News about information systems throughout MIT

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Out with the Old: AI Lab Group Plans to Reinvent Computers

Lee Ridgway

General-purpose computers, multiuser as well as desktop, have served well over the past couple of decades. A single computer can perform a multitude of functions, and even run applications not yet conceived at the time of its design. However, computers have not been designed to adapt to today's environment of rapid, continual change.

In current computing models, software and hardware are viewed as static entities, relatively unchanging once installed. For software or hardware to take advantage of even incremental technology advances usually requires manual reprogramming, or upgrading or replacement of software or hardware. Given the pace of technological change, there simply aren't enough skilled human resources available to adapt systems and programs.

André DeHon, a Ph.D. candidate in EECS, is part of a research group, headed by Thomas Knight, Jr., in MIT's AI Lab. This group thinks the current model is outdated, and their goal is to reinvent computing. They see the current model as inhibiting innovation and acceptance of new technology because of the high cost of human resources needed to implement it. This, in turn, forces consumers to accept standardized solutions because few can afford software hand-tailored to their needs.

DeHon and his colleagues are developing what they refer to as "adaptable computing." In a nutshell, this means a system that is engineered to adapt – on its own – to changes in technology and in usage, so that system resources are optimized. Three components form the basis for adaptable computing.

Global Cooperative Computing

This component exploits the National Information Infrastructure and World Wide Web to deploy new software and acquire feedback on use. Software on a computer is linked to standard home repositories on the advanced network. Throughout a program's lifetime, the computing system uses this rendezvous point to communicate usage experience, program improvements, and program variations.

Quasistatic Computing

"Quasistatic" describes a computational model, at the compiler level, in which applications and systems evolve, incorporating new technologies provided via the network, tracking shifts in software usage, and adapting to new hardware technologies. In simple terms, quasistatic computing automates the optimization of the entire system through changes in code.

DPGA-coupled Microprocessor

The third component of adaptable computers is the Dynamically Programmable Gate Array (DPGA) – a type of chip that lets hardware adapt to

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Reinventing Computers

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application and system requirements. The DPGA is a rapidly reconfigurable logic array that can be reprogrammed, in system, far faster than conventional programmable arrays. DeHon foresees that chips into which DPGA technology is tightly integrated will be used as key computational building blocks in almost all kinds of computing systems. In a general-purpose workstation, for example, each application would be able to reconfigure the DPGA for optimal performance.

Closing the Gap

DeHon makes the point that today there is often a gap between a computer's capabilities and the level of performance that software extracts from it. For example, in just about every maker's line of desktop computers there are huge differences in costs and configurations of various models, yet the same software runs on all models. The question is how to take full advantage of machine resources, especially on high- and low-end models.

For the layperson, DeHon offers the following explanations of how adaptable computing might work.

A "system manager" software client installed on your desktop computer monitors how you are using the machine and network. Say you're running a database program on your machine to work with files on the network. As you work, the system manager goes out to the network on its own to measure traffic and speed, and then makes adjustments to accommodate varying network or modem speeds. It tries to match the overall performance needed with the resources available. If the network is busy and slow, then the manager will do more caching in your machine's memory; if the network is relatively fast and free, little local cache may be needed.

In a second scenario, a program or process registers with your system's "compiler manager." Again, the compiler manager is constantly analyzing the situation to see what in the program runs and how often, looking to find out where timing can be optimized. The manager holds this information for the next time this program is run; it is also making decisions, based on feedback heuristics, on how the code can be transformed to make it run more efficiently and faster. From these decisions, the compiler manager may generate a new piece of code; when this particular program is next run, the manager will again analyze performance. All of this happens on the local machine, but the information on how the local machine was optimized is sent by the manager to a central server related to the program in question. Other machines share the results of their compiler managers through the server. The server compares these results and the different code transformations, then serves out the best solution for the given situation.

