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THE MAGAZINE OF USENIX & SAGE

July 2001 • Volume 26 • Number 4

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USENIX & SAGE

The Advanced Computing Systems Association &
The System Administrators Guild

USENIX news

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The Felten Case

By the time you read this much will have happened with this affair. Still, we thought you might like to see a copy of the news release sent out on June 6 by the Electronic Frontier Foundation.

The USENIX Association joined the case as a plaintiff since it seems clear that the Digital Millennium Copyright Act (DMCA), as interpreted by the recording industry, threatens to limit what may be presented at USENIX Association conferences and workshops.

Trenton, NJ – The Electronic Frontier Foundation (EFF) today asked a federal court to rule that Princeton University Professor Edward Felten and his research team have a First Amendment right to present their research on digital music access-control technologies at the USENIX Security Conference this August in Washington, DC, despite threats from the recording industry.

When scientists from Princeton University and Rice University tried to publish their findings in April 2001, the recording industry claimed that the 1998 Digital Millennium Copyright Act (DMCA) makes it illegal to discuss or provide technology that might be used to bypass industry controls limiting how consumers can use music they have purchased.

Like most scientists, the researchers want to discuss their findings and publish a scientific paper about the vulnerabilities of several technologies they studied. Open discussion of music customer control technologies has resulted in improved technology and enhanced consumer choice.

“Studying digital access technologies and publishing the research for our colleagues are both fundamental to the progress of science and academic freedom,” stated Princeton scientist Edward Felten. “The recording industry's inter-

pretation of the DMCA would make scientific progress on this important topic illegal.”

Felten's research team includes Princeton University scientists and plaintiffs Bede Liu, Scott Craver, and Min Wu. Also members of the research team and plaintiffs are Rice University researchers Dan Wallach, Ben Swartzlander, and Adam Stubblefield. Another scientist and plaintiff is Drew Dean, who is employed in the Silicon Valley. The USENIX Association has joined the case as a plaintiff.

The prominent scientist and his research team originally planned to publish the paper in April at the 4th International Information Hiding Workshop. However, the scientists withdrew the paper at the last minute because the Recording Industry Association of America (RIAA) and the Secure Digital Music Initiative (SDMI) Foundation threatened litigation against Felten, his research team, and the relevant universities and conference organizers.

SDMI sponsored the “SDMI Public Challenge” in September 2000, asking Netizens to try to break their favored watermark schemes, designed to control consumer access to digital music. When the scientists' paper about their successful defeat of the watermarks, including one developed by a company called Verance, was accepted for publication, Matt Oppenheim, an officer of both RIAA and SDMI, sent the Princeton professor a letter threatening legal liability if the scientist published his results.

EFF filed the legal challenge in New Jersey federal court against RIAA, SDMI, Verance, and the U.S. Justice Department so that the researchers need not fear prosecution under DMCA for publishing their research.

“When scientists are intimidated from publishing their work, there is a clear First Amendment problem,” said EFF's Legal Director Cindy Cohn. “We have

long argued that unless properly limited, the anti-distribution provisions of the DMCA would interfere with science. Now they plainly have.”

“Mathematics and code are not circumvention devices,” explained Jim Tyre, an attorney on the legal team, “so why is the recording industry trying to prevent these researchers from publishing?”

USENIX Executive Director Ellie Young commented, “We cannot stand idly by as USENIX members are prevented from discussing and publishing the results of legitimate research.”

EFF is challenging the constitutionality of the anti-distribution provisions of the DMCA as part of its ongoing Campaign for Audiovisual Free Expression (CAFE). The CAFE campaign fights over-reaching intellectual property laws and restrictive technologies that threaten free speech in the digital age. “The recording studios want to control how consumers can use the music they buy. Now they want to control scientists and publishers, to prevent consumers from finding out how to bypass the unpopular controls,” said EFF Staff Attorney Robin Gross.

Media professionals have been invited to attend a June 6 press conference and simultaneous teleconference on the Felten case featuring the legal team and Professor Felten.

