Data Automation
(ArcGIS for AutoCAD, Data Interoperability & Data Reviewer) in ArcGIS 10.1

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Agenda

- ArcGIS and AutoCAD
  - Build 300
  - Using ArcGIS Services in AutoCAD

- ArcGIS Data Interoperability
  - Top 5 Functions
  - What’s New @ 10.1

- ArcGIS Data Reviewer
  - Brief Overview
  - What’s New @ 10.1
ArcGIS for AutoCAD 300
GIS and CAD

CAD in ArcGIS
- Add CAD drawings to maps
- Use CAD with Geoprocessing
- Migrate Entities/Features to Geodatabases

ArcGIS for AutoCAD
- Access maps and information for context
- Create ArcGIS Data
- Edit Geodatabases

ArcGIS in CAD

CAD in ArcGIS Desktop
ArcGIS is a Complete System
Managing and working with geographic information

- Discover
- Create
- Manage
- Visualize
- Analyze
- Collaborate
ArcGIS CAD Data Support

- ESRI has long provided CAD support and integration tools

- Out of the box
  - No extension required

- Direct read
  - Conversion not required

- Current version support:
  - AutoCAD DWG/DXF: Up to 2012
  - MicroStation DGN: Up to V8
CAD Standards for GIS

- **Adopt National CAD Standards**
  - Logical layer and level organization
  - Improves filtering and conversion workflows
- **Create CAD objects in real-world coordinates**
  - Eliminates georeferencing tasks in GIS
- **Geometry connectivity**
  - Closed line segments to define polygons
- **Model Space versus Paper Space (AutoCAD)**
  - ArcGIS only recognizes entities in model space, not paper space
  - Paper Space is graphics (e.g. title blocks, legends, notes, etc)
ArcGIS for AutoCAD

ArcGIS System

- Discover
- Create
- Manage
- Visualize
- Analyze
- Collaborate
What You’re Going To See
Things you can do with ArcGIS for AutoCAD

- Working with ArcGIS Services
  - My ArcGIS Server Services
  - Other People’s ArcGIS Services

- Editing GIS Data with AutoCAD
  - Data Stored in .DWG
  - Data “visiting” from Feature Services
ArcGIS for AutoCAD
Using ArcGIS Services
Demo

AutoCAD using Map Service
Creating GIS-Ready .DWG Files

Coordinate System / Feature Classes / Attribute Schema

ArcGIS for AutoCAD

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Using GIS-Ready .DWG Files in ArcMap
Better Than Shapefiles
Share ArcGIS Data in .DWG Files

With ArcMap
Features From Server
Within AutoCAD
Demo

AutoCAD using Feature Service
Using Your Services
Within AutoCAD

- Geodatabase
- ArcGIS Server
- ArcGIS Desktop
- Publish to ArcGIS Server
- ArcGIS for AutoCAD
- ArcGIS Online

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ArcGIS for AutoCAD
Use Pattern Summary

ArcGIS Desktop
Geodatabase
ArcGIS Server
ArcGIS for AutoCAD

.esri

ArcGIS Online

.DWG Files
Product Features

- Feature Services
- Map Services
- Image Services
- Geo-Location Service
- Coordinate Systems
- Schema Management Tools
- Selection Tools
- Table Viewer
Download ArcGIS for AutoCAD 300 Now

- **AutoCAD Windows 32/64 bit 2010-12**
  - Civil 3D/ Map 3D/ ADT
  - Not Supported* in AutoCAD LT

- **Coming Soon:**
  - AutoCAD 2013 Support
    (ArcGIS 10.1 Service Pack 2)
  - More Languages...
ArcGIS Data Interoperability
What is the Data Interoperability Extension?

ESRI & SAFE Co-Development based on FME

• **Format Support**
  – Adds support for 130+ data formats
  – Custom Formats
  – Direct use in ArcGIS Desktop
• **Quick Data Translation**
  – Data Interoperability Tools Toolbox
  – Convert between data formats
• **Spatial ETL (Extract, Transform, Load)**
  – Schema Mapping (may be Dynamic)
  – Transformation of Geometry
  – Logic Controls Data Flow – *Per Feature*
ArcGIS 10.0 Data Interop Common Tasks

- **Data Integration**
  - Bring multiple datasets together

- **Data Migration**
  - Process of moving data between systems

- **Data Cleanup / Data Manipulation**
  - Clean up errors in the data and streamline data preparation

- **Data Distribution**
  - Distribute data to different systems

- **Change Detection**
  - Determine changes between two different files

- **Data Validation**
  - Verify and validate *spatial* data

- **Managing Databases**
  - Spatial types in a DBMS
Data Interoperability
Top 5 Functions
Countdown
5. OGC GML Simple Feature Format Support

Support for GML-SF in ArcGIS Desktop

- GML – simple features
- WFS – optionally non-cached for auto refresh

**Note:** Installation of the Data Interoperability extension is required
4. Direct Read of Formats

- Formats automatically recognized by Data Interop.
  - File-based, by extension, like .tab, .mid, .skp, .sl3....
  - Visible in Catalog window browse tree
  - May be extended with Custom Formats

- Directly usable in ArcGIS
  - Save time converting data
  - ArcPy Features, Tables, SearchCursors

- Consume external data
  - ArcPad AXF
  - Other application formats
  - Web feeds
3. Quick Data Import/Export

Extension provides Geoprocessing Tools:

- Quick Export
  - To Any Format
- Quick Import
  - To Staging Geodatabase
2. What if you need your own format?

