

## E-WORLD

By THOMAS E. WEBER



# Maverick Programmers Prepare to Unleash Anarchy on the Web

**IF YOU THINK** the Internet is an untamed frontier now, just wait. A new technology sweeping through cyberspace promises to unleash an entirely new wave of anarchy onto the Web, making it impossible for anyone to protect intellectual property online or shut down a rogue Web service.

The early warning came March 14 from a tiny computer program called Gnutella. Created by renegade programmers at a unit of America Online, Gnutella lets people share computer files—mainly music—over the Net.

AOL yanked the Gnutella Web site within a day, but it was too late. Gnutella is humming with hundreds of people swapping Pink Floyd cuts, and no one can stop them.

The technology that makes Gnutella thrive is popping up all over the Net, and it goes way beyond just music.

Known as a “distributed” or “peer-to-peer” approach, it’s pretty much the

opposite of the way the World Wide Web works. On the Web, people get information from central repositories, or servers. Shutting down a server cripples a Web site, as demonstrated in last month’s hacker attacks.



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**ON A DISTRIBUTED** system there is no central brain to attack. So there’s almost no way to turn it off short of finding and unplugging every single machine connected to it. Shutting down one of these networks would be like trying to stop every phone conversation on the planet.

“This will make censorship impossible,” says Ian Clarke, a young programmer in London with grand plans for peer-to-peer technology. For the past 18 months, he and a handful of collaborators have spent their spare time creating a peer-to-peer alternative to the World Wide Web. They call their system FreeNet, and they’re getting ready to unleash their prototype in a matter of days.

FreeNet abandons the concept of the Web “site.” Anyone would be able to make their computer a node on FreeNet by installing a piece of software. Information posted on FreeNet would be automatically replicated and stored on multiple member nodes. If someone wanted to search for something—an academic paper, say, or a photograph—the request would move from one computer to the next until it encountered and accessed the desired information. The approach would foil tracking efforts and make it nearly impossible for someone to remove information from the network.

Mr. Clarke thinks those capabilities add up to a bold new age for the Internet. He envisions FreeNet as a way for political dissidents to publish their views without fear of being found out. Read his fiery manifesto at <http://freenet.sourceforge.net>. But he admits there’s a dark side, too. If FreeNet works as advertised, it could easily be adapted for unsavory purposes, such as distributing child pornography.

“This system is, in a sense, above the law,” he says.

FreeNet may be new, but the concept of distributed networks has a long history. The Internet itself was constructed as a distributed network. Look deep inside the Net and you’ll find tiny packets of digital information finding their way from one computer to the next, largely without any central control. But then the user-friendly World Wide Web came along and created a new layer on top of the Net, centered around the servers that host Web sites. In a sense, FreeNet and Gnutella are a return to the Net’s roots.

**THESE FLEDGLING** networks are now mutating at warp speed, driven by the explosion in online music. A controversial program called Napster was designed for college students to trade songs in the popular MP3 file format. But last week Napster buffs branched out into everything from full-length feature films to copies of Microsoft Word thanks to Wrapster, an underground program written to turn the music-trading community into an all-purpose bazaar.

Napster, though largely peer-to-peer, relies on a central server to act as a directory. That means someone can pull the plug—say, a court ruling in favor of the music companies now suing Napster. But Gnutella is practically invulnerable because it’s diffuse. You have to find one other computer running the software, then you’re automatically hooked to all of the other Gnutella machines that computer knows about. And by installing the program on your PC, you turn your own machine into part of the network’s library, too.

Strangers can tap into your computer at a furious clip. A few nights ago I watched as anonymous Gnutella users scanned my laptop for the computer game Quake, songs by Fleetwood Mac, and a variety of X-rated images. (For the record, they found none of the above.) The program lets you decide which portions of your hard drive can be searched and which are off-limits, but it’s disconcerting nonetheless. If you want to give it a try, visit <http://gnutella.nerdherd.net>, one of the growing number of Web sites offering Gnutella downloads and information.

Computer-security expert Avi Rubin warns Net users to be wary. A strange file-sharing program might become a hacker’s tool for looting your entire hard drive. But Mr. Rubin, a researcher at AT&T Labs, is working on another distributed network. Called Publius, after the pseudonym used in the Federalist Papers, it’s designed to defeat censorship.

And Gnutella fans like Bryan Mayland, 26, of Tampa, Fla., are already developing new versions aimed at supporting thousands, not hundreds, of users. “This is unstoppable,” Mr. Mayland says.

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