Working with Versions in ArcInfo 8

Today's Agenda

- Definition
- Concepts and Benefits
- Server (ArcSDE) - Client (ArcInfo)
- Overview of ArcInfo's Functionality
- Available Customization
- Demonstration...
- Questions ?

A “simple” definition:

- **Versioning provides the functionality to create persistent alternative representations of the database for executing short or long transactions.**

(without data extraction or duplication)

So, what are Transactions?

- **DBMS transactions are designed for ‘short transactions’, where changes require instantaneous results**

  Example: Financial Transactions - Stock trades...
- **GIS transactions require the concept of ‘long transactions’ that evolve over time**

  Example: An edit session...

How it’s done today...

- **Coverages/Shapefiles: Single user access while being modified**
- **Librarian: Lock and extract tiles for local workspace editing**
- **ArcStorm: Define a selection set to lock and extract for local workspace editing (feature level locking)**

Disadvantages…

- Data is only accessible for one user to edit

- Data is distributed all over the organization (difficult to maintain and back up)

- Takes time to extract and check back in

- Relational data stored separately in DBMS

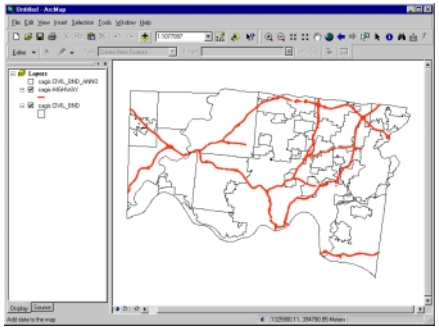
How Versioning works...

- Based on SQL queries, different representations, or states, of the data can be maintained and persisted in one location - In the DBMS
- Multiple users may access and modify the same data and in the same version
- Direct editing - no need to lock or extract

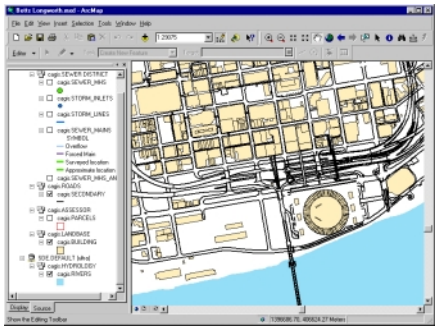
Concepts

- A version spans all multi-versioned objects in the database
- Versions differentiate only by those features or rows modified in each version
- There is still a *Geodatabase* (ArcSDE) and a *Client* (ArcInfo)

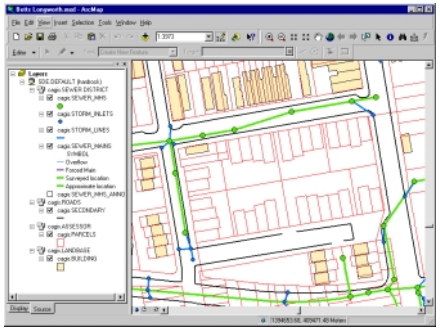
The current database



Riverfront Expansion



Geodatabase
ArcSDE



Engineering Design

ArcInfo is the window into the Geodatabase

ESRI

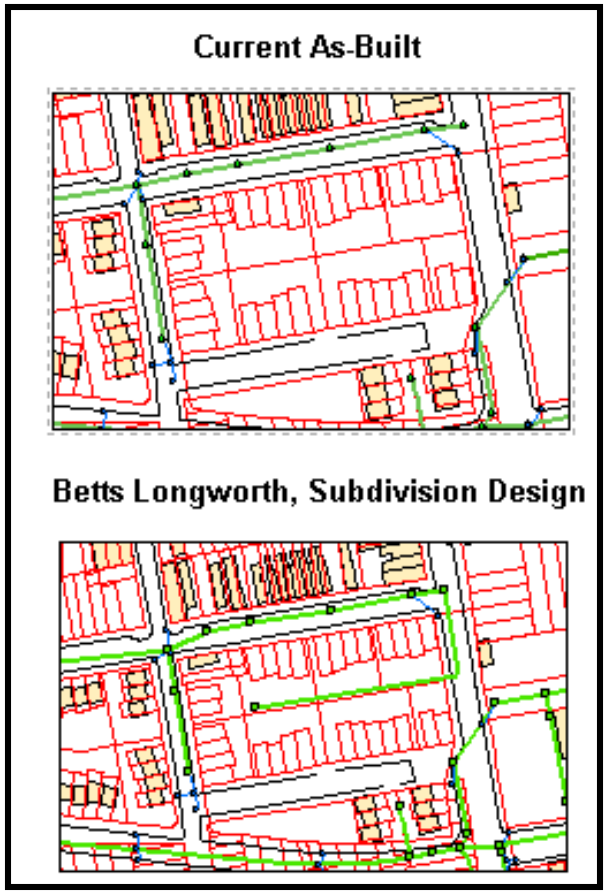
Application Uses

- **Spatial Analysis...**
  - **‘what-if’ scenarios,**
  - **spatial overlays of different versions,**
  - **statistics, report generation**
- **Temporal changes...**
  - **wild life migration,**
  - **evolution of forest stands,**
  - **parcel management**

