Information Technology
Newsletter

Doing Research in an On-line World

Nancy K. Herther, University Libraries

Even Wonderful Tools Have Limitations

Researchers need quality information services. Through LUMINA and other outlets the Libraries are now able to offer many important databases for use in your offices or homes. The University Libraries provide on-line access to electronic databases and information in order to provide the widest possible access to the most number of people for the most popular/important databases – and from the largest number of locations, including your home and office! These are wonderful research tools. However, sometimes it is worthwhile to remember the nature of these resources and their inherent limitations.

Databases come from different, largely commercial vendors who have different clientele that they have targeted and different goals in putting together their products.

Last month's column (Casting a Web for Information) has resulted in a lot of interest and questions about searching for information on-line. I hope none of the callers will mind my sharing their questions (unattributed and in some cases generalized a bit) with others. Perhaps you will get some insights here which will help your use of electronic information resources.

Question: I need recent information on my topic. Where can I go?

The update frequency for databases varies both by vendor and by database itself. Databases may be updated • continuously (such as stock market information) • daily (such as most newspaper indexes) • weekly (as are *Current Contents* and *Academic Index* available here on campus) • monthly (as are *Education Index, Applied Science and Technology Index, General Science Index, Library Literature, Social Sciences Abstracts* and most other databases) • and some are still updated only quarterly, bimonthly or annually.
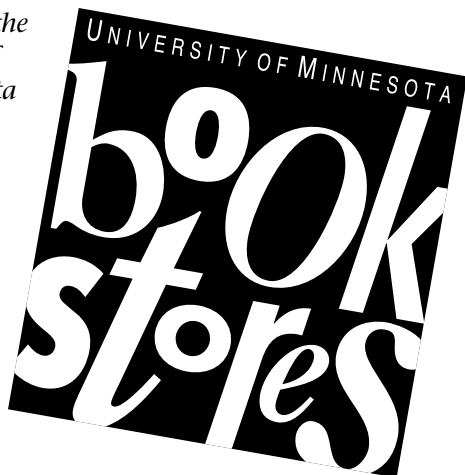
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Some funds are provided by the University of the Minnesota Bookstores.

For more information about the computer products sold at the Computer Store visit their web page <http://www.computerstore.umn.edu>.

You can access the Bookstore's Books in Print site at <http://bip.bookstore.umn.edu>.

▼ Help   Monday–Friday

CCO (BASIS/AIS/CCS), 7 am–4:30 pm 624-0555
   central systems: IBM, EPX, NVE, UZ, VX, VZ
   web: `http://www.umn.edu/ccs`
Internet/E-mail, 8 am–5 pm 6-7676
   by e-mail for U of M: `help@tc.umn.edu`
Microcomputers, Distributed Systems
   9 am–4 pm, 152 Shepherd Labs 6-4276
   1-4 pm, 93 Blegen and 50 Coffey Hall
   web: `http://www.umn.edu/adcs/`
NTS: 24-hour Repair Desk 5-0006
   web: `http://www.nts.umn.edu`
Training Library, ADCS Short Courses 5-1300
   web: `http://training.micro.umn.edu/`
Password: Forgot it? Call the Micro helpline 6-4276
   Students go, in person, to any Micro helpline.

▼ General   Phone

Academic & Distributed Computing Serv. 5-1300
Computer Store, Williamson Hall 5-3854
CUFS 4-1617
Digital Media Center 5-5055
Disability & Computing Services voice/tty 6-0365
Engineering Services 7-4525
Data Custodians • Data Warehouse Databases
   IDEA web page http://notes.ais.umn.edu
   Facilities Mgmt, Kris Boike • SPAM 6-7896
   Financial Sys Support, CUFS Help • CUFSRDB .. 4-1617
   Grad School, Genny Rosing • GSRDB 5-9839
   Human Res Info Ser, Gary Ogren • APSO 7-4341
   Inventory Ser, Luke Madsen • INVENRDB 6-8217
   Ofc of the Bursar, Sandy Pearson • STARS 6-8698
   Ofc of Human Res, Nancy Highsmith • SDRDB 4-8374
   Ofc of Planning & Analysis, John Kellogg 5-3387
   • AARDB/MARDB • CLRDB • FARDB • RETDB • RRDB
   Ofc Scholarships&FinAid, PhilMorgan • SCHOL 4-6586
   Payroll, Ann Beattie • HERDB 4-3869
NTS (Networking & Telecom Services) Helpline .. 6-7800
Statistical Support, SAS 4-3330
      SPSS, BMDP, Minitab (VX/EPX) 6-8366

