Case study: Exatel

Building an end-to-end telco services infrastructure management solution

As telecommunications operators transform their networks to meet their customers' needs for higher broadband connections, the potential rewards and challenges are significant, both in terms of potential revenues and required network investment. To meet these challenges in a cost-effective manner a geospatial network infrastructure system closely integrated with the operator's other operational support systems is critical.

In 2008 EXATEL revitalized its network inventory initiative with board-level support, a clear business vision and business owner, and a strong sponsor promoting good project management. The project's goal was to develop an end-to-end telecommunication services infrastructure management solution. EXATEL worked with Globema (a European OSS systems integrator and GE Digital Energy Value Added Reseller) to successfully deploy GE Smallworld Network Inventory solution to meet their needs.

Globema's telecommunications customers are using the Smallworld Network Inventory product portfolio to address these needs, as well as to plan, design, build, operate and maintain their network infrastructure. GE's highly scalable product set supports an impressive list of more than 140 service providers across 37 countries worldwide, including large and established national telecommunications operators, cable multi-service operators, competitive service providers, long haul carriers and mobile operators.

Technical Situation

The Smallworld Network Inventory solution is a central component of EXATEL's integrated sales and service qualification and design business process. Based on the customer's requirements, required addresses and service parameters are passed to the inventory system. Service qualification is then performed to determine whether the service can be provided based on existing and planned network resources. Implementation options are passed back to the sales team, who provides a detailed offer to the customer.

Once the contract is signed for the selected option, the detailed design of the service implementation is created and work orders are passed to the field crews via the order management system. Once the service configuration is implemented, the inventory is updated, based on both field reports for non-managed systems and NMS updates on service resources for managed systems. The service infrastructure documentation is kept up-to-date, service maintenance plans are activated and documented and the billing system is updated to charge for the service provided.

Solution

To achieve an integrated solution, the network inventory needs to maintain an entire view of the network infrastructure – both physical connections and logical services. For the process to be successful, data quality is essential. EXATEL took great care during the data capture process, introducing many cross-checking procedures to maintain data integrity. Equally important was proper integration with NMS, with every new NMS having to fit to an approved data supply model and correctly positioned within the business process management (BPM) support framework.

The solution is based on both Smallworld Physical & Logical Network Inventory platforms along with complementary Globema modules. The physical inventory contains over 15,000 kilometers of aerial routes, 1,500 xDSL devices, 50 radio point-multipoint base stations, 560 radio point-point connections, 500,000 kilometers of fiber and 1,000 optical modems in the access network. The logical inventory contains more than 1,000 SDH nodes, 400 CWDM/DWDM nodes, as well as IMS, ATM/FR and IP/MPLS based services.

