

**From Panic to Possibility:**  
 Enabling Spatial Data Transformation to Overcome Complex Interoperability Challenges

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**Agenda**

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- The INSPIRE Challenge
- Steps to Compliance
- FME Tools for INSPIRE
- Customer Examples
- Using INSPIRE Services
- Demos and exercises
  
- Summary

**INSPIRE - Goals**

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- Assist EU environmental management
- Extend Member States' SDIs using:
  - **Common data model**
  - **Open standards**
- INSPIRE SDI should:
  - **Combine** spatial data from **different sources**
  - **Share** spatial data between **public authorities**

**INSPIRE Annex I Data Requirements**

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1. Coordinate reference systems
2. Geographical grid systems
3. Geographical names
4. Administrative units
5. Addresses
6. Cadastral parcels
7. Transport networks
8. Hydrography
9. Protected sites

*All required to deploy this year*

**INSPIRE - Challenge** [www.safe.com](http://www.safe.com)

- Example Challenge:** You want to meet INSPIRE data provision requirements, but your data is organized rather differently




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**How to Achieve INSPIRE Compliance?** [www.safe.com](http://www.safe.com)

- Translation
- Transformation
- Harmonisation
- Validation
- Publication

Result: INSPIRE compliance  
Opportunity: Consume INSPIRE data




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**Translation** [www.safe.com](http://www.safe.com)

**FME supports reading from a wide array of data formats and types**


- 250+ formats, with more added each year
- CAD, GIS, raster, database, web, non-spatial, 3D





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**Transformation** [www.safe.com](http://www.safe.com)



- Move data between formats and systems
- Restructure data models and schemas
  - Geometry
  - Attributes
  - Coordinate systems and projections
- Example
  - Derive new attribute values or construct geometry





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Harmonisation	www.safe.com	
<ul style="list-style-type: none"> <li>▪ <b>Harmonisation:</b> implied INSPIRE requirement.</li> <li>▪ Disparate sources must be mapped to a <b>common destination data model</b>.</li> <li>▪ Core to the harmonization workflow is a process called <b>schema mapping</b>.</li> </ul>		
		

Validation	www.safe.com	
<ul style="list-style-type: none"> <li>▪ Ensure data quality throughout the data transformation process.</li> <li>▪ Example validation requirements (some INSPIRE defined, others implicit): <ul style="list-style-type: none"> <li>▪ Coordinate and geometry validity</li> <li>▪ ID uniqueness and validity</li> <li>▪ Relationship tests (parent / child)</li> <li>▪ Value range tests (e.g. elevation)</li> <li>▪ Domain code compliance</li> <li>▪ Null values (nullable?)</li> </ul> </li> </ul>		
		

Publication	www.safe.com	
<ul style="list-style-type: none"> <li>▪ Produce INSPIRE compliant GML</li> <li>▪ Provide discovery, view or download services, for WxS, GML and other desired formats</li> <li>▪ Publish with FME Server or integrate with your geo web server of choice: <ul style="list-style-type: none"> <li>▪ ArcServer (ArcGIS for INSPIRE)</li> <li>▪ Deegree</li> <li>▪ GeoServer</li> <li>▪ MapServer</li> </ul> </li> </ul>		
		

Consuming INSPIRE Data	www.safe.com	
<ul style="list-style-type: none"> <li>▪ Quickly consume INSPIRE data for your use, regardless of your target system's: <ul style="list-style-type: none"> <li>▪ Data model</li> <li>▪ Format</li> <li>▪ Coordinate system</li> <li>▪ Language</li> </ul> </li> <li>▪ Leverage INSPIRE data for business intelligence.</li> </ul>		
		

### FME Tools for Tackling INSPIRE

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- FME provides the tools; Partners provide the solutions
- Format translation
- Schema mapping\*
- Database loading and extraction
- WFS, GML, XML reading and processing\*
- GML, XML writing & validation\*
- Web services: WFS, WMS, integration with others
- Metadata support\*
- Data validation\*
- Dynamic schema \*

\*FME 2011 provides valuable enhancements

### Schema Transformation

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- Restructure source data (both geometry and attributes) to conform to the INSPIRE data model
- Probably the most user intensive process in most INSPIRE projects
- Often performed by domain experts, not programmers = need intuitive interfaces**