▼ Dial-in Computer Access

Internet/SLIP: up to 28,800 bps (V.34) 627-4250
Internet/SLIP: ADI and ITE (with MKO) 3-0291
SecurID Access High Speed (V.32) 19200-N81 6-1061
   2400-N81 (no parity/8 data bits/1 stop bit) ... 6-7770

▼ Internet Addresses   Quick Guide

LUMINA (Library) – web: `http://www.lib.umn.edu`
   Telnet/TN3270: `admin.ais.umn.edu`
News Server: `news.tc.umn.edu`
Internet/E-mail account management
   web: `http://www.umn.edu/validate/`
Gopher (public can log in as `gopher`):
   `consultant.micro.umn.edu`
OIT web: `http://www.umn.edu/oit`
UofM Twin Cities web: `http://www.tc.umn.edu`
Information Technology Newsletter
   web: `http://www.umn.edu/oit/newsletter`
University of Minnesota Bookstores
   web: `http://www.bookstore.umn.edu`

Last updated February 1997

This update information is critical and should be a part of every database description (generally available at the beginning of any database search session). The over 300 CD-ROM and 50 on-line databases available through the Libraries offer a variety of help for you.

If you need information on something that happened only a few days or a week ago, you will need to focus your attention on on-line databases through the INDEXES option in LUMINA that would give you that quick response. A search for information on trends in college tuition lead me to try *Academic Index*, which provided this brief abstract and citation for an article published in the *New York Times* less than a week before my search:

"More grandparents grab the tuition tab; the prepaid plans are popular; but others may make more sense (many grandparents plan to pay for grad children's college tuition). Sana Siwolop The New York Times, Jan 12, 1997 v146 S3 p9(N) p9(L) col 1 (33 col in). Press Enter for expanded citation."

The DataTimes full-text newspaper database (NEWDT), also available on-line as one of the IN-DEXES on LUMINA, is another excellent source for popular coverage of current events.

Question: **The database I want is available on CD-ROM and on-line. Which version is better? Are they the same?**

The best way to get information on the nature of any of our databases is to *both* ask the reference unit which covers this subject area – they are the true experts in the subject fields and have the most experience with the databases covering their areas – and to look at the documentation available for each product.

In some cases, our on-line databases (available through INDEXES in LUMINA) are only recent subsets of larger databases (such as *PAIS Decade*), but in most cases the information should be about the same. Clearly you need to resolve this before doing any research into either type of database.

One major difference may be one of convenience versus flexibility in searching. Personally, I still prefer to search databases using CD-ROMs rather than using most of the on-line databases. The CD-ROMs do require that you go to them, that you sign up or queue

up, and that you bring a diskette to download your results. However, on-line systems can be slow, password authentication can be a barrier, and downloading or copying information can be very tedious.

I realize this may not seem to be the 'right' answer for many people; however, for me, CD-ROMs are still the fastest and most reliable databases to use. I'm not saving screen dumps or waiting for responses just to get into busy databases.

As a professional on-line searcher, I find the search engines for most CD-ROM databases here on campus to be reliable, complex, and very flexible. I may be in the minority, but when I need to do extensive re-search, I still like CD-ROMs best.

Question: **I want to find information on unpublished dissertations. What can I use?**

First, you must think about what you really need.

What is an 'unpublished' dissertation? The Dissertation Abstracts database (also a part of INDEXES on LUMINA) provides abstracts and indexing to dissertations – all doctoral and many masters – that have been 'accepted' by the granting institutions. That is their focus and niche. If it isn't in this database, perhaps you will want to check your source again to see what type of 'dissertation' this may really be.

If the dissertation was done here at the University of Minnesota, it may also be cataloged in MNCAT and be a part of the Libraries' collections.

Question: **I did a search in a database and later found that the results I got did not include all the articles from the journals indexed. I'm confused and angry. How could this happen?**

That's actually a very common situation. Databases come from different, largely commercial vendors who have different clientele that they have targeted and different goals in putting together their products.

