

For more detailed specifications see Attachment B
For definitions of terms see Attachment C

TECHNOLOGY PATH--HARDWARE NEEDS

SERVICE OPTIONS

HARDWARE NEEDS

HARDWARE NEEDS

	<u>IN HOUSE USER</u>	<u>REMOTE USER</u>	<u>LIBRARY AS PROVIDER</u>
Dial-up to Internet for basic information need	Minimal Configuration Required Terminal Emulation software (i.e. Procomm Plus, Versa Term)		- NA -
Online Public Access Catalog—available locally through the vendored system	- As Above -		Vendored System Hardware
Local text files on local issues created and made available locally and on the Internet gopher system could be used (see footnote A)	- As Above -		"Server" must be utilized \$5 - 15,000
e-mail available locally for reference service to community Internet access to enhance reference support	- As Above -	- As Above -	Server As Above Centrally managed e-mail accounts (by library or commercial service like America Online)
Above reference service expanded further to allow for access to text files, images, and compound documents via World Wide Web clients such as Mosaic	486 computer with 8 mb of RAM, big color monitor, 120 mg hard drive or MAC or UNIX equivalent	Same As In House	Server \$25,000
Local library materials scanned to create networked files including illustrations, graphics, etc.			Add flatbed scanner plus workstation described for In house use
Full-fledged community information system implemented which allows for sound, full motion video, presentation of images, text manipulation (see footnote B)	- As Above - but Pentium/ Power MacAV preferred multi-media configuration needed)	486 computer with 8 mb of RAM 15" or larger color monitor, 120 mg hard drive or MAC equivalent but Pentium/Power Mac AV preferred	- As Above -

TECHNOLOGY PATH--NETWORK NEEDS

For more detailed specifications see Attachment B
 For definitions of terms see Attachment C

SERVICE OPTIONS

NETWORK NEEDS

NETWORK NEEDS

<u>SERVICE OPTIONS</u>	<u>NETWORK NEEDS</u>	<u>NETWORK NEEDS</u>
Dial-up to Internet for basic information need	56 kbps preferred—modem pool	REMOTE USER Voice line ok 9600 modem preferred—Communications software as under In House
Online Public Access Catalog—available locally through the vendored system	- As Above	- As Above -
Local text files on local issues created and made available locally and on the Internet gopher system could be used (see footnote A)	- As Above - or LAN, ethernet, token ring Integrated services digital network (ISDN) services useful (64-128 kbps) \$25 - \$40/month	- As Above - but 14.4 kbps modem preferred Also TCP/IP access using SLIP/PPP shareware for Internet connections
e-mail available locally for reference service to community Internet access to enhance reference support	- As Above -	-As Above -
Above reference service expanded further to allow for access to text files, images, and compound documents via World Wide Web clients such as Mosaic	More than above- T1 line preferred (1.44 Mbps leased service)	- As Above -
Local library materials scanned to create networked files including illustrations, graphics, etc.		
Full-fledged community information system implemented which allows for sound, full motion video, presentation of images, text manipulation (see footnote B)	T1 Plus (1.44 Mbps leased service) In the future will need to consider more than 1.5m bps including very high speed broadband services and video support like Asynchronous Transfer Mode (ATM)	128 kbps or faster (ISDN or above)

Footnote A Community information services using less advanced information technology could include information about campus or government agencies, council/regents member lists, minutes, agendas, and schedules of forthcoming meetings in text format. They might also be able to provide public policy discussions on community bulletin boards, as well as plain text versions of such excellent community resources as League of Women Voters issue guides.

Footnote B The ultimate service goal in this pathway is an image-rich community information system that could provide logos of agencies, images (photos of local buildings and other images, photographs of key staff, etc.); present directory information about “community” institutions (area school districts, colleges, cooperative extension, etc.); government: municipal county, and special district governments; employment and training agencies, community development, social services agencies.

It could include graphically attractive image rich “brochures” describing services, restaurants, etc. It might also include city or campus maps, a wide range of specialty maps including those which show zoning, construction, bus routes, etc. Multi-media capabilities will mean voice transmission attached to meeting minutes/reports and/or video of community meetings/presentations; also voice and/or video of historical events.

Michigan law (P.A. 335 of 1993) calling for the establishment of a Michigan Information Network (MIN) by June of 1995 provides libraries with the opportunity to define services for that network.

Agencies which may be included in and served by the MIN include state offices in legislative, executive and judicial areas, local and regional school districts, public libraries, county and regional governmental units, higher education, state agency libraries, etc.

Libraries should be an important focal point in the MIN and librarians must endeavor to become involved in defining the MIN and its services.