Prototypes and Beyond

The research into adaptable computing is still in the early stages. DeHon hopes that within two to three years his group can move beyond a small prototype in the research environment. It may take five to ten years for the idea of background recompilation to be accepted. DeHon feels that the benefits shown by experiments in the new adaptable computing model will be catalysts to further research, development, and finally, market interest.

For more information on the Reinventing Computing project, including pointers to several papers by DeHon and his colleagues, open the URL

`http://www.ai.mit.edu/projects/transit/rc_home_page.html` ø

Netscape Releases Netscape Navigator 2.0

Netscape Communications recently released Netscape Navigator 2.0, a major new version of its popular client software for the Internet. This official release version runs under Macintosh, Windows 3.1, Windows 95, Windows NT, and X Window System operating environments.

New Features

Netscape Navigator 2.0 includes a full suite of Internet applications, including Web browsing and new collaboration features such as interactive e-mail and integrated threaded discussion groups. It also includes support for Live Objects, including frames, inline plug-ins, JavaScript, and Java applets. Embedded spreadsheets, animation, streaming audio and video, and 3-D capabilities are just a few of the features made possible by Live Object technology.

Plug-ins

In addition, many developers have created software plug-ins that extend the capabilities of Netscape Navigator 2.0. Some of the better known plug-ins include the Acrobat Amber Reader from Adobe Systems; RealAudio from Progressive Networks; and Shockwave for Director from Macromedia. Netscape provides access to these plug-ins through its home page at

`http://home.netscape.com/`

(Go to the plug-ins link under the heading "Netscape Navigator 2.0 Released.")

Distribution

Netscape Navigator 2.0 is free to students and staff of academic institutions. At MIT, a Netscape 2.0 installer is available for downloading from the server net-dist. (To find out how to get to net-dist, see Network Notes on p. 4). If you have questions about installing or using Netscape Navigator 2.0, call the Computing Help Desk at x3-4101. ø

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Managing Editor
Robyn Fizz
Writer/Editor
Lee Ridgway

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Send comments or subscription requests to:
MIT 11-309, 77 Massachusetts Avenue,
Cambridge, MA 02139-4307
Phone: (617) 253-0540
Electronic mail: <fizz@mit.edu>

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Block Computer Viruses with Dr Solomon's Anti-Virus Toolkit

Jerry Isaacson

Computer viruses can cause extensive damage – if the file erased was the only copy of your thesis, or the disk contained nonreproducible research data, the impact can be very serious. But even if a virus is only a nuisance, it still requires time and effort to remove. Whether large or small, these setbacks are unnecessary. You can prevent almost all virus attacks by keeping up-to-date anti-virus software on your computer (see the related article on computer viruses on p. 7).

For several years, MIT has licensed F-PROT as anti-virus software for DOS systems. With the increased use of Windows and Windows 95 and the growing number of Netware and NT local area networks, PC users on campus require broader protection.

MIT's Information Security Office (ISO) has selected Dr Solomon's Anti-Virus Toolkit as its supported product, and has signed a site license with the Toolkit's vendor, S&S International. The Toolkit received a high rating in a recent comparative review of 15 anti-virus products. This review is online at

`http://web.mit.edu/security/www/iso3.htm`

Site License Terms

Under the terms of the site license agreement, Dr Solomon's Anti-Virus Toolkit is available free of charge for installation on any computer systems owned or administered by MIT or MIT authorized users – that is, MIT faculty, students, staff, and consultants engaged in MIT business.

The Toolkit comes in different versions for different platforms. The MIT site license includes support for DOS, Windows, Windows 95, Windows NT, IBM OS/2, Novell Netware, and SCO UNIX systems. In the near future, MIT will add a Toolkit version for the Macintosh. However, the freeware program, Disinfectant, remains a viable option for Macintosh users.

Toolkit Components

Dr Solomon's Anti-Virus Toolkit is a collection of programs that can detect and disinfect almost all virus

attacks. Components include FindVirus, Guard, ViVerify, and Scheduler, among others.

