

Information Technology Newsletter

April 1996 from the **Office of Information Technology**
This newsletter is an information resource for the University of Minnesota.

Volume 1
Number 1

World Class Information Infrastructure and Support

**Donald R. Riley, Associate Vice
President for Academic Affairs
and Acting Director
of Information Technology**

In 1992 the Advisory Users Committee for Computer and Information Services presented their vision for information technology at the University of Minnesota. In part it says:

“Given the University of Minnesota’s mission as a land grant institution, information technology must be central to the university. Strong information technology is essential to fulfilling the land grant mission because it supports University units in carrying out their research, teaching, and administrative functions; and it is central to the University’s outreach efforts to the metropolitan area, to greater Minnesota and to the international community. As members of a major research and teaching university, students, faculty and staff need access to information resources at the level of technology appropriate for their disci-


plines. This includes access to workstations and local, national, and international electronic communication networks. Additionally, as a major research institution the University of Minnesota is involved in advancing computing and information services in various technical disciplines.

We envision an electronic environment, a common space, that invites members of the University community to make use of distributed information technology in realizing our land-grant mission. In addition we wish to involve members of the community at large in this collaboration. This environment will be tolerant of diverse computing platforms, provide access to global information resources, and will value innovation. ”

That Committee also recommended a process and principles to guide the University’s planning for information technology. The restructuring of the central information technology providers into the new Office of Information Technology is the fulfillment of one of the committee’s recommendations. Further, the framework and measures developed for University-wide use in planning under U2000 have been important factors in restructuring for the Office of Information Technology (OIT).

U2000 states that the University of Minnesota aspires to be not just a good Minnesota university but a world-class instructional, research, and service provider among universities globally: “The University of Minnesota is committed to continuing to be one of the premier land-grant research universities of the nation and the world.” Although not all strategic actions have yet been

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Some funds are
provided by the
Minnesota Bookstores.



Associate Vice President for Academic Affairs and Acting
Director of Information Technology
Donald R. Riley, Professor 626-9816

Newsletter Coordinators: Joann Conradson, BASIS; Mary
Kelleher, ADCS; Lawrence Liddiard & Vivian Skordahl, NTS.

▼ Help

Monday-Friday

BASIS (AIS), 7am-4:30pm _____ 624-0555
 Central Systems, EPX, NVE, UZ, VX, VZ _____ 6-8366
 9am-4pm, requires username and password
 Web page: <http://www.umn.edu/ccs>
 E-mail & Internet, 9am-4pm, UM accounts ____ 6-7676
 by e-mail for U of M accounts: help@tc.umn.edu
 Microcomputers, Distributed Systems
 9am-4pm, 152 Shepherd Labs _____ 6-4276
 1-4pm, 93 Blegen and 58 BioSci Center
 Web page: <http://www.micro.umn.edu>
 NTS, Telecom. 24-hour Repair Desk _____ 5-0006
 NTS Web pages: <http://www.umn.edu/telecomm/telcom.html> <http://www.nts.umn.edu/>
 Password: Forgot it? Staff can call _____ 626-8366
 Students go, in person, to any Microcomputer Lab.
 Training Library, ADCS Short Courses _____ 5-1300

▼ General

Phone

Academic & Distributed Computing Serv. ____ 625-1300
 Computer Store, Williamson Hall _____ 5-3854
 CUPS _____ 4-1617
 Digital Media Center _____ 5-5055
 Disability & Computing Services voice/tty ____ 6-0365
 Engineering Services _____ 5-1595
 Microcomputer Labs for Students • 455 Blegen 6-7778
 • B50 Central Libr 4-3269 • 17 or 135 COB 6-1252
 4-9226 • 54 Eddy Hall 5-0314 • 121 Elliott 4-0866
 • 14 Folwell 5-4896 • 50 HHH 4-6526 • 26 Lind
 6-0856 • 305 McNeal 4-5367 • 9 Walter Libr 6-1899
 NTS, Telecommunications Helpline _____ 6-7800
 NTS, Networking Services _____ 5-8888
 Statistical Support, SAS _____ 4-3330
 SPSS, BMDP, Minitab (VX/EPX) _____ 6-8366
 Workstation Support Group _____ 4-7486

▼ Dial-in Access

SLIP: 2,400-14,400 (V.32 bis) _____ 626-1920
 SLIP: 14,400-28,800 (V.34) _____ 627-4250
 SLIP: ADI and ITE (with MKO) _____ 3-0291
 BASIS SecurID Access
 2400-N81 (no parity/8 data bits/1 stop bit) __ 6-7770
 High Speed (V.32) 19200-N81 _____ 6-1061

▼ Internet Addresses

LUMINA (Library): admin.ais.umn.edu
 BASIS Mainframe Systems: admin.ais.umn.edu
 Gopher (public can log in as `gopher`):
consultant.micro.umn.edu
 News Server: newsstand.tc.umn.edu

U of M Web page: <http://www.tc.umn.edu>
 OIT Web page: <http://www.umn.edu/oit>
 Information Technology Newsletter Web page:
<http://www.umn.edu/oit/newsletter>
 Internet account management Web page:
<http://www.umn.edu/validate/>

FAX via email (note: Jon.Doe 9-9999 is an example):
/pn=Jon.Doe/dd.fax=9-9999/@fax.tc.umn.edu

(Last updated April 8, 1996)

defined or implemented, it is clear that a world-class university cannot exist in the year 2000 without the effective application of information technology and an appropriate information infrastructure.

The ability of the University of Minnesota to achieve the goals set out in U2000 will increasingly depend on the development, deployment, and effective use of appropriate information technologies. Information technology is essential to accomplishing the University's mission and to building better, more productive relationships internally and externally. Just as the emerging and potential impacts of information technology on education, work life, lifestyle, leisure, and many other aspects of human activity are becoming evident, those real and potential impacts have been considered and

addressed in the University planning process. Indeed, this understanding has been explicitly conveyed in the discussions of teaching and learning, research and discovery, and outreach and public service included in University planning documents. Access, accountability, operational effectiveness, high quality teaching and research, partnerships within and beyond the state, international programs, as well as nearly every other goal set forth in U2000 will be accomplished only if an appropriate infrastructure, robust systems, and world-class information resources and services are available to every member of the University community.

In future issues of the Information Technology Newsletter, we will communicate more about OIT strategic planning in support of the University's core missions and the administrative functions.

Organized for Excellence

Steve Cawley, Assistant Vice President for Information Technology Operations

These are exciting times. Businesses are aggressively reengineering their core processes and utilizing information technology to help reach impressive new visions of the future. The information age is upon us.

The University of Minnesota has its own impressive vision for the year 2000 and recognizes the key role information technology will play in that vision. The University also recognizes that its own information technology units, as individual and often competing departments, were poorly positioned to support the U2000 goals. To correct this problem a decision was made to bring the University's information technology providers together under a single organizational structure. Through consolidation, the information technology providers would be better positioned to leverage the sometimes scarce technology resources and deliver more effective and efficient services.

On November 1, 1995 the Office of Information Technology (OIT) was created. This new office represents an important union of the University's key information technology providers: Engineering Services, Distributed Computing Services, Telecommunications Services, Networking Services, Central Computing Services, Administrative Information Services, and St. Paul Computing Services. Through a process of restructuring, these seven units were merged

into three functional service units under one organization.

- ✓ **Business and Student Information Services:** BASIS manages a central data center supporting central administrative, academic and research systems and Internet access services, such as mail-hub and X.500 directory. BASIS also manages institutional databases and the development and maintenance of administrative software applications.
- ✓ **Networking and Telecommunications Services:** NTS manages data, voice and video communications including the University's copper and fiber cable plant, telephone switches, modem pools and campus Internet backbone switches, routers and hubs.
- ✓ **Academic and Distributed Computing Services:** ADCS manages the University's microcomputer and workstation pre-sale/post-sale demonstration center, Digital Media Center, microcomputer help-line, public student labs, and microcomputer and workstation software site licenses. It provides LAN administration services, microcomputer and workstation warranty repair services and short course training services; and also develops and maintains Internet access tools such as POPmail, Web, gopher, news, and X.500.

continued on page 13

Client-Server Tool Being Selected for Applications Development

“Totally RAD”! Jane Barnard, BASIS Applications Development

Positioning itself for the future, BASIS/OIT has completed a 3-month search for a powerful, cost-effective tool to build RAD (“Rapid Applications Development”) business applications.

After a thorough search process and RFP, including vendor presentations in January to the IT search team and customers, four finalists were identified. Presently formal negotiations are in progress, and a product selection will be announced shortly. Look for news of the selected product in the May issue of this newsletter.

The benefits to our customers are many. A RAD product will allow Office of Information Technology developers to deliver fast prototypes with functionally-rich GUI screens to the desktop, and integrate these front-ends to existing legacy systems. Leveraging our multi-million-dollar investment in existing mainframe systems, we can deliver initial application prototypes in a matter of weeks, not months (or years). Legacy staff will be trained and re-tooled in the coming year, as new business applications are required.

Portability to multiple desktop “clients” (Windows, Mac, and Sun MOTIF) was a requirement, as well as interoperability with our existing IMS/

DB2/VSAM environment. Mainframe gateways are being explored to allow this connectivity.

With major systems efforts underway in Student Systems and HRMS, we also needed to ensure compatibility with future packages. The successful vendor will provide us with proven technology in the client-server arena, and will “grow with us” as we expand to fit growing business needs.

