Peer-to-peer without Napster

Whether you call it P2P or distributed computing, this emerging technology is growing quickly. Since Intel Capital has identified more than 80 P2P startups, it’s time to get to know terms like Gnutella and OpenCOLA. (And leave Napster alone... it takes up too much bandwidth on the server!)

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Peer-to-peer (P2P) is a communications model in which each party has the same capabilities and either party can initiate a communication session. Other models with which it might be contrasted include the client/server model and the master/slave model. A new generation of enormously scalable P2P applications has been defined by noncommercial developers that enable and encourage users to share unlimited content via point-to-point file transfers.

Clay Shirky of O’Reilly Network (www.oreilly.com) describes peer-to-peer as, “servers talking to one another,” and goes on to state that people are even “applying the label to email and telephones.”

Meanwhile, Napster, which jump-started the conversation, is not peer-to-peer in the strictest sense, because it uses a centralized server to store pointers and resolve addresses. Shirky defines P2P as “a class of applications that takes advantage of resources — storage, cycles, content, human presence — available at the edges of the Internet. Because accessing these decentralized resources means operating in an environment of unstable connectivity and unpredictable IP addresses, P2P nodes must operate outside the DNS system and have significant or total autonomy from central servers.”

Om Malik of Red Herring magazine explained that peer-to-peer computing is “just one-third – grid computing and distributed information infrastructure being the other two-thirds – of a very hot idea: distributed computing.” Grid computing harnesses idle MIPS (or wasted computing power) and ties them together using the cumulative power to perform supercomputer-caliber tasks.

How large is the peer-to-peer area? At last count, Intel Capital, the chipmaker’s investment arm, had identified more than 80 P2P startups.

In the near future, the networking community will begin further refining the concept of P2P. Resulting from this, a wider range of P2P-architected applications competing for attention with traditional desktop and client/server systems will appear, and P2P protocol standards will be adopted to a greater extent. Also, the open process of public debate will help settle some of the consequences of the effortless P2P-based information distribution, on copyright and intellectual property law. [See: Don’t be Caught Napping on P.50]

Opportunities

- **Content delivery networks** are intelligent broadband IP network highways intended to enhance a user’s Internet experience with rich, multimedia services that often involve streaming audio and video. They can also be interactive in nature.

- **Online marketplaces and e-procurement.** By using P2P technology, catalogues for digital market places could be stored and updated by the information’s owner. Right now, most exchanges create searchable product catalogs by collecting tons of data from many suppliers and dumping it into a central database. The data arrives on tape or gets downloaded from the Internet and must be cleaned up by hand. By the time buyers search it, many prices and quantities are outdated. A P2P network could let buyers search across suppliers’ computers and see up-to-the-second prices. “The basic problem is that if there’s any promise in this technology, there are immediately going to be a hundred other vendors offering it because it’s so easy to implement,” says Eric Scheirer, an analyst at Forrester Research, an IT
consultancy.

- **Auctions.** Ebay could demonstrate how P2P technology might penetrate the auction area by using P2P to circumvent the requirement to store everything on their databases. As an online auction user, you “could scan several auctions in progress and bring back the very latest bids. Or you could feed your bid to 25 auctions and see instantly where your offer ranked in each one – information no [web] crawler can retrieve.”

- **Increased Computing Power.** Jarret Adams of Red Herring.com states that, “for organizations with computer in many different locations, P2P networks can increase computing power by utilizing the hard drives on idle workstations. Intel claims it has already saved $500 million by harnessing spare computing power on its global network. File-swapping using a P2P configuration also enables a new level of collaboration between distant employees, who can pass huge amounts of data directly between their computers without routing through a designated server. But P2P must overcome several practical and theoretical obstacles, from a lack of security to the problems involved in the transfer of a huge amount of data, before it is ready for commercial use.”

**P2P Challenges**

P2P presents some challenges that companies will choose either to deal with or to avoid the P2P area completely.

- **Intellectual Property.** [Besides Napster], some business models use an element of trust in this area, but proving this to be sustainable has yet to occur. OpenCOLA (Open Collaborative Object Lookup Architecture), a Canadian outfit, offers a peer-to-peer search program for consumers. Unlike Napster, OpenCOLA claims to have a revenue model like “the honor system. All peer-to-peer networks enable intellectual property to be published without a publisher and without having to put up a web page. OpenCOLA provides an infrastructure that allows fans to pay artists whose work they obtain. The company is betting that users will be more likely to pay a small fee (in nickels and dimes) for intellectual property, and it plans to derive revenue from the float on these payments.”

- **Bandwidth.** One drawback of the P2P system can be in the lack of scalability. A report from web publisher Clip2 says the peer-to-peer Gnutella system is collapsing actively slow dialup modems. The report states: “The scalability of a Gnutella network to accommodate more users performing more searches is limited by the lowest bandwidth links prevalent within the network. Usage of the public Gnutella network has grown to the point that a ‘dialup modem barrier’ has been hit, with the result that network usability has degraded considerably.”

- **Enterprise security and liability.** Enterprises face such issues as security and liability as P2P becomes more widespread. A March 2000 Gartner Group report states, “Peer-to-peer, or ‘distributed,’ technologies under development for use on the Internet represent a security threat to enterprises because they provide unknown, external users access to the desktops of employees that install the software. However, corporate firewalls can block the ports and protocols used by this technology, and antiviral products can be updated to detect inbound executables.”

On the flip side, subscription security services, such as Rumor, created by Network Associates’ subsidiary myCIO.com, utilize peer-to-peer technology in order to combat security issues.

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