The X files

X Window (minus the s and the hyphen, note) has a friend in Chris Bidmead. Author Don Hopkins, however, can barely find a good word for it.

I'm always careful to call it "The X Window System" or just "X", because in the early days I used to get howled down by X buffs for daring to pluralise it and so invite confusion with products from a certain large PC software company.

A couple of months ago, I was investigating how to organise my NeXTStep installation on a 2Gb hard disk. At one point I thought that logical partitions might be the answer, but the BSD folks who live at the bottom of NeXTStep were ahead of me on this. The manual page for this particular version of fdisk concludes with the observation: "fdisk knows nothing about logical partitions, which are sub-partitions of an extended partition. Nor perhaps should it, as these are gross kludges from the Evil OS Company of the North."

Even X fans are beginning to slip into using "X Windows", and these days you see it all over the place. (By the way, hyphenating "X Windows" remains a definite no-no.) Not that Don Hopkins, author of a piece entitled *The X-Windows Disaster*, could ever be described as a fan.

Don Hopkins is a user-interface designer and graphics programmer who ported SimCity to X11, and describes himself as "working for Kaleida" at the bottom of the Web page I have here (http://www.digital.de/people/jmh/Unix_Haters/x-windows.html); what that means precisely, with Kaleida gone and Apple in disarray, is hard to say. I tried to get onto the home page indicated for Don at http://web.kaleida.com, but my browser tells me there's no such host.

Wherever Don is, his opus, actually a chapter from a book called *The UNIX Hater's Handbook*, lives on. As readers of this column will know, I'm a keen user of X because of the way it helps me unify these different operating environments about which I write, but I haven't had to program to it. Here's a flavour of Don's views:

"X-Windows is the Iran-Contra of graphical user interfaces: a tragedy of political compromises, entangled alliances, marketing hype, and just plain greed…If you sit down at a friend's Macintosh, with its single mouse button, you can use it with no problems… but just try making sense of a friend's X terminal: three buttons, each one programmed a different way to perform a different function on each different day of the week — and that's before you consider combinations like control-left-button, shift-right-button, control-shift-meta-middle-button, and so on."

But Don's chief complaint about X is the way different X applications work together. Or rather, don't. Interoperability depends on programmers following the arcane rules set by the X Consortium in a tome called the *Inter Client Communication Conventions Manual.*

"The ICCCM," says Don "is unbelievably dense. It must be followed to the last letter and it still doesn't work. ICCCM compliance is… so difficult, that many of the benefits just aren't worth the hassle… And when one program doesn't comply, it screws up other programs. This is why cut-and-paste never works properly… drag-and-drop locks up the system, colourmaps flash wildly and are never installed at the right time… and deleting a popup window can quit the whole application."

Don lays it on with a trowel, but I have to confess it's all true. A camel is a horse designed by a committee, runs the old joke, and X certainly is that horse. But, but… it mostly works and I certainly wouldn't be without it. At least not until something better comes along.

Don Hopkins' biographical footnote at the bottom of the Web page adds a little twist of the knife: "To annoy X fanatics, Don specifically asked that we include the hyphen after the letter X as well as the plural of the word "Windows"…).

Caldera and Linux

Some months ago I mentioned that Ian Nandhra, of Lasermoon, was running the gauntlet of the X Open Consortium. His plan was to take Linux-FT (his own version of Linux) through the compliance tests, and pay the huge sums of money required to certify Linux as UNIX and get it branded as such.

This is important stuff, with huge implications for the Linux community and, perhaps, for the world at large. But frankly, I never understood how a modest UK Linux vendor like Lasermoon was going to stand up to the ordeal of having the X Open Consortium's hand deep in its pocket. Well, it isn't. The financial responsibility for this extraordinarily brave venture has passed to broader shoulders and now Caldera Inc is carrying the baton.

Caldera, as regular readers will know, is the company

Cut-and-paste assisted by the xcutsel widget. NetScape is framed in the NTrigue X windows, at the bottom of which can you see the NTrigue copy utility. The red arrow indicates that test is sitting in the buffer, ready to be copied out

founded on the considerable wealth of Ray Noorda, ex-CEO of Novell. This is more than just another Linux distribution company. The central idea is to create a "Network Desktop" that will offer an alternative to the One Microsoft Way.

This ambition has a number of implications, most of which seem to be dealt with responsibly by Caldera. Providing an excellent, low-cost product is only the first hurdle, and that's where Linux comes in. The Red Hat Linux distribution provides the underpinnings, so the majority of what you pay for with your $99 is all the commercial trimmings: the Looking Glass Desktop, the font server, the Accelerated X Window system, the Netware connectivity, the Crisp text editor, and so on. The second hurdle is to make applications available for this environment, and Caldera is working hard to encourage Unix vendors to port their software across.

Caldera seems to be very serious about getting all this working, building the market for third-party software and helping developers sell in to that market. To help this "emerging technology to obtain widespread implementation in the business environment", as Caldera's portentous promotional prose puts it, requires the creation of "technical support programs and corporate accountability".