When you look over information on some database, carefully note the terminology used. Do they claim to give comprehensive indexing (and if so, what does that mean to them – all articles, all articles plus reviews, letters, etc.?) or selective coverage? Is their intention to cover a subject by providing broad coverage of 'the field'? Does the vendor instead promise complete indexing to a core set of journals?

Neither of these approaches is prefect in terms of giving you everything on any topic; and both approaches have advantages.

1. The Comprehensive Indexing Approach. The HW Wilson databases and *Current Contents* are examples of vendors and databases which select a set group of journals and publications and provide basically cover-to-cover indexing for them. This is great if you want to do a comprehensive search of a particular literature. However, you will be missing the occasional coverage from publications which might not be core to your field, since these databases do not try to drop in citations from other publications.

2. The Selective Coverage Approach. This approach casts a net broadly and sifts through what they find to present the state-of-the-art on some particular topic. *PAIS* is a good example of a database that includes some dissertations, some books, and other items that their team of indexers believe to be important in terms of covering the field of public affairs.

In an ideal world, you would probably want to cover both types of databases in your search. However, since most people don't have the time or the ability to look through all possible sources, you will need to be very specific about your needs up-front so that the choices you make will help and not hinder your research.

Question: **I found the same journal article in at least three databases. What does this mean in terms of where I should go for information?**

Many publications are core to multiple disciplines and will be covered in more than one source. In fact the duplication may work in your favor. For example, let's say the article you find in *Econlit* or *PsycINFO* is also in *Academic Index*. Since many popular titles in Academic Index are included full-text, you may not need to go any further in terms of getting the source document.

Table 1: Some Journals Available as Full-Text in Academic Index

Age and Aging
American Journal of Psychology
British Journal of Political Science Change
Criticism
Economic Geography
Environmental Law
FDA Consumer
Foreign Policy
Futurist
Geriatrics
Rights Quarterly
Industrial and Labor Relations Review
Journal of Advertising
Journal of Human Resources
Lancet
MacUser
Middle Eastern Studies
NEA Today
Observer
Public Welfare
Sciences
UNESCO Courier
Women's Studies

Recently a patron in Education/Psychology Reference needed an article that was in a journal not available in Walter Library. Because the article was available full-text in Academic Index, the patron was able to quickly print it – rather than having to find copy in a local library or request an interlibrary loan.

Table 1 is a sample listing of some of the many journals available "full-text" in Academic Index. Beware, however, that you will want to check any vendor's definition of 'full-text' if you plan to do extensive research using only the on-line full-text editions. Many vendors will not include side bars, picture captions, charts or perhaps some other types of materials that would be present with the print copy.

More Questions

If you have any questions or need help using any of the databases available through the Libraries, please feel free to stop in one of our campus libraries or contact me, Nancy Herther. Phone: 624-2020 • Internet: <n-hert@tc.umn.edu> • Campus address: Education/Psychology Unit, 6 Walter Library, East Bank. ▬

News Briefs

▼ Acceptable Use Policy URL

The Acceptable Use Policy No. 2.8.1 that we announced would be on-line soon is now available from the University Policy Development Office's web site. The exact location is `<http://www.fpd.finop.umn.edu/2/Sec8/Pol281/Acceptable_Use.html>`. ■ Yvonne Carlton, Central Computing Operations, Information Security

▼ Engineering Services Update

Keep checking our web page for new memory prices, hard drive upgrades, and other price updates for Time and Material services. You can find us on the web at `<http://www.micro.umn.edu/ES/>`.

On January 3, 1997 a retirement open house was held for Donald L. Clark, Assistant Director of Engineering Services. ■ Joyce Johnson, Engineering Services

▼ Internet/E-mail HelpLine: Open 8 am – 5 pm

Our 626-7676 Internet/E-mail HelpLine is open even longer hours than before; our consultants are available to answer your telephone calls from 8 am to 5 pm. We'll continue to make changes that will let us help more of you, more often.

Who Should Call?

Those who have questions about setting up and using their University Internet account can call the Internet/E-mail HelpLine.

Our consultants support the University's Internet kit and know about updates to the kit. They can help with simple questions, such as how to look-up e-mail addresses at the University, and more complex ones, such as how to resolve modem and direct (Ethernet) connection problems. They can also help you use Internet services besides e-mail; and, of course, they know a lot about e-mail.