### What is Schema Mapping?

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**Mapping from source to destination for:**

- Attribute Names
- Attribute Values
- Attribute Types
- Feature Type Names
- Geometry Change
- Dataset Change

**County-A Model**

- Road Name
- Num Lanes
- Pavement Type
- Address Range
- Begin Milepoint
- End Milepoint

Schema ETL  
Process

**Database Model**

- Segment ID
- State Name
- Local Name
- Local I.R.S.
- Number Lanes
- Pavement Type
- Address Range
- Begin Arm
- End Arm

### Schema Mapping in FME

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**Feature Type Mapping in FME Workbench**

**Attribute Mapping in FME Workbench**

### FME Data Model Restructuring: Attribute Names & Values

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**Value Mapping**

Here we read the DGN file. We can see that the external attributes are read as well.

Here we use the Value Mapper to perform a lookup based on the `type` style, and assign a corresponding value. This new value is called `Type`.

We've renamed our output dataset, and redefined our attribute names to something that makes sense. Then we connect the corresponding attributes.

### FME SchemaMapper

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- FME transformer for processing multiple schema transformation rules
  - Define once then automate
  - Domain experts can easily maintain rules in external spreadsheet
  - INSPIRE geographic names example:
    - TYPE\_LOC => typeLocal
    - If CNTRY\_NAME = Austria, name.GeographicalName\_language = German

### FME SchemaMapper: INSPIRE geographic names

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**FME Workspace**

**Name mapping**

A	B	C
1	Source	INSPIRE
2	TEXT	name_GeographicalName_nativeValue
3	TYPE	type
4	TYPE_LOC	typeLocal
5		

**Name & value mapping**



A	B	C	D	
1	SourceFieldname	INSPIREfieldname	Country	Language
2	CNTRY_NAME	name_GeographicalName_language	Italy	Italian
3	CNTRY_NAME	name_GeographicalName_language	Austria	German
4	CNTRY_NAME	name_GeographicalName_language	Croatia	Croatian
5				



### Schema Mapping Workspace

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**Typical Approach**

**SchemaMapper Approach**

FME Tools for INSPIRE XML: Reading / Processing	www.safe.com	
<ul style="list-style-type: none"> <li>▪ GML Reading (GML 2, 3.1.1, 3.2.1)</li> <li>▪ XML Reading – tools that allow you to easily read virtually any valid XML and extract features</li> <li>▪ XML Processing – tools for validating, formatting, cleaning, and updating XML</li> <li>▪ Joins and string processing to assemble fields needed for each feature</li> <li>▪ List processing to handle one to many relationships</li> </ul>		
		

FME Tools for INSPIRE XML: Writing	www.safe.com	
<ul style="list-style-type: none"> <li>▪ GML Writing (GML 2, 3.1.1, 3.2.1)</li> <li>▪ XML Writing - Tools to write XML or GML no matter how complex the structure</li> <li>▪ XMLTemplater           <ul style="list-style-type: none"> <li>▪ template approach FME merges attribute values into a template structure\</li> <li>▪ Typically requires a template per feature type and dataset</li> </ul> </li> <li>▪ XML Validation – output XML can be validated to ensure compliance with INSPIRE schemas</li> </ul>		
		

Example INSPIRE Solutions by FME Partners	www.safe.com	
<ul style="list-style-type: none"> <li>▪ Metria, Sweden (Protected Areas Pilot; Swedish Department of Transportation)</li> <li>▪ INSPIRE Solution Pack from con terra (North Rhine-Westphalia)</li> <li>▪ Spatialworld, Finland (WPS)</li> <li>▪ HNIT Lithuania (LGII)</li> <li>▪ Technical University of Munich (multiple INSPIRE projects)</li> </ul>		
		