Corporate accountability is the big issue. Linux is, technically, already good enough to have earned a place in serious corporate computing, but it meets a lot of resistance (even among those who have heard of it) because it gets inaccurately categorised as shareware. X/Open certification, as Ian Nandhra understood, would make a crucial difference.

Caldera has taken the Linux-FT development team aboard and is working towards what is now called Open Linux. This isn't, as some Linux newsgroups have been speculating, an attempt to hi-jack GNU software on behalf of a commercial venture. Well, Caldera is commercial all right, but Open Linux, the base on which it will be built, is (according to Caldera's own press release) going to be "published freely with full source code via the Internet to individuals and organisations seeking stable, UNIX-systems solutions."

The Caldera toppings, of course, will remain proprietary. But the important thing, it seems to me, is that the core Linux distribution, certified as fully compliant with the new Single UNIX specification, will be returned into the Linux community. When? Round about the time you're reading this. Check for further details on http://www.caldera.com.

Cut and paste

I left you last month with that puzzle about getting data in and out of NTrigue. Or more generally, cutting and pasting between any two X windows that don't agree about how to use the cut buffers.

Even the keenest fans of X tend to agree that it has its unwieldy aspects. The multiplicity of cut buffers, combined with the way a selected block of text is also able to act as its own cut buffer, does nothing to detract from this reputation. And some people flatly hate X (*see later*).

The gurus at MIT (the Massachusetts Institute of Technology) had obviously had a similar problem with copy and paste between pre-release 3X clients that know nothing about PRIMARY and later clients that use it. So (as I learn from the pages of the manual), one Ralph R Swick of the DEC/MIT project Athena, came up with a little utility called "xcutsel". The page states: "The xcutsel program is used to copy the current selection into a cut buffer and to make a selection that contains the current contents of the cut buffer."

Xcutsel pops up a small widget with three buttons on it labelled quit, copy PRIMARY to 0, and copy 0 to PRIMARY.
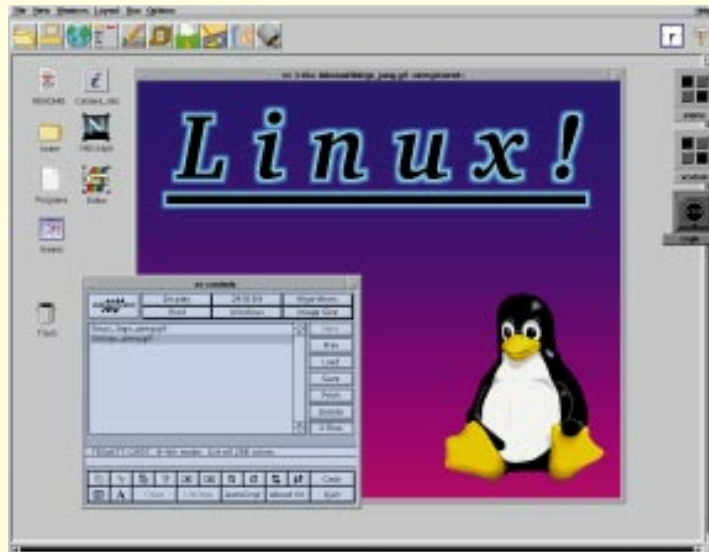
This is the PPP dialler I use on my NeXT machine. The white window is for GateKeeper's own diagnostics, and in the yellow window behind I'm running netstat, a generic network diagnostic tool that shows the internet connections

As NTrigue's copy utility NTRUtil.exe puts the output of a Windows NT copy or cut operation into the Primary buffer, and the CubX X Window server uses Cut Buffer 0, xcutsel provides a convenient bridge. It's a standard part of most X distributions, so it might be worth looking at if you have problems with cut-and-paste operations on any of the X platforms.

PPP plays up

I'm currently going through some problems with one of my Internet Service Providers (ISPs), and the tribulations are teaching me a lot about PPP (Point To Point Protocol); some of it even useful!

Unless you are lucky enough to have one of these flash high-bandwidth direct internet connections, the link from your Linux box, or Windows NT machine, or whatever is likely to use one of two serial protocols, operates out of your comm port, through your modem and along your telephone line.

The two protocols are called PPP and SLIP (Serial Line Internet Protocol). There is also a common variant of SLIP called CSLIP (Compressed SLIP) and you might also come across proprietary variants (with cute names like PinkSlip). These latter are a curse and to be avoided. They usually mean you are locked in to whatever client software the ISP provides, which in turn dictates the operating system under which you run it. Guess what that turns out to be?

It's PPP with which I've been having problems. Under the various flavours of Unix it's normally a chunk of code compiled into the kernel or loaded as a module, combined with a daemon that you power up when you want to make the link. Additionally, it's normal to address PPP through a user interface program that handles dialling and passes the correct parameters to the underlying PPP daemon.

