Poland Secures Public Funding for Broadband Infrastructure

By Magdalena Jablonska, Suntech S.A.

Universal broadband Internet access is often the determining factor for successful economic growth of a specific area. Making effective use of public funding is a basic condition for efficient construction of broadband infrastructure.

The Lower Silesia Broadband Network (LSBN) construction in Poland is one example of such a project. The investment, worth nearly 50 million euros and cofunded by the European Union (EU), will provide fiber-optic connectivity for Lower Silesia municipalities.

However, building a network is only half the battle. To ensure its best utilization, the network's infrastructure must also be properly managed. Efficient management of a network used by multiple public and private sector organizations poses quite a challenge for a network inventory system. Suntech's SunVizion Network Inventory System, based on Esri technology, will have to meet this challenge now that the tender procedure has been resolved.

Network Structure

The Lower Silesia Broadband Network has been designed to pass through as many small towns and areas with poor broadband access as possible. The LSBN includes nine backbone nodes, connected into what could be represented in a simplified way as a triangle inscribed in the triangle. Distribution sections of the
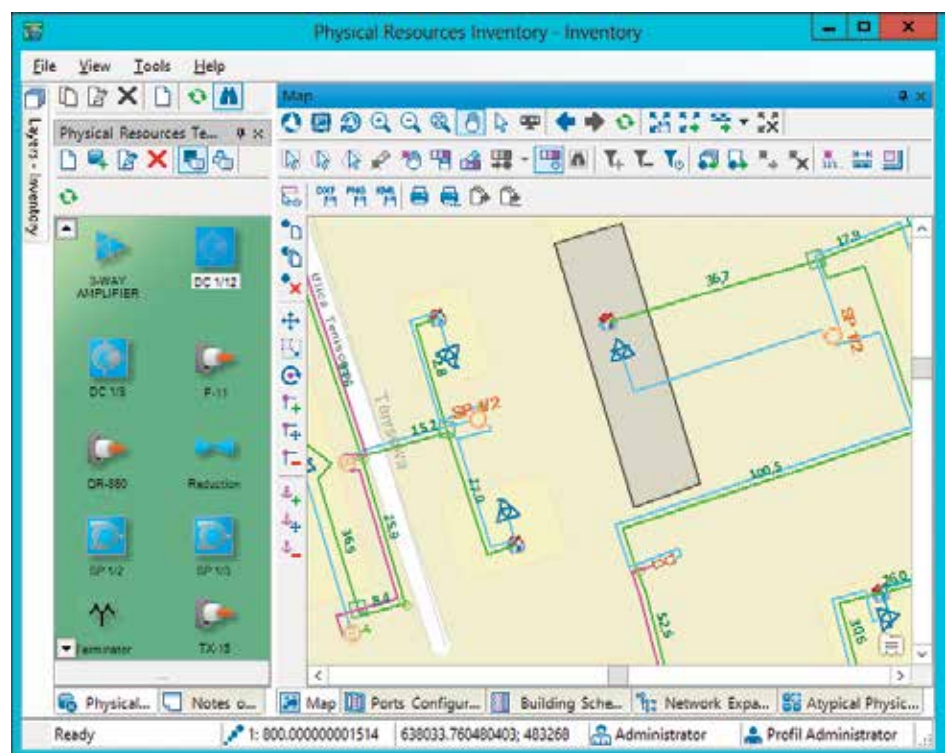
↑ Distribution nodes highlighted for LSBN construction.

network have the topology of a tree with branches ending in distribution nodes.

Two management centers have been designed for the network so that if one center fails, the network can still be managed using the other. In addition to the nine backbone nodes, the LSBN includes 82 distribution nodes and almost 500 passive access nodes, which will be used to connect the optical fibers of third-party operators. The plan is to lay

down a total of 1,700 kilometers of fiber optics located in a microduct.

"We attached great importance to ensure that the evaluation criteria in the tender procedure for the inventory system were specific and the technology neutral, and all contractors were treated on an equal basis," says Adam Okniński, Information Technology Implementation Department director at the Lower Silesia

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Is Your Organization and Network Ready for the Next Natural Disaster?