Although led by BASIS (Alice de la Cova and Jane Barnard), the process was an OIT team effort. Thanks to the Search Team and reviewers from many specialty areas: Doreen Campbell, Bryant Avey, Dan Cummings, Tim Fitzpatrick, Lee Croatt, Frank Grewe, Myron Lowe, Mark McCahill, Earl Schleske, Ed Sigman, Jerry Farrell, John Fuller, Edie Reiman, Greg Strutz, Patricia Peterson, Yvonne Carlton, representing Architecture and Planning, Security, Desktop Integration, Data Administration, System Software Support, Distributed Computing, etc.

Next steps include final negotiations, purchase, installation, training, and “ramping up” to develop and showcase a series of prototypes in late Spring. Stay tuned for the demos! ■

For Those Who May Not Have Already Heard

Joann Conradson, BASIS Customer Assistance Center

SPCS Consolidation is a Success

As communicated in the January/February issue of the *BASIS EXTRA Information* newsletter, one of the first steps in forming BASIS from AIS (Administrative Information Services), CCS (Central Computing Services), and SPCS (St. Paul Computing Services) began with the consolidation of the SPCS data center with BASIS at 1300 South Second Street.

This consolidation required many hours of detailed planning and work and included a cross-functional team with staff from BASIS, SPCS, ADCS (Academic Distributed Computing Services) and NTS (Networking and Telecommunication Services). The consolidation went very

smoothly because of the outstanding effort by the people from these units. Customers were affected for a period of time over the weekend of February 24-25. Working service resumed as promised at noon, Sunday, February 25.

The most noticeable change is the physical location of the SPCS data center. The phone number used for dial-up access as well as the alphabetic Internet address have remained the same. In addition, the help phone number for customers of the SPCS system remains the same at 624-6235. Billing or administrative questions may continued to be directed to 624-7788.

Great job! ■

Access to Student Data in IDEA Environment

Roberta A. Armstrong, Student Data Custodian

Student systems and BASIS staff have been working on making our reporting databases accessible in the IDEA environment, and we are pleased to announce that University staff who already have access to student databases in the DB2/AS environment may have access to the same data in IDEA. Affected databases are:

- AARDB Annual Admissions
- MARDB Weekly Admissions
- RRDB Registration
- RETDB Retention
- SCHOL Scholarship

John Kellogg, Office of Planning and Analysis, will notify existing users soon via E-mail and a memo about this change and exact timing; he

will also ask users to complete a new, improved database access form so that our files are up to date.

Access to the FARDB (Financial aid data) will continue to be handled on a specific request basis, given its confidential nature and complexity. Please contact John Kellogg if you need this information.

In an article on page 6 written by BASIS Data Warehouse Support staff, you will find information about access to documentation and other things you need to know to take advantage of the new environment. For more information, contact <j-kell@maroon.tc.umn.edu>.

Data Warehouse Databases and Data Custodians

Ruth Volk, BASIS Data Access

	Contact	Phone
AARDB/MARDB Admissions Reporting Database	John Kellogg	Office of Planning & Analysis 625-3387
APSO Personnel Reporting Database	Gary Ogren	Human Resources Information Service 627-4341
CLRDB Class List Reporting Database	John Kellogg	Office of Planning & Analysis 625-3387
CUFSRDB CUFS Reporting Database	Lisa Carlson	Financial Systems Support 624-1506
FARDB Financial Aid Reporting Database	John Kellogg	Office of Planning & Analysis 625-3387
GSRDB Graduate School Reporting Database	Genny Rosing	Graduate School 625-9839
HERDB Historical Earnings Reporting Database	Ann Beattie	Payroll..... 624-3869
RETDB Retention Reporting Database	John Kellogg	Office of Planning & Analysis 625-3387
RRDB Registration Reporting Database	John Kellogg	Office of Planning & Analysis 625-3387
SCHOL Scholarship Reporting Database	Phil Morgan	Office of Scholarships & Financial Aid 624-6586
SDRDB Staff Demographic Reporting Database	Nancy Highsmith	Office of Human Resources 624-8374
SPAM Space Management Reporting Database	Kris Boike	Facilities Management 626-7896
STARS Student Accts Rec. Reporting Database	Sandy Pearson	Office of the Bursar 626-8698

Responsibilities

The Data Custodian is responsible for the data:

- The Data Dictionary – Maintaining Data Privacy – Establishing Views
- Granting Access – Data Validity – Data Training – Data Help

BASIS is responsible for the delivery of the data and the access tools:

- Ensuring that the database loads properly refresh
- Help on the access tools (AS, IDEA Web, MS Access, etc.)
- Help with SQL (Structured Query Language) ■

IDEA Data Warehouse Documentation and Information

Ruth Volk, BASIS Data Warehouse Support
 r-volk@cafe.tc.umn.edu (612) 626-7206

Student data dictionaries will be available on the IDEA Web just as the other IDEA database dictionaries are, via point and click hypertext links to table and column definitions in the query building screens. The IDEA Web address is:
<http://notes.ais.umn.edu>

There is a lot of information about the IDEA Data Warehouse on our BASIS (formerly AIS) Gopher, including the full data dictionaries for all of the reporting databases. The student data dictionaries will be available there as well, in both Word and text formats, so you can download them. If you use the Web, you may get to the University of Minnesota Twin Cities Gopher by using this address: <http://gopher.tc.umn.edu>

Use the following path from the U of MN Twin Cities Gopher home page to get to IDEA information on Gopher:

University of Minnesota Campus Information
 Department and College Information
 Administrative Information Services

IDEA Information and Updates

- IDEA Bulletin Board
- Software Distribution For Windows
- Software Distribution For Macintosh
- IDEA Data Warehouse Status
- How To Change Your IDEA Password
- World Wide Web Access to IDEA
- IDEA Documents (Data Dictionaries, etc.)
- Data Warehouse Useful Terms
- IDEA Brochure (Fact Sheet)
- IDEA Listserv
- IDEA Training/Consulting
- IDEA Migration
- MARDB Enhancements Info (Text version)
- MARDB Enhancements Info (MS Word 6.0 Ver.)

If you have questions about IDEA that aren't addressed here, please contact our Customer Assistance Center by phone: (612) 624-0555, or E-mail: x-help@cafe.tc.umn.edu



- Choose *IDEA Bulletin Board* for the latest information on IDEA news and database refresh schedules and status.
- *Data Warehouse Status* is updated monthly to bring you the most current information about what's happening with IDEA, new data available, access tools, enhancements, etc.
- *Data Warehouse Useful Terms* is a dictionary of the common terms used and their definitions.
- *IDEA-L Listserv* is an electronic forum for data warehouse customers to share information and ask questions of each other. We also use the listserv to make various IDEA announcements. The document on Gopher explains how to sign up for the listserv.
- *IDEA Brochure (Fact Sheet)* explains what IDEA is and lists the hardware and software requirements for the desktop, what access tools are supported, what data is available, etc.
- Please read *How To Change Your IDEA Password*. We encourage you to change your password regularly.
- *World Wide Web Access to IDEA* explains what the IDEA Web is and how it accesses IDEA data.
- *IDEA Documents (Data Dictionaries, etc.)* contains all the database data dictionaries (table and column definitions) available for the Data Warehouse, in both Word and text formats for downloading.
- *IDEA Training/Consulting* lists the classes currently available for IDEA training, dates, costs, and how to sign up.
- We have an IDEA Training E-mail address you may use: dw-training@cafe.tc.umn.edu We are in the process of developing a Web page for customers to use for inquiring about IDEA classes and for signing up. Look for more information in the future!
- *IDEA Migration* contains information for customers who are migrating from the AS/DB2 mainframe Data Warehouse to IDEA, including tips for migrating AS queries.

Staff Demographics Office Transferred and Relocated

Effective February 19, 1996, Staff Demographics was transferred to the Office of Human Resources. Nancy Highsmith continues to be the contact person for all matters regarding Staff Demographics. Nancy's phone number is (612) 624-8374. The new fax number is (612) 625-2574.

All University of Minnesota Staff Demographic forms should be directed to the new address:

Human Resources-Staff Demographics
 200 Donhowe Building
 319 15th Avenue SE
 Minneapolis, MN 55455-0106

Integrated Services Digital Network (ISDN)

Vivian Skordahl, Networking and Telecommunications Services

ISDN (Integrated Services Digital Network) is a digital system designed to carry voice, data, and video across the public switched network. ISDN consists of a Primary Rate Interface (PRI) and a Basic Rate Interface (BRI).

Primary Rate Interface

Primary Rate access can be considered a multiplexing arrangement where a group of basic access (BRI) users share a common line facility. The Primary Rate configuration bundles 24 channels known as 23 B (Bearer) channels plus 1 D (Delta) channel. Each of the 23 B channels can be used to carry voice calls, circuit-switched data, or video. The D channel is designed for both controlling the B channels through shared network signaling functions on this channel and for transmitting packet-switched data. Transmission rate for the Primary Rate Service is 1.544 Mbytes/second, the equivalent of a T1 facility.

ISDN Primary Rate Service has the ability to create a seamless communication system without the expense of dedicated lines, modems, and special cabling. In addition to integrating voice, data, and video services, the benefits of an ISDN network include:

- High transmission quality.
- Improved and expanded services due to B and D channel data rates.
- Increased efficiency and productivity due to its ability to handle simultaneous calls on one line.