- **Cartographic...**

  - multiple versions in the same map

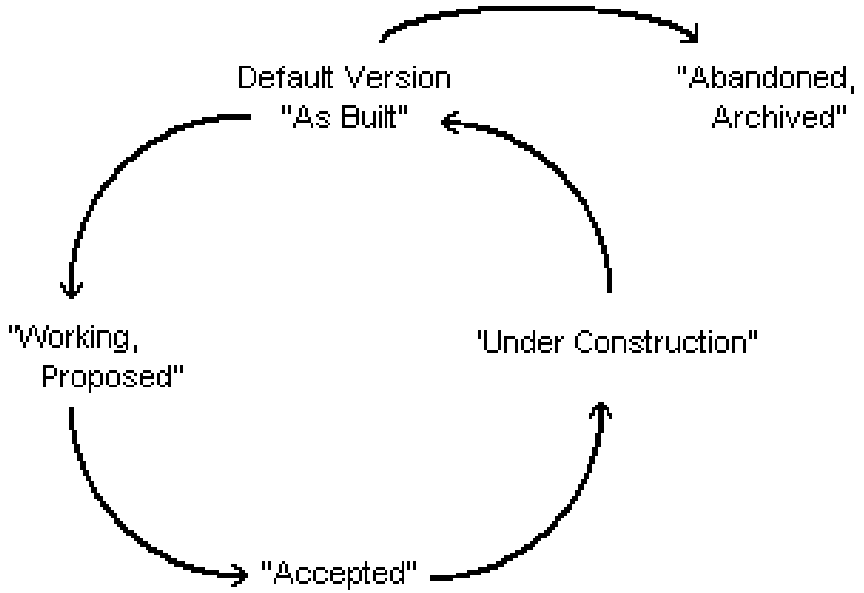
- **And, what ever you can imagine...**



- **Assist organizations with the work flow process...**

Work flow stages:

- **As-Built**
- **Working, proposed**
- **Accepted**
- **Under construction**
- **Abandoned, archived**



Workflow process evolving through individual stages

What are the Benefits?

- Simplifies the editing experience:
  - No Locking (ArcStorm/Librarian)
  - No Check out
- A centralized, seamless database
- No data extraction or duplication
- Shared Server/Client processing

DBMS Benefits

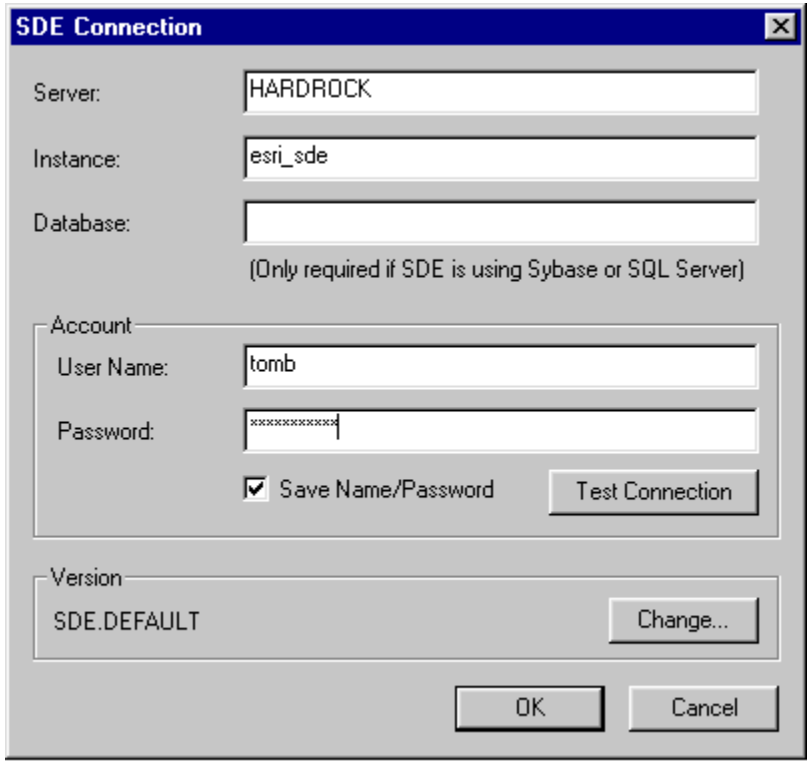
- Storing your GIS data in a Database Management System
- Native DBMS utilities for backup and instance recovery
- Proven DBMS performance and scalability

