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You can also read Connect online, through NYU Web, at the URL http://www.nyu.edu/acf/pubs/connect/ Since the summer 1995 issue, most of the material has been published in HTML, the native Web format; earlier issues (beginning with March 1993) are available in the text-only Gopher format.

We welcome your comments and suggestions about the articles in this issue, and about articles for future issues. Contributions are invited for consideration by the editor; for more information, please send e-mail to me at the address given here. Articles are written by members of the ACF staff, unless otherwise indicated.

Opinions expressed in the articles in this publication are those of the authors and not necessarily those of the Academic Computing Facility or of New York University.

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— David Frederickson

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Advisory Group Studies
NYU Use of Information Technology

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Under the leadership of Bob Berne, Vice President for Academic Development, NYU is taking the next step in embarking in our long-term planning for computing and the use of information technology on campus. Groups of technology providers, users, and external experts are currently participating in an overall assessment to ensure that students, faculty, and administrators get the service they need in an effective and efficient manner.

The need for such a study is evident from both the growth in demand for information technology services and from their increasingly pervasive use in most NYU activities. For example, general-purpose computing accounts oriented toward network services (then called EMIS accounts), rather than toward classical mainframe computing, were first introduced in 1990. Today, they dominate use of our central computing facilities. The figure below illustrates the growth in demand for NYU-NET accounts running on IS (information services) machines. (Note: the data for future time periods in all of the following graphs are extrapolated.)

As discussed in the last issue of Connect, the assignment of NetIDs to everyone in the NYU community will allow us in the future to create an e-mail account for every person in the University, using the NetID as the account name on one of the IS computing systems. That will mean another doubling in the number of accounts. We believe that e-mail will then rapidly become the preferred medium for increasing amounts of intra-NYU communication, and much of...
the interaction among faculty, staff and students will be performed using e-mail rather than via physical documents and campus mail.

In order to provide the physical on-campus connectivity needed to link members of the community, we have been expanding NYU-NET in terms of bandwidth, coverage, and reliability. The second graph on the previous page indicates the growth in the number of network nodes, or computer elements, that are part of this network. This graph does not include any of the nodes that have been added as a result of wiring the 3rd Avenue North, Brittany and Goddard residence halls, where 2,000 data jacks are now available for students to attach their computers to the network.

Many members of the NYU community want and need to become part of the network temporarily utilizing a dial-up connection. As more modems are provided, the use of dial-up services grows. The graph above indicates the number of completed calls to the ACF modem pools during the last several years.

An important phenomenon driving Internet growth has been the growth of the World-Wide Web. ACF provides information and assistance to over 275 webmasters on campus in the preparation of information about their areas of university activities. Use of the NYU Web has grown rapidly also. The graph at upper right shows the number of "hits" on the NYU Web, i.e., the number of items requested and delivered from pages in the www.nyu.edu domain.

Last but not least, instructional use of computers and networks has also continued to rise. The graph below shows the number of courses for which instructors have requested student course accounts, and the total number of students enrolled in all those courses.

Each of the preceding measures of demand and use has its inaccuracies, often in both directions. However they are consistently biased from year to year. The conclusion is clear: these information technology resources are in increasing demand at NYU.

It’s clear to us that information technology is becoming increasingly important to the way in which NYU performs its functions across the board. The study now under way will, we hope, provide good guidance on how we can organize ourselves to do better, respond correctly to the current needs of our community, and still probe the technological future for better delivery mechanisms for meeting evolving needs. We look forward to learning about the study group’s conclusions and implementing its recommendations.
A Voice for Computer Users: Computer Advocacy @ NYU

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Though Computer Advocacy @ NYU is classified as a student club, it would be safe to say that there is no other club exactly like it at NYU. Most people at NYU will encounter Computer Advocacy only in its role as a service organization. Few will notice the role it plays in commenting on resources available to members of the NYU community.

For over a year now, Computer Advocacy members have brought their opinions to bear on NYU-NET and provided services to students, staff, and other clubs. The club was formed after repeated discussions in public online newsgroups failed to yield a mechanism that would give students space on a Web server at NYU. Every so often, someone would post a note on nyu.general (one of the local newsgroups) wondering why there weren't any student Web pages at NYU. There would be a few replies, perhaps some heated discussion about tuition and services, and then things would quiet down again. When Philip Hood, webmaster for the Minetta Review, offered to showcase student Web pages as artwork, things came to a head. Within a few weeks the Computer Advocacy Club was created; one of its first aims was to campaign for student Web pages.

Computer Advocacy was born of the realization that there was a need for a student organization that could help disseminate the information about NYU-NET that was most important to students. By implication, Computer Advocacy is itself an acceptance of the fact that there is little that students can do individually to change the structure of NYU-NET. After meetings between staff members of the Academic Computing Facility and members of Computer Advocacy, and after even more proposals on the local newsgroups, one of the older computers on the ACFcluster was set aside as a Web server for individuals and was renamed pages.nyu.edu.

Today, thousands of individuals have Web pages on this server, from faculty members who use their Web pages to provide information about their classes, to students who publish their poems online.

Today, thousands of individuals have Web pages on pages.nyu.edu

As pages.nyu.edu has grown, Computer Advocacy has changed as well. One of the most fundamental changes is in its name, the club is no longer the Computer Advocacy Club but rather Computer Advocacy @ NYU. Our stance too has undergone a transformation. The club was born out of antagonism between students who wanted better services and harried ACF employees trying to keep up with the exponential growth of the university community's computing and network needs.

One of the original aims of Computer Advocacy @ NYU was to have the ACF's role redefined so that it could properly serve the computing and networking needs of the NYU community. This summer, the ACF became part of the Academic Development division and is no longer a department under the Courant Institute of Mathematical Sciences (CIMS). Though CANYU had little to do with the decision to make the ACF a university-wide facility, it is some-

Subir Grewal, CANYU’s Education Officer, graduates from CAS this year.
thing we have been promoting since the inception of the club and, we hope, have helped to bring about. The ACF can now regard its network services — provided to the entire community — as a greater portion of its work, rather than a smaller sibling of its chief purpose, providing computing resources to the scientific community. We believe this reflects a larger paradigm shift in the use of computers and computer networks in general. Computers are now used by students and staff in every part of this university, and they are increasingly being used for broader communication purposes. The transformation to a university-wide Academic Computing Facility marks the wider acceptance of the new uses for computing resources in the academic environment.

Computer Advocacy @ NYU continues to play a role in the development of NYU-NET. As a student organization, we have the flexibility that has allowed us to engage in path-breaking activities, providing solutions before one of the university’s departments can develop a comprehensive project. We were able to develop workshops for other student clubs ready to create Web pages; some officers of CANYU assist in administering the section of the pages.nyu.edu server that was set aside for student clubs. We still provide an index of student clubs with Web pages. Since there is no student directory available at NYU, Computer Advocacy maintains a directory of members of the NYU community (students, staff, and alumni) who wish to list their personal homepages in a university-wide directory.

In April 1996, Computer Advocacy organized Computer Awareness Week, where our most successful events were presentations on health and safety issues for computer users. We continue to try to raise the university community’s awareness of the adverse effects that a poorly designed work environment can have on health. Our members comment on NYU’s electronic resources, providing suggestions and criticism to make NYU Web more accessible to all (including the disabled). We have invited discussion of the social aspects of computer networks, including free speech, enabling devices, job opportunities in the network industry, and even perceptions of sexuality influenced by cyberspace. In all this, we have had the support of the ACF and valued it highly. We hope that we have been successful in opening another channel through which a dialogue may be conducted between students and the university administration.

As a student club, and specifically one that is concerned with advocating the use of computers, CANYU reaches out to the university community and seeks to explore novel uses for this technology. To this end, CANYU members write articles for a column in the Washington Square News. Contributions have ranged from discussions of the history of the Internet to concerns about health and safety. As an advocacy group, CANYU is concerned about political issues that affect our use of computers. One of our most successful set of workshops and talks has revolved around the Blue Ribbon campaign and the definition of rights and freedoms in the digital age (see “Blue Ribbon Campaign” on the next page).

How do we see ourselves in the future? It is difficult to say what role Computer Advocacy might play a year from now. Over the past year we have seen the network (and NYU-NET) change dramatically — so profoundly that it would be unwise to speculate

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**Resources provided by Computer Advocacy @ NYU**

NYU PEOPLE: index of Web pages for NYU staff, students, and alumni:

http://www.nyu.edu/pages/advocacy/nyu_people/

Index of student clubs at NYU:

http://pages.nyu.edu/clubs/

Pretty Good Privacy cryptography resources; using PGP at NYU, key signings etc.:

http://www.nyu.edu/pages/advocacy/info/pgp/

Comprehensive guide to public computers and terminals at NYU:

http://www.nyu.edu/pages/advocacy/info/labs/

Local mirror of Image icon library:

http://www.nyu.edu/pages/advocacy/image/AIIcons/

Guides to creating web pages, especially at NYU:

http://www.nyu.edu/pages/advocacy/info/web/

Top 20 Hits — lists and reviews the most popular pages on NYU Web:

http://www.nyu.edu/pages/advocacy/info/review/

nyu.trade.books — NYU’s virtual bookstore, with tips on selling and buying books:

http://www.nyu.edu/pages/advocacy/info/nyu.trade.books/

CANYU Health and Safety Committee:

http://www.nyu.edu/pages/advocacy/committee/health/
Blue Ribbon Campaign for Civil Liberties on the Net

One of CANYU’s most important concerns — as an organization, and as the spokesperson for its members — revolves around the future of the internetworked community, particularly the political environment within which the Net will develop. Many members of Computer Advocacy @ NYU are concerned that laws and procedures instituted by ill-informed bureaucrats and legislators may adversely affect the evolution of a global Internet society.

In a networked environment, it is especially important that our personal liberties and freedoms be protected. Centralized networks could easily be used as a panopticon to serve repressive political regimes and structures. Yet internetworked computers and distributed information systems almost by their very nature erode attempts to control and use information for illegitimate purposes. However, the dream of an internetworked society where information and knowledge flow freely and without hindrance may not be realized if the evolution of the tools and pathways that promote personal freedoms is restricted by overly restrictive laws.

It is important to note that technological changes periodically force the judiciary to reinterpret the common law and reevaluate the paradigms it applies to new forms of action. This process is underway at this very moment. The Blue Ribbon campaign is an attempt to give a voice to those who are concerned about personal liberties in the digital age.

The Internet does not recognize borders. Interoperable protocols are used all over the world on an infinite variety of internetworked machines, which communicate with one another freely. Yet nations derive their legitimacy, and indeed their power, from borders and by controlling movement across them. We can see governments all over the world moving to place “virtual borders” on the Internet. It may be time for us to decide whether we as Netizens need such borders at all. The Internet has often been called anarchic, and in a very real sense it is. There is no clear demarcation of jurisdictions on the Internet; most compensatory and retributive action is taken informally and arbitrarily by individuals. Often this leaves users in a gray area, unsure of what their rights and responsibilities are.

The Blue Ribbon movement seeks to create a forum for the discussion of rights and responsibilities — individual, societal, governmental, and organizational — in the digital age. With a commitment to the ideals of individual liberty, privacy, and free speech, people involved in the Blue Ribbon campaign seek to open a dialogue with lawmakers and their fellow citizens concerning the future of the Net.

The Blue Ribbon campaign was launched by the Electronic Frontier Foundation as a response to the Communications Decency Act, which was passed along with the much larger Telecommunications Bill of 1996. The movement has since grown to encompass many other facets of law, politics, and ethics in the internetworked world. Computer Advocacy @ NYU has been involved in the Blue Ribbon campaign from its inception. The EFF lists CANYU’s Blue Ribbon campaign on its activism page and has commended our concern and activities. CANYU has organized various seminars that deal with anonymity, free speech, privacy and the CDA. We hope to continue organizing such seminars and workshops in the future.

For details, please visit our Blue Ribbon page: http://www.nyu.edu/pages/advocacy/blue-ribbon/

— SG

on its future. However, we can say with reasonable confidence that CANYU will continue to complement the services provided by the university. We cannot hope to run the main Web server at NYU (as the student computing club does at MIT), but we can organize seminars and activities on topics that are complementary to the ACF’s role as facilitator for academic projects. These include plans to set up a local server for Internet Relay Chat, workshops on Pretty Good Privacy, focused workshops on HTML, talks on health issues, discussions of civil rights in the internetworked world and, most importantly, the needs of students.

Computer Advocacy will continue to play a role as an independent organization, providing constructive criticism and feedback to everyone involved in developing NYU-Net. Meanwhile, our newsgroup nyu.comp.advocacy continues to be one of the busiest and most vibrant on NYU-NET, and our Web pages http://www.nyu.edu/pages/advocacy/ continue to provide information to the world. You’re invited to visit.

You can read Connect Online on NYU Web at http://www.nyu.edu/acf/pubs/connect/
Some day the hype surrounding the Internet will die down and most of us will use it as a matter of course. Before the Internet can slip seamlessly into our lives, however, we'll need to solve the problem of how to connect. Modems are slow and tie up your phone line, so that connecting to the Internet disconnects you from voice contact with others. Moreover, the act of dialing in is both an impediment to effortless use and a reminder that we must make a connection because our computers are not already connected. When you are wired directly to a network, as with Ethernet, your connection is established whenever your computer is on. You enter and leave the Internet without effort. Access is quick — almost quick enough to keep up with the flow of your thoughts. Someday in the not-too-distant future, we will all connect this way.

Most of us will have to wait for the resolution of the connection war between the cable companies and the Baby Bells to see which companies will provide affordable high-speed connections at home. Currently the cost of a permanent high-speed line is prohibitive for an individual, but all across the country, colleges and universities are wiring their residence halls with Ethernet. Students are experiencing the speed of direct network access in their residences today.

The Internet and the NYU Intranet (an emerging network of Web sites serving the NYU community and automating many University functions) promise to improve the student experience both by providing easy access to information about classes, grades, and campus activities and by creating new avenues for intellectual and artistic collaboration. An integral part of this vision is easy access to the Internet and the World-Wide Web, and a prerequisite to easy access is direct network connections in residence-hall rooms. With this goal in mind, NYU has scaled up the initiative to wire the residence halls into a new branch of NYU-NET called ResNet (short for residence-hall network).

As a result of this initiative, three residence halls...
have now been fully wired and are able to connect all their 1816 residents to the net: Brittany, Goddard, and Third Avenue North. Although in previous years, experimental connections were available in Third Avenue North and Goddard, they had to be connected manually by a technician onsite, which proved to be an expensive and time-consuming method. This year, students registered for the service on a Web page, their data jacks were activated remotely from Warren Weaver Hall by a computer script, and they now download their Web pages at speeds limited only by Web servers’ speeds. Currently, around 235 students are using in-room connections obtained this way. Next year there may be three or four times that number and the system will be able to accommodate them all and more.

It’s a rosy picture, but in reality it hasn’t all been easy. The start-up of ResNet has had its share of challenges. There were the inevitable instances of malfunctioning devices and cable connections that didn’t work the first time. There were even some wall jacks that ended up labeled incorrectly. More colorfully, there was an incident where some sewage leaked down into a basement wiring closet, dousing a stack of sophisticated equipment. Nobody said networking would be glamorous work.

