Tao #2

Tao is an irregular tabloid meant to supplement the regular user's group newsletter. It will be released whenever there is enough new material to warrant the cost of postage. Though NeXT is generously helping Tao foot the postage bill, this rag makes no pretensions to be official, accurate, or respectable in any way. I am solely responsible for its content.

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Bits & Pieces

- UBC has inked an agreement to purchase fourty NeXT stations (8M, Optical only, accelerator drive) and two *68040* file servers for their first year lab. This decision was met with great enthusiasm by most, with the notable exception of Sun, who was a prime contender with a SparcStation bid. The NeXT lab, scheduled to be wired by June 15, will be a focal point for attracting top notch students into the Computer Science curriculum.

- The two main camps for UNIX, OSF and UI, have broken off negotiations on merging the two versions. It was an effort doomed from the start: OSF has taken to the MACH kernel, whereas UI is strictly sticking to its System V, version 4.0 as the de-facto.

  Meanwhile, nobody's holding their breath waiting for OSF to release OSF/1. Even OSF members continue developing and supporting their own brand of the operating system. IBM has its new AIX version 3.0, Apple has AU/X version 2.0, Hewlett Packard is rockin' and rollin' with HP/UX, and so on. In another word, the so-called UNIX standard platform is as chaotic as ever, and will continue to be for some time.

- IBM's announcement to support NextStep caused some unlikely people to buy NeXT machines. We are talking stiff-upper-lipped Blue Shops here. They are developing under the NeXT with an eye to port as soon as they can get their hands on NextStep under the R/6000. Considering the entry level price of $13,500 US for the least expensive R/6000, NeXT finds itself in the curios position as *inexpensive IBM clones!*

- They are calling it "NeXT on steroids". According to sources, the new 68040 based NeXT benchmark results showed SPEC Mark, Dhrystone, and general I/O throughput to put a SparcStation to shame. Pricing will also be aggressive: expect to pay much less than a fully equipped SparcStation, after accounting for all the software.

- Sun has in its wings a second generation SparcStation. This new model is aimed to compete with IBM's R/6000, and to fend off new rivals like the much rumored 68040 NeXT. For starters, they have announced the SparcStation 1+, a slightly faster version of the SparcStation 1, but sold at the same price. To follow are the SparcServers, optimized for database OLTP performance. Sun has been selling about 8,000 Sparcs per month.

- Adobe is hosting its Developers' Conference from June 5-8, at the Fairmont Hotel in San Jose. The theme is "Extending the PostScript Advantage" and costs $495 a head. For more information, contact CMI West at (415) 398-5352, ext. 233.

- The introduction of NeXT with its copious software suites has put pressure on UNIX box manufacturers to beef up their pathetic bundled software offerings. Expect most vendors to bundle Motif applications ranging from word processing to mail to prototyping tools with next year's offering of machines. Also expect *poor coordination* amongst the applications and the environment for key areas such as printing, backup storage, and inter-application communications.

- Apple has linked up with a genius programmer right here in Vancouver, who is writing something that *walks all over Interface Builder.* Apple insider called this "The software Holy Grail". Unlike Interface Builder, one can create an entire application, not just the user interface portion, with this tool, code-named **IntraVision**.

Bugs & Glitches

- If you compile the smallest possible C program, main(){}, you'll find the executable that does nothing is more than 57K! That's more than the entire usable memory of an Apple II.

- *Users Beware!* Never eject a floptical disk with the hardware eject button, until your computer is powered-off. I've spoken to one user, who ruined his drive because of this. Also, do not run your machine with the fan disconnected. I discovered, by empirical testing, that my system starts experiencing errors with its devices (optical drive and SCSI both) after about an hour without fan.

The Future of NextStep

NextStep is the soul of the NeXT computer. It is what makes the machine unique. When Steve Jobs set out to create NeXT, he did not have all the answers. He merely found the people who had the answers, and gave them the freedom to be at their best.

