



Danish Ministry of the Environment

One ministry, four agencies, +1000 data sets

Lars Storgaard

laers@gst.dk

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Biography and Agenda



Educated as chartered surveyor with SDI and environmental spatial data as specialization and has in the last five years been working with the implementation of the INSPIRE directive in the Danish Ministry of the Environment.

Agenda:

- 1) The Ministry of the Environment and its governance in regard to data, digitization and SDI
- 2) Our challenges with a huge amount of data sets and no efficient and well functioned SDI
- 3) Our approach with a strategy and reference architecture for building a SDI with focus on distribution of data sets



The Ministry of the Environment

Is in charge of administrative and research tasks in the area of environmental protection and planning.

At regional and local level, much of the administrative responsibility has been delegated to municipalities.

The Ministry employs more than 2500 people.

The Ministry consists of four agencies, and several independent Environment Centres across the country.

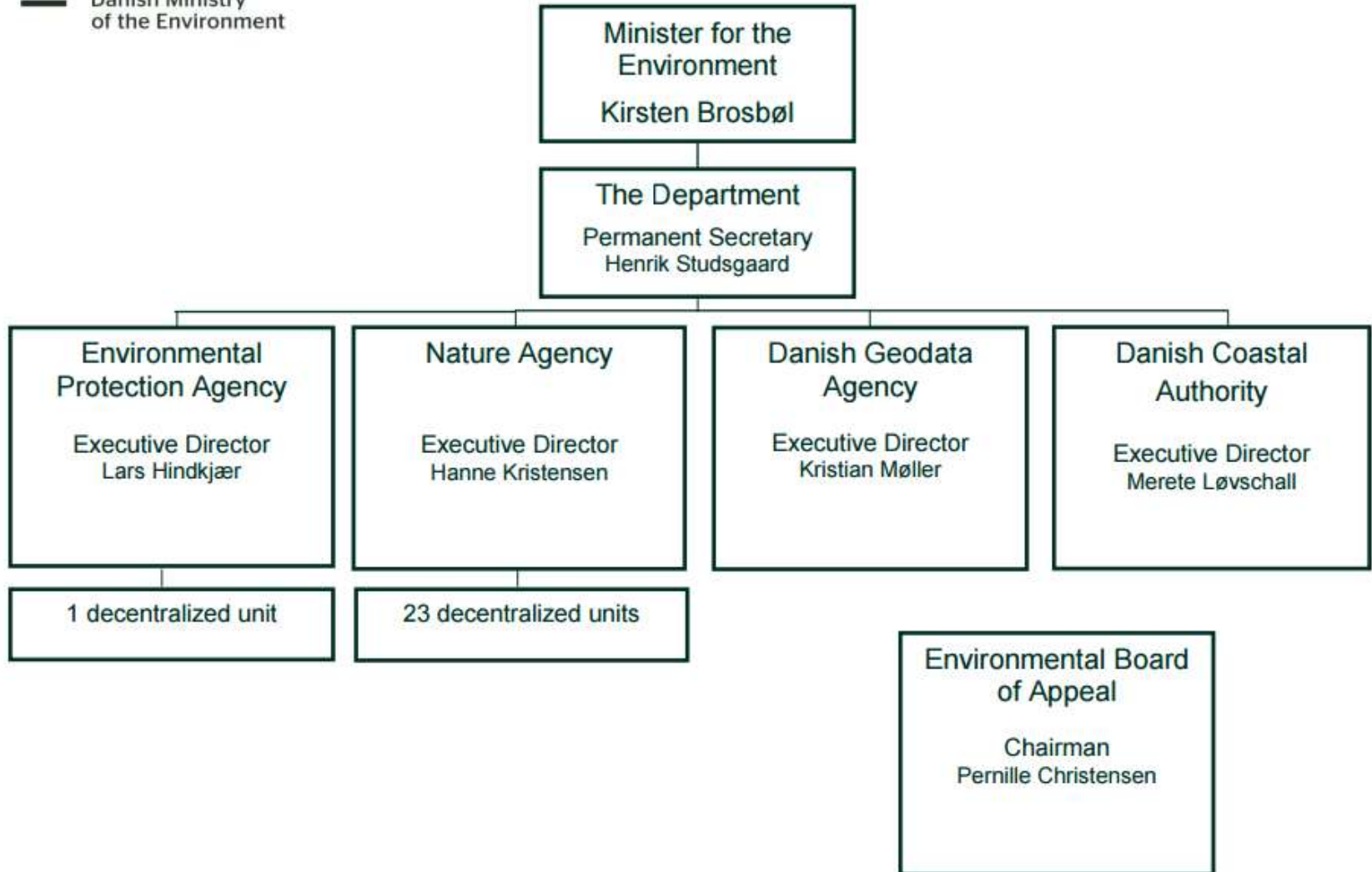
TOPICS	
Agriculture and forestry	→
Chemicals and waste	→
Climate change	→
Denmark on the map	→
In the countryside	→
International projects	→
Nature fauna and flora	→
Noise and transport	→
Planning and land use	→
Water	→
EU2012	→



