**Tao #3**

Tao is an irregular tabloid, which will be released whenever there is enough new material to warrant the cost of postage. The views expressed here are entirely my own and do not represent those of NeXT Inc. or any other organizations.

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**Odd Bits & Pieces**

- NextStep for PS/2 sighted: at Uniforum in Washington D.C., NextStep was seen running on a PS/2 under AIX 1.2. Performance was sluggish, according to eye witness. One explanation for this is either the lack of a math coprocessor, or the wimpy 80387 being a bottle neck for a floating point-intensive GUI.

  I have just received report from Bob Ellefson at UCSD that they are now using NextStep on the PS/2 for an IBM joint study.

  Take heart, NeXT programmers. Our code may yet one day appear on every 386 PC desktop!

- Hot off the rumor mill: IBM will be offering NextStep for RS/6000 at $1,500. The entire operating system, TCP/IP, NFS, etc., including NextStep and Ingres database, will be $2,500. Sounds like another OS/2 buster.

- The word from new RS/6000 users is that AIX, which they say stands for **Another IBM excrement**, is full of bugs. One NeXT developer considering porting software over to RS/6000 confided, "We won't be buying the RS/6000 at least until the next release of AIX. Why should we pay good money to hunt down bugs for IBM?"

  To be fair, though, the RS/6000 is an excellent piece of hardware that is waiting for a stablized operating system. Once AIX matures, it is sure to be a pleasure to use.

- Persistent rumors call for a faster Optical Drive in the new release of NeXT machines. My question is: what about the people who upgrade? Will they, too, get faster ODs?

- NeXT has promised version 2.0 system software to be shipped soon, perhaps as of 4th quarter 1990. Amongst other things, greater speed is on top of the list. I am told the launch time for applications is substantially decreased, so that even on 68030 machines, applications will launch noticeably faster.

- Heard on the Internet: NeXT will be using the same memory chips for the 68040 as the 68030. When they upgrade your board, all they do is move the memory right over. For those of you who have purchased extra memory, perhaps from third party, that's great news: your investment is secure.

- Are you running out of ttys on your NeXT? There are currently two ways to solve the problem: a SCSI device that branches out into a cluster of serial and Centronics parallel ports, and Cisco's ethernet device that gives you a whole bunch more serial ports.

  I am currently running a laser off ttya, a modem off ttyb, and I could use about two more serial ports.

- Just received **Diagram** from Lighthouse Design Inc., a wonderful little diagramming tool that I will review in the next issue of Tao. If you are a programmer doing documentation, or any other forms of diagrams, you'll want to check this out.

  Lighthouse Design is also working on **Exploder**, a CASE tool for programming with persistent objects. It uses Sybase as the back-end storage for these persistent objects, and generates Objective-C code. Look for a review within the future pages of Tao.

- If you are not using Stuart from Scott Hess, get it today! Stuart takes the best features of Terminal and Shell and adds other goodies along the way. Download it from any of the popular ftp archive sites, or ask your NeXT representative to get you a copy of this very useful piece of shareware.

  After using Stuart and going back to Terminal and Shell, I felt like deleting the pair from my hard disk. I used to maintain three copies of Terminal on my Icon Dock and one copy of Shell. Now only Stuart is evident.

- For you NeXT historians: Fortune magazine featured an article on how Jobs and IBM hooked up, and all that political back-biting between Microsoft and IBM, in the October 9, 1989 issue. It told of how Jobs met IBM Chairman John Akers at a party, Steve told John what he thought of OS/2, and John countered, "How would you like to help us?"

  If this thing with PS/2 works out, it may be IBM that helps NeXT, not the other way around.

  Amongst other things, the article pegged the deal between IBM and NeXT at the neighborhood of $50 million the first year.

- BusinessLand finally sets up shop in Tokyo. The store is also funded by other Japanese companies, including Canon Inc., a big NeXT share holder, which reportedly holds 6% interest of BusinessLand Japan.

