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What to expect from MySQL 8.0?

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Agenda

1. Goals
2. What will we do in 8.0?
3. Library
4. Standard compliance
5. Axis order
6. Data types

Goals

- Ease of use
  - Built-in GIS functionality
  - GIS data and functions as first class citizens
- Be the best DBMS for web maps
  - Global data
  - Data import/export
- Mobile devices
  - Tracking
  - Routing?

What will we do in 8.0?

- Geography
  - The framework to handle SRSs
  - Geographically enabling as many functions as possible
    - First add the functionality to Boost.Geometry
- Make the upgrade as easy as possible

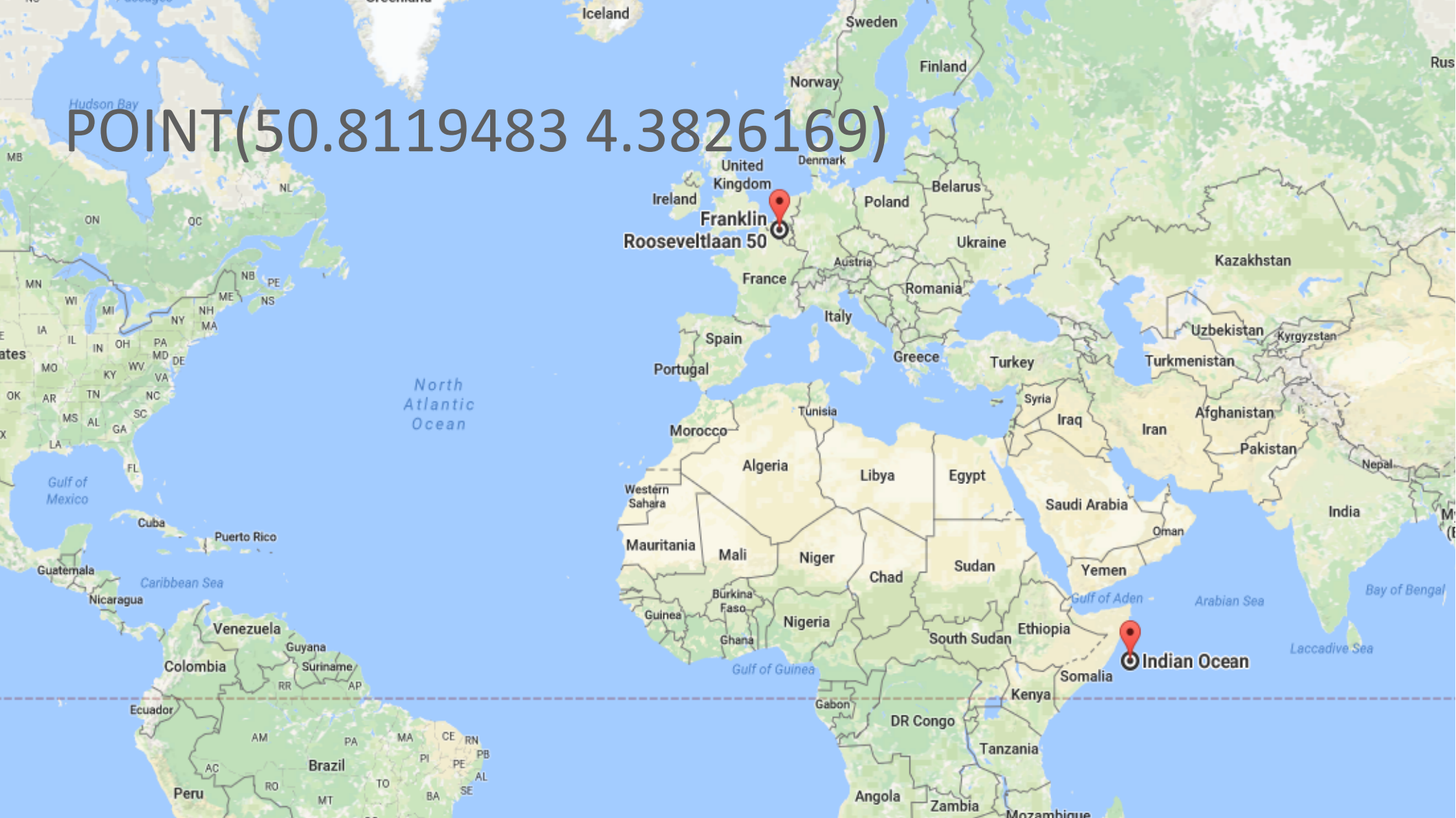
8.0 is still in development — test it and give us feedback!

