ICA | EuroSDR
GENERALISATION AND MDRB WORKSHOP FOR NMAs

BARCELONA – 21/22 MARCH 2013

Arnaud BRAUN & Jérémy RENARD
« carte à la carte » project team & COGIT lab.
IGN FRANCE
1. CURRENT DLM AND DCM AT IGN FRANCE
1. CURRENT DLM AND DCM AT IGN FRANCE

Same DBMS but no relationships between objects

Source DLM

BD Topo (accuracy 1-10 m)

New data
Clarity
WinPAT

Δ updates (2 years)

BD Carto (accuracy 15-50 m)

Δ updates
Δ updates every year

Route 120

Production since several years – whole France

25 K PostgreSQL

100 K Lamps2

250 K GeoConcept

1 M GeoConcept

DCM

« Type 2010 »
New production
End 2016

Several DCMs – several DBMS - no relationships between objects
Designed for paper maps – cf. Geoportail®
2. NEW «MULTISCALE» DCM
2. NEW « MULTISCALE » DCM

- « CARTE A LA CARTE » = NEW PROJECT LAUNCHED BY END OF 2010. AIMS:
  - NEW SERVICES FOR ON DEMAND MAPPING
  - INNOVATION: CUSTOMIZABLE CARTOGRAPHIC BACKGROUND
  - BASED ON A MULTISCALE DCM, VECTOR, UP-TO-DATE
  - + NEED FOR A NEW 1:25,000 DIGITAL MAP FOR PROFESSIONNAL USE - UPDATED EVERY YEAR
  - DEVELOPMENT TIME CONSTRAINED

- CHOICE:
  - USE EXISTING DCM WHEN VECTOR DATA COVERS WHOLE FRANCE
  - NEW PROCESS DERIVED FROM EXISTING ONE FOR COVERING WHOLE FRANCE WITH VECTOR DATA AT 1:25,000 SCALE AND LARGER SCALES
  - UNIFY SYMBOLIZATION ACROSS SCALES
  - SOFTWARE ARCHITECTURE « SERVICE ORIENTED »

- PROJECT STILL RUNNING
2. NEW « MULTISCALE » DCM

Source DLM

BD Topo

BD Carto

Route 120

Same DBMS but no relationships across DBs

New data Clarity WinPAT

25 K PostgreSQL

100 K Lamps2

250 K GeoConcept

1 M GeoConcept

Production for several years – whole France

Δ updates (2 years)

Δ updates every year

Δ updates every year

Several DCMs – several DBMS - no relationships across DBs

« Type 2010 »
New production
-> End 2016
2. NEW « MULTISCALE » DCM

Same DBMS but no relationships across DBs

Source DLM

- BD Topo
- BD Carto
- Route 120

New data
- Clarity WinPAT

Δ updates (2 years)

- 25 K PostgreSQL
- 100 K Lamps2
- 250 K GeoConcept
- 1 M GeoConcept

Δ updates every year

- Production for several years – whole France
- « Express » whole France (+ Type 2010 still exists)

Several DCMs – several DBMS - no relationships across DBs
2. NEW «MULTISCALE» DCM

Same DBMS but no relationships across DBs

Source DLM

BD Topo

BD Carto

Route 120

Δ updates

Δ updates (2 years)

Δ updates every year

Δ updates every year

New data
Clarity WinPAT

Large scales
PostgreSQL

25 K

100 K

250 K

1 M

Lamps2

GeoConcept

GeoConcept

Production since several years – whole France

«Express» whole France

Several DCMs – several DBMS - no relationships across DBs
### 2. NEW « MULTISCALE » DCM

**Source DLM**

- **BD Topo**
  - Large scales
  - 25 K PostgreSQL
  - 50 K TODO

- **BD Carto**
  - 100 K Lamps2
  - 250 K GeoConcept

**Route 120**

- 1 M GeoConcept

- **Route**
  - Δ updates every year

- **BD Topo**
  - New data
  - Clarity
  - WinPAT

- **BD Carto**
  - Δ updates (2 years)

