

# Schema Transformation as a Web Service

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# Agenda

- Introduction
- Motivation
- Schema Transformation
  - Transformation categories
  - Transformation components
- Schema Transformation Service
  - Service setup
    - Stack
    - Chain
  - Standardized Service Interfaces
- Summary

# Introduction

- Schema transformation = transforming data from a GML application schema into another
  - XML Schema, not UML
- Applied during data transfer, to data encoded in XML
  - XML-to-XML, not DB-to-XML
- Facilitating Web services-based interoperability
  - On-the-fly processing

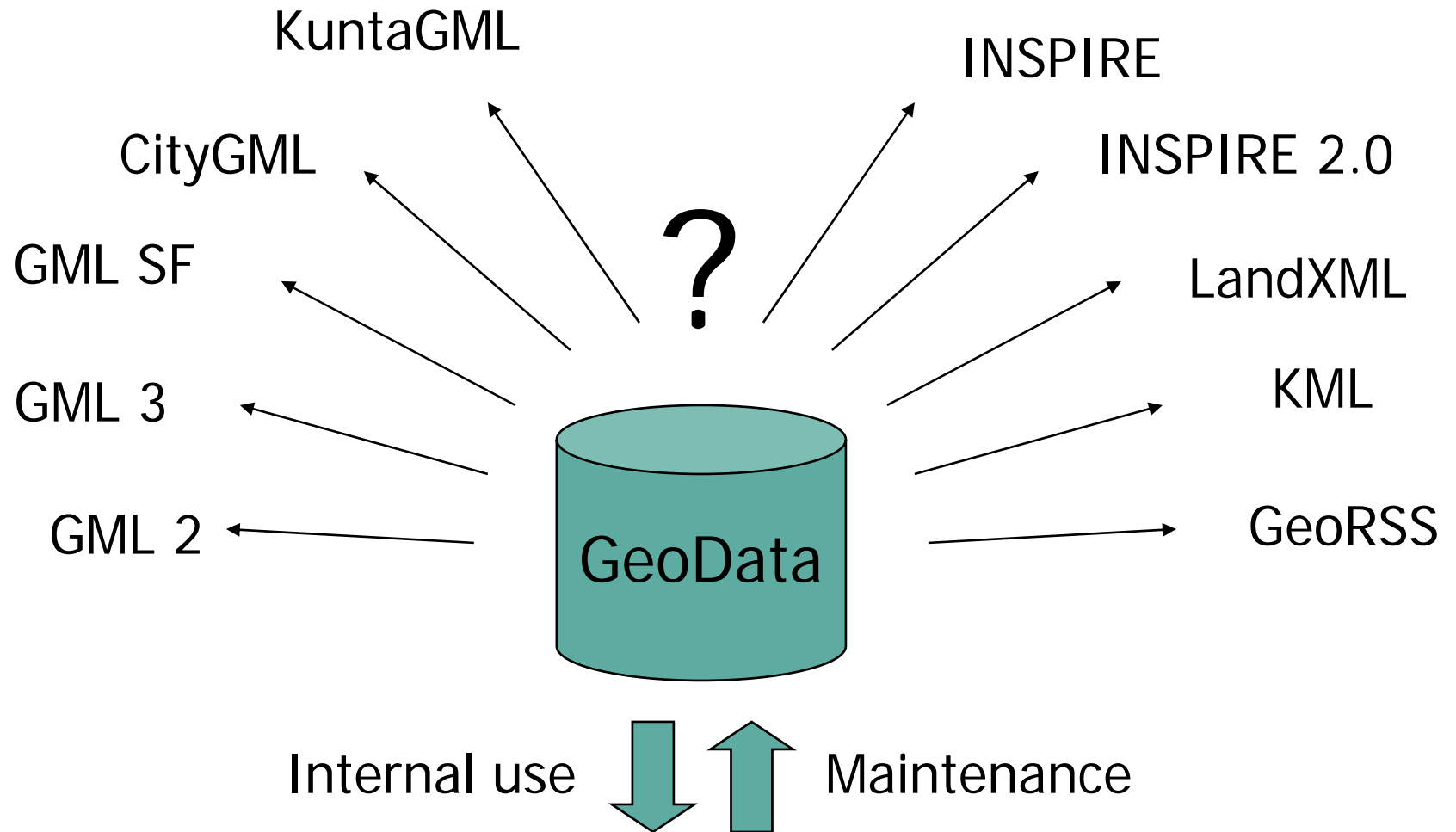
# Motivation

- Proliferation of schemas
  - GML only basis for local application schemas
  - Several regional and thematic schema development initiatives
- Intelligent applications
  - Geospatial data as reference frame for other content
  - Rich Internet Applications
    - Beyond map visualization

