AT&T
Intranet

Front Page
Archives
HR News

Patents
Labs Research
ATT Labs

InfoCenter
POST
IntraSearch

Feedback
Form

Front Page

3/12/03

Research Excellence Award

Despite the increasing use of broadband access at home, a large percentage of Internet users still rely on dial-up connections. One consideration for many users in selecting a dial-up ISP is its access speed, which is usually dominated by the speed of the "last mile". Inktomi's Personal Edge (PE) software, which would be installed on the PC client, was designed to improve Web download speed for dial-up customers by supporting a compression scheme to reduce the number of bytes transferred, in conjunction with a network cache, and by supporting enhanced caching on the client to avoid downloading objects over the slow link unnecessarily. For example, PE's differential caching algorithm decomposes a web page into a base page and a "delta". When a user repeatedly visits the same web page, the base page can be served from the local cache and only the "delta" needs to be transmitted. Other client caching strategies also minimize unnecessary traffic on the access line. This technology is of potential interest to AT&T Worldnet because it can improve the browsing experience of dial-up users and enhance customer retention.

Worldnet wanted to better understand the technology before investing in it, and, last spring, called upon members of Labs Research to conduct a detailed evaluation of the Personal Edge technology and its performance. Since Research pioneered work on differential encoding and has extensive experience in Web caching, the researchers, all in the Internet and Network Systems Research Lab, were in a good position to lead the evaluation. The members of the team – Chuck Kalmanek, Department Head, and Zhen Xiao, Senior TSM both in the Networking Research department; and Misha Rabinovich, Technology Consultant in the Database Research department – worked with Inktomi engineers to set up a test bed in the Research lab for comparing the download time of a Web page with and without Personal Edge. The test bed consisted of a group of PCs that connected to the Internet through analog phone lines, with half of the PCs using Inktomi PE and half not using it.

Chuck Kalmanek   Zhen Xiao   Misha Rabinovich

For their contributions to the evaluation of the Inktomi PE product for the Worldnet Service team, and their efforts which "made it possible for AT&T to avoid spending $10 million in capital expenditures, as well as other implementation costs, through the development of a test plan which accurately assessed the capabilities and limitation of this (Inktomi) technology," Labs Research VP Rob Calderbank presented Chuck, Zhen, and Misha with Research Excellence Awards.

Initially, Inktomi had proposed a test plan where a machine repeatedly would visit a list of popular URLs in a loop. The Research team found that such a testing methodology did not reflect the access dynamics of a typical dial-up user and that it overestimated the benefit of PE. Instead, the Research team proposed a test plan where a machine replayed the sequence of user requests from a proxy log. By doing so, they were able to obtain a more realistic estimation of the benefit of PE and discovered certain phenomena that were not revealed in the initial tests. Such information was valuable to Worldnet in its business negotiations with Inktomi and saved AT&T millions of dollars that would have been spent on the PE product. Moreover, the Research team's feedback also helped Inktomi to improve the "base page generation" algorithm in its product.