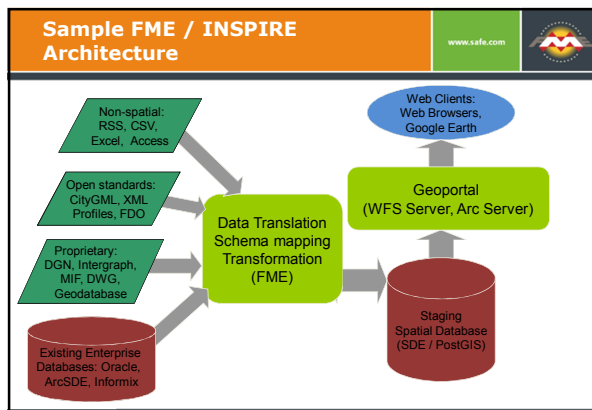
Implementation Approaches	www.safe.com	
<p><b>Approach 1:</b> INSPIRE data in <b>staging database</b></p> <ol style="list-style-type: none"> <li>1. Define staging schema based on INSPIRE</li> <li>2. Read source datasets</li> <li>3. Transform to meet staging schema</li> <li>4. Load staging database</li> <li>5. Define export transform to INSPIRE</li> <li>6. Publish INSPIRE themes to your geoportal</li> <li>7. Create INSPIRE network services</li> </ol> <p><b>Approach 2:</b> on the fly transformation which has logic, performance and scalability limitations</p>		
		

### INSPIRE Pilot: Swedish Protected Areas

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- Project partnership with Metria of Sweden
- Read from 3 different data sources:
  - Swedish Protected Areas
  - Helsinki data commission (Helcom)
  - European Natura 2000 habitats
- Perform required joins, generate IDs
- Transform to INSPIRE schema
- Load staging database (PostGIS)
- Publish web services based on staging database

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### Helsinki Commission Source Data

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Feature Type: helsinki\_input  
Coord Sys: EPSG:31466

Attribute Name	Attribute Value
Location_1	21994, 34527959
Management_1	0
Management_2	0
Management_3	0
Management_4	0
Management_5	2
Management_6	1
Management_7	1
Management_8	1
Management_9	1
Management_10	1
Management_11	1
Management_12	1
Management_13	1
Management_14	1
Management_15	1
Management_16	1
Management_17	1
Management_18	1
Management_19	1
Management_20	1
Management_21	1
Management_22	1
Management_23	1
Management_24	1
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Management_26	1
Management_27	1
Management_28	1
Management_29	1
Management_30	1
Management_31	1
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Management_37	1
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Management_86	1
Management_87	1
Management_88	1
Management_89	1
Management_90	1
Management_91	1
Management_92	1
Management_93	1
Management_94	1
Management_95	1
Management_96	1
Management_97	1
Management_98	1
Management_99	1
Management_100	1

### Schema Restructured for Loader to Staging Database


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Feature Type: helsinki\_input  
Coord Sys: EPSG:31466