# Motivation, INSPIRE

- Directive Proposal, explanatory memorandum:
  - “INSPIRE does not require Member States to change the format of their spatial data holdings; instead, Member States can provide interfaces that transform heterogeneous data to a uniform model.”
- Data Specification DT, D2.5 draft:
  - “The main goal at least for the foreseeable future will be ‘harmonisation’ through interoperability in a service-based architecture rather than (full) harmonisation of the underlying data models.”

# Motivation



# Data Transformation Categories

- Syntactic
  - Not relevant in Web Service environment, as all transformations are XML-to-XML transformations
- Schematic
  - Well-defined mapping between schemas exists
  - From an XML Schema into another XML Schema
- Semantic
  - Exact mapping not possible
  - Semantic matching with ontologies

# Schematic Transformation, Components

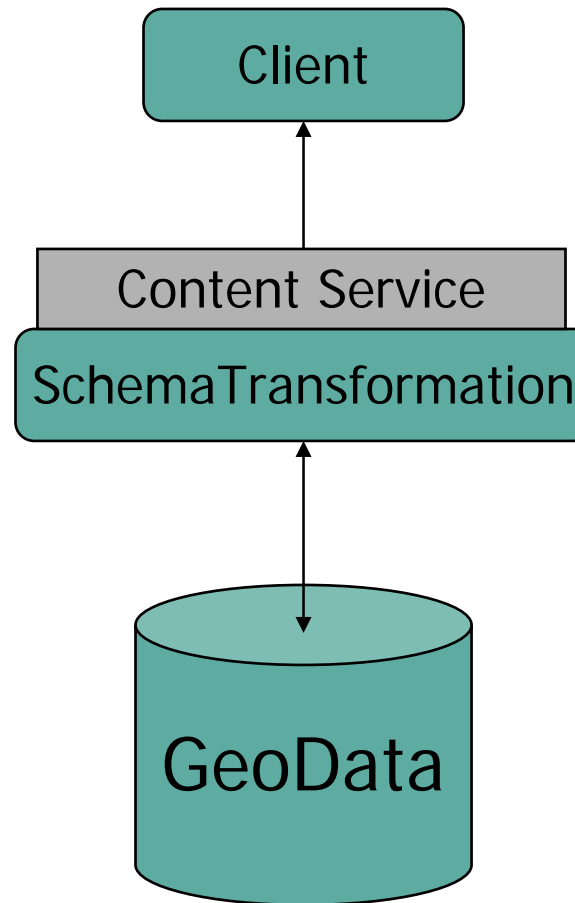
- Reordering
- Renaming
- Filtering
- Augmentation
- Reclassification
  - Converging, diverging
- Value conversions
  - Spatial conversions

# Schema Transformation as a Web Service

- Geospatial Web Standards
  - Web Feature Service (WFS)
  - Geography Markup Language (GML)
  - Both query and answer encoded in XML!
- From a GML AS to another GML AS
  - Same base concepts on both sides
  - Limited set of data constructs
- XML-based processing techniques
  - XML Schema-based data model definition
  - XSLT-based mapping instructions

