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NeXT at Large Sites: The Maintenance Perspective

by Nick Christopher

Often one reads evaluations of what a NeXT can or cannot do. Or, articles about how well NeXT's do some task. These articles tend to focus on a NeXT. By that I mean a single machine, or software on a single machine. You will now and again see an article about how a NeXT works with brand-X computer – but you rarely see an article about how NeXTs work together. That's what this article is about: what maintenance issues crop up when you put a bunch of NeXTs together and ask them to do some interpersonal computing.

My computer experience (much of it non-NeXT) has been predominantly at sites with large installed bases of computers, always in the hundreds, sometimes in the thousands. Often, as a programmer in a leading edge environment, I have been called on to do system administration because a company has not yet established support systems for the new hardware. Over time I have become a fairly crafty UNIX system administrator (SA). Since system administration is not my primary trade, my aim has always been to keep the task simple – set up systems that are easy to maintain so I can still get my programming done. That's how I have approached system administration on the NeXT. I have looked for ways to set up individual computers and the network as a whole so that they are effective for the users but easy to maintain. If a solution to a system problem requires too much long-term maintenance then I don't consider it a solution. Following, then, are some of the problems and solutions I have found in dealing with large groups of NeXTs (say, over fifteen).

NetInfo

Without question the first topic that a SA on a NeXT has to deal with is NetInfo. While some people might argue this point, I think that information management is the bulk of a UNIX SA's work. The information that needs to be maintained in a UNIX system is distributed around the network, somewhat unevenly amongst the machines, in a series of loosely related flat files. NetInfo takes the information out of this scattered suite of ASCII files and replaces them with a hierarchical, menu-driven application to maintain system/network information. Conceptually it's a panacea. But there seems to me to be two areas where NetInfo falls down: data integrity and crossing routers.

The data integrity problem is multifaceted. The foremost problem is that if you slip up you can do things to a NetInfo database that are very hard, or even impossible, to undo. NetInfo has no built-in backup system, and if you damage the database you had better hope you have backed it up because NetInfo provides no tools to help you correctly restore information. This can really be a problem if you manage to get a loop in the database hierarchy – there is a documented way to recover from this error but it is arcane.

Another integrity issue is that most information is either global (domain-wide) or local (machine-wide). In a few cases, but not all, there is no provision for global data to have a local override. By this I mean that if you want all your machines save one to have access to a certain disk, you must copy that information to every machine except the one in question. You should instead be able to just override the global directive on specific machines.

Data integrity can also be compromised by a rogue NetInfo clone. I was at one site where a certain NetInfo clone broke away from the master and for weeks was providing old network information to whoever would listen; quite a problem.

But by far the biggest data integrity issue with NetInfo is that the NetInfo configuration in which NeXTs are shipped uses client-side security. Client-side security means that the security is implemented in the various programs that access NetInfo, not in NetInfo itself. Programs like *PrintManager* allow users to change the configuration of their local printer without restriction really bother me — system configuration should be the sole domain of the SA. NeXT does provide a document on security that shows you how to clean up these various holes, but I would really prefer that they either shipped the machines secure, or offered a script that took all of the steps their documentation suggested.

Another NetInfo problem is routers. A router is a piece of hardware used to direct traffic from one network to another, traditionally between two different types of networks. But they can also be used to segment a network into smaller subnets. Large sites tend to rely heavily on routers to create big networks where local traffic won't affect the entire network. NetInfo has a problem with this partitioning of networks, because it works via a broadcast system: NetInfo conversations are based on shouting matches that everyone on the network can hear. Routers, configured the way large sites often do, don't pass these screams from one network to the next (that's how they keep local traffic local). Information can only cross a router if it is specifically directed to a host on the other side. I have instructions that are supposed to allow NetInfo to work across a router, but it has never worked correctly, and at on site a NeXT system engineer told me that, given the way the network and routers were set up, NetInfo just plain could not work.

One aspect that has amazed me about NetInfo though – particularly since everyone warned me to the contrary – is how well it cooperates with Sun's *Network Information Service* (NIS). NIS is to Sun what NetInfo is to the NeXT, so if your site has a lot of Suns, odds are they are dependant on NIS. NetInfo and the NeXT are quite good-natured about using NIS as a backup or replacement for NetInfo. I did find once when NIS was maintaining too much information, loading that information into NetInfo became a very slow task (I have since learned some hints that might help...). So sites that rely heavily on NIS might find keeping NetInfo in sync may not be possible. Fortunately, if you can't keep NetInfo in sync, and you need NIS, you can pare NetInfo to a minimum and go mostly with NIS. You lose NetInfo but things still work.

Basically, for a small site or in simple cases, NetInfo is much simpler and much more orderly than traditional administration methods – no question about it. A person with no UNIX background can be taught to successfully navigate NetInfo in a short time, which is not true of standard UNIX administrative methods. And in some ways NetInfo is more fault-tolerant than its contemporaries (NetInfo's back up servers, known as clones, actually do their job when the

master fails, unlike NIS slaves). I would say that overall NetInfo is a big improvement. But it has a few holes, and as a site grows in size and complexity the problems with NetInfo get worse.

File Sharing

Another key aspect of NeXTs working together is network file sharing. The de facto standard today for network file sharing in a UNIX environment is the Network File System (NFS). NFS was developed by Sun to transparently allow a machine to access another machine's disk as though it where its own. NFS is available on many architectures: on the NeXT it is no different than on any other platform, which is to say it is fully compatible, bugs and all! That's right: NeXT is amongst a shrinking group of vendors that have left the bugs in NFS. I have seen evidence of at least two, one where locking files fails without reporting an error, and the other allowing the creation of files of zero size when you are not supposed to be able to write at all.

This second bug has a particularly nasty side effect at a large site. One trick you quickly learn when administering too many machines is to centralize common software onto a "disk farm" (i.e., a machine whose only role in life is to distribute disk space). By keeping all the shared apps in one spot, installation, distribution and upgrades become trivial because you know exactly where to go, without hunting around the network for stray copies. But once you've put all your eggs in one basket, you have to take steps to make that basket as safe as possible.

I like to have that disk accessible as read-only by other machines. This makes sense since you should only be running (i.e., reading) applications, not writing to them. By making this disk read-only I no longer worry about file permissions – no one can damage the disk in any way. Unfortunately, an NFS bug allows you to create zero-size files even when you are not allowed to write at all makes this tactic less effective. Not only can you no longer be certain that people will not write to the disk, but a subtle side effect prevents you from logging into the Workspace as root on any machine accessing the disk. Root can still log into a dumb terminal, but if you try to log into the Workspace you get kicked out with a SIGNAL 10 because some file is zeroed out that should not ever have been touched!

To its credit, NeXT has done things to make NFS more usable. Remote disks often are needed for one of two reasons. You may need some piece of a disk on another machine on a permanent basis, to for instance hold all your network's third-party applications. Or you need a disk very briefly, just to look at, say, a memo a co-worker wrote up. The first example is traditionally very easy to handle — you make an entry in a static file (or NetInfo on the NeXT) and from then on your machine will have access to the disk you need. In the second example, occasional access — to an automounted disk as it is referred to — is a little more tricky. Accessing an NFS disk generates a lot of network traffic, so you don't want every machine accessing every disk. What you want is to have a disk available upon request and to release it when it is no longer needed. NFS can do this on any platform, but it is made particularly easy on the NeXT. On most other vendors' machines, you must either state that all shared disks are available to all people all of the time, or else generate elaborate maps explaining which one is accessible and by whom. On the NeXT, the information is extracted from NetInfo with very little work on your part – a much simpler approach.

The Developers and Vendors

The problems of file sharing are not all to be blamed on NeXT. Third-party developers and vendors to the NeXT community don't seem to be aware of problems associated with large sites, either. Particular products such as *SoftPC* and *Executor-MSW* hide subdirectories within their .app directories. These subdirectories must be writable in order to store data. This means that either everybody gets their own personal copy of the product, or people will be tampering with each other's files. Further, these products cannot be placed on a read-only disk.

Several products also have licensing schemes that are restrictive for large sites. *FrameMaker* and *SoftPC* both are licensed per copy. This means that if two people want to be able to use them, you must have two separate copies. Frame does not enforce this, but I mention it because on other platforms Frame has a better scheme known as floating licenses. In this scheme, a pool of licenses is owned by the site and each execution of the application binds to one: if you have five licenses, five people can run the application. Which copy they run does not matter; all versions on a network work from the same pool of licenses. Applications on the NeXT should offer such a floating-license scheme.