Most Linux distributions come with all this stuff in place, although you might have to recompile your kernel to get it working. NeXTStep was designed around the assumption that you're going to be directly connected into the internet though your network, so I had to add the PPP connectivity myself, with a certain amount of help (well, a lot of help, actually) from the indispensible Paul Lynch, NeXT specialist *extraordinnaire*.

When, after having worked happily for many months, the PPP link started to go wrong a couple of weeks ago, I didn't know where to start looking for the fix. I would acquire what looked like a perfectly good connection but wouldn't be able to fetch any web pages. Mail worked, but only in a strangulated sort of way that often left the larger outgoing messages stuck in my queue.

Luckily, I had other routes out to the internet, but I was determined to use the opportunity to learn more about PPP and, hopefully, fix it without imposing too much on Paul. My first port of call was the manual page for pppd (the PPP daemon). Manual pages can be confusing, even frightening. The trick is to try to enjoy them even if you don't understand them: you're bound to get something out of reading them, even if it's only more bafflement.

Here's how the manual page for pppd starts:

```
NAME
pppd - Point to Point Protocol daemon
SYNOPSIS
pppd [ options ] [ tty_name ] [ speed ]
```

Okay, so this is a daemon you call with parameters (these are normally passed by the dialup program). The port on which to look for the modem [tty_name], and [speed], the speed of the modem, were obviously okay, otherwise I wouldn't have had a connection of any kind. The problem probably lay somewhere in the first para-

meter you pass; a multifarious thing called [options].

The possible options are listed further down the manual page. There is a lot of them, some incomprehensible (to me). By correlating the options passed by my dialler as previously set up for me by Paul with the list in the manual page, I began to understand a little of what the connection was all about. To cut a long story short; a series of gentle experiments with the options (singly!) revealed bsdcomp, standing for BSD compression. The manual page states:

```
"bsdcomp nr,nt
   Request that the peer compress
packets that it sends, using the BSD-
Compress scheme, with a maximum code
size of nr bits, and agree to compress
packets sent to the peer with a maxi-
mum code size of nt bits."
```

My options were pre-set with bsdcomp 10,10, but it occurred to me that compression schemes like this were probably instituted in the days before modems were smart enough to do their own compression. I know that imposing one compression scheme on top of another can sometimes drastically slow down a link. Of course, this doesn't explain why the link should have suddenly strangled itself, but I thought it might be fun to take out the BSD compression and see what happened. When I did this (by changing the bsdcomp parameters to 0,0) the link suddenly leapt into life — amazing.

What may have happened is that the ISP switched over to a set of different modems and that suddenly, my modem found itself able to negotiate a more sophisticated compression scheme that happened to fall foul of bsdcomp. I'm going to have a play with the compression parameters on the modem and on PPP to see if I can verify this.

Meanwhile, it's a real relief to have the link back. ■

New, next month

As from the October issue, Hands On 32-Bit will become Hands On Unix which, we hope you will agree, is more relevant to today's computing needs. The new Unix column will continue to be written by Chris Bidmead.
● We will also be introducing a new *Hands On* column for Windows NT buffs, written by Dale Strickland-Clarke.

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Serial madness

Chris Bidmead goes pear-shaped, overcoming serial problems while setting up comms drivers on Windows NT. And there's further Ntrigue, too.

My mate Marcus is getting quite fond of Windows NT: he's managing to do really useful things with it at work, setting it up Intranet-wise as the basis of an enterprise-wide information system and earning himself brownie points galore on top of his already enviable salary.

Alas, for me, things have gone so smoothly for him that he hasn't had to get embroiled in the entrails of NT, which is where I seem to be spending too much of my time lately. So he couldn't help me with the serial problem I had, and wasn't even able to calm me down when I got furious about the way NT handles this.

I was trying to set up the comms drivers on the Windows NT server running on the newly-installed NEC Powermate. I'm aiming to connect my network through it to Cix, CompuServe, Global Internet, Netcom, Pipeline and the seeming myriad other Internet service providers who've been offering me trial accounts recently.

Some, like Netcom, give it to you virtually on a plate, with installation from a CD-ROM that sets you up and connects you within minutes. The catch is that most of them assume you're going to be using Windows as your operating system, and at least one of them (Pipeline) won't work with anything else.

Fiendish plan
Rather than hack away trying to get each one working with Unix, my fiendishly simple plan was to install them all on a Windows NT server and ultimately either use that as a router for the rest of my network, or migrate the more useful services to Unix once I was sure they worked well.

One small catch was that I couldn't get the serial port on the NEC Powermate to respond. It turns out that there are better ways of going about the diagnosis than the one I chose, but as a Windows NT beginner the approach seemed logical to me.

So here's what I did. Open the Control Panel and click on Devices. This shows you a list of all the software and/or hardware hoojimaflips on your system, mixed in with a list of hoojimaflips that aren't on your system but which NT knows about.

