Interorganizational Geo-Synchronization using OGC Technologies to share and harmonize data in Catalonia

Krakow, June 2010.
Objectives

Processes preparation

  mapping data models
  changes as GML features
  feature versioning

Publishing data changes for WFS access

Harvesting data

Results, uses, conclusions
Objectives: Context for Data Transfer

BCN
(1:500 Barcelona data)

Harvests changes in the area around the port

APB
(1:500 port data)

ICC
(1:5000 topographic DB of Catalonia)

Harvests changes in the port data
Objectives

• Automation of the data transfer from data producer to data consumer
  » No more ftp, dvd....

• Use of OGC standards as a means to avoid vendor lock-in

• Test and promote interoperability
  » Taking advantage of the SDI...

• Harvest data changes whenever the data consumer desires so
SDI’s: more than combining layers!

Exploring Technology: interoperability for data geo synchronization

City of Barcelona

GeoMedia WFS

Oracle (1:500 data)

APB

IOGEO GmlPipes

PostgreSQL / Postgis (1:500 APB data & 1:500 BCN data)

GeoServer WFS

ICC

Galdos Harvester

ArcSDE / Oracle (1/500 APB data)

GeoServer WFS

Harvest data

Insert harvested data adjusted to the capabilities of GeoServer WFS

Insert harvested data transformed to ICC GML schema

Harvest data

WFS
WFS-T
GML
XSLT
GML Schemas
Data models
mapping
Mapping data

APB (1:500) → ICC (1:5000)

- fme:gis_bascula_perimetre_base, fme:gis_escala_perimetre_base,
- fme:gis_elementi_decorativi_perimetre_base,
- fme:gis_monument_perimetre_base,
- fme:gis_topoli_via_ferrocarriu_perimetre_base,
- fme:gis_linia_escalera_linia_esculiera,
- fme:gis_linia_moll_no_operatiu_linia_moll_no_operatiu,
- fme:gis_limit_vorada_linia_vorada,
- fme:gis_linia_detalle_monument_linia_detalle,
- fme:gis_ileta_perimetre_base,
- fme:gis_moll_pivotat_limit_terra,
- fme:gis_moll_pivotat_limit_agua,
- fme:gis_zona_esculiera_limit_esculiera_terra,
- fme:gis_camp_export_perimetre_base

- fme:gis_cable_teleferic_cable_teleferic,
- fme:gis_eix_via_ferrocarriu_eix_base,
- fme:gis_trafic_viaf_eix_base.

HARVERBT5M.BT5MV20_P1L

- fme:gis_cobort_perimetre_supior,
- fme:gis_edificacio_perimetre_supior,
- fme:gis_voladis_perimetre_supior,
- fme:gis_garita_perimetre_base,
- fme:gis_torre_electrica_perimetre_base,
- fme:gis_torre_teleferic_perimetre_base,
- fme:gis_zona_verda_perimetre_base,
- fme:gis_deposit_perimetre_base,

HARVERBT5M.BT5MV20_C1L

- fme:gis_limit_paviment_linia_canvi_paviment,
- fme:gis_linia_accessori_linia_accessori,
- fme:gis_mur_contencio_cop_escarpat,
- fme:gis_muret_eix_base,
- fme:gis_passarel_la_perimetre_base,
- fme:gis_pintura_significativa_eix_base,
- fme:gis_pont_viantanc_perimetre_base,
- fme:gis_porta_eix_base,
- fme:gis_tanca_eix_base,
- gis_mur_contencio_piu_escarpat

HARVERBT5M.BT5MV20_P1PY

- fme:gis_scena_perimetre_base

HARVERBT5M.BT5MV20_P2L

- fme:gis_linia_terra_platja_linia_terra_platja

HARVERBT5M.BT5MV20_H2L

- fme:gis_punts_cota_punt_cota

HARVERBT5M.BT5MV20_A1PT

- fme:gis_olaiaci'o_toponim_annotacio

HARVERBT5M.BT5MV20_T1TX_5M
Date: 2008-01-01. Insertion of a new Building feature

1. A Building feature with business ID 1 is inserted in the data repository. The business ID uniquely identifies the feature instance. All version of this feature share the same business ID. Note that the database ID can be and usually is different than the business ID. There can be an arbitrary number of additional feature properties but for simplicity.

Date: 2008-02-20. Modification of the Building feature

2. A modification in the Building feature leads to the creation of a new feature version. The previous feature version is assigned the current date as its end date. The new feature version replaces the previous one in the role of the current feature version for Building feature with business ID 1, and this is indicated via a null end date.

Date: 2008-05-25. The Building feature is modified again

3. The same approach is taken as in the previous step 2. This leads to three feature versions being available for this feature instance, two historic and one current.

Date: 2008-07-31. The building is torn down and this change needs to be reflected in the data.

4. The same approach is taken as in the previous steps 2 and 3 except that the Operation field is set to DELETE. Deleting the feature instance would not make sense because it would delete all records of its existence. Therefore, a feature deletion is similar to a data update.
Publishing data changes

1. Read changes
2. Write disaggregated and versioned features
3. Read
4. Write as GML files
5. Read daily extract in GML
6. Load changed features while maintaining the history of features (i.e. Feature versions)

FME

SmallWorld 4

GML files

IOGEO GML Loader

Daily Extract in FFS format

APB GeoServer WFS

PostgreSQL/Postgis
Harvesting data

Provider: City of Barcelona

GeoMedia WFS

Oracle (1:500 data)

Harvest data

PostgreSQL/Postgis (1:500 APB data & 1:500 BCN data)

GeoServer WFS

Insert harvested data adjusted to the capabilities of GeoServer WFS

GeoServer WFS

ArcSDE/Oracle (1:500 APB data)

Galdos Harvester

GeoServer WFS

Insert harvested data transformed to ICC GML schema

ICC

APB

IOGEO GmlPipes

Harvesting data provider

Harvesting data consumer
Approx. 57,000 objects harvested in the initial harvest from the APB WFS
Conclusions

OGC GML and WFS specifications and implementing software applications can be used to **share and harmonize** geographic data between organizations.

Geo-synchronization may require **considerable resources** to define the mapping between data models, devise a process for publishing the data changes, overcome deficiencies of the available software applications, and incorporate the harvested data in the data maintenance processes.

Capability to maintain the history of data as an indirect benefit.
Thanks

http://www.geoportal-idec.cat/geoportal/eng/