# An Incomplete Guide to the Internet

**and Other Telecommunications Opportunities**

**Especially for Teachers and Students K-12**

Compiled by the NCSA Education Group
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# Why Incomplete?

In these days of high-powered computing the human element is often neglected. Acronyms and abbreviations abound and can confuse even the most educated computer consumer. What's more, those who <u>do</u> understand the concepts and jargon are often unwilling or unable to relay them to the novice computer user. This guide is meant to provide a helping hand in understand the Internet entity. It is by no means a complete guide; rather it is a general overview of what the Internet is and some of the resources available. In areas where the information presented is very general, alternate, more in-depth sources are cited, most of them available right from your computer. This guide will also provide you with ideas for using the Internet in a classroom as well as a personal environment.

This guide was a group effort of the NCSA Education Program Students and was compiled by Brian Golden and Charles Farmer, two of the NCSA Education Program Student Consultants. If you have any questions about this manual, Internet, telecommunications, or the NCSA Education Program, please call Brian at 244-5677, Chuck at 244-6122 or Lisa Bievenue at 244-1993

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# Part I

# Introduction to Internet

# Chapter 1:
# What is the Internet?

The Internet is a worldwide collection of thousands of computer networks that can intercommunicate. All of them speak the same "language," namely the TCP/IP (Transmission Control Protocol/ Internet Protocol) protocol suite. Users of any of the Internet networks can reach users on any of the other networks. The Internet started with the ARPANET, but now includes such networks as NSFNET, NEARNet, and others. Many other networks, such as BITNET, are tied to the Internet but are not an integral part of it. Approximately one million people use the Internet daily.

The ancestry of the Internet is rooted in the ARPANET, a network developed by the Advanced Research Projects Agency (ARPA) to aid in the sharing of information and resources among researchers. The ARPANET, which was made operational in 1969, became an essential tool for remote login, file transfer, electronic mail and the sharing of information by interest groups.

The ARPANET was growing in size while other networks were being developed. Soon the architects of the ARPANET recognized the need to communicate with other networks. They also realized that they needed new protocols (the NCP protocol suite that they had developed wasn't able to cope with the diverse characteristics of other networks). Therefore they designed a new architecture and protocol suite called the ARPA Internet; the protocol suite was called TCP/IP.

Since its creation in 1983, the Internet has grown exponentially in terms of numbers of networks connected to it. By 1985, the number was approximately one hundred. By 1987, the number had grown to two hundred; in 1989, it exceeded five hundred. According to tables kept at the DDN (Defense Data Net) Network Information Center (DDN NIC), there were 2,218 networks connected to the Internet as of January 1990.

NSFNET began providing backbone Internet service in July 1986 to permit supercomputer centers to communicate. NSFNET's scope has since expanded, and today it is the U.S. national research network. It has extended to the academic and commercial communities the TCP/IP services that were previously available to government researchers. NSFNET links mid level networks, which in turn connect networks at universities and commercial enterprises. Therefore, NSFNET, like the Internet of which it forms a large part, is itself a network of networks.

The Internet communicates via gateways with other networks such as CompuServe, MCI Mail, BITNET, FIDONet, UUNET, and USENET. The Internet has several component networks (which themselves include other networks):

- CREN/CSNET
- DDN (Defense Data Net )
- ESNET (Energy Sciences Network)
- NASA Science Internet
- NSFNET (National Science Foundation Network)
- Terrestrial Wideband Network

# Chapter 2:
# Internet Etiquette

"Etiquette" means "ticket" in French. On the Internet, "netiquette" is your ticket to "traveling" (by FTP, TELNET, and electronic mail) without annoying others. Here's a few tips to keep you in good standing with other users.

•Never Forget that the Person on the Other Side is Human

Because your interaction with the network is through a computer, it is easy to forget that there are people "out there." Situations arise where emotions erupt into a verbal free-for-all that can lead to hurt feelings. Strongly critical messages on the network are called "flames." The following will help you to avoid sending or provoking flames.

Try not to say anything to others that you would not say to them in person in a room full of people. Please remember that when you send a message to a bulletin board or mailing list, people all over the world are reading your words.

Don't attack people—try to persuade them by presenting facts. Cursing and abuse only make people less willing to help when you need it.

If you are upset at something or someone, wait until you have had a chance to calm down and think about it. A cup of coffee or a good night's sleep works wonders on your perspective. Hasty words create more problems than they solve.

•Be Careful What You Say About Others

Please remember—thousands of people may read your message. They quite possibly include your boss, your friend's boss, your girlfriend's brother's best friend, and one of your father's beer buddies. Information posted on the net can come back to haunt you or the person you are talking about.