The ones that aren't present are marked as Disabled and the others show whether they belong to the system, have been automatically started, manually started and so on. (Incidentally, in there I noticed the X11 display Network Interface that this version of NT adds to do its X magic. But more on that in a moment).

In there, is a device called Serial which is marked as automatically started. Select it, hit the Stop button, and a window pops up to tell you that the system is attempting to stop the serial device. After a moment the "Started" status disappears and you assume you've stopped the service.

OK, so now you hit the Start button. The system tells you it's attempting to start the service. About 20 seconds goes by and the word "Started" reappears in the Status column — so at least you know the underlying software service for the serial port is working and can proceed to the next bit of diagnosis. Yes?

No. I discovered that when the Devices module tells you the serial service has been started it may only be kidding. It turns out that my first port of call should have been the Event Viewer, a key utility you'll find grouped under Administrative Tools. There you get the real story. In this case it was a warning, which I quote verbatim: "While validating that COM1:

was really a serial port, the contents of the divisor latch register was identical to the interrupt enable and the recieve (*sic*) registers."

As it happens, after 15 years of messing about with RS232 devices, I understand what is going on. But frankly this jargon-ridden grammatical mess of a sentence, with its misspelling of "receive" really doesn't do much to reinforce your confidence in the system's view of itself.

This is followed by the peremptory: "The device is assumed not to be a serial port and will be deleted" — Oh, thanks. Thanks a bunch for not telling me about it and not even telling the poor old Devices module that was cheerfully reporting it had successfully started the service.

When the Unix people, with more than 25 years of their operating system behind them, say that Windows NT is "immature" I guess that this is the kind of thing they mean.

Afterthoughts
Later… Calm down, Bidmead. Firstly, I now realise that the Devices module wasn't lying. It was accurately reporting that the Serial Service was being started and stopped. When it said it was running, it was. Distinguish between the "serial service", which is a software module, and the device itself (which is also a software module behaving as a virtual serial device a bit lower down the chain). The "device" wasn't working and was deleted. The service continued to run. Its decision not to report the disappearance of the device is, I suppose, a matter of taste.

That phrase of mine, about "15 years of messing about with RS232 devices" is somewhat double-edged in the light of what the problem turned out to be. There's a classic joke about an old duffer who claims to have "15 years' experience", to which the retort is, "No. You've got one year's experience. It's just that it's 15 years old."

In my young day, a machine either had a serial port or it didn't. If I'd been paying attention I'd have remembered that about ten years ago manufacturers started introducing serial ports that could be switched on or off by software in the BIOS, to free up interrupts. Yup, the COM1 port was switched off (the plain English translation of "the divisor latch register was identical to the interrupt enable").

NTrigue
My mention of the X Window System in conjunction with Windows NT may have puzzled you if you've just joined the
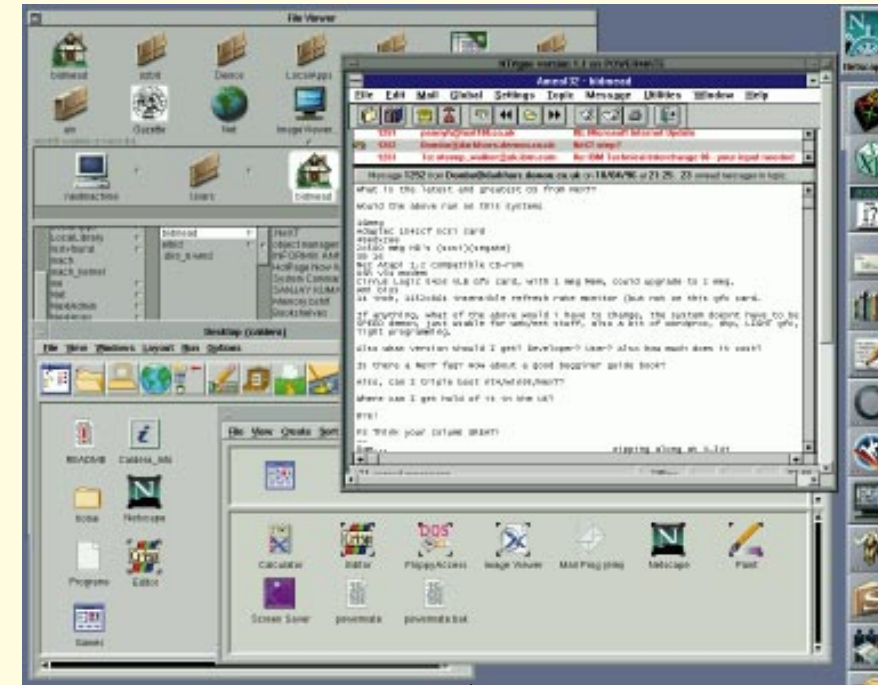
column. I'm running a product called NTrigue — essentially a version of Windows NT version 3.51 that translates the graphical user interface into X so that it can be squirted over the network. This allows you to pop up a Windows NT window (or several) on any machine on the network with an X display. NeXT natively uses Display PostScript instead of X, but a company called Intuitive Systems offers Cub'X, an X server application that integrates into NeXTStep as if to the manner born.

