The List

Database Capabilities\Geodatabase
Metadata
Linear\Pipelines

Craig Gillgrass
cgillgrass@esri.com
Key Geodata Management Themes for 9.2

• Simplify using the Geodatabase
• Improve spatial data management by allowing users to share data more readily
• Continue to improve quality
• 6 Key themes:
  – File Geodatabase and Bundled Database Servers
    • Integrate Administration into ArcCatalog
  – Improved Enterprise Integration
    • Non-versioned Editing
    • SQL Type for Oracle
  – Enhanced Transaction Model
    • Archiving
    • Replication
    • Reconcile Enhancements
Key Geodata Management Themes for 9.2

- Improved Vector Data Management
  - High precision
  - Simplify creating datasets in the Geodatabase

- Improved Raster Data Management
  - Improved raster format support
  - Support for raster attribute tables
    - Improved data loading and transfer
  - On-the-fly pan sharpening and ortho-rectification

- Support for very large Terrain Datasets
The List

- **Database Capabilities**
  - One-to-Many Table Joins (1)
  - Row/Feature level Security (9)
- **Metadata**
  - IMS Metadata from SDE (6)
  - Access to source metadata from layer files (8)
  - Row level metadata (new)
- **Linear/Pipelines**
  - Point, Line, & Editing Topology – Pipelines (7)
  - Geometric Networks & Topology (10)
  - Route Event Performance (11)
  - Case tools for pipelines (16)
  - Metadata tools for pipelines (17)
- **Other General Issues**
Database Capabilities\Geodatabase

• **One-to-Many Table Joins (1)**
  • Two main issues
    – Add ability to perform One-to-Many Joins in ArcGIS
    – Improve usability of data stored in One-to-Many Relationships\Related Tables
  • Add ability to perform One-to-Many Joins
    – We were able to do one to many table joins in ArcView 3.x but are not able to do them in ArcGIS without customized code (which is too difficult to deploy in an Enterprise GIS).
    – As we are able to get around the gap with customized code, why is it not a part of the end user interface? Several major vended datasets that are very important to the petroleum industry rely on one to many joins for proper display. When will this be corrected?
  • This is on our list to address
One-to-Many Table Joins (1)

- Improve usability of data stored in One-to-Many Relationships\Related Tables
- You’ve given us a good set of use cases and a proposed solution to this from last year’s PUG and the wiki
  - Need to improve accessing and using data stored in one to many related tables
  - Improving the following to work against linked tables would greatly increase the utility of ArcMap:
    - Labeling
    - Chart Symbology
    - One-the-fly statistical operations against linked tables (min, max, avg, etc) instead of summarizing to a static table and joins
    - Improved access to linked table data from master table that doesn't require the id tool or having two tables open and use of the select tool.
Database Capabilities\Geodatabase

- **Row/Feature level Security (9)**
  - Restrict access to rows in a table to those that have a “need to know”.
  - Example usage case:
    - Prospect outlines and associated attributes are stored worldwide but prospects for Oman should be exposed to a different group of users from prospects in Yemen.

- **Need to manage spatial data as a single dataset but cannot allow users read and or write access to all the records in the table.**
  - For example, different groups of people are responsible for managing data in different asset areas. However, we want to be able to role up all the asset information into reports so it is inefficient to have them in separate tables.
• **Row/Feature level Security (9) …**
  - Row-level security is implemented via an attribute on the row (Label), specific to the standards of the underlying database.
  - There are several approaches that can be considered to restrict access to data – each has its advantages and disadvantages.
  - DBMS Row Level Security – also called Label Security
  - Discussed in the ESRI Security White Paper
  - Row level security requires a DBA well versed in the feature to implement and maintain the security label checks.
    - Need to manage the extra columns added to tables, and the procedures that are used in the query rewrite.
Database Capabilities\Geodatabase

• **Row/Feature level Security (9) …**
  - Issues
    • Using on data with relationships, spatial and attribute
      - Topologies
      - Network Datasets, Geometric Networks and Schematics
      - Terrains
      - Cadastral Dataset
      - Complex behavior or relationships where the presence or absence of the feature is critical
    • Does not work with Versioning
  • While DBMS row level security will work in simple implementations, it is not for the faint of heart, has significant restrictions on use, and can have performance impacts given the query rewrite that takes place to validate the user against the label.
Database Capabilities\Geodatabase