Another nuisance is caused by applications that install supporting files on the disk of the local workstation. These files must be copied to every machine you wish to run the application; otherwise it fails to run. [FloppyWorks, for example, puts Macintosh disk drivers into /usr/filesystems –Ed.] These little lost files cannot easily be stored in a central location, and so you are forced to make changes to each and every machine. It seems that developers still think in terms of single machines, but perhaps as the NeXT community swells, they will become more aware.

System Configurations

With system configuration, NeXT has done a mixed job. If you need to do much beyond the simplest run-of-the-mill installation, you may be in trouble. The first problem is the way NeXT lays out the disk: they don't cleanly separate the different classes of software, shared and local, from each other. What does this mean? Well, the software that comprises the User Edition and that which makes up the Extended Addition are fully intermingled with each other. Consequently, to turn a User Edition workstation into an Extended Edition workstation by sharing files with an existing Extended Edition machine involves weaving quite a patchwork of linked files. Since it is legal to extend a User Edition in this way, it would be a good way to save money at a large site if setting it up were not such a problem.

Also, certain resources which really should be in a shared area, such as the EMACS editor, are in places local to each machine. Not only is this a waste of disk space on each and every machine, but when you need to customize EMACS, you need to go from machine to machine rather than work in a central location.

One configuration issue which NeXT seems to ignore is subdividing disks. Traditional UNIX systems separate their disk space into partitions. There are several reasons to do this. NFS's finest level of "security granularity" is a partition, so if you want to allow everyone access to one area of your machine's disk space but only, say your boss, access to another, the two areas must be in separate partitions. Another useful feature of partitions is that data cannot cross a partition boundary. That might sound like an awful restriction, but in fact it is a great boon. Files for databases or developers can be put in their own partition, protecting the rest of the disk from their activities (or crashes).

Unfortunately, NeXT does not believe in partitions – they like disks to be one big chunk, or at most two. If you want to divide your disk into more partitions, it requires a fair degree of skill on your part. This is particularly annoying at a large site where you want to break up a disk a little more to permit greater flexibility for NFS and achieve greater reliability by setting aside a safe place for swap space (swap space is the portion of the disk that UNIX uses to create virtual memory – if you run out of swap space your machine can freeze up). Don't get me wrong: it can be done on a NeXT, and it's not much harder than on another platform; but NeXT has improved so much else with respect to disk maintenance and system administration that this problem really sticks out.

The Right Stuff

What has NeXT done right? Setting up a machine for simple use is just that – simple. NeXTs come with the software already on the disk, and hooking one up to a network is as easy as plugging the machine in. Also, assuming your NetInfo server is set up for automatic host addition, the job of adding the information associated with a new machine into NetInfo is very simple. You plug the

machine in, give it a name, and you're done. NetInfo does the rest. That is a pleasant change compared to what you go through with many other vendors; workstations, where adding a new machine involves a fair amount of administrative work.

Another bonus of this system is that the resulting configuration is not just saved locally on the new machine, but on the network's NetInfo server, so administrative maintenance can be done centrally there.

Conversion of the Dreaded High Maintenance User

One area where I give the NeXT a perfect five stars rating is with High Maintenance Users (HMUs): people who are highly dependant on the computer to do their work each and every day, but know absolutely nothing about computers or their operation. When system administration is not your primary job, the one thing you dread is an HMU. But when you have a large group of computers, you likely have a wide range of users, from computer scientist to secretary, and some of them will be HMUs. No matter how well-intentioned or smart an HMU is, they still require a lot of training and help, and if you are basically at a site to program, the time spent training is maddening after a while.

The NeXT is great for this type of user. Why? Well, when you double-click a file on the NeXT, a program to manipulate that file is opened. On most platforms that's not the case. When I administered Suns, everything had to be explained: if a user needed to use *FrameMaker*, even before you pointed them at the printed documentation, you had to tell them where Frame was stored and how to start it. On the NeXT a user either double-clicks *FrameMaker* or a .frame file and they're in.

And the documentation is online and indexed! While this seems like a minor difference, in fact it helps to cultivate an entirely different attitude in the users. If a Sun user wants to work with graphics for the first time, they would track down an SA and ask what tools are available to edit images and how to run them. On the NeXT, a user who has used the NeXT for a while would probably just double-click an image and see what happens – or use cmd-3 to see what applications are available. If they are not documentation haters, they can even look at the online manuals for the applications they have just found. They never leave their desk, they never call on the SA. I have found that the ratio of self-reliant to dependent NeXT users is much higher then on any other platform I have dealt with. The NeXT is more elegant, fun, and simpler; people respond. If you can eliminate the traffic of just a few HMUs on a daily basis, you can get back a good hour or so of each day!

All in All....

I think the deficiencies of the NeXT in a group environment can be inferred from a comment I heard by a NeXT employee. I was badgering Kristofer Younger, a NeXT systems engineer, about the company's stance with respect to some rather technical UNIX software. I felt that NeXT, which lacks this software, should provide it since it is important to the UNIX community. He lost patience and said "I wish we had never said the NeXT ran UNIX!" What does this comment say to me? NeXT is pretty much a UNIX machine. UNIX has real benefits at a large site. But NeXT's goal was not to make a better UNIX box. NeXT had other goals in mind, and those goals centered much more around how an individual used a computer. Sometimes to meet the goals for the individual, they lost sight of the needs of groups. And NeXT still is approaching their machine with that attitude.

As a whole, though, the NeXT is a lot more than a UNIX box. While the sum rating of the tools specifically for an SA might not be perfect, it's better than any other platform I have worked on. And regardless of how good or bad the tools of system administration are on the NeXT, you must realize that NeXT has empowered the common user (remember that Apple ad?), reducing the support the user requires. That reduction leaves the SA to do the work that needs doing. And that has made managing large groups of NeXTs a job I am happy to do.

Meetings (recorded by Ken Biller)

General Meeting, 3/11/92:

Ed Wright presented *Simon Says*, a voice recognition program from HSD. Marble Associates demonstrated an interesting decision-support tool developed by them for use in their consulting practice, called *Decision Builder*. GUN's license for its review copy of *SoftPC* was sold by auction for a landmark $210! Volunteers were solicited to assist with preparations for the future GUN-sponsored NYMUG meeting.

Minutes of GUN's February Board meeting held 2/17/92 at the Star Diner at 7:00pm:

1) State of the network: As of the present moment, GUN's Wide Area Network, which will offer subscribers Internet access (including email, NEWS, and ftp services), is ready except for a connection to PSI, for which we are waiting. Also, we need to secure at least one more reconditioned 660 meg. hard disk, in order to mirror the archives at gun.com.

2) Non-member aliases: It was agreed that all non-member aliases would be deleted from the gun-announce list, and from gun.com.

3) State of sales: So far, 4 Telebit T3000 modems have been sold, and we will be looking into the possibility of expanding sales of the modems into the European market.

4) State of finances: Our finances are in good shape.

5) State of organization: Tim Reed is currently maintaining a Sybase database with our membership information. It is necessary for the organization to reconcile its mailing list with its list of paid members.

6) Pulled From the Net: It was decided that *Pulled From the Net* will be included in GUN's mailings as an insert in the newsletter, but not sent out with our newsletter on the Internet.

7) GUN BULLETin: Options were considered for translating the newsletter into a multimedia format, or having Skylee Press produce some of the contents. Both options were deferred for discussion at some future time, and so for now the newsletter will retain its current format.

8) Things we need to acquire: Accounting services, reconditioned hard disks, and a tape backup unit.

9) T-Shirts: We will be speaking with several artists who might be interested in submitting designs for GUN t-shirts and a new GUN logo.

10) "About GUN": Jim Cornacchia will pursue production of a glossy "About GUN" flyer.

11) NYMUG relations: Ken Biller will attend NYMUG's (NY Macintosh Users' Group) Feb. board meeting for discussions of an "Introduction to NeXT" event that GUN will present to NYMUG members.

12) Discounts: Ken Biller and Ed Wright will prepare a list of specific software and hardware discounts for GUN to offer its members.

13) Board Meeting guests: GUN will adopt the current BANG practice of inviting members to board meetings, on a limited basis.

