OWS6-AIM Server Side Architecture

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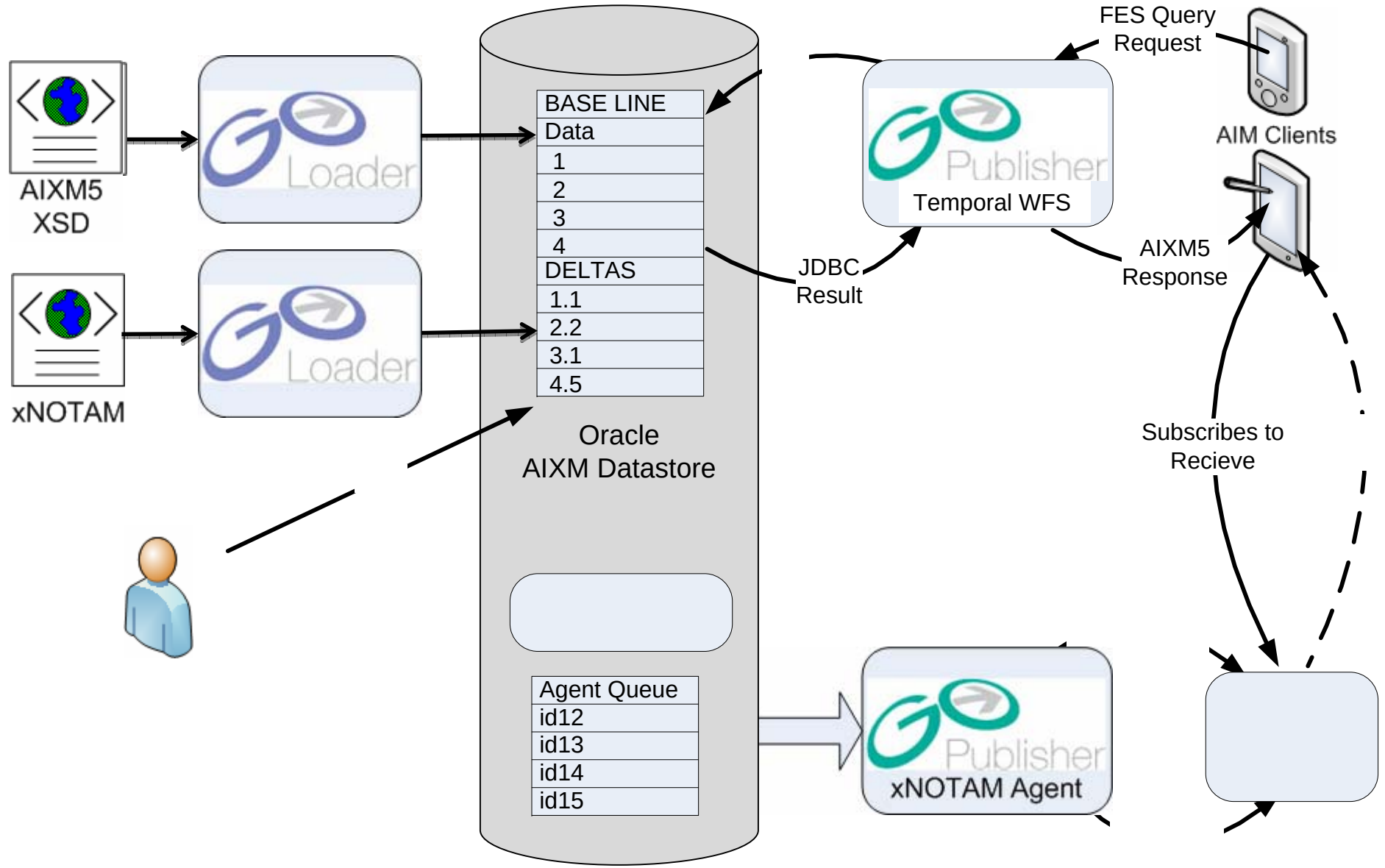
OGC™ Member