Other Services

Besides exploring ways to better serve people who need the services of the Internet/E-mail HelpLine, we're working to improve the availability of services on the Microcomputer HelpLine at 626-4276. Look for improvements and more options in all our services in the months ahead. ■ Mary Kelleher, Academic and Distributed Computing Services.

▼ Windows 95 and Windows NT Mailing Lists

Windows 95

Those who support Windows 95 machines at the University can join a new mailing list called Win95. The list was set up so technical coordinators could share problems, questions, comments, tips, and other information regarding using and supporting Windows 95 machines.

Windows NT

Those who use Windows NT have unique support issues and other concerns. To make it easier to discuss issues related to Windows NT and to share individually developed expertise, a local WinNT mailing list was set up. The list is called WinNT.

Subscribing

The Windows 95 and Windows NT mailing lists are standard LISTSERV lists. To subscribe to either list, send a message to the listserv address shown here. In the body of the message type the appropriate subscribe line, using your real name where the example shows <your name>.

```
listserv@tc.umn.edu
SUBSCRIBE Win95 <your name>
SUBSCRIBE WinNT <your name>
```

■ Mary Kelleher, Tips from the Microcomputer HelpLine and Academic and Distributed and Computing Services

Data Marts and Data Warehouses

Data Marts

An enterprise data warehouse is exactly what the name implies. A data warehouse includes all data related to the enterprise. A data mart is a subject-specific data warehouse.

Data marts are created for a specific department, college or campus. A data mart can be created for several different reasons. Some data marts are created to begin an enterprise data warehouse. They tackle the most basic and valuable data for the business. Other data marts are created for data that doesn't interact with any other data in the enterprise. Those data marts are called independent data marts. Both of these scenarios are valid; however, experts caution data mart builders to structure data to coexist with the data warehouse data. In other-words, have a data warehouse strategy in place and follow it so that the data is modeled and can be linked to the data warehouse for future use.

Another type of data mart, a dependent data mart, will take data from the enterprise data warehouse and extract and load that data into the data mart databases.

Enhanced Response Time

Creating a data mart enhances query response time for those with access to the data mart. It does this because they are only reading through the data specific to their area and not the entire data warehouse. This is useful for those doing a lot of querying, but for the enterprise or University-wide analysis, the enterprise data warehouse should be your primary source of information.

Data Islands

The majority of departments and colleges have what are called data islands: data floating around, including shadow systems, spreadsheets of critical data, or FileMaker applications that have been handed down from student worker to student worker.

All of this data is valuable. Who thinks about the vulnerability of this data? Could you run your department if that application or shadow system disappeared? If the answer is no, you might want to consider talking to a Data Warehouse Consultant about locating the source of the data and storing it in the data warehouse or creating a data mart.

Data Warehouse Consultants

The University of Minnesota's Data Warehouse is also known as IDEA. To learn more about IDEA, you can visit our web site <http://notes.ais.umn.edu> or speak to a consultant by calling 612/624-0555, the Central Computing Operations Customer Assistance Center (CAC).

■ Ann Warner, Integrated Systems Solutions

Figure 1: IRS On-Line
http://www.irs.ustreas.gov/plain/cover.html

THE DIGITAL DAILY

FASTER THAN A SPEEDING 1040-EZ . . . Make that "Faster than a speeding snail" today!

Due to unusually high traffic volumes we are rerouting all users through our Text Only Version to speed things up a bit. You can take this exit ramp to the Graphics Version, but expect delays. Enjoy your visit.

Tax Stats | Tax Info For You | Tax Info For Business | Electronic Services | Taxpayer Help & Ed | Tax Regs In English | IRS Newsstand | Forms & Pubs | What's Hot | Meet The Commissioner | Comments & Help | Site Tree

(Prev) (Search) (Help) (Email)

On-line IRS Resources

Try the Text Version

So many people have found their way to the IRS *Digital Planet* web site that you may encounter a busy signal, especially during the hours people might be working from home. We've found it's easier to get a connection earlier in the day and that using the text only (plain) version speeds things up <http://www.irs.ustreas.gov/plain/cover.html>.

