The Executive Computer

By PETER H. LEWIS; NCR INTRODUCES ITS VERSION OF A NETWORK WITHOUT WIRES

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Expletives and teeth-gnashing are nothing new to network administrators, but losing a network at the country's premiere network show was bad luck indeed for the handful of companies that were showing off the system. The accident, however, left the people at the NCR Corporation's exhibit smiling.

NCR, of Dayton, Ohio, the country's fifth-largest maker of computers, was demonstrating a wireless network system called Wavelan. The system connects standard AT-class computers by a wireless technology called spread-spectrum radio transmission, which works with the DOS and Novell Netware 286 operating systems, allowing computer users to share files, programs, electronic mail, laser printers and other common office-computer resources.

NCR officials said computer files could be transferred over its spread-spectrum network almost 10 times faster than other wireless networks, which rely on infrared light. Still, the NCR system, which can transfer 2 megabits of data a second, is not fast enough for some network applications, like sending and receiving large graphics files. In those cases, a wired network like Ethernet or Token Ring, capable of transferring data at 4 million to 16 million bits a second, is required.

A Wavelan personal computer has an omnidirectional antenna, which like a three-inch-square rudder, attached to a card that plugs into any standard AT-type PC slot. Because there are no wires, a Wavelan-connected PC can be moved from one office to the next with no significant effect on the network. Most networked PC's, by contrast, have cables or wires attached to their network cards.

Wireless networks are attracting a great deal of interest, especially from companies that are growing rapidly or that have to reconfigure office designs frequently. They might be thought of as "instant" networks, because they can be set up literally overnight, with a simple rearrangement of cards.

That is a sharp contrast to conventional, wired, networks, where adding a work station or moving a worker to a different office can create headaches. Older buildings, not designed for the electronic age, often have cables snaking under floors, behind walls or through air ducts. Any changes in the wiring can create a logistical monster. Even in newer buildings, with structured wiring schemes, adding or moving a computer user is seldom a trivial operation.

The spread-spectrum transmission used by Wavelan is not new; it was developed during World War II to prevent the enemy from jamming or eavesdropping on Allied radio transmissions, and it is essentially forklift-proof. It is also impervious to construction crews that might accidentally saw through the wrong place in the office wall.

In a spread-spectrum network, data travel through the air, not through the coaxial cables or wires that connect most networked PC's today. Also, the radio signals can travel through office partitions and sheet-rock walls (though not through concrete or steel). It is this ability to pass through typical office partitions and walls that gives spread-spectrum an advantage over the other main type of wireless network. In infrared networks, computers beam information to one another along direct, focused paths of light. If any object blocks the line of sight between computers, the signal is interrupted and data can be lost. At least one company, Photonics Inc. of Campbell, Calif., has sidestepped this problem by aiming the infrared beams at relay stations placed on office ceilings, lessening the risk that someone walking past will cut the data flow.

NCR officials said the effective range of a Wavelan network is several hundred feet, although several wireless networks can be connected by special, optional antennas.

Cees Links, director of product management for NCR Systems Engineering B.V. in Nieuwegein, the Netherlands, said that because Wavelan does not use physical cabling, it is much more flexible for office, retail, commercial and industrial settings. He said he thought Wavelan could be an alternative to Ethernet, Token Ring, Arcnet and other conventional network hook-ups in almost all business applications.

That was disputed by Bill Redman, director of local area communications at the Gartner Group, a market research company based in Stamford, Conn., who said Wavelan was probably best viewed as a niche product for certain specialized needs. These might include offices in historic buildings where remodeling for wired networks would be impractical, or where temporary networks are needed, as in the case of a team of reporters covering a convention or a team of auditors working at the client's site, he said.

"In companies where there is a lot of reconfiguration, or some limitation on cabling, there is little doubt that Wavelan would augment wired systems very well," Mr. Redman said. (One computer with a card for a wireless network and a card for a wired network could link the two systems.) "But it's expensive, at $1,390 per machine," he said. "These days I can get a production-level Ethernet card for about $250, and wiring is often no more than $150 per run."

NCR officials, citing data provided by other market researchers, insisted that the costs of conventional wiring were actually much higher, ranging from $500 to $1,500 for each computer on a network. High labor costs involved account for the most expense, Mr. Links said.

NCR officials, noting spread-spectrum's counterespionage origins, said data security on Wavelan was actually superior to that on a wired system. Spread-spectrum broadcasts are low-power signals across a broad band of frequencies from 902 to 928 megahertz. Only authorized users that know the "spreading pattern" of the frequencies and how to unspread it can listen in.

NCR also gives each Wavelan network its own identifying characteristics, so two Wavelan networks can operate in the same area without interfering with one another. The network is immune to interference from radios, cellular phones or other communication devices - but not from some military radar. Mr. Links said if the network were adjacent to a military base, some interference might result.

Although the network is essentially a broadcast station, the Federal Communications Commission does not require a broadcast license for spread-spectrum operations. Khaled Marrei, vice president of NCR's financial systems division, said the company was working with the F.C.C. and international regulatory agencies to explore the possibility of increasing the power and frequency available for spread-spectrum.