

New software allows ISPs and P2P users to get along without getting too cozy

Peer-to-peer (P2P) file-sharing services, which connect individual users for simultaneous uploads and downloads directly rather than through a central server, are reported to account for as much as 70 percent of Internet traffic worldwide. That level of use has led to a growing tension between Internet Service Providers (ISPs) and their customers' P2P file-sharing services, and has driven service providers to forcefully reduce P2P traffic at the expense of unhappy subscribers and the risk of government investigations.

Now researchers at Northwestern University's McCormick School of Engineering and Applied Science have discovered a way to ease that tension: Ono, a unique software solution that allows users to efficiently identify nearby P2P clients. The software, which is freely available and has been downloaded by more than 150,000 users, benefits ISPs by reducing costly cross-network traffic without sacrificing performance for the user. In fact, when ISPs configure their networks properly, their software significantly improves transfer speeds – by as much as 207 percent on average.

Ono, developed by Fabián E. Bustamante, assistant professor of electrical engineering and computer science, and Ph.D. student David Choffnes, has been deployed for the Azureus BitTorrent P2P file-sharing client.

"Finding nearby computers for transferring data may seem like a simple thing to do," says Choffnes, "but the problem is that the Internet doesn't have a Google Map. Every computer may have an address, but it doesn't tell you whether the machine is close to you."

Worse yet, the simplest solution to finding computers that are close to you requires measuring the distance to every single one – an operation that is too costly and time consuming to be practical.

Instead, Ono – Hawaiian for "delicious" – relies on a clever trick based on observations of Internet companies like Akamai (incidentally Hawaiian for "clever"). Akamai is a content-distribution network (CDN), which offloads data traffic from Web sites onto their proprietary network of more than 10,000 servers worldwide. CDNs such as Akamai and Limelight power some of the most popular Web sites worldwide and enable higher performance for Web clients by sending them to one of those servers within close proximity.

Using the key assumption that two computers sent to the same CDN server are likely close to each other, Ono allows P2P users to quickly identify nearby users.

Ono is different from other software applications that address the conflict between ISPs and P2P traffic (see, for example, the recently announced partnership between Verizon and P4P) because it requires no cooperation or trust between ISPs and P2P users. Ono is also open source and does not demand the deployment of additional infrastructure. Bustamante's Aqualab research group has made Ono publicly available since March 2007 and recently published code that makes it easy to incorporate Ono services into other applications.

"The more users we have, the better the system works, so we're just trying make it easy to spread," says Bustamante.

Ono (and other related source code) is available at the Aqualab Web site at

<http://aqualab.cs.northwestern.edu> .

Source: Northwestern University

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