Fairy Bench

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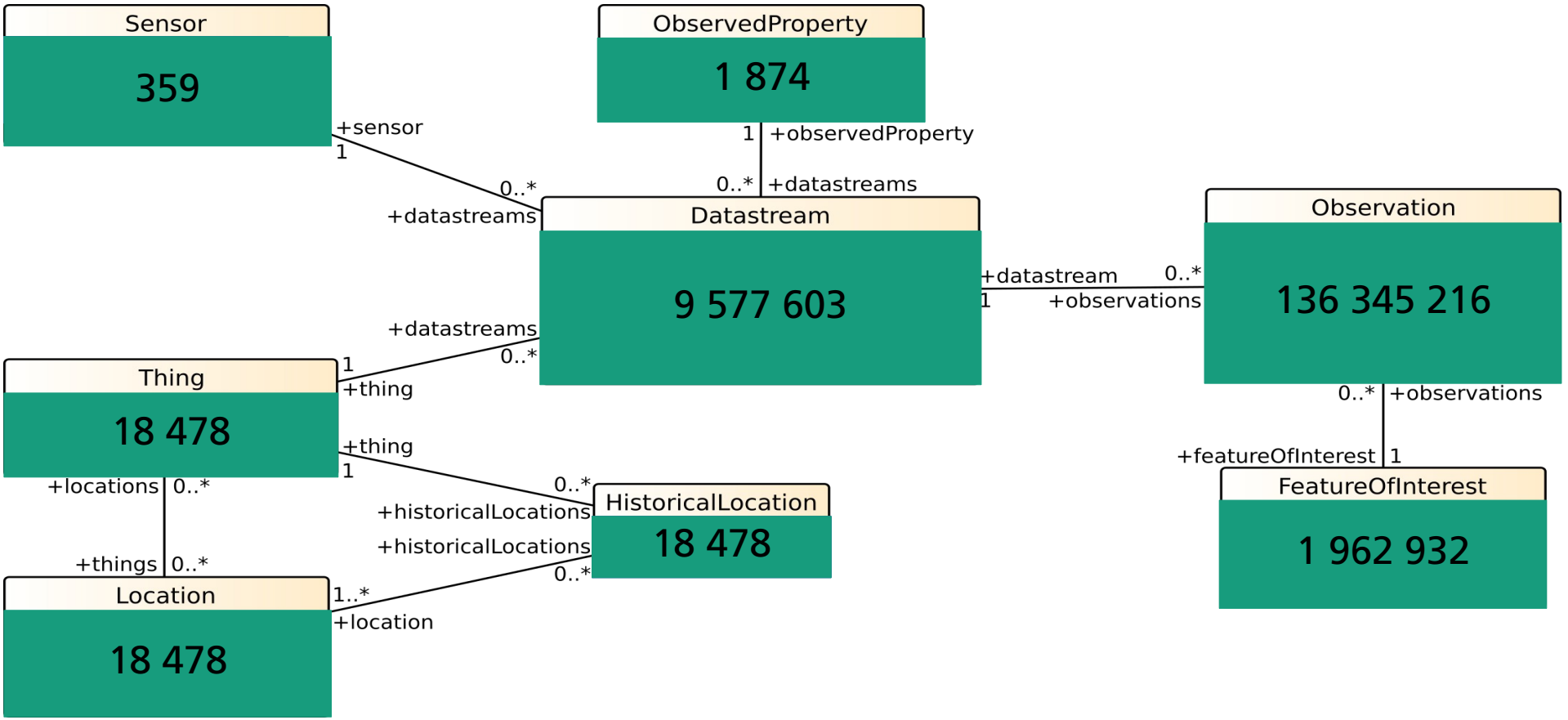
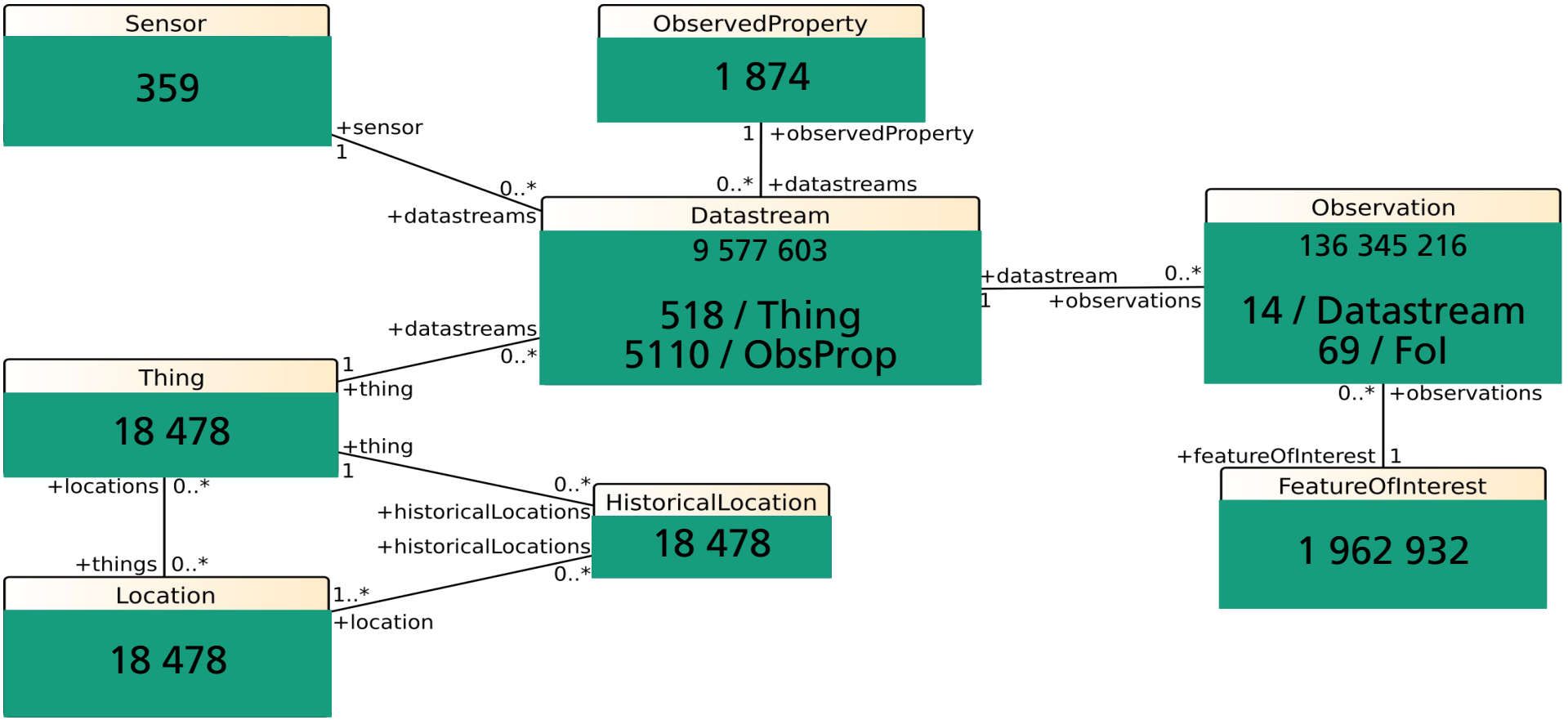
Fraunhofer
IOSB