The good news is that the system works and that things are getting better every day. We who work on ResNet are working on automating more and more of the processes of connection and troubleshooting. All aspects of getting connected will get progressively faster and easier as we go along. The program is just beginning, but already all the major features are in place. The next step is to expand connectivity to more and more residence halls. NYU is ready to do just that.

**Nuts and Bolts**

In some residence halls, jacks have been in place for some time, but making them active requires quite a bit of infrastructure behind the walls. Before a building can have active Ethernet connections, a fiber-optic link must be run under the street to connect it to the NYU-NET backbone. Hubs (like the ones in the photo below) must be installed; then a data line from each room is plugged into them. All the elements, from backbone to switches to hubs, need to be connected together, configured, and tested. Only then can the jack in a student’s room be activated.

Once a student applies to have a data jack activated, relevant information has to be channeled into two databases in order to make the connection live. These two databases, the BootP Server and the Domain Name Server (DNS), hold vital information about each computer on the network. The BootP Server assigns each computer an IP (Internet Protocol) address, its unique identity on the Internet. The DNS provides a name and a face for that address (some information about the computer and person associated with it).

In addition, a registered student’s Ethernet address must be programmed into the hub’s memory to activate the student’s port. NYU uses special hubs that prevent unregistered computers from connecting and their users from causing mischief. These

(continued on page 15)
Should You Create Your Own Internet System with Linux?

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Author's Note: Try the enclosed suggestions in the safety of your own home, but fortify yourself with liberal helpings of books, online documentation, and a lifeline back to the Linux community on the Internet, in case you need help from peers around the world.

There are many good things to be said for large, shared Unix systems. If competently run, they offer you the security of regular backups, the convenience of timely software updates, the blessing of swift hardware repair, and the reassurance of acceptably secure operation. For example, ACF's NYU-Internet system runs on a group of Unix computers that support nearly 30,000 accounts.

The problem for some of us is that there is always a feature we want on the system that is not of interest to the wide audience of account-holders, so the changes we request may be delayed, if they appear at all. Or we may want more control over our configurations than a shared system can reasonably offer. We may wish for an almost infinite amount of disk space, which few shared systems can promise. We may want to transcend configurations that are intended to make the shared system a civilized place to work. We may simply want the highest privileges — root access — available on a Unix system.

Ah, some of us imagine, if only I had the computer all to myself!

Once, this would have been a fantasy for most people. Today, however, there is an operating system known as Linux (pronounced LINN-ucks), which can be installed even on modest PC hardware, giving you your own version of a system that can be tailored for exceptional Internet access. Linux distributions are freely available on the Internet, and are widely sold on CD-ROM at modest prices. (Some components included with Linux distributions are shareware, and the authors' requests for payment or other compensation should be honored.)

A Unix-like operating system, Linux squeezes the best possible performance from PC hardware. As a result, a 386 (or better) PC with as little as 8MB of memory and 200MB of disk space can provide the working environment that was once the exclusive province of large central systems and high-priced desktop workstations. (Of course, the normal rules of computing apply here: Faster computers are better performers than slow computers; more disk space is always handy; the more memory in the computer, the better.) Linux offers multitasking (meaning that multiple programs can run simultaneously), an X Windows environment, and support for much Unix software that is distributed as source code (so you can compile it to run on your machine). Linux itself is freely distributable, and, since a Linux distribution consists of discrete pieces of software, it allows a user to create a customized system configuration to suit the individual's needs.

Given this situation, several groups or organizations have created Linux distributions, which are collections of the basic Linux core software, pack-
aged with configurations, documentation, and third-party applications (such as Pine, Tin, Emacs, nn, and Lynx). When the system is installed, a user can download a Linux-specific version of commercial software, such as Netscape. Many vendors of strictly commercial software (such as Matlab) now sell Linux versions of their products.

In general, you are limited by what you can afford and by how your hardware performs, when you choose to use Linux as your basic operating system.

Used in conjunction with PPP service (such as an ACF DIAL account), you can connect to the Internet from home and perform virtually any task you would be able to do on an NYU system, except that the entire processing power of your machine is available to you alone.

Since Linux is a multitasking operating system, it allows you to keep your favorite programs running simultaneously, independent of each other. Linux exploits PC-compatible hardware in a way that DOS and Windows cannot. And Linux is no longer limited strictly to PCs. At the time this article is being written, at the end of 1996, Linux is available for many other computer platforms, including such systems as Digital Alpha, Sun Sparc, Power Macintosh, IBM & Motorola PowerPC, and MIPS. The latest detailed information is always available on the World-Wide Web through the Linux Documentation Project (http://sunsite.unc.edu/LDP/). For the latest news on hardware compatibility, see the Web page at http://sunsite.unc.edu/LDP/HOWTO/Hardware-HOWTO.html; note that some of these adaptations are still considered experimental.

However you proceed, work with caution: Linux is not for everyone. If you are uncomfortable with technical details, you should probably not opt to install Linux on your machine.

For example, one frequent request from ambitious, technically savvy people who use ACF's NYU-Internet systems is for greater control and customization of their accounts. Some wish to completely redefine their environments on the systems. Some want their favorite software installed. Some prefer to avoid certain system-wide default settings.

At first glance, these appear to be reasonable requests: They would empower people to set defaults to suit their individual preferences. But the NYU-Internet systems — which are computers based on Digital Alpha hardware, running the Digital Unix operating system — serve nearly 30,000 people as 1996 draws to a close. For practical reasons (especially in terms of the level of technical support ACF can realistically provide to tens of thousands of users, each of whom could theoretically have a unique configuration), extended NYU-Internet customization is not presently an option.

These advanced users are the people who might be able to exploit the power of Linux.

**The Linux Approach**

Originally created by a student in Finland named Linus Torvalds, Linux is now maintained by a large number of volunteer programmers around the world, though Linus himself continues to coordinate development efforts of the core of the Linux operating system.

Source code for all freely distributed programs is available. This means that a capable system owner can tune the installation extensively — a luxury not normally available on a computer that must be shared by hundreds or thousands of other account-holders.

Recall, however, that Unix system administration...
— whether on a Digital Alpha computer running Digital Unix, or a generic PC running Linux — is no simple task, and requires a considerably greater commitment on the part of the machine’s owner than does a comparable PC running DOS and Windows. Linux puts greater power at a computer owner’s fingertips — but that requires more responsibility than many people can comfortably accept. Linux is definitely not for the casual user. (Hence the author’s note at the top of this article.) But those who are up to the Linux challenge may find the results indescribably rewarding.

It always helps to have books at hand when delving into a new system. The technical publishers O’Reilly & Associates publish a series of useful books for the budding Linux system administrator:

- *Running Linux*, by Matt Welsh and Lar Kaufman
- *Linux Network Administrator’s Guide*, by Olaf Kirch

Some of O’Reilly’s more general books are also invaluable for reference and for basic system administration:

- *Practical Unix and Internet Security*, by Simson Garfinkel and Gene Spafford
- *Essential System Administration*, by Aileen Frisch
- *TCP/IP Network Administration*, by Craig Hunt

The major Linux distributions include copies of the Linux Documentation Project’s series of how-to tips, which offer guidance on everything from setting up PPP service to configuring a tape drive for backups.

**Which Linux Distribution?**

Since anyone can take the Linux kernel and build a system around that core, several groups have developed their own models of what constitutes a functional Linux system. A few configurations have emerged as key elements in the Linux world. Some of them are

- Red Hat ([http://www.redhat.com](http://www.redhat.com))
- Debian ([http://www.debian.org](http://www.debian.org) & [http://www.i-connect.net](http://www.i-connect.net))
- Slackware ([http://www.cdrom.com/titles/os/sack96.htm](http://www.cdrom.com/titles/os/sack96.htm))
- Caldera ([http://www.caldera.com](http://www.caldera.com))

Which is right for you? Your needs will dictate the product you select.

Red Hat boasts that it offers a “commercial” Linux, which means that you can buy the CD-ROM (for under $50) or download almost the entire collection (several hundred megabytes). If you buy the software on CD, you get thirty days of free support. One of Red Hat’s greatest strengths is that the vendor supplies the software in packages, so that you can upgrade your system, or a small part of it, without needing to reinstall your machine from scratch; instead, you run an “update” command, and the system automatically updates old software with the new copies as distributed by Red Hat. The Red Hat distribution is maintained by the staff of Red Hat, which is a for-profit company. (Minor disclaimer: the Red Hat package is what I have selected as the basis for my own systems. I have no other interest in the company.) The current version (4.0) ships, ironically, with an X Windows desktop that is a clone of the Windows 95 desktop.

Debian also offers a sophisticated package-ori-
ent system, and has a wide range of developers around the world contributing to it. Debian is a non-profit group. Its distribution may be freely downloaded from the Debian site, or can be purchased on CD-ROM for $25. The Debian distribution offers powerful management tools, but it is not as polished as the Red Hat product.

Slackware is one of the oldest Linux distributions. Its installation mechanisms are not as advanced as Red Hat’s and Debian’s, but the basic system is robust and full of features. One of Slackware’s most irritating limitations, however, has been that upgrading to a new version required significant manual labor. (Additional disclaimer: Although I used Slackware distributions for a couple of years, I abandoned it in 1995, in favor of Red Hat.)

Caldera, in contrast to most other Linux distributions, is the product of a corporation selling its vision of a desktop Unix that happens to be based upon Linux. The basic price is $99; the software is not available for free downloading. One enhancement Caldera offers is its $329 Internet Office Suite, which includes Linux as well as WordPerfect for Unix (adapted to run under Linux), as well as other desktop applications. Caldera’s marketing strategy is to place Unix systems on desktops as workstations that can coexist with Windows and Macintosh computers; to work within this philosophy, one must spring for the entire $329 product. If you don’t need the full-blown desktop product, you may be better off with Red Hat’s offering.

Each distribution has its own loyal following. After considerable experimentation, I settled on Red Hat because of its ease of maintenance. Its features suit my needs. It is the distribution endorsed and distributed by O’Reilly and Associates, which means there is a significant amount of documentation available. And when bugs or security alerts emerge, the Red Hat team swiftly issues software patches at no charge.

The Power Is Yours — But Recognize Your Responsibilities

Just as running your own system gives you more latitude and autonomy, that added freedom carries with it significantly greater responsibility. Traditional housekeeping activities that are now performed on ACF’s central systems must be performed by the Linux owner, rather than by ACF operations staff. This includes system security matters, backups, software updates, hardware repairs and upgrades, and trouble diagnosis and solution.

Security: No system can be declared 100% secure. Linux is no exception to this rule. Indeed, a number of security advisories have been issued this year (continued on page 37)
Ways to Spot an Internet Bandit.

Web browser to travel around the Internet is destined to be a worldwide network of networks, you may be leaving behind footprints and other traces in cyberspace, in the form of log entries and other (more permanent) records. You may know about some of them. Others may not come to your attention until after you have done something that embarrasses you in front of thousands of observers.

Essentially, Daniel Barrett adds a healthy perspective to the extreme views of the Internet. He has an appealing style, speaking often in terms of balances and risks. True, the Internet lets us meet new people; but each new person is a stranger, and we may be lured into trusting someone we would never trust in person. Barrett's angle is not strictly microscopic; he sees the big picture, too. For example, one common platitude is that the Internet is destined to solve many of today's vexing social and political troubles; another decries services on the network as intrinsically worthless and pointless, and repeatedly predicts the end of the net as we know it. Fortunately, Barrett is level-headed and unflappable as he considers the good and bad points of each extreme view.

To begin, Barrett defines the basic concepts that are familiar to regular users of the Internet (including an especially lucid definition of the Internet itself). Generically speaking, he lists some of these as e-mail, Network News, the World-Wide Web, Chat, FTP, and Finger.

Speaking of mail, for example, Barrett sensibly reminds us that while a piece of e-mail may be composed in confidence, on your private machine, with your windowshades down and your doors locked, it is essentially open to snoopers and interlopers who might be positioned between you and your correspondent. (Although several years ago I was lovesick enough to supplement a real-life romance with one or two small e-mail love letters a day, I know now how foolish I would have felt if such mail ever went astray. It still drains the blood from my face to consider how I would react if I or my past girlfriend saw those notes today in public.) You may feel the same after studying Barrett's illustration of how circuitous a route e-mail may take on its trip from you to the recipient. His point is not that you should avoid e-mail, but that you should learn to use it with due caution, and to understand that unless you have made previous (and inevitably complex) arrangements, there is no guarantee that your e-mail will remain private at any point after you have sent it. (Incidentally, some solutions to this problem are emerging; see my articles on privacy and encryption in the Spring 1996 Connect, or read them online at http://www.nyu.edu/acf/pubs/connect/spring96/.)

The bulk of this book, however, focuses on the methods used by thieves — physical, virtual, logical; call them whatever you like — to separate you from your money, your privacy, your computer account, even your identity.

For example, "junk mail" (unsolicited messages, offering services that are often fraudulent or nearly so, transmitted via e-mail and Network News) is one of the faster-growing and more irritating practices on the Internet. A popular recent technique is for online marketers to grab chunks of e-mail addresses from sources such as mailing lists and network newsgroups, and then to unleash mass mailings on the unsuspecting victims. A large percentage of these efforts are variations on the classic pyramid scheme, in which you are urged to join a "Make Money Fast" endeavor, or to earn fabulous amounts of money by working at home with your computer.

Compared to other troubles that can happen on the network, though, junk mail seems almost pleasant. Some individuals who have made unpopular or contrarian statements in public have found themselves on the receiving end of "mail bombs," in which another network citizen and...
The Internet in Sub-Saharan Africa: Colloquium

What does it take to bring full Internet connectivity to a developing country in sub-Saharan Africa? Join us on Friday, February 7, when Nii Narku Quaynor will describe the special issues and challenges that he and his technical team have encountered while achieving this in Ghana in just a few years. The CEO of Network Computer Systems, a company providing a variety of information services, Dr. Quaynor will give us an expert’s view of how Internet access might best be extended in Ghana and elsewhere in Africa in the coming years.

His talk, which is provisionally titled “Building Internetworks and Bringing the Internet to Africa: The Interaction of Capitalism and Telecommunications Deregulation,” will take place at 2 p.m. in room 109 Warren Weaver Hall. All NYU faculty, staff, and students are welcome to attend.

The Spring ’97 Colloquia

Dr. Quaynor’s talk is part of a continuing series of NYU colloquia on computers and communications. Produced each fall and spring semester, the series is co-sponsored by NYU’s Academic Computing Facility and the Faculty of Arts and Science, with support from Apple Computer, Inc. Additional departments and schools join in co-sponsoring individual colloquia.

As we go to press, additional presentations in the series are being planned. For the latest details, check the NYU Web at http://www.nyu.edu/acf/nyu-events/. Flyers about each colloquium are mailed to all NYU faculty members. To receive an e-mail flyer, or to be added to the ACF’s mailing list, please send e-mail to document@nyu.edu . All colloquia since 1993 have been videotaped, and have been placed on reserve at the Avery Fisher Media Center in Bobst Library, where they can be viewed onsite or borrowed by faculty overnight for incorporation in a class session.

Product Presentations from Apple

Watch also for announcements of several technical and product presentations by specialists from Apple Computer, Inc. Part of a series begun last fall, these talks feature new products and applications of interest to the NYU academic community.

