The Evolution of a Disconnected Editing Workflow Using Two-way Replication

introduction

- Sarasota County, FL

- Jones Edmunds – Florida engineering firm

- Long-standing relationship

    - Enterprise GIS development

    - Database design/development

   - Data collection/population

    - Integration services

outline

- Benefits of Distributed Geodatabases (GDB)

- Through Replication

- Project History with Sarasota County

- Transactional Software Pairs

  - Personal, Workgroup, Enterprise

- Parent/Child Setup and Housekeeping

- Dynamic QA/QC

- Potential Causes of Failures

- Lessons Learned

distributing geodatabases

- Allows organizations to distribute data from central repositories

- Connected or <u>Disconnected</u> environments

- Replicating data in whole or in part

- Delta synchronization process

- Introduced at the 9.2 (8.3) release

- Esri maintains toolsets
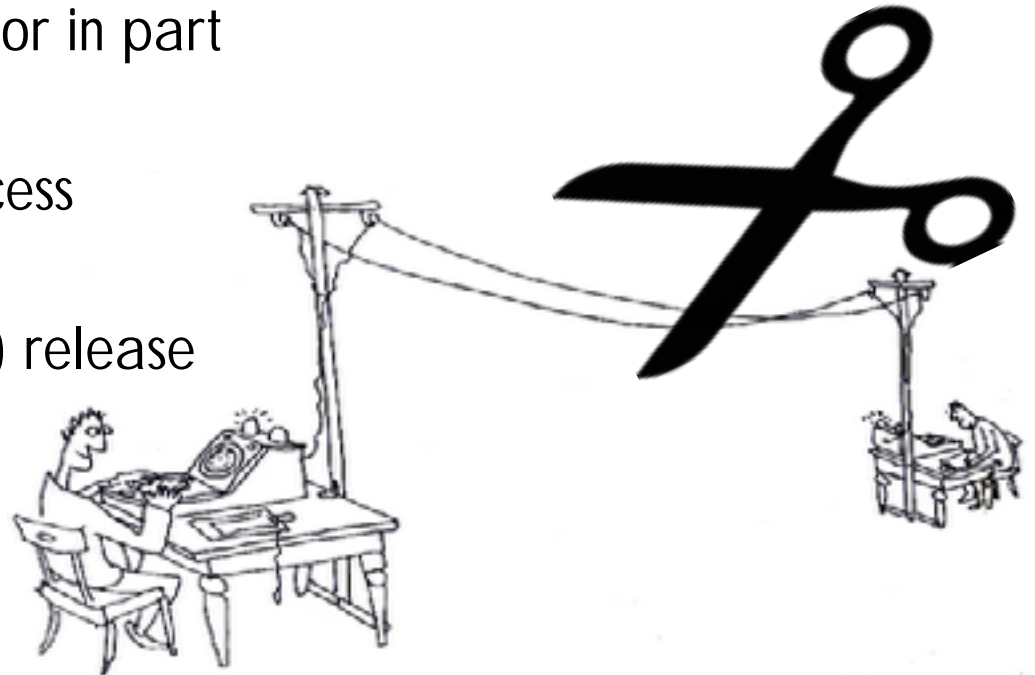
why disconnected editing

- Project requirements:

    - Manage GDB edits between <u>disconnected</u> enterprise environments

    - Allow the County to maintain day-to-day operations without interruption

    - Allow Jones Edmunds to manage separate editing workflow

- Third-party support (i.e., Bentley)

"Edit my stuff from over there without touching my actual stuff and deliver it without me having to jump through hoops to reconcile the edits…"

replication options

- **Two-way Replica**

  - Data changes are sent in _**both**_ directions (ArcSDE)

  - Persistent connection – unregister/register

 - Useful for a controlled enterprise editing environment

- **One-way Replica**

  - Data changes are sent in _**one**_ direction (ArcSDE)

  - Persistent connection – unregister/register

  - Useful for read-only source databases such as service data providers and models