I told you last month that I would get NTrigue version 1.1 installed on the new NEC 100MHz Pentium Powermate in time for this column and for once I've managed to keep a promise, despite silly setbacks like the serial port problem. The installation is identical to a standard Windows NT install except for the process I mentioned last month, of having to run a validation program which provides you with a magic number derived from the machine and the date. You then fax that number to Insignia, which then faxes you back another number that unlocks the software — as long as you key it in before midnight on the same day.

Worrying, this. Picture a financial dealing room at around 11pm when the Tokyo market is getting under way and your 12 dealers all need their NTrigue sessions on their screens. Suddenly, for whatever reason, your NTrigue server crashes and has to be restored from back-up. Do you need to go though the validation routine with Insignia again?

I checked with Insignia, which didn't have an immediate answer to this

question. Worst case — what if the system restore has to be done at midnight from the original CD? In that case you'd certainly need to be able to get in touch with Insignia to get a new validation code. Does it run a 24-hour, 7-days a week service? Er… no, it doesn't.

With the main Windows NT engine installed on my NEC Powermate, the next step is to set it up to handle remote sessions. This is done with an extra NTrigue administration utility called WINCFG. You use it to create "WinStations" — individual connections to sessions on the NTrigue server.

NTrigue Winstations all use X11 as the transport mechanism, but can have different characteristics depending on whether you want to use encryption or allow sessions to time-out if left unused for a certain time. Winstations can be created in sets: essentially a collection of identical clone sessions with sequentially numbered names. You don't have to know these names when you log on, they're just automatically allocated. ➡
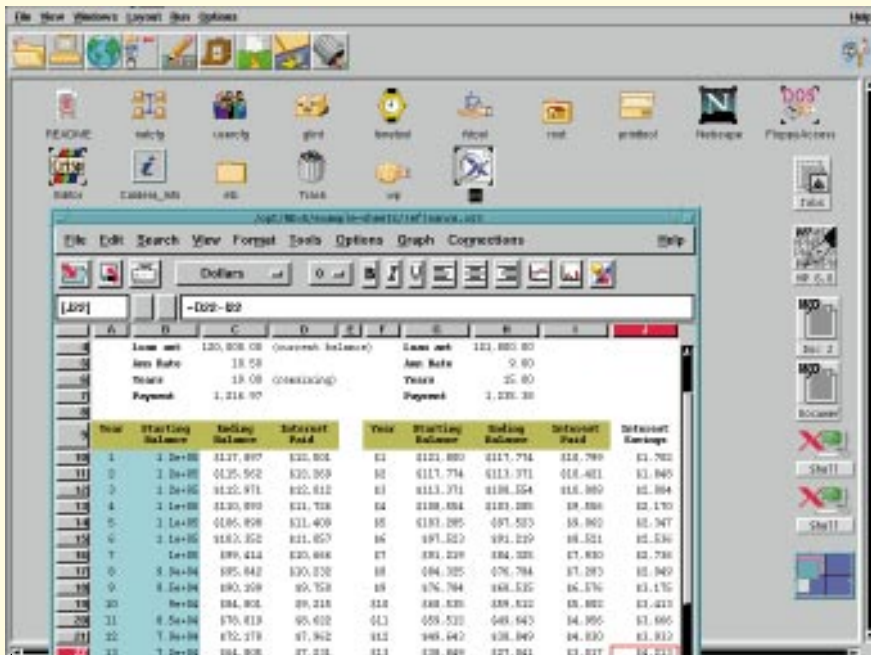
The latest addition to Caldera is the Internet Office Suite. It comprises WordPerfect 6.0 for UNIX (now under the aegis of Corel), NCD's Z-mail and a spreadsheet (seen here) called NExS. Frankly, I don't think it's going to set the world on fire and without a database it's surely no great bargain at $329. But the Caldera company sees it as the vanguard of a stream of UNIX commercial products that will be ported to Caldera over the coming months

You log on from a remote X system by using the rsh (remote shell) utility which is a standard Unix feature also provided with Windows NT.

Instead of starting up a process in a shell on my own machine, if I enter the command

```
rsh <ProcessName> <YourMachineName>
```

I run the process on your machine. It's not quite that simple, though, as there will usually be some security hurdles to be cleared, but you get the general picture (man rsh will tell you the full story if you're running Linux or something similar). NTrigue uses this command to establish a Winstation connection, and on my system it goes something like this:

```
rsh powermate nextmachine:0 640x480 4
```

where "powermate" is the name of my NTrigue server; nextmachine:0 is the X display I want the session to appear on; and the figures at the end (you've guessed it), define the size in pixels of the display and the colour depth. The size is arbitrary. I've got the habit of creating windows of different sizes depending on the Windows NT applications I'll be running in them.