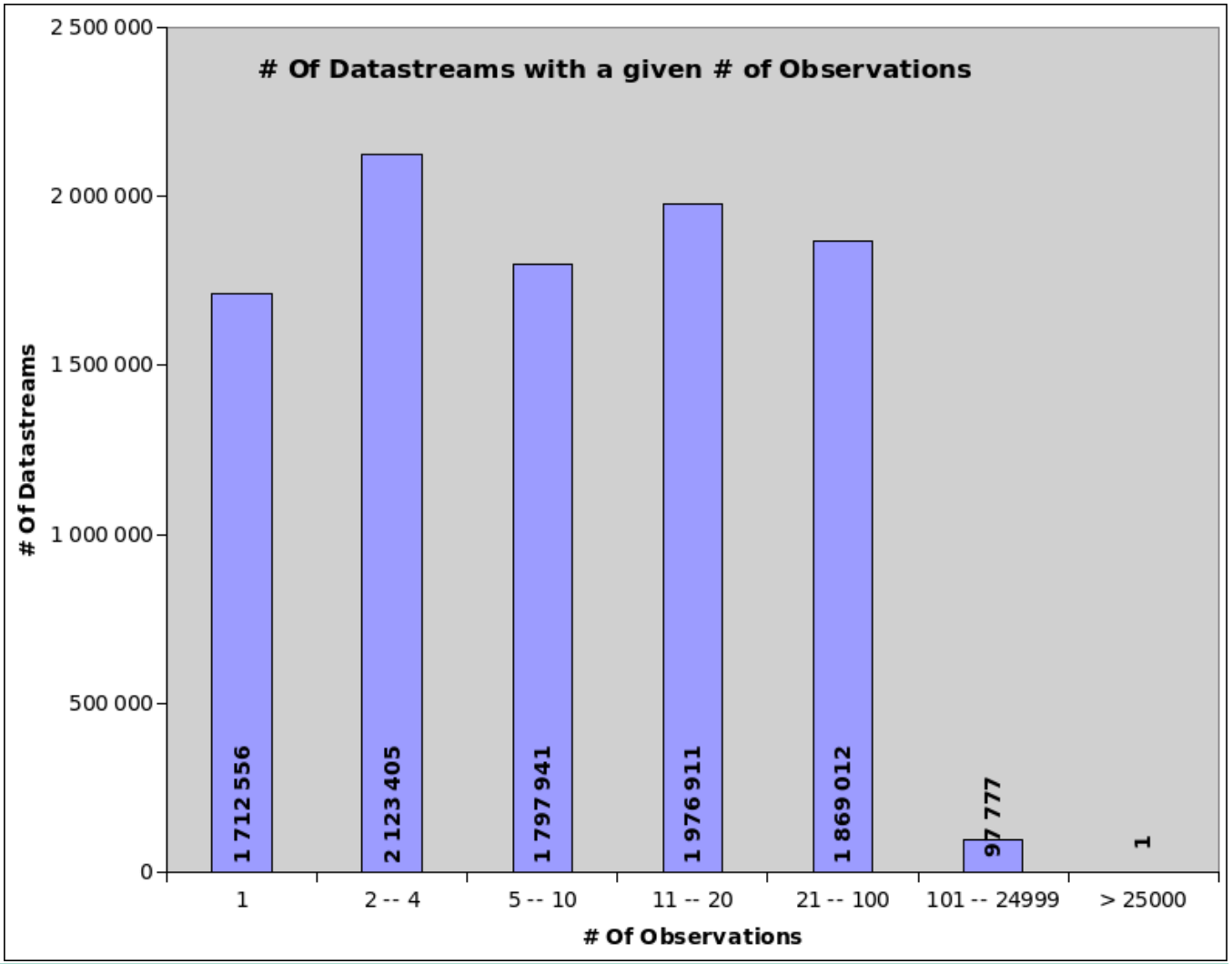
Statistics



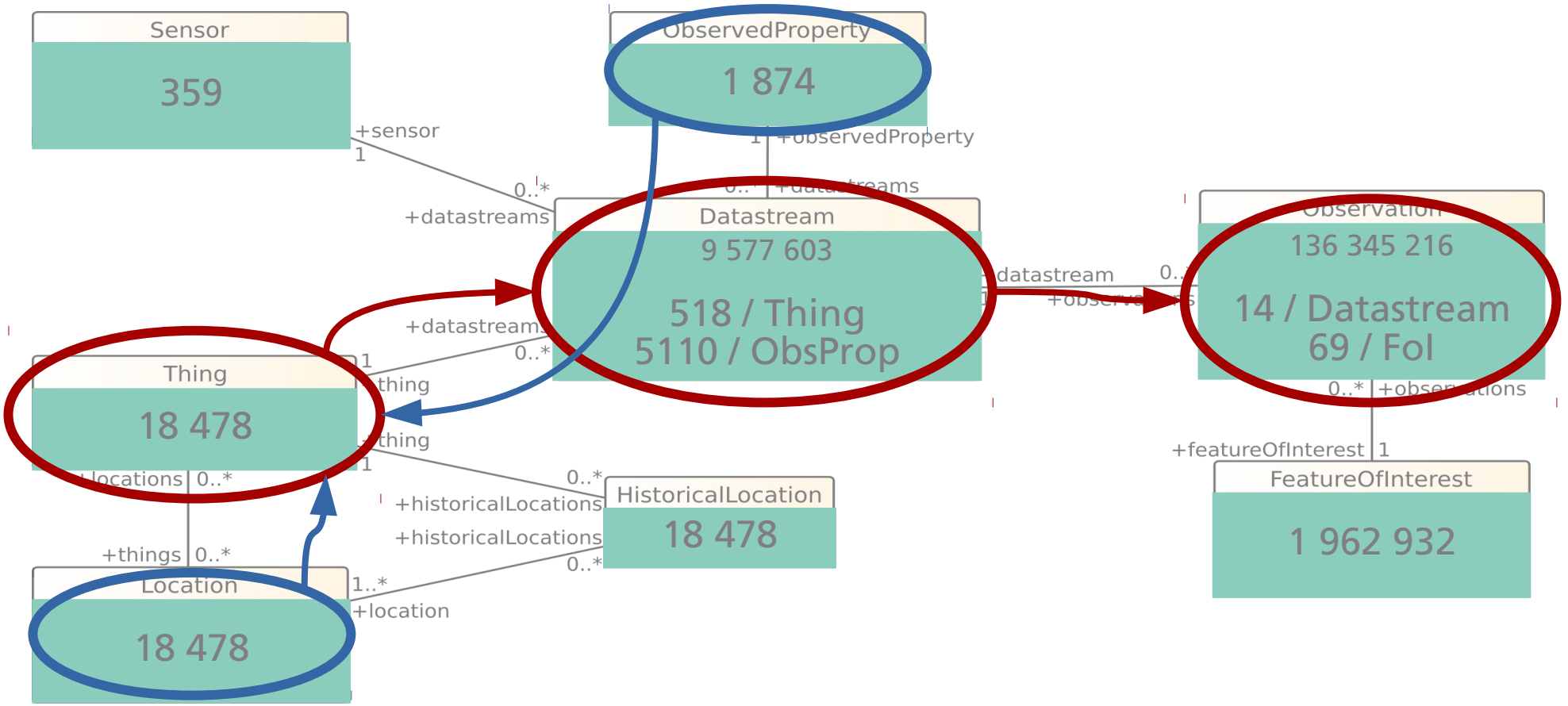
Statistics



Statistics



Query Patterns



Queries – Things

Label	Average
Flat Things; No Filter	148
Flat Things; No Filter; Select name,id	45
Flat Things; No Filter; Select name,id; Skip 10000	51
Flat Things; Top; No Filter	47
Flat Things; Top; No Filter; Count	55
Flat Things; Top; Filter DSTime;	132117
Flat Things; Top; Filter ObsTime;	--
Flat Things; Top; Filter DSTime, 2DepId	819
Flat Things; Top; Filter DSTime, 2DepId; Count	869
Flat Things; Top; Filter DSTime, 2DepId; Order StationCode	944
Flat Things; Top; Filter DSTime, 1DepId, ResultCode;	3384
Flat Things; Top; Filter DSTime, 2RivBasId;	650
Flat Things; Top; Filter DSTime, 2RivBasId; Order StationCode	1565
Flat Things; Top; Filter DSTime, 2StationCode	313
Flat Things; Top; Filter DSTime, 1ObsProp	170
Flat Things; Top; Filter DSTime, 1ObsProp; Select	149
Flat Things; Top; Filter DSTime, 1ObsProp; Select; Count	208
Flat Things; Top; Filter DSTime, 2DepId, 1ObsPropId	760