Four months ago, I saw a prototype of Japanese kanji running on NeXT. I wouldn't be surprised if all this signals a thrust from NeXT into the potentially lucrative Japanese market.

- NeXT Inc. is offering its employees option to buy stocks, at $1 a share, or so I've heard. If I were a NeXT employee, I'd buy as much as I am allowed; at $1 a share, it's a bargain. The cynics say those stocks will be worthless when IBM/ DEC/Sun/Apple/what-have-you walks all over NeXT. But you know, I've seen their software and I am willing to bet hard cash on NeXT.

**Computex Report**

You should have seen it. A computer trade show the size of Comdex, featuring all the latest high tech toys from Taiwan. That's the 1990 Computex, recently held in Taipei.

The show grabber is without a doubt the new line of 80486 motherboards. I saw at least six companies with 486 EISA motherboards. I played with a 486 box running SCO UNIX. I couldn't believe the speed! It felt more like a DEC 3100 RISC box. Benchmarks show the 486 to be anywhere from two to three times faster than 386.

The 486 has an integrated math coprocessor, which gave it excellent floating point performance. I'd love to see how it fares with AIX and running NextStep.

The Taiwan N.T. dollar is currently very strong against the US dollar. This has made life difficult for Taiwan exporters, especially when it's been accompanied by rising labour cost. Now Taiwan, like Japan did with its cars, is going upstream to high end products, where profit margins are better.

In pushing into the 486 market, traditional Taiwan clone makers find themselves in brand new territories. Suddenly, there isn't anybody to copy anymore. Indeed, the Taiwan computer industry is gradually shifting from Mr. Copy Shabby to innovative designs. I saw demonstrations of bus mastering SCSI controllers, parallel processing transputers, etc. All based on EISA and all using Surface Mount Technology.

Even the clones are becoming more high end. Twinhead Corp. of Taipei announced they will make SparcStation compatibles, at half their price. That puts Sparc power squarely in PC dollar range. This follows an announcement by Hyundai to make super fast Sparc clones.

I also counted five companies that are now manufacturing high speed, 9600 V.32 MNP 5 modems. Competition is bound to drive the price of modems down. Street price for a good 9600 bps V.32 modem is around $700 to $800 US right now. In a year, it'll be half that.

Finally, a Taiwan consortium is trying to break Japan's monopoly on CCD (Charge Coupled Device), a prime component used for scanners, fax, and digital cameras. By manufacturing their own CCD, consortium members hope to further cut prices on all of the above.

## SLIP Into the Future

All NeXT machines come with ethernet built-in. Using TCP/IP and NFS, NeXT works as a harmonious member of UNIX networks. We even have this marvelous ability to run a NextStep application on one machine, but see it on another machine across the network.

When you specify the -NXHost command, a NextStep application automatically invokes NSWS (see your man page about it) to establish a TCP/IP link with another machine on the network. The target machine runs NSWSd, the daemon that intercepts the stream and directs it into the Display Postscript Server.

With this ability, we can use computers in new and wonderful ways. This is the concept behind an Application Server (see issue #1); instead of running the program on your machine, which may have limited memory and storage space, and maybe even slow CPU, why not run it on a big machine next door, then send all the display code to your machine?

With the advent of RS/6000 and the forth coming 68040 NeXT, we will see a proliferation of Application Servers. It won't matter so much that your machine is only a 68030 with no hard disk. The fact is, by off-loading the Display Postscript Server (DPS) stuff from the Application Server, you get better over-all performance. You are effectively putting two processors to work on one application.

What makes all this possible is a very compact display protocol, Postscript. When your program sends its output to a DPS, it is a tightly encoded binary stream. The division of responsibility between the DPS and the application is designed to minimize communications overhead.

X-windows was designed around the very same idea, except X doesn't have the Postscript component. It turns out that the division of responsibility in X is different than that in NextStep, and the communications burden is higher.

This is all very good and fine if you've got a network, but what about the Rest of Us?

Well, I've got news for you. Everyone's got a network, a Wide Area Network (WAN) in the form of telephone lines.