STATE INFRASTRUCTURE

RECOMMENDATION: That the MLA commit itself to active participation in the work of establishing the MIN and that particular attention be paid to defining what services libraries should receive and provide in that environment

- That the MLA support as part of MIN development that such a network will encourage the participation of AT&T, Ameritech, GTE, Merit and Sprint, MCI and others to develop a working partnership and that current telecommunications funding be reallocated to support (and provide incentives for) this effort.

PUBLIC POLICY ISSUES

Of equal importance in the development of the NII to the physical infrastructure issues raised in the previous section, it will be vital that libraries play an active role in the public policy arena. It is in this arena that the issues of access and cost will be defined and determined. Both at the national and the state level, librarians must be active in defining the issues and promoting the needs of the public, especially those who are not "information rich." The issues of access, privacy, intellectual property will be a part of the public debate that will shape the "Information Highway." We must be active in that debate.

RECOMMENDATION: MLA support the concepts that:

- the NII must be readily available, accessible, and affordable throughout Michigan and the nation for individuals and for libraries
- legislation should alter copyright law to ensure the intellectual property rights of creators but also to safeguard the existing rights of users to inquiry and the search for knowledge
- the right of privacy for the user of electronic resources and services must be maintained and guaranteed in a manner similar to those rights which have been established over time for the users of all library materials
- First Amendment rights of users of the NII must not be abridged
- state and federal incentives for affordable telecommunications rates for the library and education communities will be necessary. MLA will closely monitor state and federal legislation regarding telecommunications rates for all types of libraries. It is critical that library supporters demonstrate the need for effective legislation in this area, i.e., the expected rewrite of the Michigan Telecommunications Act.
- state and federal commitments to equitable access to the NII for all citizens of the United States must be emphasized. MLA will work with national organizations such as the American Library Association, Electronic Frontier Foundation, and the Center for Civic Networking, and also other Michigan statewide library organizations to assure that the need for equitable access is clearly understood by legislative leaders. Library organizations must articulate the clear public interest served by a public with reasonably priced access to these electronic resources.
- local, state, and federal governments must make a commitment to the provision of government information to its citizens via the NII. Never before in our history has a country had such an opportunity to inform its citizenry. MLA will work with state and national organizations to ensure this expanded access to government information is achieved. Building on the experience of depository libraries, libraries can and should continue to assist citizens in identifying and obtaining government information.

- In summary, MLA promotes and supports legislative initiatives at the state and federal levels which support affordable access and telecommunications rates, privacy and intellectual property rights protection, and access to government information.

COOPERATION/COLLABORATION

The framework for collaboration is based on a model of national, state, regional and local partnerships and cooperation among libraries and other agencies. Collaborations are currently what is attracting state and federal funding.

RECOMMENDATION: That MLA provide leadership and support so that every library within the state of Michigan, alone or with other library partners, can become a center of its own community/organization information network. To do this, each library regardless of type will need to:

- develop and facilitate partnerships or alliances appropriate to that community or organization.
- create and then maintain the necessary expertise to support knowledge creation and access within the quickly changing electronic environment.

These new partnerships should be innovative and broad reaching to reflect the goal of providing all citizens and organizations with equitable access to the Internet and its successors.

In addition to the existing collaborative endeavors among libraries and library organizations, new collaborative arrangements should include such partners as:

telecommunication providers
 computer hardware and software vendors
 local businesses
 local government units
 the media
 community organizations
 business organizations
 educational units

Potential partnerships for networking are limited only by the imagination. Every educational, business, cultural, governmental and service agency may play a role in providing the state's citizens with access to the NII.

Libraries are the logical focal points for Internet activity. The information resources, the technological resources, and the personnel to provide guidance in the use of those resources reside in the state's libraries. It will be to the libraries that the citizens look for assistance in becoming information providers as well as information users. The library will serve as both demonstration site and training center.

MODELS OF COLLABORATION

Nation-wide libraries are already participating in or are in the process of creating new alliances with other types of libraries and with non-library agencies such as the programs which are already operational in Alaska and North Carolina. Michigan has also been active in this area

and there are several models in various stages of development to look at for inspiration. In Calhoun county the Great Lakes FreeNet has been developed and has been operational for over a year. The Greater Thumb Telecommunications Consortium is comprised of members of the education community and libraries in the thumb and the Mideast region of Michigan and are currently seeking funding. A similar venture is the greater Flint Educational Telecommunications Consortium which includes the Genesee Intermediate School District, public and private school districts and the four higher education institutions located in Flint, which has developed a public modem pool and mounted a community information server and the development of the Flint Area Libraries Online Network (FALCON). Alpen is another example of successful collaborative effort between the library, area educational institutions and the business community.

