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Wireless Networking: Does Infrared Have a Chance?

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Scientists think that one key to future networking may reside in the infrared technology used by the lowly television remote control.

The more people and businesses add computers to those they already have, the harder scientists search for efficient ways to connect them. One dark-horse technology candidate could reside in the ordinary television remote control that you use to flick through channels.

Infrared technology, which has been around for quite a while, has so far remained in the shadow of other, newer technologies. But if current research pans out, it could become the wireless networking tool of the future.

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Slowed by Echoes

Computers are already using light beams to communicate with each other. Using standards established by the [Infrared Data Association](#) (IRDA), handheld computers like Palm Pilots are able to "beam" short notes in small data "packets." Infrared is also used in laptops to send data to printers without the need of cables.

But there are drawbacks that have proven discouraging to researchers and investors. For example, the technology works best when the transmitter is pointed directly at the receiver.

"That's a problem, even if you count bouncing the beams up to the ceiling and down toward the port," Allen Noguee, senior analyst with Cahners In-Stat Group, told Wireless NewsFactor.

"The second problem is that the data rates have never really been all that fast. You think 'light' and you think 'high-speed.' but the fact of the matter is, when the

light is bouncing all around the walls and ceiling, you get a lot of echoes. That slows the data rate down considerably. Competing technologies are more feasible right now."

Infrared Hackers

Another drawback is that infrared signals cannot pass through walls or ceilings, meaning that at least one receiver and one transmitter is required in every room.

Also, infrared's reputation suffered a setback recently when Microsoft warned that the part of Windows 2000 software that involves infrared support could allow malicious users to shut down computers by remote control.

According to the Microsoft warning, a hacker could create a special packet that exploits Windows 2000's built-in support for IRDA. The packet could flood a computer with data and create a "buffer overflow" that could cause the computer to restart.

1,000 Times Faster?

But work is going on now aimed at solving these problems.

Researchers at Penn State University are trying to develop a high-speed information network using infrared that they say could be faster, more efficient and possibly even healthier, since health experts aren't sure about the long-term effects of radio waves on humans.

Drs. Mohsen Kavehrad and Svetla Jivkova are experimenting with infrared light that bounces off myriad surfaces in a room, and which they say is capable of transmitting data at two gigabits per second -- roughly 1,000 times faster than cable modems -- and with fewer errors.

As for the echoes, the Penn State researchers claim they may have solved the problem with holographic filters. The filters produce pencil-thin beams that create wide grids as they reflect around a room, eliminating interference.

And, researchers in Germany are working on a receiver that can separate true signals from interference and echoes.

Infrared More Secure

Infrared technology has several advantages over radio waves, especially in areas such as video teleconferencing. The radio spectrum is heavily regulated, and only certain frequencies can be used.

Infrared frequencies, which are just below visible light on the electromagnetic scale, are free and available to anyone who wants to use them.

In addition, one of infrared's disadvantages can be turned into an advantage in terms of security. Since infrared cannot penetrate walls, there is less likelihood of eavesdropping than there would be using ordinary radio waves. **END**

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