14) *Framemaker* license: We will try to get a GUN *Framemaker* license.

15) Bylaws: A set of bylaws were reviewed and approved with the addition of some revisions.

16) Policy on software: GUN's policy on group-acquired software will be to retain the license or raffle it to members at a general meeting.

17) Future Meetings: At the March meeting, Paul Murphy will present GUN's network, and Marble Software Products will present Decision Builder. Also, at a future meeting Nicholas Christopher will present voice recognition software from HSD.

Minutes of GUN's March Board meeting held 3/11/92:

1) T-shirts: The design for GUN's first series of t-shirts was ratified. Four different colored t-shirts will be manufactured, with an initial order for four dozen. Additional orders will be placed as warranted.

2) State of the network: The network hardware is in place, and the connection from PSI is ready. All that needs to be completed is the software setup, which will be done by Paul Murphy as his time permits.

3) Bylaws: Paul has incorporated changes requested by the board into GUN's new bylaws.

4) FEmail: GUN will offer a fax-email service so users without access to email can receive selected GUN mailings. The service will be made possible with the use of a FEmail manager application under development by Marble, and will cost $5/year.

5) Newsletter: Robb Allan will write an article on electromagnetic emissions from NeXT monitors.. Jim Cornacchia will review *Framemaker 3.0*, Paul Murphy and Tim Reed will evaluate four utilities from Rightbrain Software, and Ken Biller will review *Concurrence*.

6) Workplace Manager: This database of skilled NeXT professionals for hire in the New York Metro area is currently under development.

7) NYMUG: A specific agenda for a GUN-sponsored NYMUG meeting tailored to the interests of the Macintosh community will be submitted to NeXT. Ken Biller will coordinate this event, and continue to act as the primary contact with the NYMUG board.

8) Future meetings: In April, Marble will present *Teleconnect* and the GUN network; Objective Technologies will present *OTProvide* and *SQL Buddy*; and Nicholas Christopher will present his *One-Person Shop* personal accounting package. Ken Biller will confirm DIT to present *OnDuty* in May, and Nick will talk to VISUS about presenting their voice recognition software.

NeXT In The News

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by Eric Rosenthal

Elaine Santangelo, User Group News, *BCS Update*, January 1992, p. 21. Boston Computer Society NeXT group taken over by David Pollak.

James N. Engel, What's in a 4GL? (letter), *DBMS*, January 1992, p. 6. "I have recently been developing applications on a NeXT computer using Objective-C. With NeXT's rich set of objects and interactive interface builder I can build comprehensive applications with a small amount of code and have more functionality than what is possible with a 4GL (at least the ones I've seen)."

Earl Allen, The Zen of Black Holes (letter), *Network Computing,* January 1992, pp. 6, 8. Manager of heterogenous network including NeXTs praises magazine.

New Sponsors And Affiliates (item in Association News), *UniForum Monthly*, January 1992, p. 14. NeXT Computer, Inc. becomes corporate sponsor of UniForum.

Philip J. Gill, What Is Open Systems?, *UniForum Monthly*, January 1992, pp. 22-24, 26, 28. "Steve Jobs, president and founder of NeXT Computer of Redwood City, CA, credits customers with advancing the concept of open systems in his firm. Our definition of "open" has evolved from what customers tell us they need: systems that allow collaboration and data exchange in a heterogeneous computing environment. Platforms that are open support this kind of interoperability between heterogeneous systems."

Doug Millison, Animating The Creative Process, *UniForum Monthly*, January 1992, pp. 30-32, 34, 36, 38. Mentions the William Morris Agency's s network of 275 NeXT workstations, which are mainly used for electronic mail. *Word* processors and spreadsheets are also used, and more ambitious custom development is planned.

Untitled, *Computerworld*, January 6, 1992, p. 32. Product announcement for Pencom Software's Co-Xist, Release 2.1.1, which adds color and cut-and-paste to its full client/server support for X Window Version X11R4.

John Dodge, Heeding the Call for Short-Term Action and Long-Term Planning, *PC Week*, January 6, 1992, p. 3. "Steve Jobs and other prestigious executives have argued for a long-term American industrial policy?."

William Zachmann, 1991 Saw Promises and Missed Deadlines Aplenty, *PC Week*, January 6, 1992, p. 52. In the UNIX market, all the "great new stuff to come" was delayed until 1992, including "Steve Jobs' latest NeXT rabbit from the hat, NeXT Step for IBM."

Nico Krohn and Steven Burke, NeXT Interface Upgrade Wins Users' Applause, *PC Week*, January 13, p. 61. Users praised the increased interoperability of NeXTstep 3.0, due to be announced in January with a database kit and improved NetWare and EtherTalk support.

Andrew Pollack, Compaq and Dell May Use the NeXTstep Operating System, *The New York Times*, January 1 4, 1992, p. D4. Compaq and Dell are discussing support of NeXTstep, and agreements could be announced on January 22 at NeXTWORLD in conjunction with NeXT's announcement of a version of NeXTstep for the 486. NeXT is expected to sell this version as a retail product, but is also seeking for computer manufacturers to offer the software. Compaq's involvement might affect its involvement with the Advanced Computing Environment. NeXT is also expected to announce new computer models, a color printer, and a new version of NeXTstep. NeXT's 1991 sales are estimated to have been $130 million, about five times those in 1990 but less than the $200 million Steven P. Jobs had predicted.

Glover, Robert, A good opportunity (letter), *Computerworld*, January 20, 1992, p. 24. "If Bill Gates or Philippe Kahn or Steven Jobs, etc., had a relative who was a paraplegic, certainly Windows NT or Borland's IDE or NeXT would have a paraplegic mode."

What's NeXT? (item in Inside Lines), *Computerworld*, January 20, 1992, p. 114. Steve Jobs's keynote address at NeXTWORLD will announce NeXTstep for the Intel 486. Availability for IBM-compatible machines will make NeXT attractive for PC owners.

Stewart Alsop, Sometimes you can do without the bells and whistles, *InfoWorld*, January 20, 1992, p. 4. "We were tempted to rant and rave about UNIX this week, since we thought it might be timely with UniForum and NeXTWORLD Expo happening side by side. But quite frankly, we are bored with the war between PCs and workstations."

Bert Glass, Information sources abound for the brave UNIX scout, *InfoWorld*, January 20, 1992, p. S68. "Interfaces such as NeXTstep and Santa Cruz Operation's Open Desktop have made it unnecessary to deal with UNIX commands most of the time." Also mentions three UNIX

magazines, including NeXTWORLD (and that two of the three are affiliated with InfoWorld).

Kris Coale and Cate Corcoran, Development issues have changed, Jobs says, *InfoWorld*, January 20, 1992, p. 126. Interview with Steve Jobs. Corporations are now increasing profits by rapidly developing their custom applications on NeXT. Microsoft's NT is not object-oriented, but Apple and IBM are correct to develop object-oriented systems, the "future of our industry." The layers above the operating system will be "what matters in the `90s." UNIX is only a fraction of what a NeXTstep programmer sees.

Untitled item in Who's News, *The Wall Street Journal*, January 20, 1992, p. B8. Marcel Gani, formerly director of finance and treasurer at Cypress Semiconductor and director of finance and administration at Intel, succeeds Susan Kelly Barnes as chief financial officer of NeXT Computer Inc.

NeXT Computer's Revenues, *The New York Times*, January 23, 1994, p. D22. NeXT Computer Inc. reported at NeXTWORLD that 1991 revenues were $127.5 million, compared to $28 million in 1990. Steven P. Jobs said the company expects to be profitable this year, but not whether it already is profitable. Next also announced a version of NeXTstep for the 486 due in the third quarter for $995, systems using faster 68040s, a color printer manufactured by Canon for $3,495, and a new version of NeXTstep. Compaq and Dell demonstrated NeXTstep at NeXTWORLD, but no distribution agreements were announced.

Stephen Kreider Yoder, NeXT's Software Lets PCs Mimic Its Workstations, *The Wall Street Journal*, January 23, 1992, p. B8. NeXT Inc. announces NeXTstep 486, a version of its software for the Intel 486, due in the third quarter for $995. Faster and lower-cost workstations and a new version of NeXTstep due in the second quarter were also announced. Sales in 1991 were $127 million, up from $28 million in 1990.