ArcInfo's Functionality

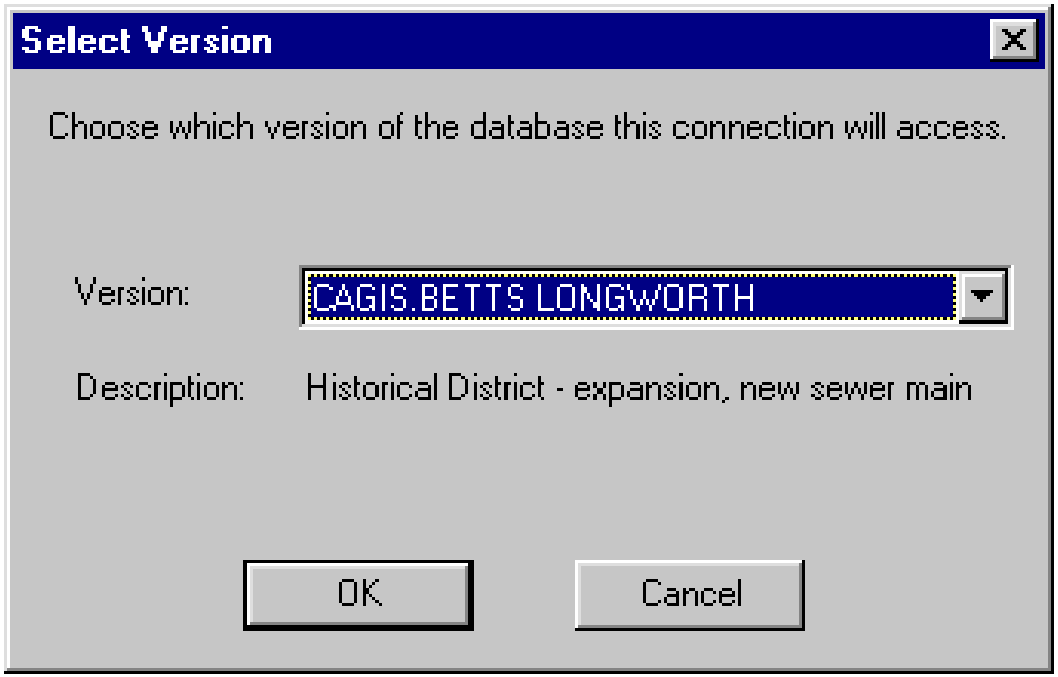
Connecting to the database

- **Requires server, ArcSDE instance, user name/password**

  and...

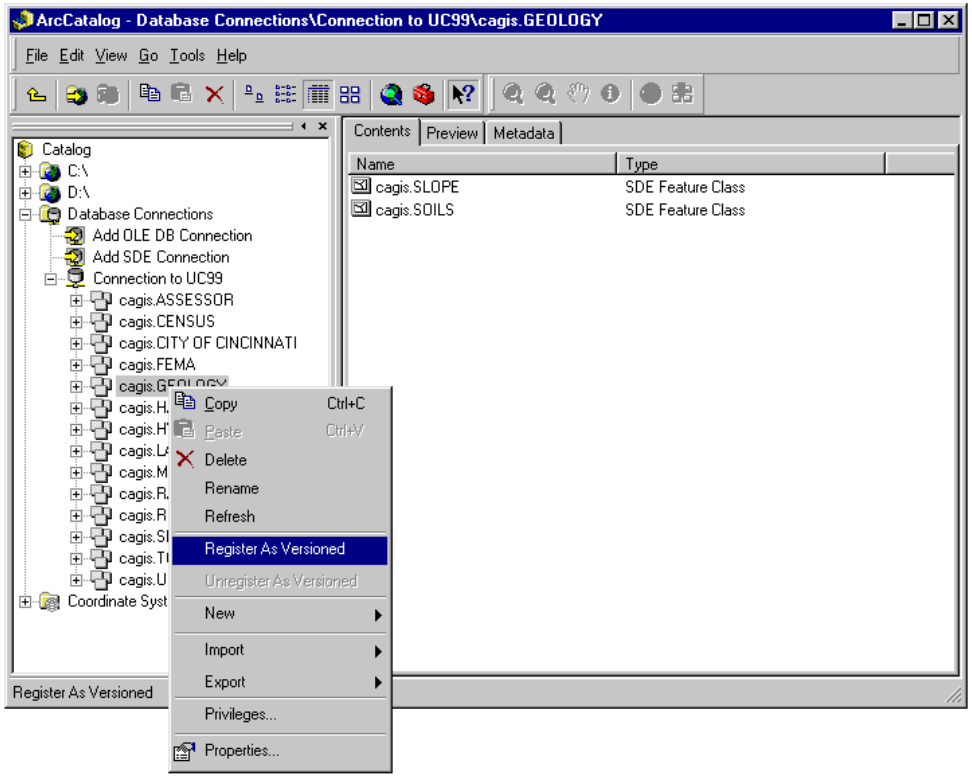


- **The option to connect to a different version, other than ‘DEFAULT’**



Registering object's as Versioned

Using ArcCatalog Register a Feature Data Set or Feature Class



Restrictions

- **Only the owner can Register an object as Versioned**
- **A Primary key is required - type integer**

  - Creating/Loading feature classes with A/I will create a primary key (OBJECTID, OID)

You can...

- Add columns
- Drop columns (Oracle 8i)
- Add and Drop Indexes
- Alter the spatial index
- Establish geodatabase relationships and behaviors (domains, connectivity rules, etc.)