Not so simple copy and paste

So that's how I get to run Windows NT on my NeXTStep desktop. Necessarily there are some distinct oddities about this, because the cultures of the two operating systems are completely different. But I've got used to this sort of thing from running OS/2 and its built-in WinOS/2 environment. The NTrigue setup costs you an extra machine but in return gives you a full 32-bit version of Windows. And X lets me add Caldera (or whatever) to the mix too.

This set-up saves me walking across the room between the Windows NT machine and the NeXT machine but it's hardly the integrated environment of one's dreams. I'm hoping OpenStep for Windows NT will bring me closer to that in the fullness of time. Meanwhile I have to make the best of X's limited talents at text-only copying and pasting between screens. For graphics, you have to use screen-grabbing.

At first, I couldn't get copy and paste to work. For example, I access the online news service NewsBytes through the Cix conferencing system and connect to Cix using Steve Palmer's AMEOL off-line reader. If there's an item in NewsBytes that I want to save in my NeXT machine's Digital Librarian, I copy it in the NTrigue window and paste it into the NeXT editor. Well, that's the theory. Except that nothing, or something completely different, would appear in the NeXT editor.

The copy and paste features in X can be very baffling if all you're used to is the Windows way of doing things. Essentially, instead of having just one clipboard, there are several. In IBM's implementation of X

for OS/2, called PMX, the documentation describes the cut buffer as a stack of eight separate buffers: "By convention, data first goes into CUT_BUFFER0. As each new piece of data is added to the cut buffer, the existing data is moved to CUT_BUFFER1, then CUT_BUFFER2, and so on."

This process is reversed when text is transferred back from the cut buffer stack. The catch is that the stack handling isn't managed centrally by the X server. Each X client is supposed to take care of rotating the data in an orderly fashion, but in practice they tend to do this in different ways.

Just to add some spice to the story, X11 release 3 introduced yet another cut buffer: a special one called PRIMARY. The principle of PRIMARY is that if you've dragged the mouse over some text it's probably because you want to do something with it. So even if you don't bother to do a copy, any text you select automatically turns up in PRIMARY.

In order for NTrigue to be able export the contents of the Windows NT pasteboard, the installation routine puts a special utility called NTutil into the Windows Startup folder. NTutil automatically copies the contents of the Windows clipboard into PRIMARY, which is hardly logical as it can only arrive there after an explicit copy. On the other hand, the Cub'X people have used CUT_BUFFER0 as the transfer buffer between X and NeXTStep. This is a sensible choice because NeXTStep uses copy and paste extensively and, like Windows, doesn't use the PRIMARY style of short cut.

So there's the problem: text copied from NTrigue moves into the X window's PRIMARY buffer, but text copied into NeXTStep is expected to arrive from CUT_BUFFER0. The train turns up on the wrong platform.

My roundabout solution was to start up an X editor under Cub'X (which comes with a full suite of the standard X mini-clients compiled for NeXT). I'd copy from a Windows app running under NTrigue, dump the text into the X editor by clicking the right mouse button, then select the text, copy it, (which gets it into CUT-BUFFER0) and thus be able to get it into NeXTStep. There's got to be a better way, I thought, having done this a couple of times. Happily, there is, but more about this next month, and the new developments on the Caldera front. ■

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Mixed marriage

Apple's Copland and IBM's PowerPC-based OS are both floating free so how about a relationship, proposes Chris Bidmead. Plus, NTRigue and NeXT.

Apple doesn't get much space in this column, for the reason that its venerable co-operative multitasking OS (at heart, on a par with Windows 3.1) doesn't in my view qualify as a modern 32-bit operating system.

The heart of the matter

I've certainly been looking forward to Copland — in fact there's an Apple PowerMac here waiting to run it. Last year we heard that the launch of this microkernel-based truly pre-emptive multitasking operating system had been deferred until the middle of this year.

In January, amid the financial crisis at Apple that finally shed Michael Spindler, a leaked internal memo from Apple's Senior VP, David Nagel, revealed that the company was freezing all new spending on research and development. Okay, this was qualified by the word "temporarily", and in

any case, we reassured ourselves, Copland as a long-running development project probably didn't qualify as "new spending". And Apple's PR people were keen to point out that the new CEO, Gilbert Amelio, was no mere bean counter and wouldn't be operating a slash-and-burn policy to get Apple back into shape.

I very much hoped that this would be true. Apple, as a company and as a computing environment, is different. And if this column is about anything, it is about exploring the merit and the merriment of just these kinds of differences. Different 32-bit multitasking operating systems can mix and match in a way that the rigid old 8- and 16-bit operating systems never could. I want healthy plurality.

But is Apple's heart still in the game? Earlier this year I had a long chat with Nick Graves, Apple's European Marketing Manager, and asked him about the slippage of Copland, hoping to hear that it was now steaming ahead on all cylinders. Instead, I got some intricate foot-work. "We never announced a date, so when people say

Copland has 'slipped', that is really a comment about perception," he told me. Ah, I see. "Copland is probably the largest system software project ever undertaken in the personal computer industry," he continued, "a massive, massive project, so clearly the timescales are long."