Attribute Name	Attribute Value
inspire_id	4452389
inspire_name	Östernsundet (Pommerskan Bay)
inspire_type	DE
inspire_lang	DE
inspire_langcode	132
inspire_langname	209539
inspire_langabbr	Pommersche Bucht (Pommerskan Bay)
inspire_langdesc	DE 1952401
inspire_langdesc2	202026, 28327668
inspire_langdesc3	202026, 28327668
inspire_langdesc4	202026, 28327668
inspire_langdesc5	202026, 28327668
inspire_langdesc6	202026, 28327668
inspire_langdesc7	202026, 28327668
inspire_langdesc8	202026, 28327668
inspire_langdesc9	202026, 28327668
inspire_langdesc10	202026, 28327668
inspire_langdesc11	202026, 28327668
inspire_langdesc12	202026, 28327668
inspire_langdesc13	202026, 28327668
inspire_langdesc14	202026, 28327668
inspire_langdesc15	202026, 28327668
inspire_langdesc16	202026, 28327668
inspire_langdesc17	202026, 28327668
inspire_langdesc18	202026, 28327668
inspire_langdesc19	202026, 28327668
inspire_langdesc20	202026, 28327668
inspire_langdesc21	202026, 28327668
inspire_langdesc22	202026, 28327668
inspire_langdesc23	202026, 28327668
inspire_langdesc24	202026, 28327668
inspire_langdesc25	202026, 28327668
inspire_langdesc26	202026, 28327668
inspire_langdesc27	202026, 28327668
inspire_langdesc28	202026, 28327668
inspire_langdesc29	202026, 28327668
inspire_langdesc30	202026, 28327668
inspire_langdesc31	202026, 28327668
inspire_langdesc32	202026, 28327668
inspire_langdesc33	202026, 28327668
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inspire_langdesc35	202026, 28327668
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inspire_langdesc41	202026, 28327668
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inspire_langdesc43	202026, 28327668
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inspire_langdesc46	202026, 28327668
inspire_langdesc47	202026, 28327668
inspire_langdesc48	202026, 28327668
inspire_langdesc49	202026, 28327668
inspire_langdesc50	202026, 28327668
inspire_langdesc51	202026, 28327668
inspire_langdesc52	202026, 28327668
inspire_langdesc53	202026, 28327668
inspire_langdesc54	202026, 28327668
inspire_langdesc55	202026, 28327668
inspire_langdesc56	202026, 28327668
inspire_langdesc57	202026, 28327668
inspire_langdesc58	202026, 28327668
inspire_langdesc59	202026, 28327668
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inspire_langdesc65	202026, 28327668
inspire_langdesc66	202026, 28327668
inspire_langdesc67	202026, 28327668
inspire_langdesc68	202026, 28327668
inspire_langdesc69	202026, 28327668
inspire_langdesc70	202026, 28327668
inspire_langdesc71	202026, 28327668
inspire_langdesc72	202026, 28327668
inspire_langdesc73	202026, 28327668
inspire_langdesc74	202026, 28327668
inspire_langdesc75	202026, 28327668
inspire_langdesc76	202026, 28327668
inspire_langdesc77	202026, 28327668
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inspire_langdesc79	202026, 28327668
inspire_langdesc80	202026, 28327668
inspire_langdesc81	202026, 28327668
inspire_langdesc82	202026, 28327668
inspire_langdesc83	202026, 28327668
inspire_langdesc84	202026, 28327668
inspire_langdesc85	202026, 28327668
inspire_langdesc86	202026, 28327668
inspire_langdesc87	202026, 28327668
inspire_langdesc88	202026, 28327668
inspire_langdesc89	202026, 28327668
inspire_langdesc90	202026, 28327668
inspire_langdesc91	202026, 28327668
inspire_langdesc92	202026, 28327668
inspire_langdesc93	202026, 28327668
inspire_langdesc94	202026, 28327668
inspire_langdesc95	202026, 28327668
inspire_langdesc96	202026, 28327668
inspire_langdesc97	202026, 28327668
inspire_langdesc98	202026, 28327668
inspire_langdesc99	202026, 28327668
inspire_langdesc100	202026, 28327668


### Staging Database Schema Considerations

- Common data model needed
- Flat schema (e.g. flat version of Inspire schema - available from vendors like ESRI)
- Includes representations for nested / object and one to many relationships
- May include caching of pre-generated XML / GML for performance reasons

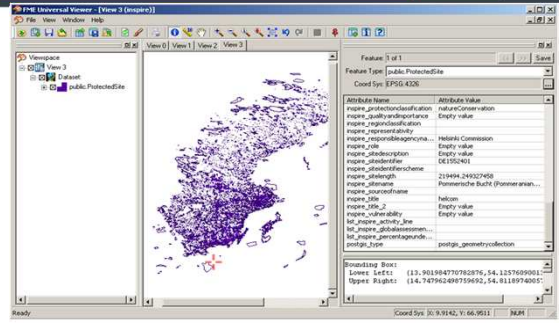


### Load Staging Database

- Read source datasets and perform needed transforms (joins, schema mapping, id generation)
- Write to staging database - the primary store for the production geoportal and web services
- Standardized, relational INSPIRE data model makes implementation of INSPIRE services easier