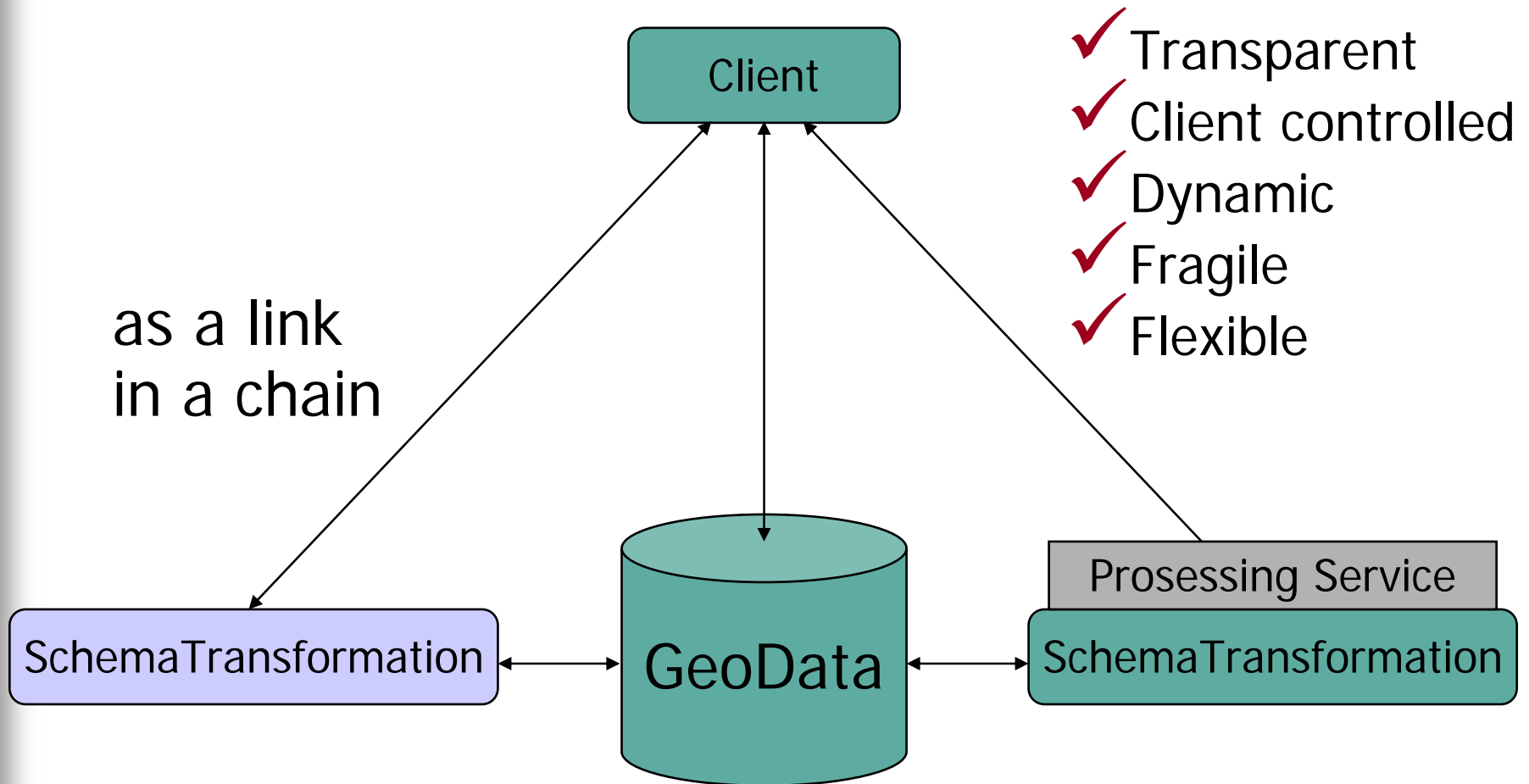
# Schema Transformation Service

as a layer  
in a stack



- ✓ Opaque
- ✓ Provider controlled
- ✓ Static
- ✓ Robust
- ✓ Inflexible

# Schema Transformation Service



# Service Interfaces

- No standard interface specification for Schema Transformation Service
- Relevant interfaces:
- OGC Web Services Common (OWS)
  - Service metadata etc.
- Web Coordinate Transformation Service (WCTS)
  - Functionally close to Schema Transformation
- Web Processing Service (WPS)
  - Generic data processing service interface
  - Could be extended to schema transformation?

# Summary

- Schema Transformation as a Web Service
  - Needed in distributed ESDI
  - Layer in a stack
  - Link in a chain
- Generic XML-based Approach
  - XSLT both for data and query transformation
  - Declarative, repeatable
- No standard for service interface
  - Extension of Web Processing Service?