The legal team includes EFF attorneys Lee Tien, Cindy Cohn, and Robin Gross. Outside lead counsel Gino Scarselli, argued the Junger case where the 6th Circuit Court of Appeals ruled unanimously that computer code is creative expression worthy of First Amendment protection. Also members of the legal team are James Tyre, a technology savvy lawyer from Southern California who co-founded the Censorware Project and wrote an amicus brief in *Universal v. Reimerdes*, and Joe Liu, a Professor of Law at Boston College. Local counsel in New Jersey are First Amendment specialists Frank Corrado of Rossi, Barry,

Corrado, Grassi and Radell, and Grayson Barber, chair of the ACLU-NJ privacy committee.

For more background on Professor Felten and his team's legal challenge:

<http://www.eff.org/sc/felten/>

Upturns and Otherwise

by Daniel Geer

President, USENIX
Board of Directors



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The best (only good?) part of accumulating years is a chance to see long waves. I've been on this rock long enough to see trees mature, which should just about settle the question about me, and if that doesn't, this will: A former colleague of mine, talking to his grandfather on what turned out to be his grandfather's deathbed, asked him if he was sorry to be going. The grandfather said, “I have only one regret: I won't get to see how it all turns out.”

That so sums up the essence of the long wave, I want to repeat myself. The chance to see long waves is a privilege, and of course, it sure as hell beats the alternative. That said, I've seen downturns before and you'll see them again. While anyone can prosper in fat years, only the well-prepared prosper in lean years. Yeah, there is an element of luck in it, but just like Satchel Paige said, “The harder I work, the luckier I get.”

It is during a downturn that evolution happens. It is when there is survival pressure that survival of the fittest has mean-

ing. Everyone who is enough of a USENIX member to be reading this is off to a good start and if you want to read that as elitist, please do. For all that any decent person wants to share a measure of their good fortune, survival is more elemental than decency, and it is a form of power. Power is never given, only taken. Each of us, when confronted with a world in which, especially suddenly, there is less to go around, will have to choose what they want to maximize, and I suggest you maximize your marketability.

Speaking purely idiosyncratically, which is to say with the subjective bias of personal myopia, what has worked for me through several complete turns of the business cycle is to always be worth more than I am paid, to never assume that any saleable skill necessarily comes with a durable market, that hybrid vigor works for careers even better than it works for seed corn, that nothing begets loyalty like a frightening commitment to excellence in preference to maneuvered advantage, and that more opportunities exist than anyone can ever exhaust but only on the condition that you keep your eyes open enough to notice the blamed things.

Where does USENIX fit in this? For me, at least, it has been one long tub soak in hybrid vigor, a daily wake-up call telling me what it is I do not know and didn't even know I didn't know, a place to teach and be taught, to be put on the spot in so many ways by people who are the best there is at what they do that I just couldn't help absorb something, by osmosis if nothing else. For much of my career, I have attended USENIX on my own nickel, and I always figured that the pain was more than compensated by the gain. You can invest in yourself any way you damned well please – I'm in no position to tell you how to run your life – but if you want a career that spans more than one business cycle, you had better invest in things that are durable, that make your survivability more probable

than for the guy sitting next to you. For me, memorizing as much as I could of the combined proceedings of USENIX has been, at once, impossible and essential. Building up a web of colleagues who are as good, as pervasive, as central, as insightful, as bizarre as the USENIX attendees has made me resistant if not immune to business cycles.

However much your mileage may vary, check your gas gauge. I recommend you fill up here. Self-serve if you have to.

Update on EFF DMCA Cases

by **Cindy Cohn**

Legal Director, Electronic Frontier
Foundation

Cindy@eff.org

The Electronic Frontier Foundation (EFF) is pursuing several legal cases to protect copyright and fair-use rights by opposing the anti-circumvention rules of the Digital Millennium Copyright Act (DMCA) on the grounds that the act violates the constitutional right to free expression. The cases build on EFF's earlier precedent-setting victory, *Bernstein v. U.S. Department of Justice*, where a federal appeals court ruled that code is free speech and, therefore, protected by the Constitution.

USENIX has generously supported our work on these important cases. In turn, we will attempt to give regular updates to ;login: so that USENIX members can watch our work as it develops. While this support has been greatly needed and appreciated, the cost of this effort has greatly outstripped our annual budget, even with the support of USENIX. As a member-supported organization, the EFF relies on the backing of those who believe that free speech is essential. If you believe we are doing the right thing in opposing the DMCA, we invite you to join EFF and to assist us in our efforts.