### Results in Staging Database



Attribute Value

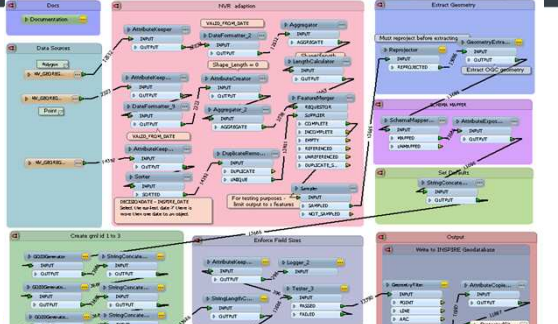
inspire_protectionclassification	natureConservation
inspire_qualification	Empty value
inspire_representation	Empty value
inspire_2dfile	Empty value
inspire_classification	Habitat Commission
inspire_id	DE1552401
inspire_classificationcode	Empty value
inspire_alonglength	214494.249227459
inspire_altername	Pommersche Buche (Pommerschan...
inspire_sourceofname	halcom
inspire_sire	Empty value
inspire_2dfile_2	Empty value
inspire_cuboid	Empty value
inspire_activity_line	Empty value
inspire_cuboidexpression	Empty value
inspire_percentagelength	Empty value
inspire_type	point@_geometrycollection

Coordinate System: EPSG:4326

Coordinate System: UTM, Zone 32N, EPSG:31462, Y: 66,9511

\* Data provided by Lantmäteriet, the Swedish mapping, cadastral and land registration authority [www.lantmateriet.se](http://www.lantmateriet.se), and Matrik, Sweden [www.matrik.se](http://www.matrik.se)

### FME Import to Staging Database: Swedish NVR Importer



The workspace is divided into several sections:

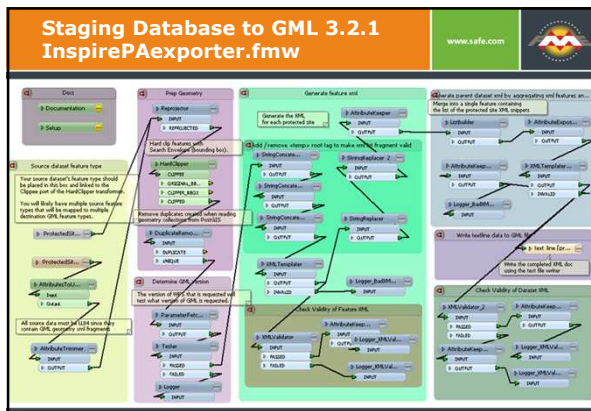
- Data Sources:** Connectors for 'NVR\_IMPORTER' and 'NVR\_IMPORTER\_2'.
- Transforms:** Multiple 'AttributeCreator' and 'AttributeReader' transformers for handling metadata and attributes.
- Database:** A 'DatabaseConnector' transformer for writing data to the staging database.
- Output:** A 'Write to Database' transformer for final data storage.



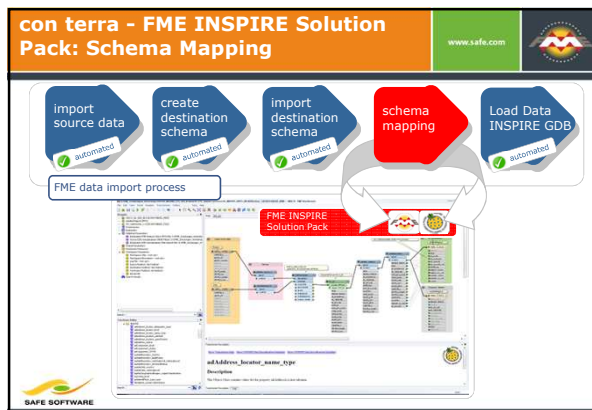
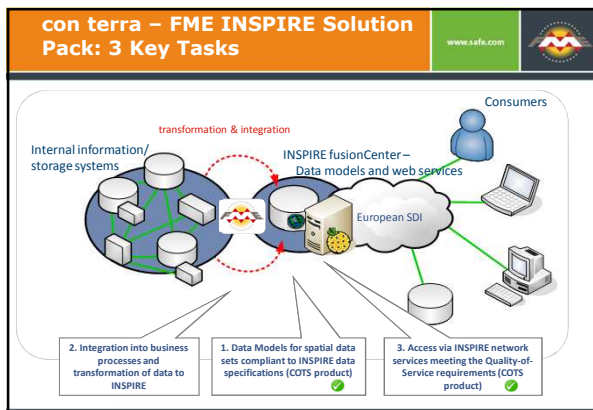
### Schema Mapping: NVR to INSPIRE

