What is INTERLIS and why it's used

INTERLIS (INTER Land Information Systems) is a data description language and a transfer format with special consideration of geodata. INTERLIS offers the possibility to describe spatial data precisely, to integrate them in conformity with the model and to exchange them easily among different users. INTERLIS has been bindingly anchored in Swiss geoinformation legislation since 2008. Since INTERLIS has been object-oriented since version 2, it can be extended very easily. This means that, for example, the federal government defines a model that the cantonal authorities can derive and extend according to their needs.

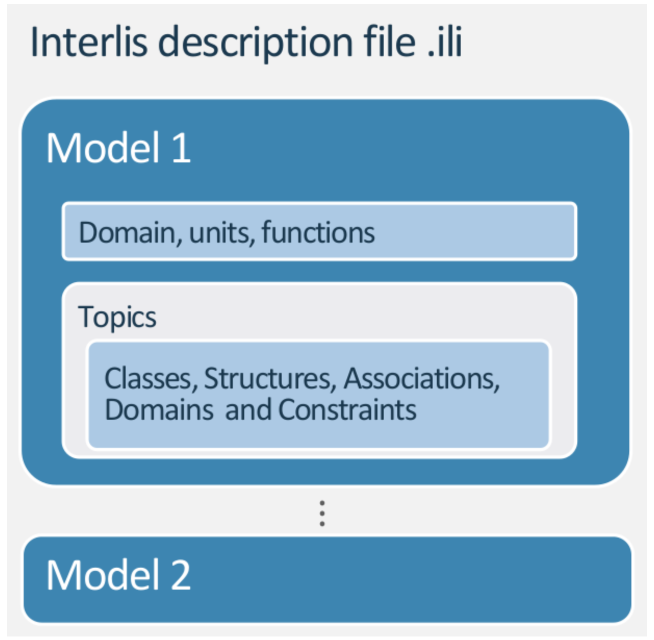
- A very precise standardized language at a conceptual level for the description of data models (schemas)
- Easy extendable (so optimal for data exchange between authorities with different needs)
- System neutral (platform independent)
- Facilitates communication and understanding between IT and thematic specialists
- It is readable by both humans and machines
- Integrates data types to be used on GIS (for example Geometries)
- Strict division between the transfer part and the modeling part (model driven approach)

> Personally I like about INTERLIS that you have your database schema in your poket. It's readable and precice. Compared to e.g. SQL Scripts you can simply extend it. Thanks to the nice tools (ili2 and Model Baker) it's easy to implement in your database and in QGIS.

INTERLIS Modelling in 10 Minutes

Model Structure

```
INTERLIS 2.3;
MODEL Wildruhezonen_LV95_V2_1 (de)
AT "https://models.geo.admin.ch/BAFU/"
VERSION "2020-04-21"  =
  DOMAIN
    Punkt = GeometryCHLV95_V1.Coord2;
  TOPIC Wildruhezonen =
    CLASS Wildruhezone =
      Name : MANDATORY TEXT*80;
    END Wildruhezone;
  END Wildruhezonen;
END Wildruhezonen_LV95_V2_1.
```


Interlis description file .ili
Model 1
Domain, units, functions
Topics
Classes, Structures, Associations, Domains and Constraints
Model 2

Classes

Syntax

```
ClassDef =  'CLASS' Class-Name '='
              { AttributeDef }
            'END' Class-Name ';'.
```

Example

```
CLASS Wildruhezone =
  ObjNummer : MANDATORY 0 .. 9999;
  Name : MANDATORY TEXT*80;
END Wildruhezone;
```

Attributes

Syntax

```
AttributDef = Attribute-Name : [MANDATORY]
                               Type | DomainRef;

DomainRef = [ Model-Name '.' [ Topic-Name '.' ] ] Domain-Name
```

Example

```
Name : MANDATORY TEXT*80;
Schutzstatus : MANDATORY Wildruhezonen_Codelisten_V2_1.Codelisten.Schutzstatus_CatRef;
```

Structures

Syntax

```
StructureDef =  'STRUCTURE' Struct-Name '='
                  { AttributeDef }
                'END' Struct-Name ';'.
```

