# Cyberbajt Case Study

## Axxcelera Forward to Cyberbajt Case Study

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Every deployment is different and subject to variations in project experiences. No guarantee of performance of the ExcelMAX product beyond standard product specifications is made by virtue of this case study.

## Case Study

### Project: Department of Technical Services Zagorz (ZUT)-WiMAX network



### Brief description the problem:

Department of Technical Services in city of Zagorz (ZUT) provides comprehensive services to the Town and Municipality of Zagorz. As part of its activities, ZUT owned a radio network which provides residents with Internet service. ZUT decided to upgrade its wireless network and to improve the quality of services for local government, schools, and residents of Zagorz.

The first and most troublesome problem was the varied terrain of Municipal Zagorz. The beauty of the Bieszczady Mountains, are not helpful in building a wireless network. Very different levels of terrain, meant a very difficult task for the designer and integrator. Network assumptions needed to be extended to cover the largest area and to provide Internet access for the greatest numbers of recipients.

Hilly terrain required very careful and deliberate



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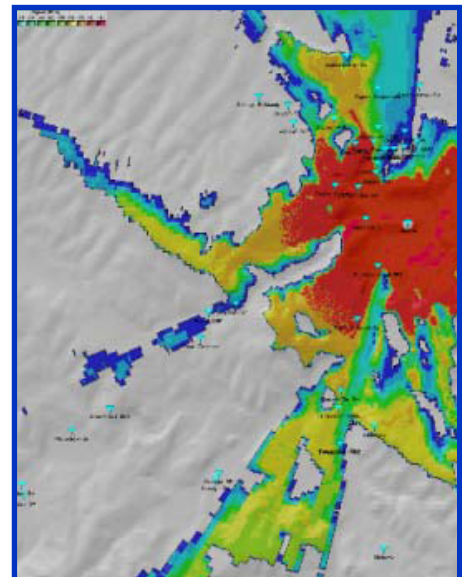
choice of sites for base stations to achieve the desired effect of creating a publicly accessible network for residents, schools, and officials. This required the designer and integrator to have very extensive experience in designing and building wireless access networks to the Internet.

A key issue for ZUT Zagorz was to build a reliable and interference free network. Achieving such a goal was made possible by investing in a licensed band.

## Solution:

Cyberbajt engineers carefully prepared to draft and implement a network for ZUT Zagorz. The first step was to audit the network in the unlicensed band, which had an investor. Careful analysis of the network developed information about currently available resources and allowed creation of a strategy for further extension of the existing WiMAX network of base stations.

For the purpose of the network in Zagorz, Cyberbajt conducted detailed planning of radio using modern tools - specialized software for radio planning and spectrum analyzer Rohde & Schwarz FSH6. In addition, to more accurately verify the simulation results, Cyberbajt carried out tests using WiMAX equipment. This made it possible to collect comprehensive data resulting in the necessity to undertake further work on the project. Cyberbajt engineers went on-site of the future radio network to verify the pre-established network model and any modifications to the deployment of base stations. Following an audit of the network and radio planning, Cyberbajt proposed implementation of the investor network based on IEEE 802.16-2004, popularly known as WiMAX in the licensed 3.5 GHz band. Relying on Cyberbajt's experience, ZUT Zagorz approved the selected technology for the network and asked the relevant bodies of the reservation of radio frequencies. Upon receipt of the decision,

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frequency reservation began to prepare for the selection and implementation of WiMAX components. Cyberbajt engineers proposed a solution using Axxcelera's hardware.

Axxcelera ExcelMAX is an efficient and economical platform for WiMAX and is designed to work in the frequency range 3.3 GHz to 3.8 GHz. ExcelMAX can be used in different sized networks providing broadband Internet access and telephony and already installed successfully in other corporate networks and access networks to the Internet.



ExcelMAX is a scalable and flexible system - it can be scaled at any time with new elements - to increase coverage and / or throughput of the system - thereby providing faster transmission and extended range of services.



ExcelMAX APs are independent, external devices powered by the Power over Ethernet 802.3af, form the base stations. APs are equipped with a connector that allows connection to external antenna. Client terminals are formed by three types of CPE:

- FD CPE - operating mode Full Duplex
- HD CPE - operating in Half Duplex mode
- Indoor CPE - CPE internal operating in Half Duplex mode.

CPEs are offered in both integrated antenna and external antenna connector versions and are powered by 802.3af PoE. It is noteworthy that ExcelMAX is one of the few if not the only system which has a CPE operating in full duplex.

## Result:

Quick and easy installation of the ExcelMAX wireless system made the system proposed by Cyberbajt to be met with a very positive assessment of the investors. All system requirements have been met - the WiMAX network implemented in Zagorz is resistant frequency interference, easy to
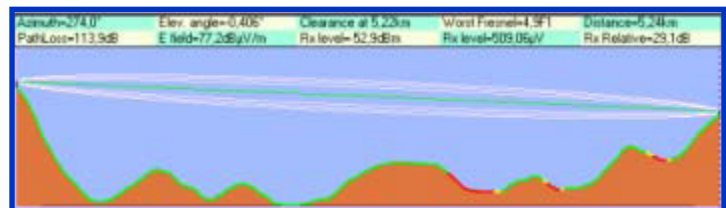
expand, secure, and very efficient. Network ZUTNet now works successfully for several years and continues to grow its resources for future users. The implementation of WiMAX network was preceded by insightful analysis so as to bring about the expected outcome.

## Department of Technical Services Zagorz:

The activities of the Department of Technical Services are focused around the provision of diverse and comprehensive services to cities and municipalities of Zagorz. The main sphere of activity ZUT are:

- Provision of radio services, Internet access
- GPZ - marketing, transmission and distribution of electricity
- Transport and storage of solid waste
- Water intake and sewage treatment plants in Kalnicy and Medium Grand
- Workshop repair
- Composition of fuel
- Wastewater treatment plant in Zagorz
- Tire service
- Powers of UDT (Office of Technical Inspection) - Repairs and modernization and to prepare documentation necessary to register devices in the Office of Technical Inspection:
  - hook
  - loading platforms
  - forklifts
  - Mobile cranes (outboards HDS)

## Cyberbajt Integration:

Cyberbajt Integration focuses on integration services and deployment of broad network solutions. Cyberbajt services are addressed to corporate clients, medium and small business, and public administration. Cyberbajt designs and implements wireless networks; performs upgrades and audits; provides expertise related to the WLAN and any integration services; and develops and implements security policies for computer networks. Cyberbajt is an equipment distributor for radio and optical data. The strategy of the company is based on the fact that it does not provide the same equipment but primarily the knowledge of how effectively to build and operate the network.

Cyberbajt Wireless staff has a deep theoretical knowledge and rich practical experience. Employees are regularly trained to improve skills that have always been able to provide their knowledge to solve problems and assist in the selection of equipment.

Cyberbajt is a provider of wireless solutions for individual customers and small businesses. Through the online store, Cyberbajt provides an excellent supply of various equipment for home use and specialized equipment for

advanced implementations. A wide range of solutions allows Cyberbajt offer directly to a wide audience.

Developed logistics structure - Commercial guarantees fast and prompt delivery and high quality services. Cyberbajt is also a producer of high quality radio antennas for wireless networks. In this portfolio is a very diverse range of products allowing realization of even the most custom designs.

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