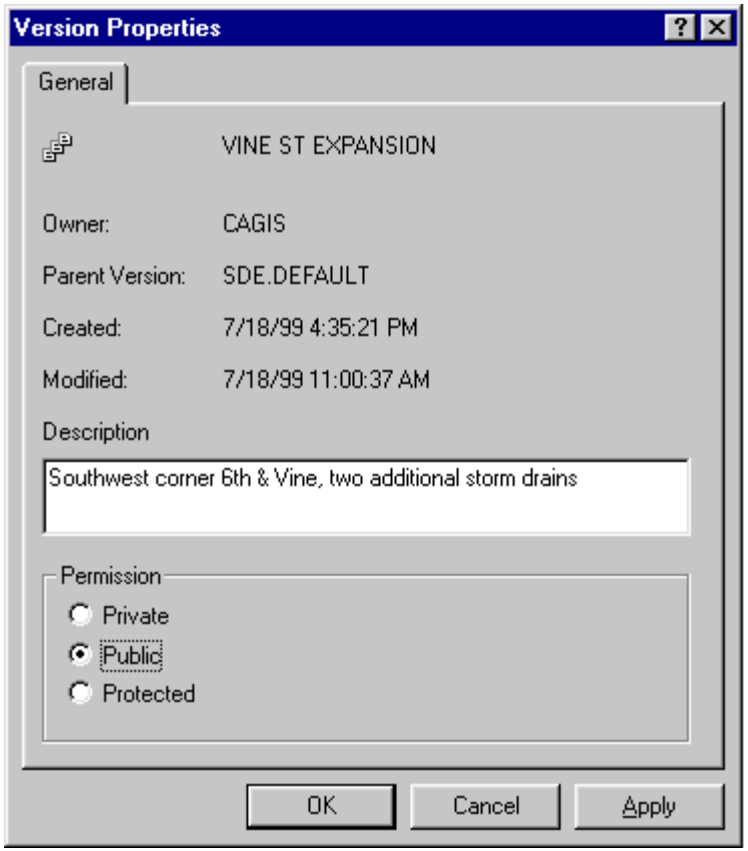
Relationships between Versions:

- ArcSDE provides the ‘DEFAULT’ version, owned by the ArcSDE administrative user
- The ‘DEFAULT’ version is the database
- Versions maintain Parent/Child - referential integrity

  - Parent version cannot be deleted until all dependant versions are first removed

Version properties

- Name
- Owner
- Parent Version
- Date created
- Date modified
- Description
- Permission

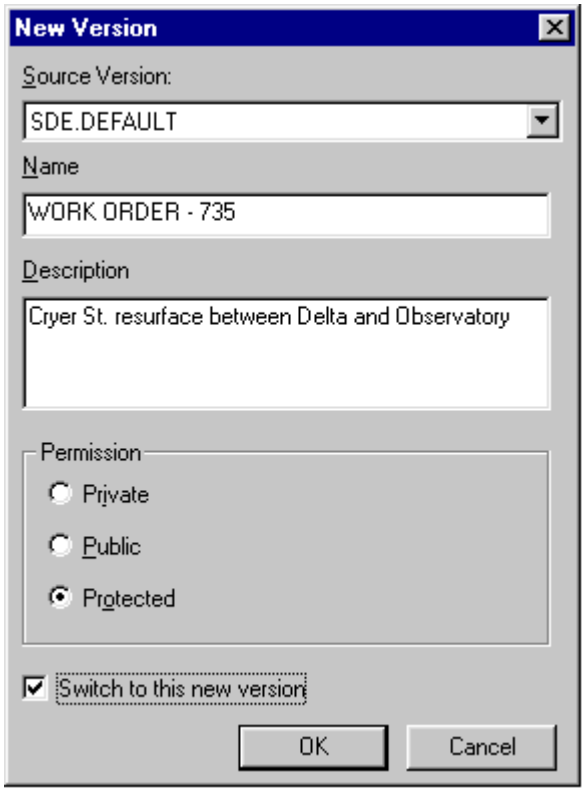


Permissions

- **Private:**
  - **only the owner can view and edit**
- **Protected:**
  - **all users can view, but only the owner can edit (Read Only)**
- **Public:**
  - **all users can view and edit**