replication options continued

- **Check-out**

  - Edit the replica's data and then synchronize edits with the parent database

  - Once synchronized, you can no longer synchronize additional edits

  - Requires creating a new check-out

  - Destination can be ArcSDE, File, or Personal GDB

  - Natively <u>disconnected</u>
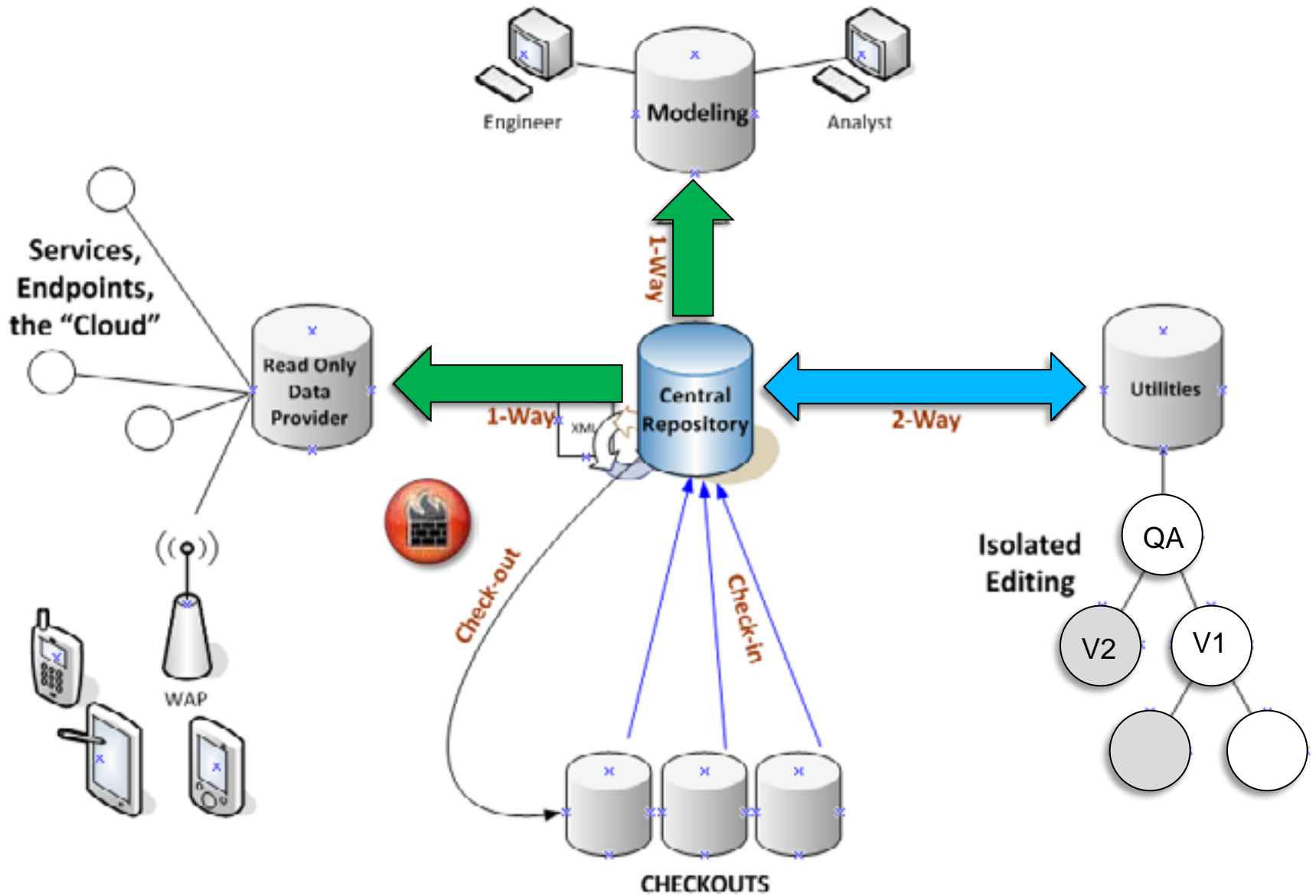
through the versions
-project history

- Project detail

  - Timeline - ArcGIS 9.2; continues today

  - Started with stormwater infrastructure updates; expanded to most infrastructure data collections at the County

- Replication was not used previously

  - Isolated workspaces (AOIs)