Example

```
STRUCTURE PolygonStructure =
  Polygon: Polygon;
END PolygonStructure;

STRUCTURE MultiPolygon =
  Polygons: BAG {1..*} OF PolygonStructure;
END MultiPolygon;
```

Accociations

Syntax

```
AssociationDef = 'ASSOCIATION' '='
                   { RoleDef }
                 'END' ';'.
RoleDef = Role-Name '--' ClassRef ';'.
```

Example

```
ASSOCIATION RoutennetzWildruhezone =
  WRZ_Routennetz -- {0..*} Routennetz;
  WRZ -<#> {1} Wildruhezone;
END RoutennetzWildruhezone;
```

Extends

```
CLASS Wildruhezone =
  ObjNummer : MANDATORY 0 .. 9999;
  Name : MANDATORY TEXT*80;
END Wildruhezone;

CLASS Wildruhezone (EXTENDED) =
    /** Zuordnung der Zielarten Schutzbestimmung zur Wildruhezone */
    Zielart: GL_Wildruhezonen_Codelisten_V1.Codelisten.Zielarten_CatRef;
END Wildruhezone;
```

Types of classes

- Concrete
- Abstract
- Final
- Derivate/Extended

```
CLASS Wildruhezone (ABSTRACT)=
END Wildruhezone;
```

Catalogues are external codelists that can be used like `Enumerations` but less static.

Structure of a catalogue

Catalogues base on the model `CatalogueObjects_V1` and extend the abstract classes and structures

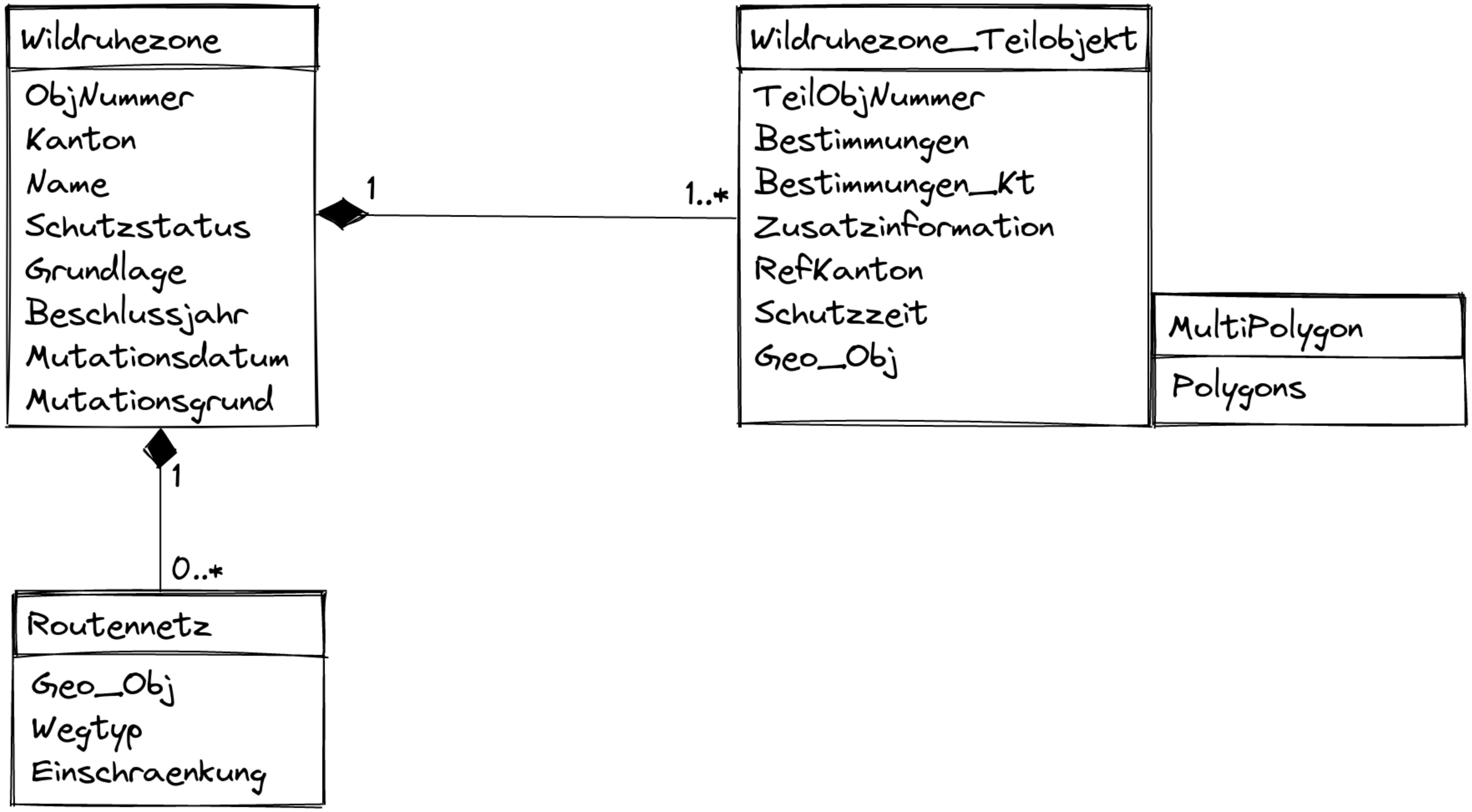
```
CLASS Bestimmungen_Catalogue
EXTENDS CatalogueObjects_V1.Catalogues.Item =
    Code : MANDATORY TEXT*5;
    Description : MANDATORY LocalisationCH_V1.MultilingualText;
END Bestimmungen_Catalogue;

STRUCTURE Bestimmungen_CatRef
EXTENDS CatalogueObjects_V1.Catalogues.MandatoryCatalogueReference =
    Reference (EXTENDED) : MANDATORY REFERENCE TO (EXTERNAL) Bestimmungen_Catalogue;
END Bestimmungen_CatRef;
```