Basic Rate Interface

The Basic Rate Interface (BRI), also known as Single Line ISDN Service, provides 1 or 2 B communications channels and 1 D channel. Transmission rate for each B channel is 64 Kbps (kilobytes), while the D channel transmits at speeds up to 16 Kbps. The D channel carries signaling and/or packet data information while the B channels transmit voice, data, or video. By combining the 2 B channels one can achieve a transmission rate of 128 Kbps.

BRI, or Single Line ISDN Service, is the perfect solution for telecommuting, high speed file transfers, high speed access to the Internet, and video communications. The University of Minnesota currently has several video conference rooms, each served by its own BRI facility.

ISDN and Telecommuting

Pacific Bell, the Baby Bell for the Western United States, has seen a dramatic increase in recent years in the use of ISDN for telecommuting. Telecommuting has become more common for many companies as a way to alleviate long commutes, due to traffic congestion, for employees. It is also a good vehicle for faculty who wish to work from their home office.

US West Extends ISDN Service

US West recently issued a new tariff for ISDN service. The tariff offers a variety of pricing options based on service and amount of usage. One especially attractive aspect of this new tariff is the expanded availability of ISDN.

US West customers who were previously unable to get ISDN service due to the 18kf (kilofeet) distance limitation (from a US West Central Office) can now receive the service. US West will install a repeater (or BRITE card) to extend the service. However, there is an additional \$100.00 one-time charge to extend this service to the residential location.

For more information on the US West ISDN service, see their Web site at <http://www.uswest.com>.

ISDN Project Team

The newly merged Networking and Telecommunications Services (NTS) has organized an ISDN Project Team that has been given the task of evaluating ISDN as a new service offering to the University community. The mission of the ISDN Project Team is to "determine the feasibility of

providing ISDN to the home office for University staff and faculty." The findings of the Project Team will determine whether ISDN will be a viable service for the University of Minnesota.

The evaluation of a new service offering such as ISDN involves a variety of issues both technical and non-technical. Some of the factors that have been evaluated by the ISDN Project Team include the following items. It is important to keep in mind that this list is not all-inclusive in terms of the many criteria related to ISDN.

1. Evaluation of terminal equipment both at the user end and at the host in terms of password security and remote administration capability.
2. Development of user guides and documents for the evaluation of the entire service process and end user equipment.
3. Determination of a pricing plan which includes ISDN service, equipment, as well as support and maintenance.
4. Evaluation of dynamic versus static IP addressing.

5. Development of a training process and related materials both for the NTS repair desk and helpline personnel.
6. Assessment of technical capabilities, includes such items as bridging, spoofing, compression, bonding, robustness, and ease of upgrade.

A Beta Trial

As part of this project, a beta trial will be conducted to assist in the evaluation of service, terminal equipment, support and maintenance, and pricing. Beta participants will provide feedback to the project team to evaluate a variety of pre-determined criteria for testing technical and support issues.

The findings of the ISDN Project Team will be published in the Information Technology Newsletter. Based on the complexity of evaluating a new service offering such as ISDN, it may be several months before a final recommendation is presented by the Project Team.

Questions about this project, or ISDN in general, can be directed to Vivian Skordahl at 625-3535 or <skordahl@nts.umn.edu>. ■

Phone FAQs: Frequently Asked Questions

Q: I periodically work at home and access the campus backbone via my home computer. How can I also remotely access the campus voice mail system?

A: You can access any voice mail system via a touch tone telephone—which is one of the many benefits of voice mail. To access the University of Minnesota's voice mail system:

1. Enter 626-0000 into a touch-tone telephone.
2. Press *.
3. Enter 5-digit mailbox (campus phone) number.
4. Enter Passcode.

Once you have gained access to your campus voice mailbox you can then use all the features of the voice mail system from your remote location.

Q: What is Extended Absence and how can I program it on my campus telephone?

A: Extended Absence is a voice mail feature that is commonly used when employees are away from the office for an extended period of time, such as vacation or sabbatical. Once extended absence is programmed, the caller is forced to listen to the entire greeting prior to leaving a message.

If extended absence is not programmed, callers can press the # sign, thus skipping through the greeting and getting a tone to leave a voicemail message.

To Program for Extended Absence:

1. Access your voice mailbox.
2. From the Main Menu, Press 9 for Mailbox Options.
3. Press 1 for Greetings and Name Announcements.
4. Press 1 for Personal Greetings; follow the voice instructions to record your extended greeting.
5. Press # when you have finished recording your greeting.
6. Press 3 to mark it for Extended Absence.

To Remove Extended Absence:

1. Access your voice mailbox.
2. Press 9 for Mailbox Options.
3. Press 1 for Greetings and Name Announcements.
4. Press 1 for Personal Greetings.
5. Press 1 to listen to your greeting.
6. Press 3 to no longer mark it for Extended Absence. ■

SLIP Modem Pool Statistics

Or more than you ever wanted to know, Lawrence Liddiard, NTS

Yes! There are not enough modems to satisfy current demand. We doubled the SLIP pools to 784 from last year's 400, and 192 modems are on order for delivery in April.

them, compared with 5.6 Gigabytes delivered by slower modems in the 626-1920 V.32bis pool. Table 2 also gives CCITT Standards/speed and what SNMP reports for V.34 pool.

A Picture of SLIP Activity

Start with Figure 1, the "Combined University of Minnesota SLIP Pools, Monday-Friday Daily Average" graphic. It sums both pools during the fourteen weeks after Thanksgiving.

Although the weekends are not shown, Friday and Saturday night usually do not max out. Sunday, at about 1 pm the beat picks up. During the week, there are slight dips at noon and 6 pm when some Minnesota Nice leave their systems to refuel.

If you do not need sleep, the best time to use the pool, without getting a busy signal, is between 2 am and 8 am.

Average Minutes per Session

The average minutes per session (Table 3) are important since that duration decides the limit for the number of users per modem that can be handled in a single day.

If the average session lasts 30 minutes, then 48 users would be the limit for around-the-clock usage. But if sessions last an average of one hour, then 24 is the limit [and the pool, instead of needing to be twice as large, would need to be 4 times the current size].

In Table 3, note that the categories *Unknown*, *Other UofMN* and *U of MN Students* average more minutes per session than the total average; but not by significant amounts.

How are People Using the New V.34 Pool?

Both pools have approximately the same number of modems. The sampling in Table 1 shows V.34 sessions start at 28.8K (kilobytes) and eventually settle at that speed or slightly less by n*2.4K.

Table 2 shows more than half of those who dial the 627-4250 number have V.34 (28.8K) modems. Those using the 28.8K modems get the University to deliver 8.6 Gigabytes per day to

Answered, Busy, and Users per Modem

In Tables 4a and 4b we compare March-May 1995 and January-February 1996. The average values, least and most users per modem, were about the same for the 400 modem, SLIP 6-1920 pool. In each period, one day had a rejection rate of 75-78% of the modem calls, usually due to automated attempts to get a connection. In 1996 Tuesday has been a record setting day.

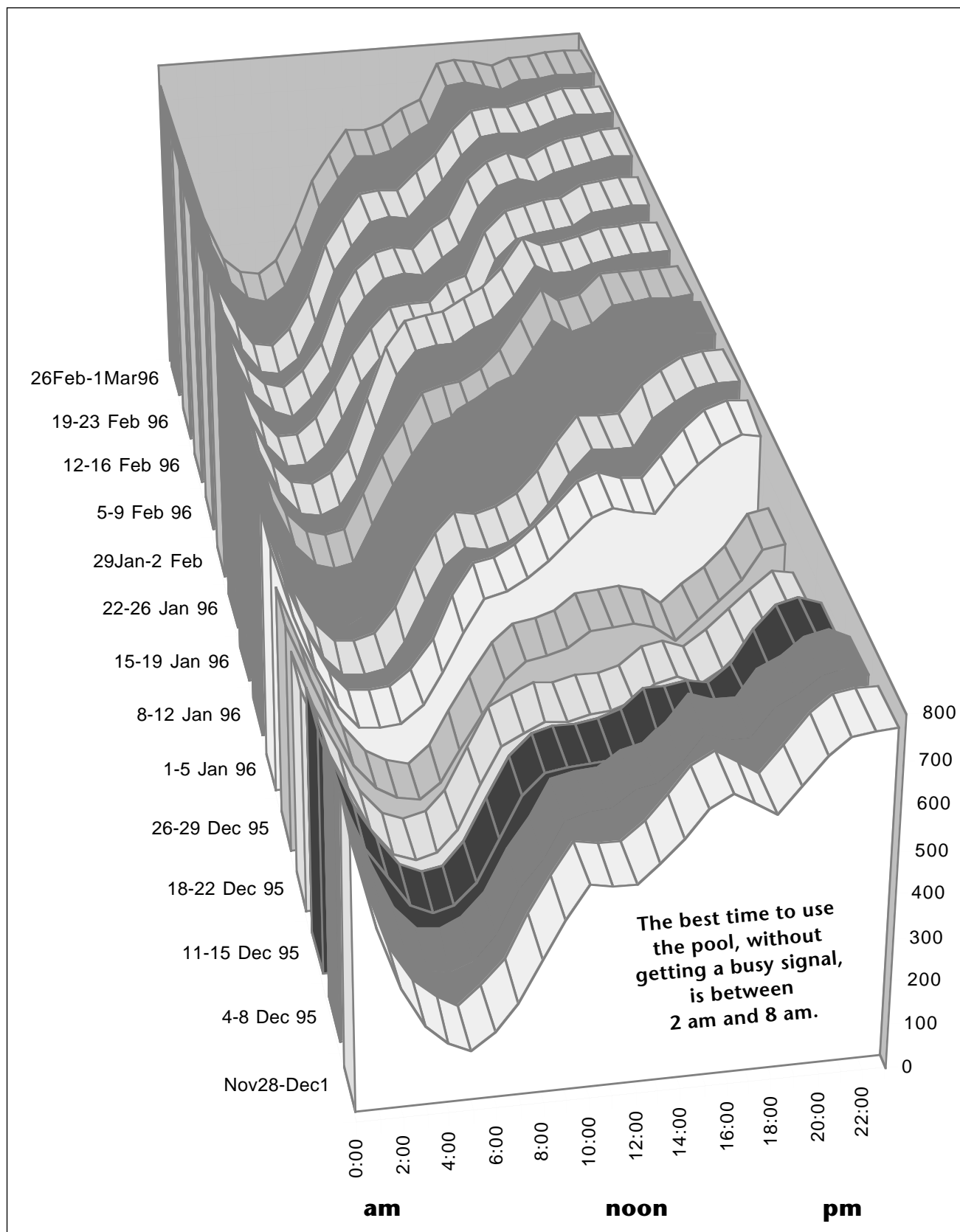
Table 1: Sample of 196,970 V.34 modem pool instances of session speed