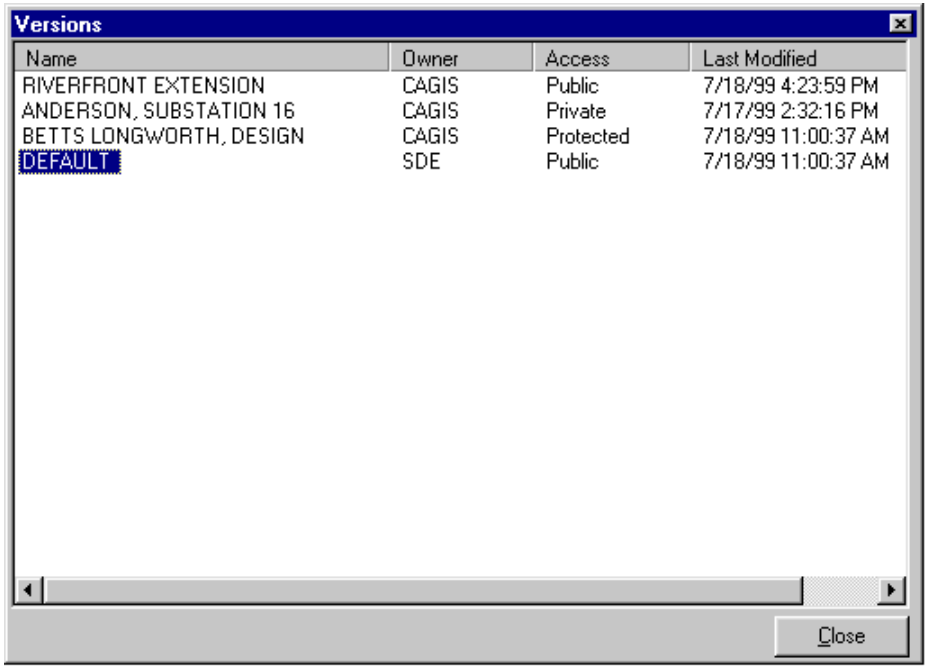
Creating New Versions

- **Always derived from existing versions**
- **Case sensitive, 64 characters length**
- **Using the Version Manager or ArcMap (even while editing)**



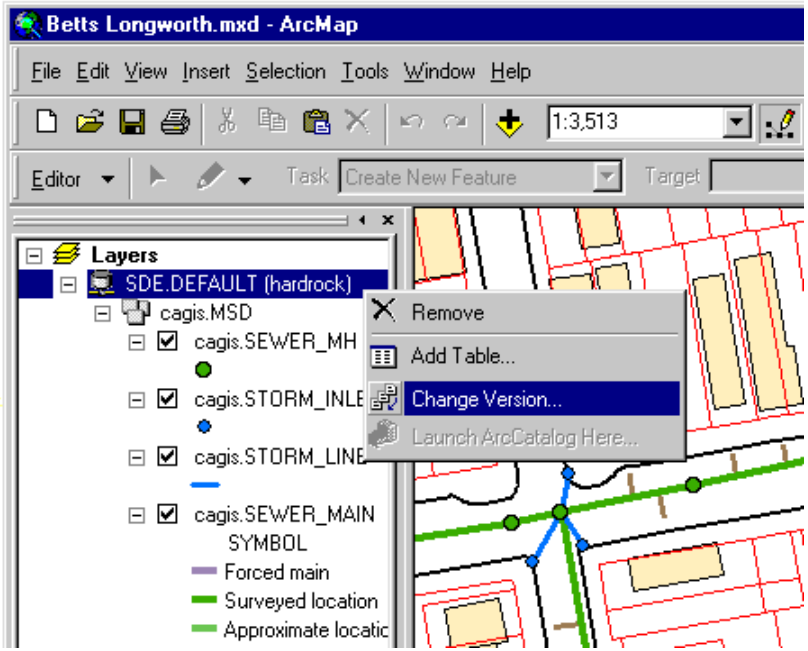
Version Manager

- Create versions
- Delete versions
- Alter descriptions, rename, change permissions



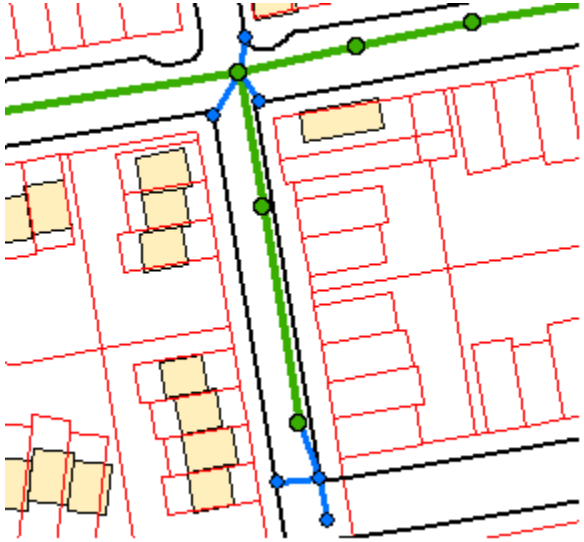
Changing Versions

Changing versions in the map, changes all feature data sets and feature classes to the target version (can not change while editing)



“Refreshing” Versions

- Synchronizes the map with the version’s ‘current’ representation in the database



Before

After

Editing

- Multiple users may edit the same version simultaneously, the database maintains concurrency
- You can edit the ‘DEFAULT’ Version or any version which you have access
- Or alternatively you can create new versions and post when finished

Your edit session is its own representation of the database until you save or post

- Changes are only viewable by you

- Saving applies the edits to the version

- You can only edit one version per ArcMap session

Version Reconciliation

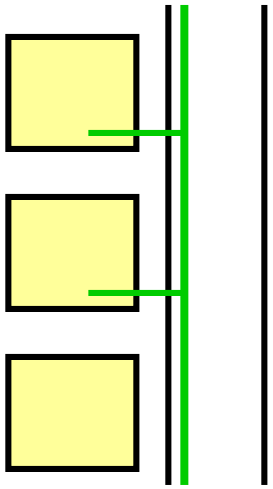
- **Reconciliation is the process of merging any changes in a target version with those in the current edit session**
- **Once ‘Reconciled’ you can:**

1. **Save the results to the current version**
2. **Create a new version**
3. **Post the results to the target version**