If we look at the NeXT machine in cold objectivity, we find a machine like many other UNIX machines. The Floptical drive is something available to any micro or workstation; the DSP option can be had on Suns, Macs, PCs, and others; SCSI, ethernet, and big monitors are all old news; MACH is funky but offers the users nothing over stock UNIX.

The true genius of NeXT is the author of NextStep. The fluid integration of Display PostScript, Objective C, and the AppKit leap-frogs other me-too UNIX boxes. It is the gains in programmer productivity that sets NeXT apart.

The large number of bundled software is surely significant, but it is only made possible with NextStep as a solid foundation. We may have very few of the bundled software, if NextStep didn't encourage productivity the way it does.

People talk about how application software drives the hardware market. But what drives the application software? Some would say it is large market shares. I would agree, but point out also that good software can only come about from good application platforms. Look at the mess in DOS world. Millions of applications, and almost all limited by the 640K memory barrier. In fact, it isn't the *quantity* of application software that counts, it is rather the *quality* and *coverage* of software that matters.

We have seen how NextStep promotes quality software, because so much of the hard work for writing quality software has been done for you already. We have also seen how NextStep promotes coverage. Since it is easy to write programs, more people will write more code on more different areas.

Now comes the market share problem. Why would people write NextStep programs, when only 10,000 cubes have been sold, according to NextWeek? The R/6000 isn't even on the market yet. But what if NextStep was available on every 386? All of a sudden, the picture changes.

There is no technical barrier that stands in the way. An 80386 with a Weitek FPU is more powerful than the 68030 in just about every conceivable way. The new generation 486's are at least twice as fast as their 386 counterparts, and completely compatible. The standard Super-VGA graphics that most 386s support will give you 800 by 600, with 16 colors, and 1:1 aspect ratio. Many VGA boards also give you 1024 X 768, with 256 simultaneous colors. That compares favorably with the MegaPixel display.

IBM has the right and the resources to put NextStep on 386 boxes. This would not be another pretty DOS front-end, since NextStep does demand UNIX as the underlying operating system. UNIX doesn't have to be expensive; Marc Williams Software has a $99 UNIX called Concurrent for PC, and it runs happily within 640K.

It is to both IBM and NeXT's interest to sell NextStep/386 for cheap, bundled with perhaps AIX/386. IBM would instantly create a huge market for NextStep applications, a situation that can only help its new R/6000. NeXT would extract royalty from potentially millions of copies sold. The DOS crowd could even be pleased with a DOS compatibility box, much like that of OS/2 or Windows 3.0.

Such a move would devastate Microsoft's grand plans. Windows 3.0 and OS/2

Presentation Manager can never hope to match NextStep. Even its most ardent supporters would defect, once they find themselves free of the cursed GDI.

It is a pain to deal with Microsoft's GUIs. They only look similar to a user. One needs different API for Windows 3.0, PM, and Motif. Worse yet, the operating systems calls for all three are different. Finally, until Royale font technology is implemented, the programmer has no true device independence. Companies stick by Microsoft right now for one simple reason: the huge PC market, with everyone eager to go GUI. Give them a better way, and they will rally behind NextStep.

There's been a persistent rumor that NextStep has been seen running on a PS/2 Model 70. I believe the current NextStep application base is strong enough to convince any 386 user to dump Windows or OS/2, if given a choice. It is now up to NeXT and IBM to show both the wisdom and the courage to popularize NextStep.

All About External SCSI Hard Disks

If you bought an Optical-Only system, then decided to upgrade to a SCSI hard disk, you may have an Accelerator Disk lying around, doing nothing. Or, you may be cannibalizing a Mac SCSI drive that you no longer find useful. Either way, you'll want to know about what it takes to hook up external SCSI hard disks, and possibly boot off them.

I will assume you are familiar with SCSIs in general, and will remember to properly terminate the SCSI chain. You should make sure to **turn on** all SCSI devices, before you power-up your cube, so that they'll be recognized on boot-up.