— Estelle Hochberg
estelle.hochberg@nyu.edu

Attempts to exact revenge for a real or perceived slight, and arranged an automated mechanism that sends thousands of messages to the victim, thus potentially overflowing the victim’s disk space or even crippling the receiving system or network connection. (A nasty variation on this is to launch a mail bombing and make it appear to have originated from an unwitting third party. In this approach both the recipient and the putative sender are victims, and the episode leaves a bad taste in the mouths of all involved.)

A related problem is online harassment and stalking, in which a victim is pursued by someone who seeks to establish . . . something: a relationship, a correspondence, a friendship, a professional arrangement. Most frequently, these situations tend to involve men pursuing women. Says Barrett, ‘Some men ‘cruise’ the Internet using the finger command, looking for women who are logged in, and then send bothersome messages to the women’s screens (using the talk command, for example). There is a women’s college in my area whose students regularly complain about such interruptions.’

As pathetic as this may sound to the neutral observer, Barrett makes it plain that to the person on the receiving end of this attention, it can be disconcerting, even terrifying, simply because the sender is almost literally disembodied. In a long sidebar, “A Net romance that led to tragedy,” he tells of a woman who “met” a man online and fell for him, only to be bilked of her savings by him. Seeking to get her money back, she invited him into her home, with results that seem obvious in retrospect.

But that is the point of Bandits on the Information Superhighway. We can find ourselves carried away online — by dreams of money, of power, of love — and, as in real life, we may be disappointed by the results.

Unlike many books about the Internet, Bandits did not leave me with the feeling that my pocket had been picked by a wily publisher. I often recommend this book to people who are concerned about their vulnerability on the Internet.

I like to keep a copy on my desk as well, to serve as a kind of sanity check in those times when I myself need to hear the sound of a calm, reassuring voice, or as I try to assist people who have wandered too close to Internet chaos. By the time such people see me, they have already ventured too deep into the dark caves of the Internet. A book like Bandits on the Information Superhighway could help such people avoid common pitfalls.

I hope this book enjoys a long life in print (perhaps with a less flashy title in future editions), because given human nature, the technology may change, but the problems will remain, whatever the medium.
Security Is My Business

It ain't a pretty racket, but somebody's gotta do it

Tim O'Chandler

It was a hot and sticky night in town. I was at the office late. I had a new book slapped open across my knee, because a client who always paid on time had asked me to evaluate it. I turned the pages without really noticing what they said. The how-to books don't interest me much. I could write up a report on this one without wasting my time reading every page.

I opened my window and left it open. All I got for the trouble was a hot breeze and a racket from the street way down below, which made me even more restless and itchy. It felt like a night when anything could happen. Nights like that, I try to get home fast, so I can stay out of trouble. It was my own fault that I was still around when the little man in the blue suit showed up.

He knocked on my office door weakly and pushed his way in without waiting for me to answer. I have a knack for attracting this kind of business. I leave my door ajar for guys like this.

He didn't say a word. All he did was slump down in my spare chair. I knew right then that it was a security problem. A serious security problem. I waited for him to start talking. They always start talking when they have security problems. All you need to do is sit. All you need to do is wait, and listen. And soon enough you learn to listen very carefully, and then you bill just as carefully as you listen.

The little man took off his hat and crushed it in his lap. He was stoop-shouldered even when he was in a chair. I made him out to be a small-time system manager in some company that probably paid him a lot of money and expected too much in return. He had that kind of worried look I recognized in the ones who go to work on Wall Street — but I knew no serious firm would entrust its operations to a guy who looked like this. I had plenty of contacts downtown. I was willing to bet a day's pay that this guy was a nobody, bankrolled by a private outfit that had plenty of cash and gave him new priorities five times a week, then yelled at him for being unproductive.

You had plenty of those operations around town. I made easy money from many of them, because the people in charge were always willing to write out a big check to someone who would come in from outside and second-guess their own tech staff.

When I took these jobs, I liked to drop in and talk things over with the insiders and then, in the end, if the staff seemed solid and the shop was secure, I enjoyed telling the guys in the suits that they ought to start trusting their own people. I never had any use for the slimy types in my business who come in for a day or two and write a lazy report that slams the working stiffs who run the computers.

I set the book aside, out of sight, and swung my feet up onto my desk. I looked the little man up and down. Then I asked him, "How badly were you compromised?"

Sometimes the direct approach works best.

His face turned the color of wet newspaper. "Bad," he said. "Bad. The worst. I don't know what I'm supposed to do next. I don't even know where to begin checking." He looked around the office. His face twitched. "Are we alone?"

I looked around the room. "It looks like it." My office is about as empty as an office can get. One desk, two chairs, and a garbage can.

He leaned toward me. "You don't have a tape recorder going, do you?"

I shrugged. "I don't own a tape recorder, Mister."

"I'm just checking," he said. "I try to watch what I say."


"No."

I took a couple of nuts and popped them in my mouth, shells and all. I cracked open the first shell with my teeth and spat the halves into the garbage can. He watched every move I made, so I did it slowly and carefully. You can never tell how the little nervous guys are going to act. I didn't want to scare him off. I had a feeling that there might be a payoff for me if I played things right. I said, "So, tell me what happened."

"I don't know where to begin."

"Try the part where it starts, and work your way through to the point right before you decided to walk through that door over there."

He let out a deep breath, which did nothing to raise

As his alter ego Tim O'Connor, the author works at NYU's Academic Computing Facility.
the color of his face, and he crushed the hat even more, and then he said, "My whole system is shot. From what I can tell, they broke into everything, at every level. All my machines are tied together. If these guys had enough access, nothing is protected."

"Did they do any damage?"
"Why don't you start with my reputation? It's ruined."
"I never saw you before, Mac, so as far as I know, you don't have a reputation. Tell me what happened. Give me the details. I draw my own conclusions."

"They used my systems to break into other computers."

I spat another shell in the garbage. "That happens all the time. Call the people who run those systems," I said. "Let them know they have a problem. Who's involved at the other end?"

He paused, then named a particular government agency that was as tough as government agencies get. I raised my eyebrows at that, and let out a slow whistle, strictly for effect. I said, "The guy who cracked your system got into that system?"

"They're going crazy about it. Right after I left my office, two agents showed up with, uh, paperwork, looking for me."

"Who told you that?" I asked.
"The girl who covers my phones." He got a little color in his face. "We're engaged."

"What did she tell them?"
"She said I was out to get help."
"Did she say where you were going?"
"No."
"Good," I said. "I don't want those guys in my office. But you can be sure they have a tap on your line."

His chest puffed up a little. "They won't hear a word. We scramble our calls."

I raised a single eyebrow and spat out another shell. "I don't want to alarm you or anything," I said, "but those guys unscramble phone calls for fun. There's not much you can hide from them. I know that for a fact."

His chest deflated.
"What else did the crackers do to you?"
"They wired a lot of money out of our accounts. Our financial guy is locked in his office right now trying to figure out the losses."

"You can kiss that money goodbye." His eyes bugged out. There must have been a lot of company assets at risk.
"We have the fraud laws on our side."
"Prove it."
"The logs. There must be something on my system — "
"First thing they do is get rid of any traces. These are not stupid people." I gazed at him. "You'd better get your head screwed on straight."

He gulped. "There was one more thing."
"And what was that?"
"They sent some mail," he said. "They got into my account and sent the mail as me."

"Where to?"
"Washington."
"Who?"
"A — a couple of people."
"Like who?"

He stared at the floor. "The — they — they sent it to — uh..."

"Don't waste my time," I said.
"The president," he said. "They made certain threats."
"Oh," I said. This system-cracker was sadistic, if my hunch was accurate.

"There were certain words used," he said.
I asked quietly, "Like — 'kill'?..."

[To be continued in the next issue of Connect. If you don't want to wait that long, look for the next episode at http://www.nyu.edu/acf/pubs/connect.]

ResNet (continued from page 7)
hubs also help keep traffic on ResNet private by encoding data carried on the ResNet infrastructure. Information destined for a particular Ethernet address is decoded only on the port registered for that Ethernet address. This prevents unscrupulous ResNet users from setting their computers to eavesdrop on other people's data. Once students venture beyond NYU-NET onto the Internet, though, their data can no longer be safeguarded in this way.

After students have activated their connections, they are offered continued support. Software and documentation are mailed to each student when the connection is activated. The software — the same suite of programs used with an ACF DIAL connection — consists of Netscape for browsing the Web, Eudora for handling mail, Telnet for connecting to remote computers, and FTP for transferring files. A staff of student employees called ResTechs is available to help resolve problems of connection and configuration. The ACF HelpLine and the ResNet Coordinator provide phone support and can dispatch ResTechs when needed. Wiring troubles (which have been an issue as thousands of connections were made) are handled by a crack team of data-line technicians. All of these support systems are being constantly improved as the project moves into its second semester.
YouthCaN: Kids Teaching Kids about Technology and the Environment

Millard Clements
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YouthCaN — Youth Communicating and Networking — is a project of kids teaching kids about technology and the environment. It is a telecommunications project, a community of students and their adult mentors, and a series of annual all-day gatherings of more than a thousand students, teachers, and parents.

On May 20, 1997, about a thousand students will attend YouthCaN97 at the American Museum of Natural History. This year’s YouthCaN is a joint project of students in Texas and New York. For two years, students from Rogers, Texas, came to YouthCaN in New York and made presentations dealing with environmental projects in their schools. This time, there will be computer-video connections between the two cities all day, bracketed by opening ceremonies transmitted from New York to Texas, and concluding ceremonies transmitted the other direction.

Background

YouthCaN began some years ago when NYU students in the Environmental Conservation Education program (SEd) gave small demonstrations of telecommunications projects at the United Nations. In the first such project, a teacher and seven elementary-school students demonstrated telecommunications projects connecting a school in Queens with one in Florida. One day in the fall and one in the spring, each class took a walk in the neighborhood of its school, making notes on the weather, birds, plants, and animals they observed. The classes then reported to each other about the life in their own communities; questions and discussion followed.

For a number of years, NYU students helped with telecommunications activities organized in association with youth events sponsored by the UN’s Environment Programme (UNEP). At one, 350 New York City students were involved in telecommunications, and about 700 students attended a parallel event.

YouthCaN events are now planned, organized, and administered by elementary and high-school students, with help from the NYU Department of Teaching and Learning and the Program in Environmental Conservation Education, and support from the American Museum of Natural History and a number of other organizations.

The mission of YouthCaN is to develop a sustainable computer network of youth groups, in order to coordinate and express their concerns on environmental issues. Young people with computer and telecommunications skills teach those skills to others, so that they can connect with like-minded young people around the world.

Workshops at the YouthCaN events deal with a range of environmental issues, from endangered species to pond ecology to toxic waste. There are also computer-related workshops on using e-mail, exploring the World-Wide Web, producing WWW pages, and developing cooperative projects with schools and organizations in the New York area and around the world. There have been video communications with students in Argentina, Australia, Spain, China, Canada, India, and Africa.

YouthCaN95 addressed issues of environmental
restoration, with presentations about several restoration projects. The Globetree project of Stockholm, Sweden, conducted a uniting-the-water ceremony to underscore its basic theme: Without water, there can be no life on earth. Since 1990, Globetree had already conducted such ceremonies in the Netherlands, Ireland, Brazil, Hungary, India, and Kenya. The large crystal bowl used in the ceremonies, which is to be given to the UN as a symbol of children's concern for water and their future, now contains water from more than 85 countries.

YouthCaN96 focused on projects to restore damaged ecosystems, create habitats, and protect existing wildlife: a joint Argentine-Israeli project on desertification, restoration of salmon runs in Oregon, and starting an urban butterfly habitat in New York with native plant species.

Why YouthCaN?

There are many school-based telecommunications projects. Heavy advertising and extravagant rhetoric sometimes exaggerate the contribution of telecommunications to education. The significance of this new technology is enormous but little understood: to some it seems a demonic conspiracy or a violation of human community.

In the last ten years or so there has been a profound change in human communications systems. Students in Florida can now communicate with their counterparts in Belarus, using telephone lines and other technology cheap enough for modest school budgets.

This technology allows direct communication between people in one part of the world with people in another. It provides access to alternative sources of information. It generates new relationships, new communities based on the written word. Governments may try to control these new communities; businesses will try to profit from them.

The Challenge

Our challenge for YouthCaN — and more broadly for us as environmentalists, educators, citizens, poets, and artists — is to use telecommunications to find significant information relating to environmental issues, and to participate in communities of environmental engagement in all parts of the world.

The information is there. For almost any topic, there are online resources that are more current than textbooks, more diverse in perspective than the public media. For some issues — climate change, rainforests, population, sustainable development, toxic waste, the ozone layer, and global warming, to name a few — there are no better resources than those online today.

Freer Information: With computer telecommunications there can be few secrets. Many governments are online. Computer records usually become public. The study in school of the nations of the world can now be based on direct access to credible information. Although information is neither knowledge nor wisdom, it can be the beginning of an understanding of how the governments, the United Nations, and the business communities of the world operate. A more or less secret world is becoming public. One might call this change the democratization of information.

Broader Perspectives: The new technology makes possible direct communication among people in different parts of the world. As students, scholars, indigenous people, and women's advocates have freer communications with colleagues in distant places, distant social issues, geography, languages, and culture become living realities.

World history from any national perspective is limited by the resources of that nation, but joint world-history studies can provide some freedom from the cultural limitations of any one nation. That freedom of shared perspectives can be the basis of a

YouthCaN Wants You!

This recruiting message was sent as broadly as possible over the Internet; perhaps Connect readers will know, or be, potential participants:

Attention all teachers and students in distant nations and regions of the world!

The YouthCaN97 Planning Committee is looking for student groups in Europe, in the Eastern Democracies, in South America, and around the world that are interested in doing long-term collaborative projects with students in the New York area. The projects will then be presented as workshops at the YouthCaN97 conference on May 16, 1997. We are seeking to develop sustainable, intensive partnerships among schools in New York and around the world.

If you are interested, please get in touch with Jay Holmes at jholmes@igc.apc.org or (212) 769-5039. — MC

(continued on page 19)
Performing Art Online

How does an artist perform technologically? This question framed Electronic Performance, an undergraduate workshop I taught last fall in the Department of Drama, Tisch School of the Arts; a graduate workshop was offered the previous summer through the Department of Performance Studies. The focus of both workshops was to explore electronic performance as the cross of cultural performance (such as theater, ritual, and performance art) and technological performance (ranging from clocks and answering machines to computers and the Internet).

In the fall course, students worked individually and in groups to create different poetics of electronic performance—poetics they embodied both in live performances and in Web sites. The individual projects focused on technologies in everyday life, using the work of Brenda Laurel and Donald Norman to develop an aesthetic approach to technological performance, especially that of common interfaces. The group projects sought to use the work of Gregory Ulmer to generate more detailed manifestos of electronic performances which were inspired by major practitioners of experimental theatre—Artaud, Brecht, Schechner, Boal, LeCompte, and Novarina. We analyzed the political and social dimension of our work using The Electronic Disturbance, by the Critical Art Ensemble.

Working with the ACF Innovation Center to develop these courses, I have begun to formalize a pedagogy I call StudioLab. As the name suggests, StudioLab takes place in performance studio and computer lab: students discuss theoretical issues and develop performances while in studio, and see demonstrations and create media while in lab. Electronic performance emerges from the flow of materials, skills, and ideas through these different environments. Projects, syllabi, and information about the summer and fall workshops are available at www.nyu.edu/classes/mckenzie.

