

GE
Grid Solutions

Swisscom and GE's Smallworld:

Meeting the Growing Demand for Higher Bandwidth Service



imagination at work

Summary

Swisscom, Switzerland's leading communication provider, selected GE's Smallworld™ Network Inventory portfolio as a foundation for its Planning Tool for Access Networks (PTA) application to document and plan its telecommunications network. Using Smallworld Physical Network Inventory, Swisscom has documented its national copper and fiber networks, creating a complete and accurate representation of the physical network, from the switch to the customer.

Smallworld provides a single, consolidated, end-to-end view of the Swisscom outside plant network that allows the network model to be manipulated and visualized at any level. To support Swisscom business processes efficiently, Smallworld has been integrated via various interfaces with other systems in the Swisscom IT system landscape.

As Swisscom has turned to the ongoing task of rapidly expanding its fiber network, Smallworld continues to play a key role. To enable the rapid and cost-effective nationwide rollout of ultra-fast broadband, Swisscom has deployed fiber-optic technologies such as Fiber to the Home (FTTH), Fiber to the Street (FTTS), Fiber to the Building (FTTB) and vectoring technology.

Company Background

Swisscom is Switzerland's leading telecommunications provider offering a full spectrum of services including television, Internet, and mobile and fixed line telephone service. Their services are enabled by their broadband network, and are sold to both residential and business customers in convenient subscription and bundling formats.

Swisscom continues to expand and upgrade its fixed network infrastructure and had connected around 3.5 million Swiss households and businesses with broadband at speeds in excess of 50 Mbps by the end of 2016. Swisscom's target is, by the end of 2020, to supply 85% of all households and businesses with broadband of at least 100 Mbps and ensure that every Swiss municipality is provided with almost 100% ultra-fast broadband coverage in the long term.

Today, Swisscom meets Switzerland's telecommunications needs using a mix of technologies. By the end of 2016, it had equipped more than 2.5 million lines nationwide with the latest fiber-optic technologies such as FTTH, FTTS or FTTB. More than 1.5 million customers currently use Swisscom's comprehensive IP technology.

The Challenge

In 2005, Swisscom was faced with a rapidly expanding network without having a single view into its physical inventory, making it hard to plan and scale the network.

Much of the company's network documentation existed in hard copy only, with limited digital data available. With more than 30,000 schematic plans, 110,000 situation plans, and one million splicing sketches, Swisscom's extensive network documentation was challenging to manage, and data integrity had become increasingly hard to maintain.

With 17 different work sites, the existing CAD tool and supporting systems didn't easily scale, and it was challenging to share work or resources among so many locations. In addition, Swisscom needed a scalable solution to share specified data with other utilities and third party network operators as mandated by law.

Swisscom identified four key areas for success of its network documentation:

- Secure business position: Increase level of transparency and improve time to market
- Customer orientation: Improve network and inventory quality, customer satisfaction and time to delivery
- Efficiency: Increase efficiency and quality of data capturing by the means of automation and reducing dependence on manual interfaces
- Cost leadership: Realize savings in capital and operational expenditures

The Solution

To counter the business challenges and help meet its success criteria, Swisscom brought in GE's Smallworld Physical Network Inventory. Smallworld models the entire physical network for copper and fiber networks, supporting multiple communications technologies and equipment from multiple vendors. The GE technology also offers the ability to interface with an array of IT systems, allowing end-to-end business process integration.

Swisscom's PTA application is a Smallworld-based solution supporting the lifecycle of network construction projects and a network asset inventory of Swisscom. PTA inventories all physical outside plant assets such as cables, conduits, cabinets and other items in copper and fiber in both the access and transport networks. Surrounding systems are automatically provided with the necessary information as the project lifecycle advances.

GE's Smallworld solution supports much of Swisscom's planning process (from designing to building to operations). This includes:

- Geographic base data and physical asset management based on GIS functionality
- Geographic analysis to support decision making
- Design of end-to-end connectivity from the central office to the customer location
- Output of construction drawing and information
- Automated data delivery to surrounding systems for the fulfillment, assurance and supporting processes