Think twice before you post personal information about yourself or others.

•Be Brief

Say what you have to say succinctly and it will have a greater impact. Remember that the longer you make your article, the fewer people will bother to read it.

•Your Postings Reflect Upon You—Be Proud of Them

Most people will know you only by what you say and how well you say it. Take some time to make sure each posting won't embarrass you later. Minimize your spelling errors and make sure that the article is easy to read and to understand.

•Use Descriptive Titles

The subject line of an article enables people to decide whether or not to read your article. Tell people what the article is about before they read it.  A title like "Car for Sale" does not help as much as "66 MG Midget for sale: Beaverton OR."  Don't expect people to read your article to find out what it's about — many won't bother.  Some sites truncate the length of the subject line to forty characters, so keep your subjects short and to the point.

•Think About Your Audience

When you post an article, think about the people you are trying to reach.  Try to get the most appropriate audience for your message, not the widest.  Avoid abbreviations and acronyms, if possible, and define the ones you use.

If your message is of interest to a limited geographic area (apartments, car sales, meetings, concerts, etc...), restrict the distribution of the message to your local area.  Some areas have special newsgroups with geographical limitations—check with your system administrator.

If you want to try a test of something, don't use a world-wide newsgroup!  There are newsgroups that are local to your computer or area, which should be used for this.  Your system administrator can tell you what they are.

•Be familiar with the group you are posting to before you post.

You shouldn't post to groups you don't read, or to groups you've only read a few articles from—you may not be familiar with the conventions and themes of the group.  One normally does not join a conversation by just walking up and talking.  Instead, you listen first and then join in if you have something pertinent to contribute.

•Be Careful with Humor and Sarcasm

Without the voice inflections and body language of personal communications, it's easy for remarks meant to be funny to be
misinterpreted.  Subtle humor tends to get lost.  Take steps to make sure that people realize you are trying to be funny.  The net has developed a symbol called the smiley face, which looks like this: :-) It points out sections of articles with humorous intent.  No matter how broad the humor or satire, it is safer to remind people that you are being funny.

But also be aware that frequently satire is posted without explicit indications.  If an article outrages you strongly, ask yourself if it may have been unmarked satire.  Several self-proclaimed connoisseurs refuse to use smiley faces, so take heed or you may make a temporary fool of yourself.

•Only Post a Message Once

Avoid posting messages to more than one group unless you are sure  it is appropriate.  If you do post to multiple groups, don't post to each group separately.  Instead, specify all the groups on a single message.  This reduces network overhead and lets people who subscribe to more than one of those groups see the message once instead of having to wade through each copy.

•Please "Rotate" Messages With Questionable Content

Certain messages may be offensive to some people. To make sure that these messages are not read unless they are explicitly requested, they should be encrypted. The standard encryption method is to rotate each letter by thirteen characters so that an "a" becomes an "n." This is known on the network as "rot13"; when you rotate a message the word "rot13" should be in the "Subject:" line.

Most of the software used to read network articles has some way of encrypting and decrypting messages. Your system administrator can tell you how the software on your system works.

•Summarize What You are Following Up

When you are following up someone's article, please summarize the parts of the article to which you are responding. This allows readers to appreciate your comments rather than trying to remember what the original article said. It is also possible for your response to reach some sites before the original article does!

Summarization is best done by including appropriate quotes from the original article. Don't include the entire article, since it will irritate the people who have already seen it. Even if you are responding to the entire article, summarize only the major points you are discussing.

•When Summarizing, Summarize!

When you request information from the network, it is common courtesy to report your findings so that others can benefit as well. The best way of doing this is to take all the responses that you received and edit them into a single article that is posted to the places where you originally posted your question. Take the time to strip headers, combine duplicate information, and write a short summary. Try to credit the information to the people that sent it to you, where possible.

•Use Mail, Don't Post a Follow-up

One of the biggest problems we have on the network is that when someone asks a question, many people send out identical answers. When this happens, dozens of identical answers pour through the net. Mail your answer to the person and suggest that they summarize to the network. This way the net will only see a single copy of the answers, no matter how many people answer the question.

If you post a question, please remind people to send you the answers by mail and at least offer to summarize them to the network.

•Read All Follow-ups and Don't Repeat What's Been Said

Before you submit a follow-up to a message, read the rest of the messages in the newsgroup to see whether someone has already said what you want to say. If someone has, don't repeat it.