— Jon McKenzie
mckenzie@is2.nyu.edu

Jon McKenzie is cofounder of VRcades, a research/art group located at the intersection of cultural theory and electronic media. Jon holds a PhD in Performance Studies from NYU, and his work has appeared in the New Museum of Contemporary Art, The Drama Review, and Lusitania, and on WFMU radio.
### Spring ’97 Schedule

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<td>Using a PC at an ACF Lab</td>
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<td>Advanced Topics in MS-Word</td>
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<td>Using a PC at an ACF Lab</td>
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<td>Regression Models with SPSS</td>
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<tr>
<td>Intro to the World-Wide Web</td>
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<tr>
<td>Understanding Your Mac</td>
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<td>NYU-Net Software (PC)</td>
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<td>Using Unix at ACF</td>
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<td><strong>Saturday, February 8</strong></td>
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<td>Using a Mac at an ACF Lab</td>
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<td><strong>Tuesday February 11</strong></td>
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<td><strong>Time Series, Part 1</strong></td>
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<td>SPSS on IBM-RISC</td>
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<td>News Groups</td>
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<td>Mutivariate Analysis in SPSS</td>
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<td>Parallel Computing at ACF</td>
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<td>File Transfer with Kermit (PC)</td>
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<td>Intro to SAS</td>
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<td>Understanding Your PC</td>
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<td>Intro to GIS</td>
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<td><strong>Wednesday, March 23</strong></td>
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<tr>
<td>Powerpoint (Mac and PC)</td>
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<td>File Transfer with Kermit (Mac)</td>
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<td><strong>Wednesday, February 19</strong></td>
<td>C-11</td>
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<tr>
<td>NYU-Net Software (Mac)</td>
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<td>Advanced Topics in Excel</td>
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<td>Multivariate Analysis in SPSS</td>
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<td>Intro to MPI</td>
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<td>SAS: Categorical Data Analysis</td>
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<td>C-13</td>
<td><strong>Wednesday, April 2</strong></td>
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<td>Choosing Your Computer</td>
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<td>NYU-Net Software (PC)</td>
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<td>Intro to HTML</td>
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<td>Image Scanning (Mac)</td>
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<td>Intro to SPSS</td>
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<td>Scanning Test Scores</td>
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<td>Using UNIX: Special Topics</td>
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<td>Time Series, Part 3</td>
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<td>Scientific Visualization</td>
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<td>Resources at ACF</td>
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<td><strong>Friday, April 11</strong></td>
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<td><strong>Thursday, February 27</strong></td>
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<td>Multithreaded Programming</td>
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<td>Regression Models with SAS</td>
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<td>NYU-Net Software (PC)</td>
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**Important Dates for Users of ACF Services**

(For updates to this list, please check the NYU Web at www.nyu.edu/acf/nty-events/.)

Jan. 20—Martin Luther King, Jr. Day.*

Jan. 22—Spring ’97 semester opens; ACF labs’ in-session hours begin.**

Feb. 17—Presidents’ Day.*

Feb. 18—Students’ responsibilities forms due back from instructors with Class Accounts.

Mar. 3—Instructors’ applications for Summer ’97 Class Accounts accepted (through Apr. 4).

Mar. 17—NYU’s spring recess (through Mar. 22).**

Apr. 1—Instructors’ applications for Fall ’97 Class Accounts accepted (through May 16).

Apr. 24—Applications for computer account extensions from students expecting incompletes accepted (through May 16). Instructor’s signature required.

May 5—Students with Unix Class Accounts should download files they wish to keep after their accounts expire (through May 24).

May 14—Spring ’97 semester ends; ACF labs’ summer hours begin.**

May 19—First summer session begins.

May 24—Spring ’97 Class Accounts expire.

May 26—Memorial Day.*

*NYU holiday: Labs & offices closed.

**Please check at labs and at above Web address for updates on ACF hours.
Choosing Your Computer (Mac and PC)
This talk is intended to help you select the best personal computer for your needs. It will cover the basic components of a computer, as well as the other hardware required for various tasks. We will also discuss how you can assess your particular needs to establish your criteria for selecting computer tools. Taught by staff from the NYU Computer Store.

Warren Weaver Hall, room 313
Seating capacity: 30; first come, first served; talk.
Fridays 12:00–1:30
January 31
February 21

Understanding Your Computer (Mac and PC)
This introductory talk will help you learn about your computing equipment. It will focus on such basic operations as setting up your computer, setting up a printer, and configuring your operating system with the fonts and tools you need. Discussion will include troubleshooting techniques and other strategies for dealing with problems you might encounter while using your PC. Taught by staff from the NYU Computer Store.

Warren Weaver Hall, room 313
Seating capacity: 30; first come, first served; talk.

For Mac Owners
Fridays 12:00–1:30
February 7
February 28

For PC Owners
Fridays 12:00–1:30
February 14
March 7

Using a Mac at an ACF Lab (Mac)
A hands-on introduction to the Macintosh computer. Topics include the ergonomics of proper computer use, working with the graphical user interface, understanding the file system, choosing printers, file servers, and other devices, and launching software applications. ACF staff.

Education Building, 2nd floor
Seating capacity: 25; first come, first served; hands-on class.

Tuesdays 11:00–12:00
January 28
February 4

Saturdays 11:00–12:00
February 1, 8

3rd Ave. North Res. Hall, level C-3
Seating capacity: 15; first come, first served; hands-on class.

Mondays 11:00–12:00
January 27
February 3

Wednesdays 1:00–2:00
January 29
February 5

Using a PC at an ACF Lab (PC)
A hands-on introduction to the PC — the "IBM-type" personal computer. Topics include the ergonomics of proper computer use, working with the user menus on the PCs in the labs, understanding the file system, choosing printers and file servers, and launching software applications. ACF staff.

Tisch Hall, room LC8
Seating capacity: 24; first come, first served; hands-on class.

Saturdays 11:00–12:00
February 1, 8

14 Washington Place, basement
Seating capacity: 15; first come, first served; hands-on class.

Thursdays 11:00–12:00
January 30
February 6

3rd Ave. North Res. Hall, level C-3
Seating capacity: 15; first come, first served; hands-on class.

Mondays 1:00–2:00
January 27
February 3

Wednesdays 11:00–12:00
January 29
February 5

Learn Unix by E-Mail
Taught by Computer Advocacy @ NYU, this is a course on Unix for anyone who has an e-mail account on any computer at NYU and knows how to read e-mail. The course will cover a broad range of topics, starting with the basic commands (such as the ones used to move around the file structure), and going into intermediate topics (permissions, etc.). Also covered are basic Internet utilities (Telnet, Finger, etc.), as well as an introduction to the information systems available on the Internet (newsgroups, WWW).

The lessons will be mailed to subscribers twice a week, starting February 10. Subscriptions are open to all members of the NYU community. If this schedule isn't good for you, you can find past lessons on the Web.

For more information, send e-mail to cac.unix.lessons@acf5.nyu.edu or see http://www.nyu.edu/pages/advocacy/committee/unix/ on NYU Web.
Using Unix at ACF
(Unix)
An introductory class on using the Unix operating system, variants of which run on several different types of computers at the ACF. Most are accessed at ACF labs through PCs, Macs, and terminals, but the SGI workstations also use Unix. The basics will be covered: logging onto the host machines, organizing files, editing text, printing files, and using applications. See also Using Unix: Special Topics, below. ACF staff.
ACF Unix account required.

Tisch Hall, room LC8
Seating capacity: 24; first come, first served; hands-on class.
Wednesday 11:00–12:00
February 5

14 Washington Place, basement
Seating capacity: 15; first come, first served; hands-on class.
Friday 1:00–2:00
February 7

E-Mail and Network Services

www.nyu.edu/acf/accounts.office.html
www.nyu.edu/acf/help/

Introduction to the Internet and Your ACF E-Mail Account
(NYU-Internet Account, Unix)
This talk-demo introduces new holders of the NYU-Internet Account to its menu interface and components. E-mail concepts and commands will be explained and demonstrated. The account runs on ACF’s DEC mini-computers and is connected to NYU-NET and the Internet. Lisa Barnett and Vincent Doogan.

Warren Weaver Hall, room 102
Seating capacity: 50; first come, first served; talk-demonstration.
Fridays 2:00–3:30
January 31
February 14, 28
March 14
April 11

NYU-NET Software
(Mac, Windows)
This talk is intended for those who have TCP/IP connections to NYU-NET from their office or home. The TCP/IP and PPP protocols will be discussed, and software based on these protocols will be demonstrated. The software to be discussed includes Netscape, Eudora, and Fetch. Lisa Barnett, Jane DelFavero.

1. For PC Users
Warren Weaver Hall, room 313
Seating capacity: 30; first come, first served; talk.
Wednesday 12:00–1:30
March 12

2. For Mac Users
Warren Weaver Hall, room 313
Seating capacity: 30; first come, first served; talk.
Wednesday 12:00–1:30
March 26

News Groups
(NYU-Internet Account, Unix)
News groups are discussion forums on the Internet. Using the NYU-Internet Account, the speaker will introduce basic concepts and demonstrate the command sets of and Tin, a newsreader utility. ACF staff.

Warren Weaver Hall, room 313
Seating capacity: 30; first come, first served; talk.
Wednesday 12:00–1:30
February 12

Uploading & Downloading Using Kermit
A useful class for those who want to do their word processing and other work on their desktop PCs or Macs, and then send the files by E-mail or upload them to VMS or Unix machines, or need to download files from distant machines to their own computers. Telnet, FTP, and Archie will be discussed. Johnny Chung and Michael Fuskar.

1. For PC Users
Warren Weaver Hall, room 313
Seating capacity: 30; first come, first served; talk.
Wednesday 12:00–1:30
March 12

2. For Macintosh Users
Warren Weaver Hall, room 313
Seating capacity: 30; first come, first served; talk.
Wednesday 12:00–1:30
March 26

Computers and Operating Systems

Using Unix: Special Topics
(Unix)
An intermediate talk on using the Unix operating system for those who have attended Using Unix at ACF (above) or have equivalent knowledge. Topics include file permissions, path, aliases, pipes, redirect, filename completion, command substitution, and such common utilities as man, vi, and grep. Ed Nichols.

Warren Weaver Hall, room 313
Seating capacity: 30; first come, first served; talk.
Wednesday 12:00–1:30
February 26

C-4 Spring 1997 ACF Classes and Talks
World-Wide Web Browsing and Publishing

The World-Wide Web is a hypertext interface system for publishing documents containing text, sounds, and images. These documents are browsed with software such as Netscape and Lynx. Hypertext Markup Language (HTML) is the mechanism for preparing home pages and other Web creations. ACF staff.

1. Introduction to the World-Wide Web (Mac, Unix, Windows)

Lynx and Netscape are programs that allow you to browse World-Wide Web servers — repositories of digital images, sounds, and text. The evolution of these easy-to-use browsing tools has made it possible for even novice computer users to locate desired information resources from across the Internet. This talk will feature a demonstration and explanations of basic concepts and commands.

Warren Weaver Hall, room 102
Seating capacity: 50; first come, first served; talk.
Friday 2:00-3:30
February 7

2. Introduction to HTML

Beginning with the basics of what an HTML file looks like, the speaker will explain the structure of a document and its HTML elements. Sample pages will be analyzed and constructed. Topics will include tags, links, URLs, and embedded graphics.

Warren Weaver Hall, room 102
Seating capacity: 50; first come, first served; talk.
Friday 2:00-3:30
February 21

3. Advanced HTML Topics

This session focuses on including images on your Web pages; “image maps,” frames, and Java will be explained. The dos and don’ts for writing and designing Web pages will also be discussed.

Warren Weaver Hall, room 102
Seating capacity: 50; first come, first served; talk.
Friday 2:00-3:30
March 7

Powerpoint (Mac, Windows)

Powerpoint presentation software is platform-independent, part of the Microsoft Office suite. This demonstration and workshop will explain the main features of Powerpoint and how best to use it for lectures or other public-speaking activities. Discussions will include using text and graphics, slide transitions, and options for displaying or distributing a completed presentation. Jeffrey Lane.

Warren Weaver Hall, room 313
Seating capacity: 30; first come, first served; talk.
Tuesdays 2:00-3:30
February 18
April 1

Mathematica 3.0 (Unix, PC, Mac)

With the release of Version 3.0, Mathematica can now produce files that integrate graphics, mathematical typesetting, unlimited-precision arithmetic, and advanced mathematics. These files can be printed, displayed on a computer monitor, or posted as Web pages. The notebook interface is available on Unix, Windows, and Macintosh computers. Topics discussed will include run-
ning Mathematica on ACF computers and using the new features. Howard Fink.

Warren Weaver Hall, room 313
Seating capacity: 30; first come, first served; talk.
Friday 2:00–3:30
April 11

High-Performance Computer Resources
(SGI Challenges; IBM RISC cluster; NSF supercomputers)
An introduction to high-performance computers at NYU and elsewhere. The speaker will discuss the IBM RISC cluster and the SGI Challenge systems at NYU and the various systems available at the NSF supercomputing centers. Edward Friedman.

Warren Weaver Hall, room 313
Seating capacity: 30; first come, first served; talk.
Wednesday 2:00–3:30
January 29

Parallel Computing
(SGI Challenges; IBM RISC cluster; NSF supercomputers)
A series of talks on the principles and practices of parallel computing.

1. Parallel Computing at ACF
A survey of hardware and software for parallel computing provided by ACF and by NSF Supercomputing Centers at Cornell and Pittsburgh. Hua Chen.

Warren Weaver Hall, room 313
Seating capacity: 30; first come, first served; talk.
Thursday 12:30–2:00
February 13

2. Introduction to MPI
An introduction to the Message-Passing Interface standard for distributed computing and a survey of existing implementation of the standard. Hua Chen.

Warren Weaver Hall, room 313
Seating capacity: 30; first come, first served; talk.
Thursday 12:30–2:00
February 20

3. Introduction to Multithreaded Programming
Introduction to thread libraries and a discussion of the advent of shared-memory multiprocessors and the interactions between threads and SMP machines. Adel Hanna.

Warren Weaver Hall, room 313
Seating capacity: 30; first come, first served; talk.
Thursday 12:30–2:00
February 27

Scientific Visualization Resources at the ACF
(Silicon Graphics)
The need to understand large data sets generated from scientific studies makes scientific visualization ever more important. The lecturer will present an overview and hands-on multimedia demonstration of the resources — software and equipment — available to scientists on the Silicon Graphics computers at ACF.

Topics will include software for visualizing fluid dynamics, molecular models, volumes, and abstract mathematics; modular software packages; libraries for 2D and 3D graphics; image processing; movie; and audio; interactive visualization packages and solutions; and visual debugging and analysis of computer programs; and conversion between image formats.

ACF's stereographics equipment will be demonstrated in relation to visualization packages and solutions for the programmer. ACF staff.

Warren Weaver Hall, room 313
Seating capacity: 30; first come, first served; talk.
Wednesday 2:00–3:30
February 26

Scientific Visualization Videos
A presentation of videos created at the ACF Scientific Visualization Lab, as well as a selection of videos previously presented at various national visualization conferences. Featured videos will include The Visible Human and The Largest Structures in the Universe. ACF staff.

