A Service Approach to Providing Off-Campus Internet Access

by Austin Shelton

The University of California, Berkeley’s Information Systems and Technology division developed a service approach to meeting the challenge of providing off-campus Internet access to more users at a reasonable cost, from wherever they access the campus network, while maintaining quality control over services and support. For this service-oriented approach, the University received the 1996 CAUSE Award for Best Practices in Service.

The Information Systems and Technology (IST) division of the University of California, Berkeley has for many years provided free, off-campus dial-up access via modems to campus computers, a service traditionally used by information systems staff and a few faculty members. But with the widespread growth of the Internet, e-mail, and the World Wide Web in recent years, a very large portion of the campus community found access to the network to be essential to their teaching, learning, and research activities. Since much of this activity takes place off-campus, in dorm rooms, homes, or even from across the country, IST began to experience enormous pressure to expand and improve off-campus network access. In 1994, SLIP/PPP1 service was offered and more high-speed modems were added to the 600-modem pool to try to keep up with the accelerating demand among the University’s user base of 44,000 students, faculty, and staff.

The problem

By the spring of 1995, it was clear that the campus had a problem. To begin with, supporting network access from both on and off campus was occupying most of the time of the user-support staff to the neglect of other things. Secondly, the general modem pool was saturated from before noon until after midnight, and it was becoming clear that the campus itself would not be able to meet the rapidly growing need for dial-tone access to the network. We were already spending nearly $500K per year and facing the prospect of acquiring thousands of modems to meet projected demand.

Our solution

We decided to address both aspects of this problem at once. We would (1) develop and distribute a comprehensive package of software and services that would meet the needs of our users from wherever they were accessing the network, and (2) leverage the value of these products and services to gain pricing advantage by partnering with a commercial Internet Service Provider (ISP) and cooperatively supporting our users.

Building the BIK

Early in 1995, we began to develop a single suite of software to replace all of the various individual products and combinations of products we had been distributing for network access. The resulting package was named the Berkeley Internet Kit (BIK).

The BIK allowed users to install everything needed for networked computing in one sitting. The package contained appropriate IP components, an e-mail client (Eudora), Netscape, news readers, etc., in a suite known to run in a standard set of environments (Mac OS 7.x, Windows NT, Windows95, etc.). An installation mechanism allowed the user to configure the individual pieces by following the instructions included with the kit. This reduced user questions because the “kit” installed everything needed.

The BIK was released in the fall of 1995. We developed a “one-stop shopping” Web site that enabled new users to set up an e-mail account and a home-IP account online. Users without access to networked computers were invited to use those in our open-access computer labs. The Web page also permitted them to automatically download the BIK to diskettes, an option which proved to be problematic. Downloading took too much time and was prone to failures, increasing the workload of the computer labs. Failure to read the documentation increased the number of contacts with our help desk.

1 SLIP/PPP stands for “Serial Line Internet Protocol” and “Point-to-Point Protocol.”
In the spring semester of 1996, we produced the BIK in a “shrink-wrap” package that contained printed documentation and all of the software on diskettes, priced to cover only production costs. We then actively discouraged downloading in the labs. This “BIK-in-a-box” proved to be very popular—2,500 boxes were sold during the spring semester.

Partnering with an ISP

A solution to the problem of insufficient modem resources was to encourage campus users to subscribe to one of the commercial Internet Service Providers in the Bay Area. As a dial-tone provider, ISPs provide some real advantages over the campus modems. The ISP is able to provide “toll-free” access for its customers. Moreover, a nationwide ISP would be able to provide access from many Points of Presence (POPs) around the country. This could be useful to faculty at conferences or students at home during breaks. Two challenges we would need to address, however, were: (1) the pricing of the service would have to be very reasonable to overcome potential resistance from those who had come to expect free Internet access; and (2) the connectivity packages ISPs provided did not contain the functionality of the software that we had been distributing.

During BIK development, IST began discussions with ISPs who had shown an interest in marketing their services to the campus. NETCOM met our basic requirements for an ISP fee (PPP services, P.01 grade of service, and nationwide points of presence). Furthermore, they recognized that our BIK contained a far richer suite of functionality than the all-in-one package they provided. Since we were already providing e-mail to our users, it would not be necessary for them to do so. We were able to quickly develop the NETCOM Higher Education Access Program, whereby they would provide dial-tone service to any campus customers at reduced rates, while NETCOM provided e-mail services and the BIK software.