FindVirus

This component identifies and repairs known viruses in partition sectors, boot sectors, and files. More specifically, FindVirus

- Finds and repairs even complex encrypted and polymorphic viruses using its Generic Decryption Engine
- Looks for virus-like code using advanced heuristic analysis
- Scans recursively inside compressed and archived files. (It supports most widely used compression formats, with new compression formats added regularly.)

FindVirus is written in 32-bit code, so its scans are extremely fast. Scans are initiated by the user.

Guard (WinGuard for Windows, VirusGuard for DOS)

Guard intercepts virus attacks before they can do damage. It provides constant background protection by checking every file and disk accessed, including files being downloaded from bulletin board systems or the Internet.

Guard remains completely transparent until it detects a virus.

ViVerify

ViVerify adds an extra measure of protection by creating a fingerprint database of all the programs on your hard disk. It warns you if it detects any suspicious changes in a program's fingerprint, which could indicate a virus infection.

Scheduler

This component lets you run a virus scan at a specified date and time, including times when you are not at your computer. You can set scans to run constantly, hourly, or daily, whichever is most convenient.

Memory Issues

Many users, particularly those on DOS/Windows machines, are reluctant to tie up memory on already overloaded computers. The use of a Terminate and Stay Ready (TSR) scanner to monitor for virus attacks is often ignored in an effort to save low memory resources. Dr Solomon's Toolkit uses only 10K for Guard, its resident scanner, and Guard can be loaded into High Memory if it's available. The Toolkit also uses Extended Memory for processing if it's available.

WinGuard, the Windows version of Guard, uses a virtual device driver to provide constant background monitoring and interception without using "real" memory.

Distribution at MIT

You can download the Toolkit for DOS, Windows, Windows 95, or OS/2 from the ISO Web page at

`http://web.mit.edu/security/www`

You can also download it from the net-dist server (see Network Notes on p. 4). The Toolkit for the Macintosh is due out in the next month or two and will be distributed the same way.

The Toolkit for Windows NT and Novell Netware will be provided directly to LAN managers, who should contact the ISO at x3-1440 for more information.

What Happens to F-PROT and Disinfectant?

MIT's F-PROT license expires in August of this year. Until then, the ISO will continue to make the updates available via the net-dist server and the PC PASS server in the MIT Computer Connection (W20-021). After August, as a courtesy, the ISO will continue to provide F-PROT updates on the PC PASS Server, and the updates will continue to be available as shareware from several mirror sites on the Internet.

Disinfectant will continue to be available via net-dist and on the Macintosh PASS Server at the MIT Computer Connection.

Additional Information

To learn more about Dr Solomon's Anti-Virus Toolkit, come to a free presentation being held on April 19 from noon to 1pm in E40-302 (repeated on May 29). You can also find out more about the software through the Dr Solomon's Web page at

`http://www.drsolomon.com/`

If you have questions about the Toolkit or about computer viruses, contact Jerry Isaacson of the ISO at x3-1440 or <gii@mit.edu>. ø

Four Ways to Get MITnet Applications for Macs and PCs

Aafia Siddiqui

There's a lot of free network-related software for Macintoshes and PCs that you can download via MITnet. This software is stored on MIT's network software distribution site, net-dist. The net-dist server is well worth exploring, especially if:

- You just got an MITnet connection and want to find out what applications MIT has to offer.
- You want to upgrade to a newer version of your computer's network software.
- You want to download an e-mail application, World Wide Web browser, or newsreader program.

Available Applications

Net-dist houses a range of applications for both platforms. In the Web directory (folder), you'll find various Web browsers, helper applications, and publishing applications. The Eudora e-mail program and TechInfo, MIT's public information system, are on net-dist. Assorted newsreaders and FTP/Telnet clients are also online.

Macintosh users may want to check out MacDiscuss, MacOLX, MacPPP, and MacZephyr. For DOS, Windows, and OS/2 users, there's a complete set of distribution disks of LAN WorkPlace.