The IRS has made a lot of information available. Some information has been converted or created for straight web viewing, although many publications are only in Acrobat (pdf) format. (The Acrobat reader software is included in our Internet kits.) The IRS web site is divided into the sections shown in Figure 1 and includes *Search* and *Help* options. Before you use the search option you may want to read the *How to Search* section. Simply searching for "1040 form" yielded 775 hits.

If you want an abbreviated tour of the IRS's digital site before visiting it, read on.

Tax Info For You

- You can download Internal Revenue Bulletins, weekly publications that are in Acrobat format.
- The Publication 17 section now contains instructions for preparing 1996 returns; it's a pdf file.
- *Tax Trails* contains a few yes-or-no questionnaires, such as "Are Your Educational Expenses Deductible?"
- *Other Items Of Interest* currently contains a few entries, such as "Pub 1600 (Rev 11-96): Disaster Losses - Help from the IRS," a 141K Acrobat (pdf) file.
- You'll find summaries of 1996 changes such as "Limit on itemized deductions," "Standard mileage rate," and "Direct deposit of refund" in the *Important Changes* section at <http://www.irs.ustreas.gov/plain/ind_info/impchgs.html>.

Taxpayer Help & Ed

Like many people the IRS has put together a FAQ (Frequently Asked Questions) page where they answer questions such as • "How long do I need to keep certain records?" • "I forgot to mail my Form W-2 with my tax return. What should I do?" • "My daughter is my dependent and receives dividend income. Does she need to file a federal income tax return?" And my personal favorite • "I am concerned about the public debt. Can I make a payment to reduce it?"

IRS Newstand

The *Tax Supplements/Family Section* covers topics such as • Household or Relationship Test • Taxes and the Working Student • and Babies Need SSNs. Other *Tax Supplements* sections cover business, general, and international topics.

Forms & Pub

This section <http://www.irs.ustreas.gov/plain/forms_pubs/index.html> includes access to prior year's and current year tax forms. Although it's good to know the forms are there if you need them, most people will find it's just as easy to pick up common forms from the usual places, such as Post Offices. Here's a sample of what you'll find

- *Popular Forms and Pubs* and *Extensions*: the names say it all.
- *What's Hot In Tax Forms*: one hot topic is errors in 1996 forms that were downloaded earlier in 1996.
- *Link to State Tax Forms*: the Minnesota links takes you to this site <http://www.irs.ustreas.gov/prod/forms_pubs/ftaframes.html>.

What's Hot

This section includes links to a list of 115 forms and instructions and 131 tax topics that are available via fax.

Common Errors

The *Ernst & Young Tax Guide 1996* contains a list of the 25 more common errors, such as: If you worked for more than one employer, be sure to claim a credit for any overpaid social security taxes withheld from your wages. Ernst & Young have made the list available on the web at <http://www.ey.com/us/tax/25error.htm>.

What About Minnesota Info?

To access the Minnesota Department of Revenue visit this web site <http://www.state.mn.us/ebranch/mdor/index.html>. ■ Mary Kelleher, Tips from the Microcomputer HelpLine

Net-Happenings

Helps You Keep Up-to-Date

InterNIC: a funny name; a good service. The InterNIC's (Internet Network Information Center) Information and Education Services web page <`http://rs.internic.net/nic-support/`> provides links to excellent Internet resources, such as the *Scout Report* and the *Net-Happenings* announcements. They also publish *InterNIC News*, a monthly newsletter.

Scout Report, for Researchers and Educators

Many of your colleagues may already subscribe to the *Scout Report*. It is an electronic publication whose primary audience is researchers and educators. Each report aims for quality not quantity and features new or rediscovered Internet resources and tools. If you subscribe to it, you can get it delivered to you by e-mail. You can also read it via the InterNIC's web page <`http://rs.internic.net/scout/report/`>.