FilterAttribute	FilterAttribute Value	SourceAttribute	Field_Inspire	Destination AttributeValue	DestinationAttribute
		DID	INSPIRE_LOCALID	Full	INSPIRE_APPLICATIONSCHEMA
		VALID_FROM_DATE	INSPIRE_LEGALFOUNDATIONDATE	SE	INSPIRE_NAMESPACE
		DECISIONDATE	INSPIRE_DATE		
JUNC_CATEGORY	j		creation	Empty value	INSPIRE_DATATYPE
JUNC_CATEGORY	ja		strictNatureReserve		INSPIRE_DESIGNATION
JUNC_CATEGORY	jb		wildernessArea		INSPIRE_DESIGNATION
JUNC_CATEGORY	jc		nationalPark		INSPIRE_DESIGNATION
JUNC_CATEGORY	jd		naturalMonument	Empty value	INSPIRE_DESIGNATION
JUNC_CATEGORY	Null				INSPIRE_DESIGNATION
PROTECTIONTYPE	1	OBJECTNAME	INSPIRE_SITENAME	natureConservation	INSPIRE_PROTECTIONCLASSIFICATION
PROTECTIONTYPE	2			natureConservation	INSPIRE_PROTECTIONCLASSIFICATION

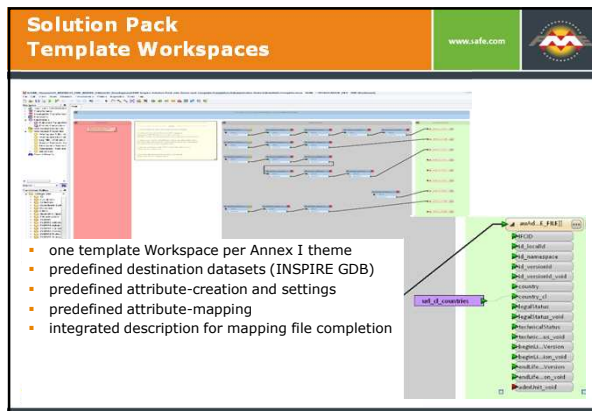
- ### FME Database Export to INSPIRE GML
- FME Server Supports download services:
    - Formats of choice
    - Data model of choice
      - INSPIRE
      - Regional or national
  - Supports web services
    - E.g. PostGIS to GML.fmw, when published, becomes INSPIRE compliant web service
    - Also can provide transformation capabilities behind third party web services: ArcServer, GeoServer, Degree etc



- ### Swedish Protected Areas Update
- Swedish Environmental Protection Agency
    - Production system for version 1.0 of the download services following on the successful pilot with Safe last year.
    - Metria hosts the protected sites view services.
    - Metria performed schema mapping for five protected sites source datasets to INSPIRE.



- Components of the FME INSPIRE Solution Pack**
- **Additional INSPIRE information**
    - Tutorial workspace (complete sample mapping [AdminUnits])
    - Additional HTML Workbench Help (description of INSPIRE GDB data model)
    - Direct access to the INSPIRE data specification (link to specific themes)
  - **Additional functionality**
    - Template workspaces (destination schema and predefined workspaces)
    - Destination data schema for all Annex 1 themes (INSPIRE GDB of ArcGIS for INSPIRE)
    - More than 100 additional INSPIRE transformers
      - INSPIRE specific value and attribute mapping (voidable values)
      - transformer for recurrent tasks (ID management, lifespan setter)



### INSPIRE Transformers (Attribute and Value Mapping)

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- Automated filling of obligated attribute
  - legalStatus
  - legalStatus\_void
- Possible values for obligated attributes (if not void)
  - agreed
  - notAgreed
- Predefined void value reasons (if void)
  - 0 = no reason given
  - 1 = reason: unknown
  - 2 = reason: unpopulated
- AttributeRenamer functionality
  - usable if attribute already existing

Transformer Name: subboundary\_legalStatus\_2  
 Void attribute: Not void  
 Set value for legalStatus: <Unset>  
 Input Attribute: CC\_FLAG, COAS\_FLAG, COAS\_FLAG\_ID, DATA\_SRC\_CODE