Server Side Scenarios

1. Flight is ready – Load baseline data
   - Query on timeframe of flight and within 100 nautical miles of flight path

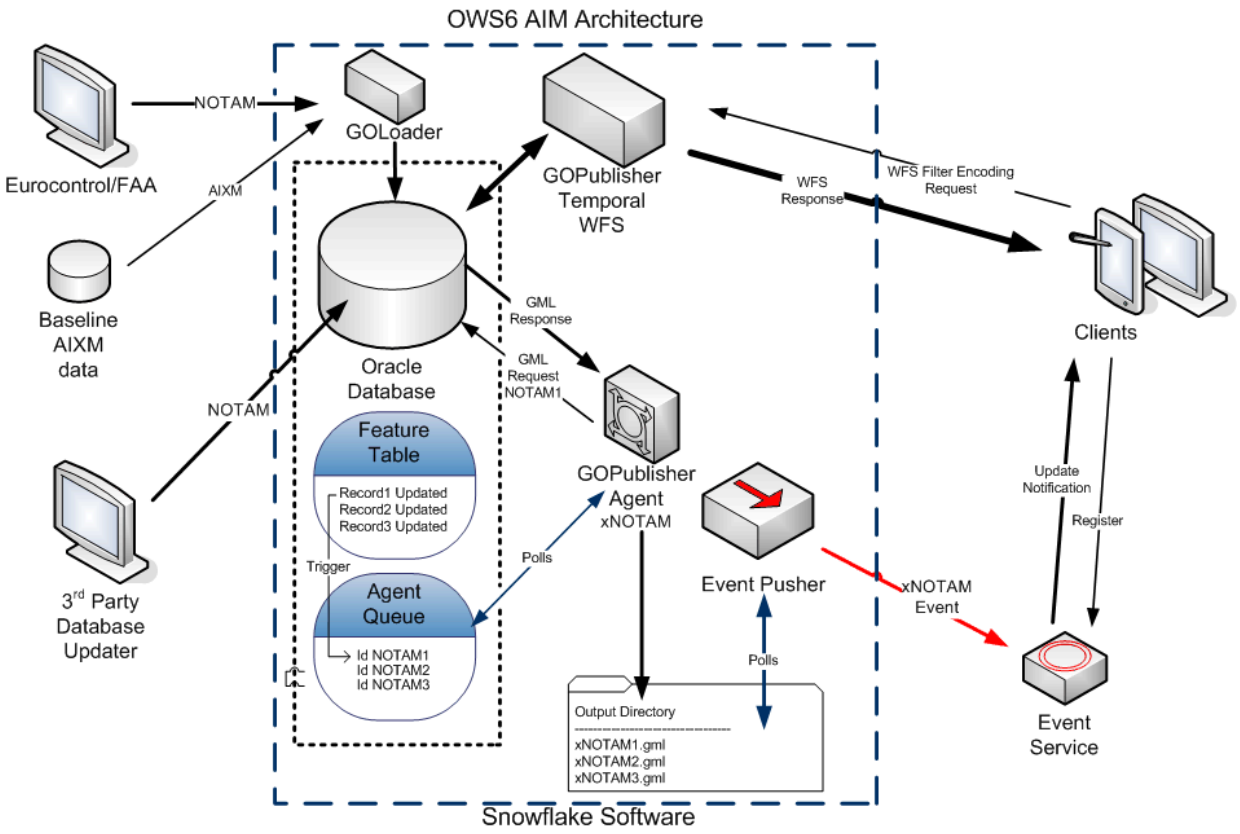
2. Flight is delayed for 3 hour - Query for any changes
   - Query aixm:TimeSlice since baseline data was last obtained

3. An xNOTAM is received that ILN runways are closed
   - Change uploaded and xNOTAM forwarded to clients


AIXM5
XSD
xNOTAM
Loader
Loader
BASE LINE
Data
1
2
3
4
DELTAS
1.1
2.2
3.1
4.5
Oracle
AIXM Datastore
Agent Queue
id12
id13
id14
id15
JDBC
Result
Publisher
Temporal WFS
FES Query
Request
AIM Clients
AIXM5
Response
Subscribes to
Recieve
Publisher
xNOTAM Agent