15,000 KILOMETERS **OF AERIAL ROUTES**

50 RADIO point-multipoint base stations

550 RADIO point-point connections

400 CWDM/ DWDM NODES

500.000 km of fiber

IMS, ATM/FR and IP/MPLS based services

1,000 OPTICAL MODEMS IN THE ACCESS NETWORK

1,000 SDH NODES

1,500 x DSL devices

150 Core routers and switches
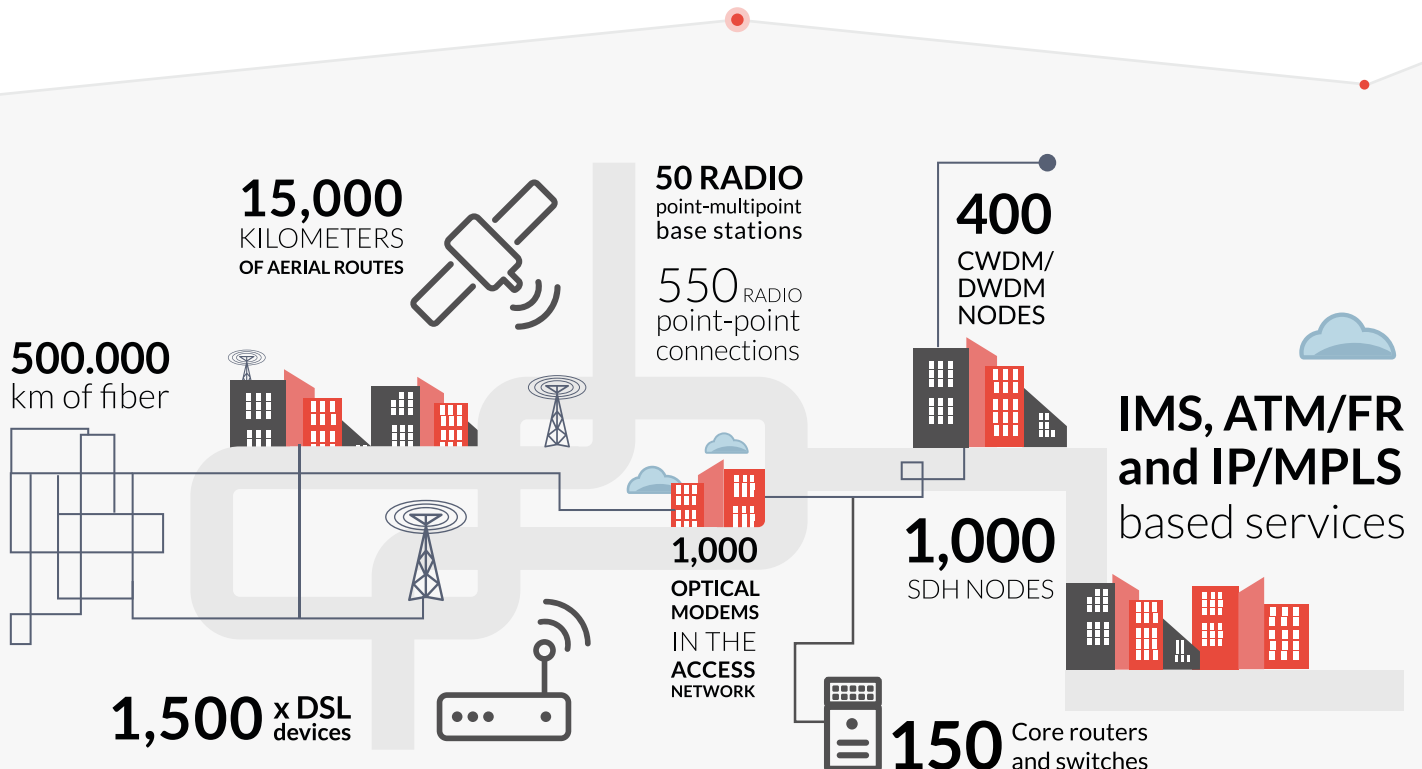
End-to-end service visualization maps the service to the supporting logical paths and then to the physical network. Fiber network support helps maintain and manage fiber routes and provide standardized optical path schemes. Support for IP/MPLS includes capacity checking for IP services, monitoring of utilized Ethernet links, ports, and QoS classes, and planning maintenance jobs.

Benefits

The Smallworld solutions for the telecommunications industry help customers to reduce network capital and operational expenditure by:

- Improving network utilization through better understanding of available network assets
- Increasing workforce productivity supported by network planning tools and processes
- Reducing planning and engineering time based on accurate physical network inventory records
- Accelerating response to network outages with knowledge of the exact location of network faults
- Reducing risk of provisioning failure based on accurate knowledge of the physical connectivity of the network

In addition, it fully integrates with other business applications, providing a seamless flow of information throughout the enterprise.