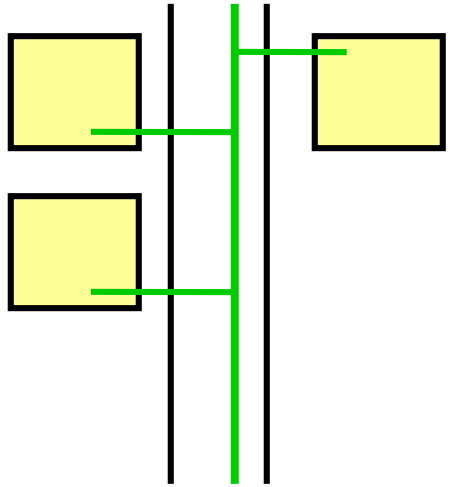
Reconcile

- May reconcile with the parent version, or ancestral version (grandparent…)
- Merges all features modified in the target version (inserts, updates, deletes), into your edit session
- Conflict detection only occurs during the reconcile process
- Can undo/redo, continue editing, save or post

Reconcile Example



Edit Session



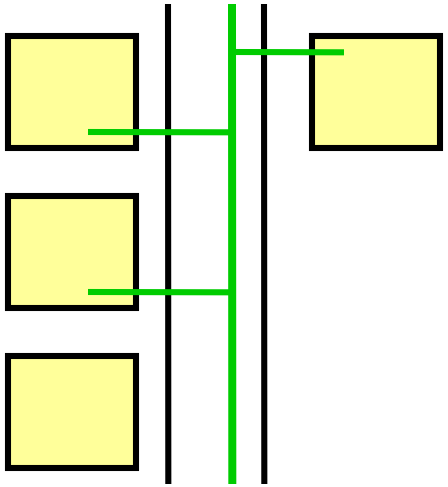
Target Version

Result...

New features are inserted,

existing features are updated,

others may be deleted



Still the Edit Session

Posting a version

1. Reconcile the edit session with a target version,

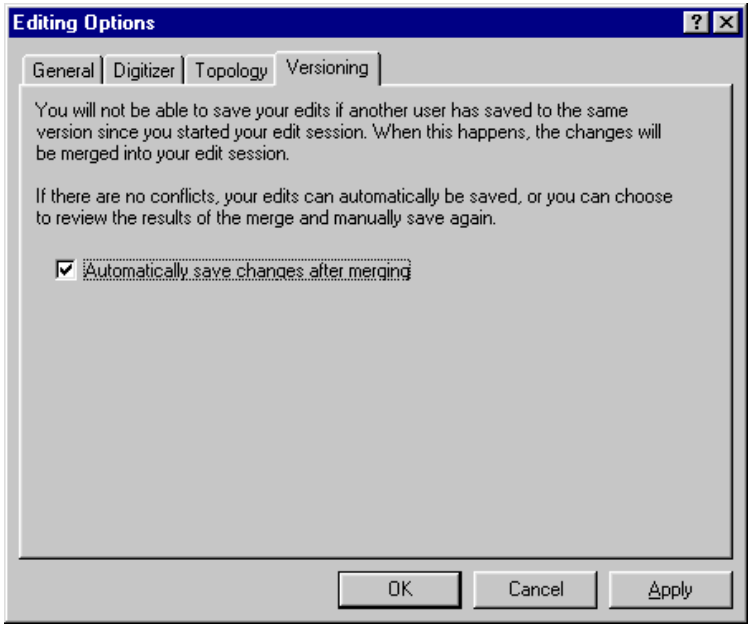
2. Resolve any conflicts,

3. Post, it just happens… (cannot undo)

Auto Reconcile (Save)

Editing option to automatically save changes while saving

Beneficial for reviewing changes after the reconcile



Conflicts

Definition:

Any features updated or deleted in the edit session, which were also updated or deleted in the target version.

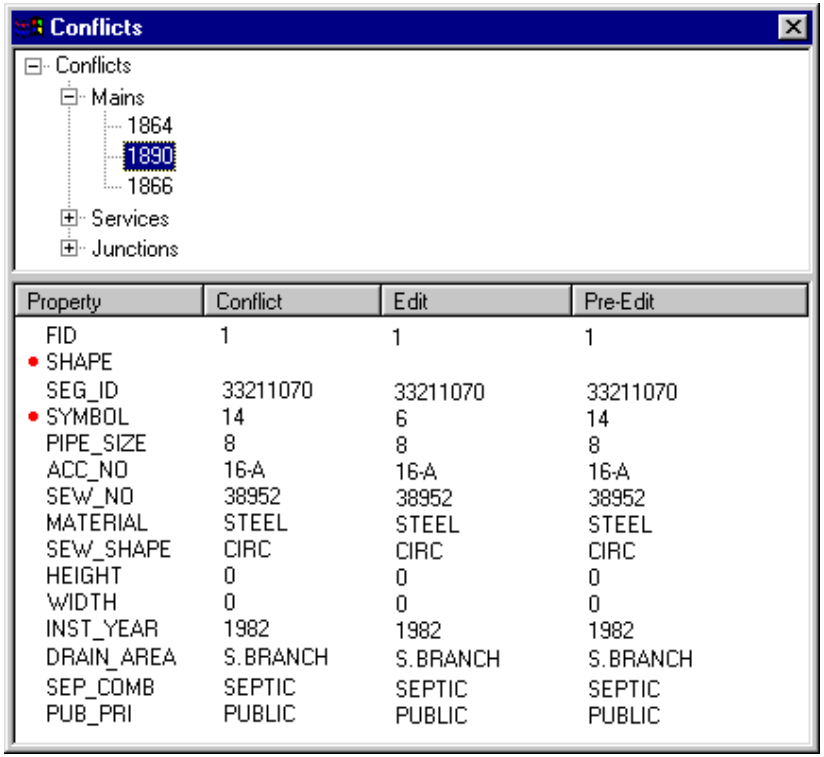
Version A	Version B
Update	Update
Update	Delete
Delete	Update