This really wasn't what I wanted to hear. When it comes to "massive, massive projects" Apple has already been there, done that, got the T-shirt. In the mid-eighties Apple got caught up in the development of "Pink", the object-orientated buzz-word operating system to end all operating systems, which was so slow coming and such a drain on resources that it nearly put paid to the entire company. And so it would if the then CEO, John Sculley, hadn't managed to palm Pink off onto IBM as part of the joint venture they set up together.

Pink became Taligent, fizzled down from a be-all, end-all operating system to just another application development environment, changed its name (unmemorably) to CommonPoint, got absorbed into IBM, and, er, is now just a tiny footnote in the history of computing. And here was Nick Graves telling me that Copland was bigger than Taligent.

"The man-hours associated with Copland are far greater than something like Taligent," insisted Graves. "I would stake my life on that." Interesting choice of words, Nick, but it's clear that Copland is more than mere vapourware.

"Currently, we have what we call the 'Developer Tools' release of Copland out with people who, er, write developer tools," he told me. "There will be a wide developer release this spring. Then through the middle of the year there will be a release into customers' hands. We're calling it 'the customer evaluation release'— with such a big project it's very difficult to talk about alphas and betas."

What I wanted to know was, would Copland be out, released, finished, this year. And what he was telling me, translated into English, was "No".

Gilbert Amelio says it more straight-

forwardly. He told Wall Street analysts that Copland will be "a 1997 event" — so now we know.

Or do we? It seems possible to me that Copland may not turn out to be an event at all. A day or two before Amelio "clarified" the Copland schedule, the news came through that David Nagel had left the company. Nagel was in charge of R&D and I'm very concerned that this might mean the "temporary freeze" in that department is destined to become permafrost. Frankly, I think without Copland, or something very much like it, Apple is going to end up as a toymaker.

Meeting Merlin

As I write I am due to go to Nashville, Tennessee, to spend a week with IBM when the new version of OS/2, codenamed

Merlin, is due to be unveiled.

At the moment, the only thing I know about Merlin is that it's not the cross-platform, microkernel-based OS/2 we were promised by IBM last year. Merlin is Intel-only and like Warp, it's predecessor, stays tight and efficient by avoiding the message-passing interfaces required by micro-kernel architecture.

There is a microkernel OS/2 in existence: it's the PowerPC version which was quietly released last December. IBM has said it will leave it alone for a year and then, if there's a market for it, the company will consider further development. This is a bit like leaving a weakling child on a mountain-top in winter and saying you'll drop round at the same time next year with some food and blankets — if they're still needed.

Codenamed Merlin, IBM's newest OS/2 will be out sometime soon, voice enabled, and with a different look and feel

Running NeXTStep on a 486

I'm conscious that NeXTStep is a luxury not everyone can afford, so I've been writing about it with some caution. I love it, but then, I don't have to pay for the hardware and software. If I did, Linux would probably be my OS of choice. But hardware prices are coming down and today's so-called "entry-level" machine, at least as far as the processor is concerned, actually has a higher spec than the 100MHz 486 Canon object.station I have here on my network, running NeXTStep. Perhaps that's why I'm getting so many queries from readers now about NeXT. One such comes from Dominic Hopton (dombo@darkhos.demon.co.uk). He has a 486DX2 66MHz with 16Mb of RAM and wants to know if he can run NeXTStep on it. Here's the full spec:
● 16Mb RAM
● Adaptec 1542cf SCSI card
● 2 x 500Mb SCSI Seagate hard drives
● SoundBlaster 16
● NEC Atapi 1.2 Compatible CD-ROM
● USR V.34 modem
● Cirrus Logic 5426 VLB Gfx card with 1Mb, upgradable to 2M.
● AMI BIOS
● 14in, 1152 x 864 refresh rate monitor

NeXTStep is broadening its hardware base all the time as new drivers come on line. To get the latest news on this, I checked with Paul Lynch of P&L Systems who's been helping me set up my own NeXTStep installation. Here's what Paul calls his generic-type answer, because obviously it's hard to be too specific when you don't have all the details:

Memory: 16Mb is okay. "You'll get noticeable swapping, but it'll run," says Paul. "Not as bad as Windows with 4Mb. About the same as NT with 16Mb. Commercial customers usually have 32Mb as a minimum."

Paul considers that the processor, the Adaptec card, the SoundBlaster and the hard drives are all great. Personally, I'd have thought the processor a touch on the slow side.

The NEC Atapi 1.2 Compatible CD-ROM? Paul tells me that NEC isn't on the supported list, which means that it may or may not work. "Atapi CD-ROMs can be made to work, although you will need to ftp some driver disks from NeXT before you can even attempt an install."