AIXM5

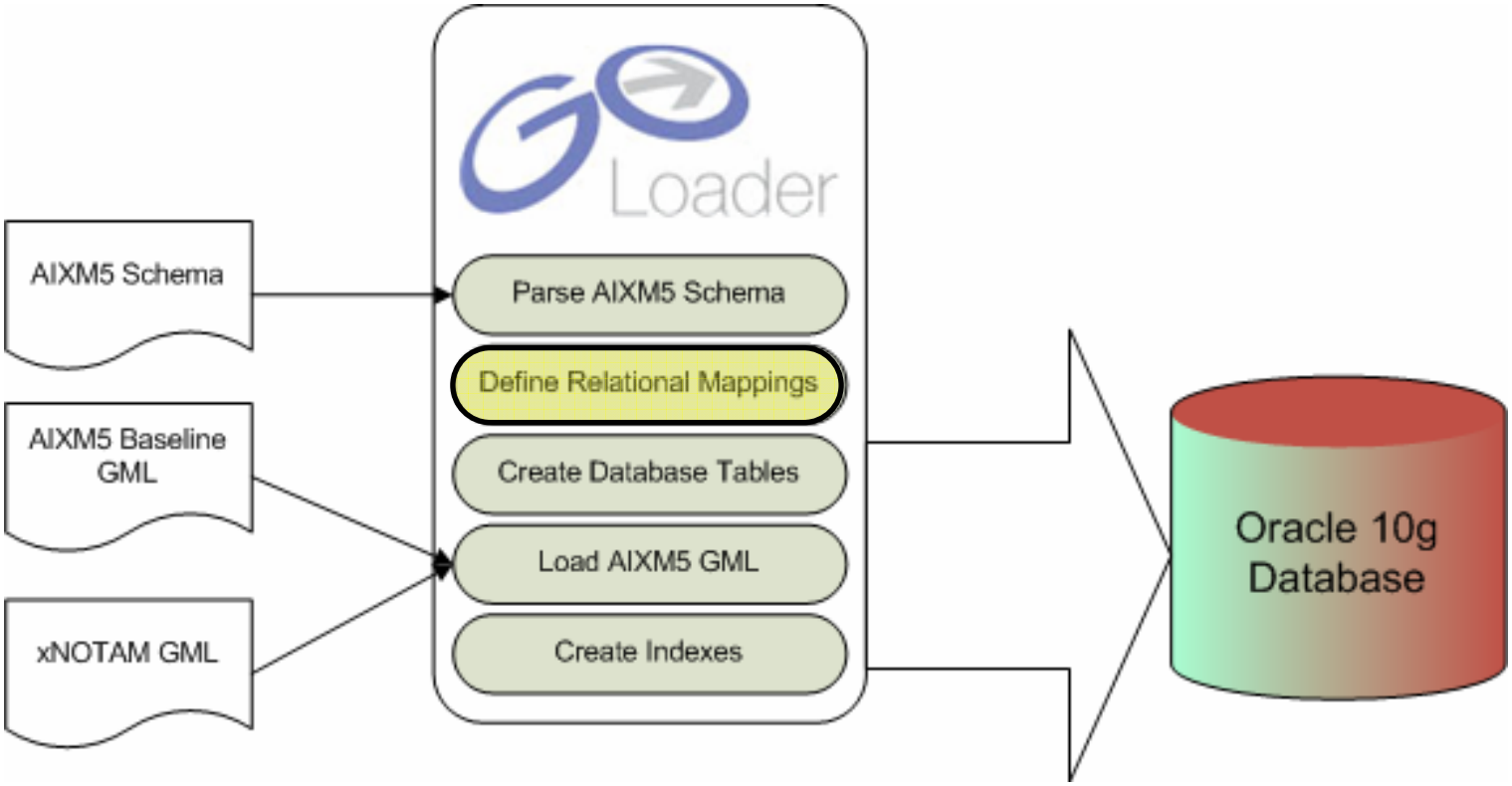
OWS6-AIM Server Side Architecture



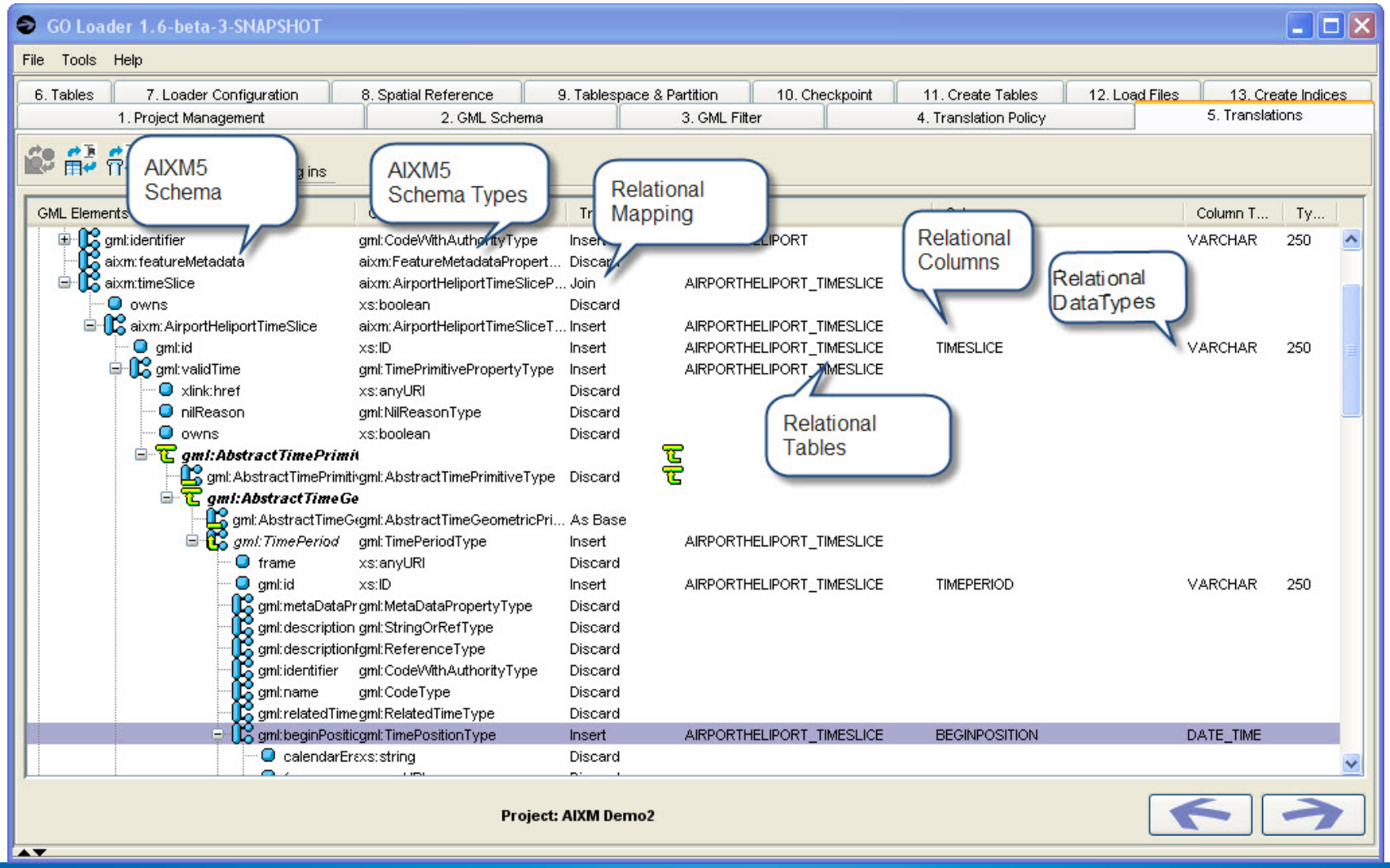
1. GO Loader: Loading xNOTAM & AIXM5 baseline data
2. GO Publisher WFS: publishing AIXM5 over WFS
3. GO Publisher WFS: Temporal queries over FES2.0
4. GO Publisher Agent: Bulk Publishing xNOTAM to the Event Service

AIXM5 Data Load & Management

Creating and Loading the AIXM5 Datastore



Define Relational Mappings



Data Load Issues (Shapefiles)

- Shapefiles were missing data (aixm:identifiers)
- Mixed projection systems and projections not identified in source data
- Geometries in the shapefiles were not always valid, containing self intersections, duplicate vertices and other geometry errors – these were fixed using the Oracle geometry tools.
- Sections of Runway where runways crossed each other were often held in separate shapefiles from other runway sections..
- Lengths and widths of the Runway features were not included