By Randy Frantz,
Telecommunications and
Land-Based Services Manager, Esri

At OSP EXPO 2013 in Dallas, Texas, I was impressed by the keynote presentation from Diane McCarthy, senior vice president at Verizon Network and Technology. She said network reliability is so critical to Verizon that the company is investing in programs to ensure resilient networks.

I agree with the need for resilient networks. The lifeline of our modern technology-based society is our communications network. During major disasters and emergencies, communications become even more critical as businesses and citizens reach out for assistance.

A significant impediment to network investments that would improve network resiliency is this: major disasters occur relatively infrequently and therefore quickly fade from memory. Take, for example, a string of major events within the last 12 months including Superstorm Sandy, the Moore tornado, and the Colorado floods. These disasters are constant reminders of nature's destructive potential. They give us good cause for concern over reliability issues and strong motivation to take action.

Esri provides telecommunications companies with a powerful tool designed to help you understand, respond to, and prepare for environmental threats. By tracking Tweets in New York City, for example, we could see the location of electric service outages. This level of technology can help telecom carriers identify the magnitude of power outages and help them manage backup generators. Post-storm images available after Superstorm Sandy and the Moore tornado were posted by the Federal Emergency Management Agency. Ground and aerial photos allowed telecom companies to identify the level of structure damage and determine which customers required service and which homes were uninhabitable.

During the Colorado floods in September, high-resolution images were available within 24 hours from DigitalGlobe. The availability of images showing the extent of the flooding and damages to roads and bridges so soon after the storm illustrates the power of cloud-based geospatial services. Esri can help telecom companies obtain critical, near real-time information. Thus, companies can reduce network outages by basing recovery plans on accurate and timely data.

Faster recovery is the current goal, but I believe the next evolution will be proactive response to pending threats before service is interrupted. Esri participated in a Catalyst program, Maintaining Telecom Services during Disasters, through the TM Forum. We looked at proactive response to network threats. The goal is a more resilient network available when we need it most.

Maine Fiber Tracks Network Construction and Provides Accurate Quotes

Seascapes blend with cityscapes in the US city of Portland, Maine. Perched on a peninsula, Portland is the state's largest city as well as its center for business, finance, and retail. With a metro population of 230,000, the greater Portland area is home to almost one-quarter of Maine's total population. The population of the city is 64,000.

It's no wonder so many people want to live in and around Portland. The city was rated in July 2012 by *Parenting* magazine as the third best city in the United States for families due to its low crime, quality education, and active family living. In March 2012, *Forbes* magazine ranked the Portland area in its top 10 for job prospects. Of course, having so many desirable homes and successful businesses leads to a greater need for telecommunications. This is where the Maine Fiber Company comes into play.

The Maine Fiber Company is a telecommunications provider based in Portland, Maine. The company was formed to oversee the construction, leasing, and maintenance of a 1,100-mile high-capacity fiber-optic network in the state of Maine.

Unlike most companies that operate fiber-optic networks, Maine Fiber does not directly service consumer users. Instead, Maine Fiber is a dark fiber provider, which means the company leases its network infrastructure to other telecom service providers as well as businesses and schools. Those companies, known as lit fiber providers, use Maine Fiber's network as the backbone for broadband services provided to consumers or to establish a connection between offices or buildings.

The Maine Fiber network was launched with the backing of a group of private investors and a matching economic stimulus grant from the federal government.

↑ Maine Fiber Company oversees 1,100 miles of fiber network.

With customers ranging from the New Hampshire border to Canada and its relatively unique business model as a dark fiber provider, Maine Fiber faced a complex and challenging undertaking at its inception.

"We started from scratch," said Dewey Allison, vice president (VP) of Maine Fiber. "As we began to lay our first five-mile segment of fiber-optic cable, we quickly realized it was going to be a big task for us to keep track of who our customers were, which fibers were being used, and how to most efficiently use the fibers we had available."