Net-dist also offers applications that haven't been officially released in its alpha-beta directory, as well as utilities for use with network applications. Last but not least, you can find anti-virus applications on net-dist.

Most of these applications come with readme files, installation instructions, and help files. If you aren't sure what an application does, check its readme file.

How to Download Applications

You can connect to net-dist in several ways. Options include anonymous ftp, the World Wide Web, TechInfo, and AppleShare (Macintosh only). Once connected, you can download files to your machine in a matter of minutes.

• *Anonymous FTP.* Using any File Transfer Protocol (FTP) program, you can connect to net-dist and download applications. For Macintosh users, IS recommends Fetch; for PCs running LAN Workplace, Rapid Filer is the recommended FTP program. Both programs are part of the network installation software distributed by IS.

To download software using this method, start your ftp client. In the host name field, enter `net-dist.mit.edu`. In the user name field, enter anonymous and in the password field, enter your e-mail address. Go to the directory /pub/mac or /pub/dos to see a list of applications for your platform.

Select the file you want, and use the get or copy command to transfer it to your computer.

• *World Wide Web.* You can get MITnet applications using Netscape Navigator (the recommended Web browser for Macintoshes and PCs) or any other browser. To connect to the net-dist server, open the URL

`ftp://net-dist.mit.edu/pub/`

Click on mac or dos to move to the appropriate directory. Once in, click on files you wish to download.

• *TechInfo.* TechInfo also provides a convenient way to download MITnet applications. From the TechInfo main menu, choose Computing, then Network Software Distribution (net-dist), and finally mac or dos, depending on your platform. Double-click on the desired file to download it to your machine.

• *AppleShare (Macintoshes only).* Open the Chooser and select the AppleShare icon and then the IS-DCNS AppleTalk zone. In the list of fileservers, double-click on net-dist. In the dialog box that appears, click on the Guest button and click OK. Then in the net-dist dialog box, make sure net-dist is selected and click OK again. When the net-dist icon appears on your desktop, you can open it and copy (drag and drop) applications to your computer. Note that the AppleShare version of net-dist contains MITnet applications for Macintosh computers only.

Need Help?

If you have questions about downloading files from net-dist, or about using the applications you find there, contact the Computing Help Desk at <net-help@mit.edu> or call x3-4101. ø

This column presents news and tips from the consultants who staff the Computing Help Desk, x3-0001. Check out their Web home page at `http://micro-help.mit.edu/`

Q My PowerBook 5300 has had its share of problems. Now I hear that Apple has released a system update for it. What's does the update include, and where do I get it?

A Apple released the PowerBook 5300 System Software Update in January. It is a revision to the system software that shipped with early model PowerBook 5300 and 190 series computers. This update offers several significant improvements, including

- Improved emulator performance
- Integration of Finder 7.5.4, which optimizes caching
- Native resource updates to improve system level performance
- An improved PC Card modem extension for faxing
- Improved application launches

This update is useful only for PowerBook 5300s and 190 series computers purchased before mid-January 1996. You can tell the difference between the most recent system software and earlier versions by checking the system enabler version in the "About This Macintosh…" window. If your system enabler version is earlier than 1.2, the update should improve performance.

Apple strongly recommends that you do a "clean" installation to update your system software. For details, see "Reinstalling System Software" in the chapter on diagnostic techniques in your Apple computer manual.

The PowerBook 5300 System Software Update is available via AppleShare from the CSS File Server in the IS-CSS AppleTalk zone. The path is

Public:AppleSoftware:SystemSoftware:PB5300 SW Update(14 HD Disks)

After you download the folder to your computer, double-click on the System Software Installer to install the Update.

For assistance, call the Computing Help Desk at x3-0001 to schedule an afternoon walk-in appointment in 11-221. The do-it-yourself installation takes 15 to 30 minutes; staff will be available to guide you during the process. ø

Apple Computer's Spring Sale Lasts Through May

Ginny Williams

Apple Computer recently announced a Spring Sale, with pricing good through May 1996. Many popular products are included in this sale, from PowerBooks to printers.