EXATEL, in conjunction with Globema, developed an end-to-end network inventory system that is in a central position within their business processes. The Smallworld solution is in use daily, and the system positioning has stimulated people to understand how and why they should use it. The integrated solution enables fast, accurate responses to customer service requests and timely service implementation. The well-defined business process ensures the Smallworld Network Inventory is maintained to provide an accurate up-to-date model of the physical and logical network.
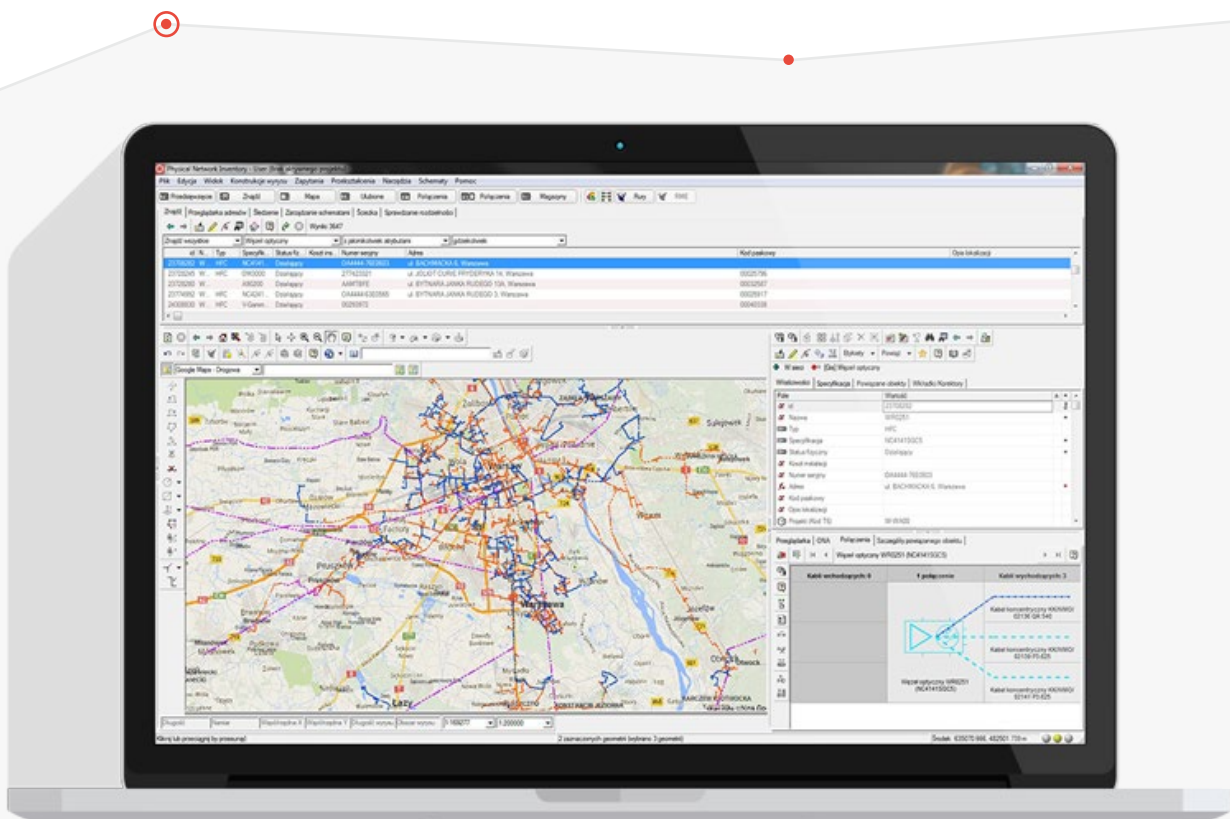
Solution Components
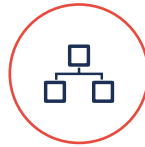
GE Smallworld Physical Network Inventory (PNI)

Physical Network Inventory offers a complete and accurate representation of the physical network, from the switch to the customer. By integrating inside and outside plant data into a single, consolidated database, Physical Network Inventory provides an end-to-end network view that allows the network model to be manipulated and visualized at any level.