•Check the Headers When Following Up

Some software has provisions to specify that follow-ups to an article should go to a specific set of newsgroups—possibly different from the newsgroups to which the original article was posted. Sometimes the groups chosen for follow-ups are inappropriate, especially as a thread of discussion changes with repeated postings. You should carefully check the groups and distributions given in the header and edit them as appropriate. If you change the groups named in the header, or if you direct follow-ups to a particular group, say so in the body of the message—not everyone reads the headers of postings.

•Be Careful About Copyrights and Licenses

Once something is posted onto the network, it is *probably* in the public domain unless you own the appropriate rights (for example, if you wrote it yourself) and you post it with a valid copyright notice; a court would have to decide the specifics and there are arguments for both sides of the issue.

Now that the US has ratified the Berne convention, the issue is even murkier. For all practical purposes, though, assume that you effectively give up the copyright if you don't put in a notice. Of course, the *information* becomes public, so you mustn't post trade secrets that way.

Keep in mind that material that is UNIX-related may be restricted by the license you or your company signed with AT&T, so be careful not to violate it. You should also be aware that posting movie reviews, song lyrics, or anything else published under a copyright could cause you, your company, or members of the net community to be held liable for damages, so we highly recommend caution in using this material.

•Cite Appropriate References

If you are using facts to support a cause, state where they came from. Don't take someone else's ideas and use them as your own. You don't want someone pretending that your ideas are theirs; show them the same respect.

•Mark or Rotate Answers and Spoilers

When you post something (like a movie review that discusses a detail of the plot) that might spoil a surprise for other people, please mark your message with a warning so that they can skip the message. Another alternative would be to use the "rot13" protocol to encrypt the message so it cannot be read accidentally. When you post a message with a spoiler in it make sure the word "spoiler" is part of the "Subject:" line.

•Spelling Flames Considered Harmful

Every few months a plague descends on the network called the spelling flame. It starts out when someone posts an article correcting the spelling or grammar in some article. The immediate result seems to be for everyone on the net to turn into a sixth grade English teacher and pick apart each other's posting. This is not productive and tends to cause people to get angry with each other.

It is important to remember that we all make mistakes, and that there are many users on the net who use English as a second language. There are also a number of people who suffer from dyslexia and who have difficulty noticing their spelling mistakes. If you feel that you must make a comment on the quality of a posting, please do so by mail, not on the network.

•Don't Overdo Signatures

Many people can have a signature added to their postings automatically by placing it in a file called "$HOME/.signature". Don't overdo it. Signatures can tell the world something about you, but keep them short. A signature that is longer than the message itself is considered to be in bad taste. The main purpose of a signature is to help people locate you, not to tell your life story. Every signature should include at least your return address relative to a major, known site on the network and a proper domain-format address. Your system administrator can give this to you. Some news posters attempt to enforce a four-line limit on signature files—an amount that should be more than sufficient to provide a return address and attribution.

•Limit Line Length and Avoid Control Characters

Try to keep your text in a generic format. Many (if not most) of the people reading Usenet do so from eighty-column terminals or from workstations with eighty-column terminal windows. Try to keep your lines of text to less than eighty-characters for optimal readability. Also realize that there are many, many different forms of terminals in use.

If you enter special control characters in your message, it may result in your message being unreadable on some terminal types; a character sequence that causes reverse video on your screen may result in a keyboard lock and graphics mode on someone else's terminal. You should try to avoid the use of tabs, too, since they may also be interpreted differently on terminals other than your own.

•Summary of Things to Remember

**- Never forget that the person on the other side is human**

**- Be careful what you say about others**

**- Be brief**

**- Your postings reflect upon you; be proud of them**

**- Use descriptive titles**

**- Think about your audience**

- Be careful with humor and sarcasm

- Only post a message once

- Please rotate material with questionable content

- Summarize what you are following up

- Use e-mail, don’t post a follow-up

- Read all follow-ups and don’t repeat what has already been said

- Double-check follow-up newsgroups and distributions.