  - Manual reconciliation of deliveries

  - Wholesale replacements

  - Overall messy

check-out
-project history

- First attempts were focused on a small collection area

- Decided to use **check-out** replication

  - Check-out to a single GDB

  - A single editor at Jones Edmunds made edits

  - Delivered the GDB

  - County checked-in the GDB

Check-in

County SDE

Check-out

pGDB
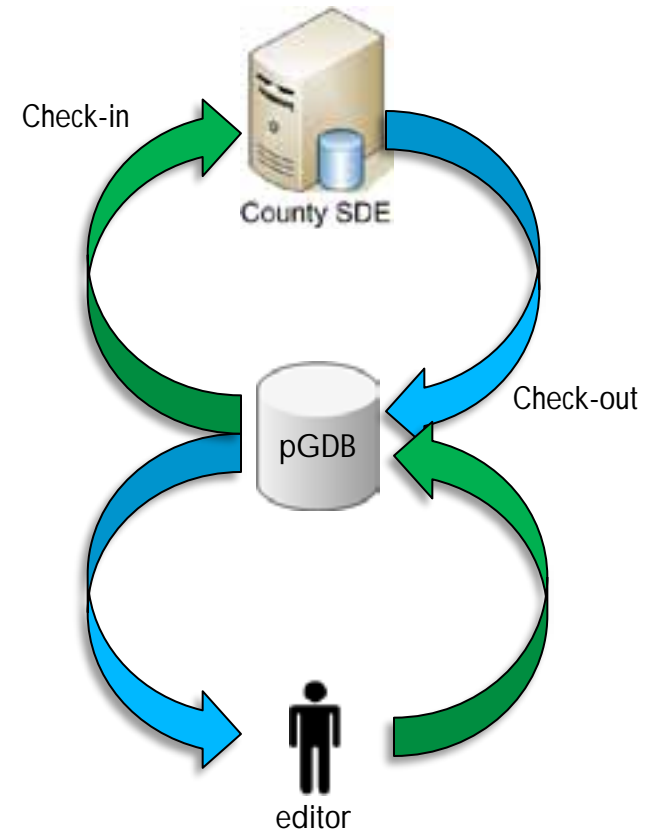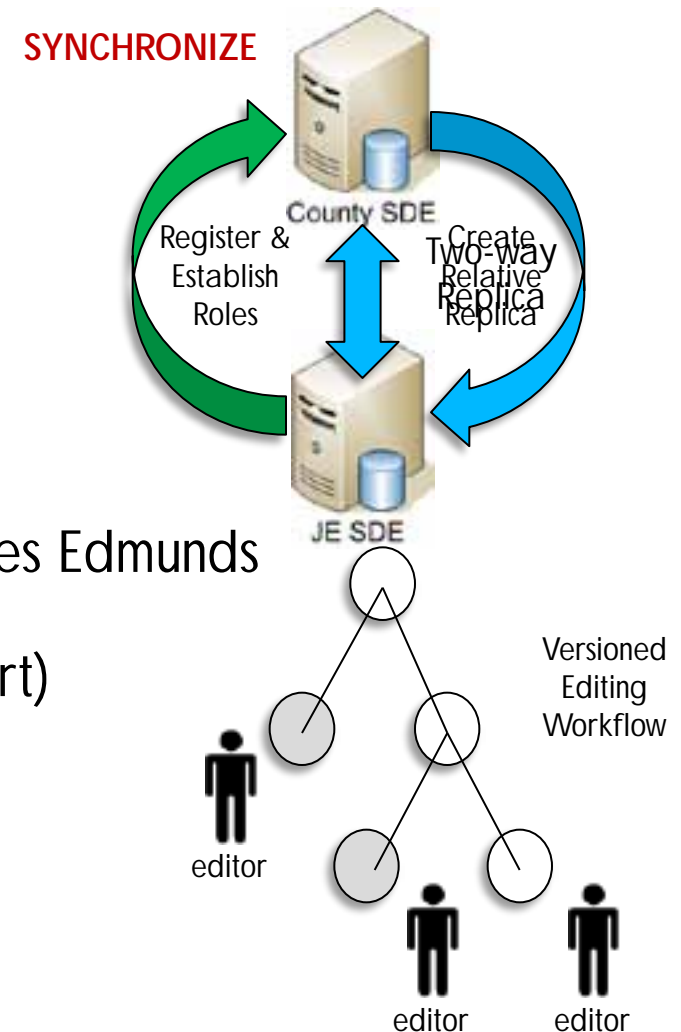
editor

check-out continued
-project history

- Challenges

  - Client-side management overhead of multiple checkouts

- Limitations

  - Only one editor per <u>registered</u> checkout

  - Must be delivered back to the client in the <u>registered</u> container

  - Workflow disruptions – waiting for new check-outs

- Issues

  - Tried distributing copies of the registered database to multiple editors

  - Do not compress (zip) your deliveries

through the versions
-project history

- Ability to manage multiple editors

- Eliminate downtime (on both sides)

- Evolved into two-way replication

  - Register two <u>disconnected</u> SDEs

  - Create versioned workflow at Jones Edmunds

  - Synchronize (XML exchange/import)

  - Acknowledgements (optional)