Recent issues included these reports:

" Brookings Institution Policy Briefs: <`http://www.brook.edu/ES/POLICY/POLICY.HTM`>

The Brookings Institution, America's oldest policy think tank, has recently made a new series of its publications, Policy Briefs, available at its web site. These are short papers that focus on various aspects of US and international politics, economics, and foreign policy. At present, ten papers are available, including "China and the WTO," "Inside Outsourcing: More Bad News from Business Regulation?," "An Analysis of Out-of-Wedlock Births in the United States," and "America's Bosnia Policy: The Work Ahead." The Brookings site also contains information about the institution and its work. " [December 20, 1996]

" A Web of On-line Grammars: <`http://www.bucknell.edu/~rbeard/grammars.html`>

Robert Beard, Professor and Chair of the Russian Program at Bucknell University, has compiled this page of links to online grammar resources for more than twenty languages. The criteria for inclusion is that the grammars "are accurate and useful for learning the language they describe." Most lan-

guages are represented by a single site, and only a few have two or three sites listed; each entry provides the name of the resource author, but no further information. The offerings range from "Survival Bengali" to "An Integral Dutch Course" to Professor Beard's own "On-line Russian Reference Grammar." Most of the sites were developed or are supported by university faculty around the world; some are still being completed, but most are fairly polished and inviting to the language learner. An additional page of morphology links connects to sites that will conjugate verbs, assist in declensions, and provide morphological analysis in response to user input. " [January 3, 1997]

" Bodleian Library / Toyota City Imaging Project— Oxford University: <`http://www.bodley.ox.ac.uk/toyota/`>

The Bodleian Library of Oxford University has released its first digital imaging project on the web. The John Johnson Collection of Printed Ephemera, one of the largest and most important collections of printed ephemera anywhere in the world, was the source of the thousands of motoring and transportation images now accessible at this site. This image database can be searched by keyword or by browsing through images categorized by type of transport (motor cars, carriages and coaches, bicycles, ships, and railways, among others). Images range from single page advertising leaflets for 19th century bicycles to complete early 20th century motoring manuals. There are three screen display formats: text only, thumbnail images with brief descriptions, and full-screen images. " [January 10, 1997]

Net-Happenings, a Huge Listing

Want quantity so you can decide for yourself what's a quality item? Then turn to Net-Happenings. You can subscribe to daily mailings or browse current and archived announcements on the web. Beware. The mailing list is high volume. Here's a brief example of items announced at the beginning of January:

- K12> Kyls's Kook Kid Stuff
- MISC> Personality Tests
- EMAG> Health Management Technology Magazine
- RESOUR> Global Electronic Commerce
- UPDATED> A Taste of Canada
- GOVT> FCC Press Release on SUPERNet

- LISTS> Knightmare Chess mailing list info
- CORR> Spam Hater URL

More Net-Happenings mailing list and archive information is available at this InterNIC page <http://rs.internic.net/cgi-bin/lwgate/NET-HAPPEN-INGS/>. Inquiries you make here will be e-mailed to you, not displayed on the screen.

Internet Roadmap, the Series

In 1996 InterNIC became the home of the Internet Roadmap <http://rs.internic.net/nic-support/roadmap96/>, an on-line workshop of 27 interrelated lessons. InterNIC charges no fee for this workshop.

The lessons are geared to a general audience. They don't use a step 1, step 2, step 3-type of approach that guides you through using your software to perform the tasks or access the resources that are introduced. This approach allows a more conversational style of lessons and encourages the motivated to explore on their own.

You can have the workshops delivered to you by e-mail or use the web version. At the end of each web lesson (Map) is a button for the next lesson. For an overview of all the lessons, look at the syllabus <http://rs.internic.net/nic-support/roadmap96/syllabus.html>.

A Little About InterNIC

The InterNIC was established four years ago and is supported by cooperative agreements with the National Science Foundation <http://rs.internic.net/internic/>. It is a collaborative project between AT&T and Networks Solutions, Inc. (General Atomics dropped out of the project.)

Networks Solutions provides registration services for the Internet community, such as registering domains and assigning IP network numbers. AT&T provides directory and database services support.

◼ Mary Kelleher, Tips from the Microcomputer HelpLine and Academic and Distributed Computing Services

Technology Watch

PNG: For a Healthy Image

by Rich Landers, Information & Education Services, InterNIC News

PNG origins
Are the days of creating gif images for the World Wide Web coming to an end? Well, that's not likely to happen soon, but as graphics and web technology continue to merge and improve we can expect to see some significant enhancements to graphic capabilities. Perhaps the most notable WWW graphics enhancement to come along recently is the Portable Network Graphic (PNG).

Before I go any further on this topic I feel obliged to inform my readers that PNG is pronounced "ping" by people who sound as if they know what they're talking about, and it also will appear as an extension to the PNG filename (for example, "image.png").