Features

- A data-driven equipment catalogue
- Support for work order management and generation of bills of materials
- Support for the design and documentation of both underground and overhead structures
- Effective management of the capacity of various aspects of the network, such as ducts, conduits, floor and rack space
- Generation of a range of schematic representations of the network
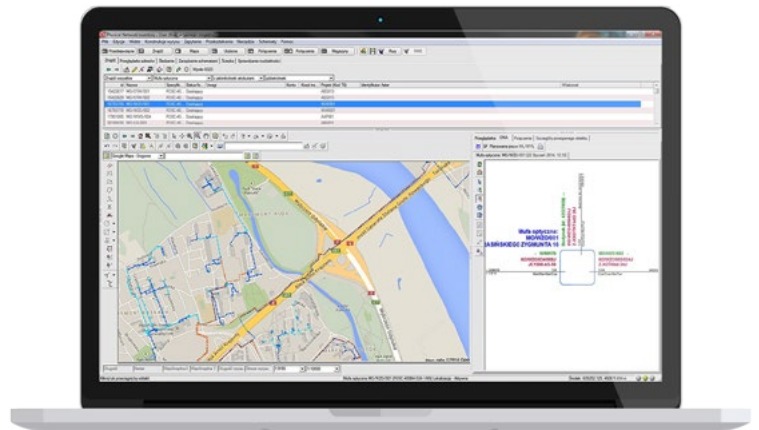

GE Smallworld Logical Network Inventory (LNI)

Logical Network Inventory provides tools to configure, capture and manage the complex elements that govern the real life behavior and capabilities of network. This includes the logical infrastructure of the network and also the rules that control the operation of the network – both from a technical and business perspective. Logical Network Inventory provides also the functionality to support the complete end-to-end process of planning and designing services.

Features

- The ability to define the network structures
- Recording of the logical services riding on the underlying structures
- Configuration and capability rules to support network operations
- Circuit routing rules for achieving service level requirements
- A flexible channel hierarchy, supporting both synchronous and asynchronous technologies
- Life cycle management for operational state transitions and validation.
- Ability to define and implement complex protection and diversity schemes
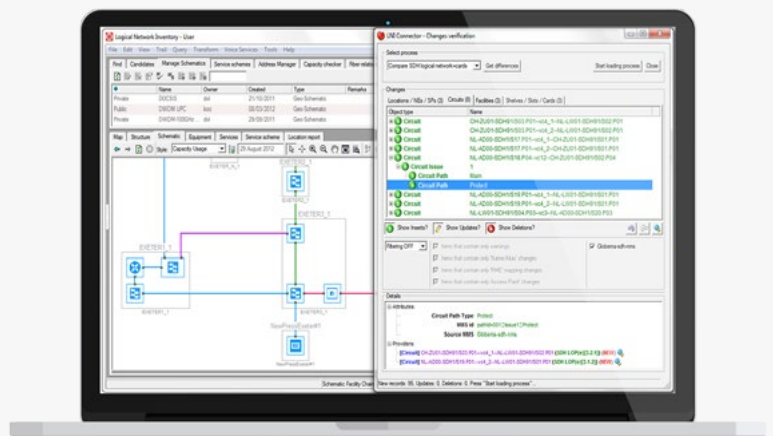
Globema Network Inventory Maintenance Support (NIMS)

Network Inventory Maintenance Support is aimed at automating the process of reporting changes in the network and updating the network inventory directly from the field. App is compatible with all types of mobile devices (standard web-based User Interface & special UI for PDAs available). NIMS is integrated with Smallworld Physical Network Inventory, Globema Physical Route Manager & GE Field Force Automation (FFA).