BACKGROUND

The Digital Millennium Copyright Act was introduced in Congress several years before it actually passed in 1998. From its inception, the law was rife with problems for free speech and the growth of technology. Most particularly, the anti-circumvention rules of section 1201 of the DMCA give content holders much broader rights to digital content than they ever held with non-digital content.

Concerned about fair use and reverse engineering, EFF, with several other groups, including members of the library and scientific communities, fought against passage of the DMCA. However, the music, movie and software industries, with their bottomless funding bases, lobbied hard for its passage, and,

ultimately, the DMCA became the law of the land.

This law is problematic on several levels. Most importantly, it will eviscerate the public side of the copyright bargain — the part that recognizes that the goal of the copyright monopoly is to give authors the incentive to produce works so that eventually those works will fall into the public domain or be available for fair use or ordinary use to all people. The DMCA effectively eliminates fair use by letting content owners use technology to completely control all uses of their works. This has already come to a head in the *2600* case (see below), where content owners have gone after an electronic newspaper for publishing computer code.

Also troublesome is the criminalization of circumvention software based upon its possible misuse, even though it has plain and important acceptable uses. This has also come to a head in the *2600* case, where software that circumvents the encryption code used on DVDs was posted on the Internet to facilitate the creation of a DVD player using the Linux operating system. The court held that since the software could be used to pirate DVDs, it was in violation of the DMCA.

Finally, the impact on science could be quite severe, since those who seek to do

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encryption research that could be used for circumvention by others must effectively clear their work with the content industry ahead of time or face liability for publishing it. Science rarely works that way, even where the results could affect national defense. We've just recently seen the beginning of this problem, as the SDMI, a record industry coalition, issued threatening letters to Professor Edward Felten and others. The threat succeeded in convincing the professors to withdraw a paper about the breaking of the watermarks on digital music from a scientific conference in late April 2001.

LEGAL CASES

2600 CASE

In January of 2000, the movie industry brought a lawsuit under the DMCA. This case was brought in the federal District Court in the Southern District of New York against *2600 Magazine* based upon the discovery that the secret key to the weak encryption system used on DVDs was posted all over the Internet. The eight major motion picture studios sued *2600 Magazine* based upon its publication of the DeCSS code, its news coverage of the controversy, and the large number of links the magazine provided to the code.

From the outset the EFF knew this case was not going to go well; the judge in the

case, Judge Kaplan, sided with the industry from the very first hearing. We fought a temporary restraining order, but the court found that the anti-circumvention rules of the DMCA prevented *2600 Magazine* from publishing or even linking to DeCSS, because it could be used to circumvent the encryption placed on DVDs. CSS is designed to prevent copyright infringement, but the court held that publishing DeCSS was illegal even when no infringement had occurred — despite the fact that it was being used for legitimate, even constitutionally protected, purposes — simply because it could be used for infringement.

The case was argued before the Second Circuit Court of Appeals on May 1, 2001. The lower court's ruling basically says that code is not free speech, the *Bernstein* decision notwithstanding. The appellate briefs describe the lower court's decision as "putting the anti-circumvention rules of the DMCA on a collision course with the Constitution." EFF is asking the Second Circuit to prevent this by interpreting the statute consistent with the First Amendment and settled copyright laws.

In late January, eight *amicus* briefs were filed in support of EFF's appeal of the injunction against *2600 Magazine*, including from the ACLU, the Digital Future Coalition, librarians, journalists, computer scientists, law professors, edu-

cators, and cryptographers. A sponsor of the computer programmers' brief, noted Princeton University Computer Science Professor Edward Felten, stated, "The lower court's interpretation of the DMCA would effectively shut down research in some areas of computer security by banning the publication of research results in those areas. Ironically, it has already prevented me from publishing research results that could be used to strengthen the protection of copyrighted works."

The EFF successfully convinced noted constitutional scholar and advocate Kathleen Sullivan, dean of the Stanford Law School, to argue the case on behalf of *2600 Magazine*. The Second Circuit will either send the case back down to the trial court for further hearings (if, for instance, we are successful in convincing the appellate court that the trial court misapplied the law), or it will be set for a review of the appellate panel decision by the entire Second Circuit Court and then probably petitioned for decision by the U.S. Supreme Court. While the exact path is difficult to predict, it is likely that this case will continue for at least two to three more years.

