Topological Errors

Topological errors violate relationships that are defined by the user or required by a GIS package.
• The coverage has these topological relationships:
  – Connectivity
  – Area definition
  – Contiguity
• The geodatabase has over 25 topological rules

• Common topological errors can be classified by the feature type:
  – Polygon
  – Line
  – Point
Polygon Errors

- Unclosed gaps
- Gaps between polygons
- Overlapping polygons

Line Errors

- Do not meet at node
  - Overshoot (overextended line)
  - Undershoot (gap exists between line)
  
  The result of these is a dangling node at the end of a dangle. This may be acceptable in the case of dead end streets, for example.

- Pseudo node
  - Appears along a continuous line and divides it unnecessarily
  
  This may be acceptable if attribute values change.

- Direction of line
  - Important in the case of one-way streets or rivers/streams
Dangles

• Not many point errors
• Label point in polygon
  – Each polygon should contain exactly one
Errors between Layers

• Don’t have to be the same feature type
• Common error: boundaries are not coincident
• Common error: Lines don’t connect
• Common error: Points don’t fall along line feature

Topological Editing on Coverages

• Clean command
  – Builds topology
  – Applies dangle length and fuzzy tolerance
    • Dangle length: minimum length for dangling arcs
    • Fuzzy tolerance: minimum distance between vertices and arcs
  – Removes duplicate lines
  – Inserts a node at line intersection
Editing Using Map Topology

• Map topology: a temporary set of topological relationships between the parts of features that are supposed to be coincident
• Can be shapefiles or geodatabase feature classes, but not coverages
• Coincident features are defined by cluster tolerance
  – Snaps vertices and lines if they fall within a specified tolerance (similar to fuzzy tolerance for coverages)

Editing Using Topology Rules

1. Create topology:
   ✓ Define participating feature classes
   ✓ Topology rules
   ✓ Cluster tolerance
2. Validation of topology
   ✓ Creates errors which indicate where features have violated topology rules
   ✓ Edges and vertices snap together if they fall within cluster tolerance
3. Fixing errors or accepting exceptions
Sources


• ArcGIS 9.2 Desktop Help. 