For the company's first attempt at tracking the network, it utilized free, web-based, non-GIS map programs to model the routes cables would take. Distances could only be approximated to provide a rough estimate of what it would cost for a customer to lease cable from point A to point B. This method was time consuming and far from precise.
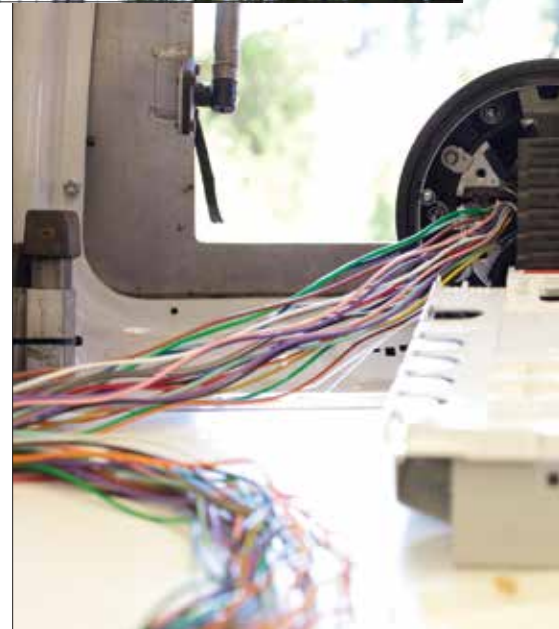
↑ Maine Fiber tracks construction with GIS.

"When we tried to map those fibers on our own, we almost immediately arrived at the conclusion that it was going to be nearly impossible. We needed an advanced solution that could help guide us as we grew," Allison said. Maine Fiber needed to find a tool that would not only track the construction of the fiber

network and the availability of strands for customer use but also provide the flexibility and power to serve additional uses in the future.

After evaluating several fiber-optic infrastructure management systems through a competitive bid process, Maine Fiber chose to work with GIS technology from Schneider Electric (formerly Telvent) and Esri.

"Of all the options we considered, Telvent and Esri provided the most flexibility and the best out-of-the-box

solutions," Allison explained. "The functionality of the software provides much more than we expected it would. It can capture greater detail and data than we even realized we'd have available to us."

Now that Maine Fiber has implemented GIS, many daily operations rely heavily on accurate and easy-to-use GIS data.

For example, operators can download the exact locations of fiber-optic splice cases and make those locations available to customer engineering teams. This information is also used to determine where to interconnect fibers or to estimate the cost of extending fiber to a new wireless tower or building. Staff members also use GIS data to calculate the exact fiber distance between points on the network. While fiber distance data is critical for Maine Fiber's cost estimates and billing purposes, it is also a requirement for customers working to establish lit fiber networks for optimum performance.

On-site support was crucial in helping Maine Fiber tailor the software installation to its specific needs. Schneider provided strategic guidance and preemptively addressed potential issues by meeting with Maine Fiber's managers every three weeks to review the implementation progress.

"The relationship formed during those weeks was phenomenal," said Allison. "They understood what we were trying to accomplish and went above and beyond to leave things in the best possible shape."

As a dark fiber provider, Maine Fiber charges customers per leased strand mile, requiring the Maine Fiber staff members to provide customers with estimates of lease costs on a monthly and yearly basis. Now the company is able to provide quotes much more accurately and easily.

Allison explained, "We decided to see just how accurate the GIS data was at tracking the length and position of the cable we'd already installed. When we ran the numbers for a 75-mile segment of cable, we found that the difference between the system report and the field test was only 200 feet. Over a 75-mile

segment of fiber-optic cable, that's an error of less than one-half of one percent, which is outstanding. Now we're able to quickly and accurately provide estimates on distance and cost without field testing, which is critical to our business model."

Maine Fiber has expanded its use of GIS to include tracking and mapping the existing fiber-optic cable already installed. As Maine Fiber continues to build its network and add customers and lease segments of the network, the company will be able to take advantage of GIS as a dynamic tool to model, manage, and optimize the addition of thousands of different splice points and connections.

With the 1,100-mile network already installed and about 99 percent of the finished network cables entered into the GIS, Maine Fiber is wrapping up the implementation phase. As it moves ahead with network extensions and interconnections in Boston and Canada, the company now has a platform with the power and flexibility to grow with its business and adapt to new uses.

Contact Jeff McCarthy, VP, business development, Maine Fiber Company, at 207-523-8937 or jmccarthy@mainefiberco .com.

