Is 'super-broadband' worth it for business?

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Telecommunications researchers at the Georgia Institute of Technology have developed a system with the potential to deliver the fastest broadband and wireless access yet to businesses in the next five years.

The "super-broadband" optical-wireless hybrid system was recently launched at the OFC/NFOEC Optical Conference in Anaheim, Calif., by Professor Gee-Kung Chang from the Georgia Center for Advanced Telecommunication Technology. The service would provide both ultra high-speed wireless and wired access services from the same signals, carried on a single optical fiber, and increasing online speed and access by a hundred-fold. Through the techniques developed at Chang's lab at Georgia Tech, wireless and baseband signals carried by multiple wavelengths would be converted onto millimeter wave carrier simultaneously.

In the current telecommunications market, services are either exclusively wired (cable, DSL) or wireless (cell phones, WiFi access found in cafes, trains and airplanes). The novelty of the hybrid communications system would that it could provide delivery of all of the content on current networks through a single delivery node. Customers would either plug into a wireless connection in the wall or access a wireless system, with either route allowing them to chat with colleagues and friends, watch movies, or work interactively.

The battle against slow download and browsing speeds is an ongoing headache for industry. Third-generation (3G) wireless and broadband technologies have upped the stakes for bringing faster access to

customers, but are being matched by the new bandwidth intensive products being offered. Video on demand (VoD), Voice over Internet Protocol (VoIP), and high-definition television (HDTV) have all been cited by telecom providers as the upcoming popular services to watch out for, causing the convergence of the bandwidth needs wired and wireless services. And these are applications which matter to business. VoIP allows cell-phone users to overcome the usual restrictions about where they can pick up a signal, letting them make those vital calls anywhere they can get online access. A main restriction to current widespread VoIP use? Not enough reliable, high-speed internet connections.

Technical challenges to the hybrid system still need to be overcome. Although Chang and his workmates have demonstrated a zippy 2.5 gigabits per second wireless service in the lab, antennas have yet to be designed which are capable of delivering this high-speed wireless to specific areas in a building without interfering with services in adjoining places. Then there's the issue of adverse weather conditions: the signals are being delivered over a millimeter wave range. Although this range is capable of cutting through heavy fog, it performs less well in the rain. Given that the bulk of signal transmission is planned to be in the covered buildings, this may not prove too much of a problem.

Another challenge to a viable business model for the system is financial, covering the costs of renovation work to each building where the "super-broadband" service becomes available. Although the signal would be carried through an existing optical network infrastructure installed throughout the building, the wireless component of the signal would then be detected by high-speed receivers which would have to be built into every room that the service was accessible in.

Until researchers are able to bring the price of the main components down, the system seems unlikely to appeal to home or small office users.

The most probable customer base looks likely to be large commercial locations, such as hotels or malls, where the cost of installation could be shared by many users. Businesses will need to decide whether these costs weigh up against the potential ease and mobility of high-speed WiFi hotspots that the service provides.

Ultimately this decision could be affected by whether or not a demand comes from the actual businessfolk who pass through these hotels, airports and convention centers. In the past couple of years many of these venues have been quick to provide their clients with net access; last year the Hilton hotel chain completed a $3.5 million installation of high-speed Internet services across its 12,500 United Kingdom guest rooms. While uptake of the service has been high, the question remains of whether customer needs for a faster service will be higher still to push adoption of the hybrid model.

Companies like BellSouth and NEC seem to think it will be, having already invested in the research needed to integrate the systems component needed to create a working model of the hybrid system. And time may well be on their side. A commercially viable model could be ready in five to seven years, by which time the overload of videos, music and other bandwidth-heavy products online may have businesses begging for a new, faster way of making use of networked services.

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