Reference to the catalogue

```
CLASS Wildruhezone_Teilobjekt =
  Bestimmungen : MANDATORY Wildruhezonen_Codelisten_V2_1.Codelisten.Bestimmungen_CatRef;
```

The real model `Wildruhezonen_LV95_V2_1`



Have a look at the ILI file

Wildruhezonen_V2_1

INTERLIS implementation workflow and tools

workflow

(Graphic by landnetwork.ch)

ili2 world

made by Eisenhut Informatik

Compiler ili2c

The INTERLIS Compiler checks an INTERLIS model if the constructs of the language INTERLIS were applied correctly. It reports syntactic errors in the model with the line number so that they can be corrected by the modeler.

ili2fme and ili2db

ili2pg, ili2gpkg and ili2fgdb are programs that write an INTERLIS transfer file according to an INTERLIS model into a database (PostgrSQL/PostGIS, GeoPackage or ESRI FileGDB) or create such a transfer file from a database.

ilivalidator

The ilivalidator tool checks whether data in the INTERLIS 1 and 2 transfer format (.*itf/*.xtf) complies with the associated model (*.ili). License terms and further information about the ilivalidator can be found here:

Swiss geodata repositories

ilimodels.xml

- Based on the model `IliRepository09`
- Contains objects of the class `ModelMetadata` where a model name and a file path is defined
- The files are on the same repository

ilisites.xml

- Based on the model `IliSite09`
- Contains objects of the class `SiteMetadata` where path to other repositories are defined
  http://models.interlis.ch/ilisite.xml -> http://models.geo.kgk-cgc.ch/ilisite.xml -> http://models.geo.sh.ch/ilisite.xml

Let's have a look

QGIS MODEL BAKER is the gateway drug

A QGIS Project Generator

The Model Baker is a QGIS plugin that allows to quickly create a QGIS project from a physical data model. The Model Baker analyzes the existing structure and configures a QGIS project with all available information.

A QGIS Project Generator optimized for INTERLIS

Models defined in INTERLIS provide additional meta information like domains, units of attributes or object oriented definitions of tables. This can be used to further optimize the project configuration.

An ili2db controll station

It provides the user only the needed settings to pass parameters to the ili2db.

Metaconfiguration and Toppings

Get the additional information with the `ilidata.xml` file on the UsabILIty Hub (currently https://models.opengis.ch) and the linked repositories.

Metaconfiguration and Toppings

Settings for tools are configured in a metaconfiguration file, as well as links to topping files that contain information about GIS project (such as symbologies or legend structures). Thus, this additional information usually consists of a metaconfiguration and any number of toppings.

Bild von usabilityhub.ch

Why not using INTERLIS