More information about this case is available on the EFF Web site at: http://www.eff.org/pub/Intellectual_Property/Video/MPAA_DVD_cases/.

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PAVLOVICH v. DVD-CCA

The DVD Copy Control Association (DVD-CCA), a newly formed association of the Motion Picture Association of America (MPAA), is suing hundreds of individuals who put DeCSS on their Web sites, alleging that the plaintiffs misappropriated trade secrets when they reverse engineered DVD technology. At issue in the case is the First Amendment right to free expression, as well as the right to engage in lawful reverse engineering. EFF is coordinating the defense, representing Andrew Bunner and paying for additional outside counsel for him. Mr. Bunner is the only defendant who has been properly brought into the California courts. The superior court issued an injunction preventing the publication of DeCSS by the defendants, and we have appealed. The First Amendment Project, a California-based nonprofit located in Oakland, has been serving as lead counsel on the appeal.

In addition, EFF co-operating counsel Allon Levy has also represented Matthew Pavlovich, one of the many named defendants who are not properly sued in California. Pavlovich won an initial victory in December 2000 when the California Supreme Court granted his petition for review based on lack of personal jurisdiction and sent the matter back to the appellate court for further review. EFF also assisted in locating counsel for Derek Fawkus, another person who claimed that California jurisdiction was improper since he is based in Scotland and has never even visited California.

Both issues – the jurisdiction question concerning Mr. Pavlovich and the appeal of the preliminary injunction by Mr. Bunner – have been fully briefed and are currently scheduled to be heard together by the California Court of Appeals at a date to be set soon. We expect the arguments to be held in May or June 2001. The remainder of the case has been put on hold by the California Supreme

Court pending the appellate court determination.

More information about the case is available at: http://www.eff.org/IP/Video/DVDCCA_case/.

OTHER RELATED PROJECTS

In addition to the litigation, we are doing ongoing public awareness work around this issue, with speeches, press work, and grassroots efforts under our CAFE project (Campaign for Audiovisual Free Expression). CAFE is a multi-venue campaign to educate and engage the public in the issues surrounding fair-use rights, and in particular the DVD/DeCSS legal cases. Campaign strategies include public discussions through our BayFF public forum; posting up-to-date information on the DVD/DeCSS cases on our Web site, with extensive links to other sites; media coverage; and most recently, our Radio EFF Program. We have also recently released the “Open Art License,” an attempt, with homage to the Free Software Foundation and the open source movement, to allow artists to release their works to the public to be freely copied and used as long as original attribution is made. We believe that unless people outside the technology community understand this issue, we will not be successful in combating the DMCA.

The CAFE project Web page is available at: <http://www.eff.org/cafe/>.

CONCLUSION

We recognize that the battle against section 1201 of the DMCA will be a long, difficult one. We expect it to continue for at least five years and to change as the technology to limit access to digital content continues to develop. Although DVDs are currently at the center of the dispute, it is only a matter of time before books, music, multimedia tools and content as diverse as human thought will be similarly locked up and metered out to

us. We believe that such a scenario would create a world much different than our current one – one in which we would be much the poorer for the loss of access to what, at the end of the day, is really our shared culture. From the standpoint of technological progress, we also see that criminalizing the software tools that might be used for illegal purposes, even if they are not being used illegally, is likely to become more and more prevalent if 1201 is allowed to stand. The scientific process itself, and the Internet’s promise of science freely available to all interested persons, not just those pre-selected to sit in ivory towers or corporate offices, is ultimately at risk.

Happy 20th Birthday FRUUG!

by Steve Gaede

Steve Gaede has been FRUUG coordinator since 1984. In his early years, he created UNIX capacity planning tools. Today he undertakes a variety of research and prototyping projects through his company Lone Eagle Systems Inc.



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April 1981 – April 2001

April 2001 marked the 20th birthday of the Front Range UNIX Users Group (FRUUG), making it the oldest, still-running local UNIX users group around. Our ripe old age – probably a century in high-tech years – provides a good excuse for a bit of senile reminiscing about all we’ve managed to accomplish in these two decades. It turns out that we’ve been surprisingly on top of quite a few technological developments well before their time; and embarrassingly wrong about a few, too.