James Daly, NeXT makes big play for key Intel desktops, *Computerworld*, January 27, 1992, p. 133. Steven Jobs announces NeXTstep 486 at NeXTWORLD Expo, with the same features as NeXTstep 3.0. Although the software will cost $995, but will have steep hardware requirements. Developers say it is too early to judge how easy i t will be to port MS-DOS applications to NeXTstep 486.

Cate Corcoran, NeXT debuts 486 version of NeXTstep, *InfoWorld*, January 27, 1992, p. 3. NeXT announces 486 version of NeXTstep and signed OEM agreements to be disclosed later. NeXTstep 3.0 will include tools for developing three-dimensional graphics and database applications, PostScript Level 2, 3-D Renderman, and Pantone color.

Robert X. Cringely, (In)Taligent? (item in Notes from the Field: Sorry, John, but if we're not having fun, Apple can't have any either), *InfoWorld*, January 27, 1992, p. 102. A top programmer has left the Pink project for a similar object-oriented programming project at NeXT.

Mitch Ratcliffe, UNIX competitors divvy up GUI pie at UniForum `92, *MacWEEK*, January 27, 1992, pp. 1, 92. "[First Boston analyst Paul] Johnson said he believes NeXT Inc. and Microsoft stand the best chance for success in the OS war. NeXT, in the hands of less of an egomaniac (than CEO Steve Jobs) could be a big contender in the UNIX world, he said."

Daniel Farber, Jobs makes NeXT move to 486 CPUs, *MacWEEK*, January 27, 1992, p. 92. At NeXTWORLD Expo, Steve Jobs announces NeXTstep 486, due in the third quarter for $995 (developer's version $2,495); NeXTstep 3.0, due this spring; systems based on the 33-MHz 68040; and a color printer. He also said Taligent has validated NeXT's direction and that the company will concentrate on competing against Sun Microsystems.

Peter Coffee, Mathematica for Windows Greater Than DOS Version, *PC Week*, January 27, 1992, pp. 33, 36. Wolfram Research's Mathematica for Windows adds the "superb notebook user interface, long available on both the NeXT and Macintosh platforms."

Mark L. Van Name and Bill Catchings, NeXT, X Windows Differ in Graphic Focus, *PC Week*, January 27, 1992, p. 95. The original focus of X Windows, the display standard being adopted by most UNIX vendors, was distributed processing. NeXT took a "bottom-up whole-system approach" with Display PostScript.

Vance McCarthy, NeXT Makes Play for Corporate Users, *PC Week*, January 27, 1992, pp. 137, 139. NeXTstep 486, 33-MHz workstations, a color printer, and database and graphics tools for interoperability were announced. Over the last six months, there has been a "refocusing" on corporate and government users.

Frederic E. Davis, OS Portability Breaks Through Hardware Barriers, *PC Week*, January 27, 1992, p. 150. NeXTstep 486 is an example of an "evolutionary leap" in which computing platforms will be defined by operating systems and not hardware. Compaq and Dell may offer NeXTstep in order to differentiate their products. NeXTstep's "sophistication and capabilities are unequalled by any other PC UNIX."

Spencer & Son, Rumor Central: The Wise One Takes a Left Turn Toward Consumer Advocacy, *PC Week*, January 27, 1992, p. 150. NeXTstep ports to Hewlett-Packard and SPARC workstations have been rumored, but IBM's Bill Fillip says IBM will not port it to the RS/6000.

Christopher Barr, Adobe's Carousel: The Fortified ASCII, *PC Magazine*, January 28, 1992, p. 31. Adobe's Carousel technology for document interchange would allow compound documents to be exchanged with other computers, including NeXT.

Michael J. Miller, Communicating A Document: Not by Text Alone, *PC Magazine*, January 28, 1992, pp. 81-82. Mentions that Adobe Systems's new technology for document communications would allow documents to be exchanged between different machines, including NeXT.

William F. Zachmann, Does the Best Product Always Win?, *PC Magazine*, January 28, 1992, p. 107. "Another frequent claim is that better products often fail because the vendor is not sufficiently prestigious, because marketing is mediocre, or because buyers are simply too obtuse to properly appreciate their superiority. Recent examples cited by some analysts include Steve Jobs' NeXT system and GeoWorks' Ensemble. Both have been touted as superior to their competitors by some experts, but neither has been very successful in the marketplace."

Kenneth M. Sheldon, Owen Linderholm, and Trevor Marshall, The Future of Personal Computing?, *BYTE*, February 1992, pp. 96-100, 102. BYTE's analysis of the IBM/Apple/Motorola PowerPC describes Apple and IBM's new object-oriented operating system Pink as a "completely object-oriented operating system, rather than an object-oriented layer added on top of a traditional operating system (e.g., NeXTstep)," according to Apple's director of Enterprise Computing, Jim Groff.

Carol S. Holzberg, New Fontographer Designs Type, Converts to TrueType, *Computer Shopper*, February 1992, pp. 645-646. Review of Altsys Corp.'s Fontographer 3.3 for Macintosh, which can convert Type 1 Macintosh fonts to NeXT fonts.

Robin Bloor, Shells and Kernels, *DBMS*, February 1992, pp. 12-13. Mentions NeXT Step as one of several graphical shells for UNIX.

Sesha Pratap, Achieving component-based programming today, *Object Magazine*, January/February 1992, pp. 13-14. "In the future, a complete object-oriented computing environment will include an object-oriented operating system, a message request broker, and an O-O programming

language such as C++. Programs will consist of individual components that are easily connected to form an application.? Unfortunately for software developers, the computing systems-level environments required to support component-based software development will not be widely available for several years. The most notable exception is the NeXT proprietary environment, which provides many of the operating system and language services required to work with components."

Buyers' Guide, *Object Magazine*, January/February 1992, pp. 37-39. Comparison of six interactive graphical user interface tools, including NeXT's Interface Builder.

Andy Novobilski, NeXTstep and me, *Object Magazine*, January/February 1992, pp. 58-66. Demonstrates software reuse by developing a simple application with Interface Builder.

IDB Object Database, *Object Magazine*, January/February 1992, p. 77. Product announcement for Persistent Data Systems, Inc.'s IDB Object Database.

Pamela Pfiffner, Interchangeable PostScript Files, *Publish*, February 1992, pp. 17-18. Adobe Systems' technology, previously exhibited as Editable or Interchange PostScript, will support different platforms, including NeXT.

Rob Kolstad, What Vendors Should Do II, *UNIX Review*, February 1992, pp. 95-97. One respondent to author's survey of how vendors could simplify system administration, David Lemson, said NeXT Computer's Network and System Administration gave good examples of performing routine tasks.

Untitled item in New Products, *UNIX World*, February 1992, p. 129. Product announcement for Pencom Software's Co-Xist version 2.1.1 with support for cut-and-paste between X and NeXTstep and X access to NeXT's dictionary and documentation.

DSP's DADiSP to X Window, HP-UX 8.0, HP 9000/700, NeXT (item in Port Report), *Workstation News*, February 1992, p. 10. Product announcement for DSP Development Corp.'s DADiSP, a "technical spreadsheet for scientific data analysis."

David MacNeill, An Apple in the Future (letter), *PC Magazine*, February 11, 1992, pp. 17-18. "That Apple Computer [of the 1984 commercial] was run by a brash, inspired young man named Steve Jobs, who wasn't afraid to air his strongly held views on the subject of personal computing's impact on the people who use it."

Mary Kathleen Flynn, An Object By Any Other Name, *PC Magazine*, February 11, 1992, pp. 29, 32. Different views on the meaning of object-oriented programming. "Many credit Stephen Jobs, CEO of NeXT, with developing the most object-oriented environment to date. Philippe Kahn says NeXTstep is "no more object oriented than anything else," but Jim Manzi calls it "the richest and best development environment today," and even Bill Gates says it "does some very nice things, and did them before others." Jobs agrees that it "is in danger of becoming meaningless, like artificial intelligence." To be object oriented, says Jobs, a product "has to have an object structure. It has to use runtime binding; it has to have messaging; and there has to be a rich suite of objects."

Guy Kawasaki, Help!, *MacUser*, March 1992, pp. 29-30. When calling tech support, "Don't leave a message like "This is Steve Jobs. I have a problem. Call me back?." Instead, leave a message like this: "This is Steve Jobs. I am using version 4.01 of WordMaker, running under System 7.0.1 on my IIci with 8 megabytes of RAM?."