<9.6K	9.6K	14.4K	16.8K	19.2K	21.6K	24.0K	26.4K	28.8K	33.6K	Other
0.6%	4.4%	39.2%	0.9%	5.2%	3.1%	8.7%	27.0%	9.3%	0.2%	0.1%

Table 2: an SNMP Report on CCITT Standards and Speed

CCITT(VFC=pre-V.34)	V.32	V.32bis	V.32terbo	VFC	V.34	Other
Maximum Speed	9.6K	14.4K	19.2K	28.8K	28.8K	
	0.0%	0.0%	43.3%	5.2%	50.6%	0.8%

**Figure 1: Monday–Friday Daily Average
Combined University of Minnesota SLIP Modem Pools**



To Receive is Better Than to Give

As the years go by we receive more bytes than we send (Figure 2). In 1993 the SLIP byte ratio had the user receive 2 outputs bytes from the University for every 1 input. For late 1995 and 1996 that number has increased to over 5 outputs for every 1 input.

The rise of Netscape and other Web browsers has accelerated this change. The graph in Figure 3

shows that the total University of Minnesota traffic with the Internet has doubled each year since 1992.

During the years that Minnesota's Gopher product was widely used, the Ma Gopher servers made the University a net exporter of bytes to the Internet (Figure 4). Now, with the growth in use of Web browsers, we are becoming a net importer of bytes from the Internet. ■

**Table 3: SLIP Pool - Who and How Long?
SLIP 6-1920 Authentications & Sessions
62 days in 1995 • March through May 8**

	Number of Logins	% Total	Minutes Average	Hours	% Total
Unknown	28	0.0%	43.8	20.5	0.0%
A Alumni	126,309	14.6%	21.9	46,121.0	11.3%
C Central Computing Staff	42,863	5.0%	26.6	18,980.8	4.7%
F Faculty/Staff	157,678	18.2%	26.7	70,036.1	17.2%
O Other UofMN (Dept Auth)	53,020	6.1%	42.3	37,337.3	9.2%
U U of MN Students	484,776	56.1%	29.1	234,768.3	57.6%
Total	864,674	100.0%	28.3	407,264.0	100.0%

**SLIP 6-1920 • Compare Early 1995 and 1996
Answered, Busy, and Average Users per Modem**

**Table 4a: 39 Monday-Friday days in 1995
March through May 8**

Day	Answered	Gave Busy	Users/Modem	
Mon 17-Apr-95	13,077	31,149	33	Least users/modem day
Tue 28-Mar-95	24,232	19,234	61	Most users/modem day
Wed 12-Apr-95	16,474	58,810	41	Highest % gave busy
Average Day	18,059		45	

**Table 4b: 38 Monday-Friday days in 1996
January through February**

Day	Answered	Gave Busy	Users/Modem	
Tue 2-Jan-96	15,308	11,440	38	Least users/modem day
Tue 16-Jan-96	24,843	18,374	62	Most users/modem day
Tue 27-Feb-96	17,148	57,500	44	Highest % gave busy
Average	18,058		45	