Flat Things; Top; Filter DSTime, 2DepId, 1ObsPropId; Count	998
Flat Things; Top; Filter 1StationCode;	405
Flat Things; Top; Filter BBox	93
Flat Things; Top; Filter BBox; Count	90

Queries – Things

Label	Average
Flat Things; No Filter	148
Flat Things; No Filter; Select name,id	45
Flat Things; No Filter; Select name,id; Skip 10000	51
Flat Things; Top; No Filter	47
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Flat Things; Top; Filter DSTime;	132117
Flat Things; Top; Filter ObsTime;	--
Flat Things; Top; Filter DSTime, 2DepId	819
Flat Things; Top; Filter DSTime, 2DepId; Count	869
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Flat Things; Top; Filter DSTime, 2StationCode	313
Flat Things; Top; Filter DSTime, 1ObsProp	170
Flat Things; Top; Filter DSTime, 1ObsProp; Select	149
Flat Things; Top; Filter DSTime, 1ObsProp; Select; Count	208
Flat Things; Top; Filter DSTime, 2DepId, 1ObsPropId	760
Flat Things; Top; Filter DSTime, 2DepId, 1ObsPropId; Count	998
Flat Things; Top; Filter 1StationCode;	405
Flat Things; Top; Filter BBox	93
Flat Things; Top; Filter BBox; Count	90