Henry Bortman, The Universal View Master, *MacUser*, March 1992, pp. 183-185. Another report on Adobe Systems's document-interchange technology, but with more technical details.

Henry Bortman, On Beyond Email, *MacUser*, March 1992, pp. 191-194, 196-197. "The NeXT computer provides systemwide mail and fax capabilities that are available from within any application. With OCE, Mac users will get similar capability, although it will most likely have a different interface."

T. L. (Frank) Pappas, UNIX hardware and software, *Computer*, February 1992, pp. 85-88. "NeXT, which donated the Objective C front end, used GNU C to build its entire system, including its port of NSF and Carnegie Mellon University's Mach kernel."

Rosemary Hamilton, Easy as 1-2-3? Not anymore, *Computerworld*, February 3, 1992, p. 6. Lotus Development will announce Improv for Windows this year. Originally offered for the NeXT workstation, Improv "is considered a breakthrough in spreadsheet technology by many observers."

Scott Mace, Low-cost Poet object-oriented database introduced, *InfoWorld*, February 3, 1992, p. 16. BKS Software Corp.'s Poet object-oriented database, with NeXT version due in February.

Cate Corcoran, NeXTstep 486 needs a niche, I*nfoWorld,* February 3, 1992, p. 26. "Despite NeXTstep's reputation as having the best interface in the UNIX world, NeXTstep 486 failed to attract support from systems developers when the operating system was announced in January." Analysts suggest that NeXTstep 4 86 may require an expensive 486 system and compete with NeXTstep for NeXT hardware, but may appeal to users who require a second source or want to use 486 systems they already own.

Jean-Louis Gassee, How much should Apple worry about NeXT?, *MacWEEK*, February 3, 1992, p. 35. NeXT is now competing directly with Sun by offering better tools and Intel support before Solaris ships. Its new strategy is to gain initial acceptance in corporations for development of custom applications. In a few years, Ne XT will be in competition with Sun, Microsoft, and Apple-IBM. Pink and NeXTstep have the same goal, so NeXTstep could be Pink's major opponent.

Not NeXT (item in Short Takes), *PC Week*, February 3, 1992, p. 111. Microsoft is not interested in developing NeXT applications because sales are too small, according to Mike Maples, senior vice president of the applications group.

Untitled item in Pipeline, *InfoWorld*, February 10, 1992, p. 26. Product announcement for IP Design Inc.'s Parabase.

Neil McManus and Carolyn Said, New architecture to simplify printing for users, developers, *MacWEEK*, February 10, 1992, pp. 1, 103. Apple's new Macintosh print architecture will allow documents to printed by dragging their icons to a printer icon, as is possible on the NeXT and Windows 3.1.

ISDN Interface Module Due for NeXT Machines (item in News Briefs), *PC Week*, February 10, 1992, p. 64. Hayes Microcomputer Product Inc.'s ISDN Extender will provide ISDN Basic Rate access and analog telephone line connectivity.

NeXT At The Corporate Gates, *UniNews*, February 17, 1992, p. 2. The history of NeXT parallels that of the Macintosh: both featured a distinctive user interface, lacked features considered important for business systems, were led by Steven Jobs, and only found their markets after they were introduced. Jobs says NeXTstep's advantages for developing custom applications will lead to sales just as desktop publishing led to Macintosh sales. NeXT reported selling four times as many systems in 1991 as in 1990 and announced faster, less expensive versions of its computers. NeXTstep 3.0 will support Novell and Apple network, UNIX databases, point-and-click encryption and compression, and localization. NeXTstep 486, for the Intel 486, might increase sales by

opening the large Intel market and making NeXTstep more attractive as an operating system for heterogeneous environments. What would have happened if the Macintosh operating system had been ported to other platforms?

Hayes Announces IDSN Adapter for NeXT Computer, *Boardwatch*, March 1992, pp. 15, 17. Hayes Microcomputer Products, Inc.'s Hayes ISDN Extender.

Jim Maivald, Versatile *FrameMaker* (item in Hot Type), *Business Publishing*, March 1992, p. 16. Analysis of Frame Technologies Inc.'s *FrameMaker* 3.0 for Windows mentions NeXT version.

DADiSP 3.0 for Two New Platforms, *BYTE*, March 1992, p. 84. Product announcement for DSP Development Corp.'s DADiSP scientific data analysis program.

Nicholas Baran, WordPerfect for Windows, *BYTE*, March 1992, pp. 257-258. Review of WordPerfect Corp.'s WordPerfect for Windows mentions file compatibility with NeXT and other versions.

Amy Wœl, Through the Looking Glass to UnixLand, *Computer Shopper*, March 1992, pp. 155, 164. "Lotus's Improv spreadsheet is better than nearly any thing the traditional PC spreadsheet market can offer today; the version of WordPerfect for the NeXT machine will set new standards for word processing."

Tony Bove, What's NeXT in Multimedia?, *New Media*, March 1992, p. 11. The big multimedia news at NeXTWORLD Expo was that Pixar's Photorealistic RenderMan and Interactive RenderMan to be included in NeXTstep 3.0. Imagine Multimedia's MediaStation authoring program, Xanthus's CraftMan HyperCard-like authoring tool, Metaresearch's Digital Eye video frame grabber and SoundWorks graphical sound editor, and Multimedia Learning's KnowledgeTool authoring system were also shown. Keith Ohlf's Oscar and Thoughtful Software's HyperCube are still under development.

Untitled item in Product Watch, *Publish*, March 1992, p. 22. Adobe Systems's Illustrator for Windows 4.0 adds features, like Edit in Preview, which had only been available in Illustrator for NeXT

Gary Andrew Poole and Carolyn W. C. Wong, Getting Use out of User Groups, *UNIX World*, March 1992, pp. 55-57. A list of vendor-oriented user groups includes International NeXT User Groups.

More About Tuples, *UNIX World*, March 1992, p. 114. Product announcement for Torque Systems Inc.'s Linda-based Tuplex operating system for multiprocessing.

Compaq, Dell adopt NeXTstep (item in Snapshots), *Workstation News*, March 1992, p. 5. Compaq and Dell reportedly will support NeXTstep.

Eiffel to HP 9000/700 and 400 (item in Port Report), *Workstation News*, March 1992, p. 13. Product announcement mentions Interactive Software Engineering Inc.'s Eiffel for NeXT.

IDB Object Database to NeXT, HP-UX (item in Port Report), *Workstation News*, March 1992, p. 13. Persistent Data Systems Inc.'s IDB Object Database Version 1.1.

NeXT Nugget News Digest

"The Machine that Changed the World" on PBS

PBS will broadcast a five part series beginning April 6th (check your local listings), "The Machine that Changed the World",A joint venture with WGBH/NOVA and the BBC. History and impact of computers featuring among others Thomas J. Watson, Steve Wozniak, Steven Jobs, Bill Gates, and Marvin Minsky.

Five programs are as follows:

1) "Giant Brains": WWII to ENICA
2) "Inventing the Future": Impact on business processing
3) "The Paperback Computer": Miniaturization brings computers to ordinary people
4) "The Thinking Machine": computers vie with humans in intelligence
5) "The World at Your Fingertips": the social impacts of computing

NeXT Names President & COO

REDWOOD CITY, Calif., March 18, 1992 - NeXT Computer, Inc. announced today that it has hired Peter van Cuylenburg for the newly created position of president and chief operating officer (COO). Van Cuylenburg will report to Steven P. Jobs, chairman and chief executive officer (CEO), and will also join NeXT's Board of Directors.

Van Cuylenburg will join Jobs in a newly created "office of the president." All NeXT vice presidents will report to this jointly held office, and Jobs and van Cuylenburg will share day-to-day management responsibilities.

"Peter is an especially good choice to be NeXT's COO for two reasons," Jobs said. "First, Peter's last job was running half of a $6 billion corporation, so he has very strong operational experience. Second, he `discovered' object-oriented software and mission-critical custom applications independently several years ago, while working at Texas Instruments with LISP computers, so he has a deep understanding of NeXT's core strategy and technology vision."

"NeXT grew fourfold last year, and we have the opportunity to become the next billion-dollar computer company. I need a partner such as Peter to help me manage NeXT's growth," Jobs said.