Figure 2: SLIP Output/Input Byte Ratio

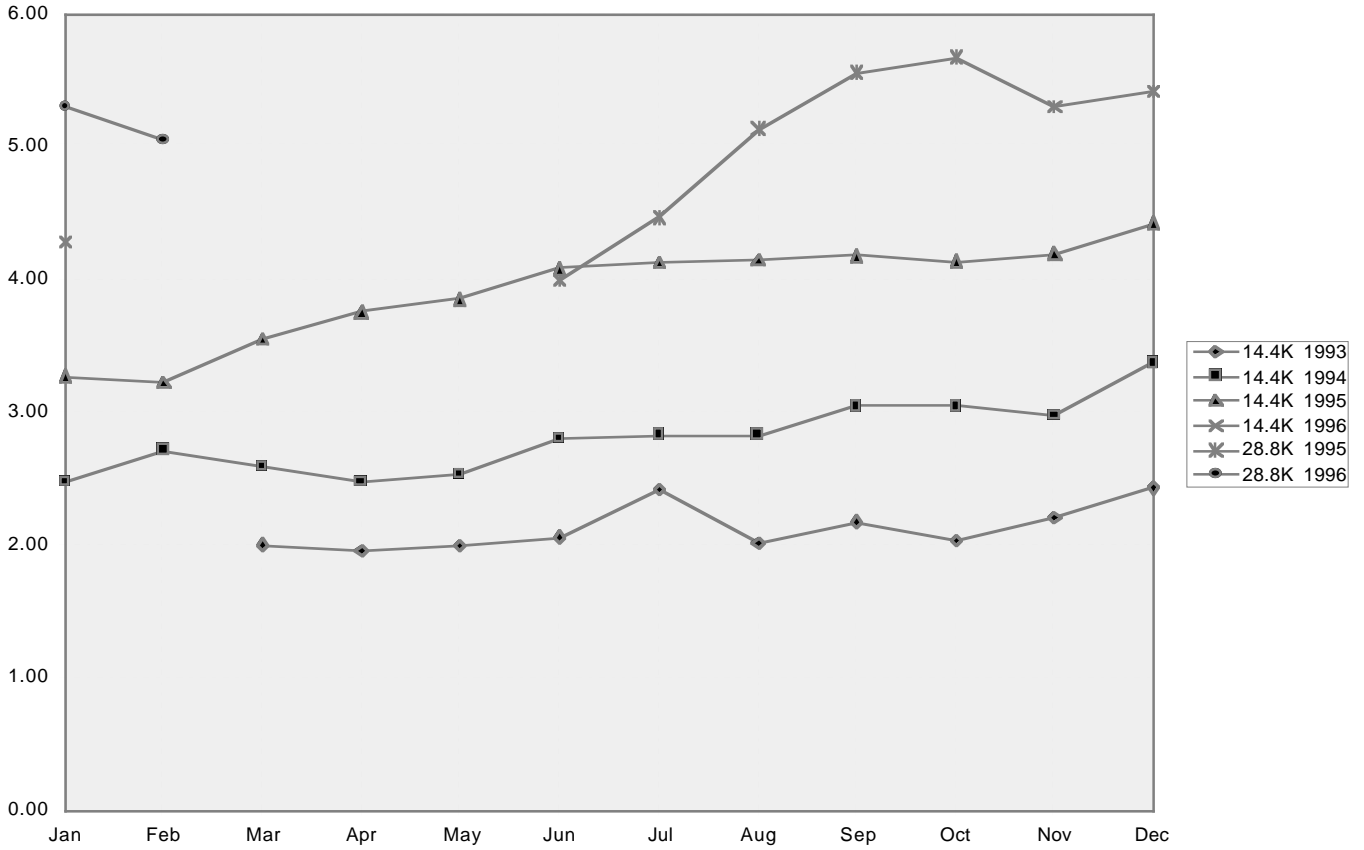


Figure 3: Average Daily UofM Total Internet Traffic in Megabytes

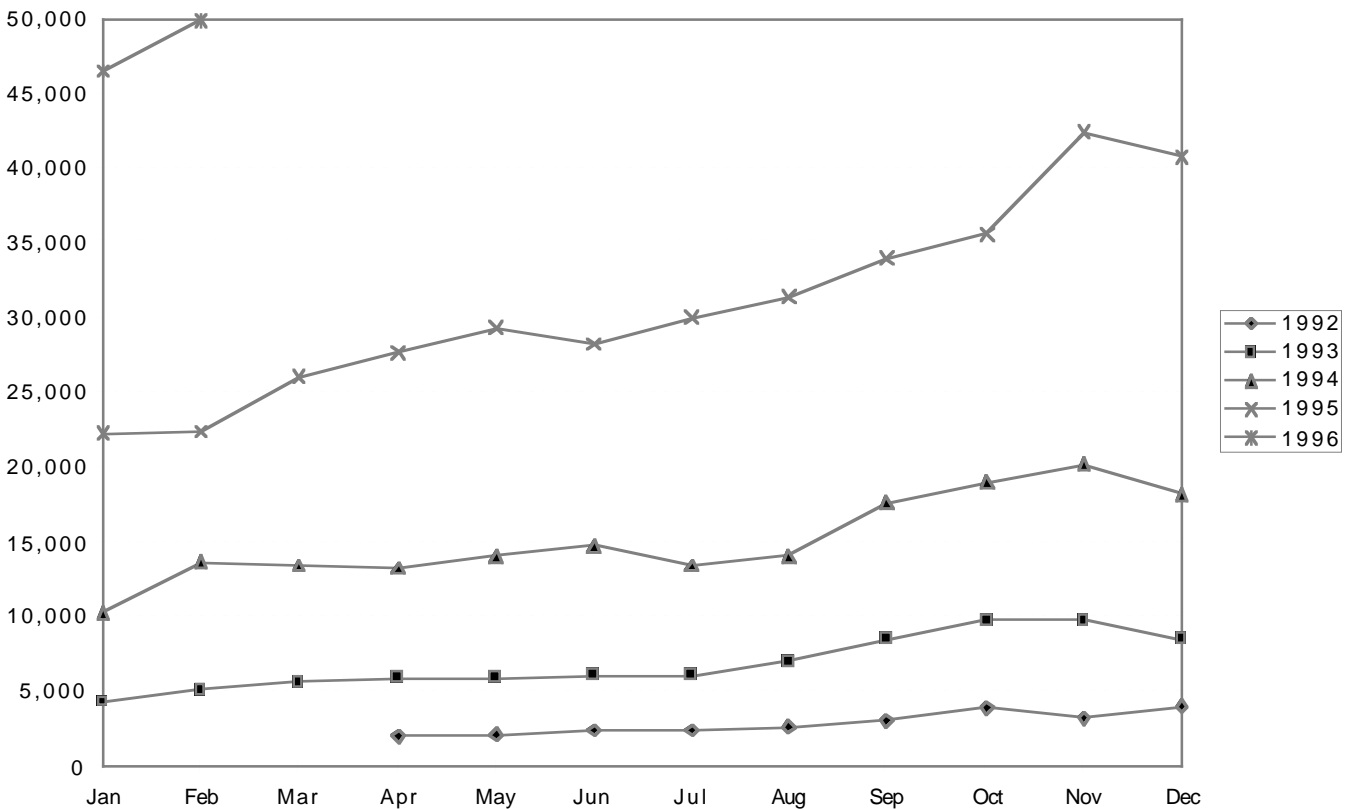
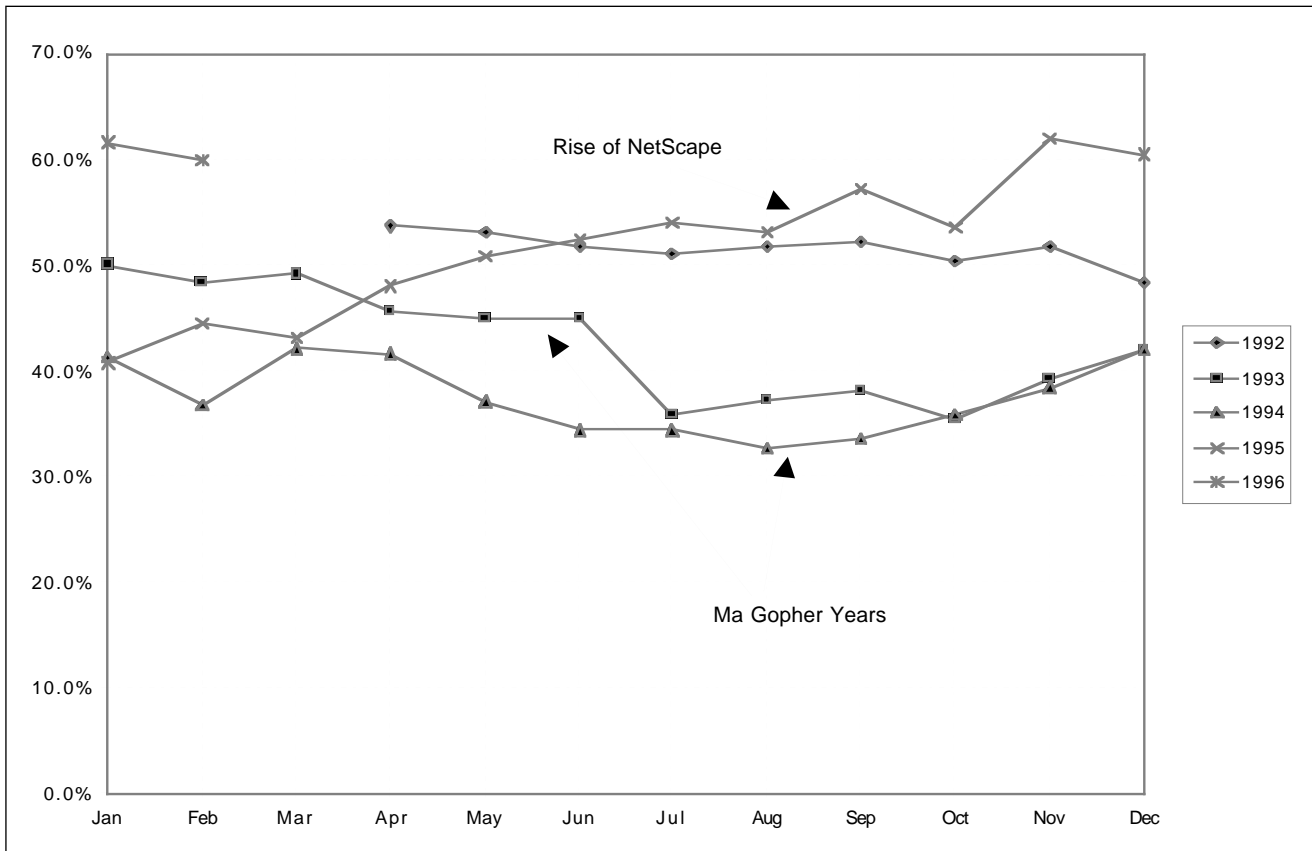


Figure 4: Input/Total Bytes in U of M Internet Traffic



from page 3 • Organized for Excellence

We are working to establish strong organizational structures that can best support the challenges ahead. In less than 5 months we have established a new functional organization structure, completed the mapping of employees into the new organizational structure, moved the St. Paul Center to the West Bank Office Building—consolidating that operation with the administrative computing operation, and launched a process reengineering effort in NTS.

Through this transition period the Office of Information Technology will support all of its service offerings at current or improved levels.

Over the next few months the OIT unit Directors will examine each line of business and set new objectives for excellence. OIT is also developing a new measurement and accountability methodology that will be adopted throughout the OIT

organization. The Directors will be able to measure and track service levels, accurately track costs, manage expense to revenue, manage capacity planning, benchmark each service for market competitiveness, measure quality, and uniformly track problem resolution. The objective is to be able to guarantee highest quality services at lowest possible costs. We want the University community to select OIT services because they are the best deal around.

The newly created Office of Information Technology is a great beginning. We are off to a fast start but still have many challenges to overcome. I am confident that we are positioning the OIT organization to be key enablers of the University's U2000 goals. With strong support from our dedicated employees we will overcome the challenges and succeed in providing the excellent services the University requires. ■

Windows 95 on Campus

Issues for University of Minnesota Network Administrators

This article is brought to you by folks from Academic and Distributed Computing Services and Networking and Telecommunicating Services.

On August 24, 1995, Microsoft Corporation introduced Windows 95, its upgraded graphical user interface for the Intel CPU-based computer platform. Ever since, some departments at the University of Minnesota have cautiously begun to move some of their computer users to this new platform.

In most respects, this has proven to be a relatively easy transition. However, in the area of networking, Windows 95 provides some unique challenges and pitfalls. In this article we will address some of these issues. We present some of the advantages of moving from the older Windows 3.x platform to Windows 95. We will discuss how to install TCP/IP and Novell's Client32 services under Windows 95. We'll also mention some of the known bugs and bug fixes.

Windows 95 Networking

What does Windows 95 offer to the departmental network administrator? Microsoft Windows 95 includes built-in networking support for a variety of networking schemes. Among the supported networking options are:

- Novell NetWare 3.x and 4.x
- Microsoft LAN Manager
- Windows for Workgroups 3.x
- Windows NT Server
- SunSoft PC-NFS 5.x

The built-in networking components include support for all of the popular network transports, including TCP/IP, IPX/SPX (NetWare), Network Device Interface Standard (NDIS), and Open Datalink Interface (ODI).


Below is a listing of some of the major networking features found in Windows 95. Table 1, at the end of this article, gives you a more detailed comparison of Windows 95's and Windows 3.1's network features.