For more detailed descriptions of these Models of Collaboration, see Attachment C.

Collaboration will need to occur at the state level in Michigan as well.

RECOMMENDATION: That MLA endorse the establishment of the Michigan Information Network as an open, interoperable, multi-vendor network and further recommends that such a statewide network have the following characteristics. It should:

- provide high speed, direct connections for all libraries in Michigan
- be developed by users and network providers from a broad spectrum of the population.
- establish minimum standards for participation
- provide the leadership in moving the entire state to an interactive multimedia-capable network with equitable access for all citizens and organizations.

Elements of this network already exist within the state but a greater commitment to joint collaborative efforts are necessary now to make Michigan an equal partner with other states. The network must consist of a planning group which can provide the vision; a group to establish realistic minimum standards and define the process for upgrading voice, video, and data networks. Integration, flexibility, and a clear realistic vision are necessary to make this a success.

COMPETENCIES

Librarians have a track-record of developing systems, approaches, and services to identify, organize, and provide access to the world's knowledge and information. Librarians have developed standards and protocols which are universally used to retrieve information in various formats.

As the NII emerges, the library community needs to recognize essential knowledge competencies, skills, and attitudes.

RECOMMENDATION: MLA affirms that librarians and library staff need **Knowledge Competencies** such as the ability to:

- learn how today's Internet and tomorrow's NII differ from traditional print and electronic publishing environments
- learn how to use and exploit current and future tools and develop strategies to stay abreast of change
- develop means of adding value to the knowledge and information in networked formats, develop and add value to digital library resources
- develop an ability to bring together in electronic form unique community information and resources (governmental, historical, economic, and other community centered resources) into digital formats
- gain and maintain knowledge of the evolving information infrastructure

RECOMMENDATION: MLA affirms that librarians and library staff need such **Skills** as the ability to:

- adapt to the distributed information environment (Internet, the present precursor of the Nation Information Infrastructure)
- become competent in retrieving distributed information
- exploit the communication capabilities of the emerging NII
- organize and create access to digital resources on the Internet
- create and publish relevant digital resources through the use of current tools, i.e. Mosaic, a software interface to the World Wide Web
- assist Michigan's citizens, businesses, organizations, non-profits, and governments in the effective utilization of digital resources

RECOMMENDATION: MLA affirms that librarians and library staff need Attitudes which enable them to:

- use new approaches to organize and retrieve information
- become comfortable in this environment of distributed information in order to fulfill their potential as information professionals
- anticipate and embrace technological innovation
- uphold librarianship's long-held professional values which promote intellectual and physical access

A key strategy to accomplish these recommendations will be:

RECOMMENDATION: That providers of professional and continuing education — schools of library and information science, library cooperatives, Michigan Library Consortium, Library of Michigan, Michigan Library Association, etc. — prepare librarians and library staff to acquire the knowledge, skills, and attitudes necessary to make changes in professional practice, using the most effective technologies and approaches. Further, that these and other providers of education, continuing education, and Internet training create an NII Staff Development Council whose aim is to carry out this recommendation

Early emphasis must, necessarily, focus on retraining librarians to adapt existing competencies to a technological environment. How to plan for, purchase, and use technology must also be emphasized if today's library staff are to retool their libraries to effectively use the NII.

Training will need to occur both formally and informally, directly and electronically. Classes, workshops, tutorials, and demonstrations should be supplemented by point of need training, using all types of learning aids available. It is important to build communities of librarians who share knowledge. This can be done by identifying "mentors", gurus, change agents who are willing to experiment, and good trainers. This may be within an institution or done cooperatively across several libraries. Partnerships with others in the community will provide additional sources of knowledge and should be encouraged.

The commitment required by the library profession to adapt to this new technological environment is extensive and ongoing. Success cannot be achieved if libraries and library organizations do not make a serious, long lasting, commitment to adapting existing competencies and developing new skills.

Libraries will need to recognize that some funding for ongoing training needs to be included in library budgets. Time for learning will need to be scheduled for library staff.

Education goals for library school programs should emphasize new competencies related to electronic communications and networking. Continuing education programs will need to remain responsive to the changing nature of electronic communication. Library staff will need frequent retraining to keep up with the rapid pace of advancement in this area.

Traditional library expertise will still be important and many skills librarians now possess will be needed in this new arena. Evaluating information on the Internet, assessing and organizing information resources, and teaching patrons to find information resources to meet their needs are some of the skills that will be valuable and they are not "new" but are newly focused.