NETCOM provided twenty-four-hour, seven-days-a-week toll-free telephone support, much more extensive coverage than IST’s help desk could offer. It made sense for NETCOM personnel to provide the first level of support, since the majority of calls would involve problems with network transport and account administration, about which we could do nothing. We provided them with current releases of our software and documentation, including ongoing software updates and revisions. Furthermore, we trained their support staff in the installation, configuration, and use of our software on both Macintosh and Windows computers. They agreed to make every effort to resolve campus customer problems and to refer problems they could not resolve to our support staff via e-mail.

NETCOM began advertising their new customized services to the campus in December of 1995. We felt that we had developed an adaptable model under which we could outsource dial-tone access to the campus network, and at the same time ensure a very high quality of service tailored to the unique needs of our users at more affordable rates.

A great success—with some unintended consequences

Our initial evaluation of the project was that it was a huge success. In a very short period of time, thousands of copies of the BIK were distributed. We had obviously hit upon a great need among the less computer-savvy consumer of network services to have Internet connectivity software packaged in an immediately understandable format.

Our ISP partnership was also well received, and its success attracted other ISPs to working with us. IST concluded a pilot study with Metricom—a provider of wireless data communications—and later releases of the Berkeley Internet Kit were pre-configured for use with a Ricochet modem. The Ricochet University Partners Program is largely a clone of our NETCOM agreement.

After two years, however, we have a broader perspective of the issues involved in providing low-cost, reliable Internet access to a large campus population. Several unintended consequences have led us to rethink our approach, and we would now not recommend the course of action we took to another institution.

Alas, there was a considerable resistance on the part of the campus community to paying for a NETCOM account—despite its competitive pricing and reliable connectivity, and even though it is more difficult than ever to obtain a dial tone from our modem pool. While we continue promoting the benefits of the service to those who can afford it, we cannot yet discontinue our free modem pool and do not expect to see any reduction in the load on those modems for a long time.

Besides not realizing any relief from modem-pool support, the success of the BIK had an unexpected effect on related services. The number of new requests for free electronic mail skyrocketed in conjunction with the introduction of the BIK, no doubt due to the coupling of the BIK with this service on the “one-stop-shopping” Web page. The BIK’s success also created a...
tremendous number of requests for assistance at our help desk; staff are now overwhelmed by the volume of BIK support required. While we continue to engineer the BIK to be ever more foolproof, the intrinsic complexity of dial-up Internet software continues to be problematic for our users, who are mostly not computer literate.

Also, the more we improve the BIK for the users, the more complex and prone to error it becomes. We are at the mercy of the vendors of BIK components (Netscape, Qualcomm, etc.), and often find ourselves pushed against deadlines, waiting for the latest release of some component of the BIK. The increasing complexity of operating systems and the rapid change in them also keeps us scurrying to keep up.

We have come to the conclusion that the very idea of supporting users remotely, that is, via telephone or in any manner by which we do not have direct access to the computer in question, is ineffective. The networking and operating system components are so interwoven and dependent upon one another that in many cases we need to personally examine the computer itself to determine the cause of failure. We are now exploring alternate support models to address this need.

There are also ISP-related support problems. Supporting a multitude of different value-added packages represents an enormous cost overhead for an ISP compared to supporting only one such package. Our NETCOM collaboration led them to improve their value-added software package (called NETCOMplete) which they now promote instead of ours in an effort to reduce their end-user support costs. In addition, our arrangement with NETCOM (whereby we provide e-mail and they provide the end-user support) works poorly for them. The costs of providing e-mail to a large number of users is trivial compared to the cost of supporting those users. Their NETCOMplete package includes an e-mail account and is easier for them to support.

We are working with ISP providers to develop ways to leverage their services to make them attractive for reasons other than ease of connectivity (for example, by providing Web space, something we do not offer). Also, we are encouraging them to increase their marketing activities, albeit with little success so far. We are also exploring the possibility of “volume purchase” arrangements, by which we might buy a large number of accounts in a block for redistribution to campus users at a (possibly) subsidized and, for the end-user, reduced cost.

Looking to the future

Although it was a pioneering effort in its time, the BIK will eventually become obsolete. The two aspects of network functionality—connectivity and applications—provided in the BIK will ultimately move into the desktop.

In the first case, the major manufacturers of operating systems are racing to integrate dial-up networking capability into their systems. The need for custom installers to correctly install and configure complex Internet/PPP connectivity software will become unnecessary.

With regard to applications, the actual functionality of most network software will become available as components integrated with the desktop. The need for stand-alone applications to perform particular network tasks will become superfluous.

Of course, fully integrated dial-up networking and comprehensive component architectures are still works in progress. So we expect that the BIK will continue to enable users to get started on the Internet until the convenience it provides is commonplace in vendor-supported systems. In the meantime it will evolve to take advantage of new technologies and provide a bridge to them for our users.

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