Data Load Issues (AIXM5)

- Generally more complete and accurate

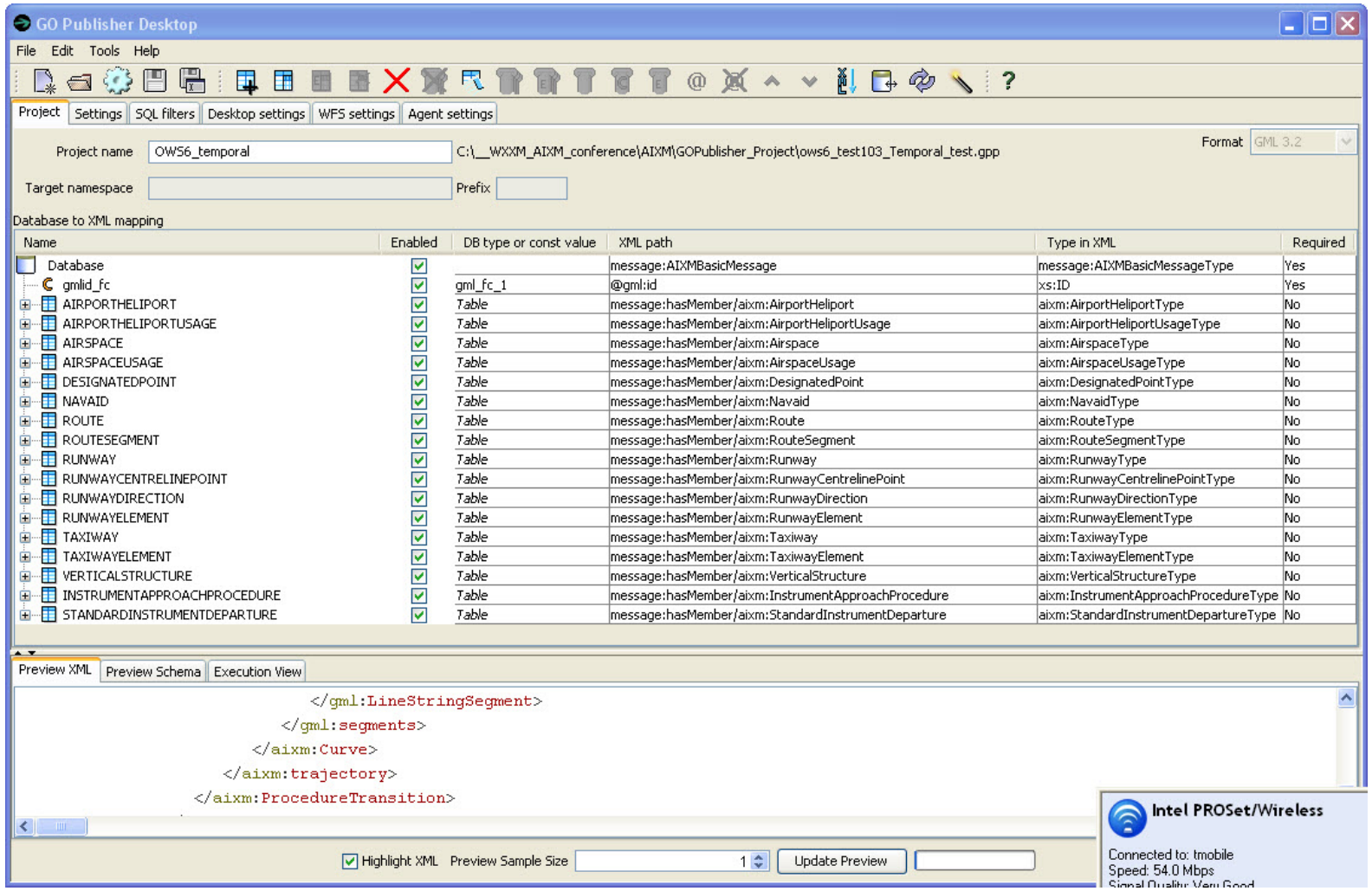
- Gml:id unique within a file but not within database
- Ids in xlinks not within the same file
- AIXM5 overlapping shapefiles
- Indeterminate dates invalid for queries

