

GSM Backhaul in Nicaragua

Enitel expands GSM service with SkyAbis™



Enitel provides PSTN, GSM, Internet access and other telecommunications services in Nicaragua. To keep up with the nation's large demand for cellular services, Enitel needed a solution allowing rapid expansion into rural regions. SkyAbis™ provides a highly efficient solution that can be rapidly implemented, helping Enitel increase its market size.

The Client/Project

Empresa Nicaraguense de Telecomunicaciones (EniTel), a subsidiary of Mexico's América Móvil, provides the full range of telecommunications services in Nicaragua, including PSTN, GSM, Internet access and satellite communications. Nicaragua's rapid economic growth has created a strong demand for cellular telephony. EniTel was already using Gilat equipment for rural telephony as part of its USO (Universal Service Obligation), and it was looking for a way to increase expansion of its GSM network in Nicaragua.

The Challenge

Cellular telephony, especially GSM, is a competitive and rapidly growing market as it is a relatively efficient way to provide service to areas of low population density and where terrestrial communication infrastructure is not advanced. Extending coverage and providing value-added features are keys to increasing market share. There are three potential rural GSM backhaul methods:

- **Microwave** — Microwave stations and repeaters connect BTSs. This is usually recommended for dense areas where towers are close and support high bandwidth.
- **SCPC** — Single Channel Per Carrier (SCPC) satellite communications requires an individual dedicated satellite channel per telephone connection. This is usually used in remote large cities, where average bandwidth is large with low variance.
- **DAMA** — Demand Assign Multiple Access (DAMA) satellite communications dynamically allocates bandwidth according to transmission needs. This is excellent for rural sites, with low to medium density.

EniTel quickly narrowed the choice to satellite backhaul for rural sites, due to the complexity



“ Our GSM investment starts a new era of development in the telecom industry in Nicaragua. Our country has experienced rapid change in the telecom sector, driven by the private sector, and Enitel is playing a key role by adopting a business model focused on our commitment with Nicaragua development. ”

Víctor M. García, Enitel Chief of Regulatory Affairs



CASE STUDY

EniTel saw that SkyAbis would provide:

1. Optimized CAPEX.
2. OPEX savings through DAMA and traffic optimization.
3. Integration and interoperability with the existing GSM equipment.
4. Rapid installation that helps EniTel expand their coverage faster.
5. Efficiency on shared hubs alongside other telecom applications.

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in developing a series of towers and repeaters for microwave connectivity for BTSs.

With SCPC, multiple modems are needed at the hub, one per channel, escalating satellite solution costs. While those costs aren't excessive for smaller networks, they can be quite high for large networks with many channels. Space segment costs, usually the largest portion of operational expenses, can be significant because SCPC modems operate in Permanent Assignment Multiple Access (PAMA) mode.

Some SCPC solutions also offer silence removal. While that saves on peak bandwidth transmission costs, a permanent assigned channel wide enough for peak traffic is still required, even when no traffic is sent on the Abis link. Therefore SCPC links do not take advantage of the full potential of bandwidth savings.

Enitel was looking for better bandwidth utilization. In addition, Enitel had already chosen to deploy a SkyEdge™ Hub for other telecommunications needs. Having a solution that could leverage the existing VSAT network would be a tremendous advantage.

