Scalable Growth

> "Our trial with one ePMP™ Access Point and ten subscribers was immediately successful. We quickly installed another Access Point with 50 subscribers, and it is performing equally well. With ePMP we can grow and add customers quickly."

AKOS CSIKI - NETWORK DIRECTOR, ESZAKNET

Overview

Connectivity helps communities thrive – particularly in rural locations. Eszak-Net saw the opportunity to connect business and residential customers in Miskolc and the North-East region of Hungary. Instead of waiting for fiber, DSL or cable alternatives from larger service providers, customers now get Internet services, VoIP telecommunication services and IP based video surveillance systems from EszakNet.

"We have been providing service for years," says Akos Csiki "and we have a passion for investigating the technologies that provide the best service. We enjoy the challenge." Technicians work closely with customers to clearly understand their communication needs. With this information, designers, engineers and support technicians develop the best solution.

As a result, EszakNet customers were very satisfied with their wireless broadband connectivity, and the network quickly grew to 2,000 subscribers. As their reputation for reliable service grew, local government agencies purchased VoIP services and the largest manufacturers in the region subscribed to leased line services in addition to residential customers. New opportunities brought in additional revenue that was reinvested to expand the network and extend the customer base. EszakNet had found a model for success and growth.

PROFILE - ESZAKNET

Centralized in Miskolc, Hungary EszakNet provides data, voice and video services to 2,000 subscribers in north-east Hungary. www.eszaknet.hu

CHALLENGE

Provide consistently reliable service to a growing customer base.

SOLUTION

- Unlicensed point to point backhaul to bring service to an area.
- Unlicensed point to multipoint fixed wireless broadband access network to distribute connectivity.

Challenge

Initially, EszakNet had been working with low cost wireless broadband solutions, but as demand began to grow, they found that backhaul links were constrained and the access network equipment could only handle 20 subscribers per Access Point (AP) before reaching capacity. While the current technology was meeting the existing demand levels, they needed a different solution that would meet the needs of rapidly expanding network. With 2,000 customers already, and more being added daily, they needed a solution that could scale to support their customers' needs.

Station Module Provides Municipal Connectivity

Terrain and environment were also difficult obstacles. While some of the links in the backhaul and access network had clear Line of Sight (LOS) conditions, many had obstructions caused by trees or buildings and required performance in near Line of Sight (nLOS) and non-Line of Sight (NLOS) conditions. Also, the increasing number of emitters in the 5 GHz unlicensed spectrum posed a challenge. The solutions needed high levels of interference tolerance to provide reliable connectivity in the presence of other equipment.

They decided to trial new wireless backhaul and access network equipment from Cambium Networks before adding a large number of low capacity units to satisfy rapidly growing demand. This would provide them a true comparison of performance in their environment with real customers, and provide them with a solution that will scale as the network was beginning to grow at a rate of 10% per year.

Why EszakNet chose Cambium Networks:

• **High Throughput** – for data transfer, voice and streaming video applications.

• **Scalability** – GPS synchronization reduces access network self-interference and enables frequency re-use in selected areas.

• **High Performance** – maximum throughput, even in noisy RF conditions.

• **Ease of Installation** – so that the network can be built quickly requiring minimal labor time and cost.

Solution

BACKHAUL INFRASTRUCTURE

Point to Point (PTP) 650 modules were deployed to provide backhaul links using the unlicensed 5 GHz spectrum.

• COMPARISON – one PTP 650 link was able to be deployed in locations where two or three LigoWave links were required.

• PERFORMANCE – In an application with obstructions that created an nLOS environment with many other emitters creating a high noise level, PTP 650 provided 240 Mbps of usable throughput, and used Dynamic Spectrum Optimization™ (DSO) continuously monitor signal quality and automatically make adjustments.

Backhaul and Access Points Distribute Broadband over a Wide Area

Wireless Access Network

Point to Multipoint ePMP access networks distributed connectivity to business and residential customers. In a trial of one ePMP AP with an omnidirectional antenna provides connectivity to 50 Station Modules (SM). This AP covers the same geography that would have required two or three Ubiquiti or MikroTik AP modules, and provides throughput speeds at 90 Mbps or more. Installation was easy, and technicians did not need detailed training.

• COMPARISON – ePMP provided connectivity to 50 station modules instead of 20 with Ubiquiti and MikroTik equipment. In addition, ePMP enabled EszakNET to prioritize traffic to meet customer requirements.

• PERFORMANCE – ePMP was found to have good performance in non-Line of Sight (NLoS) conditions as in situations where there was clear RF conditions. The system performed perfectly during recent storms in the region.

Station Module Provides Residential Connectivity

Results

Conditions	45 Registered Stations at AP Other traffic during test: 12 Mbps download and 3 Mbps upload 4 Sessions were tested simultaneously		
Setting	**Ping (msec)**	**Download Speed (Mbps)**	**Upload Speed (Mbps)**
Flexible Mode	39	40.83	16.17
	37	42.35	16.16
	34	37.13	15.34
TDD 50/50 Mode	37	37.43	20.79
	34	34.58	25.6
	34	35.94	25.84

Speed Test Resuts

Field results showed good performance at low subscriber loads, but dramatically superior performance as additional subscribers are added to the network. "If we have a few subscribers on an Access Point, the systems both perform well," says Akos Csiki, Network Director. "But if a tower has 40 – 50 customers, one ePMP Access Point provides the same performance and better service quality than two or three of the other suppliers' Access Points. At higher subscriber density, ePMP costs much less than other alternatives."

Wireless Broadband Connectivity Where it is Needed

Next Steps

EszakNet found that ePMP wireless access networks with a PTP 650 backhaul infrastructure provided them the best solution for reliability as more customers were added to the network. As the network has grown, they now have 800 customers served by PTP 650 backhaul and 60 customers served by ePMP wireless access. Satisfied customers spread the word and new customers are added to the network each week. This foundation, with a proven wireless broadband solution, positions Eszaknet for continuous growth.