FUNDING ISSUES

The issues of funding for the large scale initiatives such as are described in our goal statement are complex and multifaceted. They are also critical to the eventual success of this action plan. Libraries are funded through a variety of methods (and from a variety of sources) depending on their type, location, population served and governance structure. It is outside the scope of this report to make detailed recommendations for both start up and ongoing funds to support access to the NII for all types of libraries. We will, however, attempt to define the challenges libraries face and identify some potential solutions. We also stress that while initial funding may focus on getting connected to the NII, long term goals can only be achieved by funding plans that stress planning, implementation and training as well as physical connectivity.

Active participation in the National Information Infrastructure (as both points of physical access and providers of information) will require substantial new commitments of funds on the local, state and federal levels as well as reallocation of existing resources.

RECOMMENDATION: MLA strongly supports the following funding needs:

- Librarians must be willing to actively seek new funding and re-examine priorities within existing budgets in order to fund participation and leadership in the NII and must learn how to compete for local, state, federal and private dollars effectively. MLA will work to support librarians in this regard through its legislative and continuing education activities.
- Local funding support will be critical for the role of the library as a vital link in community networking. Community networking efforts are separate from providing physical connectivity for libraries and should be supported as such. Expert advice on technical issues will be essential and MLA will work with others to identify such expert help and promote its use at the local level.
- State funding support for connections for all libraries in Michigan to the NII will be essential, and the role of libraries is critical to the development and accessibility of the NII in this state. Equitable access for all libraries must be provided, i.e. rural areas participating in the MIN and NII.
- MLA will support state funding for the development of library related services in the Michigan Information Network.

NOTE: MLA will incorporate the above two goals into its legislative agenda.

- Federal funding support for library-related networking initiatives is likely to come from a multitude of sources including the Commerce Department, National Science Foundation, national libraries (NLM) and through a revised and reauthorized Library Services and Construction Act.

- Michigan's librarians must also call for funding adequate to insure that Michigan's depository libraries will have electronic access to all federal, state, and local documents.
- Libraries and other nonprofit/educational institutions should join together to insure all benefit from the most advantageous hardware/software discounts available. MLA, in conjunction with the Michigan Library Consortium, the Library of Michigan, REMCS and library cooperatives should work to identify and negotiate discount opportunities for libraries.
- MLA will call for a clearinghouse, to be maintained by the Library of Michigan, to provide Michigan's librarians with access to the latest possible information on funding opportunities from federal and state sources as well as private sources.

This clearinghouse will be provided as an online resource accessible to all Michigan librarians and will include information about (but not limited to) the following initiatives:

Ameritech, Michigan Information Network, Michigan Industrial Extension Partnership (MIEP), National Telecommunications Information Administration, Rural Datafication Program, Rural Electrification Administration, National Science Foundation, National Library of Medicine, National Institutes of Health, Higher Education Act, Library Services and Construction Act, Elementary and Secondary Education Act (ESEA), private foundation grants, and corporate giving programs.

Status of Connectivity as it Relates to Funding

Many academic libraries throughout the state are already connected to MichNet and more are joining every day. The National Science Foundation has been a strong source of funding for many academic institutions. In most cases, once the connection has been brought to the institution extending that connection to the library occurs quickly. Additionally, state funded initiatives are underway to connect community colleges across the state. Currently 63 colleges and universities are connected to MichNet, including 18 community colleges. While the status of physical connectivity among higher education institutions is encouraging, there is still much work to be completed in this area. At least 32 Michigan colleges and universities still need connections.

A major statewide initiative is also underway to connect Michigan's K-12 schools to MichNet. Funded with Ameritech rebate monies, this project should begin in late 1994. Although there is little physical connectivity for schools at this point, it is anticipated that connectivity will occur quickly once the state and Ameritech award their combined \$22 million earmarked for this initiative. Many public and special libraries are likely to benefit from this through the local and regional consortia developed to respond to the project's request for proposals. There is little doubt, however, that the major beneficiary in the project will be the K-12 community and, hopefully its libraries. Even this commitment of funds will not provide all classrooms with access to MichNet.

Through both local and state initiatives some 125 of the state's 379 public libraries (not including branches) are currently accessing MichNet through either a direct physical connection or dial in access. It is estimated that providing the training and physical connections for public libraries in Michigan to MichNet will cost approximately \$4.5 million. Some of those start up funds will undoubtedly come from federal programs such as the Library Services and Construction Act and the National Telecommunication Information Administration. Ongoing costs for public libraries are expected to exceed \$2.5 million (at current rates) annually. There are no state dollars earmarked specifically for library connectivity and/or training at this time.