Conflict Resolution

Conflict: Feature representation in the target version

Edit: Feature as it existed in the edit session

Pre-Edit: Feature as it existed prior to editing



Property	Conflict	Edit	Pre-Edit
FID	1	1	1
• SHAPE			
SEG_ID	33211070	33211070	33211070
• SYMBOL	14	6	14
PIPE_SIZE	8	8	8
ACC_NO	16-A	16-A	16-A
SEW_NO	38952	38952	38952
MATERIAL	STEEL	STEEL	STEEL
SEW_SHAPE	CIRC	CIRC	CIRC
HEIGHT	0	0	0
WIDTH	0	0	0
INST_YEAR	1982	1982	1982
DRAIN_AREA	S.BRANCH	S.BRANCH	S.BRANCH
SEP_COMB	SEPTIC	SEPTIC	SEPTIC
PUB_PRI	PUBLIC	PUBLIC	PUBLIC

Displaying Conflicts

- **Ability to specify conflict display environment**

Conflict version:

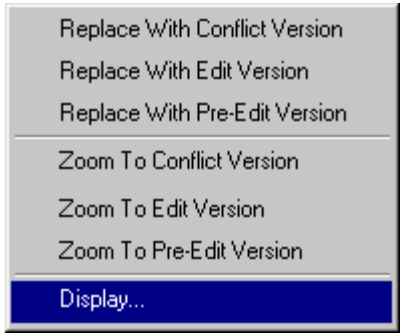
Display Color, Red

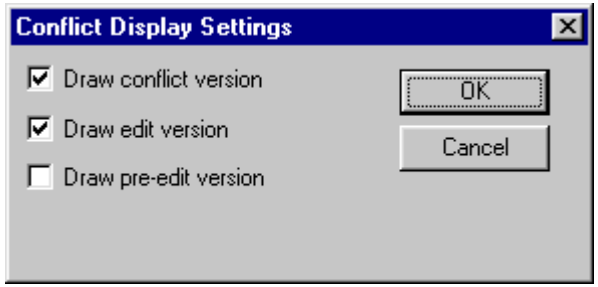
Edit version:

Display Color, Green

Pre-edit version:

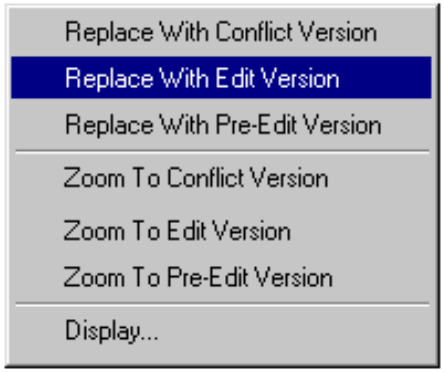
Display Color, Yellow



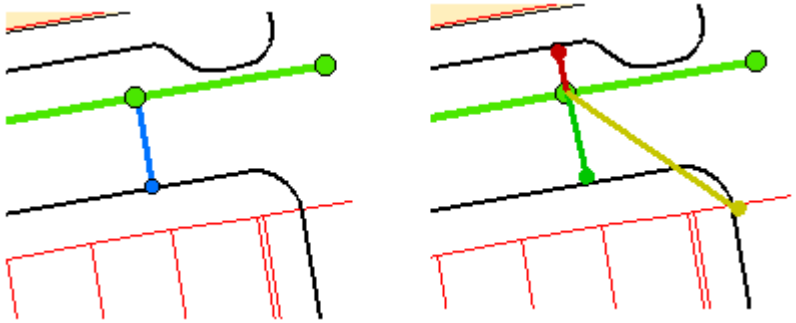


Resolving Conflicts

- **Ability to replace features with 1 of 3 representations:**

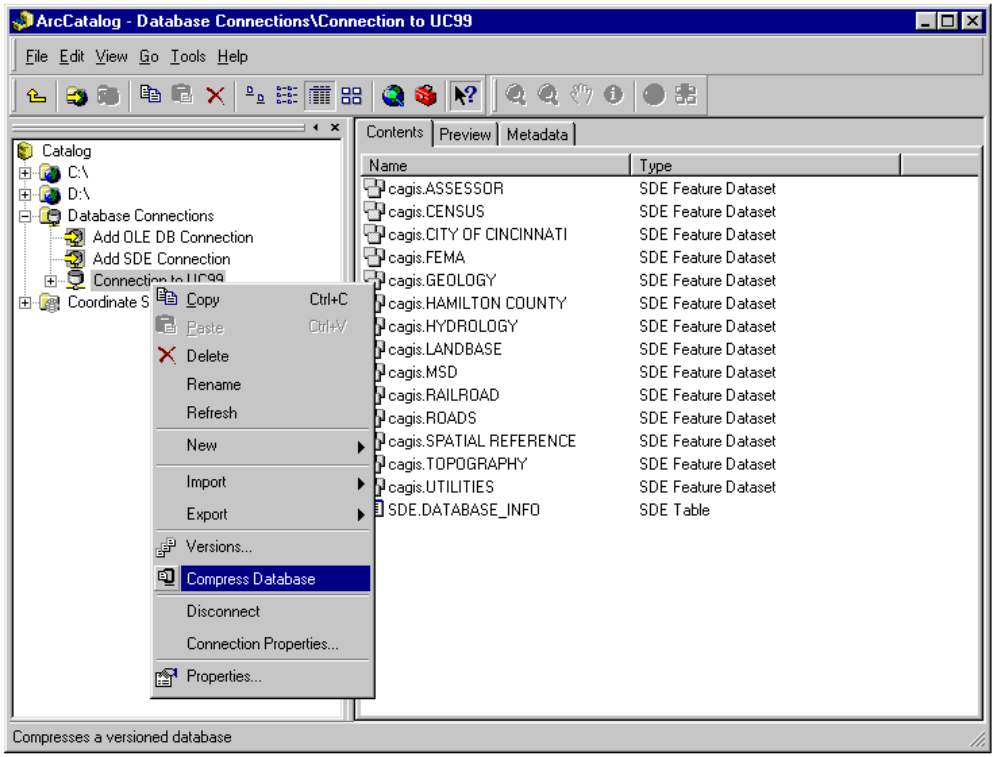


1. **Conflict Version**
2. **Edit Version**
3. **Pre-Edit Version**



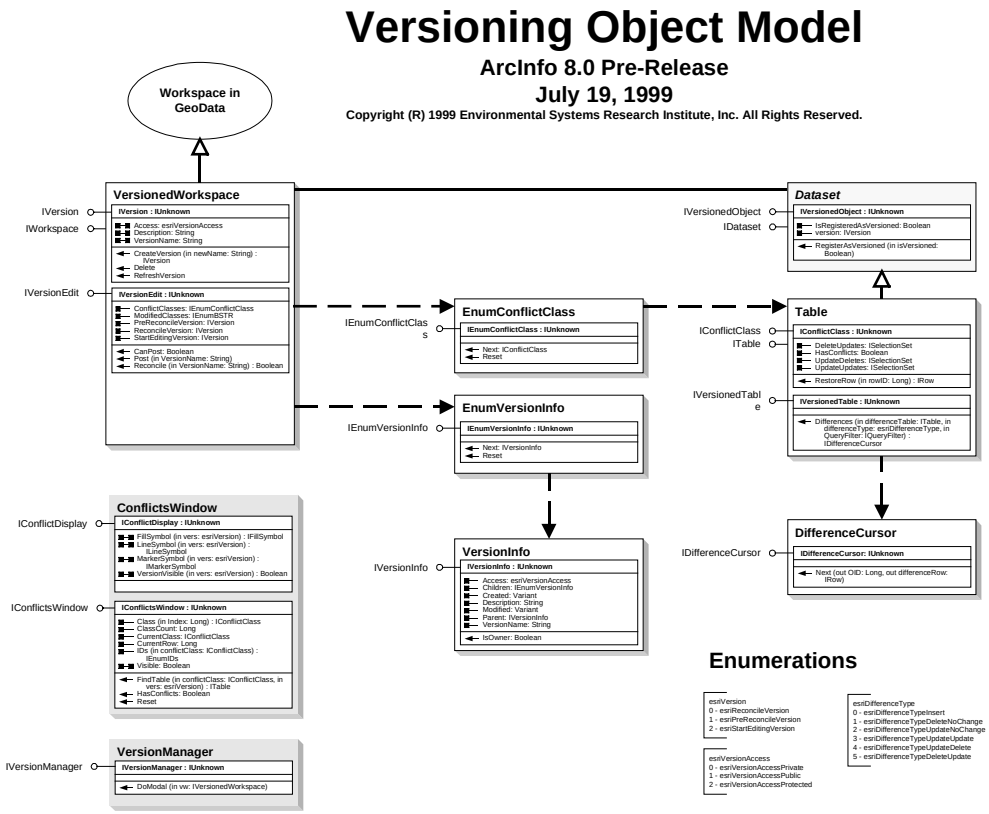
Compressing the database

- Only the ArcSDE user may execute
- Improves query performance
- Frequency depends on the organization



Versioning's ArcObjects

All ArcInfo's functionality is available for application customization



Accessing Versioned data outside of A/I

- Ability to access and manipulate a versioned database
  - OleDB
  - Native SQL
- No Conflict resolution tools, only detection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