  - Schema changes

SYNCHRONIZE

County SDE

Register & Establish Roles

Create Two-way Relative Replica

JE SDE

Versioned Editing Workflow

editor

editor   editor

check-out
-project history

- Challenges

  - Initial Setup/Registration

    - SDE release compatibility – *to the patch!*

    - Errors in data – failed to create a database from XML

- Limitations

  - Becomes a additional constraint on an enterprise

- Issues

  - Delta (XML) import failures/non-failures

  - Sender/Receiver state abandonment

child - setup and housekeeping

- Headless Database Owner
    - Not Admininstrator
    - Not a Version Owner
- Before XML Exchange
    - Roll-up Edits
    - Delete Versions
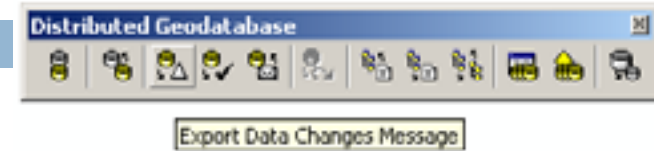   - Compress
- Do not Zip/Compress Delta (XML) File

Parent

Create Relative Replica

County SDE

Child

JE SDE
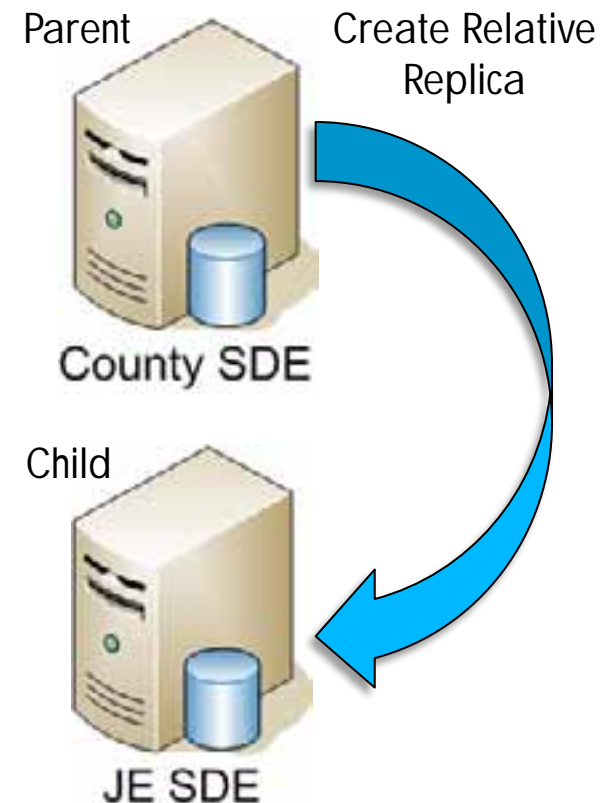
Export Changes Wizard

This wizard exports data change messages that contain the most recent data
The changes are exported to a delta file which can then be sent to the relativ

Choose the replica from which to export data changes. Only replicas that are
a date change message. Replicas that are data receivers are not listed below

notes of consequence
-tips and tricks

- **Child**:

  - Before creating the Delta (XML), <u>reconcile,</u> <u>post</u> all versions, and <u>compress</u> the database

  - Create Delta (XML) as the "headless" database

  - During Delta (XML) **export** make sure to switch to Receiver

- **Parent -** During Delta (XML) **import**:

  - <u>Always</u> resolve conflicts in favor of the import

  - Import into the version where the two-way replica was initially created

Make sure that both the Parent and Child are in Same Release of SDE.

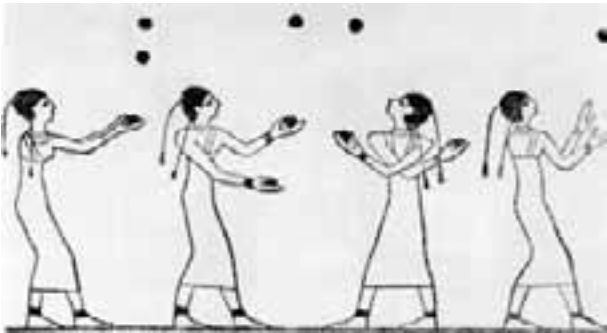# notes of consequence continued
-tips and tricks

- Sometimes, there is no explanation for synch failure.

- State of Parent or Child?

- XML exchange issues?

    - Number of edits on Parent or Child side?

    - Size Limitation?

        - Failed at 28 mb and 78 mb

        - Success with >5 mb, 18 mb, and 37 mb

- Invalid character in XML?

- Schema differences?

dynamic QA/QC

- Only works with two-way
- Iterative QA process

improvements to process
-future

- ArcGIS Server
  - Geodata Service
  - Potential Issues
    - Network performance/latency
    - Not only do databases need to be compatible but the disconnected networks need to play well together.

questions?

thank-you

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