Features

- ✔ Registering network changes by mobile workers
- ✔ Automated network inventory update process
- ✔ Smallworld PNI data visible in the field
- ✔ Web based or mobile (Smartphone / Tablet / PDA) version
- ✔ Can be integrated with Workforce Management System
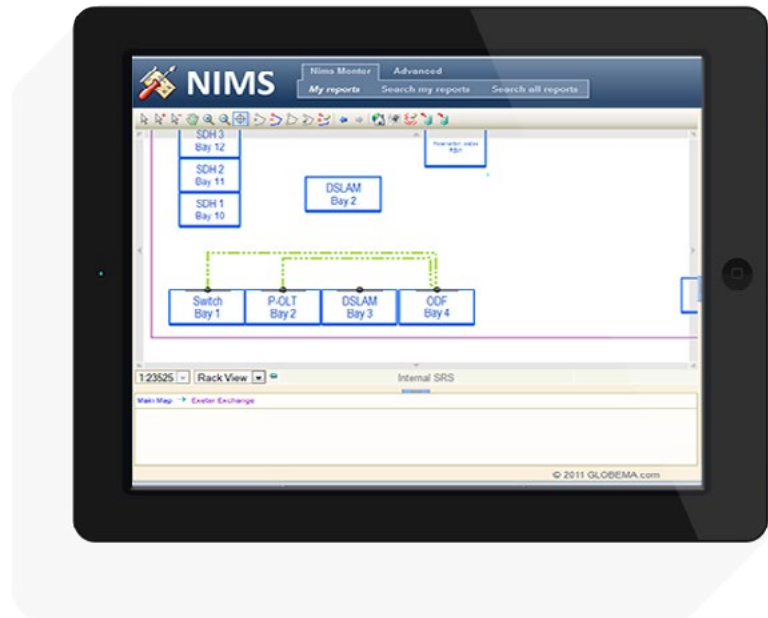
Globema Physical Route Manager (PRM)

Physical Route Manager is an extension to the Smallworld Physical Network Inventory application. PRM allows grouping of any number of physical resources into an easily accessible and manageable entity called Route. Route consists of mutually related elements, such as, fibres, ports, and splices that comprises a connection between two locations.

Features

- ✔ Enhanced copper and optical network topology management
- ✔ Dark fibers / leased lines management
- ✔ Integration with Connectivity in Smallworld PNI
- ✔ Ability to assign additional attributes to optical relation
- ✔ Physical routes for transmission services mapped onto Facility objects in LNI
- ✔ Support for core network connections
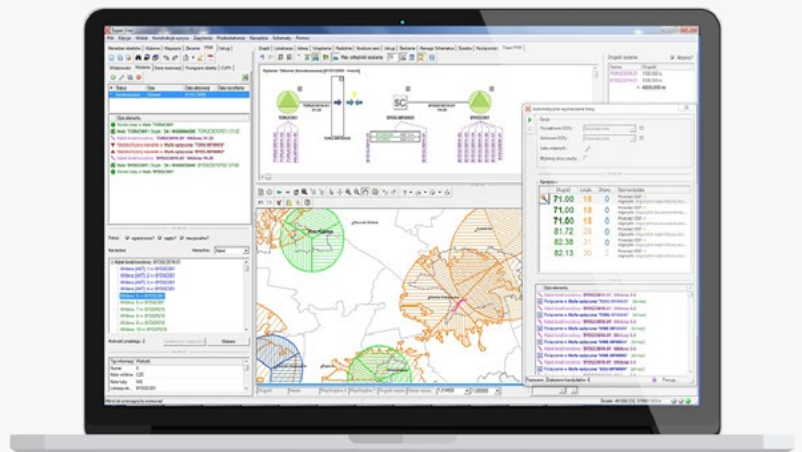
Globema Optical Path Scheme

Optical Path Scheme is a module that extends functionality of Physical Network Inventory with automatic generation of schemes for optical routes. Generated schemes present the optical network at fibre level. The scheme provides information about fibre numbers and optical lengths, connections inside splices and other devices, and descriptions of connected ports. The scheme can be easily printed with standard Smallworld tools.