"I am delighted to be joining NeXT," said van Cuylenburg, "because the computer industry has always been my overriding interest. I think NeXT has a real opportunity to be one of the most successful computer companies in the 1990s, and I am excited to work with Steve Jobs to build NeXT into that company. I think Steve and I will be a great team leading a great company."

Background on van Cuylenburg

Van Cuylenburg, 43, joined Mercury Communications as its chief executive in December 1989. Mercury is the second licensed public telecommunications operator in the U.K. (the "MCI" of the U.K.) and a subsidiary of Cable and Wireless PLC, a $6 billion company that provides telecommunications products and services through its subsidiaries in more than 50 countries.

During van Cuylenburg's tenure as chief executive of Mercury Communications, Mercury doubled its market share, more than doubled its revenues, tripled its profits and forged strong strategic alliances with cable TV and other telecommunications companies. After only six years of operating a public service, Mercury grew to $2 billion in revenues and achieved more than a 10-percent market share in its core business, long-distance telephone service to corporate customers. Mercury employs 9,000 people and supplies a wide range of communications products and services to its customers throughout the U.K.

Based on his success at Mercury, van Cuylenburg was promoted in September 1991 to group director of Cable and Wireless PLC, Mercury's parent company, with responsibility for running all of Cable and Wire-

less' telephone companies in the 24 countries belonging to the OECD (Organization for European Cooperation and Development).

Prior to joining Mercury Communications, van Cuylenburg spent 16 years at Texas Instruments, most recently as a vice president and member of the "Office of the President" of TI's Information Technology Group. In this role he was responsible for TI's worldwide computer business, including commercial minicomputers, advanced technical workstations and advanced software development packages.His organization at TI was an early pioneer in custom applications for vertical markets, making use of the object- oriented programming capabilities of TI's LISP workstations.

Van Cuylenburg, a British national, graduated from Bristol Polytechnic in 1971, where he also received the Institute of Electrical Engineers' award for "Outstanding work in the study of Electrical Engineering." In January 1992 he was invited to accept an honorary doctorate in technology from Bristol Polytechnic.

NeXT Strengthens Management

Van Cuylenburg's appointment further strengthens NeXT's senior management team, following January's appointment of Marcel Gani as CFO and February's promotion of Mike Slade to vice president of marketing. Gani spent 12 years at Intel serving in a number of senior financial positions, including director of internal audit for Intel's U.S. corporate headquarters and director of finance and administration for Intel Europe. Slade spent more than seven years at Microsoft, most recently as director of corporate marketing in charge of corporate strategy and marketing for system software. Slade joined NeXT in May 1991.

In addition, Rich Page, a NeXT founder and formerly vice president of hardware engineering, was promoted in January to vice president and general manager of NeXT's newly formed Hardware Division. NeXT's Hardware Division combines all of NeXT's hardware engineering, manufacturing and distribution into one streamlined organization.

Thanks to Adamation for Special offer to NeXT User Groups!

Thanks go to Mark Richards of Adamation for making his 96% and 98% off offers to NeXT user groups for one copy of "Who's Calling" and "LiveWire" software products for the NeXT. A reminder - this offer is valid until April 30, 1992 for each NeXT user group. Here is Mark's contact information:

Mark Richards
Vice President Sales
1435 Center St.
Oakland, CA 94607
Phone: 510-452-5252
FAX: 510-452-5033
Email: mark@adamation.com

NeXT and the Olympics

US Rowing has been using my NeXT machine to compute speed order and national team trial race results for a year, but they've been unsure about Olympic trials, citing a commitment to existing PC and Mac approaches.

Well, they changed their minds, and a NeXT computer will help at the Olympic Trials, May 1-3 in Princeton.

– Geoffrey S. Knauth, Marble Associates, Inc.

gsk@marble.com, (617) 891-5555 work, (617) 547-5247 home

(Editor: Improv is one of the apps that is used to provide almost instant results information and analysis to the judges, crowd and competitors.)

Largest Known Prime Number and NeXT

REDWOOD CITY, Calif., March 27, 1992 - NeXT Computer, Inc. today announced that the largest prime number, discovered by Cray scientists Gage and Slowinski during a random search at a computer laboratory in Great Britain, was verified in the U.S. using a NeXT program. The new prime number was reported in the March 26, 1992 issue of Nature magazine. The new world record prime was verified by Crandall, Doenias and Smitley on a government supercomputer running a software program written at NeXT, using NeXTstation workstations and NeXT-to-supercomputer connectivity tools. The software development for the program took place over the last two years, using connections between NeXT and the San Diego Supercomputer Center.

The new number is (2 ^756839) - 1. The NeXT program verifies in about 16 Cray hours that this number is indeed a prime number. "When they stumbled upon this new prime in England they asked a group of us in the U.S. P a team we refer to as the `Gang-of-Eight' to prove the number was indeed prime," explained Richard E. Crandall, NeXT's chief scientist.

The "Gang-of-Eight" had been searching on their own for many months for primes in the region of 2^200000 to 2^500000; the newly discovered prime is way beyond this range, but still easily handled by the software. In fact, the NeXT method can test numbers for primality, up to 2^32000000.

When the team became aware of the possibility of a new prime beyond their search region, Crandall and Josh Doenias, a programmer at NeXT, asked David Smitley, a government scientist, to perform the test overnight. In this way a Cray-2 supercomputer at a U.S. government supercomputer center in Maryland ran the C software code from NeXT, 16 hours later verifying the British-discovered number as the world's largest prime.

"The verification program we developed with NeXT software technology arose from several ideas exchanged among the Gang-of-Eight over the last few years," Crandall said. "Modern programs such as this one combine ideas from the fields of number theory and signal processing. One basically treats the digits of a monster number as a signal, and applies some new algorithms from the field of signal processing. It says a great deal for NeXT technology, portability and connectivity that we not only developed the program using NeXT tools, but also found it so easy to run the program overnight on a Cray supercomputer, the most powerful computer in the world."

In addition to Crandall, Doenias and Smitley, members of the Gang-of-Eight included Barry Fagin at Dartmouth College, Walter Colquitt at HARC, Joseph Buhler at Reed College, Roger Frye at Thinking Machines, Inc. and David Slowinski at Cray Research, Inc.

NeXTwatch publication information

NeXTwatch is a new newsletter keeping a pulse on newly released NeXT applications and reviews of those apps. To find out more about this frequently released and timely publication... The info-please email address (to which an autoreply daemon will hurriedly send you information on NeXTwatch) is:

nextwatch-info@skylee.com (ASCII email)

nextwatch-info-next@skylee.com (NeXTmail)
Jiro Nakamura
Technical Editor / NeXTwatch
+1 607 277-1440 Voice/Fax/Data

Executor-MSW Review

by Jiro Nakamura
jiro@shaman.com
Group Coordinator FuNK – Finger Lakes NeXT Users Group

Since Day 0 of the NeXT's birth, people have been wondering whether or not it would be Mac compatible. Unfortunately since Steve's departure from Apple was somewhat tumultuous, NeXT has been forever barred from making Macintosh-compatible hardware. This hasn't prevented third parties from trying to do so, however, and today I review the first promising glimpse of Mac compatibility for the NeXT: *Executor-MSW* by Abacus Research and Design, Inc. (ARDI).

Trying to reverse-engineer the Mac ROMs and MacOS is a tremendous task. What ARDI has chosen to do is to do it piece by piece. They decided that rather than doing a complete Mac emulation, they would piece bits and pieces together to emulate *enough* of a Mac for certain pieces of software to run. The software chosen were Microsoft *Word* and later, *Excel*. This was a smart choice for two reasons. The first was that the chances of Microsoft porting *Word* and *Excel* to the NeXT were minimal (Bill Gates and Steve Jobs go together as well as IBM and Apple – wait, that doesn't work anymore). The other is that *Word* and *Excel* together make up more than 80% of the Macintosh business market. Anyone trying to get die-hard Mac users to work on the NeXT would have to convince them of some Mac capabilities. What better than *Word* and *Excel*? Smart choice, very smart.

Installation

The software packages comes on a 1.44Mb 3.5-inch disk. The *Executor* and *HFS_Xfer* programs together constitute 1.5Mb unpackaged. Online documentation is provided, which takes up a whopping 3.5Mb. Evidently they didn't compress the TIFF images in the RTFD help files. Come on, ARDI!

