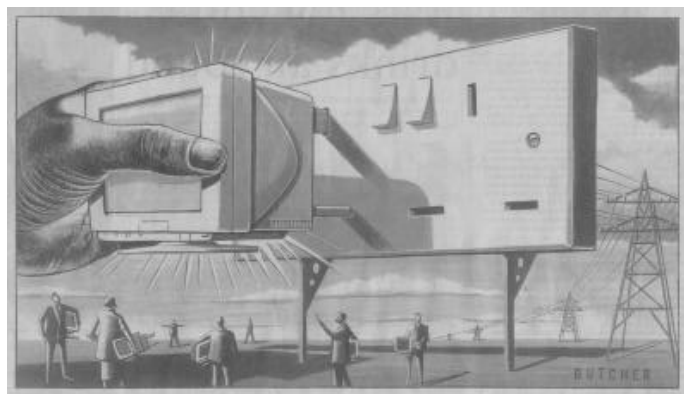


Sparks fly in race to power the net



Cheap, fast access to web services via existing electricity networks is attracting attention worldwide, writes Paola di Maio

For anyone paying by the minute to use the internet, the prospect of immediate, permanently switched-on access to huge quantities of bandwidth at a flat rate is highly attractive.

That is what is on offer with powerline telecommunications (PLT) technology, which gives electricity users two-way, high-speed access to data communications services over existing electricity networks.

Despite technical challenges and recent setbacks - notably in the UK - PLT is attracting considerable attention worldwide for its potential to accelerate the availability of fast, cost-effective internet services for anyone connected to an electricity grid. In the coming months developers hope to be able to push ahead quickly to try to ensure they do not get left behind by rival technologies.

PLT offers an alternative to the "last mile", or local loop, the copper wires that link telephone users to modern, fibre-optic telecommunications networks.

The user's personal computer is connected via a coaxial cable to a protocol translator, and the signal passes to and from the local electricity substation through the existing low-voltage network. At the substation a data concentrator connects with the conventional telecommunications trunk network or backbone. Future generations of the technology may use higher voltage cables for the backbone to allow a highly cost-effective communication infrastructure to be built.

Currently available PLT products can transmit data rates at up to 1Mb per second - nearly 20 times faster than a standard 55Kb modem - but future technology could be much faster still.

John Dickinson, one of the first scientists behind the technology who now works for Electricom, a UK-based PLT information service, says: "PLT offers the prospect of being several orders of magnitude faster than any comparable mass-access technology, potentially delivering the equivalent information carried on 100 extra telephone lines to each electricity customer."

"For the power distributor the opportunities are increased revenues and profits from the provision of telecommunications services and the potential for entering an entirely new sphere of service, that of the 'information utility'," says David Hines, editor of UK-based Powerline Publishing, a dedicated industry service.

This in turn could extend consumer choice and represent serious competition for existing telecommunications providers, says David Healey, chairman of the International Powerline Communications Forum (www.ipcf.org), which represents the industry and is encouraging the speedy regulatory approval of PLT standards.

"Marginal incremental cost in additional equipment would make the cost of entry into the telecommunications business by the power distributors very affordable, and the deployment very rapid," explains Mr Healey.

But network providers would also benefit. Connection costs would be low, because they could reuse existing infrastructure, while new "always-on" services could be offered.

Meanwhile, content providers and other third parties could use PLT to evaluate and optimise the emerging market for new applications including internet telephony, home automation and security, home banking and shopping, and data back-up.

PLT has obvious attractions in Europe, where access to the local loop is charged, although tariffs vary widely.

In the US local loop access is practically free and the eventual market for PLT is more likely to be "indoors" - enabling households to link PCs and other devices in a local access network.

So far, however, the technology has achieved more on the drawing-board than it has in practice. Technical obstacles - such as line noise, electrical load imbalances and transformer interference have hindered efforts to develop the technology. These obstacles have now largely been surmounted, along with fears about internet data security.

Last year several European utilities successfully tested residential internet access over power lines.

In the UK, Nor.Web, a joint venture between United Utilities and Nortel, the Canadian telecoms equipment manufacturer, was to have been the first to deliver PLT on a commercial basis. Its solution, digital powerline technology, or DPL, was working and ready to be deployed, but last September the plug was pulled on the entire operation.

Nor.Web's problem was that orders from utilities had failed to materialise fast enough, in spite of thousands of commercial inquiries and apparently high end-user demand.

"In a sense we were ready too early for [the utilities]," says John Laycock, Nor.Web's former director for new enterprise development.

That may be only part of the story. Mr Healey had headed the project since 1997, and concluded in a report that the closure had been "based on an internal business decision - probably driven by Nortel - prioritising other access products with better established markets".

Others were more forthright. Gerhard Goll, a manager at EnBW, a German utility that was involved in the Nor.Web trials, said the closure was "hard to understand". He added that the technology was economically viable and said that in spite of the "incomprehensible decision to cease, we will continue to pursue the project from our side".

EnBW is not alone in wishing to press ahead. In Europe Ascom, a Swiss telecoms solution provider, has been running a demonstration system smoothly for several months in collaboration with RWE Energie, one of the biggest utilities in Germany. Ascom plans broad-based user trials in the middle of this year with RWE and other potential customers in Europe, and intends to launch commercially next year.

Other companies involved in PLT include Siemens and Ericsson in Europe, Newbridge in North America and Keyin Telecom in South Korea.

The technology is developing fast - Alcatel of France, for example, offers a 2Mb product for the medium voltage network, injecting the signal into the cable's metal sheath. Newbridge's Orthogonal Frequency Division Multiplexing (OFDM) technology has the potential to offer much greater bandwidth than is available now.

Media Fusion's technology, Advanced Sub-Carrier Modulation, uses proprietary software and hardware to write data within the naturally occurring magnetic wave surrounding power lines. According to William Stewart, chairman and chief scientist, it offers near limitless capacity.

So perhaps it will not be long before the power socket on your wall doubles as a broadband communications gateway.