Telecom New Zealand Boosts Sales

ArcGIS Online iPad App Gives Instant Access to Key Customer Data

Telecom New Zealand recently put customer data at the fingertips of its door-to-door (D2D) sales teams. Now, iPads loaded with an ArcGIS Online app have helped team members become more productive and increase sales revenues.

Telecom New Zealand's D2D sales teams now have mobile access to geo-referenced customer records overlaid on digital maps. This has resulted in increased productivity, more sales, and a richer dataset for future telecom marketing and sales initiatives.

"Our D2D sales teams have more confidence as they knock on a prospect's door," said Stephen Usmar, geographic information specialist, retail marketing, Telecom New Zealand. "As a result, we have seen an increase in both the number of high-value contacts made per rep per shift as well as a significant boost in total sales. The project has been so successful that we have been asked to expand the program to cover commercial sales initiatives as well."

↑ Real-time maps are now available via tablets.

The new iPads equipped with ArcGIS Online are a far cry from the paper map-based system that Telecom New Zealand had been using. In the past, Usmar said D2D team leaders would take paper street maps, outline the day's target area with a felt-tip pen, and send off the sales reps.

↑ Telecom New Zealand is seeing a boost in sales with ArcGIS Online.

"Our D2D sales teams have more confidence as they knock on a prospect's door. As a result, we have seen a dramatic increase in both the number of high-value contacts made per rep per shift as well as a significant boost in total sales."

—Stephen Usmar, Geographic Information Specialist, Retail Marketing, Telecom New Zealand

"Sales reps had no idea if the household was a Telecom New Zealand customer or not and, if they were, which products and services they subscribed to," he said. "It was hit or miss."

Funny Light Bulb Moment

One day, a Telecom New Zealand D2D rep visited Usmar's house, and the sales person had no information on his account whatsoever.

"'Hold on,' I thought, 'we have complete customer records all geocoded as part of our service support initiatives,'" Usmar said. "'Why can't we put that information in the hands of the sales reps as they make the rounds?'"

Usmar spoke with Graeme Henderson, account manager at Eagle Technology Group Ltd., the official Esri distributor in New Zealand. Henderson recommended ArcGIS Online.

ArcGIS Online—The Perfect Fit

"Usmar's request was made-to-order for ArcGIS Online," said Henderson. "He had a clear vision of what was required—clean, geocoded data and the technical skills to bring the pieces together into a user-friendly solution."

The actual development of the solution went very quickly for a project of this scale, according to Henderson. It took about 10 weeks to configure a prototype and another eight weeks to test and refine the pilot. Then it was another 10 weeks to train the D2D crews and roll it out nationwide.

Mobile Maps and Customer Data

"The process was really quite simple," explained Usmar. "We displayed a symbol for every household on each street in the target area."

Telecom New Zealand customers with broadband were marked with a red box that tells sales reps to skip that house. Existing customers without broadband were denoted with a blue box. These were high-value prospects. And those addresses without a Telecom New Zealand subscriber were assigned a green box. The D2D people were trained to ask residents about their current provider, as well as their telecommunications requirements, and to encourage them to switch.

"This approach has been very successful," said Usmar.

By skipping the houses of existing broadband customers, each sales team was able to cover more territory during a typical six-hour shift. Customer details for Telecom New Zealand households empowered the D2D team members to up sell and cross sell with confidence. The success rate for sales jumped immediately after deployment. Also, having noncustomer household usage patterns and competitor information in the master database is helping staff plan new strategies and pinpoint prospects for future promotions.

Enthusiastic User Acceptance

With ArcGIS Online running as an iPad app, D2D teams have been quick to realize benefits.

"They love it," said Usmar. "We added a few other useful features, like links to the complete range of Telecom New Zealand products and services for up selling and cross selling. We also added features, such as an online calculator, e-mail, and other value-added applications, to keep the D2D teams connected during the day."

From a return on investment perspective, the project has been a great success. The company did not have to involve its internal IT team or add much infrastructure other than the purchase of iPads for the field teams. Because ArcGIS Online is cloud based, it did not have to worry about software installation or upgrades, scaling up or down, or any support issues.