Ministry of the Environment



Danish Ministry
of the Environment



The agencies business areas



Danish Ministry of the Environment
Nature Agency

- clean water,
- protecting and securing nature,
- planning for cities and landscape,
- outdoor activities and information to the public about nature, forestry,
- land management of the state forests, gaming and wildlife management.



Miljøministeriet
Kystdirektoratet

- analyses coasts and carries out coastal protection,
- surveys the water depth and secures sufficient water depth by dredging sediment,
- storm surge warning along the coasts,
- legislation concerning the coasts and territorial waters



Danish Ministry of the Environment
Environmental Protection Agency

- reducing pollution of air, soil, water and marine,
- handling and recycling of waste,
- regulation of environmental impacts from agriculture,
- regulation of chemicals, pesticides.



Danish Ministry of the Environment
Danish Geodata Agency

- responsible for the Infrastructure for Spatial Information Act and thereby of the INSPIRE directive,
- NMCA and data provider of reference data,
- maintain the Danish Geoportal, geodata-info.dk and
- maintain the Digital Map Supply

The ministry's overall strategy



5B...

The ministry of the environment establishes a framework for active and effective use of authoritative environmental, nature and spatial data for policy development and decision making and promotes a shared IT and data infrastructure at the ministry and across the public sector.





The Data and Digitization Unit

Dedicated unit to secure effective (re)use of data sets and IT-components:

1. Digitization initiatives (digital process, guidelines etc.)
2. Building an Enterprise Reference Architecture to secure that strategies, business process, data and systems are connected and documented.
3. Screening procedure for all proposed data and digitization projects to secure that exiting data sets and/or components are being reused.
4. Building the part of the SDI that secure distribution of environmental data sets (spatial and non-spatial) including compliant to INSPIRE.

Committee for data digitization and IT

Committee for data digitization and IT will advise the minister/permanent secretary in the management of data digitization and IT at a strategic and tactical level.

The aim is to achieve maximum impact and benefit of digitization mechanisms in the Ministry institutions.

