The consumption of INSPIRE harmonised data made easy with the QGIS GML Application Schema Toolbox

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Supporting GML application compliant complex features in QGIS and beyond

Developments needed to break the circle “no data / no software to use the data”
Presenters

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Break the circle “no data / no software to use the data”

« another approach to demonstrate the usefulness of interoperable standards »

or

« having something to show to those who consider XML is not sexy »
Quick history

- **INSPIRE Data Specification Working groups**

2015

- **Study** on how to improve GML support in QGIS?

2016

- **POC QGIS Plugin**
  - GML App Schema OGR Driver and QGIS integration
Workflow
Technological challenges

Create database structure based on specification (XSD) … keeping in mind to have something usable

Reusable work (eg. avoid hardcoded configurations, identify core functionalities)
Technological choices

Based on open source projects

Create reader and writer for GML App Schema in a well-known and used library: GDAL

Use the GML App Schema driver in a desktop GIS: QGIS

Identify generic GIS/DB concepts which could be reused: Improve table join support, Add array types, Add custom editing widgets

Create a plugin dedicated to specialized tasks: Convert INSPIRE GML to DB
Technological choices
A new driver (GMLAS) in GDAL
Reading GML App Schema

A new driver added to GDAL OGR: **GMLAS driver**

- How-to list GML file feature types?

```bash
ogrinfo -ro GMLAS:cddaDesignatedArea.gml
INFO: Open of `GMLAS:cddaDesignatedArea.gml'
    using driver `GMLAS' successful.
1: DesignatedArea (Unknown (any), Point)
2: DesignatedArea_metaDataProperty (None)
3: DesignatedArea_name (None)
4: DesignatedArea_legalFoundationDocument_CI_Citation_alternateTitle (None)
```

- How-to convert from GML to spatialite?

```bash
ogr2ogr cdda.sqlite GMLAS:cddaDesignatedArea.gml \
    -f sqlite -dso spatialite=yes -oo EXPOSE_METADATA LAYERS=YES
```
Reading GML App Schema

XSD > Object model conversion based on Xerces

Respect application schema type

Model simplification eg. use Array db types

Exclude unused elements eg. xlink:role

XSD caching

XML validation : well-formed and/or XSD

GML geometry parsing (OGR)

XLink support
Reading GML

Configuration ...

All applications using GDAL can benefit from this.
A new driver (GMLAS) in GDAL

INSPIREd database
Database

[Image of spatialite GUI with a directory structure showing folders like User Data, ogr_fields_metadata, ogr_layer_relationships, etc.]

INSPIRE GML file
A new driver (GMLAS) in INSPIREd database Used in
Usage in QGIS
Usage in QGIS / Download and convert

(optional) Download from WFS
(based on [WFS2 plugin](https://www.wfs2plugin.org) made by Juergen Weichand)

Convert to database

[![GMLAS Download and Convert](image-url)](image-url)

**Source GML file**
- Path
- XLink depth
- Validate

**Datasets**

**Target**
- Provider
- Database
- Schema
- SRS
- Append
- Overwrite

[![SQLite or PostGIS](image-url)](image-url)
Usage in QGIS / coming work

- **Plugin**
  - Download and conversion processing
  - Predefined SQL views by INSPIRE themes to simplify database use

- **QGIS Core**
  - Autodiscover join between tables in db model
  - Navigation between related tables in attribute table mode
Additional features made in BRGM POC
XML mode > WFS Flow
XML Mode > SOS Flow
Schema representation with QGIS to ease navigation.
What’s next?
Testing

INSPIRE datasets, GeoSciML, ...

A virtual box is available with GDAL+GMLAS driver + QGIS3 + samples
Open source projects version used and roadmap

GDAL 2.2 April 2017

QGIS 3 - 2017

- 2.x series is now a maintenance release (ie. no major changes).
- QGIS 3 was announced in February 2016
- Development will be supported on the long term
- No resources to duplicate the work in 2.x and 3.x series (major changes for Python and QT).
- Contributions to 3.x by adding core functionalities, testing it, migrating plugin (eg. WFS2), which will benefit for the QGIS community
Planning

- Now
  - INSPiRE conference presentation
  - Virtual box
  - Sample datasets
  - GDAL GMLAS Reader development
  - Testing
  - GMLAS Writer
  - QGIS Array type support
  - Better join support
  - Custom editing widgets
  - QGIS Plugin
  - WFS2 Plugin
  - + GMLAS Plugin

GDAL 2.2
Next steps

Finalize the work (2016)

Support publication of GDAL2.2 and QGIS3 + QGIS plugins in QGIS official repository (BRGM POC is already available and work with QGIS2)

Develop a user and developer community

● Have people use it & report usage …

Enhance the work

● Combine work made in the POC and the current implementation
● Add domain useful widget (Hydrogeologists, …)
● This work is not INSPIRE specific so it can be useful to the overall OGC community
Links

https://github.com/rouault/gdal2/tree/gmlas

https://github.com/pvalsecc/QGIS/tree/gmlas

https://plugins.qgis.org/plugins/gml_application_schema_toolbox/
(BRGM POC)

https://github.com/INSPIRE-MIF/qgis-ogr-gmlas

http://files.titellus.net/vbox/ for testing