Replicating Statewide Property Data with ArcGIS Server

2007 ESRI International Users Conference

Office of Local Government
Comptroller of the Treasury
Presentation Outline

• Overview of the Office of Local Government (OLG) and our role in the Tennessee Base Mapping Program (TNBMP)

• How OLG plugs into Tennessee’s Spatial Data Architecture

• Five components of the OLG Maintenance Architecture
  - Data Loading, Preparation, and Distribution
  - County Level Configuration
  - State Level Data Distribution
  - Replication Management and Monitoring
  - Technical Support

• Conclusion and Questions
Statewide initiative to produce seamless parcel level cadastral and planimetric data as well as ortho imagery for the State of Tennessee.

Data production will be complete at the end of this month.

Two primary questions now:

1) How do we distribute this data to Federal, State, and Local Government users as well as the general public?

2) How do we maintain all this data?
• Distribute TNBMP Data to the Following Consumers:
  - State Agencies
  - Federal Agencies
  - General Public

• Provide Business Specific Location Based Services to State Agencies.

• Administer Future Procurements of TNBMP Ortho Imagery.
• Oversee the Maintenance of the TNBMP Data at the State and County Levels.

• Administer Two Geodatabase Instances that House the TNBMP Data for 94 of the 95 Tennessee Counties. (Approx. 3 Million Parcels)

• Provide Technical Support to Entities Performing TNBMP Data Maintenance.

• 52 Counties Maintained at the State Level by the Office of Local Government’s Mapping Division.
Data Maintenance (Cont.)

- 43 Counties Maintained at the Local Government Level either by the Property Assessors Office or an Outside Entity.

- Replicating Locally Maintained Data for 36 Counties using ArcGIS Server GeoData Services. (Over 1 Million Parcels)

- Manage the Nightly Replication Processes (OLG Maintenance Architecture).

- Oversee the Distribution of the TNBMP Data to State and Local Government Entities via Data Replication.
OLG Maintenance Architecture

- Five Components -

1) Data Loading, Preparation, and Distribution

2) County Level Configuration

3) State Level Data Distribution

4) Replication Management and Monitoring

5) Technical Support
Data Loading, Preparation, and Distribution

- Data Loading
  - Data Conversion from Coverage to Geodatabase

- Data Preparation
  - Validate Topology and Address and Conversion Errors
  - Add Global ID’s
  - Create a ‘County_Name’ Version that will Act as the Replica Parent Version

- Data Distribution
  - Create a Replica XML from the ‘County_Name’ Version for Distribution to the County
Geodatabase Version Structure

- Default
  - Maury
    - Maury Replica
  - Madison
    - Madison Replica
  - Lewis
    - Lewis Replica
  - Cheatham
    - Cheatham Replica
  - Henry
    - Henry Replica
  - ..... Replica
OLG Maintenance Architecture
- Five Components -

1) Data Loading, Preparation, and Distribution

2) County Level Configuration

3) State Level Data Distribution

4) Replication Management and Monitoring

5) Technical Support
County Level Configuration

- Install and Configure the OLG Parcel Maintenance Extension for ArcGIS.
- Load the Replica XML into the Local SQL Express Geodatabase.
- Configure the Automated Replication Task.
- Configure the Automated QC Task.
- Test the Scheduled Tasks.
OLG Maintenance Architecture

- Five Components -

1) Data Loading, Preparation, and Distribution

2) County Level Configuration

3) State Level Data Distribution

4) Replication Management and Monitoring

5) Technical Support
State Level Data Distribution

• Two Primary Data Consumers at the State Level:
  – OIR GIS Services
  – IMPACT Application (Statewide CAMA System)

• OIR GIS Services
  – 2 OLG Geodatabases are Replicated on a Monthly Basis to OIR’s Geodatabase.
  – Consumers of OIR’s GIS Services Realize Updates.

• IMPACT
  – 2 OLG Geodatabases are Replicated on a Weekly Basis to the Geodatabases Used by the IMPACT Application.
  – State and Local Government Users of IMPACT Realize Updates.
Tennessee Base Mapping Program
- Data Replication Intervals -

Office of Local Government

Monthly

Weekly

OIR GIS Services
- Data Publication -

IMPACT
- Statewide CAMA System -

36 County Property Assessors
- Local Data Maintenance -

Nightly
OLG Maintenance Architecture
- Five Components -

1) Data Loading, Preparation, and Distribution

2) County Level Configuration

3) State Level Data Distribution

4) Replication Management and Monitoring

5) Technical Support
Replication Management and Monitoring

How do we monitor the quality of the data being replicated?

1) Establish Data Quality Standards.

2) Identify QA/QC Processes that Determine the Quality of the Data.
   - Validate Topology
   - Pre & Post Replication Parcel Counts

3) Develop a C# Executable that runs the QA/QC Processes.

4) Automate the Execution of the QA/QC Process via a Scheduled Task that Runs on the Client Side.
How do we automate the data replication process?

1) Develop another C# Executable that Initiates the Replication Process.

2) Automate the Execution of the Replication Process via a Scheduled Task that Runs on the Client Side.

3) Build a Replication Schedule.
   - 15 Minute Intervals Starting at Midnight.
Replication Management and Monitoring

How do we manage all these processes from a centralized location?

Web Services Integration Throughout the Architecture.

a.) Control over the nightly replication.

b.) Control over the execution of the QC process.

c.) Control over the GeoData service being used.

d.) Automatic error notifications via email.

e.) Automatic QC notifications via email.

f.) Automatic QC logging in a centralized database.
OLG Maintenance Architecture

- Five Components -

1) Data Loading, Preparation, and Distribution

2) County Level Configuration

3) State Level Data Distribution

4) Replication Management and Monitoring

5) Technical Support
Technical Support
- 3 Tiered System -

- Tier 3 - ESRI Technical Support
- Tier 2 - OLG Central Office
- Tier 1 - Regional Support Specialists

County Property Assessors
Conclusion

• Essential Steps to Implementing a Successful Maintenance Architecture:
  1) Standardize your data. (TNBMP)
  2) Identify who will maintain the data. (County Property Assessors)
  3) Start replicating from locally maintained geodatabases to your centralized enterprise geodatabase. (ArcGIS 9.2 Data Replication Functionality)
  4) Publish your centralized geodatabase to consumers. (OIR’s TNET Portal)

• Remember that publishing data is easy, but if you don’t have a solid maintenance architecture that ensures the data being published are accurate and timely, your consumers will be working with inaccurate data resulting in poor decision making.
Questions

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