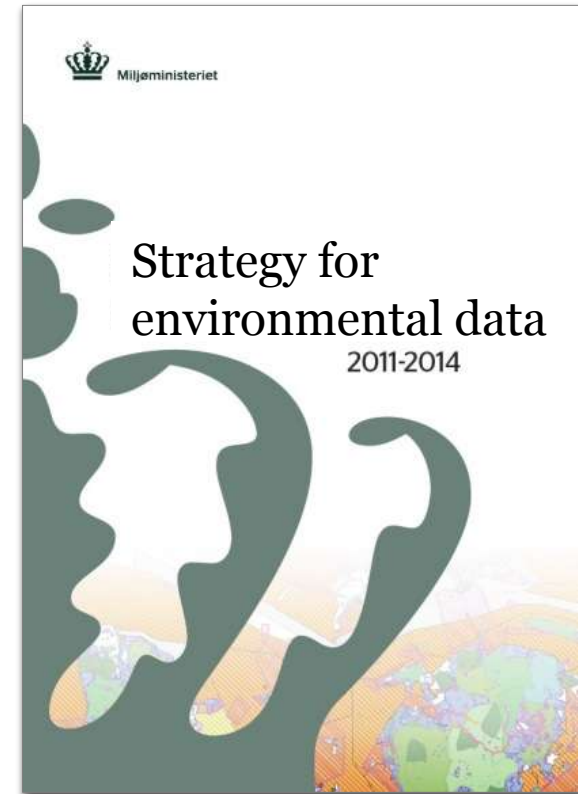


As Is situation for the environmental data



- Several independent data management systems
- File-based environmental geodata scattered on many file servers
- Poor or not updated metadata
- Uncertainty of where master data is stored
- Several copies of the same data
- Several different GIS and production, distribution, platforms
- No standardized way – no common data model – poor if no interoperability

...very chaotic and poor/no reuse of data and systems



Objectives of the SDI for environmental data

Ensure an **easy access** to, the Ministry of the Environments environmental data (both spatial and non-spatial data)

Ensure **authoritative and standardized** environmental data

Facilitate a **more efficient** problem solving

The objective is realized by....

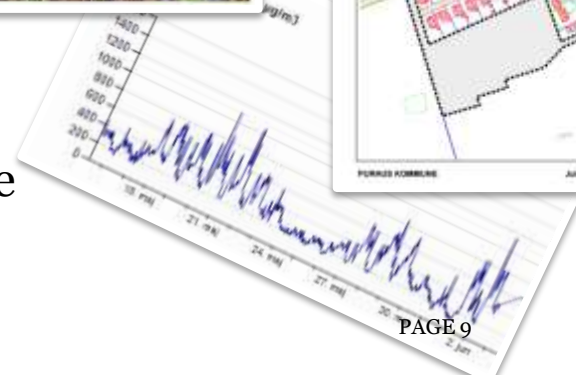
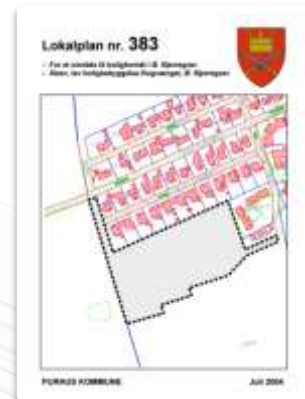
Establishing a common **Environmental Data Infrastructure** for *all* environmental data in the Ministry of the Environment

All environmental data

Diverse data types

Time series, graphs, planning documents, monitoring data

Therefore the infrastructure had to accommodate more than just spatial data.