- **Route 120**
  - Δ updates every year

- **Source DLM**
  - « Express » whole France

- **DCM**
  - Maintained for several years – whole France

**Several DCMs - no relationships across DBs**

SAME DBMS + SAME RENDERING SYSTEM

SYMBOLIZATION UNIFIED ACROSS SCALES → « PYRAMID »

EASY CUSTOMIZATION (COLORS and CONTENTS)
2. NEW « MULTISCALE » DCM

DLM
Internal BD Topo
For 1/25 000
and larger scales

Type 2010 adaptation
(former « New base map project » results)
JTS + Clarity + WinPAT

Creation of city blocks.
Points of Interests (POI) pairing with real world objects.
Name formatting: capitalization, abbreviation...
Symbols orientation
Buildings generalization
Boundaries and itineraries matching with networks
Boundaries and itineraries offsetting
Elimination of duplicated or redundant features
Cartographic label placement
Computation of symbolization by combining attributes
Upload modifications in the central PostgreSQL database
Store log files

- 30 process parallel
- ~ 7 days of computation
- Load balanced
- Management production system

Existing DCM 1/100 000
Lamps2

Existing DCM 1/250 000
GeoConcept

Existing DCM 1/1 000 000
GeoConcept

« Multiscale »
DCM
PostgreSQL/PostGIS

20x20 km² tiles

Controls
Limited interactive corrections
2. **NEW « MULTISCALE » DCM**

« Multiscale » DCM

*PostgreSQL/PostGIS*

WMS (GeoServer)

Legends

*.sld*

*Colors as variables*

WMS « harvesting »

Load balanced

Raster maps – different legends

21/03/2013  12/27
2. NEW «MULTI-SCALE» DCM 16/27
28/02/2013
NEW "MULTI-SCALE" DCM 19/27 28/02/2013
2. NEW « MULTISCALE » DCM

- VARIABLES FOR COLORS AND THEMES:
  - 47 VARIABLES TO DESCRIBE LEGENDS THROUGH THE DIFFERENTS SCALES
  - 30 FAMILIES OF COLORS DERIVED IN « LIGHT » OR « DARK » VERSIONS
  - 12 THEMES
  - 10 OTHER VARIABLES : KILOMETERS, TOURISTIC INFORMATION, ETC.

- IMPLEMENTED IN SLD FILES - USE GEOSERVER VARIABLE SUBSTITUTION IN SLD MECHANISM
Source DLM

BD Topo

BD Carto

Route 120

Derivation and integration of updates: schema dependent

New data

Large scales

25 K « Express »

50 K TODO

100 K

250 K

1 M

Derivation and integration of updates: schema dependent on every DCM

Rendering through SLD: schema dependent on every DCM

SLD + GeoServer = one type of mapping

« Applicative schema » for colors and themes customization – data schema independent

User client
2. NEW « MULTISCALE » DCM

- POTENTIAL:
  - WHOLE FRANCE AT DIFFERENT SCALES - UP-TO-DATE
  - CONSISTENT ACROSS SCALES
  - CUSTOMIZABLE: CHOICE OF THEMES AND COLORS IN ALL SCALES
  - CARTOGRAPHY: DCM RENDERING ≠ DLM RENDERING (OTHER PLAYERS)
3. TOWARDS NEW SERVICES
3. TOWARDS NEW SERVICES

Choosing cartographic themes
3. TOWARDS NEW SERVICES

Conception of cartographic samples
3. TOWARDS NEW SERVICES

Visualization of cartographic samples
3. TOWARDS NEW SERVICES

COLORADO
Guided conception of maps
• Inspirations sources
• Preferences of user
→ computation of legends

Industrialization of [Christophe 2009]
3. TOWARDS NEW SERVICES

Cartographer's expertise is maintained, but user creativity is favored as well.
4. SCHEMA DEPENDENCE: RESEARCH POINT OF VIEW
4. SCHEMA DEPENDENCE: RESEARCH PT OF VIEW

- **GENREALISATION PROCESSES APPLIED ON GENERIC INTERFACES** => **NON DEPENDENT ON THE DATA SCHEMA**