Warren Weaver Hall, room 313
Seating capacity: 30; first come, first served; talk.
Wednesday 2:00–3:30
March 12

Statistics, Databases, and Spreadsheets

www.nyu.edu/acf/soscsl/

Excel (Mac)
Microsoft's Excel is a major spreadsheet for the Mac. Howard Fink.

1. Introduction to Excel
A start-up talk-demonstration on creating a basic spreadsheet.

Warren Weaver Hall, room 313
Seating capacity: 30; first come, first served; talk.
Friday 2:00–3:30
March 14
Advanced Topics in Excel
In this advanced session, formulas and charting will be covered. Knowledge of Excel and Macintosh basics required.

Warren Weaver Hall, room 313
Seating capacity: 30; first come, first served; talk.

Friday 2:00-3:30
March 28

Scanning Test Scores (Windows)
A demonstration of affordable optical-scanner software used to read questionnaire answers to create data sets for statistical analysis. ACF staff.

Warren Weaver Hall, room 313
Seating capacity: 30; first come, first served; talk.

Friday 2:00-4:00
April 4

SAS (Windows, Unix)
This series will progress from the basic description and operation of this statistical package to advanced concepts and usage. Robert Yaffee.

Reservation required. For reservations and information, contact Dr. Yaffee at 998-3402 or yaffee@nyu.edu.

Warren Weaver Hall, room 313
Thursdays 4:30-6:00

1. Introduction to SAS
February 13

2. Categorical Data Analysis
February 20

3. Regression Models with SAS
February 27

SPSS: SPSS for Windows (Windows, Unix)
SPSS (Statistical Package for the Social Sciences) is a comprehensive, integrated system for statistical data analysis. These presentations will use either the Windows or the newer Unix version of SPSS, but the programming concepts are applicable to all versions of SPSS. Frank LoPresti.

Warren Weaver Hall, room 313
Seating capacity: 30; first come, first served; talk.

1. Introduction to SPSS
Data input, transformations of variables, creation of "system files," and other manipulations of data will be discussed.

Wednesday 2:00-3:30
February 5

Tuesday 1:00-2:30
February 25

2. Advanced Topics: Regression Models
Wednesday 2:00-3:30
February 12

Tuesday 1:00-2:30
March 4

3. Advanced Topic: Multivariate Analysis
Wednesday 2:00-3:30
February 19

Tuesday 1:00-2:30
March 11

SPSS Running on the IBM RISC-based RS/6000 at ACF (Unix)
An introduction to SPSS running on a high-performance Unix resource available to NYU faculty and students. This is a Windows-like GUI (graphical user interface) version of SPSS new at ACF. Data and output are displayed in windows rather than through traditional command-line mode. Such an application running in a Unix X-windows workstation environment holds interest for academic researchers whose storage, speed, and support needs are beyond the capabilities of a personal computing system. Frank LoPresti.

Warren Weaver Hall, room 313
Seating capacity: 30; first come, first served; talk.

Tuesday 2:00-3:30
February 11

Regression Analysis of Time Series (Windows, Unix)
This series will cover time-series analysis in detail. Robert Yaffee.

Reservation required. For reservations and information, contact Dr. Yaffee at 998-3402 or yaffee@nyu.edu.

Warren Weaver Hall, room 313
Fridays 4:00-6:00

1. Regression Diagnostics
March 7

2. Heteroskedastic Models
March 14

3. Autocorrelation
April 4

4. Distributed Lag Models
April 11

5. Model Building
April 18

6. Forecasting with Dynamic Regression Models
May 2
Microsoft Word

*(Mac)*

Microsoft Word is a major word-processing program on Macintosh computers and is especially strong on typography and formatting.

1. Introduction to Microsoft Word

This is a getting-started talk-demonstration. The basics of creating a document will be covered. Howard Fink.

Warren Weaver Hall, room 313
*Seating capacity: 30; first come, first served; talk.*
*Friday* 2:00–3:30
*February 14

2. Advanced Topics in Microsoft Word

Topics will include mailmerge and tables. Knowledge of Microsoft Word and Macintosh basics assumed. Howard Fink.

Warren Weaver Hall, room 313
*Seating capacity: 30; first come, first served; talk.*
*Friday* 2:00–3:30
*February 28

Class Locations

[http://www.nyu.edu/acf/classes/](http://www.nyu.edu/acf/classes/)
The following are the street addresses of the locations referred to in the course descriptions.

- Warren Weaver Hall, 251 Mercer Street
- 14 Washington Place, lower level
- Education Building, 35 West 4th St., 2nd floor
- Third Avenue North Residence Hall, 75 Third Ave., C-3
- Tisch Hall, 40 W. 4th Street, lower concourse

HelpCenter

[http://www.nyu.edu/acf/help/](http://www.nyu.edu/acf/help/)
251 Mercer St., 2nd floor 998-3333
Troubleshooting; software distribution; information about ACF services and academic support.

Accounts Office

[http://www.nyu.edu/acf/accounts/](http://www.nyu.edu/acf/accounts/)
251 Mercer St., 3rd floor 998-3035
Faculty and staff account applications and information: individual, coursework (class), and NYU-Internet accounts. DIAL account applications for faculty, staff, and students.

Innovation Center

[http://www.nyu.edu/acf/ic/](http://www.nyu.edu/acf/ic/)
251 Mercer St., 2nd floor 998-3044
Discipline-oriented resources and services for faculty and advanced students; instructional computing support; new and emerging technologies.

Student Computer Labs

[http://www.nyu.edu/acf/labs/](http://www.nyu.edu/acf/labs/)
14 Washington Place 998-3457
Education Building 998-3421
3rd Ave. North Res. Hall 998-3500
Tisch Hall 998-3409
Student NYU-Internet Account applications; computer and Internet access (see ACF flyers and above Web address for hours and rules of access).

Publications

[http://www.nyu.edu/acf/pubs/](http://www.nyu.edu/acf/pubs/)
Pamphlets, flyers, brochures, and the magazine *Connect* for users of NYU computer and network services. Printed copies are available at the HelpCenter and labs; online editions are at the above Web address.

News and Announcements

[http://www.nyu.edu/acf/nyu-events/](http://www.nyu.edu/acf/nyu-events/)
Updates on hours and services; special events and other notices of interest.
New Web Site for Exploring Instructional Technologies

Human knowledge and technology have taken millennia to evolve; teachers struggle to transmit the accumulated wisdom of their fields to their students. Today, the educational challenge is to ensure that this legacy informs the rapid development of digital technology, and that the latter is as useful as possible for teaching and learning.

The World-Wide Web is an important landscape for this endeavor. It provides access to timely and fast-changing information sources: it announces, explains, and offers access to technology resources — all at once.

ACF is introducing a new Web site to aid faculty in learning about and researching online resources to support and improve the teacher-student relationship. Our focus has been to try to provide an online experience for faculty who are experts in their fields, and are also learners of digital technologies. We hope that we have begun a site that will support all faculty learners. Please visit our site soon: http://www.nyu.edu/acf/usg/teach-learn/

— Vincent Doogan

YouthCaN (continued from page 17)

deepen awareness of the multiplicity of ways people live on our earth.

New Communities: Finally, the new technology generates new human relationships and communities based on the written word. The democratization of communications allows ordinary people to publish information about their own lives. With the broadcast and print media, only a few powerful individuals have full freedom of speech. With the new technology, citizens of the many nations of the world are free to voice their own concerns and interests. New telecommunities exist through words, through minds, through new possibilities of communication.

Opportunities

The new technologies provide remarkable opportunities for education. Rather than use obsolete books about other countries, we and our students can communicate by e-mail with schools in Moscow, teachers in Japan, environmentalists in Kiev, students in Estonia or London. We can visit Web sites around the world. We can teach young people to be webmasters and to engage in public life. As teachers, we must learn how to use this technology with art, skill, and wisdom.

If you care about the conflicts in Bosnia, Africa, and East Timor, or about racial tensions in the United States, or about the environmental crisis, get online. Put your students and your colleagues online too. Introduce them to the communities of concern with which you are involved. We have the technology; we must develop skill in its use.

YouthCaN is one project devoted to creating communities of cooperation and communications that are themselves devoted to facing and resolving global issues that affect our lives today.

Using the ACF Computer Labs

NYU faculty, staff, and students in degree programs may use the PCs and Macintoshes in the ACF computer labs without charge during designated hours or, with ACF access accounts, during all hours of operation. In most labs, only those with access accounts are admitted during the high-demand times from noon to 8:00 pm on weekdays.

Faculty members who wish to use the labs during restricted hours, or who expect their students to use the labs for either coursework or independent projects, should be sure to obtain coursework accounts from the ACF Accounts Office (Warren Weaver Hall, room 305). This type of account ensures access to labs during all hours of operation.

During the semester, ACF computer labs are generally open weekdays from 8:30 am until late evening, with extended hours (including all-night hours at Tisch Hall) after midsemester. For complete lab hours, pick up a brochure at any lab or see http://www.nyu.edu/acf/nyu-events/
As Data Storage Grows Denser, Older Formats Fade: Nine-Track Tapes and 3480 Cartridges to Be Retired

Where do you keep your electronic data if it's not online on a hard disk, ready to get at? For many years, a good solution has been magnetic tapes — one of the earliest forms of storage. For more than two decades, nine-track tapes have been used in computer centers, including NYU’s ACF and UCC, to transfer data from site to site or to store it inexpensively for extended periods.

Over the last decade, though, computer networks have steadily replaced physical tapes as the normal method of data transfer. At the same time, cartridge tapes have replaced the larger reel-to-reel units, and those cartridges have been getting smaller and denser.

The older nine-track tape drives at ACF can write only 250 megabytes of data onto the half-inch magnetic tape on a large reel about 10.5 inches in diameter. The IBM 3480 cartridge tape drives we have can store about the same amount of data on a cartridge 4 inches square. In comparison, a CD-ROM stores more than twice the data on a disk less than a tenth the size, and a DAT-like data tape stores almost ten times the data on a tape cartridge a tenth the size of the IBM 3480. And the coming DVD format of the CD promises as much as 20 gigabytes on a single disk.

The ACF has two large and all-but-unused nine-track tape drives and two only slightly more-often-used IBM 3480 cartridge tapes drives. As they get older, they become more expensive to maintain. Since they are used very little and occupy a large area of the ACF central machine room, we plan to retire them over this summer, and have them physically removed by the start of the Fall 1997 term.

Convert Your Data Soon!

Anyone who has data stored on either nine-track reels or the IBM 3480 format should arrange to copy the data onto a different medium during the Spring semester. If you need to use the data more than occasionally, the best solution might be to download to a large hard drive on your personal computer, since three-gigabyte drives are available for about $300. Copying the data onto a more modern medium such as DAT tapes is also a reasonable approach. In some cases, it might serve to transfer the data onto a writable CD-R disk; there are systems in the ACF Innovation Center for writing from both Mac and Unix systems (for the latter, see the article in the Spring 1996 issue of Connect).

You should also be sure you won't be receiving new data on the old formats. If you are now getting or expecting to get data from a remote site, you should experiment now with transferring the data over the Internet, or request that the data be shipped on a medium that can be read on your personal computer or on a computer server you are using. While most large computer centers in the US are retiring the older machines and moving away from the larger data-storage technologies, some foreign and underfunded sites are moving slowly. So don't get caught with your data on old media. Once the older machines have been retired at NYU, the ACF will not be able to retrieve data in the old formats, and you will have to go to an outside service bureau to have the data converted.

Getting Help before It's Too Late

Users of the ACF Scientific Computing systems should speak with a consultant (998-3051) for assistance in planning their data conversion and transport. Similarly, social science researchers should speak with the ACF Statistics and Social Science consultants (998-3398) for advice. Any other scholar with data to convert should speak to someone at the ACF HelpCenter (998-3333) for a referral.

— Stephen Tihor
stephen.tihor@nyu.edu

Stephen Tihor works in the ACF Core Technologies group, maintaining the systems, teaching classes, and answering questions.
Equipment at the ACF Computer Labs
The ACF’s four instructional computer labs have about 350 Apple and IBM-type computers. All are linked to NYU-NET, the campus data network, and are connected to Novell-based file servers and printers. Each lab has two or more laser printers. A large collection of software (over 100 packages) is available.

Education Building, 2nd floor (104 computers)
- 33 Power Mac 6100 computers, with CD-ROM drives, 16-inch color monitors, 40 MB memory, 100 MB Zip drives
- 23 Power Mac 6100 AV computers, with CD-ROM drives, 40 MB of memory, 250-GB hard drives, 270 MB Syquest drives, 100 MB Zip drives, 17-inch multiscan monitors
- 21 Macintosh Quadra 700 computers, with 20 MB memory, 80-GB hard drives, color monitors
- 2 Macintosh Quadra 800 computers, with CD-ROM drives, color monitors
- 18 Macintosh systems in the New Media Center, for special projects classes in the arts, including one transfer station with DAT, 230-GB Magnetic-Optical drive, 44-GB, 135-GB, and 200-GB Syquest drives, 100-GB Zip drive, and 1000-GB Jaz drive
- 6 Macintosh IIfx computers, with CD-ROM drives and color monitors
- 1 media transfer station, based on a Mac Quadra 800, with a 100-GB Zip drive, a 270-GB Syquest drive, a 135-GB Syquest EZ drive, a Syquest drive for 44-, 88-, or 200-GB media, and a 1000- or 500-GB Jaz drive

Other peripherals:
- 1 Mitsubishi 27-inch SVGA monitor with a 100-GB Zip drive and 1 JVC VHS VCR
- 34 APS 270-GB Syquest drives
- 50 Iomega 100-GB Zip drives
- 2 JVC VCRs

- 8 Hewlett-Packard flatbed scanners
- 4 Hewlett-Packard laser printers (3 IIIsi 300 dpi and 1 4isi 600 dpi)
- 2 Hewlett-Packard HL300 300dpi Paintjet printers
- 1 Apple 600dpi ColorLaser printer
- 1 Xerox 4220 multi-paper-size 300dpi printer

Third Ave. N. Residence Hall, C-3 (104 computers)
- 25 IBM PS/2 model 70 computers, with VGA color monitors, numeric coprocessors, and joysticks
- 9 DEC 486 computers, with 8 MB of memory, 120-GB hard drives, color monitors
- 18 Gateway 486DX2 computers, with 16 MB memory, 330-GB hard drives, 15-inch color monitors
- 36 Macintosh IIIsi computers, with color monitors
- 16 Macintosh IIci computers, with 17 MB of memory, color monitors

Tisch Hall, room LC-8 (72 computers)
- 1 IBM-type computer with Accent Text-to-Speech Synthesizer, Vocal-Eyes Screen Navigation Software, Zoom-Text Screen Magnification Software
- 34 Gateway Pentium 100s, with 16 MB memory, 1.2-GB drives, Vivitron monitors, CD-ROM drives
- 25 Gateway 486DX2 computers, with CD-ROM drives, 5.25-inch and 3.5-inch diskette drives, 340-GB hard drives, 15-inch color monitors
- 12 IBM PS/2, 555X, with VGA color monitors

14 Washington Place (71 computers)
- 30 Gateway Pentium 75s, with 16 MB memory, 696-GB drives, Vivitron monitors, 5.25-inch and 3.5-inch diskette drives, CD-ROM drives; 10 have Soundblaster Ptlt, mikes, and headphones
- 29 DEC 486DX computers, with 8 MB memory, 5.25-inch and 3.5-inch diskette drives, 120-GB hard drives
- 9 Gateway 486 DX computers, with 8 MB of memory, Super-VGA color monitors
- 3 Gateway Pentium 100s, with 16 MB memory, 1.2-GB drives, Vivitron monitors, and CD-ROM drives

Dial-in Access to ACF Computers
To connect via modem to NYU-NET, NYU’s campus-wide network, set your modem to 8 data bits, 1 stop bit, full duplex, no parity, and dial the appropriate number:

Type of connection Dial this number
Conventional dial-in (usually with Kermit), all speeds 995-4343
DIAL accounts only 253-4698
(253-4NYU)

Atlantic Monthly Poetry Pages
The Atlantic Monthly Poetry Pages (at the URL http://www.theatlantic.com/atlantic/atlweb/poetry/poetpage.htm) are “a multimedia feature devoted to poets and poetry, both classic and contemporary.” The highlight of the site is Atlantic Monthly Poetry Online, a collection of poetry from the online edition of the magazine. In addition to text versions, many of the classic poems are available in RealAudio and .wav formats.
SAS Assist: A Friendlier Face for a Statistical Powerhouse

Frank LoPresti
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Though it's known and respected at universities and research labs primarily as a package to manage data and analyze statistics, SAS is in fact a complete computing system that could run a corporation. It not only gives you control of your data through the stages of input, storage, and computation but could even be the software backbone of an automated system at a research lab or a large corporation.