WebGIS_internal



WebGIS_external



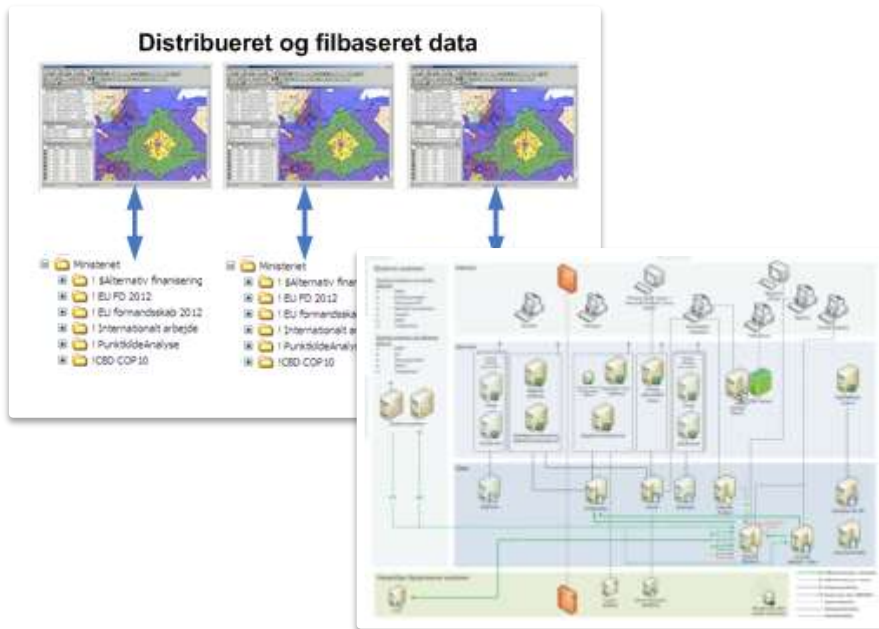
Discovery Service_internal



Discovery Service_external

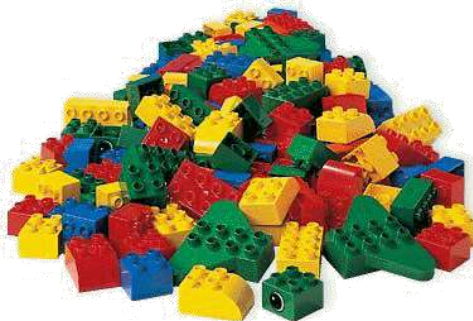


As Is: +1000 data sets file-based and stored at many servers

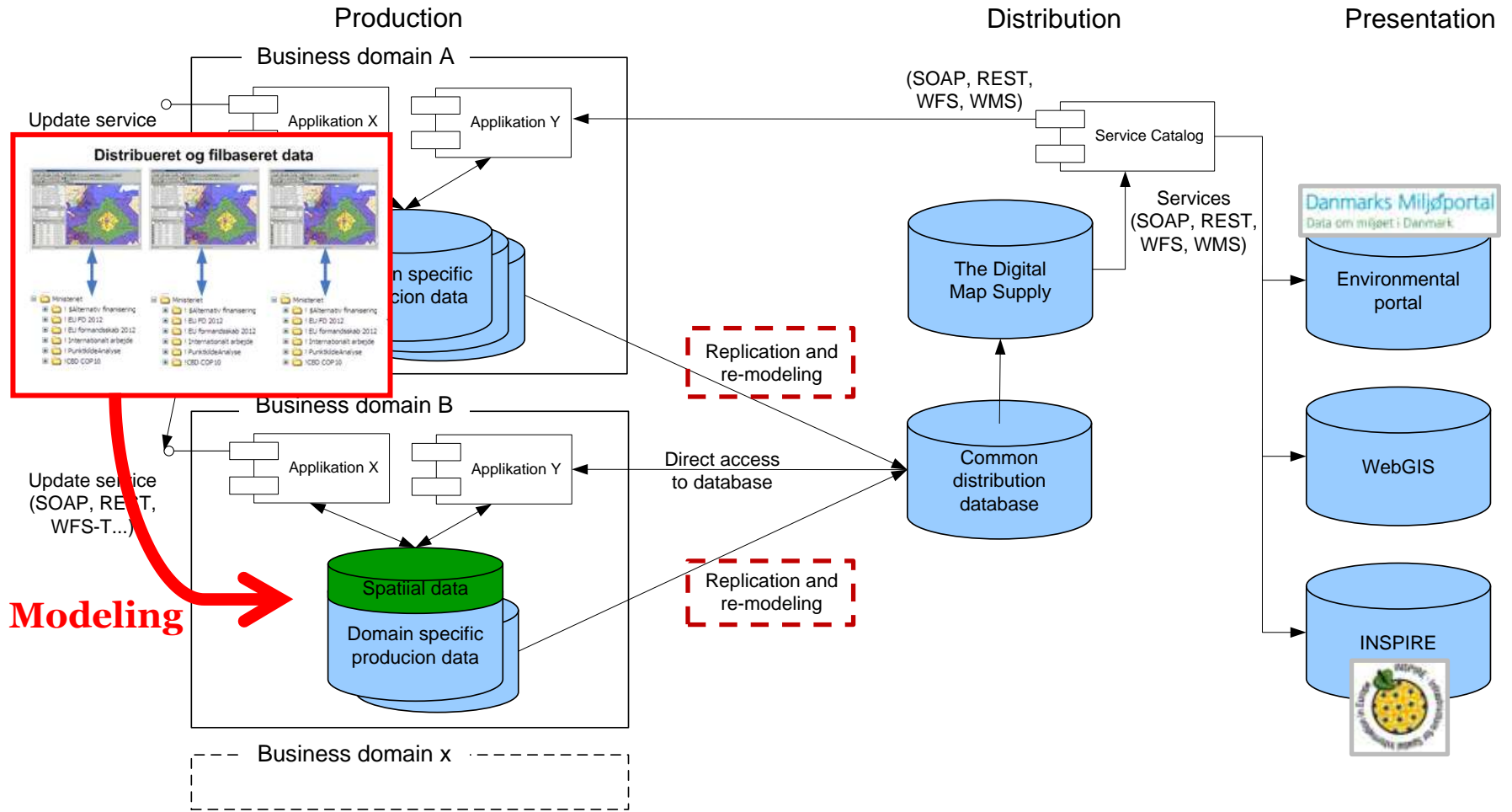


The goal:

- SDI for environmental data
- Conformant with INSPIRE
- Trustworthy and reliable data
- Streamlining – processes and governance
- Overview and access to data
- Uniform data structure
- Well-defined quality

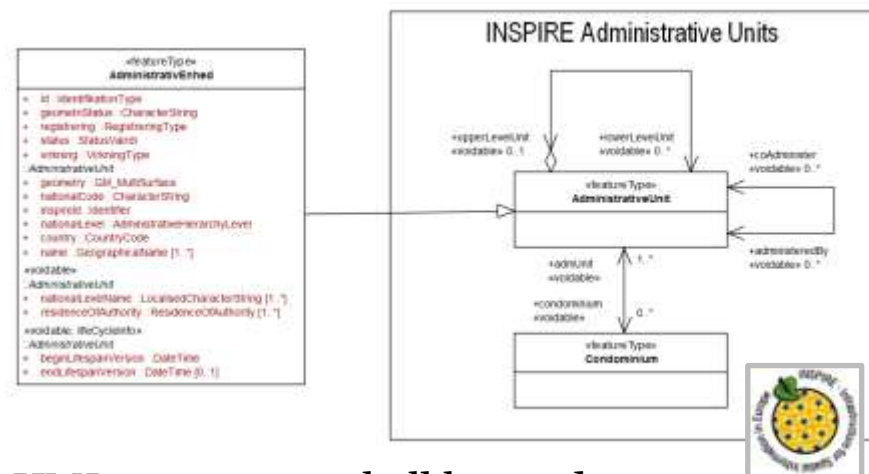


One infrastructure fits all



Model rules and model rules!

