November 1997

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Guide to Internet Access and the World Wide Web

Phil Lawlor of AGIS

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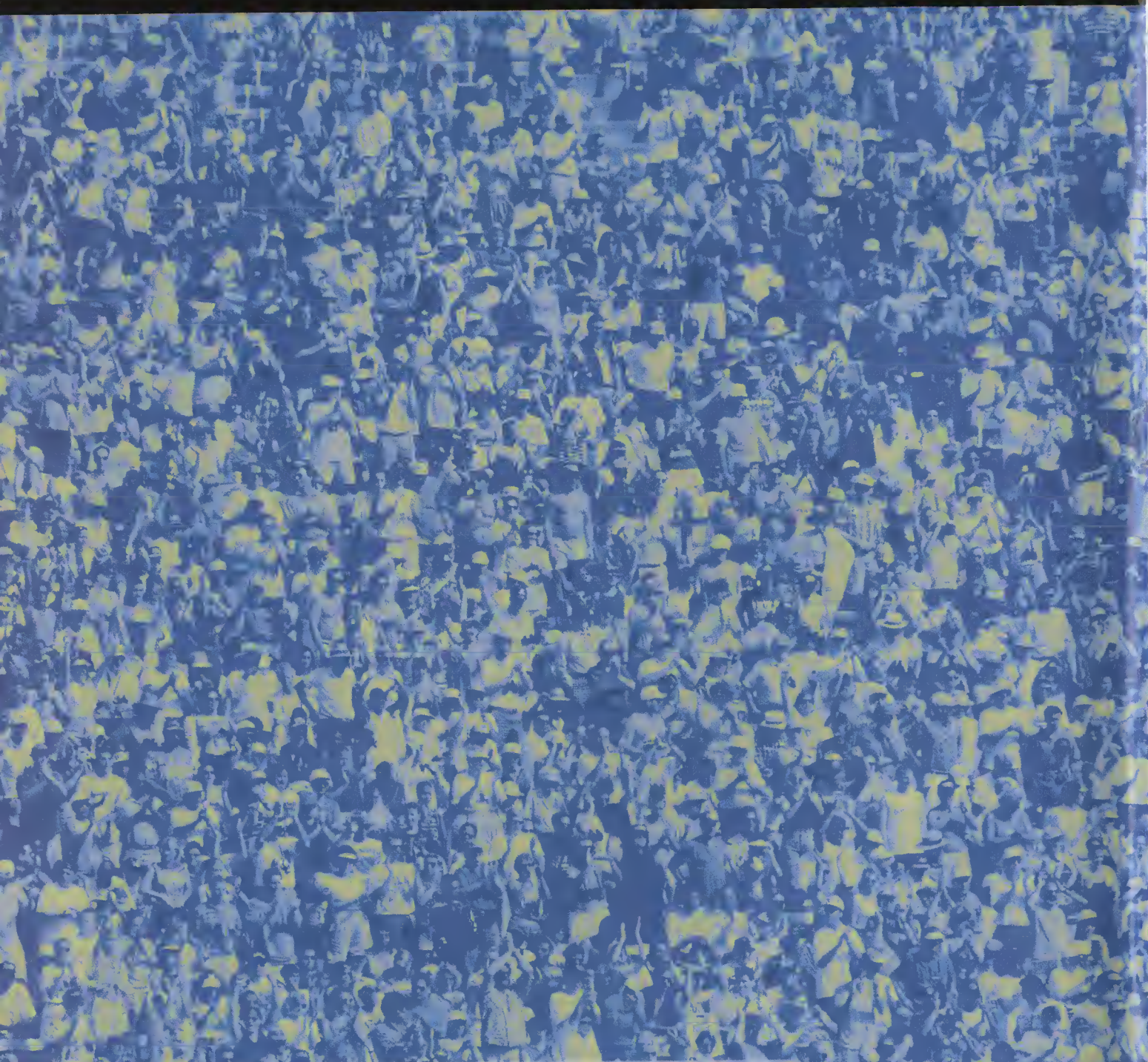

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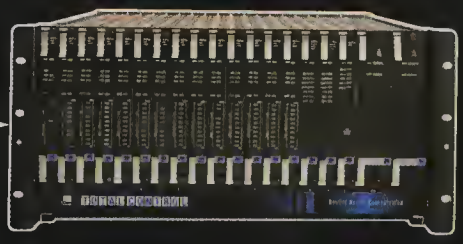

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BOARDWATCH MAGAZINE
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ISSN: 1054-2760 Volume XI, Issue 11 NOVEMBER 1997

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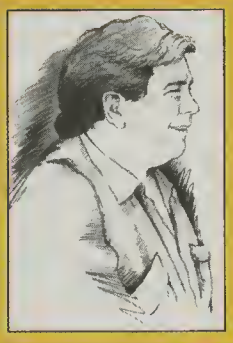

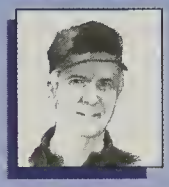

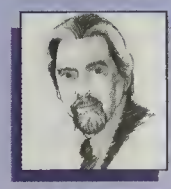

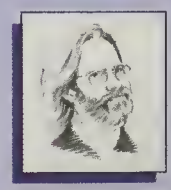

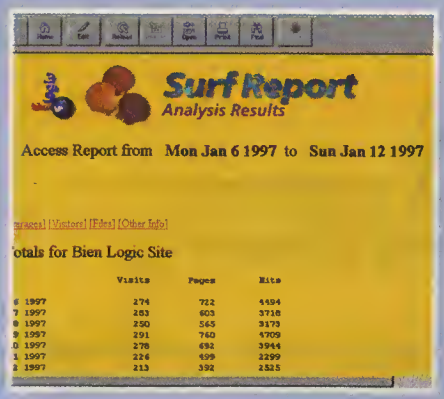

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ISPCon Information
Bob Holley
(800) 933-6038

Editorial Offices
8500 W. Bowles Ave., Suite 210
Littleton, CO 80123
(303)933-8724 Editorial
(303)933-2939 Fax
(800)933-6038 Subscriptions
http://www.boardwatch.com

World Wide Web
http://www.boardwatch.com

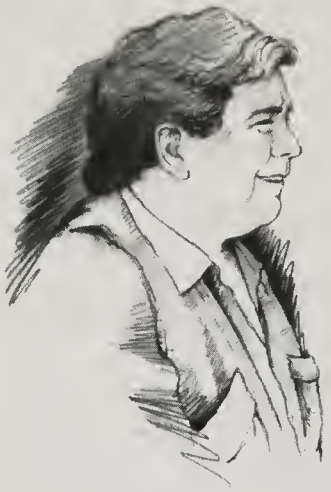
Electronic Mail
Internet:
jack.rickard@boardwatch.com
subscriptions@boardwatch.com

$5.95 U.S. and Canada

Boardwatch Magazine (Issn:1054-2760) is published monthly at an annual subscription rate of $36. ($99 Overseas) by *Boardwatch Magazine*, 8500 W. Bowles Ave., Suite 210, Littleton, CO. 80123. Periodicals Postage paid at Littleton, CO and at additional mailing offices.

POSTMASTER: Send address changes to: ***Boardwatch Magazine***, 8500 West Bowles Ave. Suite 210, Littleton, CO 80123

Printed in Canada



EDITOR'S NOTES by Jack Rickard

LAWLOR CRUCIFIED AND SIDGMORE'S PENNY PER PIXEL FANTASIES

This may be the most interesting industry ever spawned.

We have two very interesting developments for this issue. First, the spam thing is reaching critical proportions, and as an industry, we've probably just done one of the dumbest things possible in a pretty broad universe of readily available dumb things. Second, in the ever continuing game of dancing with elephants, we find ourselves in the at least interesting position of doing it during some frenzied elephant mating.

This past month, a federal judge ruled in a dispute between the Apex Global Information Service (AGIS) and Sanford Wallace's Cyber Promotions. The ruling was almost moronic, addressing no substantive issues with regards to Mr. Wallace's ever popular activities in delivering millions of e-mail messages to millions of e-mail boxes despite an almost universal desire for him and his spam to eat feces and die.

Rather, the case was a niggling interpretation as to when and if AGIS could disconnect Cyber Promotions from the AGIS backbone. Basically Phil Lawlor threw in the towel and joined the ranks of ISPs adopting "spamming policies." The judge ruled he would have to observe a 30-day termination notice and couldn't actually do the disconnect before October 16.

I would like to publicly apologize to Phil Lawlor and the entire Internet community for not taking a stronger stance on this earlier. We did do a bit of a spot on it earlier in the year, but it was a delegated story and I should have done it myself. There were a lot of other things happening at the time and I was remiss.

Phil Lawlor was dead on right in public on the spam issue, and the rest of the ISP community simply lacked the summary intellect to deal with it. Those that opposed him did so in cowardly, but at least predictably moronic fashion. They won. And they will pay the price for this many, many times over for years to come.

The situation is broadly complicated by the fact that spam has become an epidemic. Even a live-and-let-live libertarian such as myself can just barely contain Internet road rage at the deluge of crap in my e-mail box. If I HAD a penny for every "make a million dollars at home" scheme I receive by e-mail, I probably would have made the million and be at home. And I really don't need to receive an e-mail solicitation to come find dirty pictures on the Internet — I was finding them long before these people knew there was an Internet — not that I needed them then either. But the public roaring, threats, and muscle flexing by Internet service providers, largely led by Paul Vixie et al, is just pathetic. Worse, it is grossly damaging to the future of Internet service providers throughout the land.

Phil Lawlor took the public position that Internet service providers are not responsible for content of e-mail, web sites, etc. His story was that he runs a network and operates computer equipment, and that what people did with their properly paid for Internet connections wasn't any of his business. Take it up with them directly.

It was precisely the correct position in a LOT of ways, but he was beaten to death by his own peers over it to such a degree

that his network wouldn't work very well anymore. Ostensibly "hackers," but widely known to us all as other ISPs, flooded his system with every kind of attack from simple e-mail tornadoes to syn-flood attacks to who knows what in an attempt to punish him for "harboring spammers." ISPs were unsympathetic to his position most probably based on the obvious, if minuscule, economic gain AGIS derived from the Cyber Promotions account. It made Lawlor's position appear insincere. I rather gather it was quite sincere. At ISPCON'97, we had other ISPs parading around in T-shirts denigrating AGIS for their position, and Lawlor looked harried, frenzied, and beaten. I meant to say a kind word but was too busy giving away a Hummer.

The mindless concept at work here is that if ISPs all adopt an anti-spam policy, then spam will go away. I guess I think it has already been adequately and empirically demonstrated that this is nonsense. I certainly hope it is nonsense. Because if there is any truth to it, the ISPs will demonstrate once and for all that they CAN control the content and activity of their users. They will have abandoned the Whole Earth Lectronic Link's very astute position that you as an end user are responsible for your words. And Internet service providers will have publicly assumed responsibility for regulating spam — along with any other politically correct sin du jour.

That is an enormous leap. Spammers are not responsible for spam. Internet service providers who fail to regulate spammers are responsible for spam. Very interesting. How about web sites? Only web sites with truly "hateful" or socially unacceptable content? Or just politically incorrect web sites?

First, there are literally dozens of victim advocacy groups ever ready to get a little press for causing any change anywhere that serves their cause. The next step is for a women's advocacy group to pressure an ISP to stop "harboring" a web site with photos of violence against women. Or perhaps it will be an anti-defamation league mounting an online demonstration against an ISP with anti-Semitic literature. Or the NAACP raging against a Ku Klux Klan web site. Have I carried this to an extreme? It's already HAPPENING gentlemen. But there is still a little wee bit of uncertainty if the Internet service providers should actually be where the pressure is applied. Nobody really believes that the ISP shares these views. But they are a convenient and possibly effective pressure point.

That Lawlor did cave and kick Cyber Promotions off his service pretty much legitimizes this position. I would look for a LOT of pressure on ISPs from pressure groups to regulate a LOT of online activity. And as it gets to be the thing to cater to this caterwauling, you can look for it to become a nearly full time job policing who's offended by what on the Internet. But worse, once this is established, I look for a lot of state and federal legislators to look to ISPs as well.

We have a long and notorious history in this country for finding someone in the community to collect our taxes for us (employers are a good pressure point), be able to track the movements of individuals (let's use airlines — we'll call it security and the public will buy it) etc., etc., ad nauseum. I assume everyone now knows that teachers and doctors are REQUIRED by law to report any injuries or observations that MIGHT imply domestic violence or child abuse. You DID know this law was passed didn't you? What information passes between you and your doctor is privileged, just between you and the doctor and the state and any appropriate law enforcement entities that might want to know. It's not that the doctors CAN report it, they are themselves liable for criminal charges if they FAIL to report it. This is solely because they have something to lose and are a convenient pressure point to "regulate" this stuff for the greater good of the state. Kind of little deputy dawg doctors. They're like sheriffs, but not quite so much so.

If ISPs can regulate spam, which is just annoying, why can't they get this child pornography thing under control as well. If it saves even ONE CHILD, it's certainly worth it, right? We'll make the ISPs responsible for that too. In fact, there is a huge problem coming with all this electronic commerce. How can we regulate which e-mail carries money, and which is just a love letter? You didn't think this tax free zone was going to last forever did you? We can make them little deputy sheriffs just like doctors and teachers. Of course, we need to know who they are, so let's license them. And we DO want to know they are in "compliance" don't we? Annual reports, or quarterly reports or monthly reports are not too much to ask. Wineries have to do it. Medical offices have to do it. Why should ISPs get a free ride? And of course, if anything we want to regulate slips through, we do have someone with money and cash flow to go after either criminally or through the civil tort process. They are after all responsible. They have the control.

This has all gone down before. In CompuServe vs. Cubby, CompuServe was exonerated because they had no editorial control. In the more recent Prodigy case brought by a securities dealer, Prodigy lost because they DID exert editorial control, albeit a trivial amount in an unrelated area. Prodigy was actually held liable for the libelous CONTENT of an e-mail message in an online forum.

The spam heroes have just made a public demonstration of editorial control of electronic mail by Internet service providers. And I can't imagine it actually even slowing the flow of spam by as much as seven or eight e-mail messages. "Spamford" Wallace will do just fine — even without AGIS unfortunately. There is too much Internet. There are providers all over the world and Spamford could care less what the machine looks like or where it sits when it is spewing forth its e-mail poison.

I've long been annoyed by voice sales calls myself. Most people have. I don't agree that anyone has a right to use the telephone I buy and pay for as an advertising medium to call me from dinner. But you didn't hear the telcos banding together to ostracize any telco that "harbored" telemarketers. It's an

absurd notion. People got answering machines instead and today telephone solicitations are actually on the down trend because it is just too expensive to dial 100 consumers in the hopes that seven of the hapless yucks haven't gotten the word yet about voice mail. It still goes on, but nothing like it did 10 years ago. It was not unusual for me to get six or seven calls in an evening then.

But it is now open season on Internet service providers — the responsible party from here on out. By ostracizing, harassing, and abusing one of your own, you bring to bear forces that many of you apparently do not understand even around the edges. Not just dumb — dumb in public. ISPs have, with this act, stupidly stood up and VOLUNTEERED for this duty.

The other fascinating development is premarital sex among Internet elephants. WorldCom is the most interesting case. WorldCom was founded as LDDS in 1983 in preparation of the divestiture of the Bell system. They entered the long-distance market and did sufficiently well thereby that they bought Metromedia's long-distance business in 1993 for **$2.2 billion**. In 1994 they picked up both the satellite firm IDB for **$700 million** and WillTel's fiber network and spanking new Internet service for **$2.5 billion**. In 1996, Metropolitan Fiber Systems — renamed MFS Communications, bought UUNET and WorldCom almost immediately bought MFS. MFS already operated a number of Metropolitan Area Ethernet facilities, including MAE East, one of the four network access points designated by the National Science Foundation. In August of this year, WorldCom bought both CompuServe from H&R Block, and ANS from America Online. That sounds like WorldCom has bought at least five backbones in the last three years.

Despite the fact that data really only accounts for some 7.1 percent of their current **$6 billion** in annual revenues, the company has a strong ethos that in the future, data will be king and circuit-switched voice will become an anomaly. This month they have announced purchase of Brooks Fiber, which is a significant investor in Verio — a pseudo backbone. And this week they have noted they wish to buy MCI in a stock swap amounting to some **$30 billion**. MCI had supposedly BEEN bought by British Telecom, but after MCI lost some **$800 million** in the local phone market, BT wanted to re-negotiate the deal and it was quickly coming unraveled. Bernard Ebbers, head of WorldCom, announced their plans shortly after the first of October and when asked if he would consider a three way deal with British Telecom, he wryly noted that once they had the MCI deal done, he might consider purchasing BT as well.

If consummated, and there is no indication from MCI management that they would view this favorably, WorldCom would have a most interesting strangle hold on the Internet. First, between UUNET, ANS, CompuServe, and MCI, they would have a minimum of 60 percent of the world's Internet traffic flowing through one part of their network or another.

Interestingly, they still wouldn't have it all. AT&T is just now turning on the PR machine for their new backbone. We've been covering it since spring in the *Directory*. But more details are forthcoming. And it looks pretty good at this point. They have engineered a new backbone from scratch, and it has some elements to recommend it. But recall that GTE just bought BBN Planet earlier this year for some **$616 million**. As it turns out, AT&T and GTE are now dancing with an eye toward AT&T acquiring GTE. This would put them BACK in the local telco business, as well as picking up GTE's Internet services and a bit of a customer base for their new backbone.

And now it would seem that another voice telco — local exchange carrier ICG Communications, Inc. — has offered some **$283.5 million** in ICG company scrip (stock) for NETCOM On-Line Communications Services, Inc. So there does seem to be some consolidation occurring — among now 40 national backbone operators.

What does all this dancing of elephants mean? A couple of things. First, it's no longer a hedge. The large voice companies have caught on that packets are packets and that voice is eventually going to go to a data network somewhere. This actually has huge implications. The long-distance voice telephone world is now a **$100 billion** market. If it moves to data networks, particularly flat-rate data networks, this shrinks rather alarmingly. I think that is a good thing and will spur the rest of the business world dramatically as their telecommunications costs drop. But it isn't necessarily good for telephone companies. The per minute charges for telephone service make no sense, have never made any sense, and all the studies of usage in the world funded by telephone companies will never allow it to make any sense. The Internet has demonstrated this with sufficient veracity that large telephone companies do indeed want control of it.

Which brings us to the second implication — actually a revisit. At the time of the privatization of the Internet backbone, there was quite a bit of grousing from Sprint Communications as well as MCI about flat-rate pricing and how all that had to end. There were even some tentative steps toward it within those companies, which all failed rather ignominiously but at least quietly. The problem was that there were flat-rate alternatives. And given a choice, even a bad choice, consumers ALWAYS choose the flat-rate pricing. Metered pricing can only exist in any stable form in a monopolistic scenario. So any attempt to introduce metered pricing results in a sudden and dramatic market share movement to whoever is offering flat-rate pricing.

I don't think that can change. But there can be sufficient disruptions of service by those who don't understand this to be bothersome. Clearly the sentiment within WorldCom, at least as expressed by John Sidgmore and the other brilliant visionaries at UUNET, is that all of these little ISPs and backbones are "getting a free ride" and disrupting the opportunities for profit. I have regularly heard from many who should know better, that a **$19.95** flat-rate is not sufficient to provide a profit adequate to provide the communications infrastructure. I have difficulty addressing this since most of it is a bit obvious. But let's take a bit of a look anyway. Right now, several companies have gone after what is coming to be known as wholesale dial-up services in a big way — including PSI, BBN, and indeed

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UUNET. This is basically providing the ports and connectivity infrastructure WITHOUT the customer support and marketing parts. And another segment of the Internet, represented by companies such as EarthLink and MindSpring, buy this wholesale dial-up service, and then add the customer support and marketing, charging **$19.95** per month.

How much is the markup? As best we can tell, the basic infrastructure can be had in bulk for **$7** to **$9** per month. I have to assume this does include some level of profit. Even with technical support included, it runs **$12** or **$13** per month. So it is simply not true that **$19.95** cannot support the infrastructure. But the going rate for pure infrastructure would appear to be **$7** to **$9** per month depending on wholesaler, contract term length, and volume.

In any event, the WorldCom move probably heralds another run at penny-per-pixel pricing. Sidgmore is publicly railing against flat-rate pricing and inexplicably blames AOL, who went to flat-rate pricing just 10 months ago to compete with the likes of UUNET, for it all. In any event, PPPP will fail, and it won't be a mixed failure. It will fail completely and for the same reason it has always failed before. If anyone doesn't buy in — say a Qwest Communications, or anyone else capable of providing the actual fiber routes, any one of now 4,535 ISPs can rent some fiber, declare themselves a backbone, and the 60 percent or 70 percent or even 90 percent of the Internet facing penny-per-pixel pricing will simply move to PSI or Qwest or AT&T or whoever is hungry enough for market share to operate an Internet in the fashion already demonstrated. Qwest, which is busy installing 13,000 miles of fiber along Phil Anschutz's Norfolk and Southern railroad right of way, just bought Colorado SuperNet. They completed at **$220 million** IPO just a few months ago.

In any event, if WorldCom does assimilate a sufficient amount of the Internet, they can always refuse to peer with the flat-raters. But that strands THEIR customers as well as the competitors — the basic conundrum of Internetworking. A visceral understanding of this is requisite to successfully operate an Internet company.

But I would look for some serious disruptions of the network while training some of these high-powered intellectual giants and executives along the way. And the mating of elephants will continue in an ongoing if frustrated quest to try to get a stranglehold on the Internet. It's like trying to choke a jello snake by the neck in a room full of Wesson oil. Maybe you could do it if you were just a bit bigger?

One further interesting thought by way of pouring gasoline on the fire. AT&T reports an average daily call volume of 230 million calls during the month of August 1997. And they have, by all accounts, 48 percent of the long-distance market right now. That means that in the United States, we are currently placing nearly 480 million long-distance calls per day — more on Mother's Day and holidays of course. These calls average about 5.5 minutes each in duration. It takes about 24 KB of data to do a second of voice in compressed, and not terribly good, form. That's 3.8 X 10^{15} bytes. Or in other words 3,800 Terabytes more or less in data traffic terms to handle all the voice traffic in the United States for a day. That's a lot of data. The best estimates we can find would indicate a total Internet aggregate traffic of about 3,000 Terabytes per MONTH. If just 5 percent of this voice traffic moves to the Internet, we will see an increase of 190 Terabytes per day on a network that in total aggregate currently does about 100 Terabytes per day. If you really want video with it after the fashion of the 1964 World's Fair, this will, ahem...increase. Bottom line, voice can't move to the Internet in any orderly fashion. To move a paltry 5 percent of voice traffic to the Internet requires at least three times the current Internet backbone capacity. It's probably worth noting the scale of this thing when talking about it.

Get ready. This is going to get worse before it gets better.

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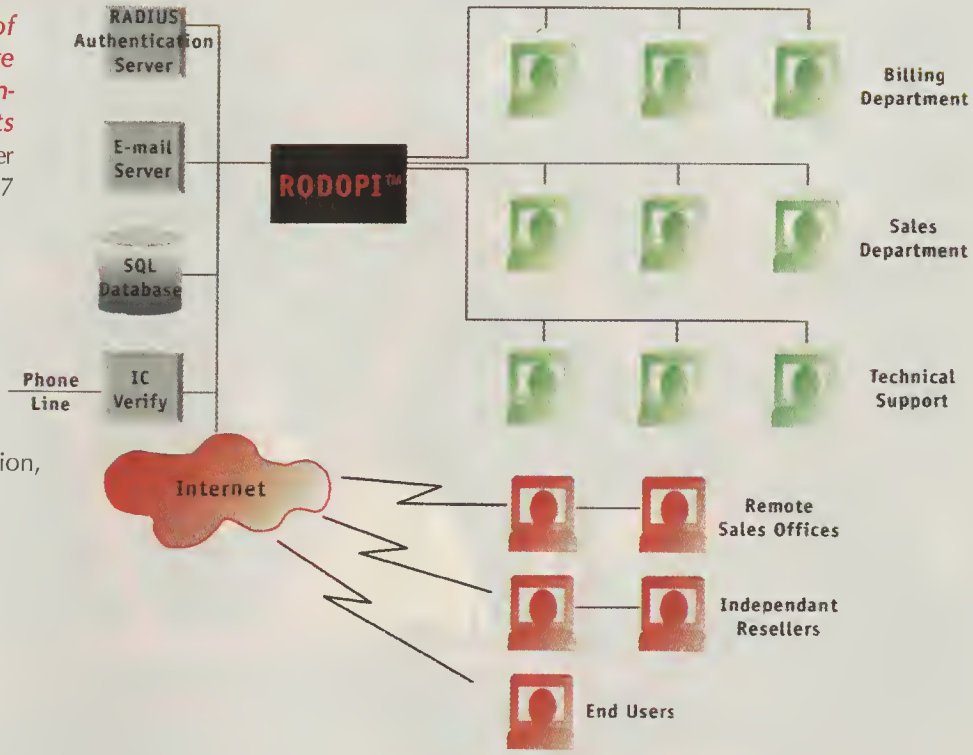

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NETWORK CONGESTION

Good article in the July issue on network performance.

Having developed some of the Internet's congestion control technology (see the RFCs that bear my name), I'd like to make a few comments.

Your study measured web page download time, which is useful from a user perspective, but doesn't tell you what's happening. You measuring the deviation in download time, and you correctly identified this as a measure of how well the network behaves under heavy load. That's a good start, but you can go further, and examine what a network does under overload, by analyzing "ping" behavior in detail.

Try sending two ICMP ping packets in a row during a busy period and observing the results. Look for

- double packet drops, where both pings got lost. This is an indication of a poor packet-drop policy in a router, and a strong sign that TCP connections are likely to fail under heavy load.
- excessive variation in round trip times for the first packet of the ping pair. As you noted for web downloads, measuring deviation is a good way to get a handle on how well a network handles overload. At the packet level, you'll see much more deviation than you saw at the web download level, and I suspect the differences between competing backbones will be striking.
- separation of the two pings, with one coming back much sooner than the other. This is good; it indicates the network has "fair queuing" and is spacing out your flow because you sent two packets in a row when the network was heavily loaded. Some ACC and Cisco routers now do this.

Ideally, under heavy load, the round trip time for the first packet of a pair should increase, but the deviation, as a fraction of round trip time, should not. The separation of the two pings should increase as load increases, and from the average separation, you can compute how much bandwidth your flow can get right now.

So, from the outside, you can find out quite a bit about the backbone providers. Perhaps more than they themselves know.

There's no fundamental reason why the Internet has to turn into a dog under overload. Yes, it has to slow down, but only in proportion to the load. Bad behavior under overload means something is broken. You can help identify what's broken and bug providers into fixing it.

John Nagle
nagle@animats.com

John:

We looked at PING and TRACEROUTE for over two years before moving the direction we did. First, no one is interested in the World Wide Ping. Most perceived performance problems center on the World Wide Web, or as some have come to refer to it, the World Wide Wait. PING uses a much different protocol, and worse, it tends to get prioritized by routers in much different, and extremely variable fashion.

John S. Quarterman wrote what we view as the first book on the Internet in 1990 — titled The Matrix. He currently is in Austin with Matrix Internet and Directory Services, Inc. He has pioneered some very interesting work with PING latency in what he calls the Internet Weather Report — a graphic weather map showing areas of high latency. The weather report is available at `http://www3.mids.org/weather/index.html`. We have also noted some similar follow-on efforts such as Clear Ink by Jon S. Stevens — `http://internetweather.com` and a very readable weather report at UCLA `http://www.cns.ucla.edu/weather.html`

These reports suffer from the usual problem of measuring their OWN connectivity as much as anyone else's — the PINGs originate from a single site through a single connection. It is true that we could simply PING from lots of locations and compile it into something more useful. But as long as we're doing that, why not use HTTP and more closely approximate the user experience? And that led us to Keynote (`http://www.keynote.com`) and our current partnership to measure Internet performance.

Jack Rickard

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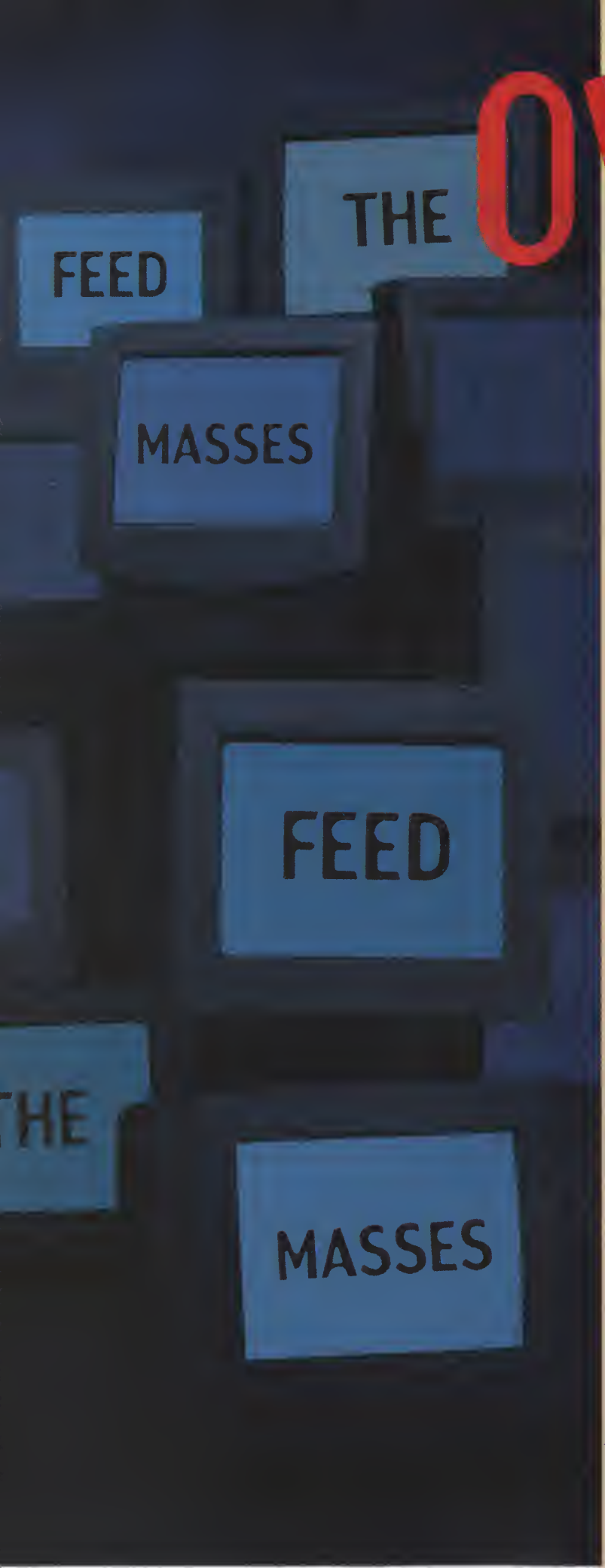
CABLE

Hi Jack,

I have been reading the on-line version of your fine publication for the last 20 minutes (I can't seem to find our paper edition in the office — it is a coveted item). I was struck by your comments on data over cable TV, and how closely you mirrored my own thoughts on this subject.

I have spent a great deal of my time over the last 2 and a half years working with different cable TV companies to "trial" data over cable networks in the States of Maine and NH, and I have the scar tissue to prove it.

During this time, I have encountered numerous cable TV "technicians" and "engineers". Out of dozens, I have met only two that I consider worthy of carrying such titles. The rest just eyeball things and hit them with blunt instruments until "Wheel of Fortune" has an acceptable level of snow and distortion in the picture.



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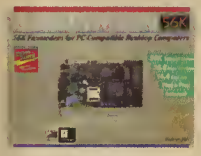
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Including America Online, CompuServe Network Services, EarthLink Network and Prodigy Internet—as well as The Microsoft Network, which incidentally is committed exclusively to K56flex.

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The barriers that prevent "data over cable" from working are defininately more cultural and operational than technical. Even if you had a cable modem system with some form of super-ninja modulation scheme that could withstand all of the horrible conditions of the cable plant (particularly the "return" system), it *still* would mysteriously stop working from time to time, as it is hard for a signal to pass through when some technican disconnects the physical cables — in the field or the head end — whenever they feel like it. And then there is the fact that none of the field equipment in the entire cable TV industry was ever designed to be fixed or upgraded while it was powered on — you have to take customers (lots of them!) out of service, however briefly, to do simple maintainence and changes. Hot-swap is an alien concept to them.

High speed data over cable is really sweet when it is working. If you invest enough time in the physical path between two points, it will generally work well if nobody screws with it — but it probably isn't any cheaper than a T1 by the time you are done investing the time, money, and energy to fix the plant.

I don't hold out much hope for "two way" cable modems being deployed on any wide scale this century. I am putting more hope into "one way" cable services that use a telephone line for the return data path. More expensive to operate and the performance isn't as nice (also is annoyingly massively asymetrical) , but much easier to get running and more reliable. Well, as reliable as cable TV can be, at least.

My company is currently the Internet provider for 3 data over cable systems. The cable companies don't have the skill set to do Internet themselves in any real way. We look at cable TV as just another transport medium option to get us from point A to point B. We are tending to use the cable co's resources more for their "dark fiber" capacity and utility pole access rights than for anything else, actually.

Thanks for a great magazine. Somewhere in an old box of stuff I have the first issue I ever got, featuring the gentleman who took over the Genesis (?) BBS system, after loosing an arm in an accident and discovering computers. I picked up issues periodically until last year (another box has the issue with one of the first print reviews of CuSee-Me). I'm glad you're still at it.

I am hell bound on making it to the March ISPCON, having missed the previous ones. Maybe see you there?

jim

———————
James Troutman,
Director of Advanced Services,
The Maine InternetWorks, Inc.

Jim:

Many thanks for the report. I sometimes think some of our readers believe I make this stuff up wholesale. I make it up of course, but retail.

Cable is what I refer to as a "looming" technology. It looms on the horizon, spewing press releases and pilot demonstrations, like a storm bank coming in from the west. But it never quite arrives.

We've seen a number of these before. As I recall, the telcos were going to take it all over a few years ago with online services patterned after France's online system. All but Nynex demonstrated something, threatened to take over everything online, and then quietly shut the services down one by one — stranding anyone who had bought into the concept.

Cable services willing to rewire with fiber have a chance. But Internet over RG-58 coax is just not going to happen. And the cable industry is so debt-burdened at this point, that fiber won't be widespread anytime soon.

But it would be cool if it did.

Jack Rickard

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US WEST STRIKES AGAIN!

We finally decided to bite the bullet and fork over the money for digital dial in trunks via a T1. We figured in a month delay because we're "Out here" in US West country. So we leased a modem bank and bought a serial server, read all the instructions and ordered the T1 line accordingly. We ordered ESF, B8ZS and E&M Wink start, we didn't need DTMF for lines that would only be dialed into.

Of course the US West rep was elated and assured us that delivery could and would be in about two weeks. About a month and a half later (to make a really LONG story a little less long) the special service tech was in the shop to make the T1 go. He asked me if I could ground the trunks to start em up...

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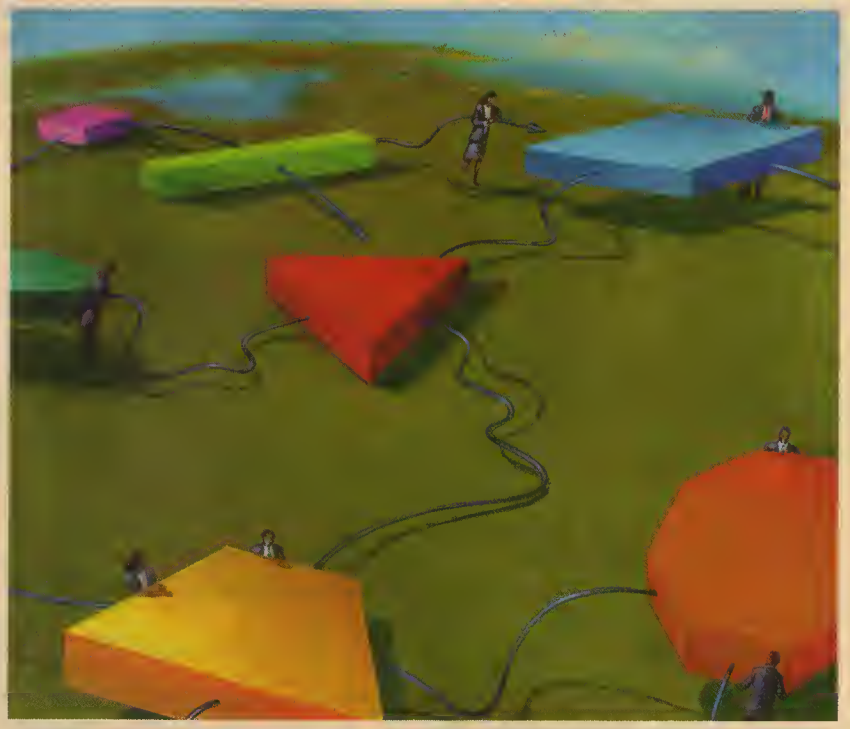

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I didn't catch the significance of his question at first and said no. He finished and went home. I later realized that they had installed Ground Start! A week later we settled on Loop Start, after much arguing. Another week and the span was up, but we couldn't answer it with our gear. More arguing and another week and we finally got an answer, at 14.4 kbs. More arguing and a tech came to the CO to test the throughput, 15 minutes at 1.544 Mbps, as he was bringing the trunks back in he said he had a "minor alarm" and asked what line coding we where using. We ordered EMS B8ZS... we got D4 AMI.