- *PowerBook 190/66 8/500*
  8MB RAM, 500MB hard drive
  M3531 MIT $1225
- *PowerBook 5300cs/100 8/500*
  8MB RAM, 512K VRAM, 500MB hard drive
  M3825 MIT $2135
- *PowerBook 5300c/100 16/750*
  16MB RAM, 1MB VRAM, 750MB hard drive
  M4488 MIT $3410
- *Performa 6214 8/1GB/CD*
  8MB RAM, 1GB hard drive, 4x CD-ROM (display sold separately)
  M4646 MIT $935
- *Power Macintosh 7200/90 8/500/CD*
  8MB RAM, 500MB hard drive, 4x CD-ROM
  M4082 MIT $1170
- *Power Macintosh 7500/100 16/1GB/CD*
  16MB RAM, 1GB hard drive, 4x CD-ROM
  M3102 MIT $2095
- *Power Macintosh 8500/120 16/1GB/CD*
  16MB RAM, 1GB hard drive, 4x CD-ROM
  M3104 MIT $3330

  Note: Keyboards and displays are sold separately for all Power Macintosh systems.
- *StyleWriter 1200*
  Includes ink cartridge and cable
  M3886 MIT $205
- *LaserWriter 4/600 PS*
  Includes toner cartridge (cables sold separately)
  M3898 MIT $785

Macintosh Tune-Up Day

Bring your Mac in for a checkup! The MCC and Apple Computer will hold a Macintosh Tune-Up Day on March 14 from noon to 4:30pm in Twenty Chimneys in the Student Center. During the checkup, a technician will

- Run diagnostics
- Rebuild the desktop
- Run Norton Utilities to check the hard drive for errors and fragmentation
- Run Disinfectant and install virus protection
- Install free software updates and MITnet applications
- Clean the inside
- On request, test keyboards and monitors

In addition, you can find out about computer maintenance, backups, and how to do a "clean install." You can also find out about trade-in values for your equipment.

For more information, call x3-7686 or send e-mail to <mcc@mit.edu>.

New on the Web: IS Training Catalog and Course Registration

Jeanne Cavanaugh

Starting with the Spring '96 edition, the IS *Computer Training Catalog* will be published on the World Wide Web, along with a form that lets you register and pay for hands-on courses electronically. These enhancements are for customers who prefer the convenience of online transactions. IS Training Services will still distribute the paper version of the *Catalog* and accept paper requisitions.

IS Training Web Page

You can find the new Training Services home page at

`http://web.mit.edu/tps/www/training/`

This page has links to the IS *Catalog* and calendar of free computer events, as well as the online registration form. To access the *Catalog* and calendar, you need to have the free Adobe Acrobat Reader on your computer, and also need to configure your Web browser to recognize the Acrobat Reader as a helper application. You can download Acrobat Reader 2.1 from the Adobe Systems Web site at

`http://www.adobe.com/Acrobat/freeread.html`

For instructions on how to configure your Web browser, open

`http://www.adobe.com/Acrobat/AcrobatWWW.html`

and select the link for the Web browser that you use.

Online Registration/EREQ

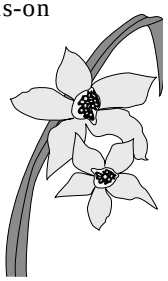
The online course registration form is essentially the same as the registration form at the back of the paper *Catalog*. The main differences are that you fill out the form using your keyboard and that, once completed, the form gets sent to Training Services via e-mail.

From the online registration form you can access EREQ (MIT's Electronic Requisitioning system). IS Training Services has become an internal EREQ provider (code: TR) to provide its customers with an additional payment method. Please note that the EREQ option is open only to authorized users. If you don't use EREQ, you can still fill out the electronic registration form and send in a paper requisition to Training Services, 11-301.