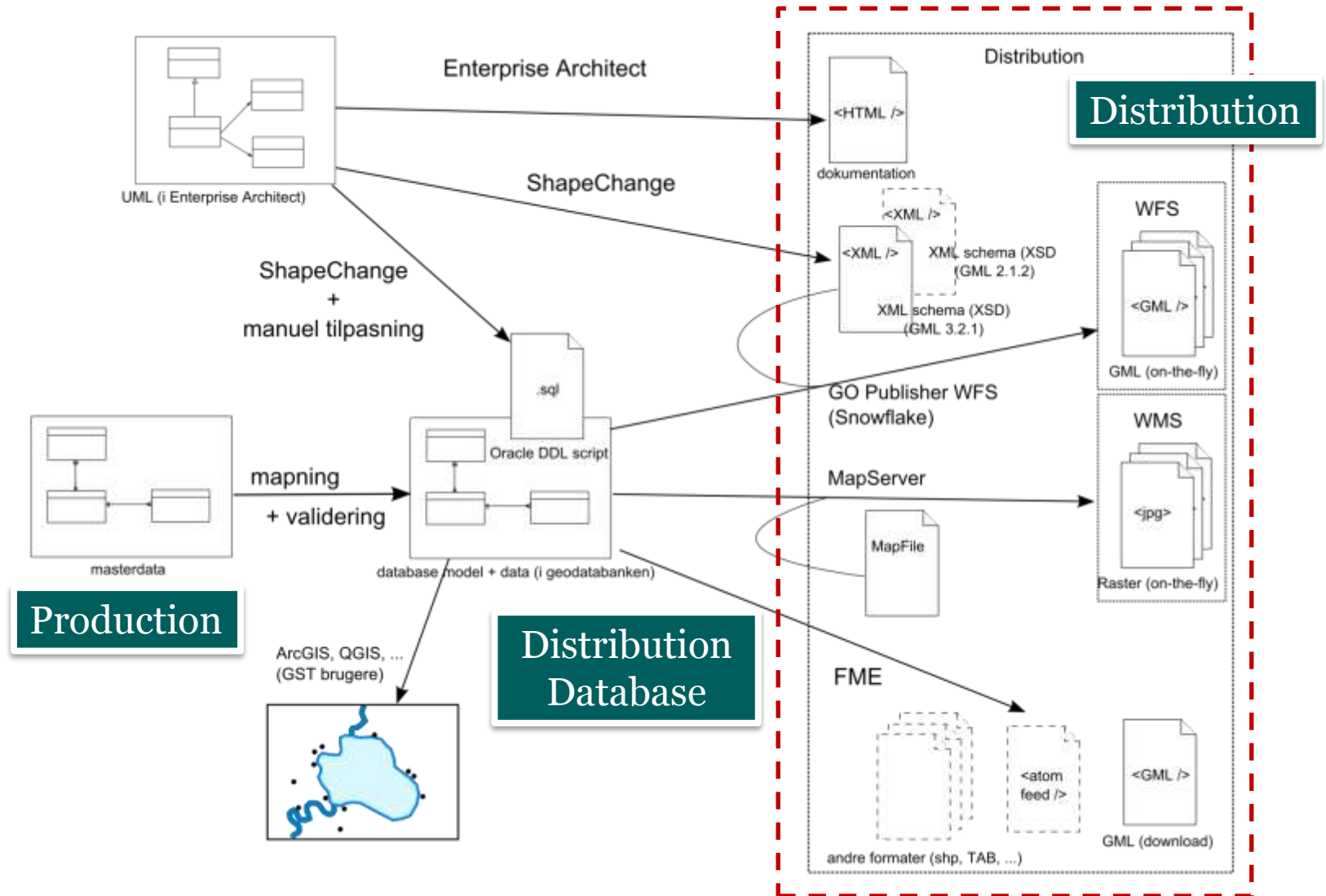
- The models are made in UML
- The models are distribution models
- The models are conceptual
- Data models shall be modelled as UML classes
- UML models shall be organized in packages
- Model entities shall be reused
- UML models shall be modelled in its whole (associations, names, roles, and multiplicity)
- Standardized data types shall be reused (based on ISO 19103 and ISO 19107 Harmonized Models)