Reduced json size → Faster

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Flat Things; Top; Filter DSTime, 2DepId, 1ObsPropId; Count	998
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Flat Things; Top; Filter BBox; Count	90

Filtering *all* Things *only* on Observations is very slow

Queries – Things

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Flat Things; Top; Filter DSTime, 2DepId, 1ObsPropId; Count	998
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Flat Things; Top; Filter BBox; Count	90

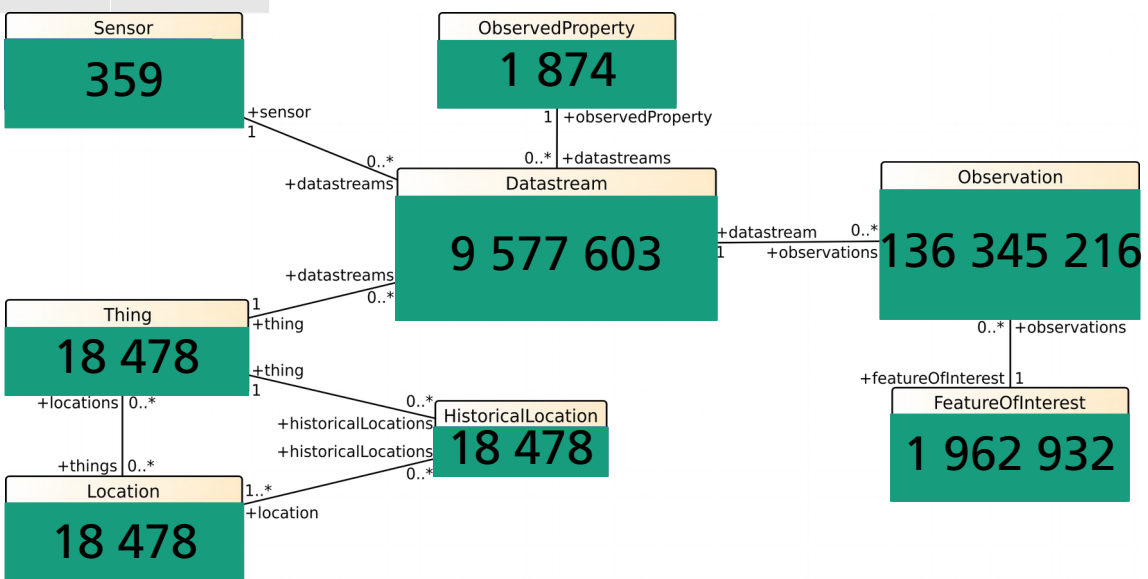
Adding any other filter for Things makes a big difference

Locations have a geo-index

Queries – ObservedProperties & Features

Label	Average
Flat ObservedProperties; Filter ThingId	42
Flat ObservedProperties; Filter ThingName	51
Flat ObservedProperties; Filter 1StationCode	223
Flat ObservedProperties; Filter ThingId; Select	44
Flat Features; Filter ThingId	104
Flat Features; Filter ThingName	107
Flat Features; Filter 1StationCode	3053
Flat Features; Filter ThingId; Select	104

Index on the Thing side not that important, but json parsing is expensive



Queries – Observations

Label	Average
Flat Observations; Filter 1StationCode, 1ObsProp	302
Datastreams+Observations; Filter 1StationCode, 1ObsProp	424
Datastreams+Observations; Filter 1ThingId, 1ObsProp	59
Datastreams+Observations; Filter 1StationCode, 1ObsProp; Select	424
Datastreams+Observations; Filter 1StationCode, 1ObsProp, (1Phentime)	397
Datastreams+Observations; Filter 1StationCode, 1ObsProp, (1YearPhentime)	362

Optimisation Potential

- FROST-Internals
  - Storing JSON in JsonB columns (GH Issue #12)
  - Generate subqueries using SQL EXISTS instead of JOINs (GH Issue #11)
- Database
  - Indices for the most used filters (can also be on JSON)
- Queries to the System
  - StationCode → Thing@iot.id, then use the @iot.id