These guys should be used car salesmen, basically we ordered (and payed for) a 1998 Red Caddilac Coupe DeVille with the big motor and vinyl interior and got a wrecked 1971 Vega Knotchback with a blown motor and 2 flat tires.

Are there any lawyers out there willing to take a case against US West on consignment, after this we have no capital, US West got it all. Actually we're hurt but not down.

I am outraged, US West's ignorance and arrogance are only out done by there incompetence at doing there job. How can a company that is incapable of communication within it's self be expected to handle the job of keeping 14 states in communications.

If there is an archive of US West horror stories I NEED to see them, if for no other reason than to prove that I am not alone. Is there a US West Anonymous program that will get me away from having to use them?

Joseph Conrad
joe@chaffee.net

PS: I don't expect an answer, just really needed to dump, but if you have ANY suggestions...

Joseph:

I don't actually, other than to note that within the next year it looks like competitive local access, complete with local number portability as it turns out, is a happening thing circa summer 1998. My editorial on letting every man with a 1964 Chevy panel truck and a rusty pair of pliers BE a phone company will have come true, slightly over 10 years after it's 1988 publication. I only wish I could adequately portray the peels of derisive laughter and ridicule I received as a result of this prognostication in 1988. Most of those people are now managing Blockbuster Video stores today, of course, and the prophecy now appears obvious.

The only thing that will make a local monopoly telco more responsive is competition from other local telcos — and the end of the monopoly. The good result will be more services faster at lower prices. But the other end of the alligator will be that things will become even more complex with regards to locating vendors, ordering services, and getting them installed. If you can master the EMS B8ZS D4 AMI M-O-U-S-E you will do very well in this future world..

Meanwhile, comparing US Worst horror stories won't be very productive unless you intend to form a victim advocacy group and go on CNN during the morning bitch sessions when anyone who is doing anything is at work anyway. I would encourage you to view it as more of an opportunity than a problem. If you are having it, others are having it as well. If you can develop a fix/work around/solution, there's probably a market for it.

Jack Rickard

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WHEN PIGS FLY

Jack

I am a big booster of your magazine, but "When Pigs Fly" was totally off the chart. AWESOME! Keep it coming.

As a reformed bean counter, I have one small quibble. The Earthlink table you included is not a balance sheet; it is a statement of operations in the current jargon, although oldtimers, such as myself, prefer profit and loss statement. I guess losses are something not to be spoken of by name in our brave new world.

Cheers,

Bob
b.dryer@worldnet.att.net

Bob:

I do stand corrected on the financial terminology.

You might be happy to learn that EarthLink did get a rather largish infusion of investor capital as predicted.

Jack Rickard

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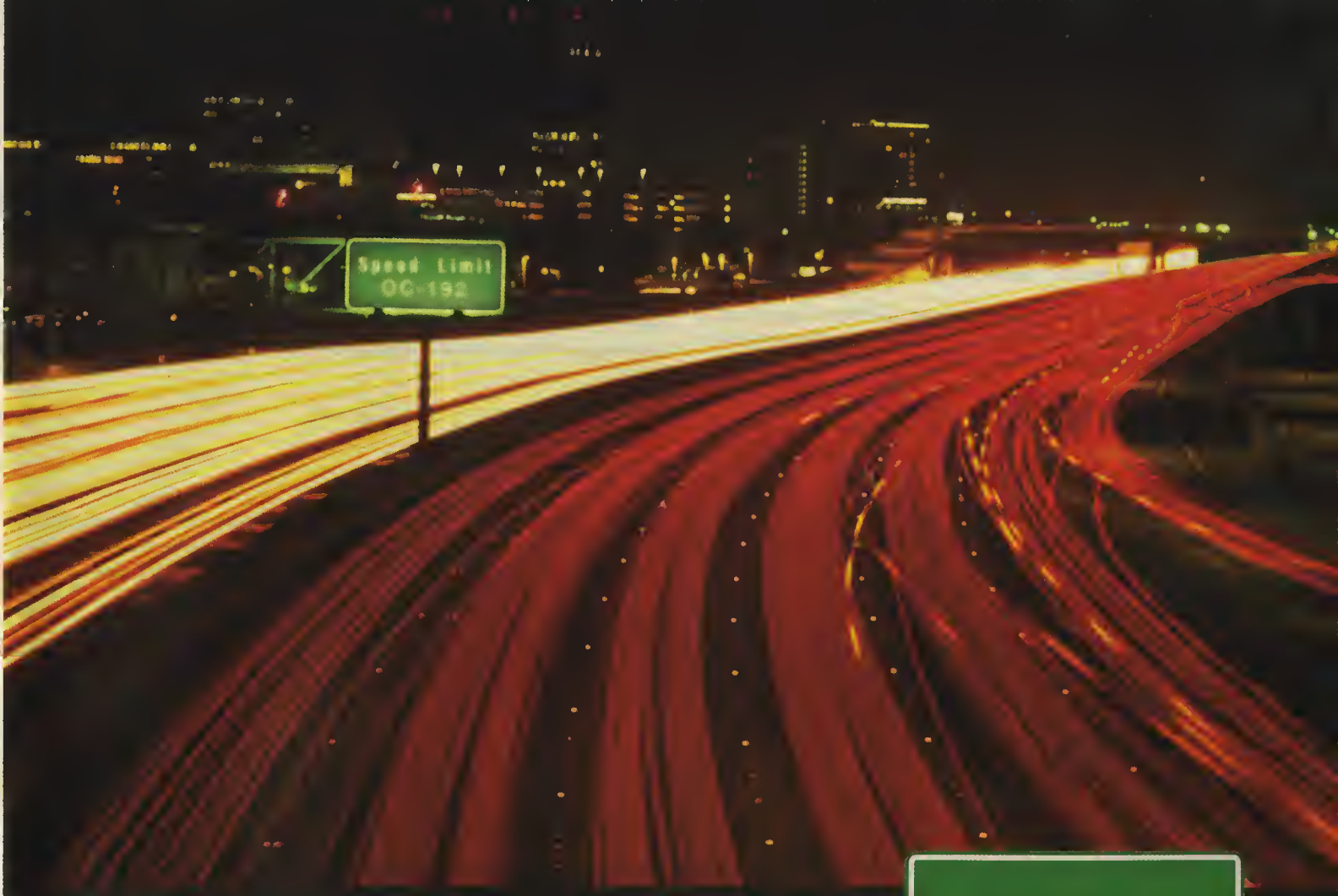
ISP ROAMING PRIVILEGES

I am seeking a solution to a tele-commuting issue and whatever ISP solves this effectively will get all of my business for the next few decades. Since I currently have accounts with Winternet in Minneapolis, MN, I thought I would start by asking you first.

Normally I tele-commute from my Stillwater, Minnesota home to my contract site in South Dakota. However, about one week out of four, I travel to South Dakota. During those trips I must dial-in long distance to my Winternet account. This costs me about **$10** per month of long distance charges if I forego all my addictions and if I put my personal Mission in life on hold.

I tele-commute from Minnesota to South Dakota now but I would love to go hang out with friends and family in Montanna, Wyoming, Colorado, Washington, and Arizona plus I would like to spend a couple weeks or more in the winter telecommuting from a wonderful beach cottage somewhere warm. In fact, this is the only sales technique that could get me to buy into a time-sharing condo deal but that's another story. I could easily travel to me heart's content and be paid for my



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work time, if I could just find a good solution to this roaming ISP account issue.

Have you considered forming alliances and reciprocal agreements with ISPs who provide coverage in these other areas. I assume that every local market has ISPs who only serve that local market. If an alliance could be formed then, as part of my travel plans I would download the list of all the local numbers and take it with me. Then, wherever I went I would dial the local number and get full access to my Winternet account.

I could easily imagine a satellite based ISP becoming part of the alliance to provide coverage for spendy resort hotels across the world. If I could work while I was there all my expenses (at least up to the level of my income earned at that location) might be deductible as business expenses. If not, I might try to claim the income as "foreign" income. I would consult a tax advisor first but I think you see my point. It will be interesting to see how the IRS messes with the telecommuting opportunities in life.

In any case, if local market ISP's do not join together into some kind of alliance then the Bells will toll for you and may end up out of business in 10 years because the competition will figure this out.

Now I must tell you that I HATE big government and big company solutions to anything. I prefer egalitarian solutions involving tens of thousands of locally owned and operated, independent companies. There are many things beyond roaming privileges that such an alliance as I propose might accomplish.

Respectfully,

Lyno
lyno.reply@freedomain.org

P.S. I copied Boardwatch because the Editor loves proposing solutions to puzzles like this or he might put it on the agenda at the next ISP Conference or he might, at least, share the puzzle with his readers.

Lyno:

There are several "roaming" initiatives already in operation. We have done articles on at least two and we had several sessions at ISPCON'97 on the topic. How to do it is pretty well established already. It probably wouldn't even be difficult to persuade Winternet to join one of these roaming consortiums. There is typically a surcharge, but on the order of $1.50 per hour.

Jack Rickard

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ALL-IN-ONE

First off, Boardwatch has been a mainstay of my literary diet for several years; in fact, it is the only magazine I subscribe to. I enjoy the mix of technical material and educational articles.

You might be interested to know about how Videotron, the local cable outfit in Montreal, is doing in the great convergence sweepstakes. Recently, they bought out a competing cable company—CFCF Cable—to create a unified cable grid. They have also been offering 10 Mbps cable modem Internet access for a year, and act as a bandwidth supplier for many of the local ISPs. Finally, this week, they applied for CLEC status to supply local-loop dial-tone in Montreal.l.

Predictably, Bell Canada and the Stetnor Alliance (a telecom alliance which controls most of the phone traffic in the Great White North) are stalling like crazy in providing switching maps. Things are definitely getting interesting . . .

Andrew Weitzman
aweitz@cam.org

They are Andrew. Cable in Canada is very different from cable in the U.S. — with LOTS of fiber going down in the North and some significant Internet over cable activity there.

*While I am obviously an advocate of **Boardwatch Magazine**, if it is the mainstay of your literary diet, you should read more widely. There are some very interesting things out right now on Republican Rome that I might recommend. Colleen McCullough has a four book series that is really quite good — start with **The Grass Crown**.*

Jack Rickard

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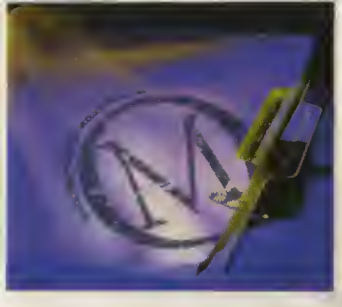
COMMENTS ON SEPTEMBER ISSUE

Hello,

I've been reading the September issue and have a few comments. I'm the President of a small ISP in southern New Jersey, and we've been in business for over three years now.

In your editorial discussing 56k modems, you state "The new technology is free if you pay the shipping." Really? I've been getting lots of offers from both 56k camps, and nothing



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approaches free in my book! About the best offer we got from a reputable company was in the **$9k** range. Can you please tell me where these free modems are?

In the letters section, someone asked about analog modems and small ISPs. You basically said that nobody was going to buy analog modems anymore. Hmmm... perhaps you should see all the discussions between ISPs for the trade/sale of used modems. I had to bid against another ISP for some 33.6 modems, but dropped out of the war for them. Instead, I found another source and just ordered them today.

We polled our customers to see if they wanted us to go 56k. Despite all the hype about how wonder 56k modems are, almost all of our customers said not to bother. They like 33.6 and get the performance they want. A couple of them had tried 56k modems (both camps) with other ISPs and were VERY disappointed with the results. They paid more for the modems, sometimes more for the higher speed, and got about the same performance as our clunky old analog systems gave them.

I think the 56k guys need to just shut up for a while and get the technology working. A lot of people are getting very turned off by all the hype and claimed performance, especially when nobody they know has it working successfully.

Call me a dumb businessman if you like, but my company has made a profit consistently for over two and a half years. All of our startup debts were repaid long ago, and we have a small but happy group of customers. Aren't these the goals of a business?

Bob

bob@waterw.com

Bob — you're a dumb businessman. And you're whistling in the dark. Deal with reality, and let wishful thinking be reserved for kids and Christmas.

No, the goals of business are growth. In that order. If you are operating at a profit, you are investing in supporting the U.S. government with tax money — rather than investing in your network.

Jack Rickard

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eDNS DOMAIN REGISTRY

Jack Rickard,

H'lo, my name is Steve Karr. I've been wanting to write you for years now, and I planned on doing so very soon...a semi-long letter on some net concerns/issues... but this ain't it! This isn't the Hi Hello great magazine great job letter...that's coming soon... this is just a quick "Oh-my-God-I-can't-believe-what-these-guys-are-doing-I-gotta-show-Jack-Rickard" kind of email.

I think you'd be interested in checking out:

eDNS Domain Registry — `http://www.newdomains.net /edns_intro.html`

These guys are 'selling' top level domains that AREN'T available yet! This a 'reservation' thing I think...it doesn't 'register' your domain, they 'reserve' it or 'hold' it for now.

...and I quote:

"Our WHOIS database currently includes information for second level domains under the top level domains .inc, .law, .mail, .learn, .asia, .sport, .kids, .email, and .games. It also returns information on the domains under the top level domains .com, .org, and .net which are registered with InterNIC."

I just did a search:

microsoft.inc

Congratulations, that domain is available. If you wish, register the domain with New Domains now.

Gee, a wee part of me inside would love to 'reserve' this name in case this "service" is on to something that is actually good. Not for the money, oh no no no...for reasons I'm sure I don't have to explain. Am I on a new topic? Sorry. Well, what do you think about this? Its all *very* interesting to me. I just called to get a new toll-free "800" number for my company...the number scheme I desired (as I already assumed) was taken. I not only had to opt for an 888 number (no big deal) but a slightly different number scheme. Oh, well. Like I said, NO BIG DEAL. Well, coincidentally the same day I was registering a new domain name for the company. Now, this can be a 'big deal'. Taken. Ok, fine. Maybe an acronym of the company name...taken. We obtained the .net. Want a .COM? Good luck. .NET? Maybe? Hmmm. This is out of hand. I especially hate the practices of the guys that are 'domain name brokers' or whatever they call themselves.

So the question is: WHEN will there be new top level domains available? And, is this 'PRE-reserve' your domain name business 'legal' and does InterNIC support the idea?

Thanks for your time, and sorry about the length, I got carried away.

Regards,

Steve Karr
steve@nvo.net
Director of Internet Services
NVO.NET — New Ventures Onlinee

Steve:

There are changes a coming in domain name service. But I don't know exactly what they'll be. Everyone, including Network Solutions, seems resigned to the concept of a competitive domain name structure. But no one seems certain how it is going to work. In July, Clinton issued an executive memorandum directing that the government was to guard the viability of Net commerce. This caused no end of consternation within the administration regarding WHO was responsible for doing this. The ball seems to have landed in the U.S. Department of Commerce for the present and they are holding hearings now. They had several in September.

*We bought BOARDWATCH.WEB a year ago on a lark for **$25** and did a story about it. I think it was the November 1996 issue. You can look it up on our web site at `http://www.boardwatch.com` Not much has actually changed other than a lot of fussing between InterNIC and AlterNIC.*

Jack Rickard

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BALANCE SHEETS

Jack,

After reading your last editorial it struck me as quite odd that you would prove your own point so well (I'm referring to #2 in the opening — "A little over 95% of what I know is wrong...", as evidenced by the financial information that you provided on EarthLink, Inc. Jack, this is a profit and loss statement, not a balance sheet!!

Avid web-reader and CPA,

Robert
herzogr@corplink.net

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*If you'd quit reading on the Web and send me **$36** for a subscription I could afford an education...*

Jack Rickard

◆◆◆

INTERNET BACKBONE MEASUREMENT RESULTS

Dear Jack:

Thanks for a very interesting article on overall Internet performance (`www.boardwatch.com/mag/97/jul/bwm22.htm`). I was directed to it by someone on Usenet and I am pleased that someone is finally presenting this type of information.

I have a few complaints though, most notably that you seem a bit US-centric in your view of what the Internet is. I will admit that a large portion of the world's 'net users may be in the US, but being a Canadian I was unhappy to see that the researchers for your story didn't take the obvious step of adding a few Canadian cities to their research sites. I have heard reports (though unconfirmed) that Canadians have a higher Internet use per capita than Americans and that my local area is (or once was) the site of highest Internet use per capita in the world. Again, these may not be accurate claims, but I think it is obvious that we are at least as Internet consuming as our southern cousins.

This leads me to the reason for my writing. Being somewhat ignorant of Internetworking technology, I am wondering if the "new" network of cable companies that is rapidly springing up in Canada will be a significant force in upgrading Internet performance.

Let me digress a bit and tell you a story. I was standing in the shower one day 2 years ago and had a great idea; why didn't, I wondered, some enterprising company establish a completely fiber-optic network parallel to the existing telco network in some major city? Then they could, over time, do another city, then another, slowly connecting them and establishing a continent-wide network of high-speed fiber, while relying on the older, slower network in the mean time.

Imagine my surprise when, only weeks later, I spoke to my local cable company and was told that they not only would soon be offering Internet access over 'cable modems' but that they had completely covered this city (Dartmouth, NS) with a network of fiber-optic cable. AND that they had done likewise in many other towns in Nova Scotia. AND that they had fiber running between most of those towns and that it would be a small matter to actually connect most of the entire province with fiber. AND that the cable companies in the neighbouring province were in the process of doing likewise.

I began to wonder if the cable company was watching me while I was in the shower. They *are* the cable company, after all...

Anyway, back to my question. If this network of fiber-optic connections, which appears to be well on its way to completion in Canada, covered all of North America, would it substantially improve Internet connectivity? Or is it similar to something we already have?

My cable company is offering (right now) Internet connectivity at 5 Mbps and they told me that the only reason they're not offering 10 Mbps is so they have a better service to, "sell customers up to."

I am aware that bandwidth over these connections will suffer if many people are online at the same time. I am also aware that once we leave the local cable network, we'll be suffering from the same bottlenecks all you other poor souls are subject to. But it sounds quite promising. Is it?

Trevor Smith
Editor-in-Chief, OS/2 e-Zine!
editor@os2ezine.com

Trevor:

In Canada, it actually is. They are doing a lot of fiber up there and I think it holds a bit of promise. It will be quite different from the U.S. where the cable companies are debt burdened and heavily into coaxial cable. Most of the problems are cultural regarding reliability, customer service, and so forth. My perception is that Canadian cable television companies are somewhat different in all respects.

We are somewhat U.S.-centric across the board. But Keynote Systems (`http://www.keynote.com`) is rapidly expanding their footprint of international measurement agents, and we look forward to revising our methodology sometime next year to include a more international "footprint" of Internet users.

Jack Rickard

◆◆◆

CLARK DEVELOPMENT

Does anyone know what happened to Clark Development?

Phone's been dis-connected and neither site answers. (`www.metaworlds.com` or `www.pcboard.com`)

Regards,

Bill
bill@wsii.com

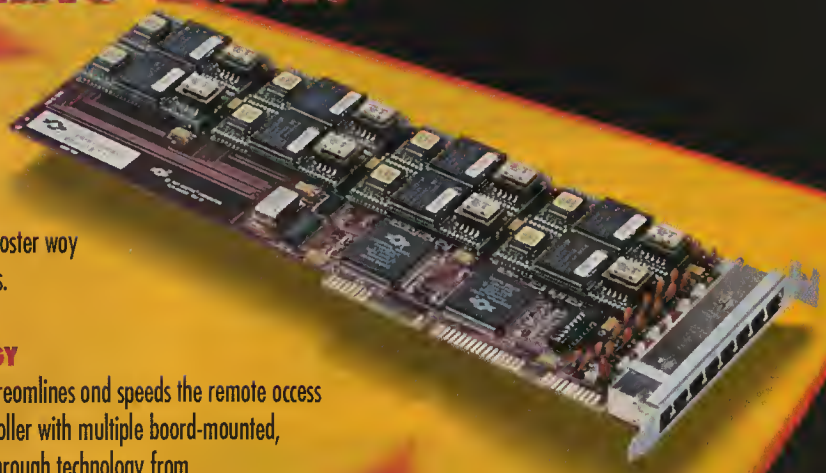
Bill:

Clark Development, makers of the popular PCBoard software, as I understand it, received a phone call from their bank one day late in May 1997 and therewith graduated from going concern status to a historical footnote in the evolution of the online world. They're in good company of course.

Jack Rickard

◆◆◆

When It Comes to Remote Access, Nothing Beats a Rocket.



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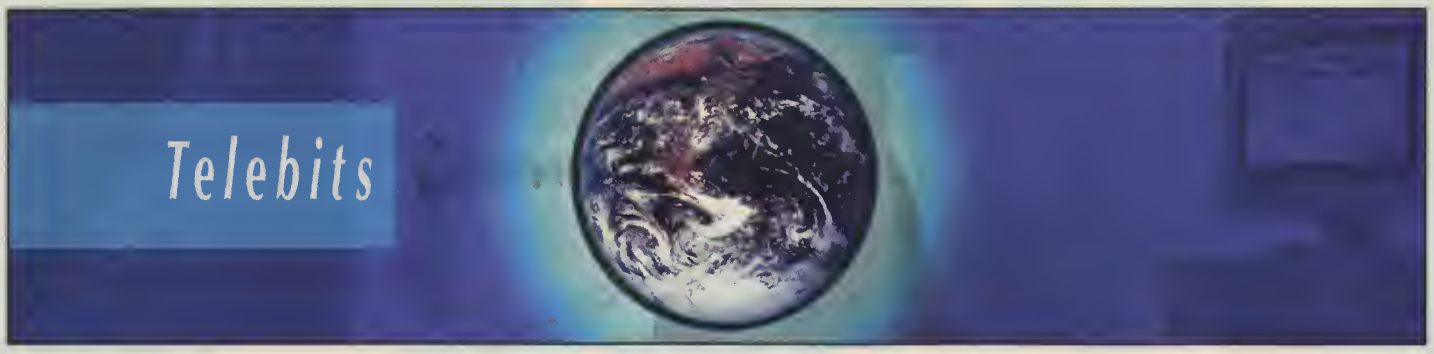
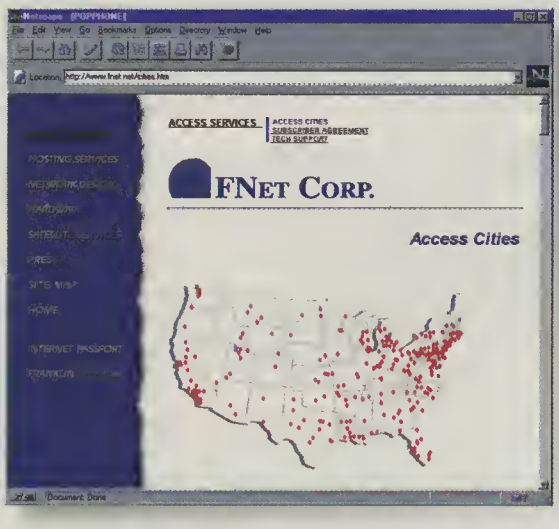


FRANKLIN TELECOM OFFERS PHONE-TO-PHONE SERVICE VIA INTERNET

Franklin Telecom will begin selling long-distance telephone service using ISPs as a "central office." Franklin's Tempest is an eight-line module that bridges local telephone calls to the IP network. Calls reach their destinations either through the Internet or Franklin's new national telecom network.

Ultimately, ISPs will be able to offer "calling cards" to their customers, who will call a local number, enter a PIN, then dial a long-distance number through the Internet. The Tempest costs between **$12,000** and **$19,000** depending on configurations and will allow ISPs access to the FNet service. FNet is Franklin's private national backbone for these Internet telephone connections.

The Tempest is available through Franklin Telecom at `www.ftel.com` or **1-800-372-6556**.



3COM / LUCENT TO LICENSE 56K PATENTS

On September 3, 3Com announced that it would license the patents received by its US Robotics subsidiary for 56 Kbps modem chips. This move was announced to help speed the ITU-proposed standard for 56K modems. Licensing of all patents related to development of USR's x2 platform will be either a flat **$100,000** fee or a per unit royalty capped at **$150,000**.

Two weeks later, Lucent Technologies announced that it too would license its three patents related to development of its own 56 Kbps modem chip.

3Com will only honor written requests for licensing through its Intellectual Property Group. Write to 3Com Corporation, Intellectual Property Group, Legal Department, 8100 N. McCormick Blvd., Skokie, Illinois 60076.

OSICOM PUSHES ROUTERMATE FAMILY

Osicom Technologies has introduced two additions to its Routermate family. The Routermate Plus D&I is a T-1 CSU with Drop and Insert features which allow for PBX systems and multiple DS-0 channels. The Routermate Executive has the same features as the Plus D&I, but also includes a serial WAN port. The Routermate Plus D&I costs **$1,795** and the Executive costs **$1,895**.

The Routermate products are low-cost CSU/router combo units. Routermates can support an unlimited number of clients on a network. The Routermate Plus 56 is a 56 Kbps CSU and integrated router costing **$995**. The Routermate Plus T-1 costs **$1,495**. It is a 1.544 Mbps CSU and integrated router.

All Routermate products come with a five-year warranty. Osicom's web site is `www.osicom.com`.

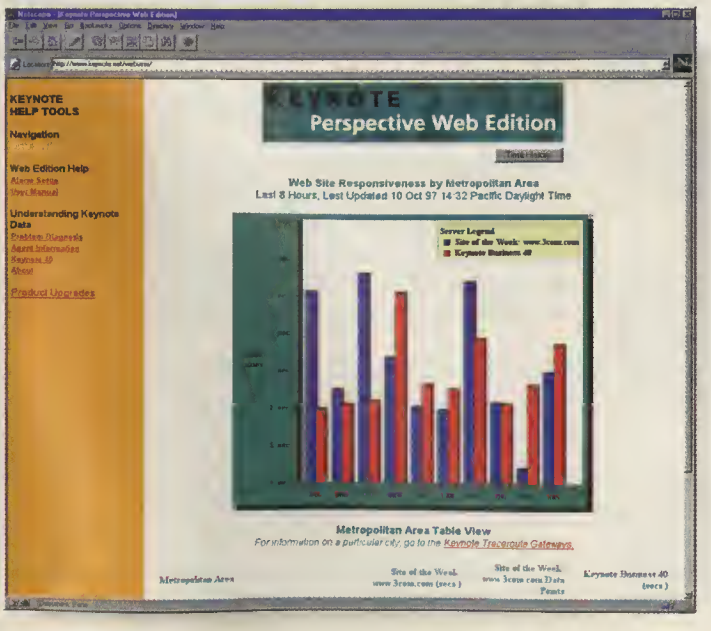
INTERNET FAX FOR END USERS OFFERED BY COMFAX

Comfax, a New York-based Internet faxing company, is offering a free trial of its fax service. By signing up, users get their own web page that acts as their fax management interface. They can send faxes through the Internet by selecting the Comfax driver during the print process.

Users who open a personal fax account pay **$20** in advance on their credit cards. That balance is billed automatically with each transaction. Comfax is located at `www.comfax.com`.

KEYNOTE ANNOUNCES REAL TIME BROWSER ACCESS

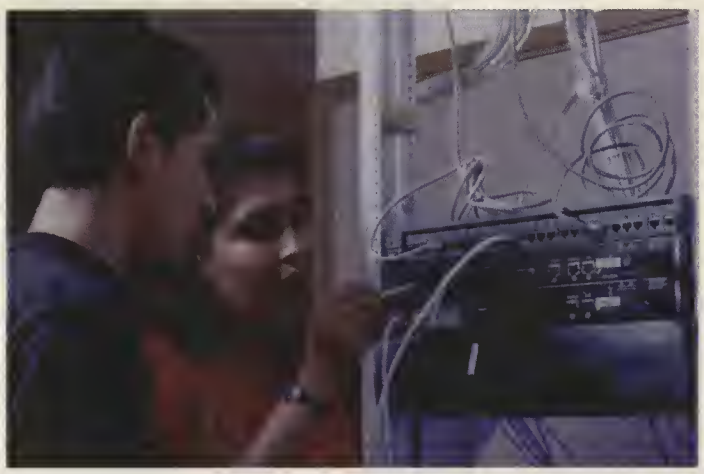
Keynote Systems, with its 43 measuring agents in 32 metropolitan areas, will measure your web site's performance as it is seen by end users. The company is now offering web-based reporting through its Perspective Web Edition and Perspective Professional Edition software. Perspective will compare your site's performance against the Keynote Business 40 Index, the top performing sites on the Web. The Web Edition will only measure from 21 agents in 10 metropolitan areas, while the Professional Edition will use all 43 agents. The Professional Edition also includes the performance alarm feature, which notifies the administrator of performance glitches. Performance alarms are extra for the Web Edition.



Every 15 minutes, the Keynote agents will download a page from your web site and document its download time. It then produces reports of performance over time or performance by metropolitan area.

Web Edition is **$295** per month per URL, and performance alarms are **$95** per month per URL. The Professional Edition is **$495** per month for the first URL and **$295** monthly for each additional URL. Additional users of the Professional Edition pay **$95** each. Contact Keynote Systems at `www.keynote.com`.

CISCO ANNOUNCES TRAINING PROGRAM

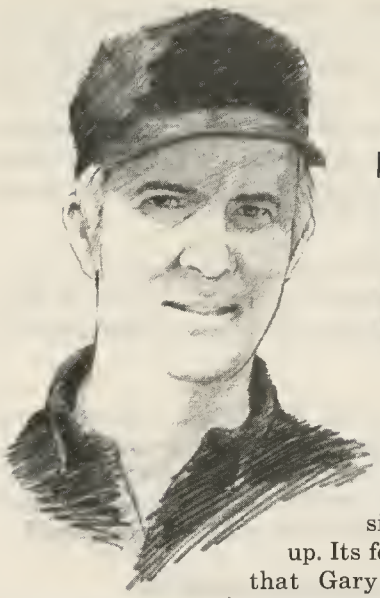


Cisco Systems has announced a certification program that will teach high school and college students the basics of designing, building and maintaining local, regional, national and global networks. Cisco has already contributed **$18 million** to 57 trade schools, high schools and colleges in Arizona, California, Florida, Minnesota, Missouri, New York and North Carolina. Cisco expects the program to expand to all 50 states by the fall of 1998. Currently, the program has over 1,000 enrolled students. For more information, go to the educational section of Cisco's web site at `www.cisco.com/edu`.

SHIVA SHIPS 56K CARDS FOR THE LANROVER

Shiva has released its LanRoverD56 remote access server, which implements T-1 and PRI technology. In addition, The company has begun selling modem cards for 56 Kbps analog connections. The cards use the Rockwell chip set and support the K56flex protocol.

List price for the LanRoverD56 starts at **$6,999**. Customers who bought Shiva v.34 modem cards before May 1, 1997 can exchange them, along with **$1,750** for a 56 Kbps card. Those who bought a v.34 card after May 1 can upgrade for **$1,000**. The offer expires December 31, 1997. Shiva's web site is at `www.shiva.com`. ◆



TECHNOLOGY FRONT

by Jim Thompson
Western News Service

WEBSITE PROFESSIONAL 2.0 - EVERYTHING THE WEB MASTER NEEDS IN A SINGLE BOX

With WebSite Pro 2.0, O'Reilly & Associates has significantly upped the ante in the web server arena. The package is comprehensive, easy-to-use and a breeze to set up. Its features are so powerful and complete that Gary Funk, the technical director at *Boardwatch Magazine*, has selected it over all other packages for the *Boardwatch* web site.

Jim Thompson is Managing Editor of Western News Service in Los Angeles, California. CompuServe: **72777,2677**, MCI Mail: **321-4127**, **mailto:** jim.thompson@wnsnews.com

FLEXIBILITY AND POWER

WebSite Pro 2.0 is far more than a server that can deliver static HTML pages. "The new WebSite Pro puts intelligence into web pages with powerful abilities like support for active server pages, CGI, server-side Java and ISAPI (Internet Server Application Programming Interface) support," notes Funk.

Flexibility and powerful tools are at the heart of the package. Support for active server pages means that you can use virtually any scripting language (including VBScript, JScript, Perl and Python) to add power and luster to your pages. This also means support for hundreds of third-party add-on products.

HTML EXTENSION

For even more flexibility, O'Reilly has built an HTML extension framework within WebSite called *iHTML Pro*. The extension provides more than 100 additional HTML tags. These include ODBC database access, file manipulation options, IF...THEN statements and sophisticated math functions. With it, you can create variables, find lengths of strings and do most of the functions you would find in a traditional language.

The HTML-like structure is easy to learn even for non-programmers. For example, if you want to add the output from a database to a page just add the <ISQL> tag or use the <iDATE> tag to insert the date. Best of all, the tags execute on the server so they are browser independent.

The possibilities here are almost unlimited. If you need a database on your site, iHTML offers ODBC/database connectivity for full web-database integration. This allows you to select and output records from a database, update records, delete records and enter information into a database. IHTML can link to Access, SQL databases or any database with an ODBC driver. According to O'Reilly & Associates, "iHTML can even access multiple data sources on one HTML page. IHTML also has numerous database cataloging capabilities (meaning, you can query a server for a list of available data sources, a data source for a list of tables, etc.), can handle multiple concurrent connections and can perform database joins between different database systems using ODBC."

A unique feature of iHTML is called *back page processing technology*, which opens a wealth of capabilities. Back page processing allows scheduled events to execute automatically, not just when a page or function is actually accessed. With this feature, you can hit a specified web page on a predetermined schedule as if it was a browser.

An example would be the creation of mail list manager. "In this case, you might have a database of e-mail addresses to which you want to redistribute a message. You would create a page with iHTML that would poll a mailbox with a POP command, if mail is there it would retrieve it, query a database for the e-mail addresses where the mail is to be sent, then send the message to each of the addressees. Some use this to have an NT backup log file sent to a list of addresses," said Russ Cobbe, president of Inline Internet Solutions Systems, Inc., the creators of iHTML.

Another unique tag is the "push" tag <iPUSH>. "It allows you to push a page to the browser when it is not fully processed. You could put this in a loop to continually push data until a condition is met. It can tell when a browser has gone away and then stop sending the data. This can be done with JavaScript but with our method it works with the 1.0 and older browsers," notes Cobbe.

There is even a tag that lets you grab information from another site and present it to a user. "One neat trick we have with this is to go to a page, take the IP addresses of the browser, do a reverse DNS lookup, find out the domain name and then do a query to the Internet." Cobbe said. "Then you can print a page that says, 'Hi (name) you are from this or that company or location.' It kind of scares people who have never seen it before."

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SETTING UP SHOP

The HTML extension framework (iHTML) was used to create a merchant server (iHTML Merchant) which is included with the package. If you want to set up an online store, this has just about everything you need and it's all ready to go. The store template is fully customizable for any kind of product and there are no limits on the number of products, categories, subcatorgies or the number of separate stores. All of the stores are maintained through a browser interface from anywhere on the Net, making it easy for others to maintain their own areas.

Using a store metaphor, there is a shopping cart where buyers can drop items. The program keeps track of the items in the cart and prepares a purchase order and even calculates all applicable taxes and shipping costs. It includes two different real-time credit card verification systems (CyberCash and Internet Secure), which make buying through the system easy for the user. Again, everything is fully customizable so your store can be as unique as your product.

For traditional HTML work, a full-featured, licensed version of HomeSite 2.5 is included with the package. HomeSite is a powerful tool that includes support for components such as JavaScript and ASP, multiple-file search-and-replace functions and script-aware color-coding. If you don't want to use HomeSite, there are plenty of other choices. WebSite Pro 2.0 is fully supported by FrontPage and supports Netscape one-button publishing.