The USR V.34 modem is fine, but only for data, as it's not supported by any of the fax software. The Cirrus Logic 5426 VLB Gfx card is okay-ish, says Paul. "There is a GD542x driver: this supports 2-bit greyscale, possibly up to 800 x 600. SoftPC (the DOS emulator) and NEXTIME (the movie module) don't work on it properly. You really want 1,024 x 768 16-bit colour to feel happy."

The AMI BIOS should be no problem. The monitor is probably a little small, thinks Paul. "Most people use 17in as a minimum."

So, some hardware swaps might be necessary but on the whole NeXTStep will run. Personally, I'd go for 32Mb. On top of that there's the price of the NeXTStep operating system, which, as I say, isn't cheap. NeXTStep is £530 plus delivery and VAT. Academic pricing is £220 plus delivery and VAT.
● *If anyone wants to follow this up, they can talk to Paul Lynch directly on 01494 432422.*

Stuart is a shareware application written for NeXTStep, and a great example of how old-style command-line computing can work with modern drag-and-drop

See what I'm thinking? Here's IBM with this microkernel, PowerPC-based OS for which it has no market and doesn't know what to do with anyway. And there's Apple, with an installed base of something like a couple of million PowerPC machines, struggling to bring down to earth a "massive, massive" operating system project that seems to be stalling in mid-air.

As it stands, OS/2 is not what Apple users want. The OS/2 interface, already Mac-like, could probably easily be fixed and would bring much useful object-orientated, drag'n'drop magic to the party.

The big problem with OS/2 is that it won't run Mac users' old apps. But microkernel operating systems are designed to make backward compatibility like this easier to implement. If Apple and IBM aren't sick of trying to work together after the Taligent fiasco, it's just possible there might be some spark to be struck here.

NEC to the rescue

In my previous column I just managed to squeeze in a screenshot of NTrigue, which I finally got working. I blamed Windows NT for the hold up because its "rsh doesn't work in a way consistent with Unix".

I apologise to Windows NT. The problem was at my end. The version of NTrigue that Insignia Solutions had sent me included printed instructions that got you as far as installing the software, but stopped short of actually telling you how to set up Windows sessions so they can magically pop up on every workstation on your network capable of running the X Window System. Eventually, I stumbled on a .PDF file on the CD-ROM which took me though the rest of it.

I did promise more on NTrigue this month but in the event I deferred work on it for a week while I waited for the delivery of a new Pentium from NEC. It's a Power-Mate V100 with a 1Gb hard disk — a modest enough spec these days but a giant of a machine compared with my network of ageing 486s.

I'd first installed NTrigue on a 25MHz Mitac with 16Mb RAM, and was pleased to see it working at all. In fact it's quite usable, bearing in mind that I'm the only user on this network. But with the Power-Mate, I hope to see some real speed. I say this, because just as I was setting up the PowerMate on the network the news came through from Insignia Solutions that version 1.1 of NTrigue was on its way. It seemed sensible to wait for that, particularly as the installation of NTrigue involves a fairly convoluted ritual with licence numbers.

You install it, run a validation program which provides you with a magic number derived from the machine and the date and then fax that number to Insignia, which then faxes you back another number to unlock the software. The catch is that you have to enter the number the same day you get it or it becomes invalid.

So hopefully, next month, I'll have NTrigue 1.1 safely installed on the Power-Mate, and we can take it from there.

NeXT: the guts under the GUI

The great thing about NeXT as far as this column is concerned is that underneath it's a reference-quality Unix, while on top it's a beautiful object-orientated interface that's more than just a pretty face.

Here's a great example of how the interface and the underlying operating system marry up. The screenshot alongside shows a shareware application written by NeXTStep veteran, Scott Hess. It's called "Stuart".

Essentially, it's just a terminal window along the lines of xterm or the Terminal app that comes as standard with every NeXT machine. A terminal window like this emulates the old DEC VT100 dumb boxes that used to be the most common way of communicating with computers. It's what you use on an operating system like NeXTStep or Linux when you want to punch your way through the GUI to get to the guts and do some raw character-based computing.

Stuart is no dumb terminal, though. Optionally you can give it a "shelf": a subclass of the shelf in the NeXT WorkPlace Manager, also used in the Librarian and the Finder. Icons of files or folders can be dragged from the WorkPlace Manager and dropped onto Scott Hess's shelf at any time while you work inside the terminal.

Why would you want to do this? Well, one of the boring things I find when working in char-based Unix is switching around between various directories. Okay, I know there are some nifty shortcuts to do this in shells like csh and bash — one day I really will learn them. Meanwhile, on the NeXT machine I just pick up a directory icon, drop it onto the terminal window and it automatically produces the cd <new directory> on the command line.

This odd meeting of old-style computing and modern drag-and-drop happens elsewhere in NeXTStep, too. Any time an application pops up, the standard file selection panel allows you to choose a filename for loading or saving: you can pick up a directory or file icon and just drop it on the panel, whereupon the appropriate entry appears in the text entry window. ■