For help using the online *Catalog* or registration form, contact the IS Training Services Office at x3-7685 or <wray@mit.edu>. If you have questions about EREQ, contact the EREQ Technical Assistance Hotline at x3-4034.

Spring Catalog Availability

The paper version of the Spring '96 *Catalog* will be mailed to all MIT faculty and staff in mid-March. It includes information about hands-on courses and free computer-related events happening in April, May, and June. The Web-based version of the Spring '96 *Catalog* should also be available by mid-March.



An Introduction to Graphics Formats on the Web

Janet Daly

Photographs and illustrations are common on World Wide Web pages. Their visual appeal is one of the elements that have made the Web so successful.

To help publishers gain a basic understanding of issues related to online graphics, this article gives an overview of graphics formats for still images on the Web. It also offers pointers on how to choose the right format for your images. However, this isn't a how-to article. There's a steep learning curve involved in creating and manipulating computer graphics. If you plan to include graphics in your Web pages, you should either hire someone with experience or expect to spend many hours poring over software manuals and Web guides.

Bitmaps and Pixels

There are many graphics formats, and several new standards have been proposed. For now, the two main formats used to deliver images on the Web are GIF and JPEG. Both are "raster" or "bitmap" formats, which describe images in pixels (picture elements). A pixel is the smallest unit for storing information about an image.

The more pixels an image has, the higher its resolution. Resolution is measured in pixels per inch (ppi), often referred to as dots per inch (dpi). A 72-dpi resolution is adequate for images that will be displayed on monitors.

Graphics files are also described in terms of pixel depth, which determines the number of colors that can be displayed. Without getting into the math, an 8-bit graphic can display up to 256 colors (a palette often referred to as indexed color). A 24-bit graphic can display over 16 million colors.

As resolution or pixel depth increases, file size increases – sometimes geometrically. With Web graphics, it's important to keep your files small – preferably below 40K – so that they don't take too long to download. To keep file size in trim, you may have to sacrifice image quality. Most people who browse the Web are comfortable with graphics of average quality.

The GIF Format

GIF stands for Graphics Interchange Format. It is the predominant graphics format on the Web, one that all browsers and helper applications recognize. GIF is an 8-bit format, although a 24-bit version has been proposed. The GIF format uses the LZW compression scheme, which reduces file size without loss of image quality.

GIF files can be displayed "inline" – that is, as a component within a Web page rather than as a graphic that launches in a separate window.

A variant of the GIF format, GIF89a, lets you assign one color as transparent, so that the background color of your graphic is the same as the color of the browser window. To learn more about transparent GIFs, see

`http://melmac.corp.harris.com/transparent_images.html`

You can also create an interlaced GIF. Interlaced GIFs deliver images to the browser in stages – first providing a skeletal image, then filling in until the image is complete. The benefit is that readers don't have to wait for the entire image to download before they can view other parts of the page.

The JPEG Format

JPEG is the acronym for the Joint Photographic Experts Group. This group developed the 24-bit JPEG format especially for photographic reproduction.

JPEG offers a range of compression options, with a trade-off between image quality and file size. Higher compression results in more information about the image being lost. It may take some trial-and-error testing to decide what compression level works best for your files. To get a sense of the trade-off between file size and quality, see the Web page at

`http://home.netscape.com/assist/net_sites/impact_docs/e-jpeg.html`

JPEG does not support transparency or interlacing, and inline JPEG files are not supported by all Web browsers (they are supported by Netscape).

To find out more about the JPEG format, check the Usenet JPEG FAQ (Frequently Asked Questions) at

`http://www.cis.ohio-state.edu/hypertext/faq/usenet/jpeg-faq/top.html`

GIF or JPEG?

Now comes the choice: GIF or JPEG? The consensus is that GIF is best suited for line art – charts, illustrations, and logos. However, it can be used for photographs, especially if you want them to have a transparent background.