ACTIVE SUPPORT

Bob Denny, lead developer of the O'Reilly WebSite project, notes that the product supports "more of what you might call 'active technologies' than other products. Our server can handle active server pages, server-side Java, ISAPI, our own API (WSAPI) and two different CGI interfaces — Windows CGI and the 'standard' CGI," said Denny. "This means that an ISP can offer Perl scripts and server-side Java on the same machine."

Denny, who also designed and implemented the first Windows CGI, adds that the Java interpreter JDK 1.1 is embedded into WebSite Pro 2.0 making it a native Java host. "When you program your server-side Java (serveletts), they run just like ASP, right in the context of the server process. This makes it flexible, efficient and fast," said Denny.

"We spent a lot of time making WebSite easy to maintain yet retain all of the features needed to make it powerful. As far as speed is concerned, our objective is to support 99.9 percent of all sites in terms of speed — that number is about 3 to 4 million hits-a-day. WebSite Pro is capable of comfortably handling 8 to 10 million hits-a-day," said Denny.

The latest version of Perl 5 for Win32, which includes a connector DLL for Microsoft's ISAPI interface, is included with the program. It also includes a version of Python which is specifically ported to the Win32 environment.

With the graphics engine, it is possible to draw images on the fly or overlay one graphic image on top of another within an HTML document. When combined with database tools, this feature can generate charts and graphs from data stored in a database. More than ten graphics formats, including BMP, PCX and TIF are supported. Conversion to JPG can be done on the fly. Again, all processing is done on the server so no plug-ins or special browsers are required.

IP-LESS SERVER

Further flexibility and capabilities are provided through the "IP-less server feature" of WebSite. According O'Reilly & Associates, "IP-less virtual servers, which work with all modern browsers, are multiple virtual servers sharing a single IP address. You can mix and match IP-less virtual servers with IP-bound ones, which allows you to provide entire webs for different companies, or different groups within one company, each with its own domain name from one machine. No additional system overhead is required and only one copy of WebSite Pro is loaded. A new identity wizard makes creating virtual servers quick and error free."

Additionally, separate anonymous accounts can be activated for each virtual server in operation — something that ISPs will love. With it, web developers can upload CGI or API programs to run on their sites without jeopardizing the integrity of the server. Not only does this provide convenience and flexibility but additional security as well.

The major benefit is that you can serve multiple virtual servers (domains) without having to allocate an IP address for each one. So, one running copy of WebSite can appear to be 50 or more different web sites.

"In the past you needed separate IP addresses because the browsers would not send information about which hosts they were trying to contact. All they would send was the URL path. The only way you could tell at the server end which of the virtual servers was being requested was to look at a different IP address for each one." explains Denny. "The newer browsers *do* send the host name that appeared in the URL at the browser end to the server. The server, therefore no longer needs an IP address so it can look up the host name — the host name just comes in allowing the server to multiplex its virtual servers off a single IP address."

ADVANCED SECURITY FEATURES

Further security features are provided through Secure Sockets Layer (SSL) version 3.0. which helps ensure that transactions are private and that information has not been altered during transmission. According to O'Reilly and Associates, "WebSite Pro's new security features include support for native Windows NT authentication, in addition to WebSite's own users, groups, and realms, as well as support for Microsoft NTLM authentication, eliminating the need for users to enter user names and passwords on NT-based intranets. A new Key Ring Manager provides graphical control over private/public key pairs, certificates, and trusted roots. In addition, you can request processing in the context of an NT account (anonymous or authenticated), and layer WebSite Pro's powerful access control with NT's native access control for super-flexible security. "

"On our virtual servers, it is possible to create separate security environments for each virtual server. As an ISP you can allow customers to upload and run CGI programs without danger to your system or other servers. You can have a contained execution environment for each virtual server. Right now, no one else can do that," said Denny. "Security features for individual items are configured by URL and not by individual file. That means you can protect virtual objects. You can also move your web around on different disks and change the mapping from URL to disk and not have to change any security settings," he added.

Even with all of these features and capabilities, WebSite Pro 2.0 is one of the fastest web servers currently available. O'Reilly & Associates claims that a "speed and performance increase of more than 50 percent over version 1.1" allows it to "easily handle over six million requests a day from a single Pentium box."

One of WebSite's strongest features has always been its intuitive user interface. Version 2.0 builds on this and adds a number of new and improved features. Particularly welcome is the full featured remote administration features of the latest version. The WebSite Windows GUI can be installed on any Windows 95 or Windows NT machine allowing for full control of the server from a remote location. They have also improved on the included version of WebView, a powerful server/site management tool that provides fast and efficient link mapping and verification. The improvements include an "Explorer-like" interface from which you can display and/or print your entire web structure in a graphical tree format. Icons indicate individual components such as images, image maps, FTP sites and mail-to locations. Additionally, all broken (unresolved) links are identified and marked. WebView will even alert you to any external links that may have changed. To keep you on top of usage, WebSite Pro 2.0 includes a site activity tracker called QuickStats so you can get a quick read on how many times a specific page has been viewed or how much overall activity you site has been receiving.

As many features as are found in WebSite Pro 2.0, many more than planned for the future. Denny would not provide any details of future additions to the program, but he did say, "we will continue to add flexibility to the program and we will implement other technologies when popularity for them warrants it."

CONCLUSIONS

Gary Funk has been using WebSite ever since it was first released. Here are his thoughts on this full-featured package:

I like WebSite Pro 2.0 for a couple of very basic and simple reasons. First, it is extremely easy to install. In fact, it sets up the web server by walking you through all the steps needed to get things operational. If you're not sure what to do, WebSite prompts you for the information needed or takes you to the area that needs to be worked on or set up. Once you go through the simple and logical install process, you are (or can be) live on the Internet immediately with no muss and no fuss. With this package anyone can set up a web site — even those who have never done anything like it before.

Once set up, the WebMaster interface, which is what O'Reilly calls the server properties, continues to make things easy. With WebMaster it is easy to do things like mapping to documents. The mapping for the CGI is done for you and there are plenty of examples on how it all works so you can make changes if you need or want to. There are also wizards that walk you through any changes you want to make.

I have always been a big fan of the O'Reilly products. The books are among the best on the market and when I first heard about WebSite back in 1995, I knew this was something I needed to take a closer look at. Since then, I have watched the product grow to what it is today. Here at *Boardwatch*, we looked at all of the web products on the market. Although there are others that you can get free, WebSite Pro contains all the tools you would ever need and is worth every penny of the price.

I also like the idea of dealing with a small company rather than a giant impersonal conglomerate. This is especially important when it comes to tech support. When I need help, I can actually get someone on the phone (without waiting on hold for hours) who cares, who knows what they are talking about and who truly wants to help me with my problem. It's a refreshing and welcome concept that has been forgotten by so many of the large software companies.

WebSite Pro also comes with excellent documentation and has plenty of examples on how to get things operating fast. It is also the only package that I know of that supports both secure HTTP, which allows you to do secure transactions over the Internet, and Secure Sockets Layer.

Inline HTML (iHTML) is, in my view, one of the best things to happen to the industry since web servers first appeared. It lets you do custom programming and create unique web pages. Best of all, no one can steal the code since the code is processed before it is sent to the client. It has added so much to the basic HTML that all I can say is "wow!" Everyday I find new things and new possibilities.

There are so many features that it is impossible to list everything that I like about the package. In fact, there is a wealth of things that I have not even used. It's what I call the "Wallmart philosophy." People go to Wallmart because it is one place where they can find almost everything. I don't want to buy everything, but if there is something I want or need, I know they have it. If Jack Rickard comes to me and wants to add or change something on the ***Boardwatch*** web site, I know I already have all the tools I need to do the job.

Of course, there is always room for improvements. One thing that I would like to see is a user log for web sites. I don't want to use the NT registry or the NT logon process. I am talking about a userlog that is a stand alone database which allows you to set flags for authorization levels and directory access and provide information about the user. It would be like the old BBS days. (You remember them, don't you?)

For me, WebSite Pro 2.0 has made running a web site fun (well, almost fun) again. I give it a big thumbs up!

SYSTEM REQUIREMENTS:

486 (or higher) Intel-based CPU (Pentium recommended), VGA video display adapter, CD-ROM drive, 16 MB RAM for Windows 95 (32 MB recommended), 32 MB for Windows NT 4.0 (64 MB recommended), 40 MB free disk space, base install — 60 MB free disk space, full install, Windows 95 or Windows NT 4.0 with TCP/IP◆

WebSite Pro version 2.0

O'Reilly & Associates
101 Morris Street
Sebastopol, California 95472
Tel: **(707) 829-0515**
`http://website.ora.com`
COST: **$799** U.S. / **$1,135** Cnd

IHTML

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Canada
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`http://www.inline.net`

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OUR RESEARCH SHOWS THAT THERE ARE OVER 65 MILLION GRANDMOTHERS WHO WOULD LIKE TO USE E-MAIL BUT DON'T OWN A COMPUTER.

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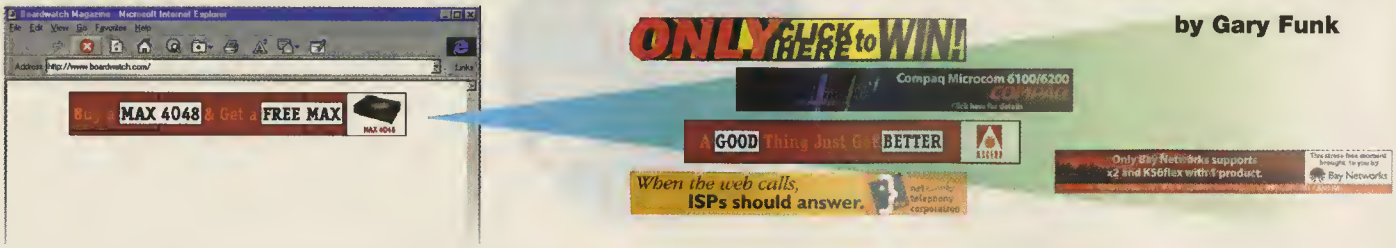
USING iHTML TO ROTATE AND DOCUMENT BANNER ADVERTISEMENTS



by Gary Funk

In this issue, we are covering several programs that use the log files from a web server to create extensive reports. These reports can be used for the purposes of security, demographics or design.

If you run a commercial web site, chances are you sell advertising space. Banner advertising is a very lucrative way to supplement providing quality content. If the ads are unobtrusive, users will visit the web site often for new information and every so often click on a banner ad to see what it's all about. But few advertisers will pump money into your web site if they are not certain that it is attracting people to their products.

You can create some pretty impressive reports with SurfReport, WebTrends and Hit List. But you can also use iHTML to both serve your banner ads and document what happens after the ads are seen. Was it simply displayed? Did the audience click on the banner? Three simple files, displayed below, will allow you to collect the data.

In addition to these three files, you will also need an ODBC-compliant database. The purpose of the database is twofold. First, it serves the banners dynamically. Afterward, it logs views and hits on each banner ad. As you could imagine, once you're able to tie a powerful relational database to the user trends of your web site, the opportunities are virtually limitless.

To set up the database, you will need a few essential fields. An **ID** field is a unique number for each banner ad you've sold. The **Weight** determines how often an ad is displayed. An ad with a weight of 4 will be displayed four times as much as an ad with a weight of 1. **Output** is the name and path, actually the URL, of the image file to be displayed. The **URL** field is the URL of the product advertised. Rarely will an advertiser send users to its main page. A special page is often set up to handle the traffic from a banner ad. This makes it easier for the advertiser to track its success. Finally, you'll need **Shown** and **Hits** fields, which document how many times the ad is displayed and clicked through. These are the guts of this application. But you'll need to make 53 hits and shown fields, one for each week of the year. If you're a real good relational database programmer, you might be able to find a way around this. But for this example, we're making simple, static fields for each week. We've created **S0**, **S1**, **S2** ... to document how often an ad is shown each week and **H0**, **H1**, **H2** ... to document its hits. This is why we need 17 lines of code to calculate the week number.

ID	Weight	Output	URL	S40	H40
1	1	images/ads/inline.gif	www/inline.net/ad.html	562	12
2	4	images/ads/ihtml.gif	www/ihtml.om/net_ad.html	1090	59

INSERT.TXT

This file is some canned text that has to be placed in the web page wherever the ad is supposed to go. Because each html page must have its own database table, the only change needed is the name of the table which in this case is MainIndex for the main Index.html page of the web site. This code is really just a call to the **AdBannerRotate.txt** file, which stores all the parameters for rotating ads. In the future, if you change your method of rotating ads, you only need to update that file, not each individual web page on your site. Note that AdBannerRotate.txt is on the C: drive. This is because it's loaded locally. The file could be anywhere on a network drive.

```
<!ihtml>
<iFORMAT>
<iEQ name=DataBase value="MainIndex">
<iINCLUDE NAME="c:\boardwatch\AdBannerRotate.txt">
</iFORMAT>
```

ADBANNERROTATE.TXT

This file, AdBannerRotate.txt, has four functions. First, it returns the week of the year. Since advertising agencies need to know how often their ads are displayed and hit on a weekly basis, this is very important. This variable can be used for many applications, and your database should be set up to deal with it. Next, this file grabs the next available image. Remember, images are displayed by weight. The next one in the cue will be displayed when this web page is open. The third function builds the HTML reference of the page that displays the image and links to the URL reference. Finally, it increments the proper counter by 1.

```
<!ihtml>
<iERROR>
:i_error<br>
:i_errortext<br>
:i_sqlerrortext<br>
:i_sqlerrorstmt<br>
</iERROR>
```

This next segment of code returns an integer representing the week of the year

```
<iEQ NAME=varA VALUE=<iSTRRIGHT SRC=<iDATE>
      NUM=2> EVAL=TRUE>
<iREM varA = last two digits of the year>
```

```
<iEQ NAME=dateA VALUE="01/01/:varA">
<iREM dateA = first date of the year>
<iEQ NAME=varB VALUE=<iDATEEXT DATE=:dateA
      TYPE=dayofweek>>
<iREM varB = day of the week the year started on>
<iEQ NAME=varX VALUE=<iMATH A=:varB B=1 O="-">>
<iREM varX = first day of year>
<iEQ NAME=varY VALUE=<iDATEDIFF DATE2=<iDATE
      ADJUST=+1> DATE1=:dateA> EVAL=TRUE>
<iREM varY = day of the year>
<iEQ NAME=varA VALUE=<iDATEEXT DATE=<iDATE>
      TYPE=dayofweek>>
<iREM Todays day-of-week>
<iEQ NAME=varB VALUE=<iEVAL EXPR=":varX - :varA
      + :varY">>
<IREM a nuber divisable by 7>
<iEQ NAME=varZ VALUE=<iMATH A=:varB B=7 O="/">>
<iEQ name=varB value="S:varZ">
```

This next segment of code selects the next banner ad

```
<iEQ NAME="ad_img" VALUE=<iRANDOM
      TABLE=:Database>>
<iSQL SQL="SELECT url FROM :Database WHERE out
      put=':ad_img'">
<iSQLFETCH>
```

This next line of code creates the HTML reference

```
<a href=/AdBannerRedir.ihtml?db=:Database&url=
      :i_sql_url&ad_img=:ad_img><IMG SRC=:ad_img
      BORDER="0" width="468" height="60"></a>
</iSQL>
```

This next line of code increments the S counter

```
<iSQL SQL="UPDATE :Database SET :varB=:varB+1
      WHERE output=':ad_img'">
</iSQL>
```

ADBANNERREDIR.IHTML

The AdBannerRedir.ihtml file simply sends the user to the ad's URL and documents the hit. It needs to return the week number as well to accurately document the hit.

```
<!ihtml>
<iERROR>
:i_error<br>
:i_errortext<br>
:i_sqlerrortext<br>
:i_sqlerrorstmt<br>
</iERROR>
<iEQ NAME=varA VALUE=<iSTRRIGHT SRC=<iDATE>
      NUM=2> EVAL=TRUE>
<iREM varA = last two digits of the year>
<iEQ NAME=dateA VALUE="01/01/:varA">
<iREM dateA = first date of the year>
<iEQ NAME=varB VALUE=<iDATEEXT DATE=:dateA
      TYPE=dayofweek>>
<iREM varB = day of the week the year started on>
<iEQ NAME=varX VALUE=<iMATH A=:varB B=1 O="-">>
<iREM varX = first day of year>
<iEQ NAME=varY VALUE=<iDATEDIFF DATE2=<iDATE
      ADJUST=+1> DATE1=:dateA> EVAL=TRUE>
<iREM varY = day of the year>
<iEQ NAME=varA VALUE=<iDATEEXT DATE=<iDATE>
      TYPE=dayofweek>>
<iREM Todays day-of-week>
<iEQ NAME=varB VALUE=<iEVAL EXPR=":varX - :varA
      + :varY">>
<IREM a nuber divisable by 7>
<iEQ NAME=varZ VALUE=<iMATH A=:varB B=7 O="/">>
<iEQ name=varB value="S:varZ">
<iSQL SQL="SELECT url FROM :db WHERE
      output=':ad_img'">
<iSQL SQL="UPDATE :db SET :varB=:varB+1 WHERE
output=':ad_img'">
</iSQL>
<iREDIR url=:url>
```

This is basically object-oriented HTML. Once you start messing around with passing variables between web site and database, there's a lot that you can do.

This code and a sample database are available at **FTP://boardwatch.com/rotate.zip**. ◆

LINUX REDUX by Alan Cox

IPV6 IS COMING

"IP version 6 is coming! When will all the software be ready, how soon will it be out?" The shouting has been underwhelming, as you may not have noticed.

It might be tempting to ignore IPv6, but it is going to arrive. The requirement for more address space will drag it kicking and screaming into the daylight regardless of vendor games and implementation difficulties. The address space is going to run out as the cable networks start to connect millions and millions of households to the Internet with their WebTV sets. An ISP would be wise to get written information on future IPv6 upgrades for purchased products. Otherwise, in two years, that cheap router becomes an expensive doorstop. Indeed from the noises coming out of 3Com, it would appear CymruNet owns several future doorstops. Time to buy some synchronous cards for the Linux boxes.

Alan Cox is the Technical Director of CymruNet, a leading Internet service provider in Wales, United Kingdom. Cox is also a member of the Linux International Technical Board and the CERT Vendor contact for Linux. He maintains the ***http://www.uk.linux.org*** *web page and leads the Linux Networking Project, the project to port UNIX to shared memory multiprocessor architectures, and a project to port Linux to 8086 embedded controller systems. Send e-mail to* `alan@cymru.net`

IPv6 has actually been designed to make the transition easy. You can run both IPv4 and IPv6 on the same network, and hosts that talk both protocols can talk to everyone else. Even in situations where the routers in the middle fail to support IPv6, you can tunnel it over IPv4 networks. At the moment, most of the testing network — the "6bone" — is built like this, with small islands of IPv6 development hosts floating on a sea of IPv4.

In the Linux world, the IPv6 code is being put into the 2.1.x development series of Linux kernels. While not terribly stable, it does work . . . mostly. The biggest remaining problems are updating all the user applications. A surprisingly large number of tools need IPv6 awareness for the Internet of the future, as do the C libraries.

Fortunately, a lot of good work has been done from the start in specifying a common clean interface for the IP version 6 interface and supporting functions. This has meant that Linux/Unix/Unix-like applications have been ported only once. Thanks to this, you can pick up all the main applications for Linux with IPv6 awareness — if you want to be brave and play with an IPv6 test box.

The FTP site `ftp.inner.net` holds all the really important goodies for those who wish to play. You'll also need an IPv6-aware kernel (2.1.55 seems like a good choice). If you want things to work sensibly, use glibc 2.05 as your C Library. This is because glibc includes all the IPv6 API and support functions specified in the RFC (request for comment) documents from the IETF. Setting that up from scratch is a big job, but you can shortcut the glibc and glibc-based tools by picking up a beta RedHat 4.8 (Thunderbird) from `ftp.redhat.com`. This is the current Red Hat development release and quite conveniently available for FTP. Another choice is the Debian development release (`www.debian.org`), which is also based on glibc 2.05.

Having downloaded the software, you need to unpack and install it. You should definitely read the Linux IPv6 FAQ before attempting to do this. The software replaces the standard networking tools like ifconfig and Telnet with IPv6-aware versions. With all this installed, you should be able to ping ::1 (that's loopback in IPv6 speak) and Telnet to it. To talk to the outside world, you will need to configure the "sit" device, which provides tunneling type services. Then you will need to set up a tunnel with a 6bone site, or just anyone who wants to join in. IPv6 on Linux is still every much for those who are prepared to experiment and work around problems. By the time version 2.2 is released, it should be a standard feature and usable by anyone.

IPv6 has both good and bad sides. Those of you who maintain domain name servers will revel in the chance to mistype entries for the new 128 bit addresses and break their domain tables. Similarly, the web fraternity will be delighted to know that they used colons (:) to separate each piece of the address rather than dots (.). This means that putting port numbers on URLs for IPv6 addresses just doesn't work. Still I guess you should be using domain names, and with IPv6 the domain name is, quite often, shorter than the address.

On the good side, IPv6 adds cryptography options. This is good if you assume that your local government hasn't finished outlawing all cryptography by the time IPv6 becomes popular. Cryptography at the protocol level allows you to run insecure applications over insecure networks, if you trust the host to which you are talking. Of course that doesn't help everywhere, but it does mean that with IPv6 you are likely to see much more security against pass-

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word stealing and hijacking of Telnet sessions. It will also offer good protection for services like NFS, that, on their own, are not really secure enough to run except on local networks or across VPNs (virtual private networks). Sadly, given the current state of U.S. crypto and patent law the U.S.-originated Linux CD-ROMs are likely to consider shipping without encryption, while European vendors like SuSE an LST are free to ship cryptography around most of the world. A fine testimony to the arguments that the U.S. crypto laws damage U.S. business.

IPv6 also has potential performance improvements. In particular, the large addresses make it practical to pick a fixed top number of bits and use those for switching at the critical network access points like MAE East and MAE West. Right now, these interconnects are threatening to simply melt under the load. One proposal currently under very serious consideration and popular with many large scale router vendors is to use a fix-number of bits. This will enable them to throw more silicon and less CPU cycles at the routing problem.

On a smaller scale system, such as a web server, IPv6 is likely to offer little difference in total system performance. It will provide some advantages. By using encryption, it will be possible to offer reasonably secure web services without using SSL, and to offer secure POP3 mail. Right now, this is a missing feature that makes using POP3 mail access over wide area networks less than desirable. With 128 bit addressing, it also becomes realistic to offer static IP addresses to customers again.

IPv6 is waiting for you a couple of years down the line, but whether with open arms or sharpened claws is really up to you. Either way, Linux will be ready.

RECOMMENDED READING

Having had to dig through the collection of new toys to play with while rebuilding X11 to include support for some extra extensions, I finally got around to looking at the book *Maximum RPM*.

I have to admit *Maximum RPM* has been sitting on my shelf in the "read me" pile for a long time. A book on package management and building is at first sight fractionally less exciting than listening to soup.

I've touched on RPM (the RedHat Package Manager) a few times when talking about security and the like. However, to make full use of its power requires going below the simple graphical install tools that the many RPM-based distributions provide (and indeed others like krpm) to the command itself.

The book is split into two sections. The first third or so deals with all the ways you can use RPM to manage packages, providing a comprehensive reference to each usage. The remainder of the book explains how to build packages and how to make RPM do much of the work for you. This is well laid out and includes both useful examples and handy shortcuts. There is a good practical emphasis that will go down well with those trying to build RPM packages for the first time.

It's a well written book, and I recommend it for anyone wanting to build packages and learn how to package software. As a reference for using RPM to install and manage machines, the book is probably overkill and the RPM HOWTO and manual page will be more than enough for most users.

You can learn more about RPM on the RPM web site (`www.rpm.org`).

S.U.S.E LINUX 5.0

S.u.S.E Linux 5.0 didn't stay on the shelf very long. I've always found S.u.S.E stuff very well designed, but until recently they have been releasing their product in German only, perhaps a fair revenge on the English speaking world. Everything about the box and the layout of the manuals just says "quality" — until you read them. At this point, it's all too obvious that the translation wasn't done by a first language English speaker and the editing was rushed in places. Odd German captions and phrasing have escaped into the manual. It is a pity that this detracts from the documentation since the content is magnificent. A lot of manuals tell you what you need to know, but the S.u.S.E. manual shows up the competition by also telling you the surprises and what you may well trip up on. Perhaps the only criticism is that it is occasionally over-detailed and might blind the newcomer.

Installation is not difficult, and driven by the YAST setup tool. The CD-ROM claims to be bootable but even if (as in my case) your BIOS cannot boot from CD-ROM, the quick install is a breeze. The packages included are comprehensive and it is easy to see why they include 4 CD-ROMs. Amongst the more unusual packages are a large number of emulators, and a large collection of licensable and demo commercial packages like the ARDI Apple Macintosh emulator.

S.u.S.E is a nice product, very well designed, and with — all things considered — a great manual. Even with the weak translation, other Linux vendors should look at this manual and then look hard at their own efforts.

S.u.S.E are at `www.suse.com`

LINUX 2.0.31 ON THE WAY

On the news front, expect Linux 2.0.31 to be released by the time this article is published. This is an update on Linux 2.0.30 featuring extensive bug fixes for most of the reported 2.0.30 bugs and various new and updated drivers. It doesn't add any new features as it is a stable release, it just makes things work a little bit better. In particular, several networking problems and a pile of Adaptec 2940 driver problems are gone.

The 2.0.31 kernel will be appearing on `Linux.kernel.org` in `/pub/linux/kernel/v2.0` once it is out. Until then, you can pick up pre-releases of it (if you wish to test them) from the testing directory.◆

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What the Internet experience should be.

One of the things that fascinates me about the Internet is the ability for people across the world to work together without meeting face to face. Take, for instance, distributed computing. Simply put, distributed computing is a method that breaks a large task into many small tasks that individual computers can solve separately.

DISTRIBUTED COMPUTING

by Geoffrey Faivre-Malloy

Geoffrey Faivre-Malloy works as a project manager and developer by day and a contractor by night. Recent interests include Internet development and game programming. He works in Atlanta, Georgia and when not working, he teaches his wife, Christy, how to program in Visual Basic.

Comments about the article are welcomed at gjf@mindspring.com.

One area that lends itself to distributed computing very well is mathematics. Using the idle time of computers around the world, people have teamed together to solve problems that previously were only in the realm of supercomputers. There are many reasons why people would participate in such efforts; fame, riches, and even to find alien life.

Distributed computing is for everyone interested. If you've got a computer, there's an extremely good chance that some project can be run on it (Yes, even you Amiga fans can use your computers again.) So dust off those doorstops, rev up those hotrods and read on!

The majority of these projects don't slow down your computer at all. Typically, they run in a very low priority consuming all idle time that your computer might have. If you do decide to participate in one of these, you will invariably be asked the question — "why are you doing it?" Here are some common answers:

- Competition — "My computer can crack RC5 keys faster than yours."
- Proof — "I was kidnapped by space aliens and SETI is gonna prove they exist!"
- Leave me alone — "My computer ain't no stinkin' doorstop!"
- Fame — "I'm gonna be in the history books"
- Because it's fun!

HOW TO USE DISTRIBUTED COMPUTING TO SOLVE A PROBLEM

Using distributed computing can be a simple or a daunting task depending on how complex your individual problem is and how many people you want to work on it. As an example of what you will need to ask before you begin coding, let's look at RC5 in depth.

RC5-56 is an encryption method patented by RSA. The 56 means that there are 56 bits available for each encryption key. Thus, there are over 72 quadrillion keys to test if you wanted to crack a message that had been encrypted with RC5-56. This is both good and bad. It's bad because a brute force method must be used to find the key. It's good because a brute force method must be used to find the key. If there is a process to test each key, then it becomes a simple problem to test all of the keys because this process can be applied to all of the keys, one at a time, until the correct one is found.

You may have heard of another encryption method called DES (Data Encryption Standard). For years, this was the only encryption that companies used. Partly because people thought it was secure, but also because the government had established it as a standard. DES also has 56 bits of encryption. However, without giving mathematical proof, DES is also much weaker than RC5-56. This was recently proven when distributed computing was applied to DES in a similar fashion as RC5 and subsequently cracked.

Now that we have identified the problem (how can we crack a message encrypted with RC5-56) and a solution (by testing 72 quadrillion keys) we can begin writing the code to do this. There are three parts to the software side:

1) Client
2) Proxy
3) Main Server

The client is simply the portion that will be testing individual keys to find the correct one. The client can be run on one computer or preferably tens of thousands of computers (the more computers, the faster the problem can be solved). If the client is running on more than one computer, you will need to get information on which key to test so that work is not duplicated and you will also need somewhere to report the results.

This is where the main server comes in. The main server keeps track of the keys that have been tested thus far and hands out new keys to test when a client asks for more. Unfortunately, it isn't this simple. If you had several thousand computers all attempting to communicate with the main server during the day, the server would quickly become overloaded and communications chaos would ensue.

That's where the proxy comes in. You could think of a proxy as a mini-server. The proxy requests a large group of keys from the server and then hands them out to the clients as the clients request blocks. When a client reports that a group of keys are done, the proxy will queue these results and later report them to the main server.

It isn't absolutely necessary to use a proxy and a main server. For instance, the Mersenne Primes and Golomb Rulers projects use e-mail to communicate their results. A range of numbers is requested via e-mail and when processing is completed, the results are returned via e-mail. This works fine for a small project like Golomb Rulers (about 30 participants so far) but is becoming unwieldy with Mersenne Primes (approximately 2,000 participants).

DOES IT WORK?

Does distributed computing really work? Simply ask one of the thousands of people who helped prove that DES is a weak encryption standard. It only took them a couple of months of concerted effort to break it (with the current group, it would take about 45 minutes). Or ask George Woltman, the coordinator of the Mersenne Primes project. Since he started the project, two new Mersenne Primes have been discovered (to date, only 36 have been found in centuries of searching).

Whether you have a slow or fast computer, there's a project available that can use those spare CPU cycles.

MERSENNE PRIMES

A Mersenne Prime is named after Marin Mersenne — a Minim Friar. As you may remember from school, a prime number is any number that is only divisible by itself and one (2, 3, 5, 7, 9, etc.) A Mersenne Prime is a special kind of prime number. A Mersenne Prime, is 2^{n-1} where n is not necessarily prime but the result is. To date, there have only been 36 Mersenne Primes discovered. The largest is over 900,000 digits long.

Finding Mersenne Primes is tough work and takes a lot of patience. With a Pentium Pro 200 it can take as long as 10 to 20 days to determine if a single exponent is a Mersenne Prime or not. If you're not worried about being famous but would still like to help, you can attempt to find factors of these numbers. This speeds up the search because when a factor is found, the number doesn't have to be tested to see if it's prime.

The current goal of this group is to test all exponents below 5,260,000 by the year 2000. If tested by a P90, it would take over 5,600 years to test the remaining exponents!

You could be the next person to discover a Mersenne Prime and get your name in history books forever.

For more information, point your browser to: `http://www.mersenne.org/prime.htm`

RC5

Encryption is a hotly debated topic. Some say we need stronger encryption, others say we need encryption that the government can crack easily. Regardless of the argument, the truth is that other countries are moving forward while we stand still. Thus, the encryption that we are allowed to export is typically not secure at all.

RC5 is a type of encryption that RSA holds the patent on. RSA has offered a **$10,000** reward to the first person/group that cracks a message encoded with RC5-56. The Bovine effort (Moo!) has written software that is attempting to find the one key out of 2^{56} (72,057,594, 037,927,936) keys. Nearly 30 percent of one the keys have been tested since this effort started.

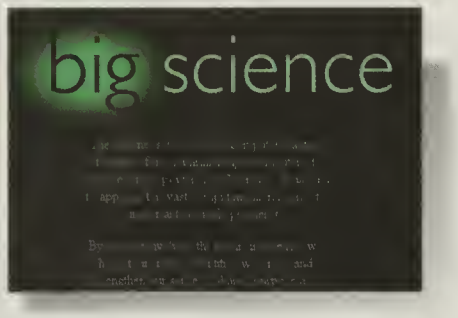
If you happen to find the key, you will get **$1,000**, Project Gutenberg (`http://promo.net/pg`) will get **$8,000** and the people that coded the software will get **$1,000** for their work.

One thing that is unusual about this effort is that the project researchers are working on modules for their software so that when they crack the key, they can easily use all the computing power to find Mersenne Primes. There is even talk of writing a distributed chess engine — look out Big Blue!

For more information, point your browser to `http://rc5.distributed.net`

SEARCH FOR EXTRA-TERRESTRIAL INTELLIGENCE (SETI)

If you've seen *Contact*, you have an idea of what this group is attempting to accomplish. Large radio telescopes receive data that will be farmed out to computers around the world. Each participant has the slight, but captivating, possibility that his or her computer will detect the faint murmur of a civilization beyond Earth.



Even more intriguing is the fact that this program will run as a screen saver so you can see information about the project, the data being processed, or the number of participants around the world.

As of this writing, the software is under development with an expected release date of first quarter of 1998. If you'd like more information, or would like to be contacted when the software is ready point your browser to `http://www.bigscience.com`

GOLOMB RULERS

Golomb rulers refer to a spacing technique that is used in a variety of areas such as astronomy (placement of antennas), x-ray sensing devices (placement of sensors), and a plethora of other fields such as data encryption.

A simple description of what Golomb Rulers are is beyond the scope of this article but you can find more information at `http://members.aol.com/golomb20/index.html`

LARGE NUMBER FACTORING

Quick — what prime numbers when multiplied together equal 1,863,773,308, 290,215,666,783,428,793,428,328,793,879,231? Finding all the factors (or even one) of a large number is a very difficult and time-consuming task. This group has written some software that runs on Unix machines to find factors of very large numbers.

For more information, send e-mail to `Majordomo@Factoring.Dataplex.NET` with the words "subscribe nfsnet" in the body of your message.◆

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CONSUMMATE WINSOCK APPS

by Forrest Stroud

THE NETWORK-TO-INTERNET SOFTWARE SCENE

If you have ever set up a small network, you can probably attest to the frustration of being able to share everything over the network *except* modems and Internet connections. You can share files, hard drives, and CD-ROM drives across the LAN, so why shouldn't you be able to share these devices as well? The truth is you *can* share modems and dial-up connections, but you'll need more than just Windows 95 or NT to do it. While one option is to purchase expensive routing hardware, an easier, less expensive alternative is to use one of the following specialized networking applications.

The applications reviewed here and many more are available at Stroud's Consummate Winsock Apps List, `www.stroud.com` and `http://cws.internet.com`.

Forrest Stroud currently works in College Station, Texas, as a web developer for Mecklermedia Corporation. He recently graduated, with honors, from The University of Texas at Austin. The Information Systems and Data Communications Management major enjoys spending what little free time he has with his wife Joanne and the "zoo" — an ever-expanding collection of dogs and cats that currently consists of a Dalmatian pup (Svoda Pop), a chocolate Lab cross (Roemer), a German Shepherd pup (Marius), and a pair of rascally kittens (Odie Pez and Bo Miggy). Animal lovers can check out pictures of the pets on Stroud's home page at `http://home.sprynet.com/sprynet/neuroses`.

If you want to connect a LAN to the Internet, you have three options. The first is to set up each client as an independent connection point to the Net. This can be done with analog modems, ISDN lines, cable modems, or even leased lines. The cost of this option quickly mounts as the number of clients on the network increases due to the fact that each station needs its own modem (or similar connection equipment), phone line, and in some cases Internet account. Another option is to purchase an external router or similar network-to-Internet hardware. (Check out Dayna's NetCenter Internet Station at `www.dayna.com/dayna/products/istation/istationintro.html`.) This is another expensive route as the cost of such equipment begins at around $500 and can quickly reach into the thousands. Neither of the first two options makes sense for small networks because of the substantial costs involved. Thankfully, there's another option — specialized network-to-Internet tools like WinGate, MidPoint, and Trumpet FireSock. These software applications allow you to share a host computer's modem and Internet connection with other users on the LAN. Modem sharing clients require only one modem connection and can generally work over a variety of mediums including analog modems, ISDN lines, and leased lines.

