technical Workshops

- **Geodatabase – an Introduction**
  - Tuesday 3:15pm – Ballroom 6A
  - Wednesday 8:30am – Ballroom 6B

- **Using the ArcGIS System to Access your Geodata**
  - Wednesday 3:15pm – Ballroom 6D
  - Thursday 3:15pm – Ballroom 6F

- **Geodatabase Administration: An Introduction**
  - Wednesday 10:15am – Room 15 A
Other Sessions

Technical Workshops

- Python – Getting started
  - Wednesday 1:30pm – Ballroom 6A
- Python – Beyond the Basics
  - Wednesday 3:15pm – Ballroom 6A
- Building Tools with Python
  - Wednesday 1:30pm – Room 28 E
  - Thursday 10:15am – Room 9
- Iteration and Branching in ModelBuilder
  - Tuesday 3:15pm – Ballroom 6B
Other Sessions

Demo Theaters

• **Python: Building a script tool from start-to-finish**
  - Tuesday 4:00pm – Analysis and Geoprocessing Demo Theater

Moderated Paper Sessions

• **Geodatabase Design Strategies**
  - Thursday 1:30pm – Room 28 A

• **Building Applications Using ModelBuilder and Python Scripting**
  - Thursday 1:30pm – Room 27A
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