FRUUG's largest concentration of members is in Boulder, with membership extending along the Front Range of the Rocky Mountains from Pueblo, Colorado, to Cheyenne, Wyoming. The group meets roughly monthly, scheduling meetings around the availability of interesting talks and speakers rather than attempting to meet on a particular day each month. It currently has close to 300 members, with around 70 attending any given meeting.

Though it started as a sort of UNIX support group, it exists today more as a forward-looking computing technology group, not limited to UNIX operating system topics. Despite its changing role, one facet of FRUUG has remained consistent: it has served as a gathering place and a stable touchstone for computing professionals to meet and make contacts for more than two decades.

The Early Years

In 1981, Dick Hackathorn and Rick Patch founded the Boulder Users Group (BUG), named without the adjective describing what it was *we used* because in those days nobody dared toy with the sacred trademark of Bell Laboratories. The group quickly grew beyond the boundaries of Boulder and its members voted to re-name it in early 1982. Those (including the author) who preferred the more colloquial sound of BUG still tend to pronounce FRUUG as if it rhymes with BUG.

In those days, Boulder was a relative hotbed of UNIX activity, with research institutions like the University of Colorado, the National Center for Atmospheric Research (NCAR), and the National Institute of Science and Technology (NIST), as well as commercial organizations like Bell Labs, Cray Labs, NBI, and Storage Technology working with the UNIX operating system. One of the first USENIX conferences was held in Boulder in 1980, pre-dating FRUUG's founding by a year. Though not officially

affiliated with any national group, FRUUG's meetings for years included reports on current events from the most recent USENIX conferences.

One of the features that put Boulder on the UNIX map was the fact that the High Altitude Observatory's UNIX machine (hao) was a key component in the UUCP networking backbone that enabled UNIX systems to transfer mail to each other. For those who didn't experience those days, UUCP stands for "UNIX-to-UNIX Copy" and was the basis for a store-and-forward network that was used to copy messages to a remote system (usually over modem connections) and then remotely execute a mail program to send them on to their next hop. The network was completely *ad hoc*. Mail addresses specified the route to be taken, and the whole thing depended on making a lot of personal contacts to establish connections.

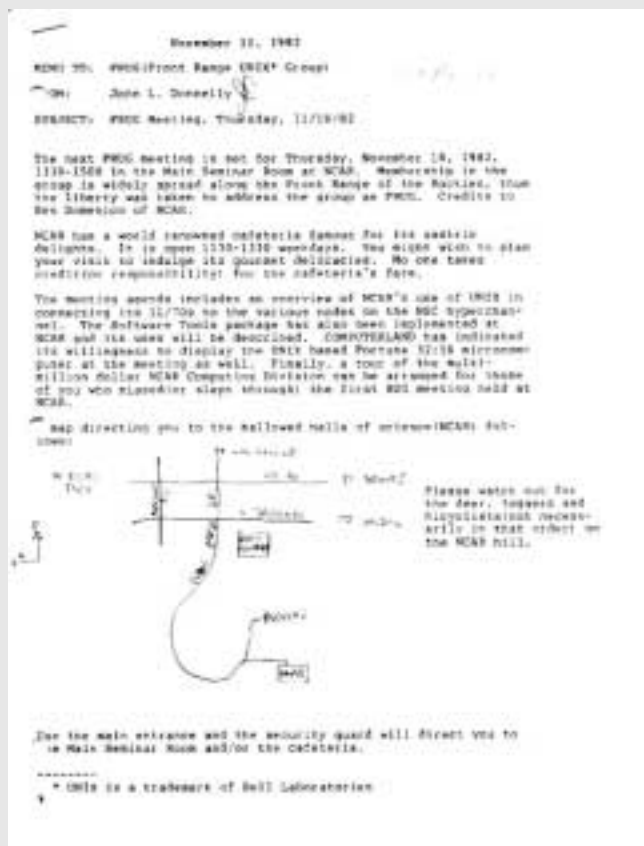
The early meetings were small enough that they could be hosted by just about any company that had a few chairs. They usually included a brief talk, a tour of whatever facility we visited, and a round-table discussion that provided a forum for people to ask questions like: "Can I set up a UUCP connection to you," or, "Do you have a driver for such and such a disk?" The unspoken question often on members' minds was: "What would it be like to work here?"

The days in which meetings toured up and down the Front Range gave us a good feel for the UNIX activity in the environs.