- Robust networking components using little conventional memory
- Easy, graphical configuration for all networking components
- Windows 95 set up automatically upgrades existing network software components
- Simultaneous connection to multiple networks and network protocols on a single computer
- Hot swappable PCMCIA networking support
- Unified logon, login script processing, and resource browsing
- Long filenames
- User profiles and system policies for administrative configuration
- Dial-up networking for remote access
- Agents for network backup and remote management

Setting up TCP/IP

How do you set up a connection to the Internet under Windows 95? Begin by assembling the parts: a network adapter card and active Ethernet Jack (from Networking & Telecommunications Services), an IP number for your workstation, and your Windows 95 CD or installation disks. Then install and configure TCP/IP and a network driver and client. The exact steps are below.

Begin the Installation

It all begins by pressing the Windows 95  button. If the setup is typical, you'll follow the steps below.

1. Select *Settings*.
2. Select *Control Panel*.
3. Double-click on the *Network* icon. You'll see the dialog box shown in Figure 1.

Install TCP/IP

4. Click the *Add...* button (shown in Figure 1).
5. Double-click on *Protocol*.
6. Select *Microsoft*.
7. Select *TCP/IP* and click *OK*.

Add Your Adapter

8. Click the *Add...* button again.
9. Double-click *Adapter*.
10. Scroll down the list of manufacturers until you see your card's vendor on the list.
11. Click on the vendor name to see the list of available drivers from that vendor.
12. Select the correct adapter driver and click *OK*.

Now your Network dialog box should contain two listings: your Adapter and the TCP/IP protocol (Figure 1).

Adapter note: if you have a Legacy adapter (i.e. an ISA Ethernet card), use the *Add Hardware Wizard* to allow Windows 95 to correctly assign and allocate legacy resources, such as the IRQ and I/O base address. You'll find the wizard in the Control Panels folder.

13. Select the adapter.
14. Click *Properties...* then click on the *Bindings* tab. Make sure the *TCP/IP* box is checked.

Configure your Network Client and TCP/IP Protocol

Now that the drivers are installed, you must configure them to work with Windows 95.

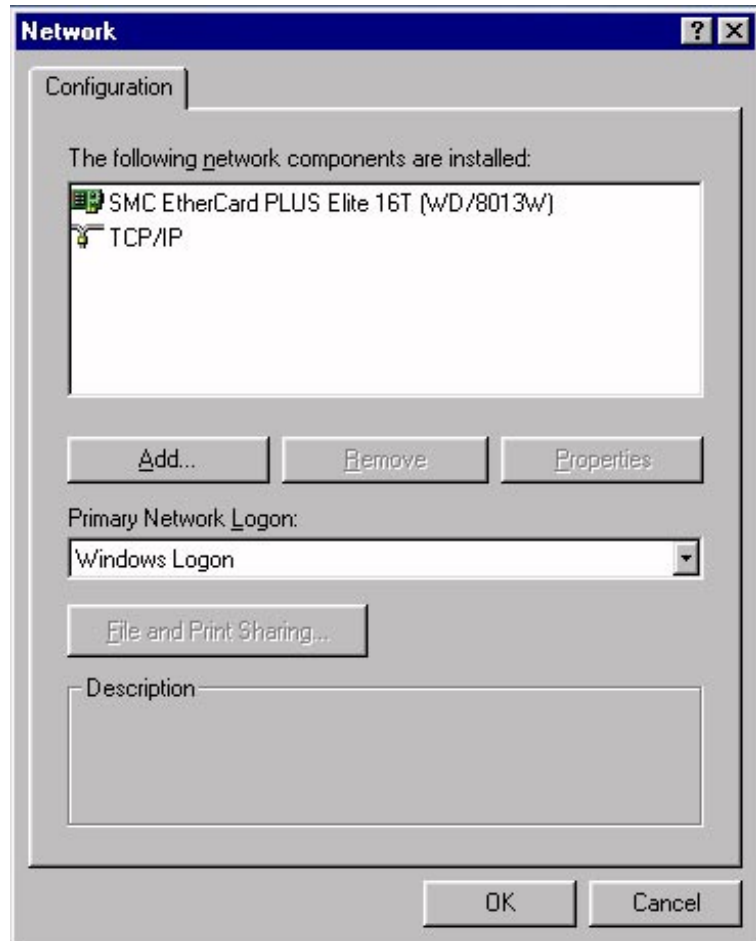
1. Go to the *Control Panel* and double-click the *Network* icon.

You should get a dialog box that looks much like Figure 1.

2. Click on the name *TCP/IP* and press the *Properties* button.

You should get the *TCP/IP Properties* box. This dialog box has six section tabs. Click on the section tab to change the settings related to that title.

Figure 1: Install TCP/IP and More



IP Address Tab

3. Select the *Specify an IP address* option.
4. Type in the IP address that was assigned to you (by NTS or your campus LAN administrator).
5. Next, fill in the *Subnet Mask* text area. This number is usually 255.255.255.0 on campus.

WINS Configuration Tab

6. Select the *Disable WINS Resolution* option; WINS is not yet implemented at the University.

Gateway Tab

7. Enter your gateway address and press the *Add* button.

On campus the gateway address is the first three numbers of your IP address followed by **254**. For example, if your IP address is 134.84.134.8, your gateway address is 134.84.134.254.

DNS Configuration Tab

8. Select the *Enable DNS* option.
9. Enter your hostname in the *Host* box. In the *Domain* box, put in the name of your domain. If you're typical, that name will be `umn.edu`. However, NTS may have assigned your department its own domain name, such as `partyon.umn.edu`.
10. In the *DNS Server Search Order* section, type in the IP address for the University of Minnesota Twin Cities campus, then press the *Add* button. Which address you use depends on which campus you are on.

Minneapolis campus workstations should use: `128.101.101.101` first followed by `134.84.84.84`

St. Paul campus workstations should use: `134.84.84.84` first followed by `128.101.101.101`

11. In the *Domain Suffix Search Order* section, type in the domain suffix (usually the same as the domain) and press the *Add* button. (Your department may have a unique domain suffix assigned to you by NTS.)
12. When you're all done setting these options, press the *OK* button. Then press the *OK* button in the *Network* dialog box.

Windows 95 will ask you to reboot.

13. Click *Yes*. Your workstation will be rebooted and the network configuration will be put into place. You can now get something to drink.

Getting Connected

Since Windows 95 automatically loads its TCP/IP stack upon startup, you should be able to fire up those 32-bit Winsock applications right away!

The new TCP/IP protocol utilized in Windows 95 does not support BOOTP, but rather another standard called Dynamic Host Configuration Protocol (DHCP). DHCP can be configured to assign parameters such as subnet mask, DNS, gateway addresses and so on. Currently, DHCP is not supported at the University; however, this protocol will be implemented in the near future.

The previous section included very detailed steps. The next sections are not as detailed.

Novell NetWare Client32

Recently Novell released a new client architecture for Windows 95 called Client32. Novell's Client32 Requester extends your Windows 95 desktop onto your Novell network. It does this by integrating the available resources of the *NetWare Bindery* and *NetWare Directory Services (NDS)*.

This section of our article will discuss NetWare Client32 requirements, where to obtain Client32, its features, known bugs, and installing the requester.

Installation Requirements

In order to install and integrate Novell's Client32, your workstation must meet the following requirements:

- Use the latest release of Windows 95.
- Have least 6MB of RAM (8MB recommended).
- Have at least 2-3MB of free hard drive space.
- Have an installed network adapter.

We also recommend that you

- Have the latest Windows 95 service pack installed.

In addition, be sure to have your Windows 95 CD-ROM or installation diskettes handy and make a backup of your workstation's files. This will enable you to recover data in the event of a problem.

Obtaining Client32

You can obtain Novell's Client32 files from the Internet using the World Wide Web at <http://netwire.novell.com/>.

Once you have connected to the Web site, click on "Product Support for Windows 95" and then click on "NetWare" to arrive at the Client32 page. Upon downloading Client32, you will have two options. If you want to perform a

server based installation, you can download the network installation archive file. If you want to install the client from floppy diskettes, you can download the diskette installation archive file. Both files are self-extracting archives (ARJ format) and are 4-5MB in size.

To download the client from Novell's FTP site <ftp://ftp.novell.com>, look for the following files in the /pub/client32/win95 directory:

- c3295n_b.exe
contains the network installation archive
- c3295d_b.exe
contains the diskette installation archive
- c32_tech.exe
contains technical description of client

If you download the network installation archive, copy the file to a TEMP directory and run c3295n_b.exe. This will create an INSTALL directory and place all the setup files in the directory.

If you download the diskette installation archive, copy the file to a TEMP directory and run c3295d_b.exe. A batch file called MAKEDISK.BAT will be extracted. You need to run this in order to copy the necessary files onto diskettes for installation.

Extract the Client32 Files

After you extract the Client32 files onto the appropriate medium, you're ready to begin the installation.

Read the README.TXT file. It explains topics such as *Installation Basics, Help Section, Graphical User Interface (GUI) Issues, Requester Issues, ODI and NDIS Support Issues, Printing Issues, SNMP Issues and NetWare 2.2 and 3.x Compatibility Issues.*

To proceed with the installation, access the subdirectory where the NetWare Client32 files reside, locate the file SETUP.EXE and execute it. When you do, you should receive the Client32 License Agreement information. Click the *Yes* button to continue.

Click the *Start* button, and the installation will start to build the Driver Information Databases for the NetWare Client32 software. It will also examine and modify your workstation's Network

Control Panel. Therefore, keep in mind that if the installation detects any previously installed network components, it will remove them prior to installing the new Client32 files.

