

Spatial Data – Cooler Than You'd Think

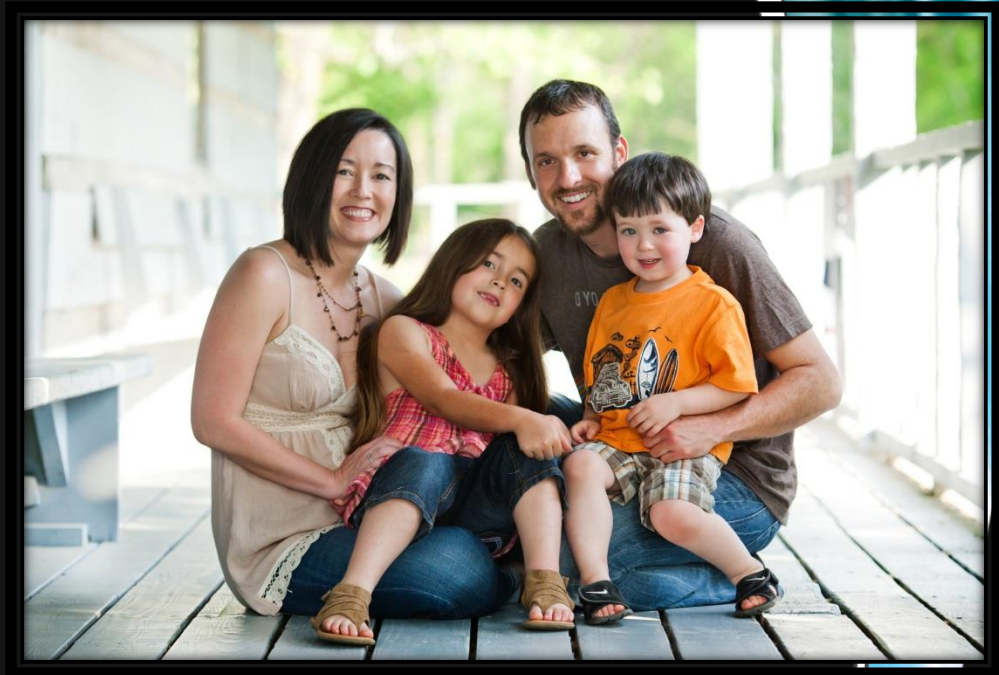
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Who Am I?

- ❑ SQL Server MVP
- ❑ Microsoft Team Lead
- ❑ SQL Server DBA
- ❑ (MCITP: Database Administration in 2005 and 2008)
- ❑ In IT industry for 12 years. DBA for 6 years. I've been with PTI for 4 years.
- ❑ Worked for various industries such as large insurance companies, government entities, large and small corporations, hospitals and medical related businesses and on and on



Agenda

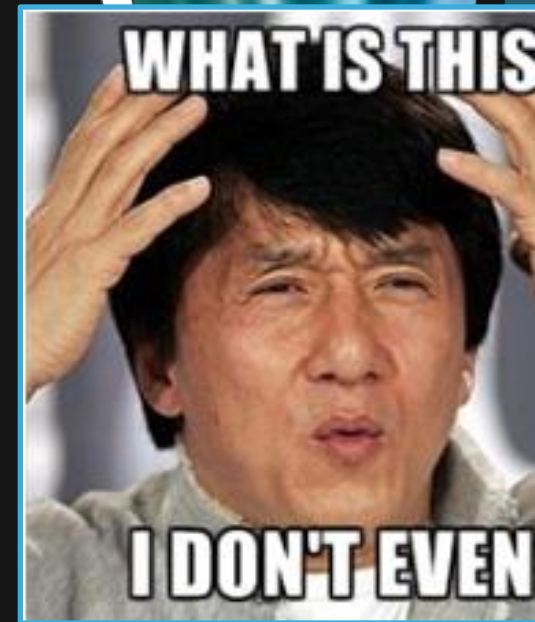
- Overview of spatial data
- Explain what it is and some of the functions within it
- Examples of spatial data functions
- Then bring it all together with a real world scenario
- Wrap up & questions



What the heck is spatial data?

Dictionary definition: Also known as *geospatial data* or *geographic information* it is the data or information that identifies the geographic location of features and boundaries on Earth, such as natural or constructed features, oceans, and more. Spatial data is usually stored as coordinates and topology, and is data that can be mapped. Spatial data is often accessed, manipulated or analyzed through Geographic Information Systems (GIS).

My definition: laying of stuff out on a map



Spatial Data in SQL Server

There are 2 types of spatial data that can be contained within SQL Server

Geometry – grid/flat (flat map and objects, floor plans)

Geography – round earth (latitude/longitude)

Just user-defined types so they don't really care what is contained within them.

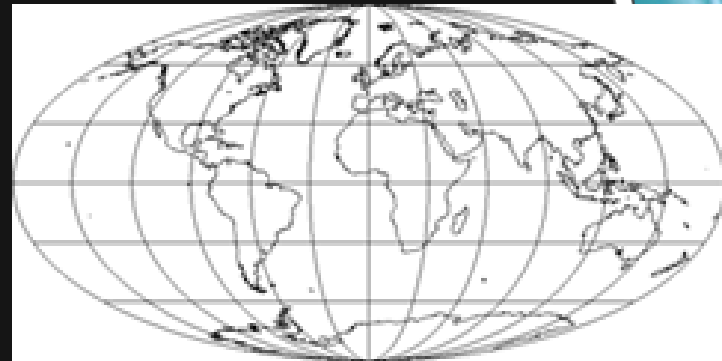
SQL Server complies with Open Geospatial Consortium (OGC). They help develop standards for geospatial and location based services.