Many libraries throughout the state are unaffiliated with local governments or educational institutions. Libraries serving state government and the state's businesses, law firms, institutions, hospitals, museums, historical societies all have significant contributions to make to the NII and the Michigan Information Network. Most of these libraries are not yet connected to MichNet and the status of their current plans to do so are uncertain and vary depending on the parent institutions.

Hospital libraries may be able to take advantage of funding from the National Library of Medicine and or the National Institutes of Health, foundations will undoubtedly play a part in funding for other nonprofit libraries. The state has also announced plans to provide connectivity to state government, although not specifically state government libraries. The Library of Michigan established its MichNet connection by reallocating existing resources.

Funding Priorities

It is critical that Michigan's libraries speak with one voice concerning funding priorities and that all efforts to redefine funding structures be prioritized. MLA will work with other library leaders and organizations throughout the state to coordinate an efficient funding campaign for libraries of all types.

CONCLUSION

Although much of this action plan focuses on specific recommendations relating to libraries, it is vital to recognize the importance of the recommendations for the general population in the State of Michigan. As the country engages in discussion of how to develop a national information infrastructure and a "national information superhighway," it is hard to imagine a more accessible and available "on-ramp" to that highway than the local library. Libraries exist in communities, in schools, on college campuses and in businesses large and small. The library's tradition of promoting access to information resources and assisting citizens in navigating through the complexities of information presentation is long-standing and adapts well to the new environment. As the State of Michigan wrestles with the issues of exactly what the Michigan Information Network (MIN) should be, libraries stand as an important access point for Michigan's citizens. This action plan for Michigan libraries is also an action plan for Michigan's citizens, and the library community will look for collaborative ways to pursue these action steps in ways that will benefit all ages and those from all walks of life across the state.

**MICHIGAN LIBRARY ASSOCIATION
NATIONAL INFORMATION INFRASTRUCTURE TASK FORCE**

CHARGE

The MLA NII Task Force will:

- Assist MLA in developing and articulating the vision and values of the library community in Michigan that are underpinnings for the emerging National Information Infrastructure.
- Capture the thinking of the library community in shaping this values statement through such efforts as the "Agenda for the 21st Century" teleconference. (See Next Page)
- Define an action agenda and specific plans which will define Michigan's role and begin to position the state for the emerging NII.
- Provide an initial report at the 1994 MLA Annual Conference.

THEMES FROM THE TELECONFERENCE

- Pilot Projects needed throughout Michigan
- Define issues in terms of services, not technology
- Partnerships/teamwork among librarians, “have” and “have nots”
- Infrastructure Issues -- access.
- Libraries and Librarians as hubs/centers in communities for information services.
- Community/collaborations agreement that cooperation will be necessary to support these efforts? How “broad” is the concept of community?
- State spending lots of money on telecommunications. Get it redirected to support the “universal access”? Kinworthy/NTIA
- Create server on funding opportunities/clearinghouse function
- What will it take for libraries/librarians to be community hub? How to develop this leadership?
- How to avoid turf issues?
- Include concrete examples of community/collaboration.
- Libraries continue “as a place.”
- Libraries as demonstration sites for technology use.
- Training issues - BIG
 - for staff
 - for users
- Leadership at state level - where will it come from?
- Paradigm shift in Library Education
- Define base/roles that will be fundamental for libraries of future.
- Define technical environment, i.e. direct connections to libraries, “Mosaic capable” equipment and connectivity. Define “the floor” - try to ensure not a ceiling.
- Federated Action as key to successful statewide effort.
- Justify role in Plan and who can play them, i.e. training.

NOVEMBER, 1994

Hardware/Software Considerations

Libraries will access the Internet, and other electronic resources, through a variety of connection types over the next few years. Many will first use dial access connections relying on basic telecommunications software using a VT100/220 terminal interface (VT100 and VT220 are the model names of old terminals made by Digital Equipment Corporation and which are widely as a standard terminal emulation software running on personal computers and workstations).

Users may then migrate to faster speed dial access connections relying on SLIP (serial line Internet protocol) or PPP (point to point protocol) to emulate dedicated network connections. However, some online applications do not work well or do not work at all at the relatively low speeds that are available using modems and voice phone lines. In order to provide better access to staff and patrons as well as to allow the library to become a provider of its own unique information resources, libraries will ultimately require local area networks (LANs) and high speed dedicated network connections.

