3.4.4 Topology

The Topology script is used to validate geometry, automatically repair some geometry issues and flag issues found in the AVM A_Door and A_Area feature classes located in SFO AVM SDE.

The A_Door feature class will be checked for the following:

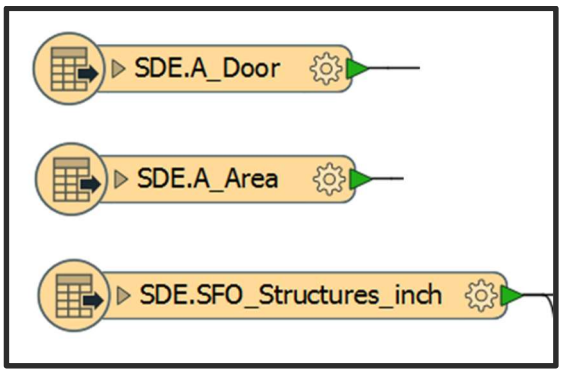
- Spatial Duplicates using attributes and geometry (Builiding, LevelName, x, y)
- Duplicate Door Numbers
- Incorrect Building Number and Incorrect Level Name
- Door falls inside Building Footprint

The A_Area feature class will be checked for the following:

- Null or Corrupt Geometry
- Self-Intersections
- Spatial Duplicates using attributes and geometry (Builiding, LevelName, x, y)
- Duplicate Space ID
- Incorrect Building Number, Level Name, Lease Type,
- Incorrect Building Number and Incorrect Level Name
- Overlaps and Gaps
- Door falls inside Building Footprint

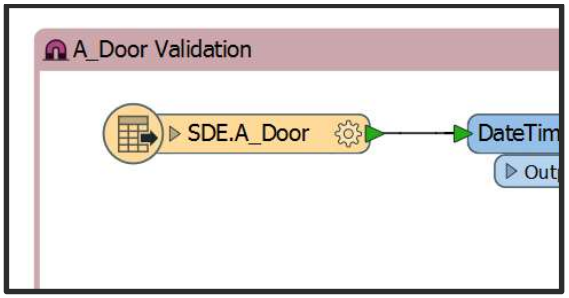
The script cleans and simplifies geometry where possible to limit the amount of errors created by the topology checks to be handled manually.

A. **Input** – The input for Topology script is the AVM A_Area, A_Door, and Structures (Building Footprint) feature classes located on DEV-DCORA01.

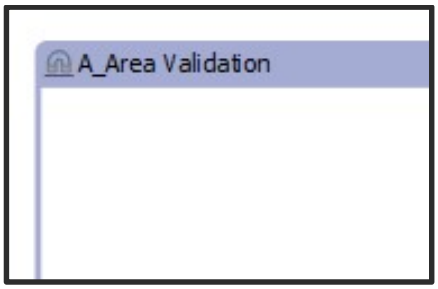


B. **Transformers** (listed in processing order)

   i. A_Door Validation Transformer performs the topology checks mentioned previously for the A_Door feature class except for the building footprint check.

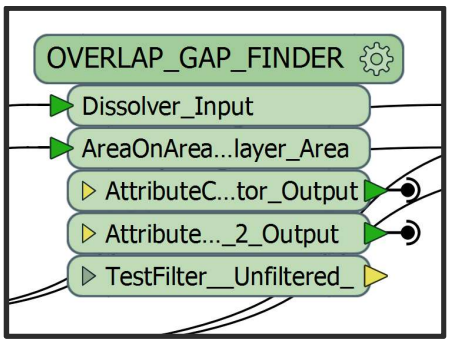


ii. A_Area Validation Transformer performs the topology checks mentioned previously for the A_Area feature class except for the building footpoint check.

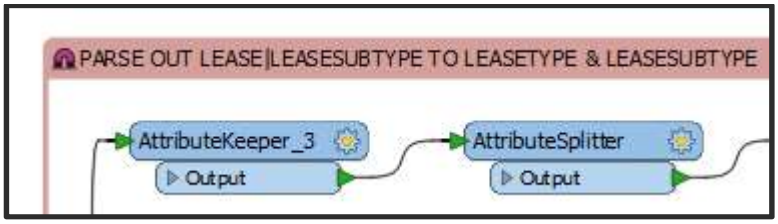


iii. **Embedded Transformer** is a transformer that is a custom built transformer that is used in the main model and located on the tab next to the main tab and shows the name of the custom transformer (Overlap_Gap_Finder).