Unfortunately, SAS isn't the easiest program to use. To make it easier, the SAS Institute has produced SAS Assist — a modern menu-driven, task-oriented interface to the entire SAS System. It allows SAS statistical programs to be written without first knowing the written command syntax. To choose a task, you use a mouse, windows, and menus.

For example, a Data statement for an input step may be written and run using the toolbars and buttons of SAS Assist and a mouse. The user clicks on some more buttons and pull-down menus and runs a Freq commands to get frequency tables for the active data set. The results of the clicking are written SAS commands, which may be viewed as they are being stored in a file. This program log records the written commands along with useful comments documenting what task each command accomplishes. The user can edit and rerun the program he or she has created. Voilà — SAS for dummies . . . Those who know the commands already will say, correctly, that the friendly interface is slower than the old command-line interface; those who haven't learned the old way will probably, and legitimately, prefer the new.

A Short Tour

Start SAS on a PC (or in Unix) in “windowed” display-manager mode. In the old days, before Windows, we would have submitted a “batch” SAS job — a program file with SAS commands created at an earlier time using a text editor and a manual. Now we simply click on a menu item or an icon.

The SAS logo appears and the user is presented with two windows, Log and Program Editor (unfortunately, there is no Data window). Each window will have an action bar with items File, Edit, View, etc.

The Primary Menu of SAS Assist presents several task groups for selection; Data Management, Data Analysis, and Results would be used in a typical analysis.

Frank LoPresti heads the ACF Statistics and Social Science Group.
In the Data Management window, a typical task would be to subset the larger data set. Here, we are building a logical expression involving variables in the main data set. First we selected the Subset or Copy icon on in the DM window, which brings up the window on the lower left, where we named the active data set, the output data set, and began specifying the selection criteria as a logical expression made up of variables and logical operators, available through the subsequent dialog boxes: first, build a WHERE clause, then specifying its components. The result is a syntactically correct SAS expression that will produce the desired subset, called WORK.ARTICLE.

Globals, and Help. In this environment, before the days of Assist, the user would have had an interactive SAS session, typing all the commands with all their parameters in the Program Editor window and then typing the command run.

Let’s start Assist. Using the mouse, pull down the menu under Globals on the action bar, then click on Assist. The Primary Menu window opens (first illustration). SAS Assist has icons that represent each primary task group: Tutorial, Data Management, Report Writing, Graphics, Data Analysis, Planning Tools, EIS (which stands for Executive Information System), Results, Setup, Index, and Exit. If you can’t find the task you want to use, click on Index to display a list of all the tasks that can be performed; if you select the one you want from the list, the software takes you directly to the task. But we will select the active data set using the Active task from the Data Management menu.

A SAS data set is processed and controlled within the SAS System. Columns and rows hold data values, where each column represents a variable and each row a single observation. The active data set could also have been chosen from an existing SAS data library — a collection of files recognized by SAS. Except for raw data, each file used in a SAS Assist session is contained in a library, usually one created for a particular project. Use Setup to designate an existing library for the session, or to create a new one.

After selecting an active data set, you might want to see what you have chosen. Within Data Management, you can use Edit/Browse to see the variables in the chosen data set. Data sets could come into the SAS Assist system as portable SAS files, raw ASCII data, SAS data sets, or database files. However they enter the session, the appropriate "engines" SAS uses to read the data are all available in SAS Assist.

Analysis is done with the pull-down menus found under Data Analysis. The menu items call up dialog boxes within which you specify your commands, your statistical model, the subset of the overall data set, and so forth.

SAS Assist versus SPSS

How does SAS stack up against its dominant rival, SPSS? SAS has three main advantages over SPSS — it allows for more and different statistical models; it is more programmable; and it is, outside the statistics modules, a larger, more functional package.

SAS performs several important statistical procedures that are unavailable in SPSS. For example, internal rater reliability (used when several raters are viewing and reporting experiments) may be calculated easily in SAS, while it is a cumbersome statistic to calculate in SPSS.

The second advantage is programmability. With SAS, it is possible for a programmer to create a complete “turnkey” system for a project or corporation, one that would handle everything from data input to inventory. SPSS lacks such scripting and networking functionality; the difference will be important to advanced users.

The third advantage is the greater functionality. One might, for instance, build an application for a lab or project to automate a process of input, processing, and output; the final results of such a process are reports or new data sets. Within this application, the input process could use the full functionality of a database. Appending new data, editing existing data, verifying the data are all possible through fully automated programs. This is powerful stuff, and it is available only with SAS, not SPSS.

There are areas in which the two packages are more or less equivalent.
SPSS 6.1 for the Mac Now Takes Full Advantage of the Macintosh Operating System

Anyone who wants to use SPSS on the Macintosh will be glad to know that version 6.1 for the Mac is now available. This is apparently the first version written specifically for the Mac; previous Mac versions seemed like inadequate translations, and failed to take full advantage of the Mac interface.

SPSS is the most-used statistical package at NYU. At the ACF labs, most of SPSS’s modules for Windows are available for student use. For students who want to buy their own copies, the NYU Computer Store has highly discounted pricing on SPSS for Mac and for Windows, along with a full selection of the necessary documentation. Almost as good a price reduction is available to the rest of the university community at ACF’s HelpCenter. The university-wide SPSS site license allows ACF to distribute the Windows and Mac version for a fraction of the normal cost (see the box for details).

Not only is SPSS a respectable, comprehensive, and flexible statistical analysis package; it is also a powerful data-management system. SPSS can take data from almost any type of file and use them to generate tabulated reports, charts, and plots of distributions and trends, descriptive statistics, and complex statistical analyses. Additionally, it allows the user to manage the data, to restructure the data file — aggregating cases, merging other data, etc. — and to save it in any of several file types, such as SPSS portable, dBase, and Excel.

As for documentation, SPSS Inc. publishes only one volume specifically for the Mac version: the SPSS Base System User’s Guide, Part 1, documents the graphical user interface of SPSS for the Macintosh. For additional and more advanced documentation, the Mac user will have to read the general guides, not specifically designated as being for the Macintosh, such as Part 2 of the Base Guide, and the guides for Professional Statistics.

Both have output windows. Obviously, a statistical package must allow for output.

Both keep log files — text files with syntactically correct code captured when we use the pull-down menus. The two packages keep these logs differently. SAS stores the commands (which can be edited and rerun) along with pedagogically useful comments explaining the commands (see illustration on page 23). SPSS not only allows logs to be kept but it allows command files, called syntax windows, to be developed by pasting commands during the session. Both methods lead to essentially the same programming results.

But there is one area where SPSS is clearly superior.

Only SPSS displays the data in a large spreadsheet-like table. I can’t imagine why SAS Assist doesn’t. Only programmers are comfortable with having the data “in the computer somewhere.” They read the data from one file into a program, which sends output to another file or a printer. It is a process old programmers had to be comfortable with. Being able to view the data in a window allows the user to see get a sense of the data, and to see the effects of each action on the data. This view of the data explains why SPSS is easier for beginners.

SAS is taken more seriously in the research community and certainly in industry. Experience with SAS is more marketable. But even with SAS Assist, it’s still not as easy to use as SPSS Windows. For academic research, SPSS is usually more than adequate. For high-end and long-term research, though, it may be worth while to invest the greater time in learning SAS. No pain, no gain.

Availability

Through ACF, NYU has a university-wide license for many modules of SAS for Windows, including ASA Assist. It is available on ACF servers and is distributed by ACF to the NYU community at a fraction of the normal cost. Additionally, ACF has a full SAS license (with the exception of SAS/GIS) on the experimental showcase RISC/6000 Unix computer, stats1.nyu.edu.

Getting SPSS for the Mac

The ACF has acquired a license for SPSS for the Macintosh. It is available for the PowerMac, and for 68K Macs with and without floating-point co-processors. The price is $295 for the first year of the license, then a $95-per-year renewal fee, which includes any future upgrades. You’ll need to supply twelve high-density diskettes.

For an order form and more information on system requirements, call the ACF HelpCenter at 998-3333.

— Jane DelFavero

SPSS for the Macintosh. For additional and more advanced documentation, the Mac user will have to read the general guides, not specifically designated as being for the Macintosh, such as Part 2 of the Base Guide, and the guides for Professional Statistics.
A Professor’s Perspective on SUDAAN

Investigators in the social sciences often want to take advantage of the large survey data sets that are generated by the Federal government and related agencies. Unfortunately, routine statistical packages (SPSS, SAS) will not handle data correctly, because of the manner in which large samples are often drawn. SUDAAN is a software package that addresses this problem. While the theory underlying the package is complicated, the user need not develop a deep understanding of the statistical issues to use the software successfully. A basic understanding, however, can be gleaned from a couple of books from Sage: Lee’s Analyzing Complex Survey Data and Kalton’s Introduction to Survey Sampling.

Graduate students wishing to do dissertations using large survey data sets should strongly consider learning about SUDAAN. In many fields, “SUDAANizing” statistical analyses is essential to getting work seriously considered for publication and dissemination. First, the investigator does the vast majority of the work using a package like SPSS or SAS. However, final analyses are run in SUDAAN, and it is the results from the SUDAAN output that are reported.

In practice, SUDAANized results are in many cases quite similar to those derived from standard packages. However, even if you do relatively uncomplicated descriptive or bivariate analyses, or “vanilla” regressions, SUDAANizing your analyses will enhance both the validity and the professional acceptability of your work.

— Jan Blustein, M.D., Ph.D.
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SUDAAN: Statistical Analysis Software for Complex Sampling Designs

SUDAAN 7, from Research Triangle Institute in Cary, NC, is special statistical software to handle complex sampling designs.

Most large surveys — the National Health Interview Survey, the National Health and Nutrition Examination Survey, the Drug Abuse Resistance Education Survey, and the Behavior Risk Factor Survey, to name a few — are conducted using large-scale complex sampling techniques. In order to obtain precise significance levels, software such as SUDAAN is needed. Among the many federal agencies that rely heavily on SUDAAN are the Centers for Disease Control, the National Center for Health Statistics, and the National Institutes of Health.

When conducting large-scale survey sampling, researchers generally employ sampling without replacement, stratification, or clustering. Although simple random samples performed with replacement use a normal distribution, random samples without replacement are based on a hypergeometric distribution, and if the ratio of the sample size to the target population is large enough to require special corrective procedures to assess the proper variance, SUDAAN employs an algorithm to obtain a robust variance estimator regardless of this sampling technique. If the sampling is performed without replacement and needs a correction for it, SUDAAN can be used to implement it.

Stratification is usually employed to limit the population being surveyed. The population may be stratified by income, if income is deemed an important variable crucial to the analysis. A cumulative frequency distribution of median household income may be computed and the distribution may be divided into low, medium, and high segments. Random samples may be conducted within each of these three strata to assure a proper representation of the population income distribution. Although standard computer programs, such as SAS or SPSS, presume a simple random sample, the variances within the strata are more homogeneous than those between the strata. This phenomenon can lead to biased significance tests. SUDAAN permits adjustment for single as well as multi-stage stratification and clustering.

When large surveys are conducted, there is often clustering of the population into areas. Random sampling first selects the clusters. Then there is random sampling within the clusters. The elements within the cluster are usually more correlated than those between the clusters. As the cluster size and intra-cluster correlation increase, cluster variances increase more than one would find in a simple random sample. In short, these effects lead to loss (continued on page 36)
Nanotechnology at NYU: Using DNA to Form Microscopic “Bricks”

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Nanotechnology deals with the deliberate construction of objects and devices on the scale of a nanometer, one-billionth of a meter. That term is less meaningful to most of us than the following: Most atoms in molecules are about 0.15 nanometers apart, so we are usually talking about fashioning arrangements of matter near the atomic scale.

What’s so unusual about that? Don’t chemists make molecules all the time? Certainly they do, but nanotechnology is usually thought to be a little less like chemistry, and a little more like manufacturing or assembly. This implies that there are — or are supposed to be — specific rules for putting things together, not just the usual mixing, activating, and bonding that one associates with the flasks and bubbling solutions we think of when we think of a chemistry laboratory.

There is already a successful nanotechnological system. We call it Professor Seeman (Chemistry, FAS) was awarded the Feynman Prize in Nanotechnology in 1995. For more about his work, see his Web page at http://seemanlab4.chem.nyu.edu/homepage.html.

Life. The goals of nanotechnology are already fulfilled in living systems, and most of our attempts at nanotechnological applications can be called biomimetic — they imitate life, either by using the structural principles of living systems with different compounds, or by using the compounds of living systems for different applications. In our laboratory, we use DNA to fabricate more complex assemblies of matter.

Why DNA? Most of us are aware that DNA is a molecule that forms a double helix. Two molecular strands wrap around each other to form the double helix; each strand contains a specific sequence of recognition groups, called bases, whose names we abbreviate as A, T, C, and G. There is a specific complementary relationship between the bases, so that if there is an A on one strand of the double helix there will be a T on the other; likewise, C on one strand implies G on the other. This is the way that we find DNA in nature.

In the laboratory, however, it is easy to synthesize strands of DNA containing specific sequences of bases. Thus, we can make DNA molecules of our own design. With that capability, it is possible to make new DNA motifs that are predicated on the same complementarity: that A will pair with T, and G with C.

In the cell, DNA is an unbranched molecule, but it is possible to design sequences that will form specific branches when the strands are mixed. For example, if four strands with the right sequences are mixed, as shown above, the four strands will...
If a branched structure like the one at left has a “sticky end” — an unmatched sequence of bases, represented by A and A', B and B' — it will seek its complement (A with A', B with B'); at right, several such complementary ends have stuck together, beginning to form a lattice that could be extended indefinitely.

