Switching on power line Internet connectivity

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One in five Europeans today enjoy broadband Internet access via competing technologies. Low-cost and fast data access over electricity network power lines is one such technology that is being extensively tested in four European nations.

“Electric utility companies have long used the electric network for communication purposes,” says Luis Legorburu, coordinator of the IST project OPERA. “But offering broadband Internet over power lines was only recently made possible by a number of key patents.”

Power line communication (PLC) is mainly proprietary and the technology has less than one per cent of the broadband market, trailing far behind digital subscriber lines (DSL) and cable. It has been hampered by regulatory issues, including concerns that PLC may interfere with existing users of the radio frequency spectrum.

“We face similar problems to competing technologies,” says Legorburu, “such as the need to have repeaters when our lines are more than 200 metres from the backbone. But that is because we mainly use low emission power for our PLC, to avoid radio-interference problems.”

PLC has much in its favour, notably the fact that almost every home and business is connected to the electricity grid. End-users can access the Internet from any power socket, without worrying about additional wiring. They can also enjoy all the usual benefits of broadband Internet – such as video on-demand, TV and IP telephony – as well services such as security monitoring and remote control of devices.

Forging alliances

Under OPERA, a consortium of 37 partners from twelve European countries and Israel – including electric utilities, PLC technology providers, manufacturers, universities, telecom operators, and engineering and consultancy firms – is working to establish PLC as one of the leading broadband access technologies. Research in the first two years focused on the technology side, developing prototypes such as terminals, filters and couplers. The partners have also assessed issues such as bandwidth, reach distance, electromagnetic compatibility and network management.

“Our main result is the current draft of the OPERA specifications for a standard, now being presented to the European Telecommunications Standards Institute (ETSI),” says Legorburu. “We will defend this over the next two years of the project and hope it will lead to a European PLC standard.”

PLC on trial

Two-month trials in Austria, Spain, Italy and Portugal begin in August 2005, using project-developed equipment. Because the electric utilities involved have different topologies and interests, they will concentrate on different areas, such as IP telephony in Austria, Automatic Meter Reading in Portugal and the Internet in Spain.

Says the coordinator: “The goal is to sign up around 15 customers per country, which will be enough to build a business case for PLC.” The trials will also look at complementarity with other broadband technologies. A rural village, for example, could use a satellite to connect to the Internet backbone and distribute this access to individual homes by powerline.

Testing will be at 200 Mbps, ten times the average speed of current PLC services in Europe. “This is critical for utilities, because the number of customers depends on the bandwidth,” says Legorburu. “By having available 200 Mbps, we can offer broadband PLC-based services to up to 200 customers – with upload and download speeds of at least one Mbps.” It is this connection speed symmetry that beats many services now available on ADSL and cable.

OPERA partners are convinced broadband PLC could achieve 10 per cent market penetration, if a new European standard for equipment and transmission systems can be agreed. This would convince utility companies to invest more in the technology, especially for their own services related with the electrical business, such as automatic meter reading and electricity network control.

Source: IST Results