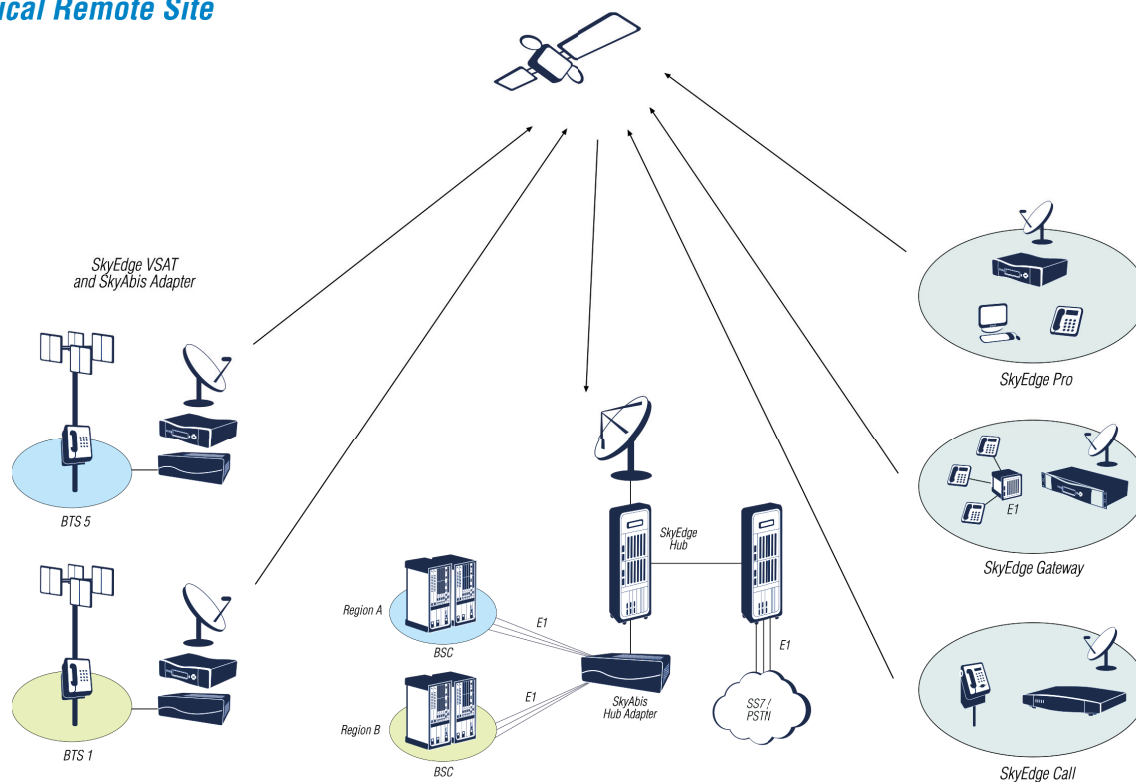
The Solution

SkyAbis is Gilat's solution for satellite-based cellular backhaul. It runs on top of the SkyEdge system. Using DAMA access, SkyEdge has the advantages of satellite communications without the disadvantages of SCPC costs. SkyAbis has proven interoperability with existing GSM equipment while maintaining the required call quality and value added services. Also, SkyAbis operates on the same SkyEdge Hub that can be used to provide other satellite services such as rural telephony, Digital Compressed Multiplication Equipment (DCME) trunking and broadband Internet.

Capital expenses are controlled through the savings from only needing a single Abis Adapter at the hub, rather than many modems. Utilizing the SkyEdge Hub optimized the initial investment required for SkyAbis.

SkyAbis optimizes GSM traffic by removing unneeded data such as silent packets and padding bits. They are recreated on the other side in a manner transparent to the GSM network. The sophisticated SkyAbis software reduces required inbound and outbound throughput compared to payloads over traditional point-to-point

Typical Remote Site



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modems, translating into significant improvement in space segment utilization.

DAMA means that SkyEdge dynamically adjusts bandwidth depending on real-time requirements at each BTS. Since not all sites are transmitting peak traffic at the same time, the bandwidth is shared by allocating space to each site according to needs while maintaining the same block rates. That means more communications per bandwidth, requiring less space segment for the same amount of traffic.

Analysis showed that a VSAT/DAMA based solution was most economical for remote BTSs with between 3 TRXs and 12 TRXs per BTS. As the system grows, the percentage savings will increase due to efficiencies of scale.

There was one key issue that Enitel wanted to be sure of: That SkyAbis could perform well in a shared hub environment. EniTel needed the SkyEdge Hub for multiple satellite services, not just for GSM. SkyAbis runs on SkyEdge, sharing resources with other applications, and does not require a dedicated hub.

SkyEdge's advanced Quality of Service features and its multiple inbound channels reduce contention between GSM and other traffic, showing that SkyAbis could perform well in a shared hub environment.



EniTel saw that SkyAbis would provide them the best solution for their needs. SkyAbis is a technologically advanced GSM solution that provides performance that help cellular companies rapidly expand their coverage area. SkyAbis is a key competitive advantage in growing markets.

Summary

Enitel needed a more efficient method of providing cellular backhaul for remote GSM towers. Using SkyAbis, Enitel has been able to dramatically decrease satellite bandwidth, improve perform and provide rapid rollout, resulting in and ability to provide coverage to more of Nicaragua.