Currently the following network components are incompatible with the NetWare Client32 requester:

1. Microsoft Client for NetWare Networks
2. Microsoft File and Print Sharing for NetWare Networks
3. Microsoft Services for NetWare Directory Services (NDS)
4. Novell NetWare Workstation Shell 3.x (NETX)
5. Novell Workstation Shell 4.x (VLMs)
6. Novell IPX ODI Protocol (16-bit version).

The Files are Placed in C:\NOVELL

After the Driver Information Databases are complete, the installation begins copying the necessary files onto your workstation. By default, these files are placed in the C:\NOVELL\ subdirectory of your workstation.

Once the operation finishes, a screen will appear informing you that the installation of the NetWare Client32 files is complete. You will then have the option of rebooting your workstation with the default configuration, customizing your NetWare32 configuration, or returning to Windows95 without initializing the new client software.

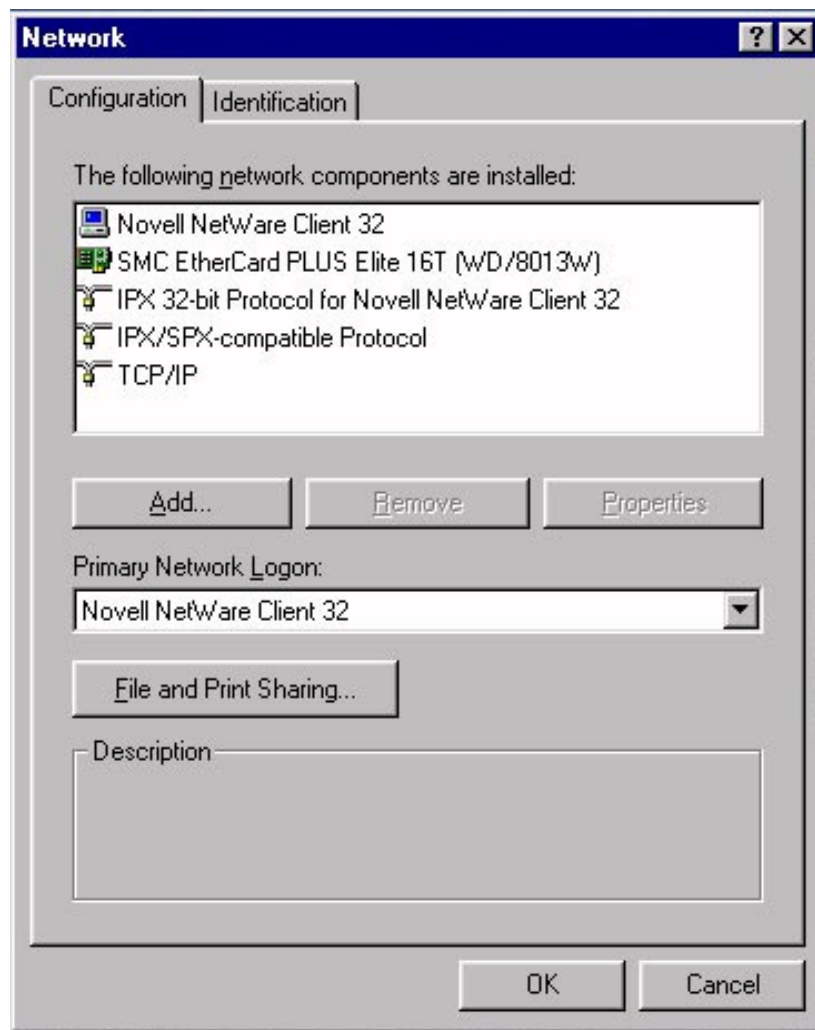
Once you have rebooted the machine, the Client32 requester screen appears prompting you to log on to a fileserver. Your Network control panel will look like the one shown in Figure 2.

Novell's NetWare Client32 for Windows 95 provides a number of features that are worth mentioning:

1. Novell's client supports packet signature and packet encryption, two important NetWare security features. (Microsoft's client does not support these features.) Novell's client also provides better support for NetWare packet burst.
2. Novell's client provides more features for reconnecting to the network after a system failure. You can specify different levels of autoreconnection.

3. Novell's network caching is quite comprehensive. While Microsoft's client provides a disk read-write cache (similar to SmartDrive for the network), Novell's client caches file read-writes, executables, network object Ids, and NDS addresses to speed up NDS performance.
4. Novell's client supports multiple NetWare Core Protocol (NCP) connections and multiple directory tree access. With Novell's client you can log in as ADMIN to multiple directory trees. Microsoft's client only allows you to view and authenticate to one directory tree at a time.
5. Novell's client uses NetWare 4.1 NCPs for better performance (these NCPs transfer larger chunks of data per request).
6. Novell's client is self-tuning. It adjusts configuration parameters on the fly.
7. Novell's client uses bi-directional NCPs, which reduce network traffic and increase performance. Microsoft's client does not support bi-directional NCPs.
8. Novell's GUI login provides an advanced option that allows users to customize their login process.
9. With Novell's client, Windows 95 user profiles and system policies are better integrated with NDS.
10. Novell's Automatic Client Update (ACU) allows you to update NETX, VLMs, or Microsoft's client over the wire. You do not have to walk to each machine.

Figure 2: Client 32 Installed



No Uninstall

When the Client32 software is installed on your workstation, no uninstall feature is available.

What do you do if you need to revert back to your original drivers and configurations? To restore your original configurations, you must remove the current drivers in the *Network* Control Panel and install the original drivers from the Windows 95 CD or installation diskettes.

Bugs and Fixes

With the release of Windows 95 and with its network constituents, several notable bugs were reported concerning: *File and Print sharing for NetWare networks, password list and incompatibility problems with shell.*

Get Microsoft Service Pack 1

These are fixed by applying the Microsoft Service Pack 1 located on the Web at <http://www.microsoft.com/windows>. This minor upgrade for Windows 95 includes the following network related topics:

- MS Client for NetWare Directory Services
- MS 32-bit Dynamic Library Code (DLC)
- File and Print sharing security update: resolves the open door virus problem, both Client32 for NetWare and MS Network.
- Password list Security Update
- Shell update: resolves incompatibility problem with shell32.dll

There are two service packs that you should be aware of: the User Service pack and the Administration Service pack. The User Service pack is the smaller of the two; it includes no network patches or fixes. The Administration Service pack includes fixes for network items such as peripherals and OS software.

What Does the Pack Do?

NWServer Update: File and Printer Sharing for NetWare Networks

Microsoft discovered an issue with File and Printer sharing for NetWare Networks which might affect data security for corporate users.

If your computer is configured for file and printer sharing and Remote Administration is enabled, you're vulnerable. Another user on the network might gain read-only access to your computer after the administrator has logged off the computer and before you have restarted your computer.

To correct this problem, Microsoft issued an updated driver for File and Printer Sharing for NetWare Networks. The updated driver ensures that only valid administrators have access to the computer's drive.

Windows 95 Password List Update

The Windows 95 Password List Update protects your password file against potential security violations.

When you connect to a password-protected resource, such as a network drive, you can choose to save that password. Windows then

stores the password in an encrypted file on your hard disk. Recently, an algorithm was posted on the Internet for decrypting this file. If someone has access to your password file and knows the decryption algorithm, they might be able to decrypt it and the passwords it contains – and then gain access to the password-protected resources.

The Password List Update provides vastly improved encryption that is 2^{96} (2 to the 96th power) and is harder to decrypt than the previous encryption method. We still recommend not using password caching.

Microsoft Windows 95 Shell Update

This update to the Windows 95 Shell32.dll file fixes a problem in which files copied onto themselves can be truncated to a zero-byte file size. This occurs only in the following circumstances:

- When you copy a file onto itself using two different views of the same network resource.
- When you copy a file onto itself using a drive that was created by the SUBST command.

This update to Shell32.dll also makes it possible to browse NetWare Directory Service printers from the Add Printer wizard, which is in the Printers folder.

This change is applicable to you if you have installed Service for NetWare Directory Services.

Version 4.00.950a

Installing the service pack updates your version of Windows 95 to version 4.00.950a.

Conclusion

Windows 95 offers many benefits, both to the end user and to the network system administrator. Drivers are usually easier to configure and memory and other conflicts occur less often than they did with Windows 3.x.

If you take care in planning how you install and configure Windows 95, you should find the upgrade to be fairly straightforward and easy. Planning is the key! ■

**Table 1: Windows 95 versus Windows 3.1
Comparison of Network Features**

Networking Feature	Windows 3.1	Windows 95
Hardware setup	Legacy hardware setup using jumpers and switches.	Plug-and-Play (PhP) devices are automatically configured.
Applications	Supports 16-bit Windows applications.	Supports 32-bit Windows and Netware applications.
Filename	Supports DOS standard filenames.	Supports long (up to 255 characters) filenames locally or on a server.
Printing	Prints files to Netware print queues.	Point-and-print, drag-and-drop to icons. Prints files to Netware print queues without LPT port capturing.
Managing desktops	Limiting users' access to Windows resources requires hand editing .INI files on each desktop.	System policies are set with graphical user interface (GUI) tools and can be centralized on a Netware server.
Backup	Backup software requires TSRs (terminate-and-stay-resident) programs.	Windows 32 backup agents are included; no TSRs are required because it uses VxDs.
Multitasking environment	16-bit nonpreemptive.	32-bit preemptive is faster and offers more protection from software failure.
Network login	Netware login scripts are not supported unless you log in before loading Windows.	Native support for Netware login and login scripts.
Multiple network support	Difficult to use; a different interface for each network.	Multiple network support with a consistent interface for each network.
Network drivers	16-bit real-mode drivers are slower and consume conventional RAM.	32-bit network drivers are faster and consume memory over 1MB, leaving more memory for DOS applications.
Autoreconnect to network	Not available. (Workstations must log in again or reboot.)	Automatically reconnects to server once the resource is available again and recreates the user's network environment.
Configuration (.INI) files	Multiple .INI files for each application on each desktop.	Registry database stores application settings in one file and can be managed remotely by the network administrator.