Extending the Solution

The success of the project means that Telecom New Zealand will be expanding its engagement.

"We'll be using the data to help us better manage our D2D teams," said Usmar. "Plus we'll be overlaying socioeconomic data on top of our route maps for predictive analytics for tighter targeting for promotions. And, as we said before, we'll be using a similar approach for contacting commercial prospects."

Visit esri.com/telecom.

Computerworld Honors TM Forum and Esri for Resilient Cloud Program

When threatened by natural disaster or civil unrest, telecommunication companies work to keep up phone and Internet service, especially to assist police, fire fighters, and paramedics. To avoid outages, network operators must transfer cloud-based applications to servers located out of harm's way. The task is not easy. Recently, TM Forum, a global nonprofit telecom industry association, worked with Esri and others to develop a high-tech solution. The resultant Resilient Cloud Catalyst: Maintaining Service in the Face of Developing Threats won the 2013 Computerworld Honors Laureate in the World Good category.

The Resilient Cloud Catalyst detects developing threats and models potential impact. Such advanced notice gives operators the time they need to identify vulnerabilities in the network and relocate critical services.

"When lives are at stake, you need to be able to sense impending threats and transfer resources," said Randy Frantz, Esri manager of telecommunications and location-based services. "When you use ArcGIS technology from Esri with your network management system, you can easily evaluate external threats and determine potential impact on operations."

Esri technology adds capabilities to network monitoring and management systems by helping companies detect and identify a developing threat, model potential impacts on the network prior to any actual impairment, and identify and relocate critical application services.

Visit www.tmforum.org.
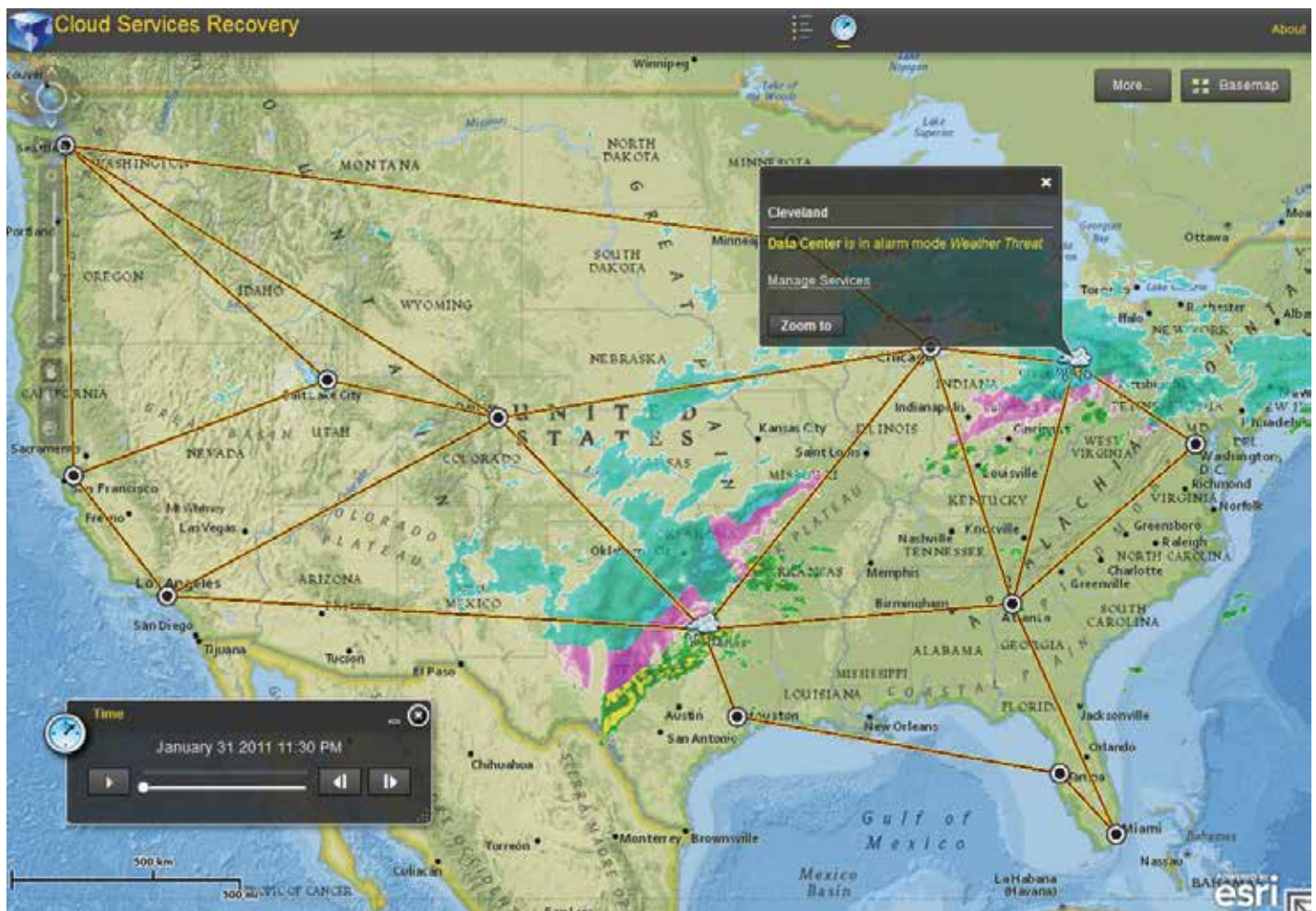
↑ The Resilient Cloud Catalyst detects developing threats.