The World Wide Web Consortium (W3C), the Internet specification organization, has endorsed PNG as a graphics algorithm. "On the web, images may be represented in many different formats," W3C remarks. "Clients vary as to the set of formats they support, and servers vary in the formats which they provide. The data is transferred in whatever seems to be the 'best' format which the client and server have in common." PNG has passed muster with the W3C, and the consortium has recently issued the following statement on PNG:

PNG is an extensible file format for the lossless, portable, well-compressed storage of raster images. PNG provides a patent-free replacement for GIF and can also replace many common uses of TIFF. Indexed-color, grayscale, and truecolor images are supported, plus an optional alpha channel for transparency. Sample depths range from 1 to 16 bits. The Internet Media Type image/png was approved on 14 October 1996.

A quick review of basic image-compression principles may help to clarify the true strengths and weaknesses of PNG. Image-compression techniques

broadly fall into two different types: lossless and lossy.

* Lossless compression compresses the image so that it is identical to the original;
* Lossy compression compresses the image by permanently throwing out some of the image data.

Nevertheless, well-implemented lossy compression schemes can achieve far higher compression ratios than any lossless method while producing results that the untrained eye cannot usually distinguish from the original.

Digitized Electronic Images

.GIF, .JPEG and .TIFF. There are hundreds of file formats, but these are the most popular ones used by graphic artists, web artists and multimedia specialists.

Graphics Interchange Format (GIF) is the universal standard graphics compression algorithm and is an 8 bit 256 color graphic that is compressed by squeezing all colors in the graphic down to 256 colors. It was developed as a proprietary format for the digital transmission of images over Compu–Serve's online service. Colors that are within an acceptable range to say a predefined green, are mapped to that green color during compression. The problem is that the Macintosh, PC and Unix platforms all define different system palettes, thus GIFs can look different on different platforms.

Joint Photographic Experts Group (JPEG) offers compression in stages, and is the industry standard for compressing 24-bit and 8-bit color or gray-image files. GIF images take up less space than JPEG images, but they represent only 8-bit images and 256 col ors, whereas JPEG supports 24-bit images and 16.7 million colors. JPEG is also mainly used by Web artists but can extend to 16 million colors and is the preferred format choice for pictures that contain a lot of hues and complex colors. The quality is best with JPEG.

Tagged image-file format (TIFF) are used mainly for desktop publishing and can contain RGB or CMYK color information. Graphic artists frequently convert TIFFs to JPEGs in webpage production.

> "Microsoft Office 97 uses Portable Network Graphics (PNG) as its native lossless compressed graphic image format. PNG allows us to drastically reduce the size of files that contain graphics and allows us to implement transparency in our new OfficeArt drawing component. Since PNG is a small and platform-independent format, Office users can easily exchange graphical documents across the web." Jon DeVaan, Vice President of Office product development, Microsoft Corporation

> "PNG is the breakthrough in color imaging on the web that finally allows everyday users to easily display high-quality images on their web pages. HP and Microsoft are particularly pleased to have PNG support RGB in its effort to accurately communicate color across the web." Michael Stokes, Project Manager, Color Research, Hewlett-Packard Research Laboratories; Chairman, International Color Consortium

PNG as a New Internet Standard

The development of the PNG specification is supported by Compu–Serve, the original creators of the GIF format, who wished to see PNG become accepted as the new Internet standard format for lossless graphics. PNG was developed in response to a need for faster loading, enhanced quality cross-platform graphics. One of the features it will provide for the web enthusiast is a consistent visual effect on a variety of different platforms and browsers.

Automatic gamma correction permits PNG files to be correctly dis-

played on Macs, PCs, SGI workstations, etc. (all of which have different gamma values) without appearing either too light and faded or too dark and contrasty. It accomplishes this by storing the source gamma used by the image author. Chromaticity data can also be stored in PNG files and used by Color Management Systems on the viewing platform to compensate for differing monitor types; an important capability where precise color matching is required (for example, brand recognition, product design, medical applications, fine art and on-line catalogs).

PNG images are also more economical with memory space. During the W3C testing phase, indexed color PNG files averaged about 30% smaller than the equivalent GIF, and truecolor PNG files were 30-40% smaller than the equivalent (LZW compressed) RGB TIFF.