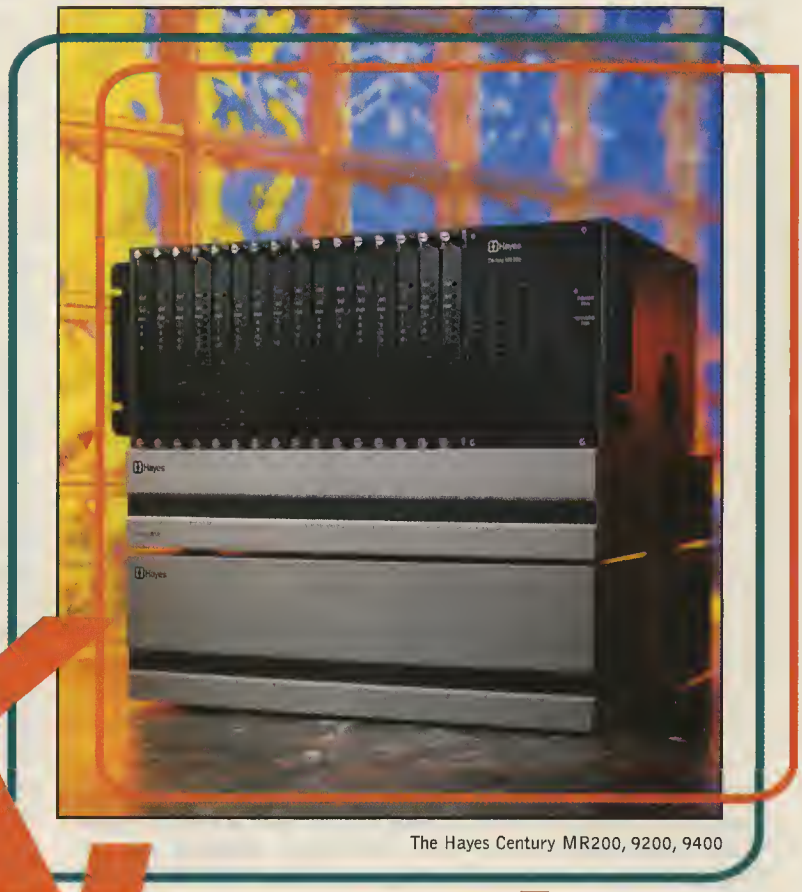
WinGate is one of the oldest and most popular modem sharing applications. While it lacks the modem teaming capabilities of some Internet hardware packages or clients like MidPoint, WinGate does support a wide variety of Internet protocols to ensure that your users can fully utilize the Net. Support for HTTP (web), HTTPS/SSL (secure web), SMTP and POP3 (e-mail), NNTP (Usenet news), Telnet, FTP, and IRC services are just the beginning of WinGate's extensive set of features. WinGate can also be set up with RealAudio/VDOLive proxy capabilities or as an AutoSOCKS/SOCKS5 server, allowing SOCKS-compatible clients to access the Internet as if they were directly connected to it. The major applications, including Netscape, Internet Explorer, and Eudora, can be automatically configured to utilize WinGate's sharing capabilities, with or without the use of AutoSOCKS. When necessary, switching back to a guest computer's local, non-shared modem is a simple process that involves automatically restoring the normal proxy settings of the applications. Like MidPoint, WinGate also utilizes a shared cache that allows users to quickly access web pages that have already been downloaded by others without having to reconnect to the Net.

WinGate

WinGate
Share A Single Internet Connection With Your Entire Network!

Desc:	Share a single Internet connection over an entire network
Pros:	Inexpensive way to share modems and Net connections over a small network, excellent set of features
Cons:	Lacks modem aggregation capabilities, could be easier to set up, help documentation needs work
Location:	ftp://ftp.parked.com/pub/wg2e95.exe
Status:	Freeware-one user. Trialware-multiple users
Platforms:	Windows 95/NT
Company:	Deerfield Communications Company
Website:	`http://www.deerfield.com/wingate`

WinGate sports an attractive, user-friendly interface, but the help documentation included with the program could use a little work. Getting up and running with the client is relatively straightforward, although it's not as easy as doing so with a client like MidPoint. If you have any problems getting WinGate to work, the WinGate Help Desk (`www.deerfield.com/wingate/help.htm`) is the best place to look for answers. WinGate can act as a general proxy server, which eliminates the need for each client to have its own IP address. It can also be a powerful firewall, authorizing and controlling the information that passes between the LAN and the Internet. It can do logging and auditing, remote control, user authentication services, and mapped links (for applications like IRC clients and news readers that generally lack support for traversing firewalls or working through proxy servers). WinGate is available as a Lite version that begins at **$110** for more than two users and a Pro version that begins at **$250** for more than two users. Both



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56K provides speeds significantly higher than 33.6 Kbps for over 80% of local phone lines. Typical speeds range between 42 and 54 Kbps (the current limit set by the FCC).

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versions of the client are free for two user networks (the host machine and one guest computer). If you're looking for an inexpensive way to share your modem and Internet connection with the entire network, WinGate offers a great selection of features in an attractively priced package.

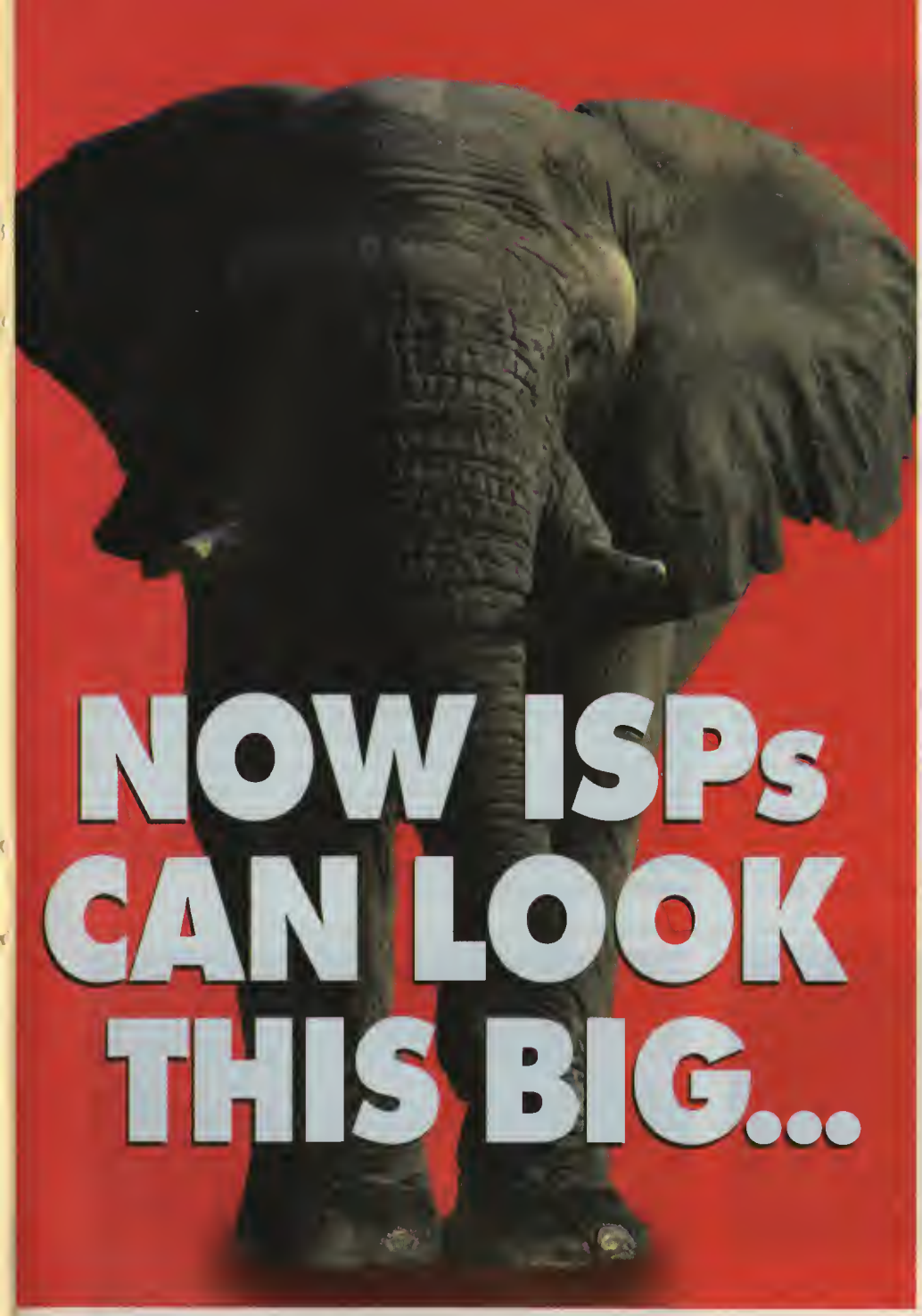
MidPoint goes beyond the competition by allowing users to consolidate multiple modem connections into a single, high-speed connection. Up to four individual modems can be "teamed" together, four 56 Kbps modems can effectively achieve a 212 Kbps connection (each modem is currently limited to a maximum connection of 53 Kbps by the federal government). This bandwidth can be shared by multiple users, or one lucky individual can have it all.

Granted, there are a couple of consolations to sharing multiple connections. These are not limited by the software but by the physical requirements of the connections. The first drawback is that each modem will need to have its own phone line, the cost of which should be considered when comparing modem aggregation with alternatives like ISDN and cable. Of course, MidPoint can also combine multiple ISDN lines and even allows for ISDN and analog modem lines to be aggregated together. The client can team individual ISDN channels even if the provider doesn't support the combination of channels. Another potential area of concern is that not all ISPs allow modem teaming. Before using MidPoint's teaming capabilities, you should check if your provider will allow simultaneous connections. Even if you can log into your account using two different computers at the same time, it's still a good idea to contact your ISP about its policy on this issue. Some providers charge higher rates for multiple simultaneous logins. If your provider restricts your access to a single connection at a time, you can still take advantage of MidPoint's teaming capabilities, but you will have to use a separate Internet account for each connection.

Setting up MidPoint is surprisingly simple. First, the main program is installed on a host computer in a process that only takes a couple of minutes. Next, run MidPoint's Guest Setup on each of the computers that will access the host computer's modem (or modems). The Guest Setup application automatically configures each computer's browser to work with MidPoint on an as-needed basis. If the guest computer also has its own modem, you can later switch back to this modem by simply changing the browser's proxy settings. For Windows NT users, this is all that is needed to get up and running with MidPoint. An additional step is required for Windows 95 users who want to take advantage of MidPoint's modem teaming capabilities and who are not using the latest upgrade of Microsoft's DUN client, v1.2 (available at `http://cws.internet.com/32msnet.html`). If this is the case, you'll need to purchase and download the **$25** MidPoint Multi-Line Support for Windows 95 add-on client. This is necessary because older versions of Microsoft DUN did not permit multiple simultaneous analog DUN connections. For most Windows 95 users, the best route is to download the 1.2 freeware release of Microsoft DUN and thereby save **$25** by not having to purchase the add-on Multi-Line program. Both MidPoint Companion and MidPoint Gateway can be downloaded and evaluated as trialware for thirty days. The **$119** MidPoint Companion client is designed for small networks of up to five computers and can be used strictly for modem or teaming. The MidPoint Gateway software begins at **$299** and supports workgroups of five or more users. It sports the same feature set as the Companion client and also offers both modem sharing and modem teaming.

MidPoint distances itself from the competition in more ways than just its modem teaming capabilities. Among its finer selling points, MidPoint features on-demand connection capabilities that allow guest computers to automatically connect to the Internet as needed. MidPoint initiates dial-up processes on the host computer, establishes connections to the Internet provider or providers, and automatically disconnects when finished or after specified periods of inactivity. MidPoint also acts as a natural firewall by ensuring that requests from the Internet are not passed directly through to your LAN. Only authorized users can pass information through the firewall and therefore between the Internet and your network. MidPoint doubles as a proxy server and routing service as well, meaning MidPoint can receive information from the Internet and, in turn, send it to the correct computer or computers on the network. This bypasses the need for each client to have its own IP address. These features allow you to connect your network to the Internet without needing to purchase expensive hardware router equipment and separate firewall software.

MidPoint features cache sharing, which allows users to quickly access web pages that have already been downloaded by others. It can download web pages at scheduled times so you have the information available when you need it without having to re-access the Web. It also reports usage statistics via activity logs, providing administrators with information such as when MidPoint was started, when connections and disconnections were made, and who requested what information and when. It has Windows traybar support and excellent online help documentation that is second to none in this category of clients. MidPoint supports every standard Internet protocol necessary to fully utilize the Net including HTTP (web), HTTPS/SSL (secure web), NNTP (Usenet news), SMTP and POP3 (e-mail), FTP and Telnet. MidPoint will also allow you to run FTP and HTTP servers through its firewall. While both WinGate and Trumpet FireSock are less expensive than MidPoint, neither combines the excellent set of features and modem teaming capabilities. These features make MidPoint a must-have application for anyone that wants to share one or more modems over a network.



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Trumpet FireSock

Desc:	Use Trumpet Winsock technology to share an Internet connection over a LAN
Pros:	Cost-efficient option for sharing a single analog modem connection over a LAN, solid set of features
Cons:	Not as feature-replete as competitive offerings, restricted to analog modems, lacks modem teaming support
Location:	ftp://ftp.trumpet.com/firesock/tfs10c.exe
Status:	Free 30 day evaluation. Commercialware
Platforms:	Windows 95/NT/3.x
Company:	Trumpet Software International
Website:	`http://www.trumpet.com/fsock.html`

FireSock is the newest member of the modem sharing class, yet the technology used in the client is one of the oldest and most commonly used technologies on the Internet. Many experienced Net users are familiar with Trumpet Winsock as the connection of choice back in the Windows 3.x days (albeit by default — there were not many alternatives back then). Although the integrated DUN capabilities of Windows 95 have largely supplanted the need for Trumpet Winsock, the new FireSock client allows the Trumpet Winsock technology to live on and is a great choice for sharing a modem and Internet connection over a small network. One advantage of FireSock is that almost any client node can be accommodated, from PCs and Macs to Unix machines. As long as the client is running a TCP/IP stack, FireSock can allow it to share the modem and Internet connection of a host computer. FireSock works on top of your TCP/IP stack, so if you're using a client like the Microsoft DUN utility, you don't need to worry about FireSock replacing it or interfering with it. Help documentation is more than sufficient, and setting up the client is relatively easy. And while not the most attractive of interfaces, the FireSock interface will be familiar to long-time users of Trumpet Winsock.

FireSock provides full access to most major Internet applications. Among its many features, FireSock can act as a transparent IP-level firewall that easily transfers incoming connections, allowing for web or FTP servers to be served from your network. It configures local clients' IP addresses by acting as a BOOTP server, alleviating the need for each node to have its own IP address, and logs all network activity. FireSock can also act as a basic router by routing packets from the Internet to the proper nodes on your LAN. If cost is a factor in your purchasing decision, FireSock is likely to be the best alternative for your network of five or more users. The cost of the client begins at **$50** for two users and scales up to **$180** for a 20-user license —- only **$9** per user! There are several drawbacks that keep FireSock from being more competitive with the likes of MidPoint and WinGate. First, the client supports analog modems only. If you want to share a leased line, ISDN or cable modem, you'll need to consider one of the other choices. Second, FireSock lacks MidPoint's teaming capabilities — only one modem can be shared at a time — so you won't be able to aggregate several modems together to achieve higher speeds. Still, if you're looking for a low-cost product for sharing a single analog modem connection over a LAN, Trumpet FireSock definitely merits considerable attention.◆

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TUCOWS

Scott Swedorski

MEDIA CLIENTS

As more and more ISPs support 56K speeds, previously impractical applications for sound and video are becoming common. These applications let you view real-time, sometimes live feeds, of audio or video on the Internet. Streaming technology permits much faster transfers of electronic data because it permits compressed files to be played while they continue to download in the background.

Scott Swedorski is president and founder of TUCOWS, The Ultimate Collection of Winsock Software. He lives in Flint, Michigan with his wife, Vicky and 2 daughters, Emily and Ashley. After joining the army at the tender age of 17, Scott received his degree in Computer Information Systems from Mott College, and received an Honorable Discharge after 8 years service. Scott welcomes input from Internet users and software developers at tucows@tucows.com.

There are an increasing variety of feeds available, from newscasts to rock concerts to cooking tips. Most of the large media interests are still nervous about web video, but with big players like CNN out there now, other media, entertainment and education interests are adding their own web video productions. Since many of the streaming formats are proprietary, you may have to download more than one plug-in to see everything that catches your interest.

Microsoft ActiveMovie Player for MSIE 3.0

Version Number:	1.0
Revision Date:	August 13, 1996
File Name:	amov4ie.exe
Byte Size:	649,296
License:	Freeware
Home Page:	http://www.microsoft.com/DirectX/default.asp

ActiveMovie Player allows Microsoft Explorer users to play ActiveMovie files that stream sound, pictures, and uniform resource locators (URLs) over the Internet. ActiveMovie supports popular formats, including MPEG audio, WAV audio, MPEG video, AVI video and Apple QuickTime video in a simple, familiar Windows interface. Microsoft is encouraging developers to add filters of their own as well. It should be noted that ActiveMovie automatically becomes your default media player. This is a bit frustrating for those who set up specific file associations, but convenient for beginners.

Emblaze

Version Number:	1.6B
Revision Date:	July 18, 1996
File Name:	emblz.exe
Byte Size:	373,620
License:	Freeware
Home Page:	http://www.emblaze.com
Also Available:	Windows 3.x version

Emblaze is a multimedia plug-in that supports sound and animation in the browser window. The animation is a bit choppy, and clipart quality, from 12 to 24 frames per second. (Television is about 30 frames per second by comparison.) Speed is the real value here — Emblaze can function over a 14.4 Kbps or faster connection. The sound quality is not too impressive. It sounds like bad AM radio, but it beats MIDI files. Your visitors are not required to download plug-ins, and you require no server-side applications.

EMULive PVx Video Receiver

Version Number:	2.0 alpha 5
Revision Date:	March 15, 1997
File Name:	epvx20a5.EXE
Byte Size:	4,064,424
License:	Freeware
HomePage:	http://www.emulive.com

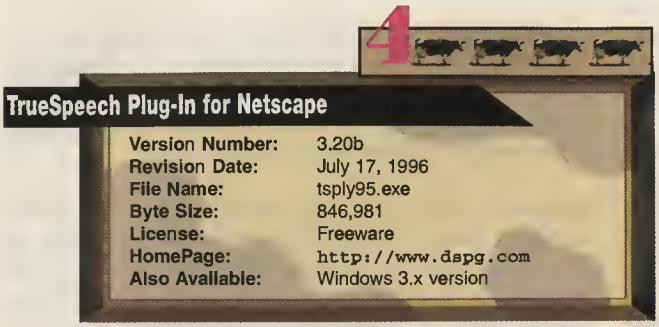
EMULive PVx receives full-motion live video from FSx Servers. EMULive PVx picture quality compares favorably to other streaming video applications. It offers resizeable windows, frame-to-disk saving and a very simple user interface.

Streamworks

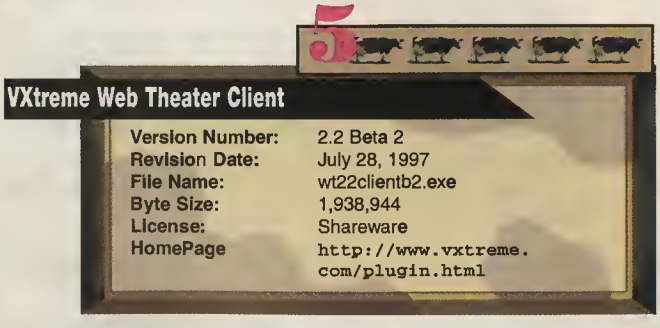
Version Number:	3.0
Revision Date:	July 12, 1996
File Name:	swp3095.exe
Byte Size:	1,634,312
License:	Freeware
HomePage:	http://www.xingtech.com
Also Available:	Windows 3.x version

A streaming video and audio helper application, StreamWorks, by Xing, is an MPEG-format player for Netscape and Explorer that handles video and sound with reasonable quality and little or no "skipping," even over a slow connection. At high speed, StreamWorks is capable of full-screen, full-motion video. StreamWorks Player has a sophisticated display engine that automatically takes advantage of hardware video acceleration from popular VGA cards and high-performance display drivers using

DCI, Direct Draw and Microsoft Direct X technology. Xing offers a catalog of CDs with content developed for StreamWorks, including a series of music videos and karaoke that includes the likes of Eartha Kitt, INXS, Dizzy Gillespie, and The Rolling Stones, as well as education and training, news, archives, libraries, travel, movies, and television. There are also many good sites offering their own "Webcasts" (if you want to jump on the bandwagon, it's worth noting you'll need their server software). It's worth a visit to their content site, but remember, while the player is free, most of the really good content is on CD and comes at a purchase price.



Enables the efficient compression, storage, communications, and playback of digital speech while reducing wait time. TrueSpeech is designed to work with Netscape, but can be configured as a support application for other browsers, and does not require a connection to the Internet to play files locally. It will play any WAV format file, but if they are not TrueSpeech encoded, the streaming features will not function (Sound Recorder may be used to encode .wav files in the TrueSpeech format). In one test file, the uncompressed file was a whopping 214 kilobytes, while the same file, encoded with TrueSpeech, danced in at under 12 kilobytes.



A great new streaming video and audio plug-in, VXTreme's client is attractive and easy to use. The movies are a little choppy and the sound quality is very good. There's no hopping at all, if you have a good connection. The home page has plenty of videos, from financial news to entertainment, including CNN Interactive, CNNfn, Reuters Financial Television, the Auto Channel, and Warner Bros. Online Movie Showcase. The only beef is the small screen size. Hopefully, in future clients they will give users an option to resize the view.

All of the applications for streaming video and audio could benefit from 56K, ISDN or cable access, and the pixelated displays of most of these clients have a long way to go before they can compete with broadcast television and radio. Still, this is the first step in the long road to perfection, and it is an opportunity for desktop developers to get into the expanding desktop video production boom that is expected to explode as soon as the usability/cost ratio becomes attractive to small info-businesses and artists. It's worth checking out. If you can't make up your mind between the different plug-ins, look at their web sites and let the content be your guide.

RATING SYSTEM

What do all of these cows have to do with software? Simple: The more cows an application is awarded, the more you need this program. Five Cows is our top rating.

Key:
5 Cows: Must have!
4 - 4½ Cows: Excellent
3 - 3½ Cows: Good
2 - 2½ Cows: Fair
1 - 1½ Cows: Needs improvement

ISP$ MARKET REPORT

Paul Stapleton

METRICOM - CAN PAUL ALLEN MAKE IT WORK?

On September 28, 1997 Paul Allen, through his investment vehicle Vulcan Ventures Inc., filed a 13D amendment to acquire 2,583,500 common shares of Metricom Inc. (OTC: MCOM) from Ryback Management Corporation of Michigan at **$6.00** per share. This purchase will increase Paul Allen's position to about 32.9 percent (4,471,745 shares) of the outstanding shares (13,675,756 shares). He previously owned 14.1 percent (1,913,245 shares). Ryback's common position will be reduced to zero, if they will still own about **$22.5 million** in convertible bonds. Allen will become the largest shareholder in Metricom.

Robert Dilworth, Metricom's chief executive officer and chairman of the board issued a press release that said, "I am pleased that Paul Allen has once again shown his confidence in Metricom and its wireless data communications technology."

Apparently, investors were pleased as well. The proposed transfer has popped up the stock 83.3 percent to **$11.00** per share since the announcement.

However, there is no immediate change in board representation or management. The company receives no funds as a result of this transaction between existing shareholders. Closing is dependent on board approval and the expiration of the waiting period under the Hart-Scott-Rodino Antitrust Improvements Act. Lastly, the Stock Purchase Agreement has an interesting clause that allows Ryback to cancel the transaction if an outsider makes a tender offer for all of Metricom's stock prior to closing.

Paul Allen initially invested in Metricom in October 1993 by purchasing 1,166,667 shares of common for **$15.00** per share and acquiring a warrant to buy an additional 408,333 shares for **$20.00** per share. This investment had restrictions attached. Allen could not acquire a further interest in the business until October 1996. Remember these were the days when Allen dared to acquire a large uninvited position in America Online and wanted board representation.

In March 1995 Allen exercised the warrant to acquire 408,333 shares for **$20** per share.

The bottom line: One day prior to this announcement, Paul Allen had invested approximately **$20.7** million in Metricom and owned stock that traded for around **$8 million**. A 60 percent loss.

One year after being uncuffed, Allen has decided to try to salvage this investment. Allen's blended buy price will be around **$9.90**. At **$11.00** per share he's up 11 percent over 4 years or roughly break-even given mild inflation.

Does he have any upside? What is the upside? Or will Metricom dither back down to **$6.00** after this excitement wears off? Does Vulcan have what it takes and is the business really worth an additional **$80 million** because Vulcan bought out Ryback?

Metricom, with its Ricochet wireless Internet access division, has a lot of potential. Ricochet really is faster and more affordable than all other wireless Internet alternatives and competitive with traditional wireline modem Internet access services. Ricochet delivers 28.8 Kbps wireless Internet access for **$29.95** per month flat rate. Other wireless access products are slower and charge anywhere from **$0.06** to **$0.54** per downloaded kilobyte. Ricochet has won Product of the Year awards from *Network Magazine* and Mobile Computing Insights and a favorable December 1996 review by Walter Mossberg in the *Wall Street Journal* and Dave Taylor in *InfoWorld*. It is, in short, a very good product.

Conservatively Metricom, the company has the following assets:
- Over 15,000 Ricochet subscribers.
- A cash position at June 30, 1997 of **$27.3 million** or **$2.00** per share.
- A license for between 5 and 20 MHz of spectrum at 2.3 GHz to offer 128 Kbps service to 125 million people (for which they paid **$1.5 million**).
- Existing coverage in Seattle, San Francisco, Fairfax County Virginia and ten international airports.
- Proprietary technology which has cost over **$80** million in research and development.

The Metricom challenge for all of 1997 was straight forward and in this order:
- Expand coverage. The economics of deploying the technology are quite good. The Ricochet technology can be deployed modularly for around **$1,000** per radio and requires 7 radios per square mile. The whole Bay Area network was constructed for under **$10 million**.
- OEM the Ricochet modem, currently sold for **$299**, into as many laptops as possible.
- Bring the 128 Kbps service to market.

This story sounds a little like @Home. Here was a company with the opportunity to deploy effective, affordable, proprietary Internet access to millions of people.

So why didn't the market get all giggly and bid Metricom way up?

After bouncing back and forth between finance, publishing and the Internet, Paul Stapleton has landed squarely in the middle. He is Managing Director of Stapleton & Associates, an Internet focused financial consulting firm. Clients include major players as well as start ups and middle market companies in media, telecomm and software.

Paul Stapleton is also editor of *ISP Report* (to subscribe, e-mail `ispreport@mediabiz.com` or call **303-271-9960** or fax 303-271-9965; annual rate is $195; sample issue sent on request) the newsletter of record for financial activity in the ISP industry. Paul welcomes comments and suggestions at `paulstapes@aol.com`. He lives in Boulder, CO with his lovely new bride.

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SYMBOL	EXCHANGE	COMPANY	PRICE 8/4/97	PRICE 9/10/97	PRICE 10/7/97	PERCENT CHANGE	SHARES (MILLIONS)	MARKET CAPITALIZATION
ATHM	NASD	**@HOME**	$19.63	$19.14	$28.00	46%	117.52	$3,290.59
AOL	NYSE	**America Online Inc.**	$73.63	$76.31	$79.63	4%	95.86	$7,632.69
CSRV	NASD	**CompuServe Corp.**	$11.38	$13.94	$13.44	-4%	92.60	$1,244.54
CNCX	NASD	**Concentric Network**	$14.38	$14.63	$12.75	-13%	13.51	$172.19
ELNK	NASD	**EarthLink Network, Inc.**	$11.38	$15.50	$17.25	11%	9.68	$166.91
IDTC	NASD	**IDT Corporation**	$8.25	$15.50	$17.94	16%	9.89	$177.43
WWW	TSE	**iSTAR internet inc.**	$2.30	$0.39	$1.13	190%	24.43	$27.60
MCOM	OTC	**Metricom Inc.**	$5.50	$5.50	$12.88	134%	13.61	$175.19
MSPG	NASD	**MindSpring Enterprises**	$13.38	$17.13	$23.38	36%	7.48	$174.77
NETC	NASD	**Netcom**	$14.63	$13.06	$13.75	5%	11.68	$160.64
OZEMY	NASD	**OzEmail Ltd.**	$6.63	$15.75	$13.50	-14%	10.20	$137.70
PSIX	NASD	**PSINet Inc.**	$8.14	$8.69	$7.88	-9%	40.27	$317.16
RMII	NASD	**Rocky Mountain Internet**	$2.44	$2.13	$3.00	41%	4.65	$13.95
		I$P Report index	**$14.74**	**$16.74**	**$18.81**			**$13,691.37**

Essentially, management has done little to prove they can execute the strategy. Instead they have:

- Paid themselves high salaries. Dilworth made over **$500,000** in 1996. Revenue was **$6.5 million** for the first six months of 1997.
- Re-priced management options when they fell below market price. And they still failed to price them low enough, only re-pricing them to **$13.125**.
- Paid directors annual fees of around **$10,000** and paid their investment bank a **$200,000** retainer in 1997 when cash was dear.

They closed no meaningful deals to deploy and install the technology needed to provide nationwide Ricochet service. They closed no OEM agreements with laptop providers and no network expansion agreements except one, with KN Energy of Lakewood, Colorado to make sure 200,000 people in Wyoming and Nebraska have the chance to subscribe to Ricochet. Huh?

The question is, will Paul Allen and Vulcan lead the required change? Or now that the Allen marquee name has made his investment whole, will he try to get out? His new 33 percent of the common stock doesn't give Allen any more immediate control over the board then he had at 14.1 percent. Vulcan has had limited success proactively managing anything. Why didn't Allen move for definitive control and acquire 51 percent?

The stock purchase agreement says Ryback can cancel the agreement with 2 days notice if at anytime prior to closing an outsider makes a tender offer for all of the outstanding Metricom common stock. What is that list of network assets listed above worth? What's a reasonable tender offer price?

Anyone bidding over **$13.125** would put an additional 1.2 million management stock options in the money. And anyone bidding over **$14.50** per share will put 3,092,783 million shares available to holders of the **$45 million** convertible debt, into the money. Combined that's an additional 25 percent dilution. Let's see, 17.8 million shares at **$15.00** is a **$267 million** enterprise value. That may be a little too rich, especially if some management comes along.

Good luck Paul Allen.◆

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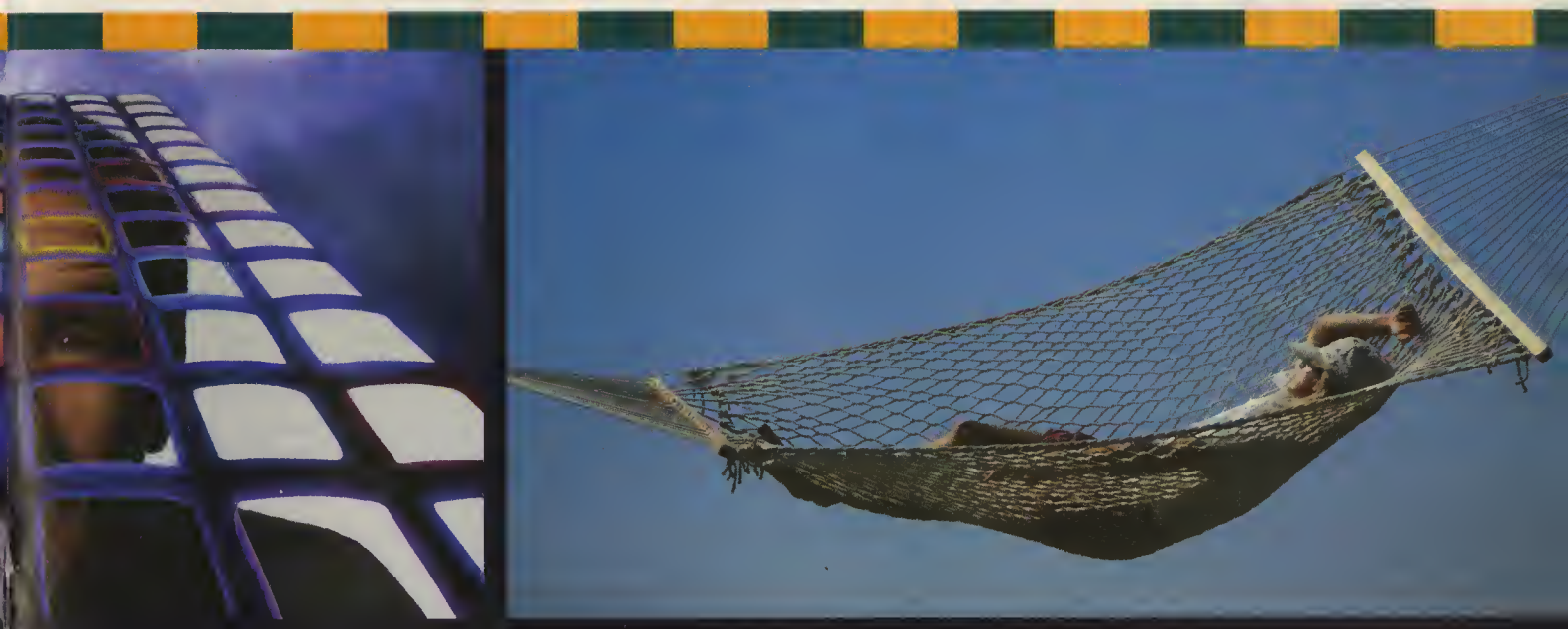

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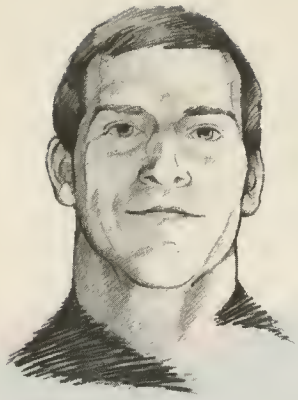

POLICY FORUM

Rudolph Geist

AN ISP-CLEC?—SHOULD YOUR ISP BECOME ONE?

Through dial-up and point-to-point dedicated Internet offerings, Internet service providers have made a substantial emergence into the telecommunications industry. Local telephone companies, on the other hand, such as incumbent local exchange carriers (ILECs) and competitive local exchange carriers (CLECs), have aggressively begun pursuing the Internet business as a corollary to their existing telephone company services. For telephone companies, this makes sense. Local telephone companies own the lines which are required to reach end-user Internet customers. They can act not only as the suppliers of lines to ISPs, but by installing remote Internet access equipment in their existing central offices, they are able to provide Internet services. As local telephone companies are now aggressively getting into the Internet business, ISPs are beginning to think about doing just the opposite — becoming telephone companies.

Why should an ISP get into the telephone company game and file to become a CLEC? There are two substantial reasons: (1) federally mandated 17 to 25 percent below-tariff interconnection rates on services; and (2) mutual compensation. Becoming a CLEC can lead to substantial cost savings, and potential new revenue streams for ISPs that currently pay tariff prices on circuits provided by ILECs or CLECs.

The Telecommunications Act of 1996 requires that ILECs open up their markets to competition by allowing competitors to interconnect with their facilities, unbundle their networks and/or resell network elements — all at federally mandated 17 to 25 percent discounts below tariffed rates for services. The states are charged with implementing interconnection under the Act. An entity, such as an ISP, which desires to interconnect with an ILEC, must become a certified CLEC and negotiate an interconnection agreement with the telephone company. If only offering intrastate services, the entity need only apply for carrier certification at the state level. However, if offering interstate services, the carrier must get certified by the Federal Communications Commission (FCC) as well.

The first thing an ISP should do to become a CLEC is to create a wholly owned separate subsidiary to its Internet company. It is important to keep separation between the activities of the unregulated ISP and the regulated CLEC side. Once the CLEC subsidiary is established, the ISP-CLEC (as we will call the new entity), as mentioned, must make the appropriate filings with its state public utility commission (PUC) and/or the FCC. This process may take as long as a year, or as little as two months from date of filing. Each state handles these applications differently, and the more sophisticated states typically have the most efficient application processes.

The ISP-CLEC must also negotiate an interconnection agreement with the ILEC whose services it intends to purchase, and whose territory it plans to enter. The interconnection agreement must reflect the 17 to 25 percent federally mandated discount rate prescribed under the Telecommunications Act. Hundreds of these agreements have been negotiated and approved by state public utility commissions since the passage of the Telecommunications Act, leading to the development of some measurable local telephone competition in the largest local telephone markets.