These branches give us the opportunity to make something new out of DNA. In contrast to cellular DNA, we can use branched DNA molecules to make stick figures. We can do this by adding small extensions to the branched molecules, so that they associate with each other, as shown above.

A and B represent short pieces of single-stranded DNA (called “sticky ends”), and A' and B' represent their complements. The DNA at A will associate with the DNA at A' on another molecule, and likewise for B and B'. We show here a single branched DNA molecule associating with four similar molecules through these sticky ends. It is possible to seal the little gaps shut with an enzyme, so this type of assembly would result in a single molecule from the four components. Note also that there are more sticky ends on the outside, so we could, in principle, extend the construction to make an infinite 2-D or 3-D lattice. Thus, DNA, which is one of the easiest molecules to make, can be directed to associate in specific ways by means of sticky ends.

This work is not all done at the laboratory bench, however. The computer is an integral part of our work. The sequences that are used to make branches and other components of useful DNA structural motifs must be designed carefully. We use a program I wrote several years ago called SEQUIN to optimize the properties of the sequences that we make. An example of an early molecule that we made in this program is shown below. It is a DNA molecule that is connected like a cube, constructed by Junghuei Chen as part of his PhD thesis work at NYU. Although the two other figures here are simple schematics that treat the DNA molecule like a ladder, one cannot escape the fact that DNA is a helix. The cube figure shows this clearly, because its six strands can be seen to wrap around each other. This wrapping results in a complex topology, which we use the computer to analyze. For this we use a program called Knotter, written by John Jenkins when he was at the University of California at

(continued on page 29)
High Performance Computing

New Resources for Scientific Computing at ACF Innovation Center

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Several new resources have recently been added to the Scientific Computing area of the ACF Innovation Center on the second floor of Warren Weaver Hall. These include

- A fast, high-resolution Ricoh scanner.
- A high-resolution color laser printer from the Tektronix Corporation.
- A high-performance shared-memory computing system from SAG Electronics with dual Pentium Pro processors.

The latter system — described in more detail later in this article — coupled with a high-performance 3D graphics processor, monitor, and appropriate software, represents a less-expensive alternative to the traditional Unix workstation. For about $10,000, a researcher could configure a robust system that could be compared to a $20,000 system from a well-known Unix-only vendor.

Ricoh Scanner

The Ricoh Model FS-2 device is capable of scanning complex images in one pass in a matter of seconds. Source material can be in black-and-white, grayscale, or color. The resolution of the scan can range from 150 to 1200 dots per inch.

The scanner is directly connected to a Silicon Graphics workstation on a fast SCSI interface. The software to enable scanning is easy to learn and use. The process initially stores the image in TIFF or SGI RGB format which you can then transform into other image file formats or the usual PostScript forms.

Researchers and graduate students have been using it to scan scientific materials such as graphs and historical plates that exist only in printed form. The scanned digital file can be interpreted, modified, or interpolated into other electronic documents for publication or viewing.

Tektronix Phaser Color Laser Printer

The Tektronix Phaser Model 550 is a fast, reasonably priced color production printer. It can print in two standard sizes (letter and legal) and in two resolutions (600 and 1200 dpi) on plain paper or standard transparencies. The printer generates about 5 pages per minute and hence will produce low-cost, high-quality output for inclusion in documents, for poster sessions at conferences, for overhead presentations, and for study. The Phaser 550 will be accessible from all ACF scientific workstations and shared Unix servers.

SAG Dual-Processor Computer

The dual-processor system, whose address is max.acf.nyu.edu, is composed of the following elements:

- Two Pentium Pro processors with clock speed of 200 MHz.
- 128 megabytes of physical memory.
- Four gigabytes of fast-wide disk storage.
- An 8X CD player.
- One Iomega Jaz drive, capable of storing a gigabyte of data on a single portable cartridge.
- A high-performance graphics card.
- A 20-inch high-resolution color monitor.

The system will be able to run in several modes:

- Windows NT Workstation.
- Unix shared system.
- Windows 3.1 and DOS.

The NT Workstation mode will have access to the
language processors Microsoft Fortran Powerstation and Microsoft Visual C++. Under the Unix environment, the standard language processors will be available, as will the GNU products from the Free Software Foundation. A functional version of MIT X11/R6 X Windows server and client protocols will be available on the machine.

In the near future the graphics hardware and software capabilities of the system will be enhanced to support fast 3D color shaded and vector graphics through Open GL and other graphics protocols.

Systems such as this one can provide a cost-effective solution to research scientists and will soon be available for them to test their applications. Support for both hardware and software is a potential problem, but no more so than with existing vendors. Since this system is made up of off-the-shelf components, it should prove easy to maintain, replace, or upgrade. Many mainstream software vendors are providing operating systems, language processors, and other applications for such systems, since so many Intel-based systems are already in existence. This market will most likely grow robustly in all areas of use, assuring continued development and support.

**DNA Bricks (continued from page 27)**

When we make a complex topological object, we often need to represent it simply. For this, we use the program KnotPlot, written by Rob Scharein of the University of British Columbia. The representation of the cube was made with NanoVision, by William Light of the Naval Research Laboratory. (In NanoVision, each strand is assigned a different color, which makes it easier to see how a strand twists along one edge paired with one partner, then joins another partner to form another edge. Unfortunately, this cannot be shown as clearly here in black-and-white.)

What do we hope to do with the research program? We have a number of goals. Primary among them is the assembly of numerous DNA boxes, like this cube, into periodic arrays (a fancy term for crystals, which have lattice structures of repeating modules) in three dimensions. Crystallizing molecules is a matter of guesswork today. We plan to put molecules of biological interest inside the boxes, and connect the boxes by means of the sticky ends; one can think of it as putting a guest in each of many separate prefabricated rooms, and then building an occupied hotel by connecting and stacking the rooms. We hope to use the system to determine the 3-D structures of the guests by x-ray crystallography.

However, we are not limited to putting biological molecules inside the boxes. We can also put in the components of molecular electronic devices and try to make "biochips." Thus, we hope that this program can lead to improvements in the storage and retrieval of information, to directed attacks on the molecular basis of medical problems, and to the assembly of very "smart" materials.

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**SPUR 1997: Summer Supercomputing Program for Undergraduate Research at Cornell**

The Cornell Theory Center, one of the country’s major supercomputing centers, is taking applications for participation in this summer’s SPUR: Supercomputing Program for Undergraduates. This program offers undergraduate students the opportunity to pursue a computational-science research project while developing skills in the use of high-performance computing technologies. Students apply to work on a specific research project under the guidance of a faculty or staff member at Cornell University. The proposed projects explore current research problems in a diversity of areas, such as chemistry, solar convection, pollution control, fractals, and population modeling.

Successful applicants will attend, full time, a nine-week training and research program at Cornell University and will pursue the research projects using the high-performance computing resources of the Cornell Theory Center. Students will receive a stipend of $2,000, travel allowance, room, and partial board.

Applicants must be undergraduate students (graduating not before December, 1997) who are U.S. citizens or permanent residents. Students must have relevant coursework for their research areas, as well as knowledge of Fortran or C. Women, minorities, and persons with disabilities are strongly encouraged to apply.

Applicants must submit a completed application form, two letters of recommendation, and college transcripts. Applications must be received by February 28, 1997. Students will be notified of their acceptance no later than March 15.

For more information or to receive a hard copy brochure with application form, contact Jeanne Butler by mail at Cornell Theory Center, Ithaca, NY 14853-3801, by phone at 607/254-8813, or by e-mail at spur@tc.cornell.edu

Information and an application are also available via the World-Wide Web at http://www.tc.cornell.edu/Edu/SPUR

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Connect: Academic Computing and Networking at NYU  Spring 1997  29
Finding the Right PC System for Your Needs

Diane Osborn
osborn@is.nyu.edu

This year the NYU Computer Store has seen a growing interest in PC products. With more and more customers requesting PCs, we are bringing in new PC products and new vendors to accommodate our users' needs.

PC manufacturers are designing a wide variety of computers that allow a customer to satisfy very specific needs. The new Compaq Presario Model 4104 is a good example. This desktop computer is very popular with students living in residence halls hooked up to ResNet, since the built-in Ethernet card allows them to connect to NYU-Net. The 133 MHz Pentium processor, 6X CD-ROM drive, 1.6 gigabyte hard drive, and 16 megabytes of RAM provide more than enough power to do reports, play games, and surf the Internet.

IBM's Aptiva line addresses the needs of customers who are buying a computer for a home office. The Aptiva C67 has a Pentium 166 MHz processor, 8X CD-ROM, 2.5 GB hard drive, and 16 MB of RAM. The Aptiva's Communication Center features a telephone-answering system with multiple voice-mail "boxes," a speakerphone, a 28.8-kilobit modem, and caller ID display. Packed with a broad selection of productivity software, games, Internet access programs, and CDs, this computer fills a range of needs.

For those of you who require portable computers, the latest laptops are every bit as robust as similarly configured desktop models, with powerful processors, CD-ROM drives, and stereo sound. Add a PCMCIA modem or Ethernet card and you can bring your work with you and be productive anytime, anywhere. For the first time, the Computer Store has started carrying Texas Instrument laptop computers, which deliver outstanding performance at reasonable prices. The Extensa 600CD has a 120 MHz Pentium processor, PCI bus architecture, 8 MB of RAM (expandable to 64 MB), an 810 MB removable hard drive, and a 6X CD-ROM drive with stereo sound and two speakers. The 12.1-inch dual-scan Super-VGA color display has 256 colors and permits simultaneous display on an external monitor.

We have also added a new laser-quality printer option for our customers. The Okidata Okipage 4w personal LED printer delivers sharp text and graphics of 600-dpi quality for less than you would expect to pay for an inkjet printer. You can print letters, labels, envelopes, and overhead transparencies at about four pages per minute. The Okipage 4w is a compact printer — only 12.2 inches by 7.5 inches — so it is fits well on desktops that are short of space.

Deferred-Payment Plan for Students Available Now at Computer Store

It's that time again! Twice a year NYU offers a Deferred Payment Plan to help its students buy computers from the NYU Computer Store.

From now through February 28, 1997, registered students can pay the minimum deposit required and apply for a loan up to $3000 — interest-free.

For more information, visit the NYU Computer Store (corner of Greene and Washington Place) or call 998-4672.

Diane Osborn is Hardware Buyer at the NYU Computer Store.

(continued on page 36)
BobCatPlus:
New Look, New Features, New System

Tom McNulty
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The first thing most people do when they enter Bobst Library is to settle in at a BobCat terminal to find books, periodicals, and other materials. By now, most library users are familiar with the text-only look of BobCat and most other computerized library catalogues. Meanwhile, over the past few years the world of information has gone increasingly graphic. Refusing to be left in the dust, BobCat has joined the ranks of online systems with an address on the World-Wide Web. With significant support from the Mellon Foundation, NYU Libraries has developed BobCatPlus, a system with enhanced search capabilities and other features that promises to take us into the next generation of Web-based online catalogues.

What Is BobCatPlus?

BobCatPlus, which went public in October, is a Web-based search system that provides access to BobCat, other libraries’ catalogs, and a range of bibliographic databases, including resources like Periodical Abstracts and the Handbook of Latin American Studies. Still in its pilot stage, BobCatPlus uses Z39.50, an international protocol for the exchange of data between different computer systems, to provide a common search screen for all the databases and catalogs it accesses. In other words, whether you search BobCat, or the UC system’s Melvyl, or Anthropological Index, the search screen will appear identical. BobCatPlus also features direct links to Internet resources and the library’s Web site.

BobCatPlus provides access to a broad range of databases through the World-Wide Web.

Searching BobCat through BobCatPlus

Like its predecessor, the old card catalog, the original BobCat (BobCat Classic?) allows users to search for books by title, author, or subject heading. These basic functions are supplemented by keyword searching, information on the availability of a particular title, and other features. BobCatPlus provides access to the same information and more.

For the user seeking a particular book or journal,
Now You Can Request Interlibrary Loans Online on the Bobst Library Web Page

Interlibrary Loans (ILLs) can now be requested through the Bobst Library home page. Forms can be found at the following URLs:

For books and dissertations:
http://www.nyu.edu/library/bobst/research/ill/ill-bks.htm

For journal articles or newspapers:
http://www.nyu.edu/library/bobst/research/ill/ill-ser.htm

ILL forms are also accessible through Bobcat-Plus, where users can select the Bobst Library home page at the bottom of the initial screen. On the home page, locate Research Resources, then Library Resources and Services at Bobst Library, and finally, the ILL page.

New users must submit their initial requests in person, either at the ILL office, Room 123 of Bobst Library, from 9 to 5 Monday through Friday, or at any of the Bobst reference centers (Main, 6th, or 9th floors) during public service hours.

Undergraduates who wish to submit requests should consult with ILL staff in person or by telephone, at (212) 998-2511.

Please direct comments and suggestions about this or any other aspect of ILL service to interlibrary@nyu.edu

—TMcN

a title search in BobCatPlus yields the same information as original BobCat, but with selected fields "linked." For example, authors, subject headings, and other fields in the catalogue record can be clicked, providing a list of works that share the linked feature (e.g., books by the same author or works on the same subject). The hypertext capabilities of BobCatPlus can streamline the research process considerably, and the common search screen makes the shift from BobCat to other catalogues or databases as effortless as possible.

Access to Internet Resources in BobCatPlus

Every day, we're bombarded with notices of new Internet-based resources for scholarly research. As in the world of print publication, not all electronic resources are of equal value to the university community. One of the missions of NYU Libraries is to integrate valuable Internet resources into the library's catalogue, BobCat. Through BobCatPlus, researchers gain instant access to important electronic resources at the click of the mouse.

Internet and other networked resources are selected for inclusion in BobCat the same way books and journals are chosen for the library's collection. Subject specialists review titles just as they review books, selecting or rejecting individual items on such criteria as quality, relevance to the collection development policy, etc. With Internet resources, some additional factors are taken into consideration, but the process of selection is essentially the same, regardless of format.

Internet-based resources in BobCatPlus appear in the regular catalogue. A search might provide a selection of books and journals along with one or more Internet items, and users can go directly to those Internet resources with a click of the mouse. These same items, in regular-old-BobCat, will provide "Internet" as their location, along with the item's address.

Where Can I Use BobCatPlus?

BobCatPlus workstations can be found in the public catalogue area of the main floor, in each of the library's three reference centers (1st, 6th, and 9th floors), and in the Avery Fisher Center on the 2nd floor. Users can search the catalogue from home or office by visiting the following address on NYU Web:
http://www.bobcatplus.nyu.edu

Some users may not have access to the full graphical capabilities of the World-Wide Web. BobCatPlus in its text-only version can be used by holders of ACF'S NYU-Internet accounts by selecting lynx, then hitting g (for "go") followed by the URL — the http address above.

What Next?

BobCatPlus is still a pilot project, and users are encouraged to comment on it. A revised version of BobCatPlus will be introduced in the spring semester with additional features, such as the circulation status of a book, and redesigned screens based on user testing and comments. Please take the time to respond online through the comments button on BobCatPlus screens, or send e-mail comments to covertvl@is2.nyu.edu.

In the next issue: The electronic revolution at the GPO, and its implications for the Depository Library system — and for you.
We don’t all welcome the change — there are many aspects that shouldn’t be welcome — but the face of publishing is changing, and the changes clearly favor electronic publication. Even the worst Luddites among us have to admit that the computer revolution is in full swing, and have to figure out how to cope with it.