Although the developers of PNG acknowledge that it produces a graphic that is far superior to GIF, it is not a competitor for JPEG, which is still the preferred graphics format for lossy storage of images. Also, since the GIF format is the accepted standard for web graphics on any platform, it is not likely to be replaced by PNG overnight. Nevertheless, the PNG enhancements are something that should be considered when creating web graphics, because PNG may very well become the lossless standard in the next few years.

A technical specification for PNG is available at http://www.boutell .com/boutell/png/PNG-CRCAppendix.html, or for a spiffy demo on PNG interlacing see http://www.wco.com/~png/pngpics.html [and] http://guest.jpl.nasa.gov/PNG/pngpics.html.

Go to http://codelab.siegelgale.com/solutions/ to install a plug-in that allows you to see PNG images directly in your web browser. ▮

▼ Internet Server and User Names

People use a wide variety of software to handle e-mail, browse the web, and engage in other on-line activities. Different activities and software ask for or require specific server, host, or Internet account IDs. Here's a review of common "labels" and University of Minnesota identifiers.

Where you see *username* in the samples below, you should substitute your own username, for example gates099. Usernames are unique identifiers and are included in e-mail addresses. For review, the most common form of University e-mail address is

```
username@tc.umn.edu
```

Notice that the @ symbol separates the username from the rest of the Internet identifier. Here's a specific example of an e-mail address for the username "oitnsltr." It's the address you use to subscribe to our newsletter.

```
oitnsltr@tc.umn.edu
```

Interactive Access

Interactive Mail Shell users should log onto the machine named: `username.email.umn.edu`
❥ Do not try to log into any `username.tc.umn.edu` machine or to machines formerly called maroon and gold.

Client Software

The table below lists the names you may need to use in configuring the various software to access your University Internet account.

▼ Domain Identifiers

Since the University is an educational institution our domain name ends in .edu. The .umn portion of the name is the University of Minnesota's identifier. Together these two names identify the University's "lower" domain: `umn.edu`

A Domain Name Server (or Service or DNS) acts much like a paper phone book, which maintains a list of names that are associated with a number. A DNS matches a name with its current numerical IP (internet protocol) address. Although DNS plays a major role in enabling you to access Internet resources, its work is generally invisible to you. Inquiring minds might wonder: should I use numerical addresses rather than host or domain names? The answer is no. You're more likely to access your intended location or information if you use its name.

To make the University's service more robust, we maintain more than one DNS. The software that needs DNS service queries one DNS first; and if it does not get a response it queries the second DNS. To spread the workload, different University locations use different "normal" and alternate DNS's.

Location	Normal DNS a/k/a Primary	Alternate DNS a/k/a Secondary
Minneapolis	128.101.101.101	134.84.84.84
St. Paul	134.84.84.84	128.101.101.101
Duluth	131.212.32.32	128.101.101.101
Morris	146.57.57.57	128.101.101.101
Crookston	128.101.101.101	134.84.84.84

▪ Revision 1 • Mary Kelleher, Phil Kachelmyer, Academic and Distributed Computing Services

Common Label	University Twin Cities Identification
X.500 username or user ID	`username`
POP username	`username`
E-mail address	`username@tc.umn.edu`
POP server	`username.email.umn.edu`
Mail server	`username.email.umn.edu`
POPmail mail account	`username@username.email.umn.edu`
SMTP server	`smtp-gw.tc.umn.edu`
Telnet server	`username.email.umn.edu`
	• to access Interactive Mail Shell
NNTP or News server	`newsstand.tc.umn.edu` *or* `news.tc.umn.edu`
IRC Server	`irc.tc.umn.edu`
UIDL	• not currently supported

Where you see *username*, substitute the actual user identification of a University Internet account holder.

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Name _____

If University of Minnesota Twin Cities Campus Mail:

Use your departmental mailing address; do not use your personal office address.
Mail processed through the Hospital Mailroom must be addressed to a UMHC Box number.

Department _____

Building _____ Room _____

If U. S. Postal Service:

Address _____

_____

City _____ State _____ Zip _____

U of Minnesota Department❑   Faculty❑   Staff❑   Student❑   Other❑

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your request to this Internet address: `oitnsltr@tc.umn.edu`

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