General Impression

The program works, full stop. *Executor* runs *Word* very well. It creates a full page display within which *Word* operates. Everything seems to work, I haven't experienced any crashes so far. Cutting and pasting RTF from within *Word* and into a NeXT application (such as *Edit*) seems to work too. As long as you are running *Word*, everything seems to be fine. *Executor* creates a directory within its application wrapper called ExecutorVolume. This directory is the hard drive space for the emulation and is where you put all of your programs and user files. You can change where this directory is, although the command is very clunky and the manual's instructions are wrong. Contact ARDI for more information on this feature. *HFS_Xfer* is the program used to transfer information to the *Executor* environment from the outside world. The interface is clunky but works. Only 1.44Mb disks are supported with the NeXT internal or PLI external 2.8Mb floppy drives. These drives cannot read 800K and 400K disks. If you buy DIT's 800K floppy disk then you can read 800kb and 400Kb disks with *HFS_Xfer.* The manual is very poorly done. While it provides a glossary it has no index nor table of contents. The formatting is terrible and the contents are something only a hacker could love. Fortunately you can figure out most of *Executor* and *HFS_Xfer* *despite* the worst wishes of the manual. ARDI need to get themselves and editor and graphic designer. The technology in the program is excellent but the packaging needs a lot more work. Also, ARDI needs to realize that the person who runs *Executor* is most probably *not* going to be a programmer/hacker. They should orient their manual and program to their end-users.

Although *Executor-MSW* is only guaranteed to run *Word* and is not advertized in any other fashion, it is always tempting to see if it will run other programs. The verdict is: some. Some programs will run, others won't. In general, old programs that don't take advantage of new system features, are 32bit clean, don't do weird stuff that messes up the cache, etc. run. Most other programs don't. Don't expect any large commercial applications to run. ARDI says it expects to produce versions of *Executor* that are qualified to run more programs every one or two months. Hopefully this means that within a year we should have most of the applications that are needed, running on the NeXT. ARDI seems to be focusing their attentions on programs that do not have a good chance of appearing in NeXT specific formats: such as all of Microsoft applications, Claris applications, etc.

Speed

Everyone wants to know two things. How fast is the darn thing and what can it run? Well, it could run one of my Mac speed testing programs, here are the results. *Executor*'s CPU is approximately 10 times faster than a Mac SE and 3 times as fast as a Mac II. The FPU is blazingly fast, but the disk emulation is somewhat slow. I don't know how MacSpeed computes the Overall speed since it doesn't seem to average with the other numbers.

MacSpeed:

Machine	CPU	Disk	Math	Overall
Mac SE	1.0	1.0	1.0	1.0
Mac II	3.18	1.46	6.60	2.70
Executor	10.79	1.13	35.98	3.53

Computer Type: Mac+
CPU: Unknown
FPU: YES
Color QD: NO
Keyboard: Mac+ Keyboard
AppleTalk: Not loaded

My own experience confirms this: the CPU response is very quick. However, graphics are slow, depending on the application you run. Apparently, *Executor* buffers the graphics output to speed it, however some applications need this disabled which slows them down. Hopefully in System 3, NeXT will include hooks that will speed up the graphics performance of emulation packages such as *Executor* and *SoftPC*. Until then we are stuck with a fast CPU and slow graphics. Good for doing word processing and other business applications, but terrible for games.

Compatibility

ARDI Qualified Apps: *Word* 4.0d (application)

With the help of some friends, I dug a veritable mountain of PDS and Shareware games, applications, etc. Also, some people on the net have reported their luck on their apps. These are the results. In general, old games written for the Mac+ that don't use any sound tend to work. Otherwise, most of them don't. In other words, don't buy *Executor* hoping your favorite application will run on it because it most probably won't.

Programs that seem to run: *AddressBook 3.0.8* (application), *BinHex 5.0* (utility), *Expressionist MacSpeed* (utility), *MacYahtzee* (game), *Mines* (game), *Missile* (game), *Motorbike* (game), *Nemesis* (game -- turn off sound), *Phraze Craze* (game), *StuntCopter 1.2* (game), *Solitaire* (game), *Spoydworks Solitaire* (game, very buggy though), *Risk*

(game), Programs that don't seem to run: All inits, cdev's, da's and other system extensions; *Aldus FreeHand Bikaka* (game: animation messes up), *Columns* (game), *Compact Pro* (utility), *Hextris* (game), *Kaliedegraph Klondike* (game), *MacEnvy* (utility), *Megaroids II* (game), *Monopoly* (game), *Speedometer* (utility), *Stuffit Classic* (utility), *TeachText 7.0* (requires System 7), *WriteNow 2.0* (application),

The programs that don't seem to run might be able to run if you fiddle with the .execonfig. Since I figure most people who want to run *Executor* (beginning to intermediate users) would not know how to write .execonfig files and since the instructions in the manual is not very clear, I have put them into the don't run list. So consider the Don't Run list to be programs that didn't seem to run "out of the box" when I tried them. Your mileage may vary.

Although the version that I have could not run either *Word* 5 or *Excel* 3.0, ARDI is working day and night on this and should be coming out with a version that does this Real Soon Now.

Bugs

When you try to run a program that isn't supported under *Executor* and *Executor* decides it can't run it, it crashes the whole application. If it can't run an application, it should put a dialog box (like SoftPC) and die somewhat gracefully.

Problems

It would be nice if there was a shared file mechanism such as the one SoftPC has. Currently you have to drag files into the Executor.app wrapper or figure out how to make the Mac-emulated volume appear within your own filespace. Also, there needs to be a way to read and write a Mac floppy without going through *HFS_Xfer*. Supposedly, *Executor* will be used in environments where the user needs to access *Word* files on a Macintosh disk from their NeXT. Currently, to read, edit, and save a file on a Mac disk, you need to go through *HFS_Xfer*, transfer the document to your *Executor* volume, launch *Word*, edit it, save it, re-launch *HFS_Xfer* and put it back on the disk. *Executor* needs to be able to natively support both Mac and UNIX (NeXT) disks from within the application themselves. Another problem is that *HFS_Xfer* does not support formatting of Macintosh floppies. In my opinion, *HFS_Xfer* needs a lot more work done on it. It needs to be integrated into *Executor* rather than being a separate application and it needs more interface design (the user interface is clumsy and gets in the way). It works, but minimally. A minor annoyance is that whenever you quit a program within *Executor*, the whole *Executor* application quits rather than allowing you to run another program. ARDI tells me that there are some problems in allowing the user to run another program after running one, but I find this behavior annoying. Since you're only "theoretically" going to be running *Word* though, it may not be that much of a problem.

Conclusion

This program is simply amazing. Even though ARDI has only complete a part of ROMlib, the remaining parts leave us drooling. *Executor* does what it advertises to do: it runs a large enough subset of the Macintosh System in order to run Microsoft *Word*. *Executor* is still very young. The manual is atrocious and the interfaces to *Executor* and *HFS_Xfer* are clunky (the two need to be integrated into one application and streamlined). Nevertheless, I am excited about the product. What ARDI needs to do is to make public their upgrade plans. You will get the version of *Executor* that supports printing for free if you buy *Executor* now. But what about the future? The current program has a bit too many rough edges. I can see people who desperately need Mac Emulation or the curious buying it. But if I were to plunk down $80 for it, I'd want to know where the program is going. What are the upgrade plans? When will they hopefully finish the project? What will it look like? Are they ever going to have the Apple System and Finder running on top of *Executor* or is it always going to be their version? When will they reedit the manual? These questions and more need to be answered before I believe *Executor* can have widespread popularity. ARDI has hinted that the future version of *Executor* that will be a complete emulation of the Mac system will cost around $700 (retail, I assume). This is quite expensive. They have also hinted that they will sell subsets of this future *Executor* that only run specific applications for $100 or so. Nevertheless, the current *Executor-MSW* is well worth the money if it supports an application you want to run (*Word*). If you are in an office that has standardized on *Word*, go for it. Otherwise, you might be better off waiting until *Executor* becomes more complete.

Summary

Application Type: Macintosh Emulator for Microsoft *Word* 4.00d

Version Tested:

JiroRating: ***(Good)

Languages Supported: English (only)

File Formats Supported: *HFS_Xfer* can read Macintosh 1.44Mb HFS disks. Microsoft *Word* under *Executor* supports RTF files, copy and pasting between other NeXTstep applications.