JPEG, in the words of its developers, "is designed for compressing either full-color or gray-scale images of natural, real-world scenes. It works well on photographs, naturalistic artwork, and similar material; not so well on lettering, simple cartoons, or line drawings."

These are the primary guidelines for choosing between GIF and JPEG. You may need to take into account additional considerations:

- If you want to include inline graphics and be sure that everyone with a graphical Web browser can see them, save your files in GIF format.
- If file size must be kept to a minimum, JPEG offers more compression power than GIF, although with trade-offs in image quality. To get a sense of how GIF and JPEG images compare in terms of file size, see

`http://www.xmission.com/~mgm/gif/jpeg.html`

- If high-quality photographic reproductions are essential to your page, save them in JPEG format. Keep in mind that it's good etiquette to first display a smaller version of the image that transfers quickly, and to make that smaller image a "hot link" to the larger, better-quality file. This gives viewers the choice of whether or not to download the larger file.

Communicating with Those Who Can't See Graphics

Some readers of your Web pages may be using text-only browsers or may be visually impaired. To help them interpret your images, be sure to code alternate words for them. For details, see

`http://web.mit.edu/cwis/faq/alt.html`

Getting Help

Contact MIT's Campus Wide Information Systems (CWIS) team if you have questions about creating graphics for the Web or need help with tools and resources. You can reach them by sending e-mail to <cwis help@mit.edu>. ø

Pagers Keep You in Touch When You're on the Go

Margaret Condon, Janice O'Connell, Valerie Hartt

If your MIT commitments keep you on the move, but you don't want to lose track of incoming messages, you may want to opt for a pager. When you carry one of these popular devices, you can be reached easily in minutes anywhere within a given coverage zone.

Pager Types

MIT Telecommunications coordinates paging services for the MIT community. Subscription services are available for the following types of pagers:

- *Tone Only*. This pager beeps when called. The user responds by calling a predetermined place for the message. Tone-only pagers are the simplest and most economical to use.
- *Numeric Display*. This type not only provides the user with an alert but can display numeric information – usually a callback number. It offers unrestricted direct access by any number of callers.
- *Alphanumeric*. With this pager, you can receive messages of up to 80 characters. Callers send messages by dialing a designated 1-800 number or by using customized software or a page-entry device. Software and page-entry devices are supplied by the pager company and issued through MIT Telecommunications.
- *Voice*. This pager alerts the user with a beep that's followed by a voice message (up to 20 seconds) from the caller.

In addition, you can subscribe to a clone service. This makes it possible to page several people at the same time, using one common number. It can be set up for all types of pagers.

New Options

Two options have been added to the set of paging services available to MIT subscribers. Both are fee-based.

- *Voice Mailbox Activation.* With this service and a little help from your callers, your voice mailbox can send a message to your pager. After callers leave you voice mail, they can enter the code *69 to activate your pager. You can then call your voice mailbox to retrieve the message.
- *Nationwide Coverage.* If you travel out of state frequently, you may want to subscribe to a nationwide paging service. The service, for numeric display or alphanumeric pagers, is available in several geographic territories. The service can be tailored to your needs, with some restrictions. Some foreign countries are also covered.

Contact Information

For more information about paging services, including coverage areas and rates, contact the Telecommunications Customer Service Center at x3-3690. ø

Update on Computer Viruses and Prevention Strategies

Jerry Isaacson

Over 7,000 computer viruses and variants have been identified by the developers of anti-virus software, and the number grows at a rate of 100 to 150 per month. Most viruses aren't a threat because they haven't spread or don't work. Even so, every computer user needs to take precautions. In January, the number of "viruses in the wild" – viruses reported by at least three virus researchers – grew to 183.