Once you are logged in, bring up the Terminal and type in the following command:

```
/usr/etc/builddisk sd1
```

This program initializes your external SCSI drive. The drive must be a supported type listed in /etc/disktab. If it doesn't exist under /etc/disktab, create an entry first. You will need the hardware specs; specifically, the number of cylinders, heads, tracks, and sectors.

You can now mount your drive onto your system. For example:

```
mount /dev/sd1a /Disk2
```

This command mounts (maps) the SCSI external drive into /Disk2 directory. If you want the mount to occur automatically, modify /etc/fstab and include the /dev/sd1a as an entry. For example, the following /etc/fstab assumes a two hard drive system:

```
#
# NOTE: This is the /etc/fstab file
```

```
#
/dev/sd0a / 4.3 rw,noquota,noauto 0 1
/dev/sd1a /Disk2 4.3 rw,noquota 1 2
```

After changing /etc/fstab, type reboot to restart the system and automount both drives.

Some people will want to boot off the external SCSI instead of OD or internal SCSI disk. To do this, you must specify a build script with the builddisk command:

```
/usr/etc/builddisk -s sd330 sd1
```

The -s sd330 specifies that the file, /etc/BLD.sd330, will be used as template for building the disk. There are other BLD.* files for 660 hard drives and optical disks and others. If you don't want to load the complete NeXT software suite, you can modify the BLD file and create a "skinny" version that only loads the bare minmum.

Having finished building the disk, again type reboot. Just as the "Testing System" icon appears, press Left-Cmd Right-Cmd ~ to enter monitor mode. Now, type

```
Next> bsd(1,0,0)
```

This boots the first device number found on controller #1 (the external SCSI controller; #0 is the internal SCSI controller). If you have more than one external SCSI disk, set the unit number jumper on the one you want to boot to the lowest value.

As an aside, I came close but failed to make a 40Meg SCSI bootable. The disk filled up completely. It is probably possible to boot with a 40Meg SCSI, but there wouldn't be enough space left to do anything interesting or useful.

Some Interesting Implications

I spoke with a military contract developer, who told me how the military is interested in NeXT for the security aspects. In their labs, no machine can be allowed internal hard disks, because it represents a security leak: someone might break in and steal government secrets that way.

So thought the military, why not use an optical disk as the removable medium? That way, they may be locked up at the end of the day. That's possible, but it would condemn many people to turtle-crawl speed.

A better way is to use removable external SCSI disks. A bit heavy to move around, yes, but many times faster. I am sure the productivity increase would outweight any extra effort needed to transport them. A SCSI Bernoulli Box takes it one step further, for both true ease of transporting and high speed.

The Thin-Wallet NeXT

We all agree the NeXT is a wonderful machine. Yet how many of us can afford to blow $13,000 on a complete system? Using NeXT with an optical drive much too painful, so we must at a minimum use a 300 meg hard disk. In fact, why not buy a diskless NeXT, if you are not going to use the OD at all? That isn't as crazy as it sounds.

With every diskless NeXT, you get a 40 meg accelerator drive. Buy a 300 meg external SCSI. APS, a mail order house that advertises in MacWeek, will sell one to you for $1650. Call at 1-800-233-7550 (good for both US and Canada).

You should then extract the hard drive from its case. Swap the 300 meg hard disk with the accelerator drive. You'll need to format the 300 meg hard disk from the network, or with someone else' NeXT. Your now external 40 meg hard disk becomes a portable file transfer unit. Sure, you won't be able to lug around 256 megs worth of data, but few of us need more than 40 megs at a time.

The thin-wallet printer is an Apple ImageWriter. If you can live without laser quality, download IWSCRIPT from your favorite archive.

Is there a catch? Yes. You don't get the system disk if you buy a diskless station. Oh well, but for this, every thing else would have worked quite well. Users would save $1,500 by not buying the OD, whose usefulness to many of us is limited. Perhaps NeXT Inc. could be persuaded to sell the system disk by itself?