Publishing AIXM5 & xNOTAM

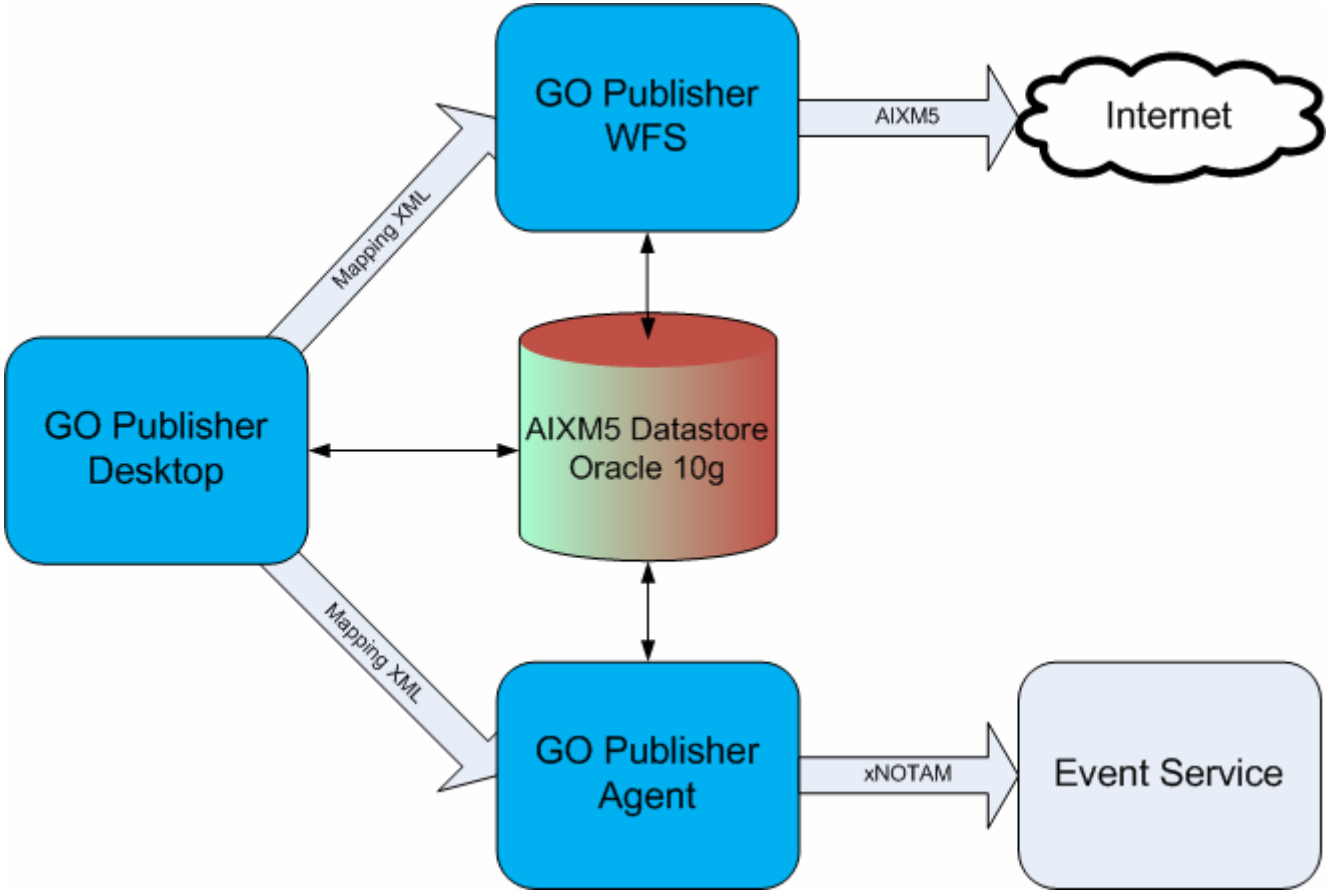
Publishing AIXM5 and xNOTAM

- Baseline & Delta data delivered using:
  - GO Publisher WFS - OGC Web Feature Service (WFS 1.1 compliant)
- Data queries using:
  - Filter Encoding Specification (FES 1.1)
- Temporal queries using
  - Temporal Operators from (FES 2.0 draft)
- xNOTAM delivered using:
  - GO Publisher Agent – Batch GML publication engine
- Data delivered:
  - AIXM5.0 (inc xNOTAM) – GML 3.2.1