The following hardware and software recommendations are intended to:

assist library staff in selecting and purchasing the tools needed for all methods of access. In many cases libraries will be able to make use of existing equipment, at least in their initial use of the Internet. When purchasing new equipment library staff are encouraged to consider both existing and potential applications. As a general rule equipment selections should be based on purchasing as much computing power as possible. In most cases, investment should be made in new microcomputers instead of upgrading existing machines. The microcomputer marketplace is constantly changing and library staff are advised to consult the most recent product reviews when considering new purchases.

Microcomputers as Individual Workstations (stand-alone and networked)

Many different configurations of microcomputers may be used on the Internet, via either a dial access or direct connection. In general, workstations with dial access connections using SLIP or PPP and dedicated connections will require more processing power, hard disk storage and random access memory (RAM) than those relying on VT100/220 terminal emulation over dial access connections. When purchasing a new microcomputer consider planning for higher end applications even if you are currently using a dial access connection.

At this date, recommended as entry level workstations are the following:

DOS/Windows

50 MHz, Pentium processor; 8MB RAM (expandable to 128MB); 3.5" 1.44MB floppy drive; 250MB internal hard disk; 1MB video RAM (expandable to 2MB); DOS; Windows. High resolution 15 inch color monitor. Keyboard. Mouse. Ethernet card (for connection to a local area network). Multimedia devices (i.e. sound board) optional. More RAM or more hard disk space are a good investment.

Macintosh

Power Macintosh 7100, 66 MHz PowerPC601 processor; 12MB RAM (expandable to 136MB); 1.4MB Apple SuperDrive; 250MB internal hard disk; 1MB video RAM (expandable to 2MB); built in LocalTalk/Ethernet connections; stereo sound ports; SoftWindows available (for running DOS applications). High resolution 14 inch color monitor or larger. Keyboard. Mouse. MacOS System 7.

Modems

While standard dial access connections to the Internet can be achieved at speeds as low as 2400 baud, faster speed modems are recommended for both standard and SLIP/PPP access. Modems with speeds of 14,400 bps (v.32bis) are affordable in today's market and are recommended. Where possible, purchase modems operating at 28,800 bps (v.34).

File Servers

Microcomputers intended to function as network file servers should be selected for speed, processing power and storage capacity. We recommend at least the following:

DOS/Windows

66 MHz, Pentium processor; 32MB RAM (expandable to 128MB); 3.5" 1.44MB floppy drive; 1 gigabyte hard disk; 1MB video RAM (expandable to 2MB); DOS; Windows. High resolution 15 inch color monitor. Keyboard. Mouse. 8 mm cartridge SCSI tape drive for disk backup.

Macintosh

PowerMacintosh 7100, 66 MHz PowerPC601 processor; 32MB RAM (expandable to 136MB); 1.4MB Apple SuperDrive; 1 gigabyte hard disk; 1MB video RAM (expandable to 2MB); built in LocalTalk/Ethernet connections; stereo sound ports; SoftWindows available (for running DOS applications). High resolution 14 inch color monitor. Keyboard. Mouse. MacOS System 7.

8 mm SCSI cartridge tape drive for disk backup.

Local Area Networks

Many libraries already have some type of local area network, either used for CD-ROM databases or to support library automation systems.

Libraries wanting to establish a direct connection to the Internet will require a local area network capable of running the Internet protocol suite: transmission control protocol/Internet protocols (TCP/IP). Existing networks may be upgradable to TCP/IP networks. Generally networks operating under both token ring and ethernet are able to connect to the Internet. Ethernet, however, is the network standard on the Internet and libraries are strongly encouraged to choose it when installing new networks.

Libraries that do not have an existing LAN should install Twisted Pair Ethernet (TPE) which is sometimes called 10BaseT ethernet using level 4 or level 5 unshielded twisted pair wiring (not unlike the wiring used for modular telephone connections, but the quality of the wire is a bit better).

Software

The software used for Internet will depend on the type of access. Standard dial access users will require an Internet provider to access services such as electronic mail and Usenet news. SLIP/PPP users will also require a provider of these services, but may also use client software to provide more efficient handling of email. Networks directly connected to the Internet may act as their own Internet 'host' and provide email and other services to their users if they wish.

Standard Dial Access Connections

Most telecommunications software currently on the market will meet the needs of those using a standard dial access connection. When selecting a telecommunications software package make sure that it can support your modem speed, provide true VT100 or VT220 terminal emulation, permit transfer of text files, provides printing functions, and offers one or more file transfer protocols that are supported on the host systems you access (preferably Kermit, Xmodem).