There are advantages to electronic publication, as the enthusiasts point out — speed, the ability to revise and stay up to date, ease of duplication to disseminate ideas and evade censorship, cheapness of the copies, conservation of the trees that would make paper. There are disadvantages as well, sometimes nearly identical to the advantages — speed, the ability to revise and falsify, ease of duplication to disseminate fraud and evade copyright, expensiveness of the equipment, the squandering of other resources to make computers and printers, which in turn end up printing all that paper anyway.

Some of the changes are discussed in other articles in this issue and the next. On page 34, Jordan Jurow reports on a November colloquium at NYU, in which Jean-Claude Guédon argued the case for publishing scholarly journals electronically, which he sees as the way to assure that scholarly communication remains independent and swift. In the next issue, David Hellman of Bobst Library will discuss the federal government’s conversion to electronic publication, and its potential problems.

The Times Online

At another colloquium, Bernard Gwertzman of the New York Times discussed the rapid development of newspaper publishing online. By this time, he said, 1300 US newspapers have online editions of some sort — all losing money. Gwertzman has been heading the New York Times on the Web since its inception; the staff now numbers fifty, of whom fifteen are “producers” — the people who actually put the material on the Web page.

The online edition (at http://www.nytimes.com) still plays second fiddle to the print edition. Most of the material comes from the print edition and goes online only after the paper hits the street. And though 800,000 people are registered with the online edition as free subscribers, only about 70,000 read it on any given day (assuming that at least ten page views go into a real reading); that compares to about 1,000,000 print copies in a day.

Is it making money? There is income, but Gwertzman wasn’t sure of the figures, since the advertising department is separate, as with the print edition.

According to a recent Wall Street Journal article, though, many other online publishers are finding advertising revenue isn’t there, and not many people will pay for an online subscription: the Journal’s 600,000 registered readers dropped to 50,000 when they had to pay for their subscriptions. Some newspapers are now pairing their online editions with Internet services, which seems a good fit — one subscription fee provides both the news and access to the Web.

But beyond newspapers and scholarly journals, there’s a broad range of electronic publishing — everything from Random House to Silicon Alley. More about those aspects in later issues.

— David Frederickson
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David Frederickson edits Connect.

CADA: SCE’s Center for Advanced Digital Applications

Last fall, the School of Continuing Education opened a new center at NYU’s Midtown Center for teaching such advanced digital applications as animation and video editing. Calling it the most advanced facility of its kind on the East Coast, Director Peter Bardazzi said it was already training people for major Silicon Alley publishers. More about CADA in the next issue; meanwhile, see http://www.nytimes.com/partners/nyu/cada/cada.html.
Guédon Discusses Electronic Scholarly Publication at ACF Colloquium

Jordan Jurow
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Though the World-Wide Web has grown exponentially during the past few years, the development of scholarly journals on the Internet has been curiously slow. In an NYU colloquium in November, Jean-Claude Guédon, Professor of Comparative Literature at the University of Montreal and founder of the electronic journal Surfaces, discussed the obstacles that electronic scholarly publications face, as well as the promise they hold, in gaining recognition as a legitimate form of serious academic communication. (The colloquium was part of a continuing series on computers and communications; for more details, see page 13.)

The Advantages of Electronic Publication

Professor Guédon began his discussion by pointing out that scholarly journals are thought to perform two important functions (as well as a third to be considered below) — communication and archiving — both of which, he thinks, can be better served by an electronic format.

In terms of communication, Guédon goes so far as to say that paper journals no longer play a significant role because they are simply too slow. Paper journals represent a nineteenth-century communications technology at a time when most communication occurs on a moment-by-moment basis. For researchers who require the involvement and criticism of a broad research community, the time delay involved in paper publishing has become an unworkable obstacle.

Guédon suggests that this obstacle can be overcome by the electronic publication of scholarly journals. Rather than incurring a scenario in which the writer of an article might have to wait months or even years to see a published response to his article (by which time the writer may have moved on to other matters), the electronic format allows a near immediate response once it has been published online for public review. Electronic publications foster an immediate and continuous flow of opinion, making them more timely and thus more useful to the scholarly community.

Another function that electronic journals can serve better than paper journals is archiving — a function that Guédon poetically calls “creating the memory of the world.” Because computers are designed to classify and retrieve things, archiving is virtually an automatic feature of electronic publishing. Given the ease with which the archivist can manage and organize electronic publications, one might follow Guédon to say that with the gradual rise in electronic publishing, the world is becoming less and less forgetful. Furthermore, because an electronic archive is largely immune to the vandalism and ordinary wear-and-tear suffered by paper archives, electronic publication serves to help prevent the senseless form of collective memory loss brought on by the physical deterioration of information stored solely in paper form.

A Slow Start for Electronic Journals

Despite the fact that electronic publishing — of journals especially — holds such promise in the areas of communication and archiving, its growth

Updated Bibliography of Scholarly Electronic Publishing Available Online

Version 3 of the Scholarly Electronic Publishing Bibliography, edited by Charles W. Bailey Jr. of the University of Houston, presents selected articles, books, electronic documents, and other sources that are useful in understanding scholarly electronic publishing efforts on the Internet and other networks. Most sources have been published since 1990, but a limited number of key sources published earlier are also included. Where possible, links are provided to sources that are available via the Internet. You can find it at

http://info.lib.uh.edu/sepb/sepb.html

— JJ
has been rather slow, particularly as compared to the explosive growth of the Internet as a whole. Guédon suggests several reasons why electronic scholarly journals have lagged behind in the general digitization of our culture.

The first reason he gives is the difficulty of publishing a journal in an environment in which the technology is changing extremely fast. Guédon notes that when he first started *Surfaces* in 1991, the only way to publish over the Internet was to use the old FTP (file transfer protocol) system, which offered various types of files that people had to learn to download and translate in order, finally, to read the material. The process of sharing files became dramatically easier with the advent of Gopher and the subsequent rise of the World-Wide Web; but with the language of the Web — HTML — rapidly changing, it is impossible to know what version will be in common currency by next year. Of course, older work done in HTML continues to be readable, but its appearance grows more and more outdated.

Electronic publishing also faced the initial problem of a population that was inexperienced with computer technology. Guédon suggests the printed book struggled against similar problems: when it first appeared, most of the population could not read. Printing, like Internet technology, inspired a drive to educate the population in the skills they needed to take advantage of that new technology; the technology itself also matured, with various refinements to help people read, such as standardized spelling, punctuation, and spacing between words. Luckily for the electronic journal, the hurdle of computer inexperience has been, in large part, successfully cleared.

Guédon points out another problem that, while less concrete than problems of technology, has been no less real in hindering the initial growth of electronic scholarly journals. "How," he asks, "do you confer prestige?"

A respected scholarly journal functions rather like a club, and editorial review is a way of asking whether a new person submitting an article will be a good member of the club — whether that person will uphold the standards and principles valued by the club. This function serves to maintain the constancy of particular approaches in various fields by making them resistant to paradigmatic shifts. An article in an established journal thus offers its writer a prestigious stamp of approval, which he can then seek to exchange for things such as grant money and tenure. Of course, prestige is a problem faced by any fledgling journal, but because newness extends even to its very format, the electronic journal has additional obstacles to overcome.

**Money, Money, Money**

As with most things, the need for money presents the electronic journal with significant difficulties. For one thing, how is it possible to support an electronic journal on a permanent basis since, as Guédon says, "a digitized bird knows no cage”? Suppose, for instance, that someone starts an electronic journal and sells one subscription. That single subscriber could then, theoretically, e-mail that journal to millions of nonsubscribers all around the world. While it is nice to think that this imagined journal would receive such wide exposure, the unfortunate person who started the journal has sold only a single subscription — certainly not enough sales to stay in business.

But Guédon suggests (with Joshua Lederberg) that since the prices of paper journals have become so high, selling one subscription is where we are headed anyway. Each library could take charge of one journal and everyone else could use it for free. Guédon argues that since libraries buy most journals and since libraries are supported primarily by public funds, scholarly journals are not actually subject to market forces. He contends that several large publishing companies are artificially inflating journal prices, thus extorting significant profits from a captive public. The electronic journal, he thinks, could work around this problem to offer quality publications at much better value.

**Hope for Electronic Scholarly Journals**

Guédon concluded his talk by saying that it is important that the electronic scholarly journal succeed for two reasons. First, it gives the scholarly community a chance to regain control over its own communication systems. Secondly, because launching an electronic journal is a lot easier than launching a paper journal, it can serve to make the international scholarly community more inclusive. This is important not only in better-off countries but especially in countries where there is not sufficient funding for paper journals. Guédon points out that in French-speaking Africa there are no paper journals left. While he is quick to point out that any sort of publishing in poor countries will remain difficult, electronic publishing can make things a bit easier.
If you could use more storage for your current system, you might consider an Iomega Zip or Jaz drive. The Zip drive lets you store up to 100 MB on Zip disks and is available with either a SCSI or parallel interface. If that’s not enough, you can use the Jaz drive and its 1 GB disks to supplement your hard disk space or to transport very large graphic or data files. It plugs into your computer’s SCSI port.

If you would like to add an internal CD-ROM drive, the Creative Labs Sound Blaster 8X CD drive Kit (which includes a sound card, CD drive, and speakers) is easy to install and produces incredible instrument sounds through its high-performance amplified speaker system. If you would prefer an external CD drive for either a desktop or laptop computer, Microsolutions Backpack offers a 6X CD with a 16-bit sound that connects to your parallel printer port.

The goal of our hardware department is to provide the NYU community with a variety of hardware and peripheral options at competitive prices. If you’re interested in an item we don’t carry, please let us know. We are here to serve the NYU community and are always open to your suggestions and comments.

SPSS for Mac (continued from page 24)

Comparing the Mac and Windows versions of SPSS, I found graphics editing to be functionally identical, though the menu interface is rather different — for instance, the edit functions are presented differently on the toolbar. As a Windows user, I had trouble figuring out how to edit a graph’s colors.

On the other hand, the Mac version is kinder when it comes to filenames. The strict file-naming conventions of DOS have made file type an issue on opening and closing SPSS files in Windows; to open a file, we must first specify which type of file we want — say a data file. One named data1.sav will show up in a listing of data files, but data2.dat will not: by default, a data file has the .sav extension, and only such files will normally be displayed.

During a Mac SPSS session, on the other hand, we only ask to open a file — we don’t tell SPSS what type of file. All files in the chosen folder are listed. SPSS opens the type of window called for by the file selected — data, chart, output, syntax — regardless of its name. Only if there is an ambiguity does the program ask us what type of file it is.

It has long been possible to share information between the Mac and IBM using portable SPSS system files, but it’s been easiest over a network connection, since the floppy disks are formatted differently on the two platforms. Now, though, since Power Macs can read IBM disks, SPSS system files can be moved between platforms on an IBM-formatted floppy disk.

— Frank LoPresti

SUDAAN (continued from page 25)

of precision and reduction of effective sample size. Unless these variance differences are taken into account, the significance tests performed by standard statistical packages will have a tendency to yield false positive results.

SUDAAN can also handle surveys with correlated data from recurrent events, longitudinal data and repeated data. SUDAAN allows the analyst to specify how the data are correlated or weighted. When the sampling weights vary substantially within the survey, it usually increases the variance of the sampling elements. SUDAAN permits adjustment for this unequal weighting.

SUDAAN can be used to perform a number of sophisticated analyses. The analyst employs his own data editor to write the SUDAAN program. SUDAAN can use either ASCII or SAS data files. It can be used to perform descriptive analysis and crosstabulational analysis, computing frequencies, percentages, odds ratios, relative risks and their standard errors, along with chi-square and Cochran-Mantel-Haenszel tests for stratified crosstabulations. The analyst can fit log-linear models and analyze ratios and their standard errors with SUDAAN.

Ordinary least squares, weighted least squares, binary logistic, cumulative logistic, and multinomial logit regression models may also be run with SUDAAN. It performs survival analysis with proportional-hazards regression models, and version 7 can run generalized estimating equations, with complex variance structures, as well. SUDAAN allows the user to customize the output format.

Although SUDAAN 7 is highly recommended for researchers applying for grants for which complex sampling designs are employed, there are some caveats. SUDAAN is properly billed as handling some repeated data analysis — e.g., survival analysis, cross-over repeated measures designs, etc. At this point in time, however, it does not handle random effects in mixed or random-effects designs. Data sets must be augmented for SUDAAN analysis.

The program is not now available at ACF, but we are considering acquiring it; if you think SUDAAN would be useful in your work, please call me at 998-3402, or send e-mail to the address below.

— Robert A. Yaffee

yaffee@nyu.edu

Dr. Yaffee is a research consultant with the ACF Statistics and Social Science Group.
regarding Linux vulnerabilities. (See the CERT archives at http://www.cert.org for more information.) A Linux system administrator must of course be sure to run the system according to generally accepted principles of secure administration. Linux is not inherently any more or less secure than other Unix or Unix-like systems. One encouraging note is that more and more standard security software tools are designed to run under Linux, thus enabling individual system administrators to check their own systems for loopholes before a malicious party does.

**Backups:** Once your Linux system is operational, you should be certain that it is reliably backed up in the event of a disk crash, a catastrophic system failure, a system administration error, or outright theft of your machine. (A note of advice: Never keep your backups with your computer. If there is a fire, theft, or other disaster, you may suffer a devastating loss of both your machine and copies of possibly irreplaceable work.) If you use your system in a way that produces frequently modified files — such as mail, file downloads, or data sets — you should be absolutely certain that your current work is backed up promptly, and that the whole system is backed up at a regular interval. One useful rule of thumb: How many days of your work can you afford to lose if a disaster happens? The answer to that question will give you a reasonable yardstick for determining how often to perform backups.

**Software Updates:** When you operate your own system, the burden is on you to keep your communications applications (such as Pine, Tin, Pico, Lynx, and Netscape) up to date. This means that you must get in the habit of keeping tabs on software developments — not only for your version of the Linux operating system, but also for the application programs you routinely use.

**Hardware Failures:** Be prepared to handle the inevitable hardware failure. System components break. Hard disks, which are precise instruments that have moving parts, will all die, eventually; the question isn’t whether it will happen, but when. Again, in preparation for this disaster, make backups as often and as currently as you can afford.

**Hardware Upgrades:** Eventually, everyone wants to upgrade to newer, faster, better hardware, either for faster processing, greater capacity, or higher reliability. When you run your own system, it is up to you to be sure the new components are compatible with the old ones, and that everything together works with your Linux configuration. If not, it is your problem to resolve.

**Problem Diagnosis and Resolution:** As with upgrading system hardware, when you operate your own system, you eventually run into problems. ACF has a staff of seasoned professionals, and can draw on contacts with various hardware and software products to resolve problems. When a person chooses to take the Linux route, the burden of problem-solving is the individual’s. ACF cannot provide a significant consulting role.

Not every PC owner will be comfortable with the complexity of running a Linux system, but for those who are willing to accept the challenge, running Linux on a desktop or laptop PC that has a network connection may be the best way to own and operate a personal Internet system.
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<td><strong>If the network is the computer, the connections are the network. Here, Third Avenue North joins ResNet and NYU-Net; for more, see page 6.</strong></td>
</tr>
</tbody>
</table>