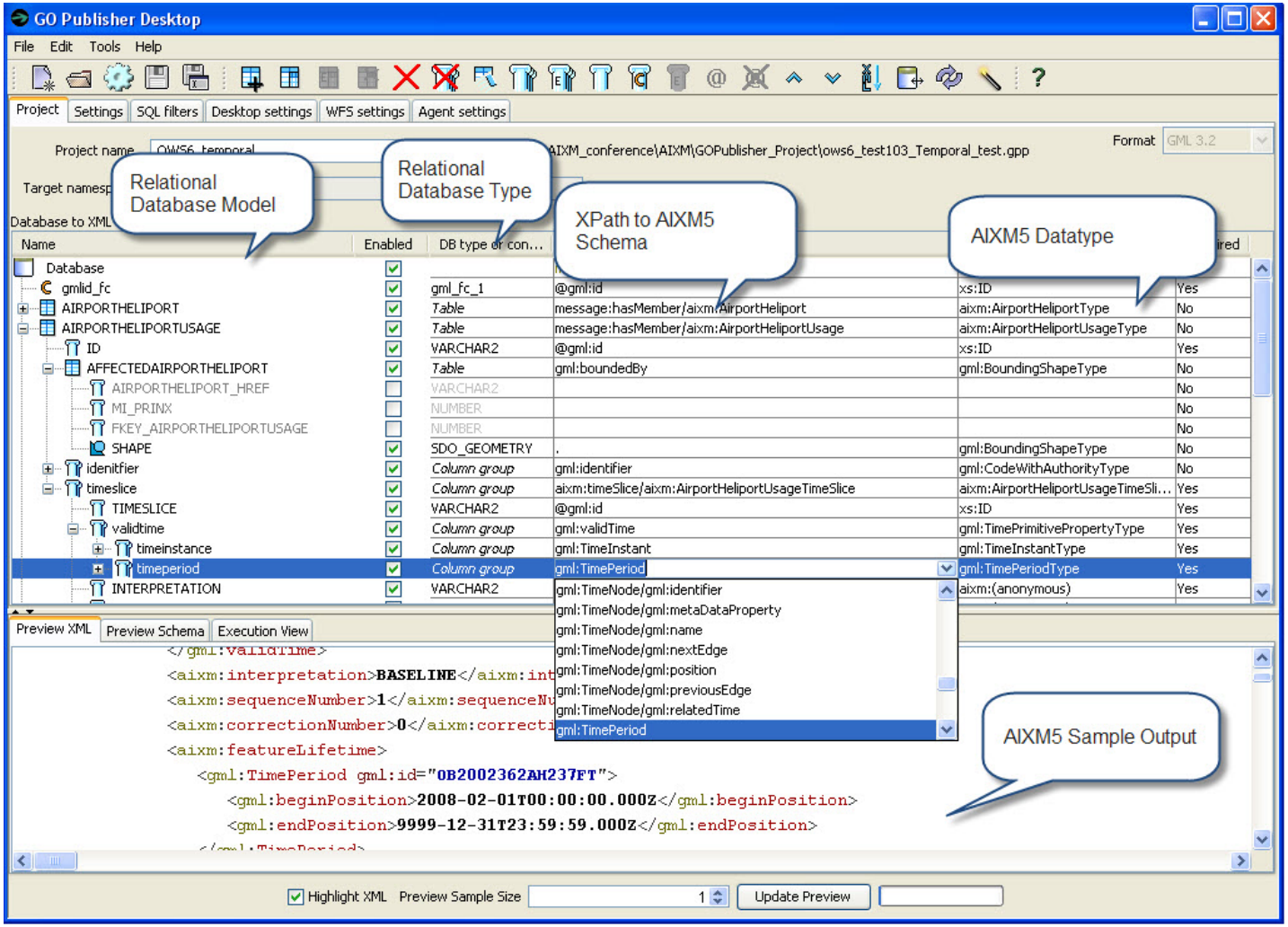
Features Published



Deploying the mapping to Publisher AIXM5



Mapping AIXM5 using GO Publisher



Temporal Queries

Query on timeframe of flight and within 100 nautical miles of flight path

```
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<fes:TemporalOperator name="BegunBy"/>
 <fes:TemporalOperator name="TContains"/>
<fes:TemporalOperator name="During"/>
<fes:TemporalOperator name="TEquals"/>
 <fes:TemporalOperator name="TOverlaps"/>
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<fes:TemporalOperator name="OverlappedBy"/>
<fes:TemporalOperator name="MetBy"/>
<fes:TemporalOperator name="Ends"/>
<fes:TemporalOperator name="EndedBy"/>