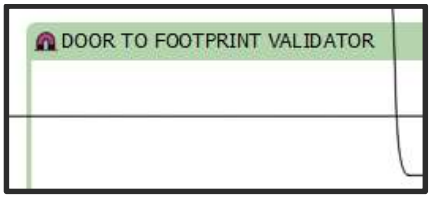
iv. Overlap_Gap_Finder Transformer is located within the A_Area validation transformer and performs the gaps and overlaps topology check.



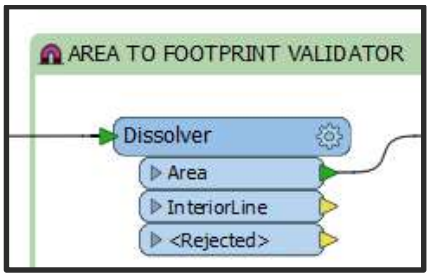
v. Parse Out Lease|LeaseSubType to LeaseType & LeaseSubType Transformer parses out the A_Area LeaseSubtype Field into two representative fields that are automatically populated, those fields are LeaseType and LeaseSubType.



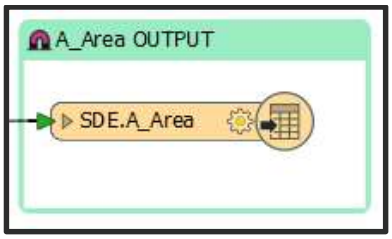
vi. Door to Footprint Validator Transformer checks to see that all A_Doors are in or on the boundary of the Building Footprints based on building name.

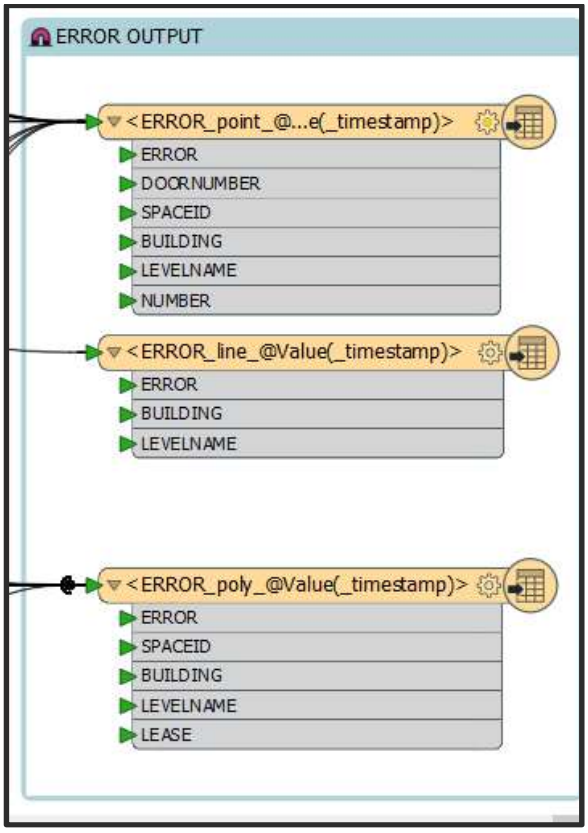


vii. Area to Footprint Validator Transformer checks to see that all A_Areas are in or on the boundary of the Building Footprints based on building name.



C. **Output** - The output for the Topology script is the SDE.A_Areas <does this go back to AVM database and overwrite A_Area?> and Error features. The Error features are Points, Lines, and Polygons with attributes to identify features and errors. The errors that can be generated and troubleshooted are in Appendix E.




ERROR OUTPUT
<ERROR_point_@...e(_timestamp)>
ERROR
DOORNUMBER
SPACEID
BUILDING
LEVELNAME
NUMBER
<ERROR_line_@Value(_timestamp)>
ERROR
BUILDING
LEVELNAME
<ERROR_poly_@Value(_timestamp)>
ERROR
SPACEID
BUILDING
LEVELNAME
LEASE