Library

- We don't want to maintain a GIS library alone
  - We're happy to contribute!
- C/C++
- Follow OGC standards
- Handle both Cartesian and geographic computations
- Started on Boost 1.55.0, now on 1.63.0
  - MySQL 5.7 requires Boost 1.59.0
  - Maintain our own patches/header files on top of Boost for bug fixing

Standard compliance

- Follow SQL/MM, OGC and other standards as closely as possible
  - Some things are not well-defined
  - Some things are just stupid
  - The MySQL SQL dialect is not object oriented
- The standards disagree
- Some things are not standardized


POINT(50.8119483 4.3826169)
Franklin
Roosevelt laan 50
Indian Ocean
Iceland
Sweden
Finland
Norway
Hudson Bay
United Kingdom
Ireland
Denmark
Poland
Belarus
Ukraine
Austria
France
Romania
Italy
Spain
Portugal
Greece
Turkey
Kazakhstan
Uzbekistan
Kyrgyzstan
Turkmenistan
Syria
Iraq
Iran
Afghanistan
Pakistan
Nepal
India
North Atlantic Ocean
Tunisia
Morocco
Algeria
Libya
Egypt
Western Sahara
Saudi Arabia
Oman
Yemen
Mauritania
Mali
Niger
Chad
Sudan
Gulf of Aden
Arabian Sea
Bay of Bengal
Gulf of Mexico
Cuba
Puerto Rico
Guatemala
Nicaragua
Caribbean Sea
Burkina Faso
Guinea
Nigeria
Ghana
Gulf of Guinea
Ethiopia
South Sudan
Somalia
Laccadive Sea
Venezuela
Guyana
Suriname
Colombia
Ecuador
Peru
Brazil
Kenya
Gabon
DR Congo
Tanzania
Angola
Zambia
Mozambique

> “Going forward, for new standards, coordinate values shall be listed in the axis order as specified by the referenced coordinate reference system (CRS).”
>
> — Axis Order Policy and Recommendations, OGC 08-038r5

Axis order

- All geographic SRSs in the EPSG Dataset are latitude-longitude
- MySQL uses the EPSG Dataset
- MySQL follows the recommendation and uses the axis order defined by the SRS
  - But it can be overridden:

```
ST_GeomFromText('POINT(50.8119483 4.3826169)', 4326,
'axis-order=lat-long')

ST_GeomFromText('POINT(50.8119483 4.3826169)', 4326,
'axis-order=long-lat')
```

Same data types for Cartesian and geographic

```
SELECT ST_Distance(
   ST_GeomFromText('POINT(50.8119483 4.3826169)', 0),
   ST_GeomFromText('POINT(4.3826169 50.8119483)', 0)) AS distance;
```

distance

65.66099015779498

Unitless

```
SELECT ST_Distance(
   ST_GeomFromText('POINT(50.8119483 4.3826169)', 4326),
   ST_GeomFromText('POINT(4.3826169 50.8119483)', 4326)) AS distance;
```

distance

6712322.144680507

Meters

Same data types for Cartesian and geographic

```
SELECT ST_Distance_Sphere(
   ST_GeomFromText('POINT(50.8119483 4.3826169)', 0),
   ST_GeomFromText('POINT(4.3826169 50.8119483)', 0)) AS distance;
```

distance

6719621.730158467

Meters

```
SELECT ST_Distance(
   ST_GeomFromText('POINT(50.8119483 4.3826169)', 4326),
   ST_GeomFromText('POINT(4.3826169 50.8119483)', 4326)) AS distance;
```

distance

6712322.144680507

Meters

Prepare now for the upgrade from 5.7 to 8.0

- Think through your use of SRIDs
  - Use SRID 0 if you're unsure
  - May affect your query results after upgrade
- Use longitude-latitude ordering in 5.7
  - It matches the storage format (x=longitude, y=latitude)
- But remember that import and export functions follow SRS defined axis order in 8.0

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