 </fes:TemporalOperators>
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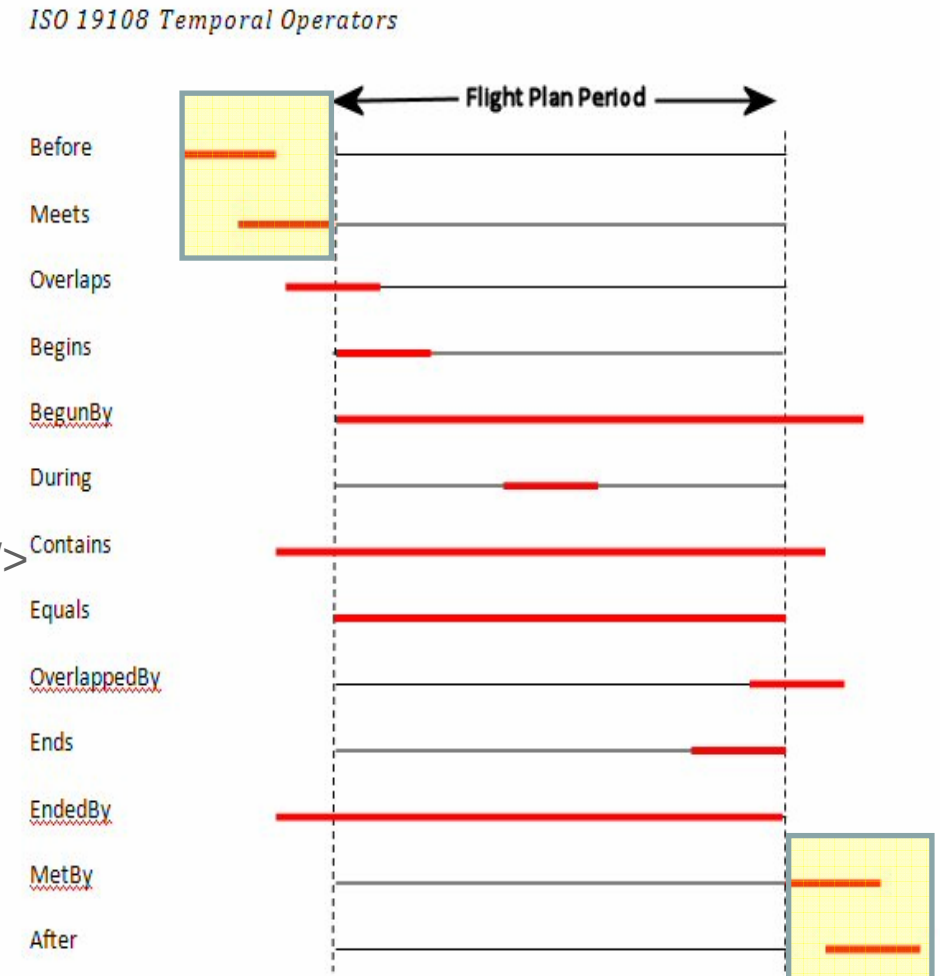

Server Side Results

- Proved that AIXM5 (and xNOTAM) can be loaded, managed and published
- The underlying OGC and ISO standards (GML, WFS, FE) fully supported the Aviation requirements
- Proved interoperability through multiple client integration
- Successfully implemented spatio-temporal queries
- Only minor issues along the way – no show stoppers

All Delivered using COTS

Network-
Technology
vel-one.net
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M A R K

Any Questions?

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