



Case Study: swisstopo Redraws its Map Production Lines

Key Facts:

Industry: Government

Problem: Inflexible map production system and data management structure

Solution: FME Server

Results: Adding FME's spatial ETL capabilities to ArcGIS Server eliminates time-consuming data conversion tasks

Location: Switzerland

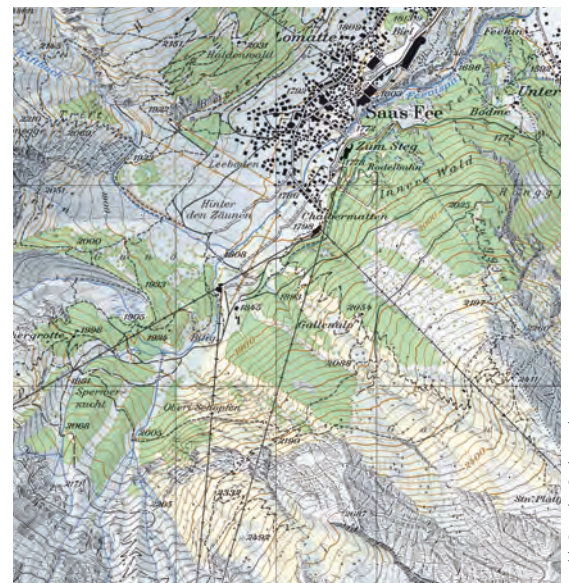


Switzerland's Federal Office of Topography (swisstopo) enjoys an enviable position in map-making circles - it is considered the benchmark for very high-quality topographic maps. It is a renowned reputation that swisstopo's topography teams have earned through their determination to sweat the small, critical details needed to create extremely accurate topographic maps and real-world landscape models. However, producing such a lauded library of topography has also been a bit of a physical challenge for the division's personnel because of its legacy map production process and spatial data management infrastructure. swisstopo's data management and map-production chains have been disjointed, requiring personnel to access separate systems through multiple interfaces in order to complete workflows. The CAD-based map-production system also created a labor-intensive environment for integrating and transforming various spatial datasets held within swisstopo.

swisstopo recognized it needed to revise its map production and data management strategy to ease the map-making process and launched a significant IT initiative to displace its CAD-based mapping system with a sophisticated and scalable GIS system. However, swisstopo also realized it needed to create a centralized interface to its various data stores and map-production models to better manage its datasets. Aptly titled the "dataHub", this central platform would serve as the data connector to swisstopo's disparate ArcGIS Server infrastructure and the data-exchange powerhouse to automatically extract and transform datasets into the formats users need. Known for its own "datahub" tendencies and complementary ArcGIS integration, swisstopo chose Safe Software's FME spatial ETL (extract, transform, load) technology to power the dataHub data-transformation core. With the new central interface, swisstopo now has the foundation in place to build a more efficient and productive map-production line and can leave FME to manage the spatial ETL details.

The Organization

Based in Wabern near Bern, the Federal Office of Topography (swisstopo) is the map source for geodetic, topographic and geological data of any given slice of Switzerland. Amassing an impressive library of national topographic and thematic maps in its 170-year history, swisstopo's penchant for detail has helped earn the agency international recognition as a renowned producer of very high-quality maps. Contributing significantly to that stature is swisstopo's topography division and its staff who produce the national topographic maps of Switzerland and adjacent regions of neighboring countries. Though it hasn't been averse to sweating the details to create 60 topographic maps each year - the scales range from 1:25,000 to 1:100,000 - producing that notable library has been increasingly time consuming for swisstopo's personnel because of the agency's inflexible CAD-driven map-production system and the inability to easily and seamlessly access disparate databases through one common interface.



One of swisstopo's renowned topographic maps at 1:25,000.



“With FME adding spatial ETL capabilities to our ArcGIS Server, we can obtain any dataset in any specified format in a matter of seconds. Removing the time-consuming data conversion tasks from our users allows them to be far more efficient and productive...”

*- Emanuel Schmassmann,
Manager of swisstopo's
Topographic Landscape
Model*



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The Challenge

Though swisstopo initiated IT projects designed to redraw the map-production system and data management structure, users still needed a data-exchange environment that would allow them to reduce the physical effort of exchanging data between different data models and systems. To address this, swisstopo needed a central spatial ETL platform that would easily integrate with its existing ArcGIS Server system and serve as the core data link to its distributed databases and applications, enabling users to easily transform spatial data into the precise models they needed for their map production workflows. In addition, they needed a robust data integration tool that could provide users with the ability to import and integrate varied datasets routinely provided by Switzerland's regional authorities and neighboring countries.

The Solution

Through long-time FME reseller INSER SA, swisstopo experienced a taste of FME's data-transformation abilities and its flexible user interface during an initial stage of its map-production redesign project. That exposure to FME was an effective test to prove to swisstopo that its "dataHub" concept could become reality.

"To develop a central, multi-faceted toolset that can simultaneously perform many different spatial ETL functions and serve many different users is quite challenging," said Emanuel Schmassmann, Manager of swisstopo's Topographic Landscape Model. "To ensure success, we needed to have ArcGIS geoprocessing tools work seamlessly with a data conversion and manipulation tool. By integrating FME with our ArcGIS Server implementation, we now have the tools to more easily and more quickly create our own datasets and maps and migrate existing data produced by other federal or regional offices into the data model and the reference system of our landscape model."

FME complements both the ArcGIS Desktop and ArcGIS Server environments. FME enables ArcGIS Desktop users to extend the geoprocessing tools to author spatial ETL tasks, and it enhances the ArcGIS Server geoprocessing tools to enable users to acquire tools and datasets in the precise format and data model they need. Acting as the dataHub's nerve center, FME takes in all data requests and



A vector dataset from swisstopo.

automatically performs any coordinate conversions, format transformations and model transformations on the fly - even those transformations that require more than 1000 transformers. It also executes more than 500 customized mapping rules such as reclassifying attribute values and overlaying land cover data, expediting and improving the quality of swisstopo's spatial datasets.

Results

With the dataHub, swisstopo has accomplished perhaps one of the most significant transformations of all: displacing the topographers' physical data-translation burden with an automated, electronic function. Indeed, by allowing FME to sweat the spatial ETL details, topographers now have the time to focus on data capturing, not data formatting. "Integrating, extracting and converting data into our workflows has been a time-consuming effort for us, particularly because of the significant data volumes we maintain - our databases maintain spatial references for more than two million buildings as well as several billion terrain points," says Schmassmann. "With FME adding spatial ETL capabilities to our ArcGIS Server, we can obtain any dataset in any specified format in a very short time through the dataHub's common interface. Removing the time-consuming data conversion tasks from our users allows them to be far more efficient and productive and affords them the time to develop new products, applications or services with far more confidence."

The Future

Now that the data spokes of the dataHub are turning smoothly, swisstopo is already developing plans to extend the functionality of FME while its map-production redesign continues.