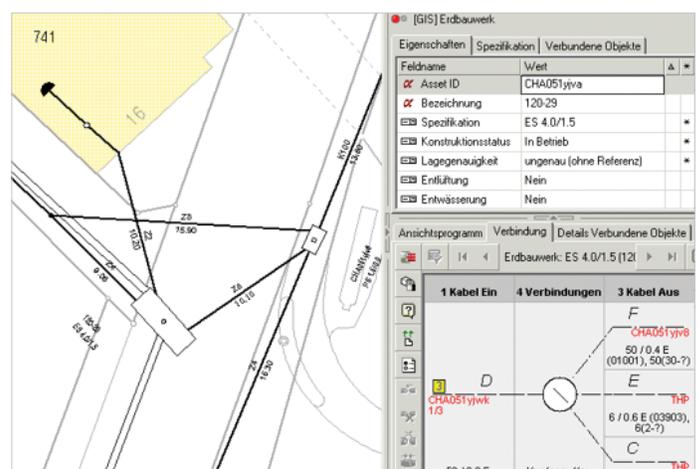


Figure 1: Smallworld Planning Tool for Access (PTA) networks

In conjunction with a third-party solution, Smallworld has enabled Swisscom to automate its mid-term design processes, such as those for the FTTS and FTTB networks. This Smallworld-based solution allows designs to be optimized to create the lowest cost network to build. These optimized designs are then automatically transferred into PTA to complete the detailed engineering work required to realize the design with no need to re-capture the assets a second time. This approach has significantly sped up the processes, bringing products to market faster.

PTA is a highly integrated part of the Swisscom application cluster with interfaces to business domains as follows:

- Logical network inventory
- Fulfillment and assurance systems (integrated via Enterprise Bus)
- Mid-term network design systems
- Construction projects steering and financial inventory
- Location management and address validation
- Reporting and data quality management systems
- External stakeholders (integrated directly, via interfaces or specific systems)

At Swisscom, one of the most critical systems that Smallworld integrates with is NetCracker, that provides the inventory of the logical fiber network. Smallworld is the master system for assets; data between the two systems must be fully synchronized to ensure customer orders can be filled without requiring a manual check before processing. This synchronization means data quality and cleanliness are essential. To address this, more than 50 data quality checks have been embedded into the Smallworld design workflow. A step was also added to simulate processing of the information before it reached the NetCracker system, allowing users to spot errors well in advance. The results of the data quality checks are stored in the Swisscom data warehouse for reporting and analysis.

As the need to expand the network has become more intense and integration with other systems increasingly critical, Swisscom has looked for ways to automate tasks as much as possible to ensure that their back offices systems can meet their operational and business demands. Efficiency has always been a key goal for Swisscom, and there have been many initiatives over the years to improve it. Starting with creating a standard set of macros that allowed for standardization and avoided data capture errors, this initiative evolved into functions such as automatic cable placement and wizards that automatically create records for specific technologies, all based upon Swisscom's specific engineering rules. For installation of FTTH customer connections, Swisscom