Features

✔ Visualization of optical network at fibre level
✔ Graphic representation of connections
✔ between fibres inside splices
✔ Fibers colouring and grouping
   Visualization of sheath slack
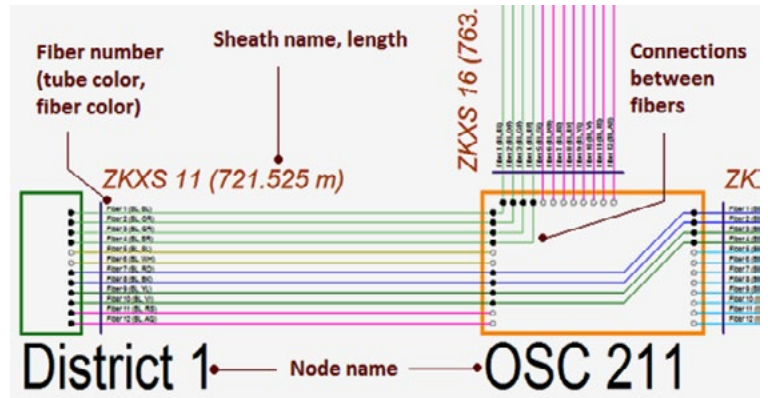
Globema Service Inventory B2B

Service Inventory is a Network Inventory extension. Its purpose is to gather all service technical data in a single database record representing the given service. With this data collected, the user receives an overview of all service resources in all technologies in each network layer. The Service Inventory extension supports service of any type (e.g., IP, Voice, ATM services, Leased lines etc.). Specific technical attributes can be defined and managed for each service type.

Features

✔ Comprehensive support for services using multiple technologies (SDH, IP, PDH, DWDM, ATM, etc.)
✔ Supports service qualification, design, fulfilment and assurance
✔ Provides a comprehensive and graphical view of service resources
✔ Keeps and provides service historical data
✔ Ready to integrate with BSS/OSS (Workflow, CRM, Fault Management)
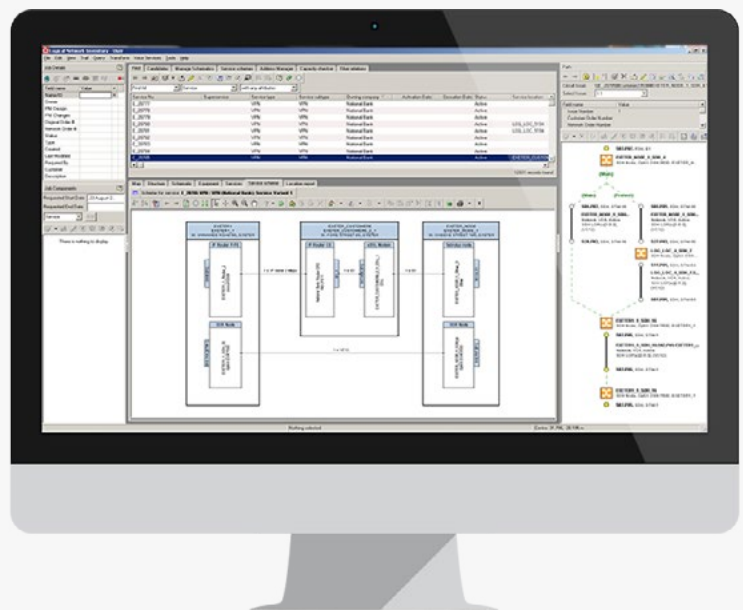
Globema LNI-Connector

Implementation of Smallworld Logical Network Inventory requires populating of the database with appropriate network data and maintaining the accuracy and consistency of data in the database with the changing state of the network. Manual data acquisition and maintenance is very tedious because of the size of the backbone network, its complexity and frequent reconfigurations that are performed. LNI-Connector has been designed to support and simplify network data import from Network Management Systems into the LNI database and periodical LNI synchronization with NMS systems.