Esri UC News

The Esri International User Conference (Esri UC) is the biggest geospatial event of the year. It's the conference that 99 percent of attendees say they recommend. The 2013 Esri UC attracted world leaders, humanitarians, a pop star, and of course the greatest minds in GIS.

What will happen at the 2014 Esri UC? Expect 900 real-world GIS projects, 300 technical sessions, a Hackathon, showcase islands, demo theaters, a party in Balboa Park, and the world's largest Map Gallery.

Each year at the Esri UC, the Esri Telecommunications User Group (TelUG) meets to solve problems operators commonly face. Groups discuss the best ways to plan networks, execute effective marketing campaigns, communicate coverage information to customers, manage network operations centers, and efficiently route a mobile work force.

Join us for the 2014 Esri UC, to be held July 14–18.
Visit esri.com/uc.

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Poland Secures Public Funding for Broadband Infrastructure

Province Office. "Suntech's bid met all our requirements. The significant advantage of Suntech's solution is that it is based on the Esri engine, which we already use for our Lower Silesia Geoportal site. As a result, we will be able to avoid any potential problems with integrating the two environments."

The Network Is Ready. What Is the Next Step?

Once the network construction is completed, the LSBN owner will open a tender to select the operator who will be responsible for managing the entire network infrastructure. The selected infrastructure operator will not be providing retail services; instead, the operator
