






The ESRI Geodatabase Data Model

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ESRI Inc. Data Models

- Coverage 1980s
- Shapefile in the 1990s
- Geodatabase 2000s
 - Built on ArcObjects

ESRI Geodatabase Data Model

Three Types of Geodatabases	Personal Geodatabase 	File Geodatabase 	Scalable Geodatabase (Three levels) 
Storage format	Microsoft Access	File folder of binary files	DBMS
Storage capacity	2 GB	1 TB per table	Depends on server
Supported O/S platform	Windows	Any platform	Any platform
Number of users	Single editor, multiple readers	Single editor, multiple readers	Multiple editors and readers
Distributed geodatabase functionality	Checkout/Check-in replication	Checkout/Check-in replication	Replication (all types) and versioning

Reference: Many Choices Many geodatabase types available with ArcGIS 9.2 By Derek Law, ESRI Product Management ArcUser January–March 2007 Vol. 10 No. 1

Geometries for Geodatabase, Shapefile and Coverage Data Models

Geodatabase	Shapefile	Coverage
Point	Point	Point
Multipoints	Multipoints	NA
Polyline	Polyline	Arc
Polygon	Polygon	Polygon
Polygon	Polygon	Region
Polyline with measure	Polyline with measure	Route
Feature Class	Shapefile	Point, arc, polygon, tic
Feature Dataset	NA	Coverage

Fundamental Building Blocks

- Tables
- Spatial indexes
- Spatial reference
- Configuration keywords

Data Structure

- Feature Class
 - Stores spatial data of the same geometry type
 - Simple features
 - Can be further broken down into subtypes
- Feature Data Set
 - Stores feature data classes that share the same coordinate system and area extent
 - Contains different theme layers, multiple datasets
- Standalone Feature Class
 - Feature class that is not included in a feature dataset

Topology Rules

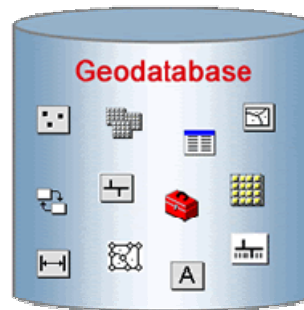
- Defines topology as relationship rules, user chooses
 - General rules (e.g. no gap, no overlap no dangles)
 - Rules specific to the discipline (e.g. transportation)
- Rules can apply to two or more feature classes

Advantages of the Geodatabase Data Model

- Provides four general validation rules
 - Attribute domains
 - Relationship rules
 - Connectivity rules
 - Custom rules

Advantages of the Geodatabase Data Model

- Store and manage:
 - Vector
 - Raster
 - TINs
 - Location data
 - Attribute tables



Advantages of the Geodatabase Data Model

- Provides foundation for development of different geodatabase models for different disciplines
- <http://suport.esri.com/datamodels>