Automating Floor Plan Data Movement to ArcGIS

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Introduction

• CAD to GIS Sync for buildings is evolving
• Industry moving quickly based on drivers
  - Space/Asset reporting
  - Operations
  - Logistics
  - Public Safety, Security
  - Health and Safety
• This session is about building Enterprise Facilities Information Systems
Floorplan Challenges

- Seamless GIS database from 00s and 000s of drawings
- 2D Floorplans to 3D seamless GIS
- Spatial Reference differences
- Identity and Attributes
- Geometry
  - Rooms within rooms
  - ArcGIS vs CAD
- Additional GIS Data creation
  - Auto-create more datasets
  - Often dependent on previous processing steps
- Change-only updates
- Source and target data needs evolve
  - Processing has to be modular
- QA and long transactions
Ways to Move Data to ArcGIS

- Geoprocessing and Arcpy
- ArcGIS Data Interoperability Extension
- Safe Software’s FME (Feature Manipulation Engine)
2 Key Patterns

- **Load/Reload data from source**
  - Typically 1-time or batch reload
  - Great for smaller campuses
  - Heavy on processing time

- **Sync Engine**
  - Enterprise implementations
  - Change detection
  - Optimized processing
  - Derived datasets
Pattern 1 – Bulk Load

- Processing
  - Extract from CAD
  - Field Calculator
  - Source Target QA
  - Replace by Field Values
- Replaces 1 floor at a time
- Bulk update
- No derived processing
- Free download example on [http://gizinta.com](http://gizinta.com)
Floorplan Drawing Setup

- Use to build source feature classes for ArcGIS
  - https://www.youtube.com/watch?v=cXXK1IOpXrY
  - https://github.com/aaronch/floorplangis

- Also possible to use Data Interop Extension to get more of the CAD properties for ArcGIS Desktop…
  - Like autocad_extended_data{0}.handle{0}
Pattern 2 – Sync Engine

- Scheduled task
- Load to Staging
- Change-only updates
- Derived data
Processing Logic

Folder

For each drawing

Run playlists

Call FME as subprocess

If no errors

Call Sync to Prod

Gizinta arcpy

Staging

Production

Example

py\cfmLoaderFME.py fpLoadPlaylist.xml,fpDerivePlaylist.xml cfmDataConfig.xml True False
Floorplan Loader
Floorplan Datasets

Floorplan Lines

Spaces

Floor Areas

(Building Outline Tilt)
Floorplan Derive
Derived Datasets

Published Lines

Outline Point

Space Points

Tilted Rooms
Gizinta for ArcGIS and FME
Make the simple stuff easier!

- Tools
  - FME Custom Transformers
  - Arcpy scripts
- Xml-driven extract from sources
- Attribute and geometry QA
- Logging and error handling
- Higher-level functionality/tools
- Xml-driven database update
- Playlists
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