### con terra – FME INSPIRE Solution Pack Highlights

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- Simplify data transformation and schema mapping for **ArcGIS for INSPIRE**
- Predefined FME Workbench templates help jump start the data migration and harmonisation process**
- Connect your existing databases to the standardized ESRI INSPIRE Geodatabase
- Automate data load and update processes
- Quality assurance and metadata
- Publish once and use many times

### Lithuania Geographic Information Infrastructure

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Photographs by:  
 Matasg, Sfu, Lestath, Julix  
(source: [http://en.wikipedia.org/wiki/File:Vilnius\\_montage.jpg](http://en.wikipedia.org/wiki/File:Vilnius_montage.jpg))

### LGII Geoport Central System Components

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- con terra's SDI Suite**
  - Content and user management
  - E-Commerce and accounting
  - Reporting
- ArcGIS Server**
  - WxS services (WMS, WFS, WCS)
  - Catalog services (CAT)
  - Metadata harvesting (CSW, WAF)
  - Spatial data editing, redlining functionality
- FME Server**
  - Data conversion for download
  - Transformation between data schemes, data models and formats

### LGII Data Products

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Destination formats:

- AutoCAD DXF / DWG
- ESRI Personal Geodatabase
- Shape
- MapInfo TAB
- Microstation Design V8
- GML
- GIF / PNG
- JPEG
- TIFF
- ERDAS IMG
- ECW

Destination coordinate systems:

- LKS94
- WGS84
- ETRS89
- 1963
- Pulkovo 1942
- UTM (34, 35 zones)

Input data sources:

- WFS
- SDE
- Files

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### LGII Processes

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FME data conversion model for download services

- SDE Direct connect (Central node)
- WFS (Partner nodes)

SDE or WFS data and Selection feature class data clipping

Reprojection to selected CS  
Zone clipping  
Reprojecting  
Fanout attributes creation  
Destination format filtering

Data fanout to user selected format

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### Production Scalability FME Server

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FME Server brings scalable and efficient spatial data access:

- Data conversion for download
- Transformation between data schemes, models and formats
- Configured by publishing harmonization models developed on FME Desktop

Users

Central Portal

Providers

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### LGII Summary

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- Solution combines FME, ArcGIS and con terra tools
- Conversion rules critical for harmonisation process
- Centralized workflow and common data model simplified source to destination mapping
- FME Server supports sharing for LGII partners, business, education and research institutions, NGOs
- SDI provides real value with broader access to seamless data via a common INSPIRE schema

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### Recent Metria Projects in Sweden

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- Geological Survey of Sweden
  - Full scale transformation of their Geology and Mineral Resources datasets.
  - Creating FME Server routines for schema transformation with GeoServer as the service provider.
- Swedish Transportation Administration
  - FME Server provides data model transformation and QC to translate 2.5 million road links into INSPIRE compliant data



### Other INSPIRE Examples

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- Technical University Of Munich
  - XMI mapping of UML schema transformation rules
  - Maps between AAA and INSPIRE data models
  - Uses FME to perform schema mapping based on XMI
- Croatian NSDI: Geoportal
  - By State Geodetic Administration (SGA)
  - Central register of base map, ortho, spatial units, cadastre
  - Database of geodetic control points
  - FME used primarily in data migration and updates
- Nature SDI: Datasiel, Liguria Region, Italy
  - FME used for data harmonization and loading a staging database
  - Generates INSPIRE compliant protected sites GML for publication via WFS