Viruses Reported at MIT

Some of those "viruses in the wild" found their way to MIT over the past year. According to the Information Security Office (ISO), the culprits included

AntiCMOS.A
AntiEXE.A
Form.A
Ripper
Sat_Bug.Natas
Stoned.Angelina
Stoned.Empire.Monkey.B
WinWord.Concept

While most of these viruses are nuisances, some, like Ripper, can destroy both your data and local backups.

Trendsetters

The well-known WinWord.Concept virus underscores two new trends in viruses: the ability to infect data files rather than programs, and the ability to run on multiple platforms. The Concept virus uses the macro capabilities built into Microsoft Word to infect files, and runs under DOS, Windows, and Macintosh versions of Word.

In another cross-platform twist, Macintoshes running DOS/Windows emulation have become susceptible to DOS/Windows viruses.

An Ounce of Prevention

Viruses are out there, and they are learning new tricks. As custodian of your computer, you have a choice. You can install anti-virus software, or you can leave your computer open to attack. A virus infection will, at the least, require hours of cleanup time. An infection caused by a boot sector virus (which can be found on any disk, even those containing only data) will require cleaning all the systems in your area that may have been infected. To prevent reinfection, you'll also need to check every diskette that may have been a source.

It's far easier to do the right thing. Anti-virus software offers a simple, effective means of protection (see the Software Spotlight on p. 3). The ISO provides such software via net-dist and through its Web page at

`http://web.mit.edu/security/www`

Once you've installed anti-virus software, be sure to keep it current. Check the ISO Web page or net-dist for updates every few months.

Virus Information Service

Members of the MIT community can subscribe to a virus information service, MITVIRUS, to get alerts and notification of new releases of anti-virus software. To subscribe, send e-mail to <listserv@mitvma.mit.edu>. In the body of the message type

`subscribe mitvirus` *`your real name`*

If you have questions about computer viruses or anti-virus software, contact Jerry Isaacson of the ISO at x3-1440 or <gii@mit.edu>. ø

Getting Help

If you don't know where to get help for your computer, network, or telephone problems, call the IS Help Line, **x3-2001** – or direct dial one of the help lines listed to the right.

If you prefer to use electronic mail, you can send your questions to the corresponding addresses on the far right. (When logged into Athena, you can also use the `olc` command to send questions to Athena's online consultants.)

For help with...	Dial...	Or send a message to...
Athena Computing Environment	3-4435	olc@mit.edu
Athena hardware repairs	3-1410	hotline@athena.mit.edu
Computer sales	3-7686	mcc@mit.edu
DEC and Sun software	3-6320	help@isis.mit.edu
Disabilities and computing	3-7808	atic@mit.edu
IS mainframes	3-7230	mithelp@mit.edu
Microcomputer and printer repairs	3-0815	pcservice@mit.edu
Microcomputer use	3-0001	micro-help@mit.edu
Networks / MITnet	3-4101	net-help@mit.edu
Telephone repairs	3-4357	5help@mit.edu
Voice mail	3-3677	vmail@mit.edu

Recent Publications from Information Systems

These publications are free. You can pick up copies in the MIT Computer Connection, W20-021, or in the racks outside E19-630. Some of these publications are on the World Wide Web. To view them, use the URLs listed beneath the titles.

You can also request IS publications by calling x3-5150 or sending e-mail to <sendpubs@mit.edu>.

Note: Due to its size, *Eudora Pro v2.1, Getting Started Guide* (NS-45) is not available in the racks. To get a paper copy, call or send e-mail.

Order No.	Title
NS-2.3	*Avoiding Problems With Your MITnet Connection* `http://web.mit.edu/tps/www/NS/NS-02/`
NS-44.1	*Basic FAQS About Eudora at MIT* `http://web.mit.edu/tps/www/eudora/faq.html`
NS-45	*Eudora Pro v2.1, Getting Started Guide* (sections of this guide are available at `http://web.mit.edu/tps/www/eudora/`)
NS-45m	*Eudora Pro Quick Reference Guide, Macintosh Version*
NS-45w	*Eudora Pro Quick Reference Guide, Windows Version*

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