

# Beaming the internet: new project aims to connect buildings using antennae not wires

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Developing ways to connect homes and businesses to the internet without using wires is the aim of a new project announced today. The research at Imperial College London (UK) could help users across Europe to access the internet, by removing the need to lay out connecting phone lines or other cables between the public internet and a users building or network.

At present, although it is possible to make use of wireless technology within homes and office buildings, the connection from these buildings back to the public internet requires wires. External routers connect local area networks to the public internet through strings of phone lines, 'T1' lines or optical fibres.

The new project, which sees Imperial working with academic and industrial partners across Europe, aims to use wireless links with advanced antennae instead of such wires to beam a radio signal between buildings' local area networks and external routers. A mesh of routers beaming data between them would form a wireless network which would relay data to and from the public internet.

The use of wireless technologies has the potential to greatly increase access to the internet for users in urban areas and also in remote areas where it might be costly or physically difficult to lay out wires. It is also anticipated that a network using multiple-input-multiple-output (MIMO) antennae would be able to carry data at very high speeds. In comparison, present wired technologies such as ADSL and T1 lines can carry a more

limited amount of data than the wireless network, and optical fibres can carry high amounts of data but are relatively expensive.

Issues that the project will be tackling include making certain that networking technologies can work efficiently with the MIMO antennae design, ensuring that the electro-magnetic waves from the antennae head in precisely the right direction and minimising any radio interference that these waves might cause.

Professor Kin Leung, project coordinator from both the Department of Electrical and Electronic Engineering and the Department of Computing at Imperial College, said: "The internet has become an integral part of our daily life and continues to grow. Instead of relying on the use of traditional wired lines, we need to explore alternative, efficient technologies to connect users in homes and office buildings to the internet.

"Our challenge here is to invent an integrated set of new antennae and wireless networking technologies that can work together efficiently to meet such needs. We are hoping that we could see this technology in use within the next five to ten years," he added.

The project, named MEMBRANE (Multi-Element Multihop Backhaul Reconfigurable Antenna Network), is expected to run until June 2008, by which time the project team are hopeful they will have built a prototype of the key elements of the new wireless network.

The Imperial researchers are working on the project alongside partners from Lucent Technologies, ETH Zurich, Intel, CEFRIEL, Intracom and Telefonica. The MEMBRANE project is part-funded with EURO2.8 million by the European Community's 6th Framework Programme.

Source: Imperial College London

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