In addition to establishing the interconnection rate, the basic interconnection agreement should reflect the type of interconnection, i.e., simply connecting the networks, unbundling network elements, and/or resale, the quality of service, and the agreed-on mutual compensation rate for terminating traffic. With respect to the type of interconnection arrangement that should be pursued, most ISPs will probably want to become resellers of local telephone company services rather than purchasing their own switching equipment and unbundling elements of the local telephone company network. An ISP-CLEC reseller can later file with the regulatory body and re-negotiate an interconnection agreement to expand its interconnection flexibility and unbundle ILEC network elements.

Becoming a CLEC can be highly advantageous because it allows the ISP to obtain federally mandated 17 to 25 percent discounts on the lines purchased by the CLEC subsidiary which are contemplated under the interconnection agreement, including dial tone lines and private point-to-point lines. For example, an ISP that has purchased T-1 lines from an ILEC at the tariffed price could save 17 to 25 percent below that tariff price on those same lines if it purchased them as a CLEC reseller under an interconnection agreement. A savings of 17 to 25 percent across the board can be extremely substantial and put any ISP in a much more competitive position within its markets. The savings on local loop lines can translate into either higher profits and/or lower price, both of which are key ingredients for a growing ISP company.

Further, the ISP-CLEC will be able to participate in mutual compensation arrangements with other carriers. Mutual compensation is the term used to describe the FCC requirement that interconnecting carriers

Rudolph J. Geist is a telecommunications attorney with the Washington DC firm of Wilkes, Artis, Hedrick & Lane specializing in and helping to develop the area of Internet law. Mr. Geist represents ISPs in numerous matters, including relations with other telecommunications providers, consultation regarding federal telecommunications grant programs, federal, state and local taxation issues, First Amendment issues, domain name and IP address allocation issues, and mergers and acquisitions. He also serves as counsel to the United States Internet Providers Association (USIPA), a national trade association established to facilitate fair government and telecommunications industry policies for ISPs. Mr. Geist can be contacted via e-mail at rgeist@wahl.com, telephone at **(202) 457-7345**, or through USIPA's World Wide Web site at www.usipa.org.

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pay to terminate traffic on each other's network. For example, where Carrier A and Carrier B have an interconnection agreement under which Carrier B purchases access lines to Carrier A's end-user customers, both Carrier A and Carrier B must pay each other for the amount of traffic per minute that each carrier terminates on the other's network over the interconnected lines. The payments for mutual compensation are typically between 0.2 and 0.4 cents per minute as established by FCC rules. Again, the state commissions are charged with implementing and establishing mutual compensation rates in their respective states under the purview of the FCC's guidelines.

Mutual compensation could be a new revenue source for ISPs that heavily utilize channelized circuits to serve dial-up customers. As traffic generated over the lines that ISPs control is typically one way, this can be beneficial to the ISP. End-user Internet customers typically originate local calls over the ILEC network which terminate at the ISP POP (or on the ISP network). But few calls are originated on the ISP network and terminated onto the ILEC network. As mutual compensation obligations are measured by the number of call minutes terminated or received and not the number of minutes originated, the balance of payments will thus be in favor of the ISP.

ISPs that choose to become carriers to participate in mutual compensation arrangements should be aware of the current regulatory climate. Some ILECs have taken the position that mutual compensation for ISP-related traffic is not contemplated by the existing FCC and state rules. The ILECs claim that mutual compensation is meant only for local calls, not calls to ISPs, which they claim are interstate in nature. These ILECs have withheld payments to CLECs who serve ISPs, who

the ILECs believe are accumulating large amounts of ISP traffic for mutual compensation purposes. The FCC and numerous states are currently addressing this issue, which likely will not be resolved anytime soon.

In addition to obtaining discounts on lines and potentially advantageous mutual compensation arrangements, being a CLEC elevates an ISP's ability to negotiate on a reletively level playing field. As opposed to an end-user customer, as a CLEC, the ISP can obtain a whole new bundle of negotiation rights, including quality of service, good faith negotiation, and regulatory protections/enforcement mechanisms.

Aside form the benefits of being an ISP-CLEC, there are certain regulatory burdens attached. First, regulated telecommunications companies may be required to pay fees to their regulatory bodies. These fees, which are used by the regulatory bodies to fund their regulatory activities, are typically based on revenues from lines, and can be quite substantial depending on the revenues generated by the contributing ISP-CLEC. Second, regulated CLECs may be required to make contributions into the Universal Service Fund (USF), that are also based on revenues from lines. The USF is used to subsidize basic telephone service to rural and urban poor residents as well as provide subsidies for providing advanced telecommunications capabilities to schools, libraries, and rural health care facilities. However, ISP-CLECs who provide services to schools or libraries that obtain USF discounts on those services under the USF program may offset their USF contribution by amounts they would be owed from the USF Fund Administrator for providing those discounted services. Further, some regulated carriers must make contributions into the telecommunications relay services (TRS) fund, which is used to support telecommunications services for the hearing impaired. Last, some regulated carriers must file tariffs with their regulatory body and obtain prior approval before expanding service offerings or geographic coverage.

From the broader perspective, the direction of telecommunications industry development suggests that ISPs who want to remain competitive in the future telecommunications industry should probably become CLECs. As the industry is certainly moving closer to a model where voice, video and data will traverse the same telecommunications lines into end-user homes, becoming a CLEC may ultimately be a critical step for a current ISP to position itself competitively. ISP-CLECs who control their own lines will more likely be in a position to rapidly bring advanced new services, such as Internet telephony, to customers.

Internet telephony is a promising business opportunity for ISPs that has become a substantial issue at the FCC since it affects the traditional regulatory model for voice telephony. The FCC and the states will likely require ISPs who are providing Internet voice telephony to become regulated carriers since, among other reasons, any contrary FCC or state PUC decision might be considered discriminatory regulation against traditional voice carriers such as ILECs. Thus, an ISP that is already a certified carrier may be better positioned under a regulatory model to enter into new lines of business such as voice telephony, than an ISP that is not a certified carrier.

The bottom line is that telecommunications is a rapidly changing industry, and ISPs can't afford to be left behind in position for the future. Therefore, ISPs should be seriously consider taking the next step — and become ISP-CLECs ◆


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MANNING THE WIRES

by Ric Manning

BIGCHARTS HELPS INVESTORS COMPETE WITH THE PROS

How do you win the hearts and minds of computer-using investors?

At one time, you could do it with price quotes for stocks, bonds and mutual funds. Put them online and investors wouldn't have to wait for the next day's newspaper or call their brokers to find out what was happening with a particular stock.

As online services became more competitive — and as investors armed themselves with more computerized tools — the stakes increased. Web services, brokerage houses and information providers now deliver a barrage of stock data. Today's online investors have almost as many tools at their fingertips as a professional stock broker.

And, if you believe Phil Hotchkiss, still more investment services will be on your desktop soon. One of the newest services is BigCharts (`www.bigcharts.com`), which was rolled out this fall by Concerto Technologies (`www.concertotech.com`), the company that Hotchkiss heads.

A former stockbroker, Hotchkiss said he became interested in investment technology while working for a firm in Minneapolis. After leaving the brokerage business, he worked with other brokers and investors to help them develop and use high-tech tools for stock tracking and analysis.

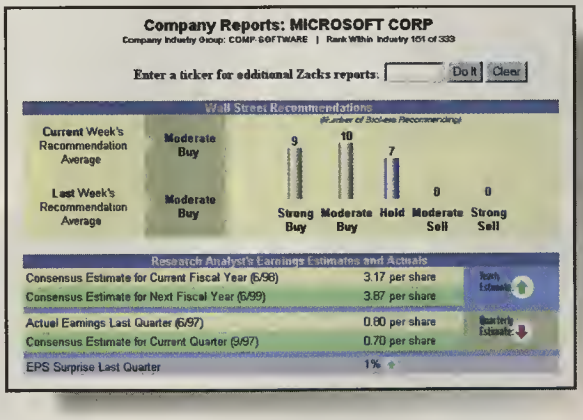
Getting timely stock quotes wasn't difficult, the hard part was analyzing where the stock had been and where it was going. And the best way to visualize that movement was to chart it.

Brokers and investment counselors can produce charts using links to pricey market data services. Hotchkiss wanted to create a way to deliver free charts to individual investors.

There are other stock-charting services on the Web, but most of them would lose in a race with BigCharts. The Concerto system can retrieve stock data in an instant and create a custom chart on the fly.

"It's completely written in C++," said Hotchkiss. "We're not using Netscape or Microsoft server. We built our own from scratch."

Hotchkiss also chose not to use Java as a development tool. "Java would work," he said, "but most of our customers don't want to use it. They would have to download it and it's still buggy. And our customers want to be able to save and print their charts. They couldn't do that with Java."



The key element in the BigCharts system is massive amounts of online memory that can store completed charts and their components. "It's a true caching server so when a user requests content, it comes off RAM," Hotchkiss said.

BigCharts stores data on 22,700 investments ranging as far back as 1985. Enter a stock symbol and use the QuickCharts option and the system will produce a chart showing price and volume activity over a period ranging from one month to 10 years.

"The grid lines change dynamically," Hotchkiss said. "You request four years of data and change size and format and we can serve it to you in a couple of seconds. We typically like to get request and send back in 2.5 seconds.

Ric Manning is a columnist and web master for ***The Courier-Journal*** in Louisville, Kentucky. His weekly column covers computers, consumer electronics and the Internet and is distributed to more than 100 newspapers by the Gannett News Service. It's also available on the World Wide Web at **http://courier-journal.com/gizweb**.

Ric was the founding editor of ***Plumb*** and ***Bulletin Board Systems,*** two newsletters that covered the BBS arena in the early 1980s. His freelance work has appeared in several magazines including ***PC/Computing, Mobile Office, PC Week*** and ***Home Office Computing.*** Ric lives in Southern Indiana with his wife, two children and two Weimaraner dogs.

"The charts are about 8K — about the same as a banner ad — and we use highly optimized graphics. They are served dynamically, so there's not a single GIF stored anywhere on the server. Ultimately," said Hotchkiss, "it comes down to the speed of your machine and your connection."

Choose the Interactive Charts option and you can customize the charts to fit a variety of needs. You can compare several stocks, for example, or compare a stock's movement to the Dow Jones or the S & P 500. Other menus will add splits and price-to-earnings ratios of mix in exotic indicators such as Bollinger Bands and rolling dividends.

BigCharts may also have the most sophisticated symbol-finding engine available on the Web. No matter how badly you mangle a company's name, BigCharts is likely to have the one you want among the dozen or so matches it tries to make.

Other features include intraday quotes (available on a 20-minute delay), links to a company's SEC filings through the Edgar database and options designed to highlight high-performing securities. TheBigMovers, for example, features each day's top movers in price and volume. TheBigMarkets provides market overviews and theBigPics presents all of the data in a graphical report geared to locating potentially lucrative investments.

Concerto also has a deal that delivers investment information from other sources. Users can immediately call up analysis reports from Zacks Investment Research (`www.zacks.com`) and get a basic company profile from Hoover's database (`www.hoovers.com`).

If you're a regular visitor to BigCharts, the site will register your Net name and remember which stocks you like to look at. You can also add a chart to your personal collection stored on BigCharts' server.

George M. Regnery, an investor who uses many different web services to track stocks, said BigCharts is useful, but not always the best tool.

"When charting stocks over a period of several years, the chart should have a logarithmic scale for it to be of any value. This way, one inch always represents the same percentage increase." he said. "BigCharts graphs only on a regular scale, which means that five-year graphs of stocks like Microsoft look sort of like the left side of Mount Everest. However, Microsoft's 20 point jump from 20 to 40 was much more impressive than the 20 point jump from 100 to 120."

Before BigCharts became available to all web users, it was first offered to users of Schwab's online investment service. Hotchkiss said BigCharts will also be offered through other online investment services. — but he has no plans to charge for access.

"We intend to keep the majority free to the end-users and get our revenue from sponsorships and advertising," he said. He also plans to license Concerto's technology to companies that want a faster engine for serving dynamic content.

The next addition to BigCharts is likely to be an investor's news service. Hotchkiss says about 12 percent of BigCharts' users have asked for company news, but there was more demand for investment analysis.

In the long run, he'd like to see BigCharts become the top source for investor information. "We like to think of BigCharts as the Yahoo of charting," he said.◆

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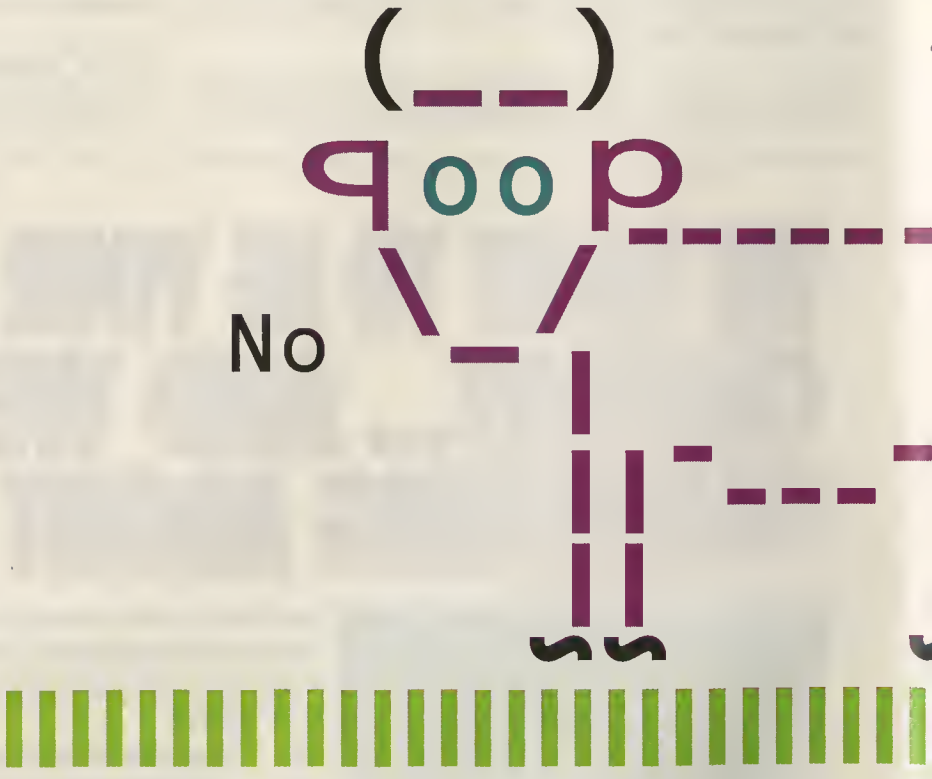

customers

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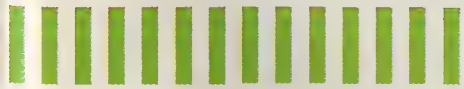

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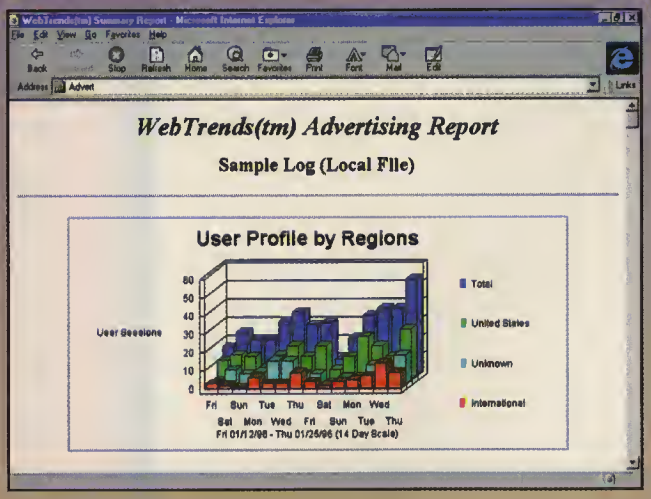
LOGGING THE LOG FILES

BY RICHARD BAGULEY

Every log file tells a story, but the trick is extracting this from the log file. There are an increasing number of programs now available that will do this for you. In this feature, we take a look at a few of them and their various strengths and weaknesses.

These programs can be useful in a number of different situations. If you are running a web site, it is important to find out how many people are coming to your site and when they use it. This is especially important if you are selling advertising on the site — one of the first things your potential advertisers are going to want to know is how many people are passing through your site. In fact, many web sites sell advertising space on the basis of a certain fee per thousand hits on a particular web page where the advertising site is located, so in this situation it is extremely important to make sure that you have a good and reliable way of tracking hits.



If you host web sites on a commercial basis (either through space provided with an ISP account or on price per megabyte), these tools are also worth looking at. These tools allow you to analyze where the traffic to your customers' web sites is coming from, so you can easily see if any one site is taking an excessive chunk of your bandwidth and whether the growth curve shows you should be buying in a bigger pipe or moving the site onto a faster server.

For those of you selling web space, these tools can also provide you with an excellent selling point. You can supply your customers with a weekly or monthly report on their site, complete with lots of nice graphs and an analysis of where their users are coming from. In fact, some products of this type seem to have been designed with this in mind, with a client-server type or web page interface type of set up which would even allow your customers to run their own reports through your server.

Of course, these products can only pull as much information from a log file as there is stored in it. The amount of analysis that can be done is limited by two factors: log file type and proxy/firewall setups.

The type of log file produced by your server depends on the type of server you use and the level of detail you decide you want to save. Many modern server programs go far beyond the original log file standards, which only stored a time, date, an IP address or machine name, and the name of the web page accessed. These days, you can also store information on referring pages, response times, error codes, etc. However, there isn't a log file program on the planet that can work out these details if they aren't stored in the log files, so it's worth bearing this in mind if you have some specific requirements for your analysis. The developers of web servers have also developed their own formats for this expanded data, so it is worth checking that the product you are interested in is capable of processing the log files for the system you use.

Secondly, many of these programs can be fooled by the use of proxies. It's not unusual for a report to claim that one machine name or IP address has been used to access the web site hundreds or thousands of times, but this in fact turns out to be a web proxy or a firewall. This is certainly worth bearing in mind if you are looking to track the number of users you get — there could be hundreds of users accessing your site through one firewall or web proxy, which would only appear as one user.

WEBTRENDS

Currently in its third incarnation (version 3.5 to be precise), WebTrends is one of the most feature-laden log file analysis programs available. It's also suitable for use in an automated

setup, as it includes a scheduler. This makes it very easy to set up a system which automatically generates analysis reports. The program can produce these reports as HTML, Word or Excel files. If HTML was used, it would also be a pretty easy operation to automatically post these to a web site, giving automatically produced and updated reports without the web master having to do anything. The reports can be heavily customized with removing or adding. This process can also be done through a web browser, so it would be easy to administer the reports produced remotely. Reports can also be automatically mailed to users.

The program copes well with multiple log files, and these can be accessed either directly from disk, by FTP or through an HTTP session from the server. This means that the reports don't have to be run on the same machine as the server, which is a good thing as they do require quite a lot of processing power to produce.

The reports can be widely configured, including a special section for auditing web advertising. This section can produce reports in individual adverts, with a breakdown which would be suitable for most advertisers. This can include both views and click through rates broken down over time and geography. There is also a geographical breakdown, which gives details on countries and U.S. states and cities where users are from. This information is built from a database which maps domains back to their origins. There is also a breakdown by organization into categories such as military, educational, etc. Again, this can be configured to produce several different levels of detail as required. A breakdown of browser type and browser platform can also be supplied, but only if the log file supports this — it isn't part of the common log file format. A wide selection of log file formats are supported, including Apache, IS, Netscape, Domino, Novell and WebSite.

Price: $299
Platforms supported: Windows NT
`http://www.webtrends.com`

HIT LIST PRO

Hit List is the most expensive program reviewed in this feature, but it is also the most powerful. It has the most comprehensive feature list, including a virtual server manager for situations where one machine runs several different domains but logs all the requests to one log file. It also works in a slightly different way to the other programs: instead of analyzing the log file directly, the log file is parsed and the results put into a database. This slows down the speed of the initial report (as the program has to do the parsing and then produce the report), but it speeds up subsequent reports as it can work directly from the optimized database. It also helps build up a long-term analysis — the system can automatically read in new data and add this to the database. As with WebTrends, it can be easily set to run different reports on a schedule automatically and to post the results to a web site. It can also use cookies to generate extra detail in the reports if these are supported.

There are a good selection of reports built into the program, all of which can be tailored to requirements. As with the other programs, it can't report on information that isn't there, so some of the more advanced reports (such as the server response time and referring URLs) can only be produced if this information is included in the log file. The data used to generate the reports (such as the names of companies) can also be edited. This also includes technical details such as the identifiers for web browsers, so new categories can be added as new software is released.

There are three different versions of the program: the standard edition (which is free), the professional edition (which costs **$1,995** and has searching capabilities) and the enterprise edition, **$6,995**, includes the ability to link into an SQL database and the option to link log file data to other data, such as address, phone number, etc...)

Price: Free —Standard Edition
$1,995 —Professional Edition
$6,995 —Enterprise Edition
Platforms supported: Windows 95/NT
`http://www.marketwave.com`

ANALOG

As far as value for money goes, you can't argue with this program — it's completely free. You can even download the complete source code, ready for rewriting and recompiling if you really want to make your own unique analysis reports. However, this probably won't be necessary — it has over 180 options and 17 pre-built reports, so most people should find what they need without any great hassle. However, it is rather more limited than some of the other programs in terms of the log file formats it understands — it can only process NCSA and Apache format log files, although the Mac version can also work with MacHTTP and WebSTAR log files. It can even produce reports in 12 different languages (such as Finnish and Norwegian), which could help make any foreign customers feel more at home.

It's all driven through a configuration file and a command line interface. Although this may seem rather strange to most PC users, it's not particularly difficult to get your brain around, and the help files do a good job of explaining how to set it up.

The reports can be produced as either HTML files or as tab delimited text files suitable for importing into a spreadsheet or database. The HTML version can be set up to use graphics or pure ASCII text, so it can even be used with a text-only browser or viewed over a slow link. The reports can include a wide range of breakdowns, including daily, weekly and monthly reports, as well as breakdowns by top level domains (such as .com, .co.uk, etc). There is also an option to produce a league table of the domains generating the most hits, but there are not tools for deeper analysis of the data.

This program lacks many of the powerful features of the other programs reviewed in this feature, but you can't fault it on what it does. It's quick, flexible and relatively easy to use. If all you need is a basic breakdown of how many people have been to your site and when, this is well worth considering.

Price: Free
Platforms supported: Unix, Windows 95/NT, Macintosh, RiscOS
`http://www.lightside.net/analo`

WEBTRAK

Webtrak takes a rather different approach to most of the other programs — there is no real user interface. Much like Analog, it is designed to run behind the scenes as part of a batch process. As such, the program is run through a command line, with the various options being controlled through a configuration file. Webtrak is also rather limited in terms of log files — it only reads CERN format log files. There is no support for any of the newer, enhanced formats used in various server systems.

The report produced can be controlled through the parameter file. Compared to many of the other programs mentioned here, the list of parameters is pretty minimal, but it includes all of the basics, such as top users, weekly, daily and hourly activity, etc. There is also a geographical breakdown, but this is based on the top level domain, so it isn't wholly accurate — it assumes that anybody in a .com domain is in the U.S., when they may in fact be coming from AOL in Austria or CompuServe in the Caribbean. It also seems to have large gaps in its regional database — in the reports I ran, over 20 percent of the log

file entries were counted as coming from a country called "unknown."

Although the program doesn't understand the extended entries of log file formats other than the CERN one, it will try to process any extra data after the standard data by indexing them and putting the results into additional tables. This means that you can get a breakdown of some of the extra items that other formats include, but it isn't properly labeled as such — they are simply called Extra 1 and Extra 2. It is possible to alter these in the configuration file, but it's hardly ideal. Direct support for a few more log file formats would have been more useful. Frankly, this program does very few things that Analog doesn't, and it costs more. It's not as expensive as many of the other programs, but it is rather lacking in the features department.

Price: $49 (Commercial, non commercial **$39**)
Platforms supported: Windows 95/NT
`http://www.knowit.com/WebTrak.htm`

SURFREPORT

Bien Logic's SurfReport is a versatile analysis program that runs on Linux as well as Unix and NT. It can produce fully customized reports from web servers that produce NCSA, extended log format, or MS log format files. Although the analysis software can be on the same server that it is analyzing, this isn't obligatory. For example, you can use the Solaris version of SurfReport to analyze your NT and Linux servers in addition to your Sun box.

SurfReport runs in the background using only a minimal amount of system resources until a report is requested, which can be produced in either text or HTML format. A client can request a secure HTML report at any time and SurfReport will deliver it through the Web or through e-mail. Clients can request that reports be generated at a given time and then immediately e-mailed to them. The reports produced are configurable, but some of the more complete analysis tools aren't present — there is no information on the geographical breakdown of the users, for instance. SurfReport is available in a single CPU, single domain format for **$695**. For single CPU, five (virtual) domain analysis, the price goes to **$2,995**, or **$4,995** for 10 domains. A corporate site license, which includes one domain and up to 20 CPUs is **$6,995**. Finally, an ISP site license, which analyses 100 domains and on 20 CPUs is **$14,995**.

Price: $695 and up
Platforms supported: Linux, Windows 95/NT, Unix
`http://bienlogic.com/SurfReport`

The choice of a log file analysis program really depends on what you want to do with it. If all you want is a simple report on the who, when and where of your web site, Analog is inexpensive and simple. It doesn't take much in the way of resources and it would be easy to produce a batch system that produced reports on a weekly or daily basis through a Cron program.

If you want a more complex analysis, SurfReport, WebTrends and Hit List are well worth looking at. WebTrends is a very powerful system in its own right, and it is significantly cheaper than Hit List and SurfReport. All programs also make it very easy to produce reports automatically, which would be a real plus for a web site hosting company or ISP that wants to offer some form of log file analysis as part of its service.

Of course, there are security implications to bear in mind when implementing this. A company isn't going to like it if anybody can read their reports by simply entering a URL, so you would also have to set up a password protected web page or FTP site that held the report and ensure that nobody else can gain access to this. The last thing that a company running a web site wants is for their rivals to gain access to their log file and the reports you produce from these, so some caution is required when setting up a system of this type.

It's also worth bearing in mind that some of the more complex (and potentially useful) reports that the more expensive programs products could be generated with the cheaper ones with a bit of thought. For instance, WebTrends and SurfReport have advertising reports, which give details of the page views and click through figures for adverts on web pages.◆

Spam's September Renaissance

by Steve Clark

Photography by Steve Clark

AGIS has been a lightning rod for anti-spam activists.

After a quiet summer, the spam issue re-ignited in late September as two well publicized cases wound up in court. On September 16, Cyber Promotions was cut off from AGIS, the white knight backbone provider that opened its doors to spammers in April hoping to establish a standard by which unsolicited commercial bulk e-mails are sent. Cyber Promotions immediately went to the U.S. District Court to obtain a court order for its connection to be reinstated.

On September 30, U.S. District Judge Anita Brody in Philadelphia ordered AGIS to reconnect Cyber's connection until October 16, or earlier if Cyber Promotions could find another connection. AGIS's contract with Cyber allows the backbone provider to pull the plug on the bulk e-mailer within 30 daynotice, or immediately if AGIS could prove that Cyber was causing damage to the AGIS network. Apparently, the judge did not agree that the ping wars between Cyber Promotions and the anti-spam guerrillas were damaging enough for AGIS to justify yanking the connection.

The day after AGIS disconnected Cyber, a district court in Travis County, Texas, issued a temporary injunction against Craig Nowak of CN Enterprises for using the domain name flowers.com in the return address of a spam he sent on March 31. Flowers.com is a domain name maintained by Tracy LaQuey Parker of Austin, Texas. By using the flowers.com domain, Nowak essentially flooded Parker's mail box with flames and bounces. Parker is no Internet novice. In fact, she wrote *The Internet Companion: A Beginner's Guide to Global Networking* (ISBN: 0201407663) in 1994.

Both cases are set to go to trial in the future, and both bring the spam issue to a new level. It has gone beyond being a matter of free speech to criminal trespassing, forgery and fraud.

THE FLOWERS.COM CASE

Craig Nowak is a 23-year-old marketing major at San Diego State University who has supplemented his modest student income with a small mail-order business. As a student, he has connections to grant money. He says that there are several services that specialize in

informing students about grant money. Information is commonly available if you know where to look.

In March, he decided to use the Internet to sell his list of organizations that offer grants. With the help of a "friend," Nowak designed an e-mail asking recipients to send $19.95 to tap into Nowak's network of foundations that give away billions of dollars each year. On or about March 31, this undisclosed friend sent the e-mail to thousands of Internet users. Nowak claims that he did not push the button that sent the spam, his friend was the actual trigger man. According to Pete Kennedy, the attorney representing the plaintiffs, Nowak has refused to disclose the name of this "friend," even after being ordered to do so by the judge. This friend made a gigantic mistake by using the name `kim!@flowers.com` as the return address. Spammers often use fake e-mail addresses as a way of avoiding flames and bounces. But this address was not entirely fake. As owner of the domain name, Tracy LaQuey Parker receives *any* e-mail addressed to *anybody* at `flowers.com`.

As Nowak's message went out on the Net and tried to arrive in mailboxes that no longer existed, they were all bounced to Parker's e-mail box at Zilker Internet Park of Austin, Texas. On April 1, Parker was bombarded with over 500 messages — most of which were bounced e-mails. This infiltration of mail shut down the mail server at Zilker. Once she realized what had happened, Parker contacted Smoot Carl Mitchell and John Quarterman at Zilker, and the Texas Internet Service Providers Association (TISPA). They hired attorneys Pete Kennedy and Roger Williams George of Donaldson & Ford LLP to pursue the culprit.

This group tracked down Nowak, whose business phone number was on the spam. According to Nowak, they asked him for a few thousand dollars to help pay for the damage he caused on the Zilker servers. He refused because he claims he didn't have the money. He did, however, agree to not use the flowers.com domain name in any further e-mails.

About a month later, he came home from school, and there was a message from

Wired Magazine. They wanted to know about the lawsuit against him. Two days later, an overnight letter arrived with the lawsuit. Nowak is under the impression that the plaintiffs, Parker, her husband Patrick, Zilker, the TISPA, and EFF-Austin, think that he's some big business with thousands of dollars laying around to settle lawsuits. In reality, he's a one-man operation, a kid working his way through school, who doesn't even have a lawyer. He's been using a paralegal service to deal with the case. He says he's looking for a lawyer who will take the case *pro bono* to help keep the freedom of speech issue alive.

On September 17, the Travis County District Court granted a temporary injunction against CN Enterprises. Nowak was ordered not to use flowers.com in the return address or anywhere in the header of any e-mail message he sends. Furthermore, he was ordered not to use any domain name in the return address of his messages without written permission from the owner and administrator of the domain.

A trial date has been set for November 10, 1997. Gene Crick of the TISPA, one of the plaintiffs in the case, says that the case is not about spam. It's about forgery and fraud. Nowak refused to comment on how many recipients of the spam were interested in buying his product.

THE STORY OF AGIS AND SPAMFORD

The ongoing saga of Apex Global Internet Services (AGIS) and Cyber Promotions came to an abrupt end on September 16 when AGIS disconnected Cyber. Sanford "Spamford" Wallace, the flamboyant president of Cyber Promotions and arguably the most hated man on the Internet, immediately filed suit against AGIS for breech of contract.

AGIS claimed it had good reason to pull the plug. Company President Phil Lawlor said that there was evidence that the spammers—most notably Cyber, Integrated Media, and Quantum Communications — were circumventing AGIS's list of individuals who did not want to receive spam. Lawlor said that the spammers were operating in an illegal and immoral manner, which were grounds, in part, for AGIS's termination of the contract.

It started in April when AGIS provided a haven for spammers in an attempt to control unsolicited commercial bulk e-mail. Shortly thereafter, AGIS became synonymous with spam among the purists of the Internet community. Lawlor's home phone number was posted on a newsgroup, and individuals were encouraged to harass him at home at all hours. That was followed by an alleged hacker attack into an AGIS router, which AGIS claims is still under investigation by the FBI.

The story seemed to die down over the summer. But all was not well on the AGIS front. A holy war between Internet purists and spammers broke out. E-mail bombs and ping attacks were launched on the autonomous networks connected to each other through the AGIS backbone. The spam war was in high gear and the battleground was AGIS. The backbone had measured very well in the first *Boardwatch*/Keynote test, which was published in the July issue of *Boardwatch*. This time around, AGIS fell dramatically.

After AGIS was forced by the court to reconnect Cyber Promotions, Lawlor said that he regretted ever taking them on as a customer. He said that he would support *any* legislation aimed at curbing spam.

ALL SPAM, ALL THE TIME

Wallace, uncharacteristically, did not return phone calls for this story. But

according to published reports, if he and his spam brigade can't find a connection, they may build their own backbone. The day before the AGIS/Cyber Promo ruling, we received an anonymous call at *Boardwatch* asking how to build a backbone. The answer is simple. Get a billion dollars, lease some circuits from WorldCom, and find some peers. Raising a billion dollars should be easier than finding a backbone that will peer with the "All Spam Network," especially if all the backbones refuse to sell connections to the Sanford Wallaces of the world. If you can't peer, you're not on the Net. But in any cartel, there will be cheaters with a greater interest in profits than in preserving an alliance.

Ultimately this could help solve the spam problem. If all the backbones refuse to sell connections to spammers and refuse to peer with a potential "Spambone," then the only way to receive spam would be through a spam service provider (SSP). An SSP would operate just like an ISP, except it would be connected to the Spamnet instead of the Internet. However, an SSP could also be an ISP. It could tie the two networks together with a high-powered router and start the process all over again.

Defining "known spammers" is an ambiguous task. One man's spam may be another man's lifeblood. In the publishing industry, we need to get press releases even if we instantly trash most of them. Most press releases are sent using an impersonal, bulk method. That's pretty close to spam in some minds.

The First Amendment argument goes both ways. Just as spammers use freedom of speech to declare that what they're doing is not illegal, an ISP can use it to refuse service to anyone it feels is distributing bogus information. And just because something is legal doesn't make it proper.

But if spammers create their own network, aside from the Internet, they can't steal bandwidth or server space from Internet providers. Then again, who's going to tune in to the spam network in the first place?

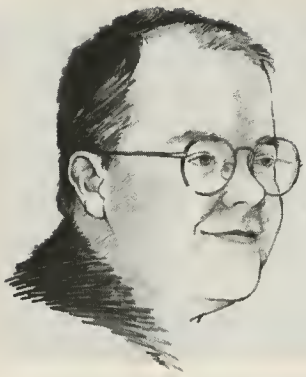
GOING POSTAL

In all fairness, Nowak seems to have simply made an honest mistake. But he still feels that "people should just relax" about the spam issue. Spammers have always stood their ground behind the First Amendment. But network operators and ISPs, with millions of dollars invested in equipment, don't think it's that simple.

E-mail is cheap, when it's done within reason. The cost of delivering 2 kilobytes of text is so small that it's barely measurable. But 500 e-mails bounced to an innocent server costs an ISP thousands of dollars to clean up. Another Texas company was forced to close its ISP operations after a spammer sent a bulk e-mail using its domain name. The domain was then blacklisted from the America Online mail system and none of its customers could communicate with AOL's then 8 million subscribers. Both Tracy LaQuey Parker and Zilker feared this would happen to them. Fortunately, Parker acted quickly and asked for help on the Internet newsgroups.

The important word here is bulk. Spam brings an e-mail message to a critical mass and it becomes a nuisance for the people who have invested big bucks making the thing go. Unlike multicasting, which is emerging as an efficient way to deliver multimedia to large audiences, spammers do not send their messages to a willing, or even a paying, audience.

Imagine that somebody, somewhere does a 2 million piece mailing and accidentally prints *your* home address as the return address. Half of it is addressed to invalid mailing addresses. After a couple of days, you get a million unwanted pieces of mail delivered to your doorstep. The postal service wasted hours upon hours sorting this bogus mail, and the letter carrier who dropped the sacks at your house wound up in the hospital with a ruptured disk in his back. Sound like a pleasant experience? It could happen to you if you're an ISP.◆



EURO NEWS

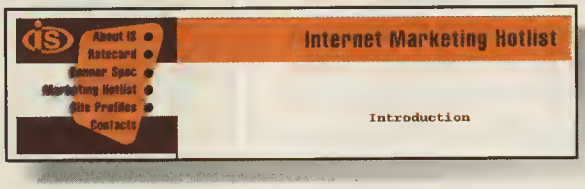
Richard Baguley

AOL AND COMPUSERVE: THE EUROPEAN ANGLE

Richard Baguley is the technical editor of *Internet Magazine* (www.emap.com/internet). He describes his job as trying to answer the question "Hey Richard, what does this bit do?" He also runs the Interent service provider tests that appear in the magazine.