SLIP/PPP

When emulating a direct connection using either SLIP or PPP both telecommunications software and TCP/IP client software are required. Merit makes available MacPPP (for Macintosh computers) and EtherPPP (for DOS/Windows computers). Many shareware TCP/IP clients are also available at little or no cost. There are, however, increasing numbers of commercially produced products on the market providing both the telecommunications and TCP/IP clients. Selection of this type of software should be made in consultation with the Internet access provider. The most current review of these new commercially available software packages can be found in "Make the Internet Connection," PC Magazine, October 11, 1994, Vol. 13 No.17, 118+ Direct Connections.

When connecting a local area network to the Internet software must be selected for both the network and the individual workstations requiring Internet access. Network operating software, such as Novell, provide TCP/IP software components and can provide gateways to connect the network's email system to the Internet. Users on the local network may also wish to run TCP/IP software on their workstations to provide maximum use of Internet's capabilities. There are an increasing number of commercial software packages available to serve both the network and its users. Please refer to the PC Magazine article noted above for a recent review of such software.

GLOSSARY OF TERMS

56K lines --- 56 thousands of bits per second. These use ordinary voice telephone channels.

Ameritech rebate funds --- The grant funding is the result of the settlement agreement reached in Michigan Bell's shareable excess earnings case, U-8987. This settlement agreement made approximately \$10.5 million of shareable earnings available for distance learning projects in Michigan.

ARPAnet --- (Advanced Research Projects Agency Network) A federally operated computer packet switching network which was originally developed by the Defense Advanced Research Projects Agency (DARPA) in 1968. In 1975 the operating responsibility was given to the Defense Communications Agency. The network primarily serves the federal government and its contractors. TCP/IP was originally developed as a part of the ARPANET project.

Asynchronous Transfer Mode --- Used when bytes or characters of information are sent with unequal time intervals between them and with special start and stop bits that are identifiable by the sending and receiving devices. Since the characters can be sent one at a time, the transmission requires less sophisticated interfaces than a synchronous one.

ATM --- see Asynchronous Transfer Mode

Bandwidth --- The range of frequencies that can be transmitted in a communications medium (cable, fiber, radio, etc.). The difference between the highest and lowest frequencies that can be transmitted is the bandwidth. The higher the bandwidth, the more data that can be transmitted.

CCN --- see Center for Civic Networking

Center for Civic Networking --- The first organization to bring citizens and the public interest community together with the Clinton Administration to discuss communication policy issues. Created initially as an invitational workshop for 80 people in April 1993 now a formal organization based in Washington and Boston.

Client-Server Interface --- a program operating on a microcomputer, workstations, or mainframe computer system that is accessed from an individual workstation and which provides an interface to remote information systems (e.g. databases). The end user is insulated from the remote system database access protocols because a common user interface is supplied. (See also Distributed computing environment)

Dial-Up Connections --- There are essentially two broad types of connections: "dial-up", which uses modems and voice telephone lines (up to 14.4 kbps), and "dedicated", which are continuously open, dedicated data circuits (56 kbps and up) which require various telecommunications devices such as routers instead.

Distributed computing environment --- with the extensive use of high-speed networking, it is no longer necessary to have the data processing and data storage units physically located at the same point. An outgrowth of this physical distribution has been development of the software which provides access to the data. "Client-server" computing distributes the load between a local "client" computer, through which the user requests information, and a "server" or host computer which receives the client's request and then sends back just what has been requested, instead of using the older, less efficient model of having all the work done by and from a central computer connected to "dumb" terminals.

Electronic Frontier Foundation --- The Electronic Frontier Foundation was started in 1990 by Mitch Kapor and John Perry Barlow as a public interest group devoted to defending the civil liberties of computer hackers. More recently, the EFF has involved itself in the promotion of the information infrastructure, working closely with the United States federal government.

ESEA --- Elementary and Secondary Education Act - funding for education including school libraries.

Ethernet --- A 10-million bit per second networking scheme originally developed by Xerox Corporation. Ethernet is widely used for LANs because it can network a wide variety of computers, it is not proprietary, and components are widely available from many commercial sources.

Flatbed Scanner --- Used for scanning text or pictures into a digital format, so the data can be manipulated with text or image editing software. The scanner operates much like a photocopier: the material to be scanned is placed on a glass plate; instead of fusing carbon particles onto a piece of paper, the information is converted into digital format, which can be stored on a hard drive, and then edited or altered by the user. "Flatbed" is used to distinguish these machines from their less powerful cousins, hand-held scanners. Scanners generally require two types of software support: Optical Character Recognition (OCR) software for text and image processing software (photo or "paint" type) for pictures and drawings.