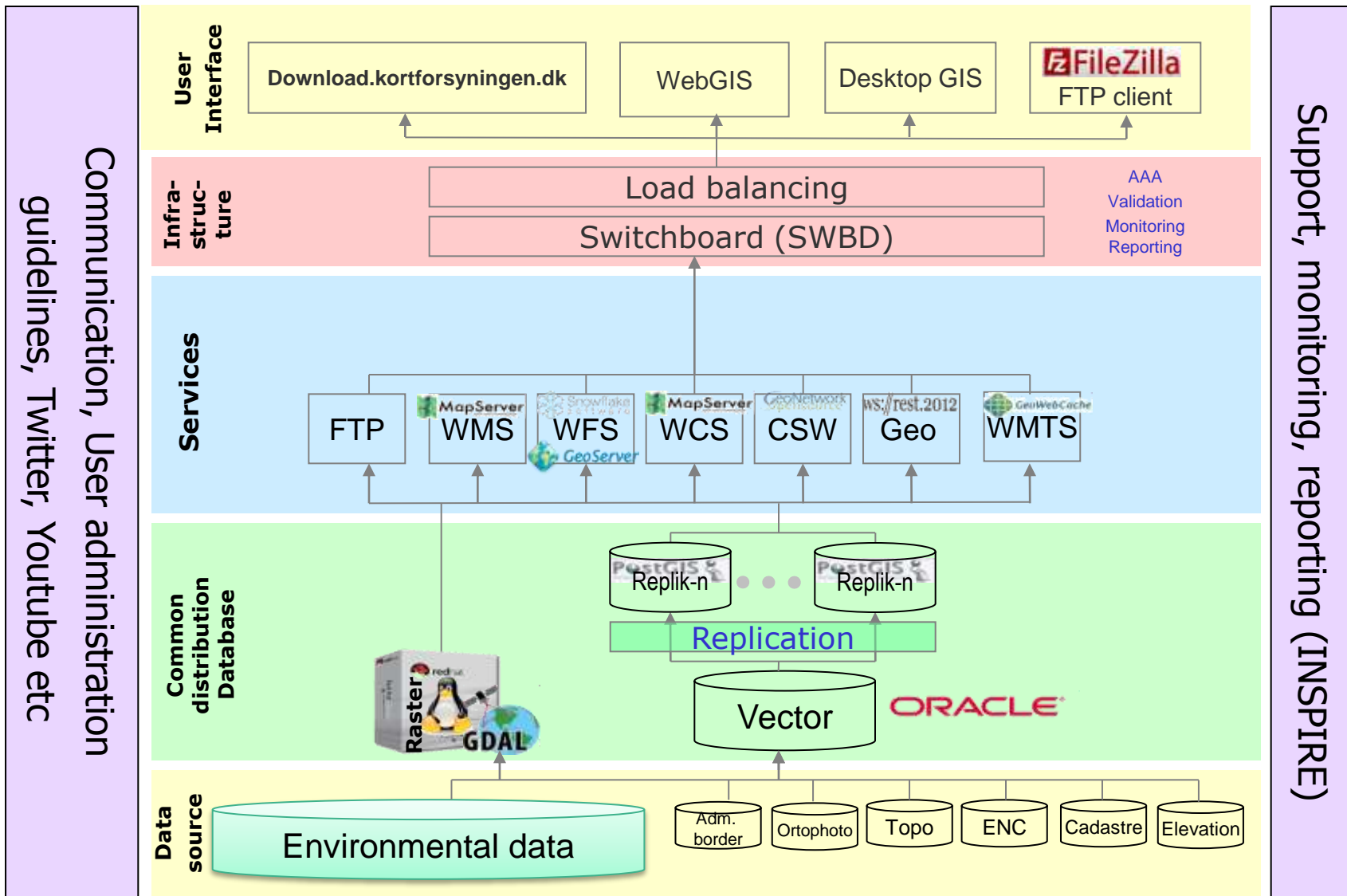
- UML stereotypes shall be used
- Language rules shall be used
- The data model shall be documented
- References to classifications, business models and organization models should be used
- All model entities shall be modelled with persistent, unique identification
- All models shall be modelled with a field STATUS
- All models shall be modelled with fields indicating time stamps of VALID_FROM, VALID_TO and REGISTER_FROM, REGISTER_TO and who is responsible ACTOR