PTA within Swisscom's application cluster

High level of integration

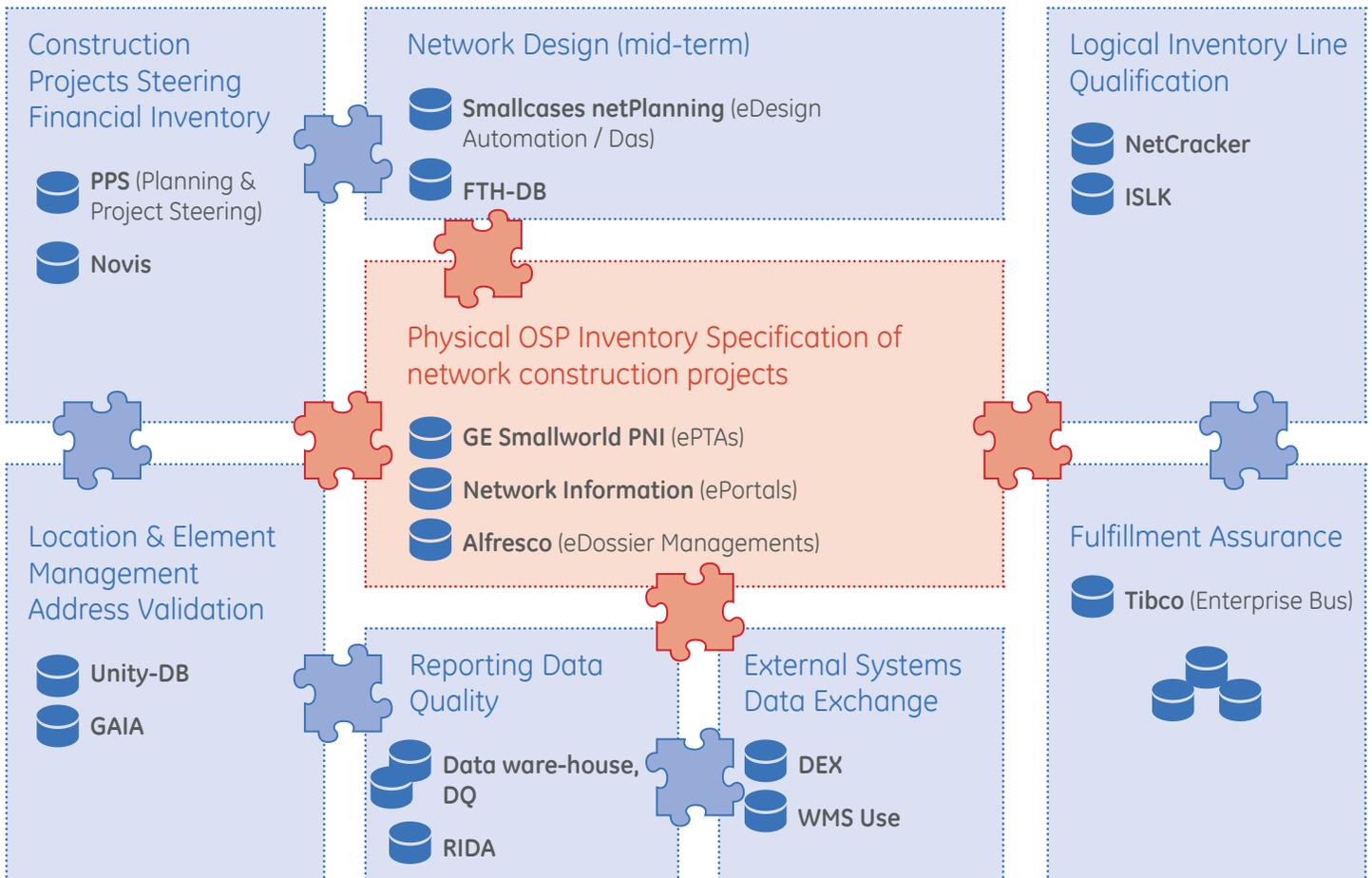


Figure 2: PTA is a highly integrated part of the Swisscom application cluster with interfaces to business domains.

has taken this further by fully automating this part of the process. In response to a notification from the workforce management system, the customer premise equipment and related splicing is automatically generated in Smallworld and updates passed to the surrounding systems, such as logical inventory.

The Results

The introduction of the Smallworld product portfolio brought a wealth of benefits to Swisscom. Having a full view into the physical network inventory allowed for more efficient use and allocation of resources as well as overall improvement and rationalization of internal processes.

Swisscom and its customer base have benefited significantly from access to an end-to-end connected model. Because of the network data held in the Smallworld system, Swisscom can offer their customers a self-service solution that allows customers to trigger an in-house construction order when purchasing new services via the Swisscom website.

Field engineers have benefited from having a geospatial planning and engineering tool. It reduces the need for printing plans, schematics and construction information. Accuracy and validity of the information is guaranteed by having a single system with rigorous quality controls in place; it also allows for immediate integration of field data (such as GPS positioning and correcting attributes).

Having a GIS-based model of physical assets has ensured that Swisscom can share data with third parties more easily. The system enables provision of information over the Internet in response to third party requests, eliminating the need to manually handle each request.

Data accuracy and quality has been an area of meaningful improvement. Standardization of processes across the whole organization has led to improved data accuracy for the new FTTx network passing quality checks. In addition, awareness of data quality issues among Swisscom employees working with PTA has increased significantly.

Conclusion

The introduction of a consolidated database that provides a common, holistic view into the physical network has provided significant benefits to Swisscom's business. Swisscom is now able to operate more efficiently with improved network technology and access. Smallworld supports much of the planning process from design to operation. It is a valuable engineering tool for geospatial planning and engineering. And it offers the added benefit of helping to ensure data quality and accuracy.

As Swisscom continues to roll out its high speed fiber network to more Swiss households, Smallworld will continue to facilitate the delivery of fast, efficient network access to its customers. As the need for simplicity and transparency grows, the focus will be on automated, highly configurable workflows with smart integration underneath. From the users' perspective, each technology must be produced according the same process and IT scheme with repetitive tasks being automated. For Smallworld based application PTA, this will mean consolidation of existing functions and interfaces as well as development of new features that efficient dealings with the future network technologies.

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