His writing has appeared in numerous places, such as *Mac Format*, *Wired News* and *WebMaster*. He is an ex-editor of *Amiga Shopper* and *Internet Today*. He lives in North London and drinks beer (although the stuff he drinks is rather different to what most Americans call beer). He can be contacted at baggers@baggers.com.

The recent sale of CompuServe to AOL and WorldCom (depending on which bits you are referring to) has had some interesting effects on the ISP market worldwide. Many people are worried that this creates a single company with a dominant position in the market — after all, the sheer number of customers on the combined service is a good portion of those who have Internet access throughout the world. Whatever the outcome of this in the long run, there is an interesting angle on this in the United Kingdom. The curious fact of the matter is that CompuServe in the U.K. is much bigger than AOL. Although subscriber figures are notoriously inaccurate (partly due to the way that many providers give away free trial accounts), there is no doubt that CompuServe is much bigger than AOL in the United Kingdom. According to the April edition of the Internet marketing hot list (at www.internetsales.com/hot, produced by EMAP, the company that publishes *Internet Magazine*), CompuServe in the U.K. has between 400,000 and 425,000 subscribers, while AOL has between 165,000 and 175,000. What this means is that AOL U.K. has taken over a company which has over twice its number of subscribers.



As I said, there figures are really little more than rough estimates, but even if you take them as orders of magnitude, CompuServe is easily the biggest service provider in the U.K., and the combined AOL and CompuServe company (with between 565,000 and 600,000 customers) is bigger than the rest of the ISPs on the list put together. Whichever way you look at it, it is a big company that is likely to have a lot of clout. Its closest rival is MSN, with between 120,000 and 130,000 subscribers while the rest are around or below 100,000 subscribers. It seems somewhat ironic that MSN is claiming it turned down the chance to buy CompuServe, a service with over three times the number of customers it has.

At the time of writing it isn't clear how the deal is going to shake down — AOL is talking about running CompuServe as a separate business unit and preserving its separate identity. AOL says that the two services are aimed at different customers, with CompuServe going for the business market and AOL going for the consumer. Quite what this will mean for all of the consumer-based content on CompuServe U.K. isn't clear. Although neither company is commenting very much on future plans (at least until the legal toings and froings that a deal of this size and type involve are done), they certainly aren't going to be competing head to head in the future.

Whether this is a long- or short-term policy remains to be seen, but I find it hard to believe that AOL will resist the temptation to start throwing its corporate and marketing weight around at some point in the future.

BT AND MCI : BIRTH OF A GLOBAL MEGACORP

Despite problems, British Telecom and MCI are going ahead with their plan to merge into huge company called Concert. This deal will have some interesting implications for the telecoms and Internet market both in the U.K. and U.S., but if you want to understand how much the U.K. telecom market has changed in the past few years, you have to look at the history of British Telecom.

What many of you may not realize is that until a few years ago, BT was owned by the U.K. government. It began life as part of the GPO (General Post Office), which ran both the telephone and postal systems in the U.K. and was wholly owned by the government. This was split into two parts in 1976 to form British Telecom and the Post Office, which is still owned by the government. At this point, BT had a complete monopoly of telephone services. If you wanted a telephone, you went to BT and you paid whatever price they wanted to charge, it was installed whenever they chose to do it and you even had to rent the telephone off BT.

BT became a private company in 1984, when the Conservative government decided to sell the majority of shares in the company on the stock market. This decision was the subject of some controversy, to put it mildly. Many people were opposed to the very idea of privatizing something that was so integral to the state of the nation. They argued that it was like selling off the roads and pavements (or sidewalks as you lot call them) — the telephone system was something that everybody had to use and was thus too important to leave to the vagaries of the free market.

Others supported privatizing BT, but argued that it would be a mistake to create a single company — it would be too big and would monopolize the market. No other company would be able to compete with the economies of scale that BT could offer. No other company would be able to build a competitive network, squashing any chance of real competition before it started.

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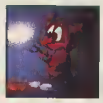

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They thought that to promote competition, BT should be split into smaller companies, with each handling a separate section of the market, such as local loop, long distance, international, etc. What eventually happened was something of a compromise. While BT was sold as a single company, restrictions were placed on what it could and couldn't do, while other companies were given access to the BT network.

What the first of these meant was that BT was allowed to offer some types of service, but not others. For instance, you could buy a telephone line of BT, but they couldn't sell you Internet access to go with the line. Although BT do have an ISP section (called BT Internet, at `www.btinternet.com`), you can't buy a combined Internet and phone service. BT is also restricted from using the profits they make out of telephone lines to subsidize BT Internet — it is run as a separate (but wholly owned) company which has to buy services from BT at the same market rate as everybody else. Likewise, the Internet backbone run by BT (BT Net, at `www.bt.net`) has to buy its infrastructure from BT at the market rate. Secondly, the prices that BT charged other telecom companies for access to their network (such as local loops, international calls and the like) were fixed. These were controlled by Oftel, the Office of Telecommunications, a government body charged with making up the rules of competition and making sure that BT and other companies stick to them.

They set the prices that BT can charge the companies, and BT isn't allowed to deny them access to their network on the grounds that they are a competitor.

More recently, Oftel has begun to lift some of the restrictions placed on BT. A recent discussion document from Oftel suggests that BT should be allowed to offer some Internet services directly, but with restrictions. For instance, they would be allowed to sell you Internet connectivity, but not services such as e-mail and Usenet news. If you wanted these, you would have to go to BT Internet or BT Net. This suggestion has produced a storm of protest from ISPs in the United Kingdom. Despite several years of competition and the increasing market presence of a number of new companies in the U.K. (such as Cable & Wireless, Energis and others), BT are still very much in a dominant position. It still supplies over 90 percent of the domestic telephone lines in the U.K., and its telephone network is still the biggest and most widespread by a long way.

Despite this, there has definitely been an increase in competition. Cable companies are now offering an alternative to BT for phone lines (although only in the areas that have been cabled), and several companies are moving in on the potentially highly profitable international telephone call market. Whichever way you look at it, BT is still dominant, and it seems unlikely that this will change.

BT itself is one of the biggest companies in the United Kingdom. Where precisely in the rankings it is depends on how you measure it, but by most measures it is in the top 10 companies in the United Kingdom. It's certainly one of the most profitable — the most recent set of company results show that it made a pre-tax profit **£881,000,000** (around **$1,384,500,000**) in the first quarter of the year alone. This works out at around **£100** per second. However, BT aren't content with dominating the U.K. market. They have set their sights on a much bigger market — the United States. MCI has recently admitted that its recent venture into the local phone market in the U.S. has been an expensive failure — expensive to the tune of around **$800,000,000**, that is. In fact, this figure was so much larger than expected that, BT renegotiated the merger deal, shaving a significant amount off the net worth of MCI. As one headline put it "BT Gets MCI — at 20 percent off."

U.K. POLICE CATCH UP WITH HACKERS

According to recent press reports, three people have been questioned by the police in connection with a number of high profile web site hacks in the United Kingdom. These included attacks on sites such as those of the Labour and Conservative political parties. The hacks, which are alleged to have happened from a cyber cafe in Manchester, happened in the lead up to this summer's election. The changes made to the sites included swapping the official portraits of the party leaders with images of satirical puppets and altering the link to the Women's section of the Labour party site to point to the web page of an Amsterdam sex shop. Those of you who are interested can check out the hacked pages on the web site of the hacker magazine *2600Hz* at `www.2600.com/hacked_pages`. This site also has copies of the hacked CIA and FBI pages.

Meanwhile, a well-known member of the U.K. hacking scene appeared in court recently. He faces nine charges under the Computer Misuses Act and one charge of "possessing software with intent to defraud." What this and other recent cases have shown is that the U.K. police are beginning to work out how to track down hackers. The cases involved the Computer Crime Unit of the Metropolitan Police, based in London. Although the police have become involved in cases of computer crime before (such as possession and distribution of illegal pornography over the Net), they are now beginning to focus their efforts on hackers who attack companies on the Net and deliberately alter web sites.◆

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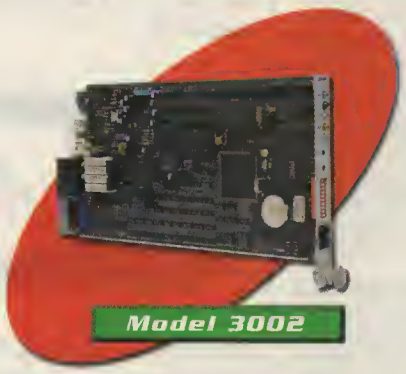

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WIRELESS Data Developments by Steve Stroh

WIRELESS INTERNET MULTICASTING

Warp Drive Networks (www.warpdrive.net) has an experimental license from the FCC to use both low power UHF television channels and Multipoint Distribution System (MDS) channels (normally used for "wireless cable") to literally broadcast Internet. In this application, there's effectively no difference between the two, other than the particular chunk of spectrum that each occupies. In areas where Warp Drive provides service, "Internet" is literally in the air — it just requires the proper equipment to receive it and authorization codes from Warp Drive to decode it.

Steve Stroh learned wireless TCP/IP networking as an amateur radio operator (callsign N8GNJ). He's one of the founding members of the *Puget Sound Amateur Radio TCP/IP Group* and is secretary for *Tucson Amateur Packet Radio (TAPR)*, a national not-for-profit amateur radio research and development corporation that specializes in wireless digital communications.

Professionally, he's a NetWare and Windows NT administrator for a large company. He's done battle with UNIX a few too many times and mostly lost, so now he's learning Linux and BSDi in preparation for his next UNIX challenge. Steve lives in Woodinville, Washington (in the shadow of Redmond) with wife Tina and daughter Merideth. He can be reached at steve@strohpub.com.

Warp Drive provides wireless, variable rate Internet access over a wide geographic area. The variable rate is burstable to high speeds, requiring only a minimum prior arrangement. Warp Drive's system attempts to overcome the "last mile" problem of getting high-speed Internet access from an ISP's point of presence to a business. Especially in urban areas with older telephone wiring, getting a 56K or T-1 line from an ISP to a business is expensive and time consuming. In contrast, Warp Drive's equipment starts at the roof with a small antenna.

Warp Drive accomplishes this by using conventional television (and MDS) transmitting and receiving technology. The transmitter is modulated with 45 Megabits per second digital data, rather than a television signal. One of the few necessary changes in the transmission and reception equipment is that the transmitter must either be de-rated (transmit lower power than for a television signal) or be modified for extra cooling. This is due to the fact that the digital data modulates the transmitter to "100 percent duty cycle." By contrast, a typical television signal modulates a television transmitter much less than 100 percent, and most television transmitters are not designed for 100 percent duty cycle.

Warp Drive's system is currently one way — literally broadcasting. Outbound, "uplink" Internet access from the user is handled conventionally — analog modem, ISDN modem, 56K leased line, etc. Warp Drive has stated that it is developing a two-way wireless system. This is one reason that it wants to form alliances with Internet service providers, since ISPs are needed to provide the uplink Internet access.

There's a lot to admire about the Warp Drive system. Warp Drive is making use of spectrum that, in a lot of areas of the country, is simply going to waste. This waste is an historical artifact of early television receivers not being able to discriminate ("tune sharply enough") between adjacent frequencies, so not all television channels could be used in a given area, and therefore more television channels were needed. With digital technology, television receivers have had adequate "discrimination" for many years now. Cable television channel frequencies are adjacent, unlike broadcast television. The FCC is acutely aware of this relative lack of use, but has been unable to change the status quo. It has been demonstrated by the recent decisions regarding the granting of an additional television channel for the use of broadcasting High Definition Television (HDTV), broadcasters have an enormous amount of clout as a lobbying group in Washington.

Because of this clout, the intended use of the television frequencies — one way broadcasting — is unlikely to change. So, another point of admiration for Warp Drive is that it figured out a way to fit Internet access into spectrum that is currently reserved for broadcasting.

One of the key features, perhaps the primary feature of Warp Drive's system, is that it is compliant with the multicast initiatives that are now evolving. Multicast makes streaming data, typically audio and video, able to flow through networks much more efficiently than the more common model of directing an individual stream of packets to an individual user across the entire Internet. The latter definitely works, but it's unlikely that it would scale it up to something approaching full-screen, high-resolution, full-motion video — at least with current network speeds. It seems to me that Warp Drive's service would work very well with multicasting.

According to Warp Drive, the aggregated data rate for one transmitter is 45 Megabits per second. But unlike a conventional wired network, that 45 Mbps is reaching every user simultaneously — without consuming any additional resources. No more network resources are being consumed to reach the second user, or the two-hundreth, or the two-thousanth.

Warp Drive has created a way to provide multiple streams of video from one television transmitter. Warp Drive will be quick to point out that it is not in the "video broadcasting" business — that's the role of a television broadcast station. Warp Drive is in the business of delivering Internet bits wirelessly — file transfers, web pages, e-mail, and also streaming media.

Multicasting technology is aimed squarely at a market very similar to pay-per-view cable television broadcasts. It seems to me that by using multicast technology, pay-per-view Internet starts becoming feasible at a much smaller audience than current pay-per-view systems. An example would be a popular local band performing at a nightclub. The nightclub audience is small — perhaps 300 people, but for those 300, the setting is intimate, comfortable, and quite enjoyable. The potential audience for the band isn't big enough to justify devoting a precious channel on a cable television system, even as a pay-per-view event. The performance could be recorded and played later, but that's just not the same experience as seeing it live . . .except for the drinks.

The alternative to these problems is to use the Internet to multicast the performance. This would work acceptably over conventional wired networks, but it would seem to work very well over Warp Drive's system. That's because Warp Drive could provide higher bandwidth — say a full 10 Mbps for this event, providing for high-resolution, full-motion video. Using multicast techniques, all the customers that want to watch this particular multicast are *receiving exactly the same bits* — once the initial bandwidth is allocated for this particular multicast, Warp Drive could sell that multicast to potentially every customer at no increased consumption of its network resources.

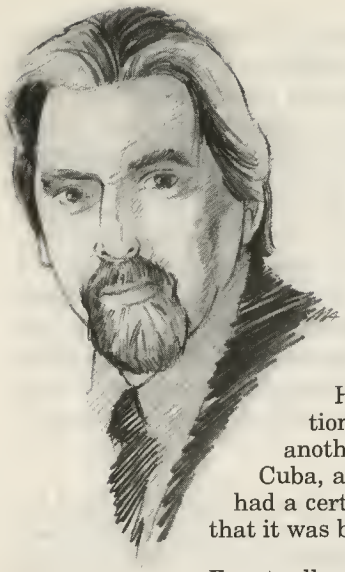
Put another way, the combination of Warp Drive's service and multicasting technology enables one television transmitter to broadcast many different video streams — and do so very efficiently.

The television broadcasters have already figured this out. Several television broadcasters have stated that they're considering broadcasting multiple "virtual channels," a capability of the HDTV specification, instead of a single transmission that uses the entire channel. Probably a good business idea, but they can't. In return for granting an additional television channel for each existing television transmitter totally free of charge (no auctions), the television broadcast industry promised congress that it would continue to transmit with no "user fee" and continue to be supported solely by advertising. This was thought of as a win/win — the broadcasters got a free channel, and the viewers receive free broadcasting (at the cost of watching commercials and purchasing new HDTV television receivers). If the television broadcasters renege on this promise, they risk angering congress, which is already stinging from the accusations of the corporate welfare endowed on the television broadcast industry for the giveaway of the additional HDTV channels.

Despite using equipment and spectrum traditionally used for television broadcasting, Warp Drive is not a television broadcaster — It sells Internet access which is a very different business from television broadcasting.

At the moment, Warp Drive is targeting business customers that need faster Internet access than they can get supplied quickly (long installation lead times), feasibly (old buildings, tough to route data lines), or economically (can't afford a dedicated T-1). The capacity of a Warp Drive transmitter is dedicated to those business customers *during the business day*, when its business customers require it.

But during the evenings, there is little demand for Internet bandwidth from businesses. Warp Drive could adopt the business model of DirecPC's "Night Owl" rate plan for consumer access during the evenings and weekends. Another consumer model for evening use of Warp Drive's system might be the recently announced WebTV Plus system, which downloads data over a cable television system during the early morning hours.◆



@INTERNET by Thom Stark

WRAP IT UP (OR THEY'LL TAKE IT)

Back in the 1960s there was a time when the demand, "Take me to Havana!" elicited instant grins of recognition. For a while there, the report that yet another airliner had been hijacked (usually to Cuba, although various North African countries had a certain constituency, as well) was so routine that it was barely even front-page news.

Eventually, the government started putting armed guards in street clothes aboard U.S. commercial passenger flights—especially those to international destinations. These sky marshalls, as they're known, put thirty to the burgeoning sport of skyjacking and "Take me to Havana!" finally became as quaint and outdated a locution as "Twenty-three skiddoo!"

In the Internet world of 1997, we have a serious hijacking problem of our own. It isn't airliners that are being pirated. Instead, it's SMTP servers. And it isn't political radicals who are doing the commandeering. The villains, instead, are spam artists, intent on flooding the Net with yet another solicitation to participate in a pyramid scheme, visit another lame pornographic web site, "fix" your credit or, worst of all, to purchase software that enables you, too, to splatter commercial diarrhea across the Internet (and leave some unsuspecting innocent holding the bag for your misbehavior).

WELCOME TO THE TERRORDROME!

During the first twenty years or so of the Internet, it was a pretty safe assumption that essentially everyone who used it understood the unwritten rules of cooperation by which it ran. One of the most central such rules was, "Bandwidth is precious. Thou shalt not waste it." Another was, "Commercial speech in Usenet is forbidden." And then there was, "Honor thy neighbor's privacy, yea, even as he/she/it honors thine own."

Isn't progress wonderful?

Three things happened to radically rework the landscape of these Elysian fields. First, and most important, was the evolution of the backbone environment from a single provider—specifically the National Science Foundation's NSFnet—to the present, multiple independent backbone model.

NSFnet shut down in May, 1995, after providing 11 years of progressively faster backbone services to the Internet community. With it went the restriction on commercial speech on Usenet and, by convention, the Net in general. That prohibition had been based on the policy that commercial use of a U.S. taxpayer-funded backbone network was forbidden—and, since Usenet was distributed via NSFnet, no commercial speech was permitted there or, by extension, anywhere on the Net. With NSF out of the way and virtually all of the Internet's U.S. backbone services being provided by commercial firms, the legal prohibition against commercial speech on Usenet went the way of the dodo. Although mossbacked Internauts of an earlier generation resisted the change, there wasn't much they could do about it from a practical standpoint.

The genie was out of the bottle.

The second major evolution came with the explosive growth of the World Wide Web. That brought with it an increasing disregard of the injunction about conserving bandwidth. How could it not? Tim Berners-Lee might originally have designed the Web to act as a front end for text-based content, but the arrival of Mosaic for Microsoft Windows and the Macintosh ensured that, as the anointed successor to the venerable Gopher, the Web would be firmly bedded in a bandwidth-hungry graphical environment.

And, what the heck, with the proliferation of backbone providers, bandwidth, per se, was no longer quite the precious commodity it had been in 1984, when NSFnet started up over 56K lines.

Within less than a year came the last of the three sea changes that have so completely altered the lay of the Internet landscape, as the major online services—especially America Online—opened the floodgates and let their poor, their tired, their clueless masses pour into Netspace. Credulous, impatient, untutored and utterly bereft of meaningful support from their access providers, this mass of newbies jammed Usenet with multiple crossposts, nit-witted pyramid scheme comeons and generally inappropriate sludge, much of it of the "Which one is the 'any' key?" variety.

As P. T. Barnum observed, "There's a sucker born every minute—and two to take him." For con artists, the Internet had suddenly become a target-rich environment.

HI, JACK!

The Internet spent most of its existence as an academic and research environment. From the very beginning, by far the largest number of registered domains were in the .edu namespace. But, by August, 1995, the commercial sector had become the tail that wagged the Internet dog as, for the first time, .com domains outnumbered those in all the other namespaces combined.

This new, commercialized milieu brought with it the scum of the Internet: fast-buck artists, scamsters, commercial pornographers and exploiters of all stripes. The Net was now infested with a menagerie of scoundrels, but at the bottom of the chum bucket there oozed the most loathsome invertebrate of them all—the spammer. Everyone hated them (except AGIS, that is) and the reaction to their spew of unsolicited commercial e-mail was virtually uniform. Each

Thom Stark is president of **Stark Realities,** a consulting firm based in the San Francisco Bay Area which specializes in integrating Internet-native technologies into existing business networks. He also conducts seminars and tutorials about the Internet at trade shows and for business and user groups. He is the author of the serialized online science fiction novel, "*A Season in Methven*", (`www.starkrealities.com/Methven`). Mr. Stark's maintains a non-commercial web site which focuses on IP internetworking technologies and policy issues at `www.starkrealities.com`. and his e-mail address is `thom@starkrealities.com`.

wave brought an instant flood of rage-filled complaints to the perpetrators' service providers, often accompanied by threats of retaliation. Especially in the early days of the plague, action often suited admonition as irritated Internauts struck back at repeat offenders with sustained mail bomb attacks.

That situation couldn't be permitted to continue. Mail bombing spammers' ISPs punished the innocent subscribers along with the guilty ones—an intolerable state of affairs for the service providers. In self-defense, ISPs began publishing acceptable use policies and putting teeth into their terms of service. They placed restrictions on the amount of e-mail any one subscriber could send in a day and they instantly cut off service to transgressors.

The spam community found itself stymied for all of five seconds by these measures.

While AGIS offered aid and comfort to Sanford Wallace's Cyber Promotions and its infamous offspring, the penny-ante operators found a friend in Forrest Dayton's nefarious Stealth Mass Mailer and *its* repugnant relatives. Both sets of miscreants began to employ the same underhanded tactics to conceal their tracks—forging headers to conceal the true source of their broadcasts and hijacking unprotected SMTP servers to re-mail their bilge. By exploiting the essentially trusting default configuration of third parties' mail servers, they've been able both directly to obscure their actual addresses and to create the appearance that their unwelcome epistles originate with what are actually innocent victims.

What the spammers are doing is pretty clearly illegal, and it's a kind of illegality—unjust enrichment, impairment of reputation, theft of services and gross imposition—that violates not only the laws of the United States, but statutes of nearly every country on Earth. So, eventually, mounting civil and criminal cases will catch up with these outlaws and put them out of business, if not behind bars. In the meantime, however, something like a sky marshall corps is needed to prevent the pirates from seizing control of other people's SMTP servers.

Like yours, for instance.

ANY PORT 25 IN A STORM

SMTP servers listen for connection requests on port 25. By default, Unix systems permit a connection to be made to port 25 from any system requesting one. That's the vulnerability at the heart of the spammers' strategy and the single most effective tool to prevent their depredations is to slam that hatch all the way closed.

To begin with you should be run sendmail out of inetd. You should install and use smap and smapd from the Trusted Information Systems Firewall Toolkit. And you should also run the smrsh SendMail Restricted Shell to limit the damage that hackers can do, too. It's easy, it's fun and it will greatly enhance your social life.

Well, okay, it's only moderately easy and it isn't all that much fun. But it *will* enhance your social life because it will cut way down on the chances that you will unjustly be accused of spamming or of harboring spammers.

Start with the README file at `ftp.tis.com/pub/firewalls/toolkit`. It will direct you to read the license agreement and, if you agree to abide by it, (it's not unduly burdensome,) to send an e-mail message with the word "accepted" as its entire content (mind you, be sure not to include your .sig and *don't* include the quotation marks!) to `fwtk-request@tis.com`. You'll get an e-mail back within seconds which will reveal the name of the hidden directory on the TIS FTP server within which the Firewall Kit currently resides.

As of this writing, Firewall Kit 2.0 is the most current version. There are already a number of mostly tiny patches to the kit (including patches authored by Marcus Ranum to the respective .c files for both smap and smapd) which you'll want to download along with the 805 kilobyte fwtk-2.0.tar.Z file.

Your best bet is to unpack and untar the archive and read all the included documentation before you alter your system. If you're chomping at the bit, you'll find a fairly complete set of installation and configuration information about the kit at `www.erols.com/avenger`, or you can check pages 670-675 in Simson Garfinkel and Gene Spafford's quite wonderful *Practical Unix & Internet Security, Second Edition* (ISBN 1-56592-148-8, copyright 1996, 1991 O'Reilly & Associates, Inc. `www.oreilly.com`) for the quick and dirty essentials.

You'll probably want to install other elements of the kit, but smap and smapd are essential. Once you've created the necessary directories and permissions, compiled the smap and smapd binaries and created a non-toxic user for sendmail to run as, you'll also want to get the SendMail Restricted Shell source from `ftp.cert.org/pub/tools/sendmail/smrsh`. (Smrsh allows you to specify those programs that you're willing to let the sendmail user run. It's a great tool for limiting hackers' ability to exploit holes in sendmail to gain root on your mail server.)

Smap and smapd allow you to run sendmail from inetd, rather than using send mail's own daemon. Instead of letting sendmail listen for SMTP requests, smap takes over the chore of listening for and receiving incoming mail, leaving sendmail to send mail placed in its queue. Smap can easily be configured to reject connection attempts from an explicit list of hosts, domains or IP address ranges, allowing you to automatically block mail from known spam sites. Also, Craig Hagan (`hagan@cih.com`) has a set of smap hacks at `www.cih.com/~hagan/smap-hacks` designed to block third-party SMTP relaying. He's had a lot of help from various contributors and, while their stuff isn't warrantied, (nor is it supported by TIS,) it's definitely worth a look.

The folks who run the Fight Spam on the Internet! site have a bunch of other links for sendmail and other MTA spam blocking measures at `http://spam.abuse.net/spam/tools/mailblock.html`.

Of course, if you're a corporate admin, rather than an ISP, one fairly effective strategy is to set your router to reject port 25 requests from anyone but your ISP's mail server. Most low-end spammers aren't sophisticated enough to research your ISP's mail server address and pretend their request is coming from there. Instead, they'll most likely go elsewhere in search of a suitably unprotected mail server. And, since your ISP will be relaying mail to and from you, your own mail won't get dropped on the floor.

Router-based filtering is pretty much a brute-force approach, but it has a certain charm. Most of the MTA-centric filtration methods significantly increase the load on your mail server's CPU. If you're a smaller ISP, that machine is probably already overloaded and doing double or triple duty as a web and/or FTP server. Offloading some of that work to your router can make a good deal of sense, especially if that router isn't laboring under an especially heavy load.

The skyjacking epidemic of the 1960s was largely cured by a combination of tough legal sanctions and the creation of the sky marshall program. Nowadays, it's practically unheard-of for a U.S. airliner to be hijacked. If the legal community does its part and enough of us close down port 25 to spammers, maybe we can help bring the mailjacking epidemic to a halt, too.

It's worth a shot◆

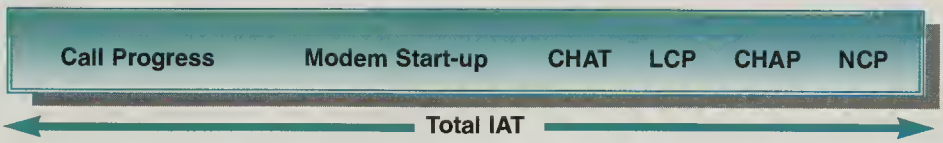
QUICKER DIAL-UP INTERNET ACCESS

by Ken Krechmer

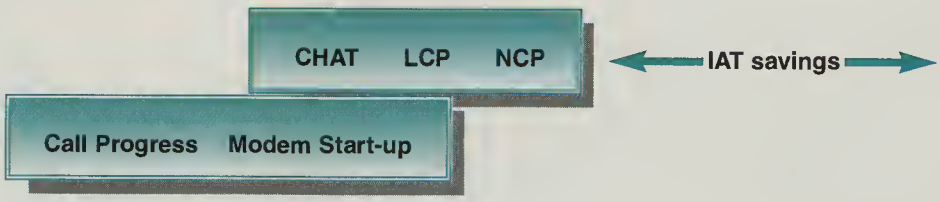
A new proposal to significantly decrease the dial-up access time to the Internet needs support from both the ISPs and the modem standards committees if it is to be implemented. The modem standards committees, working on the 56K modem (V.pcm), are not interested in implementing such features in the V.pcm modem unless there is interest from the ISP community that such changes are desirable and will be utilized.

VocalTec Communications Ltd., manufacturer of Voice over IP systems, has proposed paralleling the modem start-up time and the authentication processes to significantly shorten the Internet access time (IAT). VocalTec is concerned that voice over IP users will not accept the long start-up times currently required to establish dial-up Internet connections. Dial-up IAT is the time from when the client PC goes off-hook until an IP layer is established. These proposals for shorting the IAT time offer better utilization of ISP ports, avoid delays associated with CHAT protocol time-outs and rapid disconnect from poor quality incoming calls.

In time sequence, the establishment of a dial-up IP connection appears as:



Possible improvement when the CHAT (ASCII authentication) logon procedures are used:



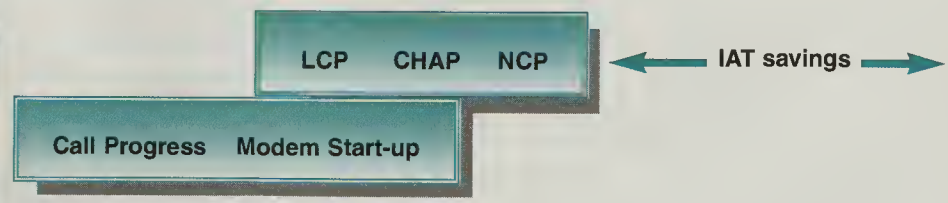
This improvement requires changes to the modem start-up procedures to pass the user name and password at the beginning of the V.8 modem negotiation. V.8 is a separate negotiation process that takes place before the V.pcm modem begins training. Of course, the communications server supplier would also have to provide compatible software in the communications server at the ISP's site to support this.

The dial-up Internet access time consists of:

procedure	time range
call progress time	1-10 sec
modem start-up	5-15 sec
CHAT	5-30 sec
LCP	<1 sec
CHAP/PAP (option)	5-10 sec
NCP	<1 sec
Totals	>16-65 sec

CHAT is an ASCII logon procedure
LCP is the link establishment phase
CHAP and **PAP** (Challenge Handshake Authentication Protocol and Password Authentication Protocol) are PPP options that could be used as alternatives to CHAT logon in procedures.
Network Control Protocol (NCP) negotiates the IP set up.

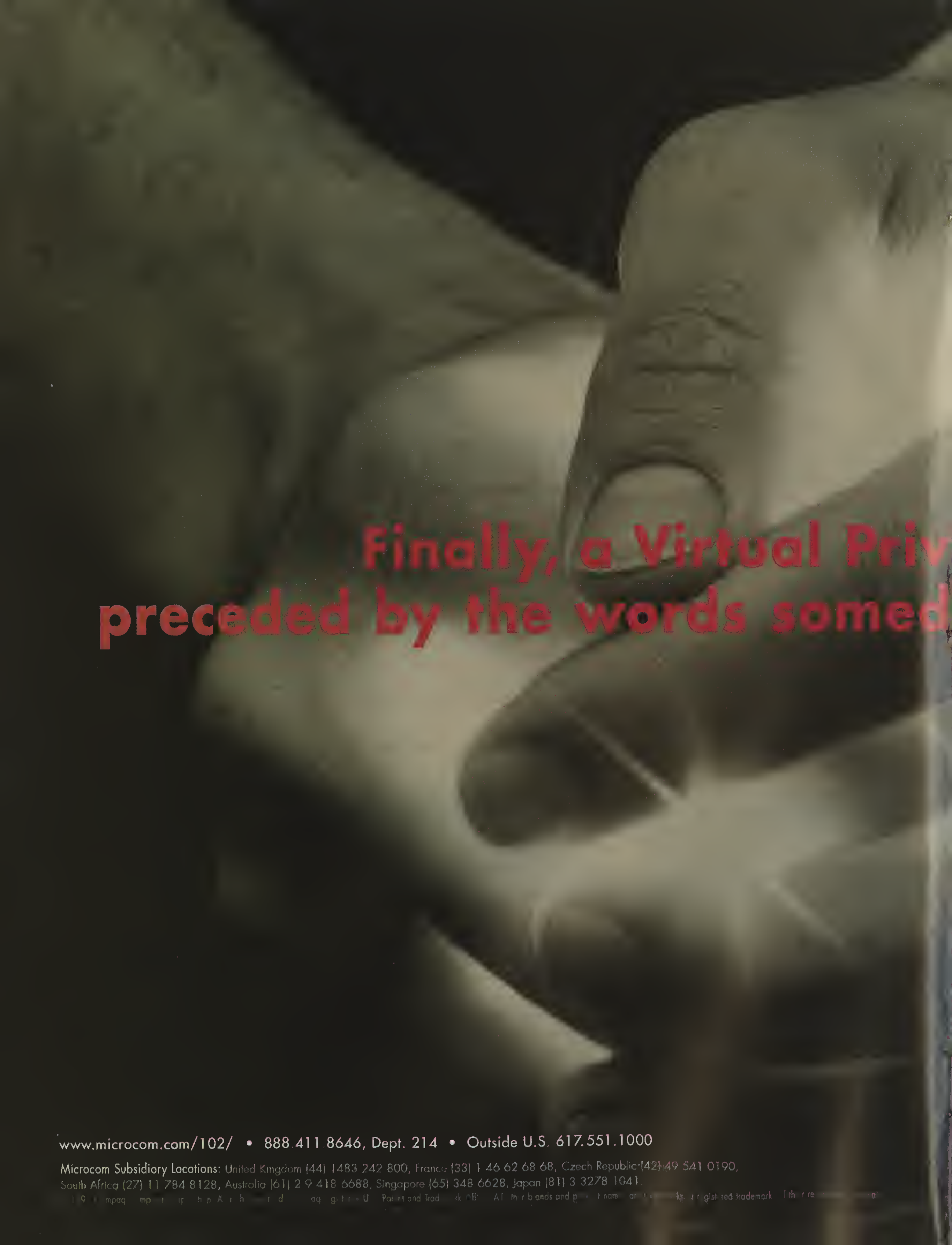
Possible improvement when CHAP/PAP is used:



One drawback to this approach is reduced security of the logon. Sending the ASCII login at the beginning of the V.8 modem negotiation would be less secure than sending it after the modems have established a high-speed connection. This occurs because it is technically much easier to tap the V.8 portion of the modem negotiation (300 bps V.21) than to tap the high-speed modem connection.

This requires changes to the V.pcm modem negotiation procedures to provide a duplex 2400 bits per second peer channel for the authentication procedure while the modem is still training. Of course, the communications server supplier would also have to provide the appropriate software to support this. Using CHAP would provide a system quite secure from wire tapping attacks to obtain user login information. PAP is less resistant to wire tapping attacks but still better than ASCII sent during V.8.

ISPs who are supportive of shortening the IAT time by either or both these methods should e-mail comments to Ken Krechmer `krechmer@ix.netcom.com` Comments received will be forwarded to the appropriate modem standards committee.◆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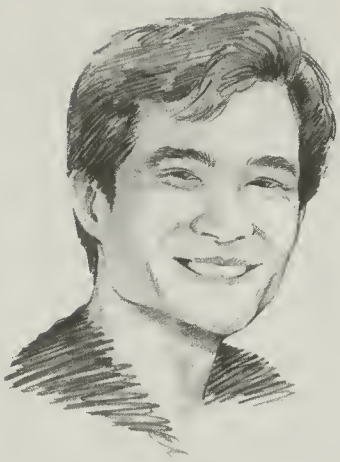


Notes From The Underground

by Wallace Wang

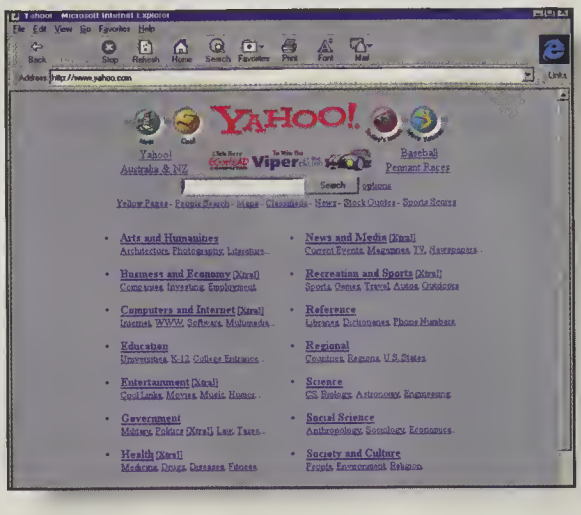
CRACKING THE MEGA$NETS CHAIN LETTER SCAM

Nearly everyone would love to make lots of money without working for it, which is why so many people run for political office. Of course, con artists use this "get-rich-quick" mentality to trick people into "investing" in an opportunity that promises fabulous riches in return for little work or effort on the victim's part. Since so many people are willing to flock toward these con games like flies toward dog droppings, it's no surprise that con games continue to appear in various forms.