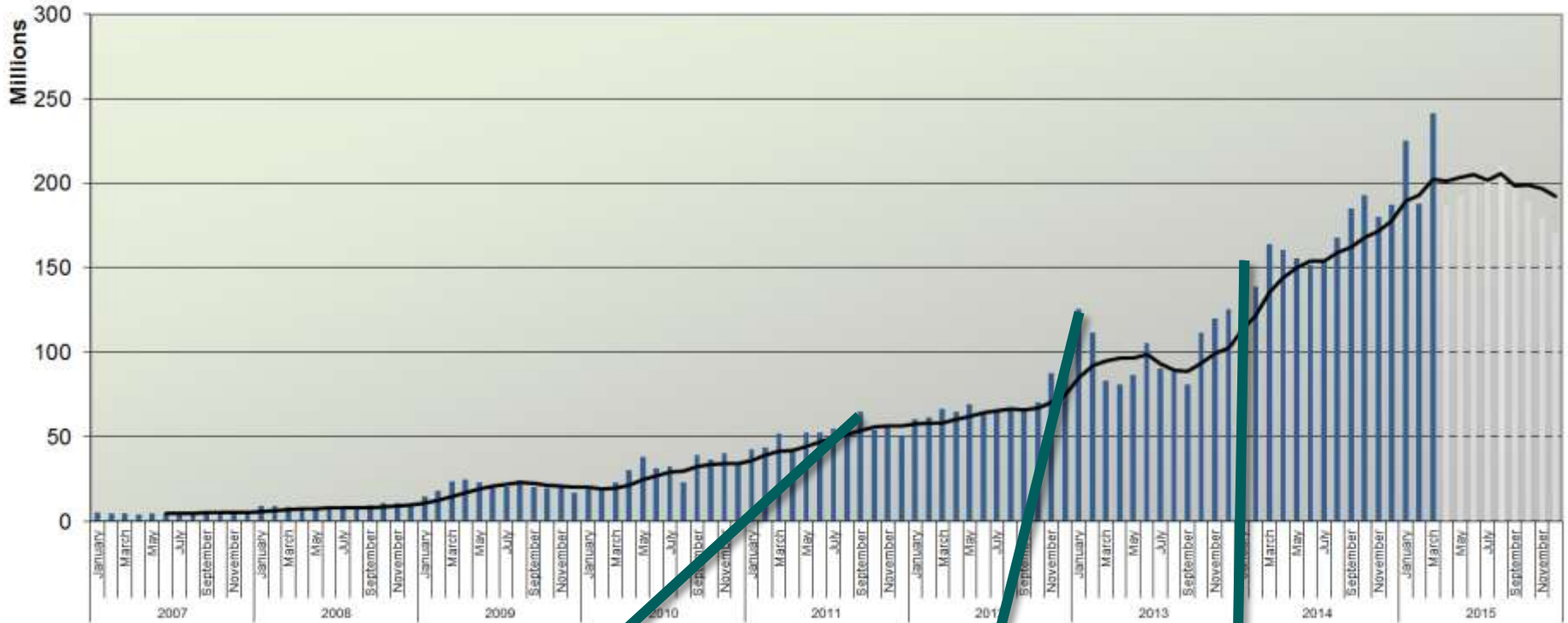
Model driven data distribution



The Digital Map Supply



Requests pr month 2007 - 2015



1/1-13 Open Data





Summary

- Environmental data is essential for the administration, the decision-making, and the business processes in the Ministry of the Environment.
- Data has to be reliable – the quality, update frequency, lineage etc. has to be known for the user -> this requires updated metadata.
- Data has to be easily to access – an efficient distribution is essential.
- Budget is tight... focus on reuse of components.
- Use of standards to secure interoperability!!! ISO, OGC, INSPIRE

Our challenges:

- It is difficult to involve the business in the ministry – SDI is nerdy!
- Many data sets – missing overview of master data set. Where to start?
- Various kind of data: Spatial, tabular, etc. in different formats stored on different servers.

We feel we are on the right track – we have the architecture, principles, components, standards – now we just have to model a lot of data and create a lot of services!





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Lars Storgaard
Danish Geodata Agency
Denmark
Phone: +45 72 54 52 79
E-mail: laers@gst.dk
www.mim.dk