The community of those using the UNIX operating system was relatively small and insular, and there was a fair amount of circulation between companies as interesting projects came and went. A memorable fall 1981 meeting was held in an outpost of Interactive Systems that occupied the old Rocky Mountain National Park headquarters in downtown Estes Park; that round-table discussion took place around a roaring fire in a huge stone fireplace with a fall snow beginning outside.

The Dawn of Desktop Computing

The early 1980s saw the convergence of three technical advancements that would form the basis for the desktop computers that we all use today. The Motorola 68010 family of microprocessors provid-



Meeting announcement for a 1982 meeting at NCAR, including a review of the cafeteria's "gastric delights."

ed support for memory mapping, enabling the UNIX operating system to run on desktop computers with isolated virtual memory for each process – one of those basic features that the Wintel world wouldn't implement until more than a decade later. Winchester disks became smaller than a filing cabinet and could fit into desktop workstations. And bitmapped displays enabled the graphical user interfaces that brought a new meaning for the word “mouse” into the vernacular.

UNIX users meeting unites NBI, ISI engineers



Demonstration of an early UNIX workstation at NBI in 1985 (from left to right: Steve Gaede, Ron Hughes, Bruce Sanders)

We heard from quite a number of Motorola 68000-based UNIX system vendors as the desktop computing world developed, and many of them have been long forgotten. We had a demonstration of a workstation by Fortune Systems in November 1982. Masscomp showed us multiprocessing based on Motorola processors in March 1984. We heard about UNIX workstations from NBI and Integrated Solutions in 1985. Bill Joy, from an outfit called Sun Microsystems, showed us a system that looked like many others at the time. The Sun 2/120 boasted a Motorola 68010 processor, bitmap display, optical mouse, and of course Berkeley 4.2BSD UNIX with a kernel-based windowing system. Who would have guessed how the landscape would change between then and now.

Although many of us hoped that the 68000 series would win the microprocessor cook-off by virtue of its clean design,

the UNIX community didn't ignore Intel architecture processors. The IBM PC came on the market, and it didn't take long for the UNIX operating system to be ported to Intel 8086 processor-based machines even without memory mapping support. When Intel released the 286 processor, UNIX was ported to it before DOS was, and systems and software were available from AT&T, Microware, and Xenix. We've had meetings through the years on UNIX for the PC, including talks from the folks at BSDi, from Bob Gray and Dick Dunn on “Cheap UNIX,” and meetings on Linux as it arrived on the scene.

In the early 1980s, window systems were typically kernel-based, but in 1986 we hit it right with a talk on the X Window System. Despite how Sun came out ahead of all of the other workstation vendors we heard from, our Sun-sponsored talk on NeWS (Network Extensible Window System) was one of those innovations that didn't get very far. We still have (somewhere) a video of the Great X Windows Debate that pitted the X Window System against Sun's NeWS, Microsoft Windows, and Apple QuickDraw in February 1988.

Network computing became a hot topic in the late 1980s. We heard about Integrated Solutions' Transparent Remote File System (TRFS), Apollo's Network Computing System (NCS), and of course Sun's Network File System (NFS). For remote procedure calls, the debate raged between Open Network Computing (ONC) and Distributed Computing Environment (DCE).

The C programming language encountered some competition from its object-oriented cousin C++, on which we hosted our first meeting in 1988. Many related topics, like the Standard Template Library and Design Patterns, followed as the years went on.

The Internet Appears on the Radar Screen

Our 10th Anniversary FRUUG meeting announcement in April 1991 was a double issue on real paper as we introduced Colorado SuperNet (CSN) to FRUUG members, with the first, local, commercial offering of dialup UUCP and SLIP services. Colorado SuperNet was one of the first Internet service providers anywhere, receiving state funding to promote the use of the Internet within Colorado for research, education, and – for the first time – business. We promoted the nonprofit, state-funded CSN for a number of newsletter issues, helping our members become aware of this great alternative to ad hoc UUCP connectivity and the long-distance dialup services provided by UUNET. CSN was eventually groomed for a corporate takeover. Qwest did the deed, and then shut them down over the holidays just this year – bringing some finality to our tax-funded efforts.

