Managing Distributed Data with Geodatabase Replication

Gary MacDougall
Premjit Singh
Synchronizing Data

- What is Replication?
Work off-line or in the field

- To work off-line
  - Replicate a subset (Check-out) from enterprise GDB
  - Make edits
  - Check in
- Intermittently connected
- Supports
  - Full geodatabase model
  - desktop add ins
DEMO 1: Working off-line
Synchronize copies of a Geodatabase

- Make edits and synchronize multiple times
- Configurations
  - Changes are sent in one direction to a read-only copy
  - Changes are sent in both directions
Synchronize copies of a Geodatabase

• Local
  - Replica geodatabases within the office

• Internet
  - WAN
    - Replica geodatabases in different offices
  - Cloud (Amazon AMI)
    - Replica geodatabase is on the cloud machine
DEMO 2: Synchronizing to a read-only Geodatabase
DEMO 2: Synchronizing to a read-only GDB

- Build maps to define the data to copy
- Use simple model when possible
- Copy to an enterprise geodatabase
Synchronizing and the cloud

- The cloud described in this session refers to...
  - Machine images preconfigured with ArcGIS Server 10
  - Hosted on Amazon cloud

- Why go to the cloud?
  - High Availability
  - Scalable
  - Saves on hardware and resources
Synchronizing and the cloud

- Copy Geodatabase data to the cloud
- Publish services
- Synchronize between Local Office and Cloud
DEMO 3: Replicate read-write Geodatabases

Replicating to the cloud
Replicating to the cloud

- Things to know:
  - IIS data size limits
  - Add in
    - [http://resources.arcgis.com/gallery/file/geodatabase](http://resources.arcgis.com/gallery/file/geodatabase)
Scheduling Synchronization

- Use scheduling to keep the data up to date
  - Create a geoprocessing model to synchronize
  - Export to python
  - Add to windows scheduler in the office

- Scheduling tasks on the cloud
  - Schedule GDB maintenance routines
    - Compress versions, rebuild statistics, rebuild indexes
    - Run after Synchronizing copies
    - See: Administering GDBs with python session
DEMO 4: Scheduling Synchronizations
Schema Changes

- Tools are provided to apply schema changes across the copies
- Subset of schema changes supported
- Can add to python script to automate
  - Requires exclusive schema locks
  - Applies defaults when making schema changes
  - Synchronize schema before synchronizing data

DEMO 5: Synchronizing Schema changes
Register only

- Registers the geodatabase copies without copying the data
- Requires the data to be pre-copied
- Data should match on the copies before registering
- Useful when…
  - Making schema changes (e.g. adding data)
  - Troubleshooting
Notes

- **Disconnected synchronization**
  - No network required
- **Fault tolerant**
  - Rolls back on failure
- **Conflicts**
  - Automatic - favor one geodatabase or the other
  - Manual
Notes

• Supports data types but...
  - Network datasets, Cadastral fabrics (coming in 10.1), Rasters

• API’s
  - ArcObjects, Geoprocessing/Python

• Uses Versioning

• Not DBMS replication
  - Synchronize geodatabases running on different DBMS’s
New in 10.1

- Better trouble shooting tools
- Used in other workflows
  - Local editing commands
  - Feature service disconnected editing REST APIs
  - Publishing to the cloud
Sample Maps
Sample Screenshots Layout *(preferred)*
Grids for Images/Screenshots (may ask designer for assistance)

- environmental conservation
- disaster response
- demographic analysis
Diagrams/Icons
Arrows

Arrows for Connecting Items

Arrows for Connecting Large Concepts
# Shapes for Diagrams

<table>
<thead>
<tr>
<th>Quick Style: Subtle Effect</th>
<th>Quick Style: Moderate Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>ArcGIS</td>
<td>ArcGIS</td>
</tr>
<tr>
<td>ArcGIS</td>
<td>ArcGIS</td>
</tr>
<tr>
<td>ArcGIS</td>
<td>ArcGIS</td>
</tr>
<tr>
<td>ArcGIS</td>
<td>ArcGIS</td>
</tr>
<tr>
<td>ArcGIS</td>
<td>ArcGIS</td>
</tr>
<tr>
<td>ArcGIS</td>
<td>ArcGIS</td>
</tr>
<tr>
<td>ArcGIS</td>
<td>ArcGIS</td>
</tr>
<tr>
<td>ArcGIS</td>
<td>ArcGIS</td>
</tr>
</tbody>
</table>

**DON'T APPLY EFFECTS from the Design tab**
Shapes for Diagrams (continued)

Cloud optimized for use behind diagrams

Circle behind a group of objects

Cloud for general diagram

Optional: Use as a frame around showcased screenshots

Content box for each tier (see sample diagrams)
Sample Diagrams
ArcGIS Implementations

Desktop
- Individuals
  - Ad Hoc Projects
  - Analysis/Modeling
  - Mapping

Server
- Workgroups
  - Shared Database
  - Fixed Applications
  - Transactions

Enterprise
- Organizations
  - Shared Services
  - Integration
  - Collaboration

Web GIS
- Cloud
- Enterprise
- Local

New
ArcGIS 10 — A Complete System

Easier
More Powerful
and Everywhere

Mobile
Desktop
Web

- Discover
- Create
- Manage
- Visualize
- Analyze
- Collaborate

Cloud
Enterprise
Local
Esri is publishing our REST Interface as an Open Standard.

Any Application

Open REST API

Open Data Access

Standards:
- OGC
- CAD
- WCS
- ISO
- INSPIRE
- WWW
- KML
- WFS
- SQL
- WMS

Open API’s:
- GDB
- Share Point
- Flex
- Silverlight
- REST
- Java

Open REST API - Any Application

Quick Style — Moderate Effect
Access the Entire Icon Library

Over 160 items added in 2010

• 430 total icons available for Esri use
• Browse and search from any Microsoft Office application
• Accessible when you’re connected to the Esri Network
• Also available offline as directories of PNG files
• See the presenter notes below for details
A Selection of Frequently Used Icons

ArcGIS Desktop
ArcGIS Online
Web Blog
Web Blog
Mashups
Mashups
Browser
Open Standards
ArcGIS Desktop Authors
Web Map
Web Map
Map
Web Map
Web Map
Map
Web Map
Web Map
Map
Web Map
Web Map
Map
Explorer
Web Map