Normal list price: $80

Academic pricing: not available

Group pricing: $80 for first copy, $70 for second, and $60 for each additional.

For information and sales:

Bill Goldman

Abacus Research and Design, Inc.

1650 University Blvd.

NE Albuquerque, NM 87102

Tel:+1 505 766-9115

Email:iclone!bill@unmvax.cs.unm.edu

#include <std_disclaimer.h> I have no connections with Abacus Research and Development, Inc.

#include <macBackground.h> I used to be a consultant for Macintosh systems for large investment and advertising firms in Tokyo three years ago and am pretty familiar with Macintosh technology up until 1989. My Mac background is stale, but used to be as extensive as my current NeXT one is. Just in case anyone wondered what my Mac background was.....

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ABOUT GUN...

Board

Paul Murphy, president	Paul_Murphy@gun.com
Robb Allan, founding	Robb_Allan@gun.com
Tim Reed, founding	Timothy_Reed@gun.com
David Bressler	David_Bressler@gun.com
Ed Wright	Ed_Wright@gun.com
Nick Christopher	Nick_Christopher@gun.com
Jim Cornacchia	James_Cornacchia@gun.com
Ken Biller	Ken_Biller@gun.com

The BULLETin

The GUN BULLETin is produced monthly (more or less) using *FrameMaker* 3.0 on a Color NeXTstation, with headlines created by Adobe *TouchType*. Article text is written directly in *FrameMaker*, with *WordPerfect*, or imported from other platforms (ugh!).

If you are interested in working with the newsletter crew, contact Robb Allan or Jim Cornacchia at the email addresses above.

Pulled From The Net

Pulled From The Net is a service designed to provide a synthesis of important NeXT-related Usenet information to those without network access and to those too busy to keep up with Usenet. Usenet, or Net News, is a bulletin board service available free of charge to anyone with Internet access. It includes hundreds of special-interest posting areas (groups), read by hundreds of thousands of people across the planet.

All GUN members receive *Pulled From The Net* with their membership. It is emailed to those capable of reading Next Mail as soon as it is available; ASCII copies are sent to those capable of reading only ASCII mail; paper copies are sent to everyone else, along with the newsletter.

Pulled From The Net tracks the following groups:

comp.sys.next.misc
Miscellaneous NeXT related information
comp.sys.next.announce
NeXT related announcements
comp.sys.next.admin
NeXT administrative information
comp.sys.next.programmer
NeXT programming information

Discounts

Many vendors are willing to give user group members discounts on their hardware and software. GUN does everything possible to ensure that its members have access to these savings. Every month, GUN compiles a list of currently available discounts. If you are interested in an unlisted item, write to discounts@gun.com or call GUN at 718-260-9848 and ask for the person in charge of group discounts. If possible, we will add the item to the list. Vendors are encouraged to contact GUN to participate in this program.

Membership & Sponsorship

Individual Dues

- $25 per year (tax deductible)
- newsletter
- email alias and inclusion in group email list
- eligible for group discounts (contact Ed Wright)
- eligible for individual UUCP services
- eligible for individual Internet connectivity
- NeXTWORLD disount

Corporate Sponsorship

- $100 per year (tax deductible)
- newsletter
- email alias and inclusion in group email list
- employees are eligible for group discounts
- eligible for corporate UUCP services
- eligible for corporate Internet connectivity
- employee NeXTWORLD disount
- sponsorship is recognized in every issue of the newsletter

GUN Sponsors

Corporate Benefactors

Organizations who have contributed materiel or equipment to GUN:

Frame Technology Corp.
FrameMaker 3.0 Page Composition Software
Lighthouse Design
Diagram! design software, Concurrence presentation software
Marble Associates, Inc.
Consulting Services, Marble Teleconnect communication software, Designer Labels labeling software
Stone Design
DataPhile database software
Telebit Corporation
T3000 Modems, NetBlazer Router
Uninet Peripherals, Inc.
SLAT Adapter

Corporate Sponsors

Organizations who have contributed $100 or more this year:

American General Information Services, Inc.
CS First Boston (Japan) Limited
Marble Associates, Inc.
NorthStar Technologies, Inc.
Nova Works Computer Systems, Inc.
Objective Technologies, Inc.
Custom Word Processing, Inc.
Light Printing Co., Inc.

Communications

GUN maintains a list of all members who can be reached via email. All mail sent to gun-members@gun.com is redistributed to everyone on the list. In addition, GUN assigns an alias to every member of the list making it possible for that person to be reached by sending mail to Firstname_Lastname@gun.com.

Individual UUCP

GUN maintains a server connected to the Internet. UUCP service allows members' machines to transparently connect to this host in order to send and receive email. Mail from the outside world can be addressed to user@gun.com. Mail you send appears to originate from the gun.com domain. It can be addressed as if you were directly on the Internet (i.e., user@next.com). Mail volume is not limited. A GUN volunteer will help you set up and maintain the UUCP connection.

Accounts will be given on a first-come, first-served basis. Once our current maximum capacity is reached, we will need to purchase additional lines and modems. This could cause a slight delay in obtaining service.

Cost
$10/month.
Timetable
2,400 bps (v.22) -- Available immediately.
9,600 bps (v.32) -- Available Q1 '92.
19,200 bps (PEP) -- Available immediately.
19,200 - 57,600† bps (v.32bis w/ v.42 & v.42bis) – avail. Q1 '92.

Individual Internet Connectivity

The gun.com domain is a wide are network (WAN). Machines are connected via the Serial Line IP protocol (SLIP). Any machine on the network can connect to any other as if it lived on the local ethernet. Machines on the network can share resources, mount each other's file systems, etc. Best of all, becoming a member of the GUN WAN gives you complete, unrestricted access to all Internet resources. This includes access to Internet mail services, News (which includes thousands of special interest groups), hundreds of archive servers, Archie (a database of software/documents stored on the archives), hundreds of library card catalogues, the Internet White Pages (X-Windows based email directory service), and a fast growing numbers of value added services (providing things like AP news feeds, stock market data, databases of vertical market information, etc.). Finally, GUN will maintain a local archive that will mirror the most important NeXT related sites in the world.

Cost
$80/month.
Timetable
We hope to begin offering this service during Q1 '92. Hardware and software purchases will be made as soon as we have a list of members committed to joining the WAN. If you are at all interested, let us know as soon as possible. Write to postmaster@gun.com or call Paul Murphy at 718-260-9848 (10 am - 7 pm).

We plan on using the v.32 and v.32bis protocols throughout the WAN. If people absolutely want PEP, we will provide it. Note, however, that the PEP protocol does not meld nicely with the SLIP protocol. Running SLIP over PEP modems yields circa 2,400 bps throughput (for interactive sessions).

Corporate Email

Corporations can request either a corporate alias or ten individual aliases. The corporate alias allows an unlimited distribution of GUN mail within the organization. The ten individual aliases allow the individuals to be reached by sending mail to Firstname_Lastname@gun.com. All corporate sponsors with email access are eligible for this service.

Cost
Included in sponsorship.
Timetable
Available immediately.

Corporate UUCP

Identical to Individual UUCP. Limited to ten employees. All corporate sponsors are eligible for this service.

Cost
$15/month.
Timetable
2,400 bps (v.22) -- Available immediately.
9,600 bps (v.32) -- Available Q1 '92.
19,200 bps (PEP) -- Available immediately.
19,200 - 57,600† bps (v.32bis w/ v.42 & v.42bis) -- Available Q1 '92.

Accounts will be given on a first-come, first-served basis. Once our current maximum capacity is reached, we will need to purchase additional lines and modems. This could cause a slight delay in obtaining service.

Corporate Internet Connectivity

Identical to Individual Internet Connectivity. All corporate sponsors are eligible for this service.

Cost
$80/month. $500 sign-up fee.
Timetable
We hope to begin offering this service during Q1 '92. Hardware and software purchases will be made as soon as we have a list of members committed to joining the WAN. If you are at all interested, let us know as soon as possible. Write to postmaster@gun.com or call Paul Murphy at 718-260-9848 (10 am - 7 pm).
We plan on using the v.32 and v.32bis protocols throughout the WAN. If people absolutely want PEP, we will provide it. Note, however, that the PEP protocol does not meld nicely with the SLIP protocol. Running SLIP over PEP modems yields circa 2,400 bps throughput (for interactive sessions).