Though at the time they were years away from becoming FRUUG Executive Committee members, Neal McBurnett and Joe VanAndel demonstrated tools for surfing the Internet in February 1994, including such classics as Mosaic and Lynx. Remember Lynx? In our 1994 meeting announcement we touted it as the less “resource-intensive” alternative to Mosaic, suggesting that the systems we used weren't quite as powerful as they are today. That February meeting was followed by an ISP cook-off with the Colorado-based ISPs presenting — and debating — their various benefits. Internet pioneer Mike O'Dell kicked off the meeting with a presentation on how the Internet worked at the time, and we had nearly a full house in the 500-seat NIST auditorium, the largest facility available to us.

Keeping Us Up-to-Date

The middle and late 1990s saw a continuation of our trend of keeping members

up-to-date on emerging technologies including networking, window systems, security, Internet connectivity, software engineering, and programming languages. The acronyms describing some of our most recent five years of meetings are sometimes dizzying: Y2K, PDA, STL, RPC, ONC, DCE, ISDN, ADSL, MPEG, DNS, BIND, XML, RMI, AWT, and



The FRUUG Executive Committee planning the next meeting, from a 1996 Boulder Daily Camera article. (from left to right: Tom Cargill, Steve Gaede, Wally Wedel, Carol Meier, Mark Carlson)

JDBC, OMG, CORBA, and even NT, COM, and OLE. Which of these will be forgotten in a decade?

We had Perl tutorials from Tom Christiansen and even an appearance by Larry Wall. John Ousterhout gave us his vision for Tcl/Tk and his concept of agents. We heard about open source from Richard Stallman, about cyberterrorism from Rob Kolstad, and the potential horrors of Y2K from Evi Nemeth. In 1995 James Gosling visited us to talk about his browser called HOTJAVA, and as a side note discussed the features of the experimental programming language called Java used to create it.

An Interesting Trip

In November 1999 Bill Joy chatted with us about his journey “from BSD to Jini,” and shared quite a few interesting stories about the technology that has been developed during those years. It’s been an interesting trip for FRUUG as well, and we hope that the next decade will

bring us as interesting a time as the last two have been — and with the continued involvement of our FRUUG members, it no doubt will be.

An Invitation

We invite you to visit the FRUUG Web site at <http://www.fruug.org> and peruse some of the relics from our meeting archive. We’re working on getting as many of the old artifacts online as possible.

Thanks!

Thanks to all those who have contributed to FRUUG over the years, especially the FRUUG Executive Committee for contributing to this historical perspective and gathering for monthly lunches to discuss technical topics of the day – and plan meetings. The FRUUG Executive Committee currently includes: Tom Cargill, Mark Carlson, Barb Dijker, Dick Dunn, Steve Gaede, Neal McBurnett, Carol Meier, Bill Meine, Joe VanAndel, and Wally Wedel.

25 Years Ago

by Peter H. Salus

USENIX Historian
<peter@matrix.net>

In the depths of my mouldering masses of paper lies a copy of a letter from Lew Law (“Director of Technical Services,” Harvard Science Center) to Mel Ferentz, dated June 24, 1976.

It begins:

“The Science Center is upgrading its present computer system which runs UNIX from an 11/45 to an 11/70. As a result we wish to sell the following:

- (1) 11/45 CPU with memory management KY11C (serial number 1147)
- (2) Hardware bootstrap
- (3) KW11L – line frequency clock
- (4) DL11 – single asynchronous serial line interface

- (5) 24K non-parity DEC core
- (6) FP11B floating point processor \$35,800
- (7) 96K non-parity core – Cambridge Memory Expandacore 11 \$13,200
- (8) RS04 controller only for fast swapping disc \$5,400

Items 1 to 6 are to be sold as a package. Items 7 and 8 could be sold separately. All DEC equipment was purchased 7/1/74 and has been under maintenance contract since installation . . .”

Wow!

This really illustrates Moore's law to me. 96K core memory for \$13,200! 25 years later, I can buy 45G for under \$150 retail.

Lew also supervised the publication of the UNIX manuals – in 1976 this was the justly famed sixth edition. He wrote:

“Printing and shipping of the UNIX documents seems to have gone quite well – we have ordered over 200 Programmers Manuals and 170 Documents. Most of these have already been shipped.”

There was an order form in *UNIX NEWS*, 6.

That issue of *UNIX NEWS* also informed us of the move of Western Electric's Patent Licensing office to Greensboro, NC. Richard G. Shahpazian, “Patent License Manager.”

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