TCP/IP talks over ethernet lines, but you can replace the ethernet with dial-up phone lines using SLIP (Serial Line Internet Protocol). With SLIP, you can interconnect computers using standard telephone. As far as your software is concerned, the machine two hundred miles away looks exactly the same as the way next to you.

Of course, the transmission speed is no where near that of ethernet, but with the new modems coming out, it can be quite impressive.

In the old days, when 2400 bps was the standard, SLIP would have been unbearably slow. But now we've got 9600 bps V.32 modems. And better yet, a new generation of V.32 modems now offer V.42bis, an international standard for data compression. With V.42bis, text data travels at at 4 times the speed, or 38,400 bits per second, on the average.

The compression algorithm used is a derivative of the famous Lempel-Ziv Welch algorithm, which looks for repeating patterns in a data stream, replacing them with single tokens. Its performance entirely depends on the type of data being sent. English text can typically be compressed to one-fourth size, and I'd expect SLIP packets of DPS stream to average about half to one-third size.

Running a remote application over SLIP would be noticeably slower than over ethernet, but it is entirely feasible. And when ISDN becomes a reality, we will have 64Kbps, which makes all this even more feasible.

This makes possible a whole new class of services. You could, for example, log into a software publisher's computer to "test drive" their new application. The vendor need not make a special crippled "demo" version, and they need not worry about piracy.

SLIP can also be used to query remote databases. Sybase servers communicate with the clients through TCP/IP, so if you run the front end on your machine, you can still access all the remote data easily and transparently from a remote Sybase server, all through the magic of SLIP.

Database packets are typically very compressible. Since all rows are returned one at a time in Sybase, user perceived response would be excellent. In fact, it'd be just as good as "being there".

So the next logical question is, how can I get SLIP? Well, you can't, not at the moment. In their foolishness, NeXT did not put in the supporting hooks into the TCP/IP kernel driver code. NeXT says they may change that in version 2.0. They'd better!

## Portable NeXT, Part II

Three months ago, I wrote about a hypothetical portable NeXT. The article is reprinted here (apologies to those of you who've already read it), with new comments at the end.

* * *

The NeXT machine, wonderful though it may be, is desk bound. When we NeXT devotees travel, we are forced to put up with mediocrity. It is hard to go back to PCs, Macs, or (shivers) terminals, after being spoiled by the cube. The answer: we need a portable NeXT!

It makes perfect sense. Every NeXT is equipped with an ethernet connector, so the devotees need not fumble with RS232 cables, nor deal with LapLink type software. The portable NeXT should have an internal hard drive (but no optical disk). On the hard drive will be the bare minimum systems software we need to get things done on the road: no Shakespeare, etc. The portable will need plenty of RAM as to minimize or avoid swapping, which chews up quite a bit of disk space.

What about the monster 17 inch screen? Some compromises are inevitable here. But since all the software is PostScript based, there is an immediate advantage: device independence. Granted, we will probably have only six docks left, but at least all the WriteNow documents will look properly spiffy and wysiwyg.

Thanks to all the work already done on VLSI, the component count should be low, especially now that the optical disk controller is no longer needed.

* * *

At Computex Taipei, I saw a beautiful electro-luminescent screen with 1024 X 864 resolution, is incredibly sharp, has 16 levels of grey, and has a viewing angle of 120 degrees. Best of all, it is flat. Sounds to me like the ideal laptop screen.

By the way, by laptop I don't mean battery powered. I have never found battery power to be any sort of advantage, except perhaps for the frequent flyer. To me, it's more important to have a sharp monitor than to squint at a MegaPixel LCD for hours at a time.

I'd like to see a minimum of 12 megs of RAM, or 3 banks of 4M SIMMs, on the laptop motherboard. An 8M system just isn't enough. After Postscript Server and Workspace Manager loads, there is hardly any room left, and the disk ends up thrashing all the time.

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For people who don't have NeXT machines, or work off text terminals, I have prepared an ASCII version of the newsletter.

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I have a NeXT machine YES / NO

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