You're losing me here...

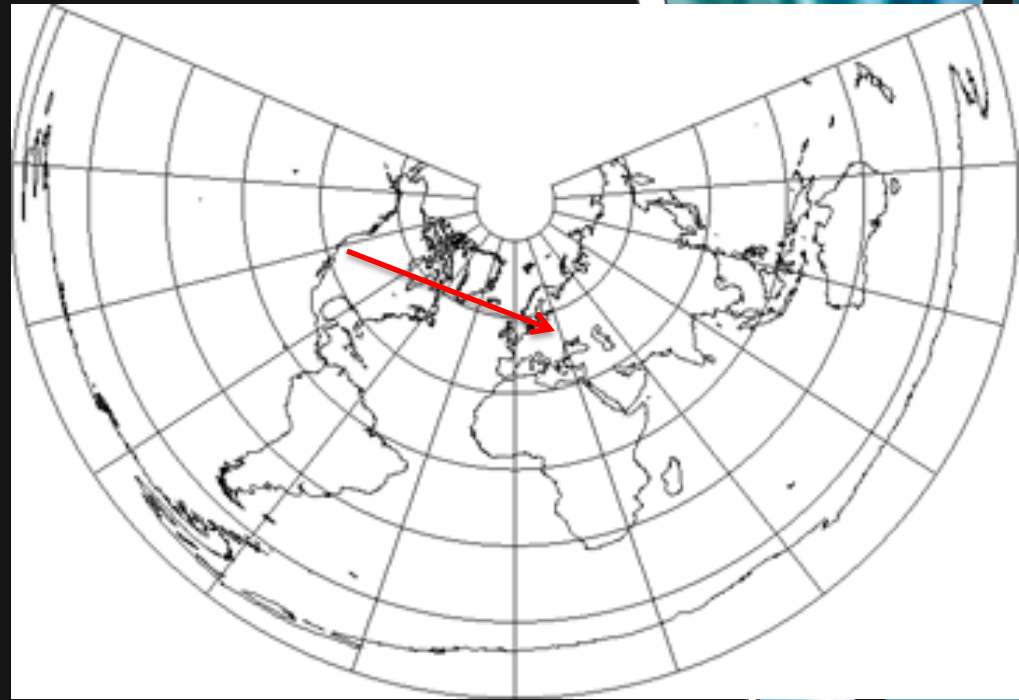
Geometry - often referred to as the flat earth system – uses grids/coordinates

Geography – the round earth system and grid also but in latitude/longitude



Example of difference

Trip from US to Europe



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Shapes

Point: an exact location identified by X & Y coordinates

- Can also have Z -> elevation
- Can also have M -> Measure
- LineString: A path between a sequence of points.
- Polygon: A closed 2 dimensional shape defined by a ring.
- Collections: collection of more than one spatial object. These can be generic collections such a GeomCollection....or more specific ones that hold a particular type ..such as MultiLineString.



New Shapes in 2012

- **CircularString**: basic curve subtype. Made up of 3 points: start (first point), curve (second point), end (third point)
- **CompoundCurve**: collection of zero or more **CircularString** or **LineString** instances. Endpoint of component must be same as start of next one (dot to dot)
- **CurvePolygon**: Enclosed shape and possibly holes within shape. Same as regular polygon except made of circular shapes where polygon is made of linestrings



Ok...so how do I look at these funky shapes?

- SQL Server supports 3 formats that the OGC defines to display geospatial information:
- Well-Known Text (WKT) – human readable form
- Well-Known Binary (WKB) – binary representation
- Geography Markup Language (GML) – XML defined by OGC



Now what can I do with this data?

There are many instance and static methods available for use with the spatial data types.

STGeomFromText

PARSE

STEnvelope

STLength

STArea

STDifference

Some new to 2012

BufferWithCurves

ShortestLineTo

Demo



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Spatial Reference ID

The SRID is the reference system that dictates rules for mapping out the information. These are set by European Petroleum Survey Group (EPSG) standard. This standard is owned by Oil and Gas Producers (OGP) Surveying and Positioning Committee.

Geometry default is 0

Geography default is 4326

New in 2012

(SRID), 104001 – Earth unit sphere (radius 1)



Shapefiles

A shapefile is a commonly used format of file that contains GIS information (same stuff we're putting in database, polygons, lines etc).

There are many places you can get shapefiles. The US Census Bureau and Indiana University have some published.



That's all well and good but let's do some real stuff with this

Now that we're done with the concept stuff lets get to real world scenario.

1. Take brewery information and in database
2. Tie it to some spatial data
3. See the potential use

- Demo



Resources

Shape2SQL tool -

<http://www.sharpgis.net/page/SQL-Server-2008-Spatial-Tools.aspx>

Geocoder site -

<http://www.gpsvisualizer.com/geocoder/>

US Census Bureau Shapefiles –

<http://www2.census.gov/cgi-bin/shapefiles2009/national-files>

New Spatial Features in Denali

<http://go.microsoft.com/fwlink/?LinkId=226407>

Lenny Lobel Blog

<http://lennilobel.wordpress.com/2012/03/08/new-spatial-features-in-sql-server-2012/>



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Questions? Need More Information?



Thank you so much! Would love feedback on presentation

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