Save time by “canning” a custom format workflow

- Commonly handled text-based sources
  - CSV
  - XML
- Build format recognition workflow once
- Re-use the persisted workflow any time
- Lets you develop a file format for sharing
1. The Full Power of Spatial ETL

- Formats are only part of the story
- Often the format does not change *
  - But the schema does
- Transformation is key
  - Many categories of transformer
  - Feature by Feature or Dataset by Dataset
  - Geometry or Attribute transformations
- Many Inputs Many Outputs is OK

*like shapefile to shapefile
1. Workbench Application
   • Graphically Design Data Flows
Data Interoperability Differentiators
Not Just About Schema Manipulation

- 3D PDF Writing
  - Share “data” with the world
- Vertical Datum Handling
  - When working with water, transmission
- XML Documents as Features or Attributes
- JSON Documents as Attributes
- HTTP interaction
- GeoRSS interaction
- Cross-platform SQL support
  - SQLite temporary workspace
- Parallel Processing
New in 10.1
More Python-based formats are coming in SP1

- Based on latest FME platform – FME 2012
  - Improved performance
  - Improved FME Workbench user experience
    - New shortcuts keys, pause/resume, enhanced drag and drop
- New Formats
  - ArcPad AXF (requires SQL Compact)
  - AIXM5
  - Esri Mapping Specification for CAD
  - Google Fusion Tables
  - Point Cloud (ASCII XYZ, LAS, LAZ)
  - R Statistical Data
- New Transformers
  - FeatureReader – spatial and aspatial queries
  - SQLCreator – create feature per result row
  - Stylers – symbology in DWG, DGN, KML, PDF
ArcGIS Data Reviewer
Data Quality Matters

• Cost of poor quality can be extreme
  - $$$ to fix
  - Impacts customers
  - Reputation

• Consider
  - Do you publish a doc without spell checking?
  - Do you operate a PC without a virus scanner?
What is ArcGIS Data Reviewer?

Data quality management for ArcGIS

- Provides
  - Rule based workflows
  - Interactive tools
  - Track errors

- For individuals and enterprise
  - Saves time/money
  - Less rework

- Standard extension to ArcGIS
  - Desktop extension since 8.0
  - Server extension at 10.1

Trusted data through improved quality management
Managing Quality Control
Scalable framework for managing QC lifecycle

REVIEW
Find & Record Errors

CORRECT
Perform Edits
or
Note Exceptions

VERIFY
Acceptable
or
Unacceptable
An Introduction to Data Reviewer Components

The Quality Control Process with Data Reviewer
Types of Quality Control

Automated Quality Control
- Fast
- Consistent and repeatable
- Objective
- 100% coverage

Visual Review
- As subjective as needed
- Better for finding patterns and missing elements
Understanding Data Reviewer Checks

- Over 40 data checks
- Grouped into 11 categories
- Configurable
- Additive/Scriptable

www.esri.com/datareviewer
Batch Validation

• Run data validation in several ways:
  - Within ArcMap
  - From ArcToolbox
  - Within a model/Python script
  - ArcGIS Workflow Manager
  - ArcGIS Server service
New Capabilities for 10.1
Server-based Data Validation

- Automated quality control for the enterprise
  - Scheduled and on-demand data validation
  - Frees data editors from running checks
  - Scalable data validation capability based on ArcGIS Server
Enhancements for 10.1
Automated Data Validation

- Check Enhancements
  - Geometry on Geometry
  - Intersection on Geometry

- Performance improvements
  - Increase batch validation performance

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Demo

ArcGIS Data Reviewer
ArcGIS Data Reviewer
Automate, Simplify, and Improve your Quality Control Process

- Extension to Desktop/Server
- Supports complete QC process
- Provides
  - Rule based workflows
  - Interactive tools
  - Track errors
- For individuals and enterprise
  - Saves time/money
  - Less rework
Summary

ArcGIS and AutoCAD
ArcGIS Data Interoperability
ArcGIS Data Reviewer
Resources

- Product Information (60-day Free Evaluations)
  - www.esri.com\arcgisforautocad
  - www.esri.com\datainteroperability
  - www.esri.com\datareviewer

- Recorded Seminars www.esri.com\training
  - ArcGIS for AutoCAD
  - Introduction to ArcGIS Data Interoperability
  - Using ArcGIS Data Reviewer to Assess Data Quality

- Courses www.esri.com\training
  - Instructor Led Training: Data QC Using GIS Data Reviewer
  - Virtual Campus:
    - ArcGIS Data Interoperability Basics
    - Introduction to GIS Data Reviewer

- Resource Center & Online Help
  - resources.arcgis.com, resources.arcgis.com/en/help/