The latest high-tech con game involves an electronic version of a chain letter called Mega$Nets, which stores five names and addresses. Upon receiving the Mega$Nets program, you're supposed to send $20 to each person on the list. In return, each person is supposed to send you a special computer code. When you have all five computer codes, you can "unlock" the Mega$Nets program so you can copy and distribute it with your name on the list.

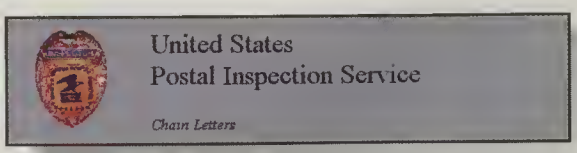
If others want to "unlock" your copy of Mega$Nets, they must send you $20 for your computer code so they can perpetuate the Mega$Nets chain letter. Thus for an investment of $100 ($20 for all five computer codes), you're theoretically in the "business" of selling the Mega$Nets software, which is like a chain letter claiming that you're in the "business" of selling mailing lists.

To view the many web sites of poor deluded souls who are distributing Mega$Nets, visit your favorite search engine (such as `www.yahoo.com`) and search for the "meganets" string.



PHONY CLAIMS

Beyond the misleading promises that Mega$Nets is a valid business that could potentially earn you millions of dollars, it also perpetuates other lies. Despite assurances that it's a legal business, Mega$Nets falls under the category of a chain letter. Although chain letters themselves are not illegal, they can be illegal if they involve sending money or other items of monetary value through the mail.



According to the U.S. Postal Service (`www.usps.gov/websites/depart/inspect/chainlet.htm`), using the mail to send money to chain letter participants violates Title 18, United States Code, Section 1302, the Postal Lottery Statute.

Besides the blatant illegality of participating in Mega$Nets, there are more amusing technical lies with Mega$Nets as well. Many web sites distributing Mega$Nets make the following claims:

No One Can Cheat You! That's right, it's impossible to cheat MEGA$NETS software . . . No names and addresses can be erased to put in the names of "friends", and the software is programmed to generate constantly changing codes that cannot be "guessed."

Wallace Wang is the author of ***CompuServe For Dummies***, ***Visual Basic For Dummies***, ***More Visual Basic For Dummies***, ***Microsoft Office 97 For Dummies***, and ***More Microsoft Office 97 For Dummies***.

When not working with computers, he performs stand-up comedy and has appeared on A&E's *Evening at the Improv* TV comedy show. He can be reached via e-mail at `70334.3672@compuserve.com`, `bothekat@aol.com`, `bo_the_cat@msn.com`, or `bothecat@prodigy.net`

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*any H.323 compatible client.

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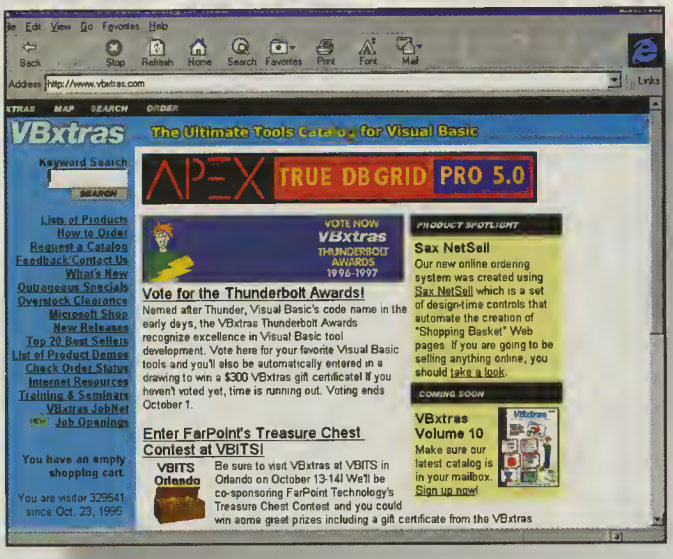
Without the correct codes, nothing works . . . (Some of today's best whiz-kids have tried to break the system and failed). In addition, MEGA$NETS checks itself for viruses. If it finds any modifications, it will simply refuse to run, so your system is fully protected without damaging your files.



MEGA$NETS CHECKS ITSELF FOR VIRUSES — WRONG!

If you get a copy of the Mega$Nets program and examine its files, you'll see the telltale VBRUN300.DLL file, which immediately tells you that the program was written with Visual Basic 3.0. Any program written in Visual Basic 3.0 or earlier can be decompiled using a handy tool called VB Decompiler, which you can buy from VBXtras at `www.vbxtras.com`.

Using the VB Decompiler program, you can recreate the source code from any Visual Basic 3.0 or earlier .exe file, including the Mega$Nets program. (As a side note, many bulk e-mailing programs are also written in Visual Basic 3.0, so you could decompile those programs for fun as well.) In case you don't feel like buying the VB Decompiler program, just download the Mega$Nets source code from `ftp://ftp.boardwatch.com/wang/megasrc.zip`.

Upon examining the Visual Basic source code, you will find no evidence whatsoever that Mega$Nets checks itself for viruses. In fact, Mega$Nets makes the perfect host for viruses because so many people are willing to distribute it in pursuit of mythical riches. If you want to cause havoc with a computer virus, infect the Mega$Nets program and watch the fun.

NO ONE CAN CHEAT YOU! — WRONG AGAIN!

After examining the Mega$Nets source code, it's trivial to crack its much vaunted computer codes that it claims, "Some of today's best whiz-kids have tried to break . . . and failed." By studying the source code, you can see that Mega$Nets uses two lines of defense to prevent people from cheating.

The first method involves scrambling the meganets.dat file that contains the names, addresses, and secret codes for each person. The second method involves calculating a six character code made up of numbers and letters. In both cases, studying the Mega$Nets source code reveals how Mega$Nets scrambles its .dat file and how it calculates its secret six character code that you're supposed to get only after paying someone else $20. In case you don't want to examine the Mega$Nets source code, just download the source code and executable version of a program called Mega$Hack (available at `ftp://ftp.boardwatch.com/wang/megahack.zip`). This program lets you edit the names and addresses in the Mega$Nets .dat file (so you can cheat) and calculates all the secret codes you need to "unlock" your own copy of Mega$Nets (so you don't have to pay anyone $20 for the computer codes you need).

Within the megahack.zip file is the install.exe file, which will install the Mega$Hack program in the Mega$Nets directory on any computer running Windows 3.1 or Windows 95. For fun, visit a Mega$Nets web site and send the Mega$Nets "distributor" the install.exe file so he (or she) can see for themselves that Mega$Nets can be cracked.

AVOIDING SCAMS

Hopefully by distributing the Mega$Hack program, we can kill further distribution of the Mega$Nets chain letter scam. But while Mega$Hack can discourage anyone from wasting money on Mega$Nets, be aware that Mega$Nets is just one of many scams appearing on the Internet.

To avoid getting suckered into a con game, avoid any "opportunity" that claims to be legal (that should be your first big clue right there) and promises large amounts of money for little or no work. Always remember that you can never get something for nothing, unless, of course, you're the one who's running a con game on others.◆

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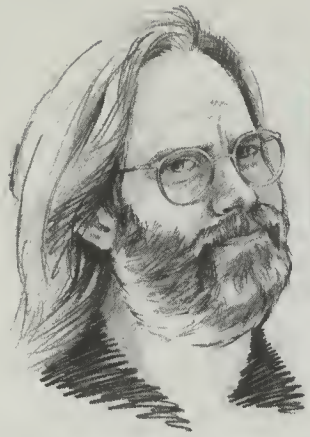


Java Jitters

by Doug Shaker

FIVE IDEAS FOR GREAT JAVA PROGRAMMING TOOLS

Hey, Apple! You want to make your platform into a real Java programming tool? Hey, entrepreneurs! You want technical leadership in Java programming tools? Forget tweaking the virtual machine to make it 5 percent or 10 percent faster. Forget making yet another visual interface tool. Try making the Java programmer's life a little — no make that a lot — easier. Here are five Java tools needed by the world of Java programmers. Maybe I am not looking the right place, but I can't find them anywhere.

Doug Shaker is a freelance technical writer in California. He has one wife, two children, three pets, and five computers. The computers are obviously out of hand. He can be reached via e-mail at **mailto: doug@theshakers .org**. Yes, that is a personal Internet domain. We told you the computers were getting out of hand.

Development environment with an integrated design tool. I don't know how you design object-oriented stuff, but I start by listing objects that I want, then I elaborate the variables that have to live in the objects and the conversations that the objects will have. Then, I code a little, modify the design a little, code a little, design a little, and so on until I have something that works and something with a design that doesn't disgust me. Right now, my design tools are paper, white board, and yellow stickies (a.k.a. Post-It Notes). Yes, there are design tools that could substitute for the yellow stickies and the white board, but most of them are pretty darned expensive and none of them are integrated with the development environment closely enough that I can switch back and forth effortlessly. Give me something that integrates deeply with the development environment and doesn't cost an arm and a leg.

A decent print library. The fact that we don't have a decent print model for Java is *shameful. Do you hear that Sun/Javasoft? SHAMEFUL!* The only print model in Java is the granite-stupid output stream — naked characters going to a naked output channel. Mention this problem to someone who programs in Java for a living and they either act ashamed or disgusted. The marketing types don't even think about it. It is stupid that we don't have a better answer.

Let me make it clear to the technology impaired. To do something butt-simple like draw a line, a Java programmer has to find the right output channel for the printer, find out what kind of printer is there, figure out the graphics commands the printer will accept, then translate the desired line location to pixels and output the proper escape sequence, command, command parameters and return escape sequence. This is an enormous pain in the rear. Just how many corporate programmers, former Cobol jocks, are going to take the time to do this? Rounding down to the nearest tenth of a percent, I would say 0.0 percent. If Java is going to live in the corporate world, where reports and fancy graphs are a way of life, where paper output is the currency of discussion and commerce, we *need* a print model with a decent API attached to it. The first IDE to pull this together gets loads of customers. Who wants it? Right now, it looks like Microsoft will be the first. Argh!

Collaboration tools that know about class structure and dependency and don't care about physical location. I might be wrong about this, but all of the version management tools that I have seen for Java are just doing that old C thing — checking files in and out. That's not as bad as it might be because Java, unlike C++, enforces a one-to-one relationship between classes and files so a file-based tool is at least dealing with a reasonable unit. Still, there is more that an object-oriented collaboration tool could do. It could, for example, allow the administrator to assign ownership of a class or a framework to a programmer or set of programmers. It could search out dependencies between classes — this class calls method printFoo in class FooBar, so it needs the old version of FooBar — and help find the right version that supports this dependency. It could baseline versions of the code and track diversions from that baseline. Maybe I haven't looked hard enough, but I haven't seen anything that even starts to do this.

I would also like to see collaboration tools that didn't depend on the clients being able to mount a particular link to a particular file server. I am sure that it hasn't happened everywhere, but in Silicon Valley telecommuting is a reality for nearly all software types. For the most part, if you say that on Tuesday you will be working at home, no one blinks an eye. It's not a big deal. The hassle isn't getting your boss's permission. The hassle is making sure you take all the right files home with you. If you forget something, getting the right files through the firewall and on to your home box can either be a pain or impossible. A collaboration tool that assumes nothing more than an Internet link and uses secure communications for transferring the files would be worth something.

A refactoring tool. A good object-oriented program usually needs to be redesigned two or three times before it can be delivered for the first time. Then it is redesigned another two or three times before it is any good. Part of redesign is refactoring — the reassignment of existing functionality to the new classes in the new redesign. Usually refactoring involves things like renaming methods, moving a method from a child class to a parent class (or the opposite), splitting the functionality of an existing method into several meth-

ods, renaming a class, etc. Doing all of this is a pain in the rear. Here is what is involved in a single method rename:

1. Find all the classes that call the method you are renaming.
2. Examine all the relevant method calls in those classes. Try to figure out if they are calling the method you are renaming or a method in another class. Bear in mind that the right answer may be both and you may need to disambiguate the object's class membership to do the right thing.
3. Edit all the relevant methods in the those classes, changing the method call appropriately.
4. Change the name of the method in the original class.
5. Test everything to see if you screwed anything up.

In a single redesign, you may need to rename dozens of methods and dozens of classes. It is, simply, one of the most dreary tasks that an object-oriented programmer has to do. A tool to make refactoring changes is called a refactoring browser or a refactory. To get a look at a Smalltalk-based refactoring browser, take a look at `http://st-www.cs.uiuc.edu/~brant/RefactoringBrowser`. If you program in Java for real, you will drool with envy at all of the functionality in the tool.

Easy to use performance tuning tools. I just did a web search on the following words: performance, Java, tool, profile. I found four URLs and all of them were for catalogs of some sort or another with the words being mentioned in different entries in the catalog. That means that there is nothing, nothing, nothing out there. I don't know how people are doing performance tuning now, but without tools, you are pretty darned limited.

In the Smalltalk world, there are several performance profilers. The best of the bunch is written by a guy named Kent Beck. When you run one on your code, you typically find that some silly method that you thought would get called five or ten times is getting called five or ten times a second because it is getting invoked every time a very common object is referenced instead of being invoked only when the object is created. A simple change improves performance by 50 percent. Then you find another method that provides the value for a calculated variable is being called a few hundred times a second. Caching the result speeds up performance another 50 percent. Then you find that growing some collection is taking up 50 percent of your CPU time. Initializing the collection to a larger size and then growing it in units of 10 or 20 members reduces the collection's computation time to near zero — another 50 percent improvement. And so it goes. A programmer who knows how to use a profiler can speed up a non-tuned application by 1,000 percent in three or four days. Without an easy-to-use profiler, you are stuck with guessing and hoping.

That's it, guys. If there were a Java development environment with all of those things in it, it would be the champion, the best of breed, the development environment for Java professionals the world over. Let's hope someone else beats Microsoft to the punch.

One of the privileges of writing a magazine column — and there ain't many, let me tell you — is that you can call up a software company, ask for a demo and actually get one. Then, if you want, you can talk to the vendor about their plans for the future. Last week I called up Symantec to ask them about their Java product line. They have just released their Java 1.1 products for Windows (NT and 95) and MacOS. All of the products are now called Visual Café, but there is a Web version, a Professional version, and a Database version. The Web version is the cheapest at **$99** list. The Professional version is **$299** and the Database version is **$499**. They showed me the Database version and it is really nice. If you want to program with JavaBeans, you can get a program rolling in a few minutes. They have programming "wizards" that guide you through the process of connecting one bean to another. Very slick. Adding access to a database takes a few minutes more, but not much. If you wanted to build browser for some existing tables in an ODBC-compliant database, I think it would take you about an hour, maybe two, from opening the box to finished code, to get one going with the Database version of Visual Café. It's a fast, workable development environment. There is a reason they own the lion's share of the for-pay Java development environments. They haven't released any of my five dream tools, but Visual Java is what I use these days. Good stuff.

Another privilege of writing a column is that, if you don't like something, you can complain about it in public, hoping to either warn others away or change things for the better. Get ready for a complaint. In June, I bought a Graphics Blaster 3D video card from Creative Digital for my NT box. It uses a graphics chip made by Cirrus Logic. I bought it specifically because it claimed to have NT drivers in the box. Sure enough, it did. There were two little problems, though. First, my system started beeping every time the modem was in heavy use and the windows were repainting. This is mostly when I am downloading a web page. I scroll the web page window so that I can read the text while the graphics are downloaded and ... Beep! Beep! Beep! This problem is merely intensely annoying. The second problem is that the board crashes the system deeply — down to a character-based error screen — if I use Microsoft Publisher to display graphics at 1024x768 resolution. It does not happen if I use 800x600 resolution. It does not happen if I use another video card. All of this can probably be explained by a memory error in the driver code that corrupts some other part of system memory. Indirectly, it is a Microsoft design error that occurred when they moved the video drivers into the kernel, making sure that video driver memory errors will be unusually serious.

I don't like having these bugs, but NT isn't as popular as Windows 95, so I expect the NT drivers to be less well tested. What bugs the hell out of me is the way Creative Digital and Cirrus Logic have responded. Creative Digital took a month to believe me that there actually was a bug. Since then customer support has been very nice but completely ineffectual. Their development group seems to find this problem to be beyond them. After a month or so, customer support admitted that Creative Digital wasn't actually writing the NT drivers, so development had nothing to do with it. They were really just passing on the drivers that Cirrus Logic sent them. E-mails to Cirrus Logic have gone unanswered and unacknowledged. Faxes to Creative Digital asking for my money back have gone unanswered and unacknowledged. To their credit, Creative Digital support seems embarrassed and ashamed that their company is treating my problems this way. However, the fact remains that after three months, the board still doesn't work right and the company hasn't done a thing to make things better. You are forewarned.◆

STREAMING MEDIA by Doug Mohney

THE FINAL FRONTIER

Live, real-time broadcast of Internet video is the most technically challenging feat to pull off today, bar none. It requires high-speed PCs to encode live video on-the-fly, a clean high-speed Internet connection to handle hundreds of viewers and a dedicated server. It all has to go off without a hitch; a breakdown with the encoder, Internet connection or server leaves the live audience high and dry.

Even with all these things mastered, current state-of-the-art video picture quality is marginal to okay for the viewer. Encoding involves mashing old-fashioned analog NTSC-quality video at 24 frames per second into digital form. Compromises in the encoding and decoding processes result in a two-inch box on the PC's screen refreshed at 12 to 14 frames per second under ISDN or cable modem; half that on a 28.8K modem.

To put things into perspective, the old-fashioned, non-HDTV broadcast UHF/VHF video of a football game, from which all the analog data zapped out of the stadium to a satellite uplink site, takes up a T-1 (1.544 Mbps) worth of bandwidth. You'd need forty-eight 28.8K modems working in perfect circumstances to transmit that amount of information over analog phone lines, assuming that you could figure out a way to splice together all the bits from the forty-eight different modems into a package without losses.

Since most people don't have T-1s in their homes, compromises have to be made in both the encoding/sending and receiving processes. Coding/decoding algorithms, known as codecs, are designed to compress and decompress sound and picture data in the most effective fashion. Codecs, depending on how they are written, trade off a mixture of speed of compression/depression, bandwidth, and quality of audio/video. Certainly, you can send sound at 2.4 Kbps using the low-bandwidth codecs of CU-SeeMe, but the sound at the viewer's end is *horrible*. Higher-speed codecs that deliver better audio/video quality to the viewer require more bandwidth.

The viewer needs to have a high-speed, multimedia machine and a high-speed connection to the Internet. Video delivered through a TCP/IP connection on a 28.8K modem using Progressive Network's RealVideo software typically appears to the viewer at anywhere from four to eight frames per second. If there are network or computer speed problems, the RealVideo client sacrifices picture quality and frame rate to insure good sound quality, dropping the number of frames back to one or two per second — or less. Even at four to six frames per second, the experience is more like a high-speed slide show than a television experience.

RealVideo and most other products start to shine when bandwidth on the viewing end is delivered at 56K or faster. A 56K RealVideo stream comes close to 12 or 14 frames per second and approaches a tolerably viewable experience, if you ignore the smaller picture size.

Okay, so how do you get more than 33.6K to the typical consumer's home? The current crop of 56K analog modems are a start, but they really don't deliver close to 56K under anything but the most perfect conditions. Still, 40 to 50 Kbps isn't bad if you don't live out in the country and if your phone lines are in decent shape. ISDN is the next step up and can provide up to 128 Kbps. Cable modems, on a well-designed fiber or coaxial network, can provide up to 10 Mbps with Ethernet quality. But, you need to have cable service and a cable company willing to support high-speed data services. Of course, Microsoft has bought a billion dollars worth of Comcast to encourage the proliferation of cable modems around the country.

Two other technologies are in limited use right now to deliver data at high speed to the home. Consumer satellite services, like Hughes's DirecPC, are becoming more common and can provide up to 400 Kbps down to the viewer, with a "backchannel" provided by a dial-up modem (e-mail and mouse clicks have to get out somehow). ISPs are also working with ADSL, but there are a lot of hurdles, mostly with phone companies dragging their feet. ADSL, depending on the type of equipment used and the distance between switching office and household, can blast anywhere from 768K up to 6 Mbps per second down to the household and allow the household to send 64K to 768K back. Mr. Gates' investment in Comcast and the dawning of @Home are likely to get the phone companies into gear with ADSL.

INTERNET AUDIO VERSUS VIDEO BROADCAST — THE DIFFERENCES

The Internet audio production outline, as presented in the September 1997 column, applies equally to video, with the following principles different from audio:

1) Video eats bandwidth on all parts of the broadcast — encoding, transmission, server. Choices need to be made

Doug Mohney was employee #10 at DIGEX. He has learned, and forgotten, a lot about help desk support, competitive intelligence, sales and marketing, leased-line service ordering, telco service, and public relations. He makes no pretenses at understanding anything more about the technical side of IP other than being able to get a PPP account working.

His writings have been published in *LA View, Washington Technology* and the *Washington Post.* Doug receives e-mail at `moo@clark.net`

between streaming video quality and network loading. Higher quality video will mean less potential viewers. Many viewers will result in a heavily loaded network.

2) Good video production requires an experienced, professional crew with cameras and lights. When in doubt, price and hire a professional crew that can simply hand you a video feed, rather than trying to do it all. Do what you do best.

3) For international cybercasters, be aware that there are different broadcast video standards between North America and Europe. The signals are not compatible and you have to convert from NTSC to PAL and vice versa *before* encoding. Once encoded, digital is digital, but a PAL-encoded video tape can't be read by an NTSC video player.

4) Video broadcast software and server choices depend upon how much money you have and the types of users you want to support.

• Microsoft NetShow client and server are free until the end of the year. The server runs on Windows NT, while the client viewers are available for Macintosh, Windows NT and Windows 95. NetShow, as of this date, has no paid technical support available and is much more difficult to install when compared to the Progressive Networks RealVideo server. The video encoder software is difficult to install and requires a 166 MHz Pentium or faster for live broadcasts. Netshow supports multicast as well as unicast modes.

• Progressive Networks RealVideo server software can start anywhere from $1,000 to $10,000. Its price depends on how many streams you want as well as the different features you need. The server software is available for practically any UNIX box or Windows NT while the client software runs on Macs and PCs. An extended function client is available for purchase either on Progressive's web site or in local software stores. Progressive Networks, being quite eager to take your money before they talk to you, has a paid support and upgrade package. The RealVideo server is relatively idiot-proof to install, as is the video encoder software. The video encoder is also relatively idiot-proof, requires, at minimum, a 200 MHz Pentium, with a dual-CPU Pentium Pro suggested. RealVideo only supports unicast at this time.

LIVE INTERNET VIDEO BROADCAST — THE EVENT CHECKLIST

- The event itself
- Video capture and hand-off
- Encoding of video on PC
- Reliable, high-speed connectivity to distribution server
- Distribution server or servers for a large audience

THE EVENT ITSELF

When is the event? Thirty days from now? A week? Six months? Longer lead times mean better planning and coordination. Unfortunately, event planners rarely bring Internet broadcast specialists into the loop more than thirty days before an event (making high-speed connectivity a challenge) or want pricing for the job in, oh . . ., 12 hours.

Is this a speech? Panel discussion? Concert? On-site reporting? Will the location have power for all of your gear or will you have to haul in an uninterruptable power supply (UPS) and your own generator?

Will you have the appropriate access to the event? Will the event crew need passes or other magical credentials to move into controlled areas?

If you are producing your own event, talking head shows or discussion panels work better than fast-moving gymnastic displays. More motion means rapid changes of objects in frames and rapid changes of objects in frames means that the objects in your video are going to look choppy as they change position from frame to frame.

VIDEO CAPTURE AND HAND-OFF

Are you using your own cameras? Do you have the appropriate lighting in place? Are you using a single view or multiple views?

A professional video crew is highly, highly recommended if the event requires multiple camera views. Typically, any event that requires high-quality production value should have the budget for a contractor on retainer to record the proceedings for posterity on video tape.

Your job as a cybercaster is to find out where the control center is so you can take a cable and pull composite video signal straight off the portable mixing board and into the encoding computer.

ENCODING OF VIDEO ON PC

Live, real-time video encoding and streaming are some of the areas in which you can justify buying a 200 MHz or faster Pentium machine. Microsoft NetShow recommends a 166 MHz machine for real-time encoding while Progressive Networks minimum is a 200 MHz machine with a dual 200 MHz Pentium Pro recommended.

They lie. 233 MHz is good, 266 MHz is better. We're talking serious computing power dedicated to a single application. Don't expect to run other heavyweight programs in the background while the video is encoding.

System RAM and disk space are secondary considerations. Either 32 or 48 Megabytes of RAM should be sufficient, while a one or two Gigabyte hard drive should provide enough free disk space to install and run the software.

You also need a video encoding board installed on the machine to take composite video input and convert it into digital form, so you'll need a free PCI slot on a desktop machine or a PCMCIA card slot on a laptop. There are a number of PCI-based

video cards available, ranging from **$199** to **$299** at the low end. A PCMCIA-based video card will run **$399** on up.

You will also have to decide the speed at which you want to encode, along with the tradeoffs between the viewer's bandwidth and the quality you want to broadcast. For live encoding, RealVideo requires you to stick with either 28.8K or 56K for encoding. Of course, if you have two machines, you can use one to encode a stream at 28.8K and the other at 56K.

RELIABLE, HIGH-SPEED CONNECTIVITY TO DISTRIBUTION SERVER

The high-speed connection to an Internet service provider (and presumably the video distribution) server is the most challenging piece of the live, real-time, on-location Internet video broadcast. As previously discussed, there are various ways to "cheat" in delivering audio.

Short of using a satellite dish, there's no real way to "cheat" in encoding and delivering video. The video from the live production typically *must* be encoded on site and then shot back through a high-speed Internet connection to a distribution server.

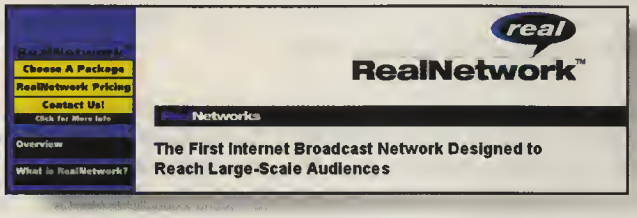
What does the high-speed connection look like? If you have faith in the phone company to deliver a fractional T-1 or T-1 line between the event site and your ISP of choice, a leased-line connection can work quite well. Unfortunately, it's difficult to get a T-1 installed under 30 days without a rush order.

Trying to get one installed in seven days or less typically requires a miracle or two. Yes, it *can* be done. I've seen it done on a couple of different occasions, but your karmic debt is significantly challenged.

ISDN is one option, if you have experience with it and, again, if you have faith in the local phone company. When I was running trade show demos of 56K Frame Relay leased-line in conjunction with an RBOC, the RBOC would bring in ISDN. Four out of five times, the Frame Relay connection came up relatively painlessly (other than my burning ears as the technical staff cursed me for interrupting their work day), while the ISDN connections were always last minute nail-biters.

Another option is bonding (combining) multiple analog modems. Many of OnRamp's first cybercasts were conducted by combining the bandwidth of multiple 28.8 Kbps modems together with the help of a Livingston Portmaster, a Sparcstation2, and some software. Today, several companies have off-the-shelf products that bond two or more analog modems together, including Transend and US Robotics. Even the most pathetic telephone company can get analog lines up and running within the business day.

DISTRIBUTION SERVER OR SERVERS FOR A LARGE AUDIENCE



All the points that apply for Internet audio distribution to a large audience are equally valid for video, including high bandwidth and a series of geographically distributed networks. The exception is bandwidth, which, to support your audience, can be cut in half. This depends on the speed you at which you allow your audience to view. Rule of thumb: More than 40 to 50 people require a dedicated distribution network.

IP multicast support can help if the local network supports it, but unless the live video broadcast is an intranet function, visitors from other ISPs are going to suck down unicast streams and there's no two ways about it. There are several companies that provide streaming media distribution services, including Progressive Network's RealNetwork (`www.realnetwork.com`), Canada's itv.net (`www.itv.net`), and Houston's AudioNet (`www.audionet.com`). The RealNetwork only supports RealAudio and RealVideo, while AudioNet and itv.net also support Microsoft NetShow. The itv.net people also work with other formats.◆

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BIG BOARD BRIEFS

by Wallace Wang

WORLDCOM BUYS COMPUSERVE, SELLS TO AMERICA ONLINE

After months of anticipation concerning a matter that few people really care about any more, America Online has finally announced that it is buying up CompuServe. H&R Block is selling CompuServe to WorldCom in a stock swap valued at about **$1.2 billion**.

As part of the deal, WorldCom also bought America Online's ANS Communications unit for about **$175 million** in cash. WorldCom plans to retain CompuServe's lucrative corporate customers while selling CompuServe's consumer division to America Online.

But don't think CompuServe is going away. "We'll continue to manage CompuServe as a separate brand . . . forever," AOL Chairman Steve Case says. "We want to preserve the existing CompuServe experience." Which could mean the continuation of high prices, a confusing user interface, lackluster customer support, and no compelling reason to stay with CompuServe when the Internet offers so much more for so much less.

Tentative plans include merging content on both online services, developing a new user interface for CompuServe (since the one CompuServe developed is clumsy at best), and adding AOL's Buddy List technology. America Online plans to retain CompuServe's previous announcement of a **$24.95** flat-fee rate for unlimited use, separate CompuServe e-mail addresses, and the reliability of connecting to CompuServe's phone network.

Look for America Online to market AOL toward home and consumer users and target CompuServe as the business and professional user's online service. Given the fact that CompuServe's previous customers were technical types who have been defecting to the Internet in droves, don't expect that America Online will be able to keep CompuServe alive much longer.

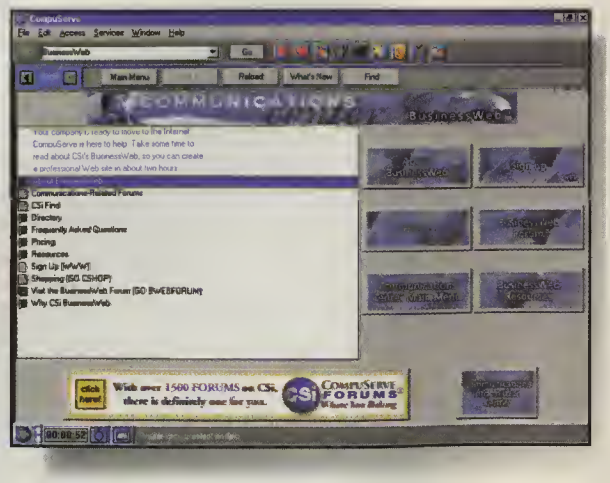
PRODIGY AND COMPUSERVE OFFER WEB-HOSTING BUSINESS

In its continuing effort to turn itself into a real Internet provider, Prodigy is now offering Prodigy ProHost, a web hosting service designed for businesses looking to establish a presence on the World Wide Web. Depending on what you need, the initial setup fee can range from **$25** to **$400** with monthly fees ranging from **$20** to **$250** a month.

"Prodigy is uniquely qualified to provide rock-solid Internet connections so that a company's web site will experience superb up-time performance," said Paul DeLacey, president and CEO of Prodigy. Businesses seeking more information about Prodigy ProHost services should call **1-888-222-2959**, send an e-mail to `info@prohost.net`, or visit the ProHost web site at `www.prohost.net`.

In a related move, CompuServe (looking for another way to make money to make up for the lack of actual subscribers) has announced BusinessWeb, which allows anyone to create, post and promote a web site in less than two hours. BusinessWeb's features includes registration with 25 of the most popular search engines on the Web, a free, licensed copy of NetObjects Fusion PE for web authoring, twenty free hours of connect time (with additional hours at a reduced rate of **$1.95**), and 30 megabytes of storage space.

BusinessWeb costs **$79** a month, plus a **$50** set-up fee. If you use BusinessWeb, CompuServe waives your regular monthly membership fee of **$9.95**. For more information on BusinessWeb, use the GO BWEB command.



Wallace Wang is the author of ***CompuServe For Dummies, Visual Basic For Dummies, More Visual Basic For Dummies, Microsoft Office 97 For Dummies,*** *and* ***More Microsoft Office 97 For Dummies.***

When not working with computers, he performs stand-up comedy and has appeared on A&E's *Evening at the Improv* TV comedy show. He can be reached via e-mail at `70334.3672@compuserve.com`, `bothekat@aol.com`, `bo_the_cat@msn.com`, or `bothecat@prodigy.net`

AMERICA ONLINE STARTS CHARGING VENDORS "RENT"

Since it can't make money off individuals any more, America Online is finding other creative ways to make a profit. Its latest proposal involves charging retailers "rent" for their presence on America Online. In the past, America Online simply took a cut (ranging from 10 to 20 percent) of each retailer's online sales.

"We have the most valuable real estate in cyberspace," AOL spokeswoman Wendy Goldberg said. "We want to encourage our merchandise partners to value their online real estate with the same seriousness as if they were in a real mall."

America Online is hoping that charging a flat fee will encourage (force) retailers to either make an effort to sell more merchandise online or make room for another company that can shovel money toward America Online's bank accounts.

America Online's new Shopping Channel will cost retailers **$125,000** for a year's lease. So far, America Online has signed book seller Barnes & Noble Inc. and floral delivery service **1-800-Flowers** to take space in its new online mall. Of course, until America Online finally solves its constant access problems, retailers may find that advertising on AOL may be as profitable as opening a store in a hard-to-access mall that nobody can visit because there aren't enough parking spaces.

COMPUSERVE EXPANDS OVERSEAS (AGAIN)

CompuServe has made agreements with four international networks to carry Internet traffic throughout Europe and Asia. Ebone accesses 76 networks in Western and Eastern Europe; DE-CIX connects to 15 networks in Germany; MAE Paris connects to seven networks in France; and Internet Initiative Japan, parent company of A-Bone connects with seven networks across Asia into Singapore, Malaysia, South Korea, Indonesia, Thailand, Hong Kong and Taiwan.

CompuServe has also entered into a strategic partnership with Satyam Infoway, a networking company based in Chennai, India. CompuServe plans to introduce its services in India with the launch of its services initially focused on India's major financial centers.

Starting with the cities of Mumbai (Bombay), Delhi, Bangalore, and Chennai (Madras), installation in India is planned by the first quarter of 1998. No word yet on any flat-rate membership plan for CompuServe's overseas customers, but if the American market is any indication, it's likely that flat-rate services will dissolve CompuServe's membership base long before CompuServe has the intelligence to adapt before it loses its competitive edge altogether.

AMERICA ONLINE BATTLES TROJAN HORSES

To protect its nine million members from Trojan Horse programs that can erase files or capture passwords, America Online has introduced "Download Sentry," a program that automatically warns users whenever they may start to download a potentially dangerous e-mail file attachments.

Of course, "Download Sentry" can only warn users of possible Trojan Horses; it can't do anything to detect or delete them. So essentially users are still left to the whims of potential Trojan Horses attached to their e-mail.

If you're really concerned about Trojan Horses, get yourself a decent hard disk utility program (such as The Norton Utilities) along with a backup program. That way if a Trojan Horse does wipe out your hard disk, your entire hard disk won't get wiped out in the process.

UNIVERSITY OF VIRGINIA ALUMNI ASSOCIATION RAISES FUNDS WITH PRODIGY

In another example of guerilla marketing, Prodigy is offering members of the University of Virginia Alumni Association the University of Virginia Prodigy Internet CD-ROM. This customized Internet access CD-ROM features a direct link to The University of Virginia Alumni Association web site on the Internet at `www.alumni.virginia.edu`.

All University of Virginia Alumni Association members are offered the full Prodigy Internet service for **$17.95** per month for unlimited access, which is **$2** less than the usual **$19.95** monthly flat-rate. More than 50,000 alumni will receive the special UVA/Prodigy Internet service offer in the mail. To further encourage the university to support its efforts, Prodigy will pay a royalty for each University of Virginia alum who joins Prodigy.

Universities and colleges interested in offering Prodigy Internet at a discount through their Alumni Associations should contact Joe Cavanagh of Prodigy at **914-448-3352** or via e-mail at `jcavanagh@prodigy.net`.

