

Rebuilding

Rebuilding Belfast with Broadband

An Irish Charity Group Turns to **Free-Space Optics and 802.11b Technology** To Connect A Strife-Torn City

By Annie Lindstrom

The Flax Trust, a 26-year-old Irish charity, has spent the past year overseeing the ongoing construction of a fixed broadband wireless access (BWA) network in North Belfast, Ireland. The pilot network is the cornerstone of Initiative 2002, an ambitious community regeneration project designed to bring an end to the "ghettoization" of the long strife-torn city and create a "digital advantage" for its poverty-stricken residents.

The Flax Trust's vision is a network that connects businesses with their customers, as well as churches with their parishioners and schools with their students, according to Liam Mailey, CEO of the Flax Trust. In addition to creating vital communication links, the network will provide much needed job training and jobs for all of the residents of North Belfast.

From Mills to Media Access

One month after the pilot network is completed in April, the Flax Trust will begin a \$12 million rehabilitation project that will transform the 230,000 sq. ft. Brookfield Linen Mill into a "media industries hub." In an effort to ease tensions between neighboring communities, all residents will have access to the mill. They will be encouraged to use the Mill's facilities to create content for a local cable TV channel that will be broadcast to residents over the BWA network. The experience will provide residents with training and experience in the "fastest growing sector of the UK and world economies," according to the Trust.

"Individuals and their communities need to be given the confidence, skills and opportunities to actively use the technology," Mailey said. "This community empowerment is a vital leg of the initiative."

The local cable channel will be broadcast alongside other high-quality broadcast terrestrial TV and radio stations. It will provide



The Belfast network uses SONAbeam optical transceivers and 802.11b radios.

information about community events to subscribers who do not own computers.

"The idea is to keep people from leaving North Belfast, and you need broadband to connect them to the rest of the world," said Mike Penner, vice president of corporate development at fSONA, whose free space optics (FSO) equipment makes up the BWA network backbone.

Lack of Infrastructure

The prohibitive expense of deploying fiber in such a downtrodden area has kept the likes of British Telecom and cable provider NTL from delivering broadband themselves, Penner explained. However, both companies are deploying interfaces to their networks at the Mill.

Seeking a cost-effective alternative to fiber, the Flax Trust turned to free space optics (FSO) and 802.11b radios to deliver a citywide

BROADBAND WIRELESS BUSINESS



SONAbeam installation for the Flax Trust network.

Upon its completion, the pilot network will support 7,000 endpoints, including homes, businesses, schools, churches and community centers. At press time, the only paying customers using the network were businesses with hard-wire connections to the Mill network. Fifty Wi-Fi users were trialing a scratch-card micropayment system.

In April, the network will be turned up to paying residential customers, who will pay \$15 a month for service.

Lily Pad Architecture

The network, which transports video and data via Fast Ethernet, is deployed in a "lily pad" architecture. The lily pad configuration is less expensive to build than a ring-based network and easier to operate, Penner explained. The network backbone will be composed of 17 point-to-point links anchored by SONAbeam optical transceivers. The cost of the transceivers ranges between \$18,000 and \$30,000, Penner said. Five of the transceivers are mounted on the roof of the Mill.

The links, which span less than 2 kilometers (1.2 miles), will connect to the radios at 23 access points. Radios are being supplied by Avaya, SMC Networks, D-Link, Belkin and Netgear Inc.

"Schools get 100 Mbps, businesses get 10 Mbps and residential users get 802.11b," Mailey said. "Wi-Fi coverage is fairly uniform over the current service area and each access point sustains just over 6 Mbps and should support 40 or 50 users each. It's a fairly simple matter to double the access points and have more subnets. I will do this if necessary, but I want to measure usage first."

To connect to the network, end users require a Wi-Fi client adapter and possibly an additional antenna or extension USB cable. This equipment currently is supplied to end users by Belfast Beacon, the entity serving as network operator and ISP.

"After April, we intend for end users to buy standard Wi-Fi adapters and antennas either from us, via mail order, or from the many suppliers in the area," Mailey said.

LAN with an Internet gateway. The pilot network will cost a total of \$1.35 million and the budget for Phase 1, which will commence after the pilot network takes off, is \$3.6 million, according to Mailey.

"We chose free space optics because, with it, we didn't need to dig up the streets and pay high annual charges for leased lines or license fees. There is no radiation risk and the network could be up and running quickly," Mailey said.

Expansion Plans

Although the existing network is symmetrical, as it expands, Belfast Beacon will experiment with "various access options for remote areas, such as bonded asymmetrical DSL or satellite links supported by cache servers," Mailey explained.



Lily pad architecture of Flax Trust's Belfast network.

"I believe we can cover the greater part of Northern Ireland with a microwave/FSO/WLAN network," Mailey added. "We will use microwave to interconnect the FSOs/WLANs in the cities we serve."

As the network grows it will be used to support a pilot program for primary schools on a "cross-border" basis. The University of Ulster is offering support for projects undertaken by local schools and colleges; it is encouraging its final-year media students to get involved in these projects as well. The Brookfield Mill is the first of several Community Technology Centers the Flax Trust hopes to create to provide residents and businesses with local access to technical expertise, hardware and software.

In Phase 2 of Initiative 2002, the Mill will house an 11,000 sq. ft. "incubator" for creative industries that the Flax Trust hopes will spawn approximately 40 creative industry-related businesses in North Belfast by 2004/2005.

About the Author ▶ Annie Lindstrom is a free-lance writer based in Florida. She writes for several leading telecommunications publications and has been covering telecom for more than a decade. Her articles have covered the full range of technologies and issues within the industry, including fiber optics, central office switching, outside plant, DSL, cable modems and wireless access. She can be reached at annielindstrom@aol.com.

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