



SENDING NOTES IN NETLAND

E-Mail Zaps Without a ZIP

By Simson L. Garfinkel
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HUNDREDS of thousands of people communicate by "e-mail." When Vicka Cory first met Alan Walker, the two didn't exchange telephone numbers — they exchanged electronic mail addresses.

Over the next two years, Ms. Cory and Mr. Walker primarily communicated not by telephone, nor by letter, but by keyboard. To Walker, Cory's name was "ins—avrd@jhunix" — an account on a computer at Johns Hopkins University. Likewise, when Cory wanted to send a reply, she addressed to "hobbit@rutgers@wiscvm.arpa," Walker's computer account at Rutgers University in New Jersey.

Rather than being borne by Cupid, these notes were carried by a vast network of university, corporate, and government computers, all connected for the purpose of transporting electronic mail. Sometimes, Cory says, the e-mail would take less than 3 minutes to travel the 200 miles that separated the two of them.

The world's first computer network, called ARPANET, was conceived in 1969 by the Pentagon's Advanced Research Projects Agency. Its purpose was to let defense contractors across the country gain access each others' computers and transmit files.

Electronic mail wasn't part of the original ARPANET plans, says John Postel, one of the network's fathers and a researcher at the Information Sciences Institute, near Los Angeles. "But, very soon, the network started being used to transport e-mail from one site to another. . . . It was one of the very spectacular [unexpected benefits]."

Since then, hundreds of networks have been built. Computer companies such as IBM and Digital Equipment have their own networks. New York State links businesses and universities through the NYSER-net. The National Science Foundation (NSF) has budgeted \$13 million over the next five years to set up its own network: Today the NSF-net connects with 351 college, regional, and governmental networks across the country.

For most people who have ac-

cess to computers on the network, e-mail is free. Network costs are usually included as part of operating a computer, like electricity and air conditioning.

People who don't have access through their school or workplace can purchase access to the network through a commercial electronic mail carrier. MCI Communications, AT&T, and GTE Telenet all offer electronic mail services, often for less than a dollar per message.

More than 200,000 people are signed up for MCI mail alone, says Mr. Postel.

"You can certainly get to all the countries in Europe," says Jim Sweeton, who manages the NSF-net. "You can get to Israel, Africa, Tunisia, . . . parts of Asia, Japan, and Korea." There are also links to South America, Aus-

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tralia, and New Zealand, he says.

The real power of networking is brought about by special computers, called "gateways" or "bridges," which can forward mail from one network to another. Bridges make it possible for virtually anybody on one network to send mail to anybody on another, provided the particular path to follow is known.

Nobody knows the total number of people who can be reached by the network. Estimates run as high as half a million. Nobody even knows how many machines are connected, but most estimates are at least 60,000.

Many people are first exposed to e-mail in college. John Baker, a freshman at the Massachusetts Institute of Technology, uses electronic mail to communicate with his faculty adviser. "I had a problem getting [a form] back, so I sent him a note," Mr. Baker says. Last semester, Baker was enrolled in a writing course and handed in his essays by e-mail.

"Mostly I talk to my friends at other schools," says Barbara Ex, a graduate student at MIT. "I'm not really good at writing letters, but I find it easy to write computer mail. I go down to log-in

and see what my mail is. . . . If there is a message, it is really easy to type one back."

But e-mail extends beyond college. When Andrew S. Gerber started managing a group of computers at McDonald Douglass Information Systems in Denver, the first thing he did was put the computers on the USENET network.

"We are using a cutting edge window system," Mr. Gerber explains. "It is very valuable to be able to exchange mail with other people using the same system. [We get] reports of bugs and fixes [in the network]." Gerber says he also uses the network to keep in touch with friends from college.

But all is not perfect in "netland," as the electronic landscape is sometimes called. At IBM, for instance, nearly 400,000 employees have access to the company's internal network, but certain IBM employees are authorized to send and receive mail with the outside world. Likewise, New York's Columbia University prevents students on its central computer from sending mail over certain networks.

Instead of sending mail to an individual, says John Romkey, a network consultant who works in the San Francisco Bay area, people can also send messages to "mailing lists." A mailing list is an electronic address that automatically forwards messages to a number of other people.

"I send mail to several technical mailing lists," Mr. Romkey says. "They tend to talk about the inner workings of the network protocols, or electronics, or mathematics."

Unlike paper mail, the one thing the electronic mailing lists aren't used for is advertising. "A lot of the networks that carry the mail are government sponsored. They can't carry blatantly commercial things like advertisements," Romkey says.

"The USENET isn't government sponsored, but there is a general agreement that advertisements will not be carried on it. Every so often someone posts an advertisement to a news-group and they get 200 to 300 people sending them hate mail for it."

Nevertheless, says Romkey, the electronic networks do have their own form of junk mail: social mailing lists, where people gossip, tell jokes, and send out invitations to parties.