### INSPIRE Protected Areas Compliant GML – Now What?

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```

<?xml version="1.0" encoding="UTF-8"?><gml:FeatureCollection xmlns="http://www.w3.org/2001/XMLSchema" xmlns:gml="http://www.opengis.net/gml/3.2"
xmlns:ps="http://www.isotc211.org/2005/gml" xmlns:gmlas="http://www.w3.org/2001/XMLSchema-instance" xmlns:sd="http://www.w3.org/2001/XMLSchema-instance"
gml:id="id-0"?>
<gml:boundedBy>
<gml:Envelope srsName="EPSG:4326" srsDimension="2">
<gml:lowerCorner>0 365</gml:lowerCorner>
<gml:upperCorner>0 365</gml:upperCorner>
</gml:Envelope>
</gml:boundedBy>
<gml:featureMembers>
<ps:ProtectedSite xmlns:ps="urn:x-ignite:specification:gmlas:ProtectedSites:3.0" xmlns:gov="http://www.isotc211.org/2005/gov"
xmlns:gml="http://www.isotc211.org/2005/gml" xmlns:sld="http://www.w3.org/2001/XMLSchema" xmlns:sd="http://www.w3.org/2001/XMLSchema-instance"
xmlns:tr="urn:x-ignite:specification:gmlas:AirTraTransportNetwork:3.0" xmlns:base="urn:x-ignite:specification:gmlas:BaseTypes:3.2" xmlns:tr="urn:x-ignite:specification:gmlas:CommonTransportElements:3.0" xmlns:gml="urn:x-ignite:specification:gmlas:GeographicalNames:3.0" xmlns:net="urn:x-ignite:specification:gmlas:Network:3.2" gml:id="ID_0A16F858D6C9C851D1E1E17804A737"?>
<ps:geometry>
<gml:MultiSurface gml:id="id-9e3b652-aa14-4f81-a3ef-9af5d5129518-0" srsName="EPSG:4326" srsDimension="2">
<gml:surfaceMembers>
<gml:Surface gml:id="id-9e3b652-aa14-4f81-a3ef-9af5d5129518-1">
<gml:patches>
<gml:PolygonPatch>
<gml:exterior>
<gml:LinearRing>
<gml:posList>59.42 18.87 59.42... </gml:posList>
</gml:LinearRing>
</gml:exterior>
<gml:interior>
<gml:LinearRing>
<gml:posList>59.41 18.89 59.47 ... </gml:posList>
</gml:LinearRing>
</gml:interior>
</gml:PolygonPatch> ...
    
```




### Now What?

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"How is anyone going to use INSPIRE?"

- One answer: FME!
- FME allows you to consume INSPIRE compliant GML as well as create it.
- Why not build value on the web services every one else is investing in?
- Extract and flatten complex INSPIRE structures for use within your own custom internal applications





### Opportunity: WPS Transformation Services

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- Pilot project with SpatialWorld of Finland
- Deegree provides the WPS
- FME Server integrated at the back end as the transformation engine
- To publish a new WPS service just author a workspace
- Can be as simple as one transformer  
(Input > Bufferer > Output)
- Or anything else you can imagine – the sky is the limit! (chain WPS's)



### Summary: Challenges

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- Authors need knowledge of complex INSPIRE rules (FME SP for INSPIRE helps here)
- Complexities in transformation from object to relational model and back
- Different schema approaches: schema mapping table vs interface intensive transformers
- Quality of service requirements
- FME Server web services demonstrates transformation capability
- FME Server can support others geospatial web service tools (ArcServer, Deegree, GeoServer)
- Modularity is key – FME plugs into your workflow



### FME Advantages for INSPIRE

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- Easier to handle schema mapping – without writing code.
- Repeatable, automated workflows save time.
- Self-documenting workspaces make collaboration easier.




### FME Advantages for INSPIRE

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- Easily integrates with INSPIRE-compliant services such as:
  - Leading OGC: Deegree, MapServer and GeoServer.
  - Esri ArcGIS Server.
- Scalability and high performance - accomplish your goals quickly and meet quality of service requirements



**FME Advantages for INSPIRE** [www.safe.com](http://www.safe.com) 

- Diverse data sources are no longer barriers to harmonization:
  - Unparalleled support for 250+ formats including:
    - Proprietary, open source, open standard, and more than 12 different types of data such as 3D, raster and XML.
    - INSPIRE GML
  - Support for Unicode
  - Support for thousands of coordinate systems
- Data validation ensures data quality
- FME provides a full range of tools for INSPIRE; our partners provide your solutions


 SAFE SOFTWARE

**Thank You!** [www.safe.com](http://www.safe.com) 

Questions?

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Safe Software

[www.safe.com/inspire](http://www.safe.com/inspire)

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