

## Migrating ArcStorm Databases to SDE and the Geodatabase

### Abstract

Data migration from ArcStorm to SDE and the Geodatabase should not be taken lightly. Since these databases are very large, a plan must be in place to ensure a rapid and successful migration. This paper discusses the steps in the migration process including; ArcStorm data preparation, conversion automation, post conversion issues and quality control considerations throughout the entire process. In most cases, data migration cannot interrupt the current environment. In order to keep the system running smoothly, migration must be well thought out.

### Migration Planning

Migrating from one technology to another is a major effort for any organization. Not only does the data need to be migrated from one format to another, but applications and data processing procedures must also be updated to work with the new data format. This paper outlines the necessary steps involved with the data migration, however data migration must be done in conjunction with many other aspects of technology migration.

Data migration planning includes evaluation of the current database design as well as creation of the target database design. A conversion specification details the steps and methods necessary for migrating data from one format to another. A quality assurance plan provides checks and balances to not only evaluate the initial quality of the database but also the accuracy of the migration process.

The target database design is created as early as possible in the migration process. The design is created using standard practices of user needs assessment, as well as conceptual, logical and physical design. The design takes into account the needs of the user community as well as the current state of the database. If the current database cannot support the target design then data enhancement is required.

The current database design must be reviewed for its completeness. Are there any proposed layers or features not currently represented in the database? If there are specific data elements that are required for the target database not in the current database, then they must be created. This process of enhancing the current database could be costly and time consuming, so it must be done judiciously.

A migration specification serves as the blueprint for the migration process. It defines the conversion of data elements in ArcStorm to layers in SDE or feature classes in the Geodatabase. Customized migration tools cannot be written without this information.

An evaluation of the initial quality of an ArcStorm can greatly reduce the time and effort it takes to convert your data. The migration process is data driven, meaning that certain data elements in ArcStorm will convert to certain features classes and feature types in the target database design. If the ArcStorm features are coded improperly, the migration will fail or result in poor quality data. By knowing the initial quality of ArcStorm data, the migration process has a better chance for success. In some cases, the ArcStorm data may be of such poor quality that migration is not possible until data corrections are made. Identification of errors due to faulty migration tools is very easy if there is a quality baseline established prior to migration.

### Migration Procedures

#### Data Reformat

Data migration from ArcStorm to SDE is straightforward. The conceptual aspects of data layering is similar in each architecture. Data for electric arcs will be migrated to an electric arc layer in SDE. The real issue in data preparation is how much data enhancement will be done during the migration process. Are there going to be updates to attributes, changes in symbology or types and subtypes? Changes to data can be done programmatically based on the conversion specification.



While data migration from ArcStorm to SDE is straightforward, migration from ArcStorm to the Geodatabase is not. Data layering no longer applies to the Geodatabase; but rather data is stored by feature class. An ArcStorm electric layer may be composed of many features such as primary, secondary and service lines. In the Geodatabase, these features will be represented by primary, secondary and service feature classes. The difficulty is deciding how to best create feature classes from the existing layered data.

## Migration Automation

Automating the migration process will save time and money. In order to fully test the migration, the process must be piloted and prototyped. Automating the migration process will allow for multiple runs of test data through the procedures.

A portion of the programming can be done with AML. The initial step of extracting each layer from ArcStorm can easily be handled with AML programming. If the data is going into SDE, all data reformat such as attribute updates, table restructuring and data enhancements can all be handled with AML. The actual loading of the processed layers can be accomplished with UNIX scripts or batch files.

If the data is going to be loaded in to the Geodatabase, then certain portions of the process can be handled with AML, while others must be done using the Geodatabase loading wizard or with customized Visual Basic programming. The process of separating the extracted coverages into coverages for each feature class can easily be controlled with AML. Additionally, as with the data going into SDE, table restructuring and data enhancements can be handled with AML. The Geodatabase loading process can be done with the out of the box loading wizard. This is fine for loading a small portion of data, or one time use, however for an iterative pilot process where data is converted several times before the process is finalized, these tools are inadequate. Custom Visual Basic programming that can perform the steps that the loading wizard does for multiple feature classes is essential to a smooth migration.

## Migration Quality Control

Quality control is critical during the migration process. Migrating data from ArcStorm involves data processing, regardless of the target database. Any time data is processed there are chances for error. Making the migration process programmatic reduces the chances of data processing errors. Obtaining feature counts for features and table records originating in ArcStorm and then counting the number of features that were migrated will ensure that no features or records are lost in translation. Frequencies of attribute values are valuable especially if there are data enhancements or mapping of types and subtypes from ArcStorm to the target database design. These attribute counts; ensure that the correct numbers of individual attribute values were translated to the correct target values.

## Pilot Project

Testing the migration process is essential to project success. There is no better way to put the process through its paces than to run data through it in a prototyping fashion. A small data set can be iteratively run through the process several times, refining it until all of the bugs are worked out. Once the process stabilizes then larger sets of data can be processed, until finally all of the data can be processed.

## Staffing Considerations

An evaluation of the current staffing situation is a necessity for migration success. The migration process adds several new tasks that must be completed in a timely manner. The migration process not only will add technical tasks, but project management tasks. It may be necessary for the migration process to run in parallel with current data maintenance functions. These two processes are likely to compete for system resources as well as staffing resources. The project management task of scheduling migration to complete so that new application rollout and application training can begin is required.

## Training

An upgrade in technology certainly means an upgrade in training. AML Programming may be adequate for migration from ArcStorm to SDE, but will fall short when migrating to the Geodatabase. To programmatically control the migration process,



Visual Basic programming will be required. Additionally training in object oriented database design is necessary for creating the target database design, ArcInfo 8 training to optimize the feature classes and the post migration application environment. For the migration to SDE, training in the RDBMS and its SDE tuning is required for a smooth transition from ArcStorm.

## **Post Migration Issues**

Once the migration is complete, an evaluation of the data must be performed. Review of feature counts and attribute frequencies will establish that the data was processed correctly. If the data is going into SDE, the attributes and relationships must be tested for accuracy. Constraints and referential integrity rules as well as triggers should be created to control the input of new data into the database. These controls will ensure that any new data that is entered into the database will fit the database design. If these controls are not put into effect, then a system of schedules validation will be required to evaluate the database at regular intervals to determine if errors are being created during data entry. If the data is going into the Geodatabase, then similar domains and relationship classes must be established. These constraints again will control the input of data during data entry.

## **Conclusion**

The migration process entails up front planning to ensure success. Large databases do not migrate easily so planning each step becomes very important. Piloting and prototyping the migration process will greatly reduce processing errors and allow application testing with the migrated data early on in the process. Quality assurance plays a vital role in determining if the data is ready for migration or if data correction and enhancements are required. Knowing the initial quality of the data and setting a quality baseline will speed migration process troubleshooting. Finally, project management must coordinate staffing, training and migration tasks in order for migration to happen smoothly.