SN•PK•DF•BS•MK

More Windows 95 Information

For more information about the topics discussed in the *Windows 95 on Campus* article, you can point your Web browser to the following sites:

- Microsoft Knowledge Base <<http://www.microsoft.com/kb/>>
- Windows 95 Net FAQ '96
<<http://www-leland.stanford.edu/~llurch/win95netbugs/faq.html>>
- Windows 95 Resource Kit Help File
<<http://www.microsoft.com/kb/softlib/cdextras.htm>>
- Netware Client32 Page <<http://netware.novell.com/home/client/client32>>
- Netware Connection <<http://www.nwconnection.com/>>
- Newsgroups: comp.os.netware

A Look at Some Basic Social Sciences Databases Available Through Lumina

Nancy K. Herther, Manager, Integrated Information Center, University Libraries

The social sciences are a very broad-based area, encompassing everything from legal information to clinical psychology to management to theories of how we think, interact, work and play. This column will look at three of the most important databases covering this literature. If you aren't a social scientist don't stop here. These databases contain critical information on virtually any topic you might have.

Social science databases do a good job of covering issues of impact, acceptance, usage, interest, applications, support/funding and other areas related to everything from computers to biological warfare to nutrition to funding for space exploration. If you need a complete picture of some subject or just a quick look at how society or groups of people view some new idea or product, take a look in these databases.

All three databases, offered through OCLC's FirstSearch service, are available through the INDEXES option in LUMINA. Give them a try.

PAIS Decade

PAIS Decade consists of over 200,000 records representing articles, books, conference proceedings, government documents, book chapters, and statistical directories in the area of public affairs.

Coverage is the most recent 10 years of citations from the printed index Public Affairs Information Service Bulletin which is kept in Wilson Reference (first floor of Wilson Library). PAIS Decade consists of over 200,000 records representing articles, books, conference proceedings, government documents, book chapters, and statistical directories in the area of public affairs.

Topics covered include business, government, international relations, banking, environment, health, social sciences, demographics, law and legislation, political science, public administration, finance, agriculture, education, statistics, and more.

Coverage is the most recent 10 years of citations from the print publications *PAIS Bulletin*, *PAIS Foreign Language Index*, and *PAIS International in Print*. The Periodicals/Publishers Directory for each of these indexes is also included, in case you wish to check on the address or publisher of some particular book or journal.

SocSciInd

SocSciInd corresponds to the Social Sciences Index published by the H. W. Wilson Company and kept in the reference collections of Wilson Reference (first floor Wilson). SocSciInd indexes more than 350 of the key international English-language periodicals in the social sciences, providing accurate, up-to-date coverage of this multi-faceted, interdisciplinary field. There is extensive coverage of current events in business, politics and foreign affairs, including anthropology, community health and medical care, economics, geography, international relations, law and criminology, political science, psychiatry, social work and public welfare, and sociology.

There are more than 350 international, English-language periodicals in sociology, anthropology, geography, economics, political science, and law. The database covers from February 1983 to the present and is updated monthly.

SocSciInd indexes feature articles, biographical sketches, interviews, obituaries, and scholarly replies to the literature. This database also cites book reviews greater than half a page in length. Book reviews of government documents and letters to the editor are not indexed.

SocioAbs

SocioAbs is a subset of the Sociological Abstracts database. SocioAbs contains over 61,000 citations (or records) to articles from 250 English-language journals reviewed and abstracted by Sociological Abstracts, Inc., San Diego, CA.

Coverage is from 1963 to the present. Abstracts have been included since 1974. Records in SocioAbs are from two files: SA and SOPODA.

Sociological Abstracts (SA)

Sociological Abstracts includes material in sociology, anthropology, criminology, demography, education, law and penology, race relations, social psychology, and urban studies. SA is updated six times a year, in February, April, June, and August.

Social Planning/Policy and Development Abstracts (SOPODA)

These are abstracts on finding and implementing solutions to social problems. SOPODA covers such areas as aging, violence, abuse and neglect, crisis intervention, urban development, development policy, and more. SOPODA records date back to 1979. SOPODA is updated twice a year in June and December.

Try a Sample Search

Just to see how these databases could help researchers with a literature review, let's take the topic of TQM, an important management technique being used extensively here on campus. Figures 1 and 2 show what I found in a

quick search of PAIS on this topic. Using the same term (su:total quality management), Figures 3 and 4 show examples of records retrieved from SocSciInd and SocAbs as well.

Interested in how people feel about presidential politics? Acceptance of computers in the workplace? Changing attitudes about AIDS or smoking? Popular opinion about priorities for space programs or immigration? "Ripple effects" from changing workplace or school-based realities?

All three databases come with extensive help screens that can help you formulate your search topic. Once you have a list of books or journals you would like to see, check MNCAT in LUMINA to see if these are owned by the Libraries.

If you need further assistance or want more information on these or other databases and reference services from the University Libraries, feel free to call or stop in any of our library reference locations or call me. Happy searching!

Nancy K. Herther is Manager of the Integrated Information Center of the University Libraries. She can be reached at Room 7 Walter Library, East Bank; 624-2020; Internet: nherther@iic.lib.umn.edu

Figure 1: PAIS Decade, a Sample Search

List of Records

DATABASE: PAIS Decade		LIMITED TO:	
SEARCH: su:total quality management		FOUND 44 Records	
NO.	TITLE	AUTHOR	YEAR
1	Advances in librarianship, 1995.	Godden, Irene P	1995
2	Creating high performance organizations: p...	Lawler, Edward	1995
3	Estrategias empresariales frente al Tratad...	Mercado Hernand	1994
4	Special issue: Industrial organization and...		1995
5	Construction economics in the single Europ...	Drake, B., ed.	1995
6	Driven by Nissan? a critical guide to the ...	Beale, Dave	1994
7	Total cost management of US national healt...	Dovi, Sebastian	1994
8	Total quality management: can its principl...		1994
HINTS: More records . . . type F. View a record . . type record number.			
Decrease number of records type L (to limit) or A (to 'and')			
Do a new search type S or SEARCH.			
ACTIONS: Help Search And Limit Print Email Database Forward BYE			
RECORD NUMBER (or Action):			

Figure 2: Another Sample Record from PAIS Decade

Full Record Display

DATABASE: PAIS Decade LIMITED TO:
SEARCH: su:total quality management

Record 2 of 44 (Page 1 of 2)

PAIS NO: 95-1001470
AUTHOR: Lawler, Edward W. III and others
TITLE: Creating high performance organizations: practices and results of employee involvement and total quality management in Fortune 1000 companies.
SOURCE: Jossey-Bass (LC 95-9136) (ISBN 0-7879-0171-7) pa \$65 1995 xxii+186p
YEAR: 1995
SPECIAL FEAT: bibl(s) il(s) table(s) chart(s)
SERIES: Jossey-Bass mgt. ser.

HINTS: Another page . type F or B. Another record . type record number
Return to Record List just press Enter
ACTIONS: Help Search Print Email LIBraries Forward Back
RECORD NUMBER (or Action):

Figure 3: Sample Record from SocSciInd

List of Records

DATABASE: SocSciInd LIMITED TO:
SEARCH: su:total quality management FOUND 52 Records

NO.	SOURCE	TITLE	YEAR
1	Adm Sci Q	Total quality management: empirical, co	1995
2	Percept Mot Skil	Customers' satisfaction in Australian t	1995
3	Public Adm Rev	Old wine in new bottles tastes better:	1995
4	Public Adm Rev	Municipal commitment to total quality m	1995
5	Forum Appl Res P	Global caretaking through quality.	1994
6	Forum Appl Res P	An industry response to saving environm	1994
7	Forum Appl Res P	Business joins ranks of environmentalis	1994

HINTS: More records . . . type F. View a record . . type record number
Decrease number of records . .type L (to limit) or A (to 'and')
Do a new search type S or SEARCH
ACTIONS: Help Search And Limit Print Email Database Forward BYE
RECORD NUMBER (or Action):

Figure 4: Sample Record from SocAbstracts

List of Records

DATABASE: SocAbstracts LIMITED TO:
SEARCH: su:total quality management FOUND 66 Records

NO.	TITLE	AUTHOR	YEAR
1	Permanent "White Water" Time: Can Children...	Cozens, W. R.	1994
2	Quality of Care Problems among Medicare an...	Nenner, Raphael	1994
3	Human Resources for the Next Decade	Hartman, E. Ala	1994
4	Improving Quality of Geriatric Health Care...	Miller, Douglas	1995
5	Total Quality Management (TQM) in the Non-...	Hodge-Williams,	1995
6	Japanese Techniques in Africa? Human Resou...	Posthuma, Anne	1995
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