• **Row/Feature level Security (9) ...**
  – Use of Web Services
    • Enable access control through publishing the data to the different audiences through a web service, and restrict access to the web services.
      – This allows you to publish different service end-points for different groups, and to customize the data access for each group.
    • Each service is restricted by sub-setting features through queries in the published map document. If a particular group is not allowed to see certain properties, or certain features, then you don’t publish the property, or you don’t select the restricted features.
Metadata

- IMS Metadata from SDE (6)
- Access to source metadata from layer files (8)

Metadata needs to be available more universally.
- A user should be able to get to source file metadata from a layer file in ArcCatalog.
- They should also be able to get to source file metadata from ArcMap and a ArcIMS client.
- In ArcMap/Catalog, for example, this could be done with a “Metadata” button in the “Source” tab of the “Layer Properties” dialogue.

- Access to source metadata from layer files (8)
  - In 9.2, you can access the Metadata for a layer from within ArcMap
  - Available on the context menu for the layer
Metadata

- IMS Metadata from SDE (6)
- Access to source metadata from layer files (8)
  - Work is ongoing to design and implement improved cataloging of GIS resources.
    - Including web resources, datasets, map layers, symbol sets, etc.
    - Resource documentation describes the resource, and in many domains, such documentation is standardized (for example, FGDC, ISO).
  - The goal is to provide a catalog that describes the resources, and content available. The catalog should be easy to use, and universally accessible. Catalogs would exist for GIS Servers, for GIS databases, and for resource clearing houses that simply reference other available resources.
Metadata

• **Row level metadata (new)**
  – Maintain feature specific information in an environment where the properties may vary from feature to feature.

• **Will be supporting XML columns**
  – Provides a way to encode properties and data specific for each feature

• **Been focusing on use cases in other sectors**
  – We’re interested in hearing about your use cases
Linear/Pipelines

- **Point, Line, & Editing Topology – Pipelines (7)**
  - Addition of Topology Rules required by Pipelines
    - Must not overlap - Points must not overlap any other point within a feature class or subtype
    - Must not have dangles within tolerance
    - Endpoint must be covered by set of feature classes
  - Define which nodes control editing of pipelines during a topological edit
  - Possible solution:
    - Define the feature classes to be used for pinning, either as a topology rule or interactively, similar to Snapping
Linear/Pipelines

- **Geometric Networks & Topology (10)**
  - Good idea, one we’ve heard from other industries
  - Allow geometric network feature classes to participate in a Topology
  - To take advantage of topology rules

- **Issue:**
  - Geometric networks maintain their own connectivity/topology. Issues if the Topology cracking/clustering is introduced

- **Possible solution:**
  - Add ability to run topology rules against feature classes without cracking/clustering the features
  - We’ll be focusing on issues with geometric networks and topology post 9.2
• **Event Performance (11)**
  - Route Events Performance requires enhancement – issues when approaching millions of records
  - The only way to access point layers in Oracle from ArcIMS is to add an SDE layer. For small tables (<1000 records) efficient access through SDE is not essential. Synchronization of SDE records and SDE license fees are an issue.
    - May be solved by Make Query Table geoprocessing tool
  - We’ll be looking at this and possible improvements on this along with the issues with geometric networks and topology post 9.2
Linear/Pipelines

• Case tools for pipelines (16)
  – Reverse engineering capabilities
  – Import XMI files into a UML CASE tool
  – Need to be able to recognize changes between a model and a geodatabase
  – Define spatial references
  – Define Topologies and Network Datasets
  – 6) We need the ability to maintain descriptive metadata in UML and be able to automatically generate/update XML metadata with the Schema Wizard

• Metadata tools for pipelines (17)
  – We need better out-of-the-box tools for creating/modifying custom metadata editors in ArcCatalog
  – Should be able to pick and choose which metadata tags to expose in an editor, and how to format them for display in the editor without any programming.
Other General Issues

• **Versioned\SDE Layer management and Batch operations**
  – Provide a tool to register SDE layers with the geodatabase
  – Register feature class (also standalone) as versioned

• **Better management of Geodatabase**
  – User and password management
  – Schema locking
  – SDE Command line utilities
  – Version tree management, recommended reconcile order