Features

✔ Simplifies maintenance and increases accuracy of data in the LNI
Fully automatic data import with results
✔ notification by email
Supports everyday automated incremental
✔ synchronization with data from NMS
Provides automatic mapping with physical
✔ equipment in the PNI database
Supports transmission planning and network
✔ element lifecycle
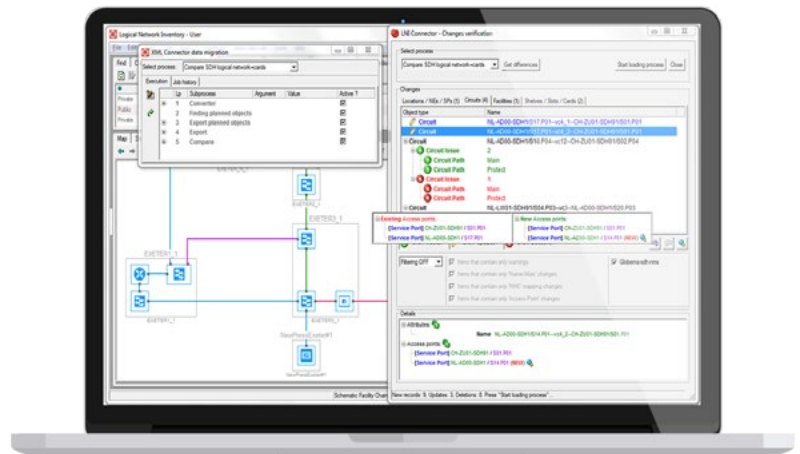
Globema Logical Browser

Logical Browser gives instant access to information about logical network configuration stored in Logical Network Inventory database. Application allows easy data viewing through a web browser. Logical Browser speeds up information flow in business and support processes of preliminary feasibility check, service delivery, fault management, and network maintenance.

Features

✔ Easy access to logical data for all network departments
✔ Reports and schematics presenting real use of logical resources
✔ Integration with Physical Browser from the Network Inventory Gateway product family

> **Globema successfully deployed the end-to-end network inventory system based on GE's Smallworld Network Inventory product portfolio and a number of its own products. In addition to the standard products, Globema developed specific functinalities in both the physical and logical layer – especially for integration with other systems and annual obligatory reporting to the Polish Office of Electronic Communications.**

globema

About Exatel

EXATEL SA is a leading telecommunications operator for business and public administration in Poland with more than 1500 customers, mainly large size companies and institutions. The company manages one of the most advanced high technology backbone networks in Europe, extending over 20 thousand kilometers and reaching a throughput of 40 Gb/s, opening new opportunities in the global market. Almost 20 years of the company's experience and proven technologies, coupled with a broad range of services, guarantee EXATEL's clients the highest quality and security.

EXATEL provides service lines, including data transmission, line lease, voice services and Internet services, as well as hosting and co-location. The company's basic competence is data transmission, especially virtual private network services based on modern IP multi-protocol label switching) networks for which EXATEL is a precursor in Poland.

EXATEL is a 100% Polish company that was formed in 2004 following the merger of Tel-Energo and Telbank, two telecommunications operators with more than 10 years of experience in providing services for demanding and strategic industries such as public administrations, network operators, banking and finance and power engineering. Among EXATEL's clients are the Ministry of Justice, the Ministry of National Defense, the Agency for Restructuring and Modernization of Agriculture, the Office of Electronic Communication (Telecommunications Market Regulator), BT Poland Sp. z o.o, Netia SA, Vectra SA, Office of the Polish Financial Supervision Authority, Bank Pekao SA, Bank PKO BP SA, Bank Handlowy SA, Raiffeisen Bank Polska SA, Warsaw Stock Exchange SA, PSE Operator SA, PGE DYSTRYBUCJA SA Oddział Lublin and Vattenfall Europe Netcom GmbH.

More information on **www.exatel.pl**

About Globema

Globema implements innovative, industry-specific, geospatial resource management systems for telecom operators, utilities and companies operating in the field. The company specializes in OSS & Network Inventory for telecoms, GIS, geo-marketing, SmartGrid, DMS/OMS and Workforce Management solutions. Globema acts as a partner and VAR of GE and Google GEO (Maps & Earth for Business), among other leading vendors.

Company's products provide functionalities for network assets inventory & design, renewable energy management, operations support, outage handling and field staff optimization. The company headquarters are located in Warsaw, Poland. Globema also has offices in Romania, Czech Republic & the USA.

Solutions & services provided by Globema support over 200 enterprise customers worldwide.

More information on **www.globema.com**