

Storing and Maintaining Topology in an ArcSDE Geodatabase

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When creating topology in an enterprise geodatabase, ArcSDE uses several tables in its repository to store the topology definition and creates tables in the user's schema to store topology errors. As the ArcSDE administrator, it is important to understand the role the ArcSDE repository plays and how to manage the topology tables in the relational database management systems (DBMS).

ArcSDE Repository

The ArcSDE repository utilizes several tables to store the topology definitions created in ArcCatalog. These tables, GDB_TOPOLOGIES, GDB_TOPOCLASSES, and GDB_TOPORULES, are maintained and updated through ArcCatalog. Any changes made to the topology in ArcCatalog are reflected in these repository tables. Editing any ArcSDE repository table through the DBMS is not supported and may cause the ArcSDE instance to become corrupted.

- The GDB_TOPOLOGIES table stores the properties of the topologies that were created in ArcCatalog. This table stores information such as the name of the topology, the feature dataset to which the topology is related, and properties of the topology such as cluster tolerance.
- The GDB_TOPOCLASSES table creates a record for each feature class that participates in a topology. Information in this table includes the topology rank and weight of the feature class.
- The GDB_TOPORULES table uses one record for each rule created in the topology. Each record contains information about the rule that was created, the feature class or classes on which the rule is built, and a Global Unique Identifier (GUID) that ArcObjects uses to instantiate the behavior.

Topology Errors

For each topology that is created, a series of feature classes will be created to store the topology errors. These feature classes are

- T_<n>_POLYERRORS
- T_<n>_POINTERRORS
- T_<n>_LINEERRORS
- T_<n>_DIRTYAREAS

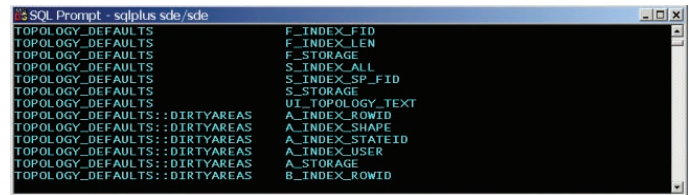
These classes are not visible through ArcCatalog but are visible in ArcMap when editing the topology. These feature classes store point, line, and polygon errors and the dirty areas. If the ArcSDE Compressed Binary format is being used, ArcSDE will also create a supporting F table to store the geometry and S table to store the spatial index for each error feature class.

Using the DBMS to store topology errors means that the database administrator (DBA) or ArcSDE administrator needs to control how these DBMS objects are stored on disk. All database object storage is controlled through the DBTUNE table, which is stored in the ArcSDE repository.

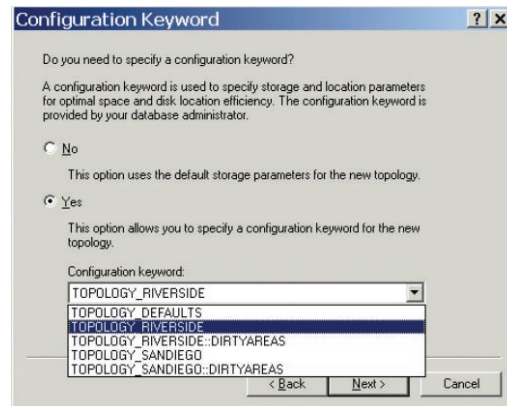
DBTUNE Topology Defaults

In the default DBTUNE table, there are two standard keywords—TOPOLOGY_DEFAULTS and TOPOLOGY_DEFAULTS::DIRTYAREAS.

The TOPOLOGY_DEFAULTS keyword controls the storage for three error feature classes (point, line, and polygon). The DIRTYAREAS feature class is typically dynamic, so administrators have the option to control the specific storage for the dirty areas through the TOPOLOGY_DEFAULTS::DIRTYAREAS composite keyword. Within the DBTUNE table, the default topology keyword must exist to create a topology.



An example of Oracle DBTUNE topology default keywords



Utilizing an alternate topology keyword

Optionally, the dirty areas default keyword can also be in the DBTUNE table.

Creating New DBTUNE Topology Keywords

Instead of using the TOPOLOGY_DEFAULTS and TOPOLOGY_DEFAULTS::DIRTYAREAS keywords, user-defined keywords can be created to control storage for the errors and dirty areas feature classes. In addition, individual topology keywords can be created for different topologies. For example, when creating the topology for the Riverside County parcels, a new keyword can be created that specifies how the topology feature classes are stored for Riverside. A different keyword could be used to specify San Diego County topology storage parameters.

Through each of these keywords, specific DBMS storage parameters that are used are specified when the tables are created. If a composite topology keyword has been created for the dirty areas, it is automatically employed with the related parent keyword. Therefore, in the above example, when the TOPOLOGY_RIVERSIDE keyword is selected, the corresponding TOPOLOGY_RIVERSIDE::DIRTYAREAS composite keyword is used.

The *ArcSDE Configuration and Tuning Guide* for each supported platform will assist in determining the parameter settings for the topology keywords. Each DBMS has unique parameters and configuration settings. To edit the feature classes participating in the topology, the feature dataset must be registered as versioned. When a feature dataset is registered as versioned, addition and deletion (A and D) tables are created for each feature class, the topology error feature classes, and the dirty area feature class. The DBTUNE keyword that was used when creating the topology feature classes is used to determine the A and D storage parameters for the topology feature classes. Edits that affect the topology errors and dirty areas will be inserted into the A and D tables and the base tables.

For more information on versioning, review the related white papers found at support.esri.com and consult the applicable *ArcSDE Configuration and Tuning Guide*.