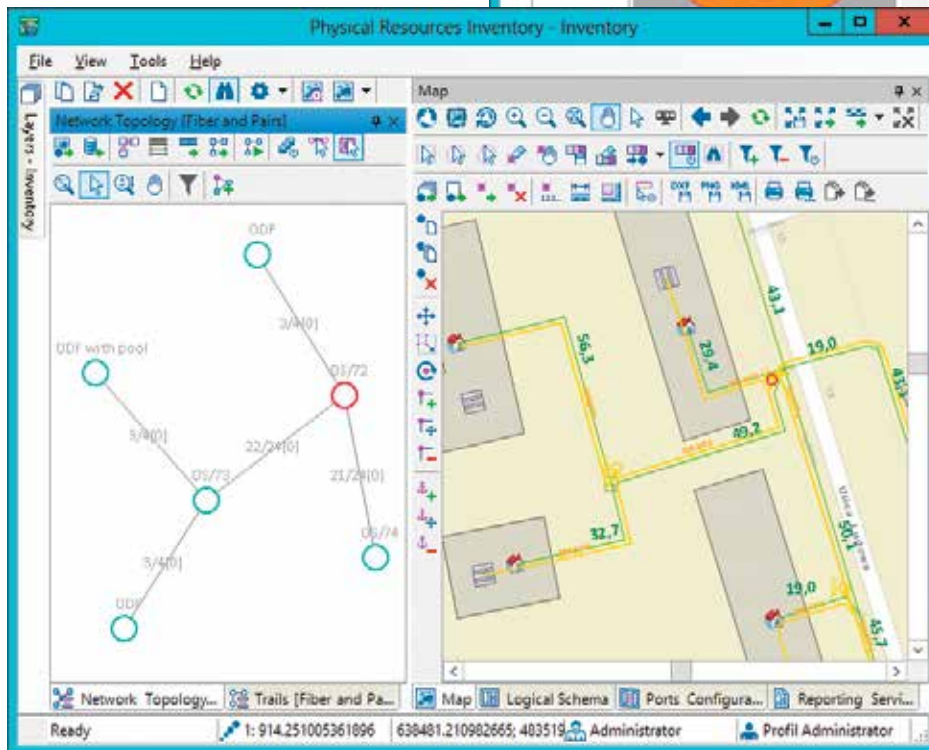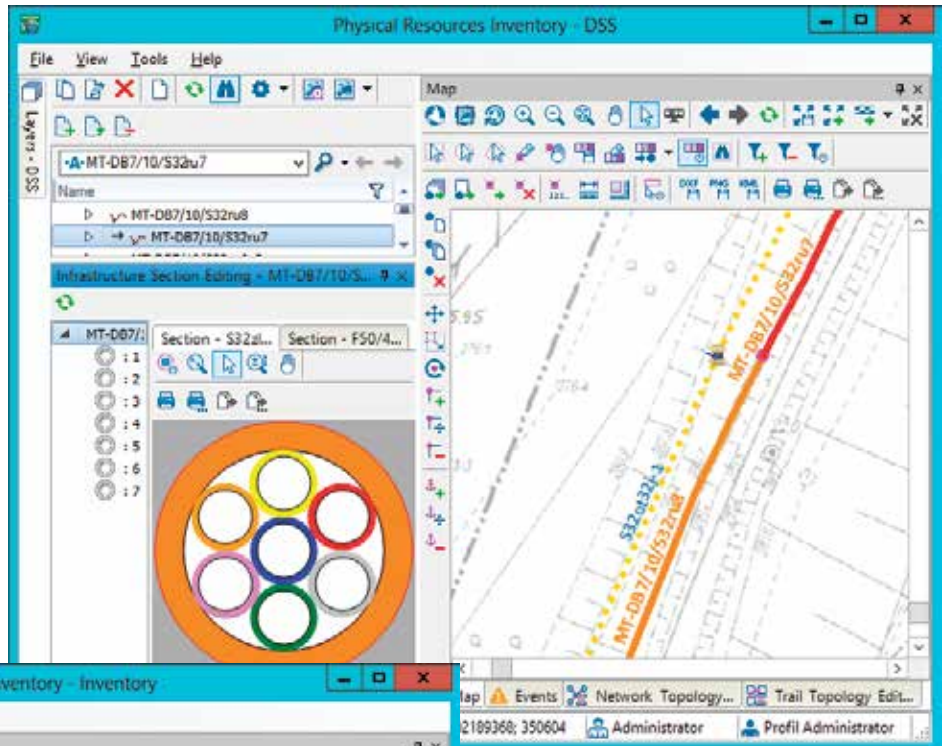
↑ Network operators monitor inventory and operations with GIS.

network modifications required in its day-to-day operation.

The owner of the network, the Lower Silesia Province, will also have access to data about the network. The staff supervising the implementation of information technology in the region will be able to read the network data and preview any changes made to the network on an ongoing basis. This is because the owner has numerous responsibilities related to reporting to relevant bodies, arising both from the fact that public funds are used to build the network and from the provisions of the Telecommunications Law. Nevertheless, the owner's access rights assigned in the inventory system must not enable the owner to make any changes, because the entire infrastructure is, in a manner of speaking, leased out to an organization with better professional expertise in management (i.e., the infrastructure operator). And only the infrastructure operator may be allowed to modify the network.

will enable local operators access to the LSBN. In compliance with the Telecommunications Law, access network operators (i.e., local operators or last-mile operators) must be provided with access to infrastructure on equal terms, without discrimination to any market

player. The Lower Silesia Province will retain ownership of the network.