Integrated Services Digital Network --- A nationwide concept with the goal of providing end-to-end digital connectivity; that is, transporting digital signals from one customer to another, or to remote data bases, without converting the signals into analog format.

ISDN --- see Integrated Services Digital Network

Internet --- A concatenation (connected series) of many individual TCP/IP campus, state, regional, and national networks (such as NSFnet and ARPAnet) into one single logical network all sharing a common addressing scheme.

Interoperable Communication Network --- The ability of multi-vendor computers to work together using a common set of protocols. With interoperability, PCs, Macs, Suns, Dec VAXen, CDC Cybers, etc., all work together allowing one host computer to communicate with and take advantage of the resources of another.

Kbps --- kilobits or thousands of bits per second.

LAN (Local Area Network) --- Any physical network technology that operates at high speed over short distances (up to a few thousand meters).

Mbps --- megabits or millions of bits per second.

Merit --- (Merit Network, Inc) is a private non-profit corporation governed by eleven of Michigan's four-year publicly supported universities. Merit operates MichNet in the state of Michigan and NSFNET on behalf of the National Science Foundation nationally.

Michigan Information Network --- Michigan law (P.A. 335 of 1993) called for the establishment of a Michigan Information Network (MIN) by June of 1995.

Michigan Telecommunications Act --- (P.A. 1991, No. 179) An act to regulate and insure the availability of certain telecommunications services; to prescribe the powers and duties of certain state agencies and officials; to prescribe penalties; to repeal certain acts and parts of acts.

It is under this law that the Michigan Information Network and other telecommunication initiatives can be implemented

MichNet --- Is a part of the world-wide network of networks that make up the Internet. It is operated by the Merit Network, Inc. and serves the Merit member universities and over 100 other affiliated organizations of all kinds (non-profit, for profit, schools, libraries, hospitals, businesses, ...). MichNet services include direct network attachments, dial-in attachments and consulting and support services.

MIN --- see Michigan Information Network

MLA - Michigan Library Association

Mosaic --- a versatile, multi-platform interface to the World-Wide Web created by the National Center for Supercomputing Applications (NCSA). Because of the number of traditional services it can handle (such as gopher, FTP, telnet, etc.), and its easy, point-and-click hypermedia interface, Mosaic is currently one of the most popular interfaces to the Web. Mosaic allows documents with text, images, video, and sound to be viewed and transferred over the Internet. By being available for Mac, MS-Windows, and X-Windows, Mosaic has popularized the Web.

National Information Infrastructure --- The Clinton administration has coined this term for the emerging national digital information environment and the need to structure it. The term NII is used both to refer to the interconnection of networks across the country and also the information resources that are made available on it. See page 4 of this Report to review a fuller explanation of the expected impacts and benefits of the NII.

National Telecommunications and Information Administration (NTIA) --- This administration was established in 1978 and has as its principal responsibility and functions:

1. - serving as the principal executive branch adviser to the President on telecommunications and information
2. - developing and presenting U.S. plans and policies at international communications conferences and related meetings
3. - prescribing policies for and managing Federal use of the radio frequency spectrum
4. - serves as the principal federal telecommunications research and engineering laboratory
5. - provides grants through PTFP to extend delivery of public telecommunication services to citizens

NII --- see National Information Infrastructure

NSFnet --- The national backbone network, funded by the National Science Foundation and operated by the Merit Corporation, used to interconnect regional (mid-level) networks such as WestNet to one another.

Pentium --- the trade name give by Intel to its proprietary 80586 processor. Pentium processors ("chips") are available at speeds from 69 MHz to about 100 MHz at present. The chip's data architecture and raw power make it a leading contender in the race to provide high-intensity processing and throughput for heavy-duty applications such as image processing, large database applications, etc. Pentium-powered machines provide a reasonable "floor" for running Mosaic client software, as an example.

PPP --- "Point-to-Point" protocol allows dial-up phone users to connect with the Internet using TCP/IP Internet Client Software such as Gopher in a direct dial-up session. Without PPP, a user would have to utilize a host/public client service.

REMCS --- Regional Educational Media Centers - REMCS provide services to local school districts. Service include audiovisual, group purchasing, library and other related items.

Rural Datafication Program --- Achieving the Goal of Ubiquitous Access to the Internet Conference was held at the McCormick Place Hotel in Chicago on May 13-14, 1993. The meeting was co-sponsored by CICNet, NetIllinois, INDNet, IREN, MichNet, MRNet, NYSERNet, PREPNET, WiscNet, and WVNET. The Program has been funded with a 2 year grant by the National Science Foundation.