"Students and alumni have been getting together on Prodigy for years," said Chip Austin, vice president of sales for Prodigy, Inc. "This is an effective way for universities to link their alumni via the Internet and earn revenue at the same time."

"We're offering the latest Internet technology to our members at a discount," said Cindy Garver, Associate Director of theUniversity of Virginia Alumni Association. "This is a service that our members really want, and it's a great fund-raiser for the Association."

AOL MAY TRACK USER CLICKS

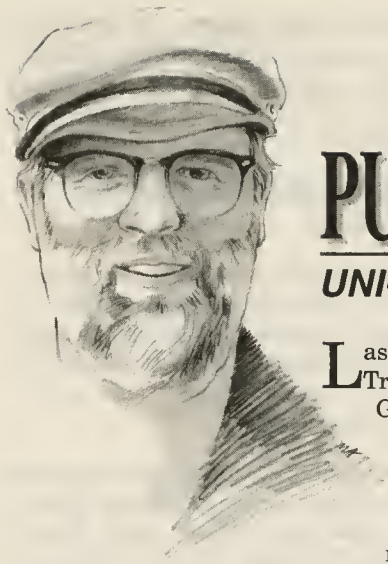
After privacy advocates screamed at America Online's plans to sell its membership mailing lists, the company has dreamed up a new plan that may also violate its members' privacy. Its latest scheme involves tracking members' mouse clicks to compile mailing lists to sell to third parties.

"This is potentially a far more serious privacy violation than the sale of phone numbers," said David Sobel, counsel to the Electronic Privacy Information Center (EPIC) `www.epic.org`, a privacy rights group. "This is a detailed profile which divulges salient details about people's lifestyle and habits."

But officials at AOL said there's little to worry about, suggesting that critics should read the forthcoming policy before passing judgment.

"We are not using that information to target our members," AOL spokeswoman Tricia Primrose said. "To the extent we use it, we'll use it in the aggregate."

Now if anyone can decipher what they mean by "use it in the aggregate," we may all finally rest assured that America Online is cooking up a new way to make money at the expense of its members. But until someone can crack this cryptic statement from AOL, your best bet to protect your privacy is to cancel your AOL membership right away.◆



PUTTING THE NET TO WORK

by Durant Imboden

UNI-VERSE DIPLOMAT

Last month, I reviewed Globalink Translator and its bundled offspring, Globalink Web Translator. These programs allow two-way translation of documents, e-mail, and web pages between English and three other languages. (Granted, the results are occasionally comical or confusing, but half a translation is better than none when you're trying to read the captions on the *Deutschlands 100 Heisseste Babes* web page.)

Durant Imboden is a freelance writer whose credentials include published novels and nonfiction, fiction editing and staff writing for ***Playboy***, travel writing for corporate clients, and representing authors at a New York literary agency. He currently manages the Writing Forum on The Microsoft Network and co-authors the "Flame Wars" column on Delphi, where he is an editorial consultant. Durant maintains a web site for writers at **http://www.writing.org**. MailTo: imboden@writing.org

Despite the usefulness of Globalink's PC translation programs, they come up short in one area: their ability to handle real-time online chat. For that, you need *Star Trek's* Universal Translator (which won't go into beta until the 22nd Century) or a new service from Uni-Verse, Inc. called Diplomat.

Diplomat is marketed as "the first tool for multilingual communication in real time." It combines client software with a translation server that automatically converts chat conversations into English, French, German, Italian, Spanish, or Brazilian Portuguese.

Two versions of the client software are available: a dedicated Windows 95/NT 4.0 program that installs on the user's hard drive, and a Java applet for embedding in web pages. The Java chat at the Uni-Verse web site wasn't working when I tried the beta in late September, but the Windows 95/NT 4.0 client software installed quickly and without any nasty surprises.

USING DIPLOMAT

Chuck Starbuck, a linguistically challenged American in Seattle, Washington, fires up his web connection and launches Diplomat from the Windows 95 Start menu. (Chuck is already a Diplomat subscriber, having registered at the Uni-Verse web site.)

When the opening screen appears, Chuck hits the "I Am" button and enters a name or alias and his native language—e.g., "Chuck/English."'

Next, Chuck clicks on the scrolling list above the "Outgoing Message" window to select the language that he'll be using to type his chat messages. He chooses "English."

Chuck now moves to the list above the "Chat Activity" window and selects "English" as his preferred language for incoming messages. (If he wished, he could transmit in one language and receive in another—a tactic that can be useful for those who read a foreign language but don't feel comfortable writing in one.)

Chuck is now ready to join a Diplomat "chat party." He clicks the "Join Chat" button and waits for a list of available chat rooms. When the list pops up, he selects "Open Forum (General)" and hits the "OK" button.

His next step is entering text. Chuck types:

The railroad station is straight ahead on the left. The gondola is expensive. The risotto is made with cuttlefish ink.

After a pause, the "Chat Window" displays his text in Italian:

Il posto della ferrovia è diritto e sulla sinistra. La gondola è costosa. Il risotto è fatto con inchiostro del cuttlefish.

Not perfect, but not bad, either. The Italian translation is intelligible (as long as the Italian listener knows that "cuttlefish" is English for "seppia.")

Things get trickier when Chuck decides to get literary and translates from Italian to English. After changing his settings, Chuck enters a description from the jacket of a novel in Italian, *Le parole non dette*, by Cheryl Durant. A human translator's interpretation of the blurb might say:

Gabi Studer accepts an offer of work from Peter Imhof, a famous writer, so she can return at last to Switzerland, the land of her ancestors.

Diplomat's translation is somewhat clumsier:

Gabi Studer accepta the offer of a job from Peter Imhof, a famous writer. It will so finally Return in Switzerland the earth of his ancestors.

The secret of avoiding such strangeness is to keep sentences simple and avoid unusual words or slang. According to the "instructions for machine translation" on the Uni-Verse web site, this is especially important in a multilingual chat where English is used as a linguistic middleman. An Austrian's remark to a Brazilian would first be translated from German into English, then from English into Portuguese. This creates two opportunities for a translation that is unintelligible or, worse yet, intelligible but incorrect.

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HOW DIPLOMAT WORKS

The standalone Windows 95/NT version of Diplomat is written in C++ and runs through a TCP/IP connection. The conversing parties are linked through the Uni-Verse, Inc. processing center in San Clemente, California, where a database (currently FoxPro) directs traffic to SMP Windows NT servers that contain translation engines licensed from Globalink.

"We feel that central processing increases our role and service commitment to third-party clients while relieving them of complex data handling," says Mike Dillon, chief of technology at Uni-Verse. The shipping version of Diplomat 1.0 (due by the time you read this) will have standard chat room features such as user lists, an indication of how many users are in a room, and wrapping text. E-mail and document translation will be included. By the end of the year, Diplomat will support two additional languages: Russian and Chinese.

Uni-Verse offers other real-time translation products based on Globalink's machine-translation technology, including:

Ambassador, a more advanced package that will allow customization (including unique dictionaries for specific applications or customers).

Symposium Server, which allows placement of the Java client applet into an existing web page.

Extreme Server, an intranet server that handles translations on the customer's own computer for enhanced security.

SDK server, which combines Symposium Server's Java applet with a customized TCP/IP interface to suit customer needs.

Uni-Verse also markets secure private conference channels to businesses, government agencies, universities, and other clients.

WHAT IT COSTS

Diplomat has a startup fee of **$19.95**, which includes three months of access. After that, the service costs **$9.95** per month for unlimited use 24 hours a day, 7 days a week. Multiple-user discounts are available, and Uni-Verse provides free accounts on a rotating basis to selected charities and nonprofit organizations.

WHO NEEDS IT

Richard Fenning and Susan Richards, co-founders of Uni-Verse, believe there are many applications for Diplomat and the company's other products. Sharon Han, a spokesperson for the company, states: "Uni-Verse can be used by businesses, educational and medical institutions, ISPs, chat providers, and users of web chat rooms." It's easy to imagine the software being used by a multinational online service like MSN or AOL/CompuServe.

WHAT I THINK

Diplomat isn't perfect—no machine-translation software or service is—but it works better than you might expect, and its performance (slow during the beta) should improve after more servers are online. The service is definitely adequate for casual chat on the Internet, even if it isn't quite ready for use in complex business negotiations or international diplomacy. Best of all, you can try it yourself—free of charge—by visiting the Uni-Verse web site at at `www.uni-verse.com`.◆

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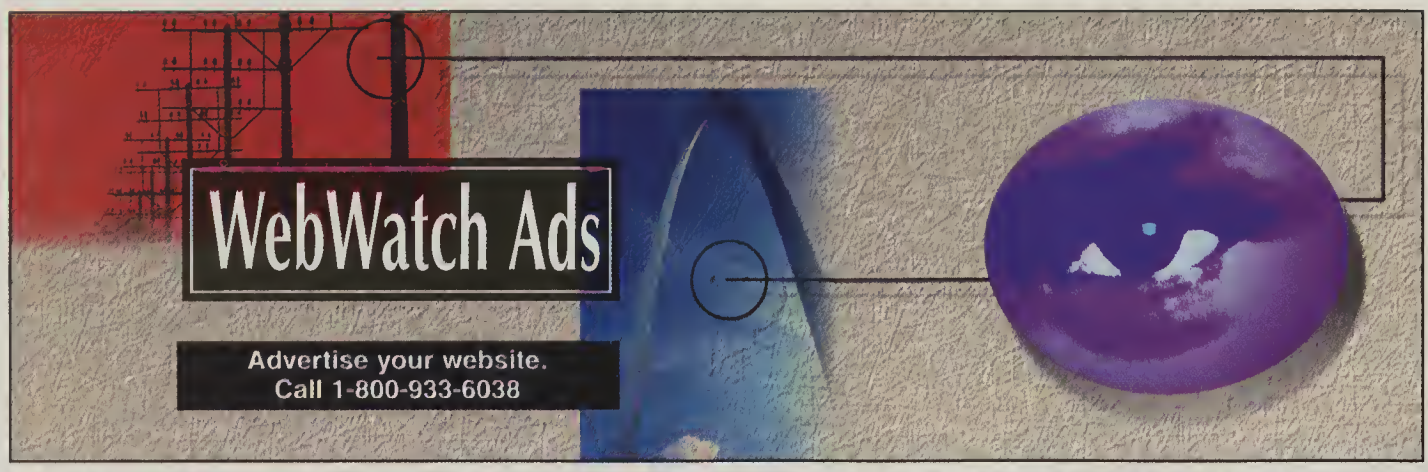

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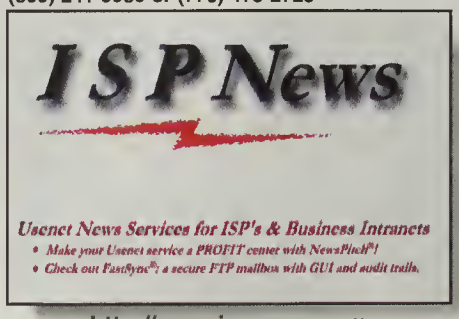

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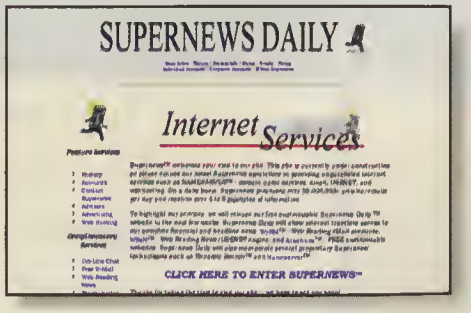

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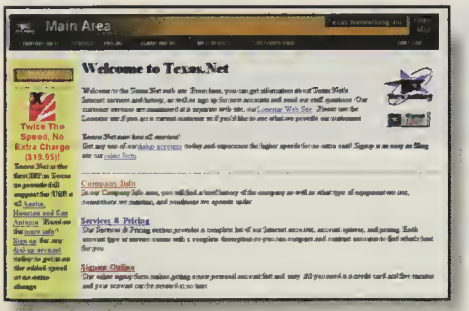

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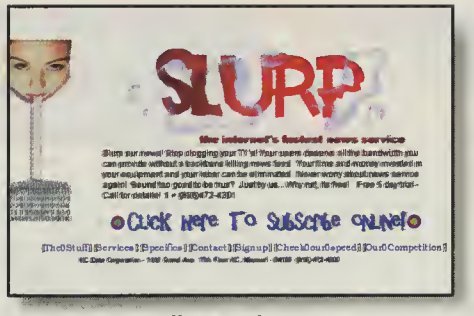
Texas Networking: Texas Networking produces Power Supplies for USR Courier & Sportster 28.8 modems. The matching racks or cages for USR Courier modems form a combination that will untangle the worst ratsnest.



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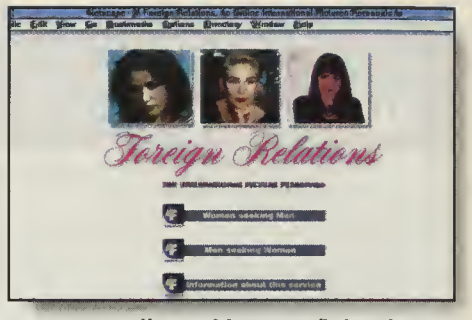

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Ascend Communications: With an installed base of 2.2 million ports, Ascend provides more ISPs with dial-in access servers than any other vendor. Ascend's scalable products let ISPs cost-effectively grow their POPs and offer subscribers Ascend's award-winning ISDN/Frame Relay Internet Access Devices. Ascend's products deliver end-to-end solutions for integrated firewall security, telecommuting, Intranets and VPNs.

http://www.bsdi.com

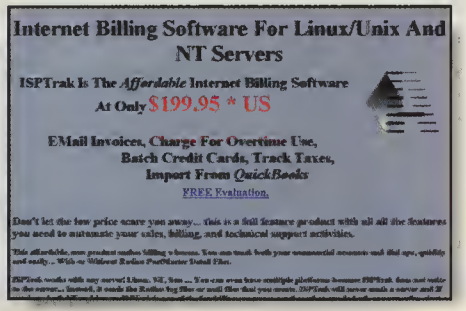
Berkeley Software Design: The most complete Internet server software includes Netscape FastTrack Web server, Apache Web server, News Server, mail server, FTP Server and more. Over 2,500 ISPs worldwide and Fortune 500 companies rely on BSDI for top web and Internet/Intranet power and stability. No additional OS to buy. Installs in minutes and features GUI configuration manager.

http://www.agis.net

AGIS: Get AGIS and get connected! AGIS is a leading Internet backbone services provider specializing in dedicated high bandwidth connectivity to the Internet backbone for Internet service providers, content providers, and large corporations. Visit our web page for details on how your company can get connected to the AGIS high speed backbone!

http://www.rockstar.com

Rockstar Studios: From FREE PPP to the Internet Setup Monkey, Rockstar Studios provides ISPs and users with smart, easy to use Internet products that saves headaches and slashes support costs. Call (415) 242-1984 for more info.



http://www.cyberacs.com

Action Computer Service: Inexpensive Internet Billing Software, Email Invoices, Charge For Actual Time Used, Process Credit Cards, Track Taxes, QuickBooks Import, FREE Trial. **818-575-3339**. action@cyberacs.com

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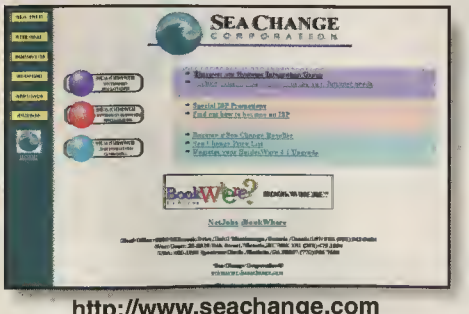

http://www.seachange.com

Sea Change Corporation is a distributor of high performance products for the Internet and Intranet. We will deliver to you the best solutions for wide-area networking, security, authentication, and commerce. Sea Change stocks: Livingston, Cisco, Ascend, US Robotics, BSDI, Adtran, Osicom and can guarantee next day delivery.

http://www.gallantry.com

Gallantry Technologies, Inc. developer of software, GallantWEB: For PC. Users interface via navigator. Takes 30 minutes to installl/configure by office secretary. It supports Win 95, NT, Apple and UNIX. Includes: Firewall, DHCP, Email, WWW, FTP, DNS, Proxy. List $169. Call 800-455-3166 for 30-day free trial.

http://www.esoft.com

eSoft, Inc: We got our start 14 years ago with TBBS. Now the The Internet Protocol Adapter, or IPAD, is our primary product. The IPAD lets you build a full-function Internet presence without specialized expertise.

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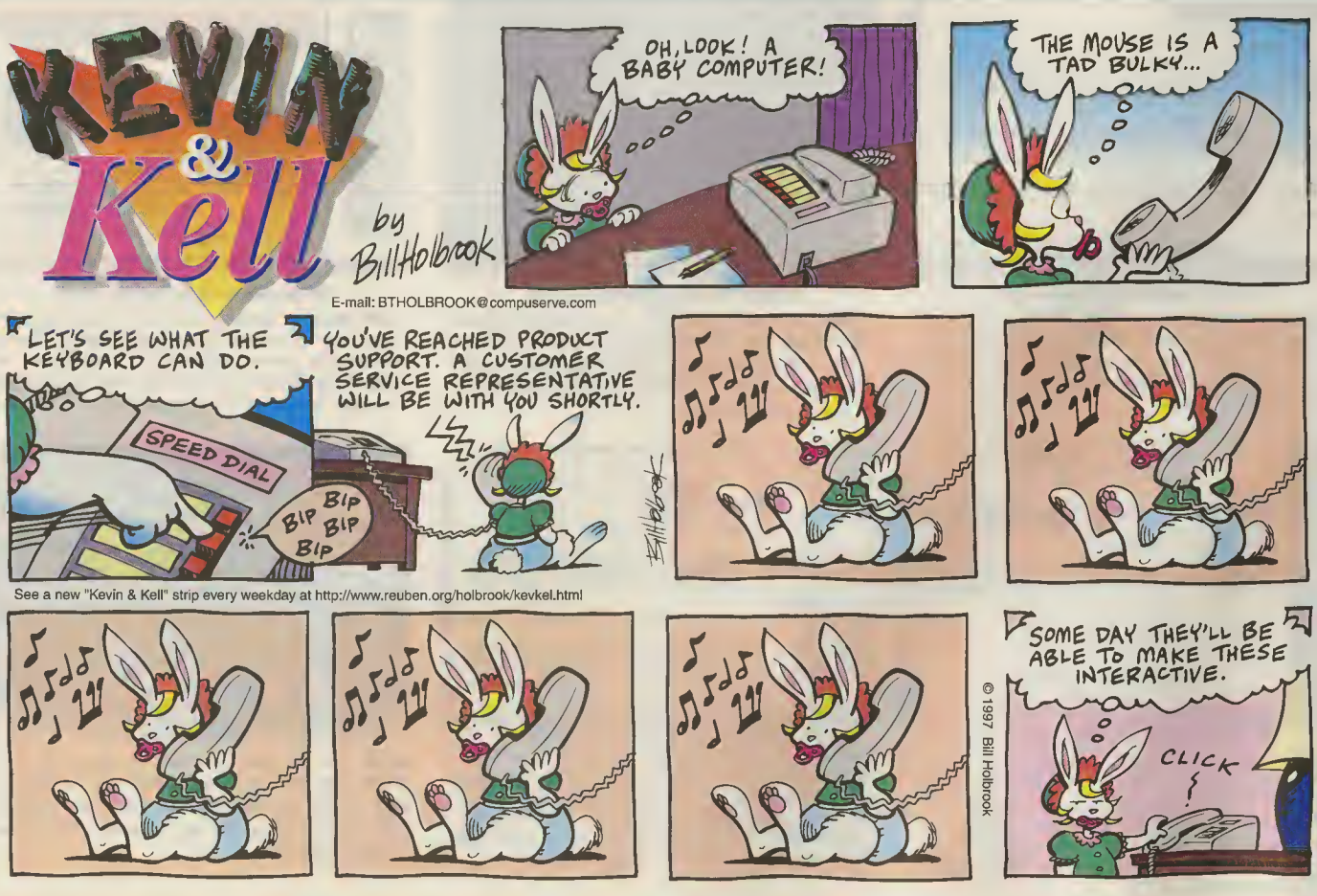
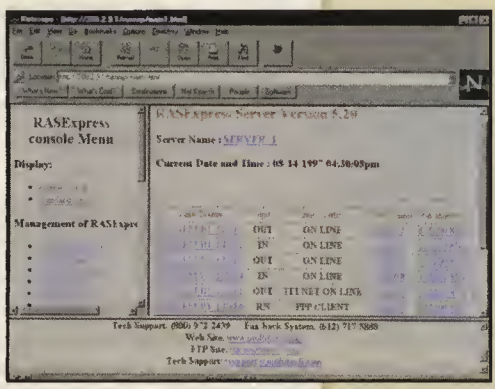


See a new "Kevin & Kell" strip every weekday at http://www.reuben.org/holbrook/kevkel.html

MULTI TECH
BONDS TWO 56K MODEMS

by Steve Clark



As the battle between 56 Kbps analog modems was in high gear earlier this year, a few modem makers took it one step further. Companies like Angia and Transend, not Rockwell, US Robotics or Lucent, started bonding together two 33.6 modems to achieve speeds of 67.2 Kbps.

These modems work by placing two telephone calls over two lines. The bandwidth of each modem, which peaks at 33.6 Kbps for those chip sets, is then combined giving the end-user twice as much bandwidth as a single modem.

But these systems required special equipment on each end. All of the bonding took place at the hardware level, mainly within the modem that the end-user needed to buy. Also, with 56 Kbps chip sets widely available, it seemed as though the same idea could be applied to 56K, resulting in a 112 Kbps connection. Not exactly ISDN, but pretty close.

Now, MultiTech has taken the dual modem idea even farther. The company has released its CommPlete Communications Server which combines two 56 Kbps connections into one 92 Kbps connection. MultiTech concedes that 56K doesn't really equal 56K, it's much closer to 46 Kbps. But the two connections bound together give a conservative 92 Kilobits per second.

The beauty of the CommPlete is that the end-user doesn't have to buy a special modem. The client only needs to have a Windows 95 computer and two K56flex modems. The bonding on the client's end is done through the Dial Up Networking software.

Everything is taken care of by the dial-up provider. An ISP can install a CommPlete and start selling second connections to anyone who has two modems and two com ports.

The new CommPlete servers come with RASExpress 5.20, the company's remote access server software. RASExpress 5.20 allows you to configure Multi-Link PPP to bond together five modems for a connection speed of 184 Kbps. You'll need a client on the other end with five modems, five phone lines, a computer with five com ports, and a way to put them all together. Although that seems unlikely, there could be an application for it in multicasting or LAN-to-LAN setups.

RASExpress 5.20 can also be managed remotely through a web browser. Remote, web-based management is becoming more common in hardware like servers and routers.

A simple CommPlete server, which can support twelve 92 Kbps calls at a time, has a T-1 interface and 24 K56flex modems. The high-end system supports four T-1s and 96 modems.

Multi-Tech Systems, Inc.

(800) 328-9717
(612) 785-3500
http://www.multitech.com

DVORAK ONLINE by John C. Dvorak

NETSCAPE AND THE DEAD END ROAD TO JAVA

Actually I'm getting a little sick of the Netscape vs. Microsoft browser battle. If Microsoft is going to forever give away its browser and if the free browser is as good as or even almost as good as the Netscape browser, then the Netscape browser is dead. Every computer will be bundled with the free Microsoft browser and that's that. End of story.

So, what is going to happen to Netscape? It hopes to move into intranet and other applications and it has high hopes for Communicator, but the likelihood of it being able to hold out much longer against Microsoft is nil. I believe that the company will eventually be absorbed by a company like 3Com or some other acquisition-hungry company that could use the Netscape talent. I would be shocked if Netscape doesn't try to shop itself soon, if it isn't already. If it isn't in this process, it could do itself a favor by changing some strategies.

In the first place is the company's incessant saber rattling. There is no good reason to threaten Microsoft and Gates with doom. It's not going to happen this year or next. Microsoft is the Ford Motor Company of our era and I can tell you that Henry Ford did not die a pauper. It took an Al Sloan and a well-conceived General Motors to throttle Ford. Even so, it didn't break Ford. It just made the company normal. The same thing will someday happen to Microsoft when the equivalent of Sloan and GM come along. This may not be for another decade. Currently, I see no one on the horizon up for the task. The industry probably has to consolidate more before we'll see this. Until then, say hello to Microsoft everywhere.

This doesn't mean that Netscape (and others) can't compete. In the early 1980s Lotus came into the market out of the blue and quickly shot to the top past Microsoft becoming the top software company. The one curious aspect to the first versions of Lotus was that it was written in assembler and was noted for its performance. Any time a program is written in assembler for performance, the user loves it. There is nothing like blazing performance. Over the years, the enormous complexity and graphical requirements of many programs have made it difficult to code from scratch in assembler and ever manage a good time to market. The basic browser is not a complex program. But, if you haven't noticed, it takes an eternity to load Microsoft Internet Explorer, even on a blazingly fast system. It's a big clumsy program. Netscape Navigator isn't much better, but it is faster. If Netscape, instead of adding new features such as that sucky layering feature, decided to make a high-performance browser that loaded fast and optimized the browsing experience, then Microsoft would back off. Microsoft's development style is always toward the other, more bloated, style of programming. This style can be defeated by quality, tight code. But companies play the feature game with Microsoft, which they can never win. Microsoft is geared to add features and features. And while they have an appeal and sometimes make marketing people happy, most users prefer performance. That's why we all keep buying faster and faster machines.

Only Borland at one point in its history had figured out how to beat Microsoft. For a period, it had done a series of ads for its compilers showing performance numbers in a comparison box. Time and time again this is one of the most effective ways to get people's attention. It's such an effective advertising technique that most European communities ban it outright because it's considered unfair advertising. But if you're going to simply play the features game, then Microsoft would kill you in a head-to-head comparison comparing features!

Then there is this Java issue. I've had mixed feelings about this over-hyped non-trend since its inception. The problem I have is a "who cares?" problem regarding portability. Maybe I'm too Intel-oriented but with 95 percent of the market why does anyone care about making it so their code runs on the other 5 percent? Again the issue is performance. Java performance stinks, and I don't see it changing anytime soon. Again, essentially playing the Microsoft game. The other hyped advantage of Java is the quickness-to-code aspect. "I'm so much faster and more productive with Java!" a programmer will tell you. Shades of the once over-hyped FORTH language of a few years back. Again the problem is performance vs. features. It's a losing battle.

This is all worsened by offbeat promoters such as the popular George Gilder who has considered Java to be

In addition to his weekly syndicated radio call-in show, *Software/Hardtalk*, syndicated newspaper columns, magazine writing for ***MacUser***, ***PC Computing***, ***DEC Professional***, ***Information Technology***, and his featured "*Inside Track*" column in ***PC Magazine***, Dvorak is the author of several best-selling books, including ***Dvorak's Inside Track to DOS & PC Performance***, ***Dvorak's Guide to PC Telecommunications***, and ***Dvorak's Inside Track to the Mac***. *John can be reached at* `dvorak@aol.com`

part of the communications revolution. Hey pal, it's just a coding language. Sheesh. Get a clue. Gilder is the darling of the Kleiner, Perkins venture capital crowd. These guys are the major investors in Netscape and Sun, hence the Java connection. Don't be fooled by this propaganda.

Then there is Rockwell International, which is about to produce a microprocessor designed to run Java. While some people hail this as a great thing, I see it as a last hope to eke performance out of Java. Also note that no microprocessor designed to run a language as machine code has ever been a success in the market. This one won't either. But if engineered into a dedicated system, it may make Java seem like a performer. Unfortunately the creeping featurism which seems to be an epidemic amongst this crowd of developers will soon negate the gains in performance offered by the chip.

In fact, Java will go the way of the last "universal" multi-platform language of our era. These languages come and go.◆

Dvorak's Recipe Nook

Pickled Walnuts

Ever since I got a jar of delicious pickled walnuts from England, I've tried to collect recipes for the delicacy. I have yet to make pickled walnuts as there is still an issue over exactly what kind of walnut to use. These pickled walnuts are traditionally served with game birds or venison. They are incredibly delicious. The most recent addition to the collection comes from Teresa Neighbors.

She writes: "I have a cookbook from England that happened to have the recipe. I started a letter to you at the time but somehow didn't get it sent. I found it tonight in my briefcase which I finally got around to cleaning out. Here's the recipe."

From *Mrs. Beeton's Cookery and Household Management* (Copyright 1977) page 1087

Use walnuts whose shells have not begun to form.
Prick well with a silver fork; if the shell can be felt, do not use the walnut.
The shell begins to form opposite the stalk, about 1/4" from the end.

Cover with a brine (1lb. of salt to 1gal. water) and leave to soak for about 6 days.
Drain, make fresh brine, and leave to soak for a further 7 days.

Drain and spread in a single layer on dishes, leaving them exposed to the air; preferably in sunshine until they blacken (1-2 days).
Pack into jars and cover with hot spiced vinegar.
Tie down when cold and leave for at least a month before using.

Note: to help to prevent stained hands, wear gloves when handling the walnuts.

Any other recipes will be welcome.


SETTING UP AN
INTERNET PRESENCE
SHOULDN'T FRAY
YOUR NERVES

THERE ARE ENOUGH COMPLEXITIES IN LIFE. CONNECTING TO THE INTERNET SHOULDN'T BE ONE OF THEM.

Creating an Internet presence can be a frustrating experience, even for the expert. Beyond the web server there are routers to make the connections, FTP to move the files, and e-mail servers to give your mail a home. And don't forget the Domain Name Server that's required so the world can know your name. Even after you gather all the pieces, you still have to integrate them. And the costs, in time and money, can be staggering. But now there is an easier way.

THE INTERNET PRESENCE IN A BOX

The Internet Protocol Adapter (IPAD) is the only product that fully integrates a router, terminal server, and core Internet services (e-mail, DNS, unlimited WWW and FTP servers) into a single device. With all the necessary internal and external connections, Domain Name Service, and other required functions, the IPAD includes everything you need to easily establish a complete Internet presence. In fact, it's so complete, you can add remote access by simply plugging in modems and dialing in with any Internet compatible computer.

BUILT WITH PERFORMANCE AND DURABILITY IN MIND

The IPAD's capability is housed in a rack-mount chassis of battle-ready construction. Its custom software, optimized for the Pentium processor, yields an unprecedented combination of performance and durability that you can never get from a general purpose operating system. The IPAD may be easy to use, but it's no toy.

	IPAD	Windows NT
Computer Hardware for Server CPU	Comparable performance $746S	166 Mhz Pentium, 2 GIG SCSI Disk, Ethernet, Caching Controller 96 MB RAM, $3S00
Router Software Configuration Time Configuration Cost Sub Total	Included Pre-configured – –	$1800 1-3 hrs $70 Avg $1870
System Software O/S Configuration Time Configuration Cost Sub Total	Included Pre-configured – –	$89S S-30 hrs $61S Avg $1S10
Web Server Configuration Time Configuration Cost Sub Total	Included Pre-configured – –	Included 3-2S hrs $490 Avg $490
FTP Server Configuration Time Configuration Cost Sub Total	Included Pre-configured – –	Included 1-2 hrs $S0 Avg $S0
ONS Server Configuration Time Configuration Cost Sub Total	Included Pre-configured – –	$49S S-80 hrs $1600 Avg $209S
E-Mail Server Configuration Time Configuration Cost Sub Total	Included Pre-configured – –	$S80 10-100 hrs $1900 Avg $2480
Support Costs Per Year	$79S Includes Hardware and Software Protection	$2100 No Hardware or Software Protection
Number of Vendors	1	S
Total Cost	**$8260**	**$13,600**
Time from receipt to fully operational site	**2 Days**	**120 Days**

PLUG 'N PLAY AND WALK AWAY

Many products claim to be easy to use, but the proof is in the time you spend getting it up and running. With other products you have to *learn everything* before you can *do anything*, and with the Internet there's a lot to learn. Only the IPAD allows you to get started immediately, and learn as you go. Information Week said of the IPAD *"from box to working system in two hours even with mistakes."*

And this ease of use doesn't stop there. With an IPAD even those without formal Internet training can confidently grow and maintain their own network.

GO WITH A WINNER!

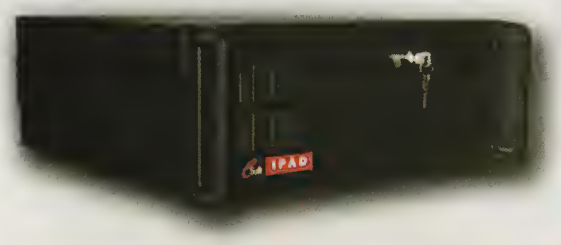
InfoWorld Magazine said *"The IPAD represents an elegant solution when you need to easily build an Internet or intranet presence. Considering the time it saves you, the price represents a good value."* In 1995 John C. Dvorak gave the IPAD his PC Telecommunications Excellence Award because he recognized the IPAD advantage.

DON'T WASTE ANY MORE OF YOUR TIME!

You want your Internet Presence up and running quickly without a long learning curve or sacrificing flexibility and power. Now you can have it! The IPAD is the *only* TCP/IP appliance that lets you *start immediately* and grow your site smoothly without forcing you to become an Internet expert(or hire one).

TAKE CONTROL!

Call 303-699-6565 today and join those who have learned the secret to controlling their network rather than having their network control them.



If it's easy, it's eSoft

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"*To stay ahead we had to move beyond conventional routers. Only the GRF delivers the scalability and speed we need to meet our customers' requirements today and into the future. Ascend, with the GRF and TNT, now provides a single-vendor solution for our NAPs.*"

Robert Krull,
President

ETHOS COMMUNICATIONS CORP.

"*The sophisticated packet switching and powerful routing features of the Ascend GRF allow us to deliver consistent, predictable performance to our rapidly growing customer base.*"

William Schrader,
President and CEO

PSINET

"*When it came to high-speed Internet and intranet business communications, Savvis chose the Ascend GRF to optimize the performance of our managed private ATM network.*"

Mike Gaddis,
EVP and Chief Technical Officer

SAVVIS COMMUNICATIONS

Ascend's GRF IP Switch Delivers Ten Times The Performance Of The Competition. It Also Comes With Some Pretty Impressive Speakers.

"*Ascend has raised the bar once again. With the GRF powering our network, route saturation and performance demands are no longer issues and we can focus our efforts on delivering new services to our growing customer base.*"

Nathan Stratton,
President and CTO

NETRAIL, INC.

"*The GRF series of high-performance IP switches gives us the scalability we need to meet the requirements of our growing customer base.*"

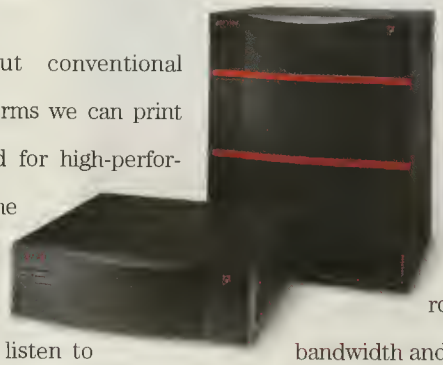
David O. Anderson,
President and CEO

THEONRAMP

"*AGIS was the first to recognize the scalable and modular advantages the Ascend GRF offers. The GRF delivers a cost-effective and immediate performance boost that has positioned AGIS for long term growth.*"

Phil Lawlor,
President

AGIS-APEX GLOBAL INTERNET SERVICES



Nobody's talking about conventional routers anymore. Not in terms we can print anyway. The new standard for high-performance IP Networking is the Ascend GRF™ IP Switch.

But you don't have to take our word for it. Just listen to the premier network service providers who are deploying Ascend's standards-based GRF. And how they are now gaining a competitive edge with ten times the performance of conventional routers, IP forwarding in hardware, and a choice of high-speed media including ATM and SONET.

There's no time to wait for routers to get up to speed. The bandwidth and economic demands of expanding networks are calling for the GRF IP Switch.

Call 1-800-632-8347, ext. 0202 for the GRF Performance Package and find out how you too, can crank it up.

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GRF Family

- Quick Branch Routing Technology (QBRT) hardware route table lookup in less than 2.5 microseconds
- Up to 16 media cards
- Up to 16 Gb/s switch bandwidth with 1 Gb/s bandwidth dedicated to each media card
- Layer-3 decisions distributed to intelligent IP forwarding media cards
- Up to 250,000 forwarding table entries
- Simultaneous support for ATM OC-3c/STM-1, ATM OC-12c/STM-4 and SONET/SDH OC-3c/STM-1, 10/100Base-T, HSSI and FDDI