The infrastructure operator (core operator) will have insight into the entire broadband network. This insight will be active in nature, which means that the operator will be able to make any

The last group of entities involved in LSBN operations includes access network operators (local operators or last-mile operators). The operators will be able to view the broadband network only at its point of contact with the operator's access network (i.e., at the access nodes). They will be able to check broadband service availability on individual paths and, for example, use this data to quickly check whether it is possible to deliver a specific service within an area.

You can also imagine the situation that the last-mile operators may be willing to connect to the inventory system that supports the entire Lower Silesia Broadband Network. To handle this, the inventory system will have to enable each operator to take inventory of its own network infrastructure and of the points of contact with the broadband network without granting access to view the entire broadband network and, most importantly, other operators' access networks. Similarly, the broadband network operator will not be able to see the last-mile operator's data even though both networks' data will be stored in the same system.

Problems

There will be at least several dozen public and private organizations involved with the Lower Silesia Broadband Network. Additionally, each of the organizations will need multiple levels of access to network information to match authorizations granted to their employees. To operate a network shared by multiple organizations, a sufficiently detailed model of access rights management must be used, and full data privacy and security must be ensured.

"Access rights management in so large, complex, and sensitive an environment poses a significant challenge to the network inventory system," says Jacek Broszczak, chief technology officer, Suntech. "However, the Suntech system has the advantage of being specifically designed to handle networks with multiple public and private sector organizations involved."

Solution

Suntech started developing its telecommunications network inventory system more than a decade ago. SunVizion Network Inventory is used by multiple telecommunications operators, cable network operators, and Internet service providers, enabling them immediate access to all data on physical and logical network infrastructure, as well as the infrastructure's configuration, status, and performance. The solution leverages the Esri platform to deliver advanced GIS tools, data migration capabilities from a variety of environments, as well as openness and its related integration opportunities.

Two years ago, based on the primary product, Suntech started to develop a bespoke inventory system designed to meet the needs of networks constructed as a part of public-private partnerships. For development of a new product, Suntech has used EU grants. The new system combined the strengths and quality of the existing solution with extensive capabilities of managing network infrastructure shared by multiple organizations.

"The decision proved to be a hit. We have already signed a few important implementation contracts for the product this year," says Piotr Saczuk, CEO of Suntech S.A. "Our competitors' products are designed with the traditional network model in mind, where a single organization (the telco) is the investor, operator, and manager of the network. In contrast, our solution is very well adapted to the business model where a network is managed by multiple organizations."

How Does It Work?

The system is designed for close cooperation and information exchange between multiple organizations that use the network. The solution supports business processes related to telecommunications network operation such as verification of service availability, booking, implementation and configuration of the services, and maintenance of a network failure.

Support for service-related processes is of critical importance for networks

shared by multiple operators, because the operators provide different types of services (such as voice, IP, VoIP, or cable TV) while often using the same resources.

In the context of services, network resource optimization is also vital. A system with information on network resources and services will enable network utilization analysis and bottleneck detection. By monitoring queries on service capability for specific paths, the solution also enables the prediction of future needs. Management of the services in the system also enables service-level agreements (SLAs) for individual services to be controlled through algorithms for analyzing the scope of failure and its effect on services.

Benefits

SunVizion Network Inventory will greatly simplify the management of the Lower Silesia Broadband Network and help optimize its utilization. Thanks to the system, all organizations that use the network's infrastructure will have immediate access to network data at any level of granularity, but always within the scope of authorization granted to each user. The solution will enable selected network data to be shared while keeping other infrastructure data strictly isolated. The system will support last-mile services to enable effective service availability checks and facilitate settlements between operators. The key benefit, however, will be realized through faster and more efficient service for end users (i.e., Lower Silesia province residents). End subscribers will be able to access up-to-date information on failures, service sale will be more efficient, and it will be possible to rapidly modify services if necessary. With big data processing capabilities, operators will be able to accurately estimate costs and consolidate needs within a specific area. As a result, services built on LSBN resources will be more attractive for end users, although they probably will not realize that the Internet access at home is a result of a complex process supported by the network inventory system.

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