- Be careful about copyrights and licenses

- Cite appropriate references

- When summarizing, summarize

- Mark or rotate answers or spoilers

- Spelling flames are considered harmful

- Don’t overdo signatures

- Limit line length and avoid control characters

# Part II

# Tools for Using the Internet

# Chapter 3:
# Connecting to NCSA by Modem

Connections to the Internet vary according to your point of contact, hardware, and software. For specific dialing via modem procedures, please refer to the manual of your software. For specific logging in procedures, please refer to the organization that provides you with access to the Internet. This chapter explains how to connect to NCSA using a Macintosh with Macintosh software. You may connect to the Internet via other systems and networks, but this chapter will discuss specific numbers for NCSA. You may also connect to NCSA using any type of computer as long as you have telecommunications software for your computer. Simply dial the NCSA number (244-0662) following the instructions for your software. In this chapter we will also use, as an example, a telecommunications program called “Z-Term”, but the procedure is basically the same for most telecommunications software. Individual differences are expected, please refer to your owners manual for any problems. You should copy Z-Term onto your hard drive if you have one. You may also use any other communications software you are familiar with, e.g. Red Ryder, White Knight, or the Communications portion of Microsoft Works. Just make sure you enter the NCSA number to dial (244-0662).

To start, double-click the Z-term icon

Z-term

Once the program has begun, go to the "Dial" menu and choose NCSA if it is part of the menu.

If you do not see “NCSA” on the Dial menu, choose “Directory” and set up an entry for NCSA.

To set up an entry for NCSA, click on New and enter the appropriate information:

Now return to the Dial menu and select NCSA.

The program will automatically dial the number to NCSA for you, and in a moment you will see

In a few moments the connection will have been made. The “CONNECT 2400 NCSA” means that you have just connected to an NCSA machine at 2400 BAUD, which is defined by the speed of the modem. 2400 BAUD means 2400 bits (of data) can be sent and received every second. If your modem is a different speed the screen will show what speed you are connected.

The terminal server will let you access any of NCSA’s computers, simply by typing in the name of the computer. You should use the one called "mars".

In order to limit access to a computer, computer operators will often use a scheme of "passwords" and "logins". A login is the person’s computer name, with each user having a different one. The password is decided upon by the user. The computer will allow access only to those whose password matches their login. You cannot, for example, use your login and a friend’s password. Your password is unique to your login. At this time, you should type your login, press return, and then enter your password (for security reasons, your password will not echo to the screen, so you will not see it). After a successful login, your screen will look something like this:

You are now connected to NCSA.

# Chapter 4:
# Unix Commands

When you log on to NCSA machines, you'll notice that the screen is different in appearance from the Macintosh. That is because it uses a different operating system than the Mac. An operating system is the way that you communicate with the computer. The operating system that NCSA machines use is called UNIX. UNIX is a command line interface operating system, which means that you type commands on the keyboard, as opposed to moving and clicking a mouse, for example.

Here are several commands in UNIX that you may find useful. Following each is a short description of what they do and options involved with each. **This is not a complete list!** If you want to know more about a command type "man <command>", where <command> is the command you want to know more about.

**`alias`** Allows you to rename a certain command. For example, if you typed "alias dir ls", every time you typed "dir" the computer would return the same thing if you had typed "ls".

**`cal <year>`** Prints a calendar for the year <year>

**`cat <file>`** Displays <file> all at once

**`cd <directory>`** "Change Directory" -- changes directory to <directory>. Equivalent to opening a folder in the Macintosh operating system

**`chmod xxx <file>`** Changes the permission modes on <file> to xxx (type "man chmod" at the UNIX prompt for more information)

**`clear`** Clears the screen

**cp <file1> <file2>** Copies the file <file1> and calls it <file2>

**date** Reports the current time and date

**diff <file1> <file2>** Compares <file1> and <file2> and reports the differences

**emacs <file>** Uses the text editor *Emacs* to edit the file <file>

**finger <user>** Displays information about a user

**ftp <site>** Connects you to a remote site for file transfer

**grep** Search files for a pattern

**head <file>** Displays the first few lines of <file>

**help <topic>** Displays on-line help about <topic>

**logout** Terminates your session

**ls** Lists the contents of a directory

**mail <user>** Send electronic mail to a user <user>

**man <topic>** Displays on-line information about <topic>

**`mkdir <directory>`** Make a directory called <directory>

**`more <file>`** Displays <file> one full screen at a time (type ‘q <return>‘ to quit)

**`mv <file>`** Moves or renames <file>

**`passwd`** Allows you to changes your password

**`ph`** UIUC phone book service

**`pwd`** Prints the working directory name (the one you are currently in)

**`rm <file>`** Permanently removes (deletes) files

**`rmdir <directory>`** Remove a directory called <directory>

**`tail <file>`** Displays the last few lines of <file>

**`talk <user>`** Talk to another user <user>

**`telnet <host>`** Directly connects you to a host computer

**`vi <file>`** Edits the file <file> with the vi editor (pronounced “Vee-Eye”)

**`whereis <file>`** Locates file <file>. Similar to Find File in Macintosh operating system

**`who`** Shows what users are on the system `whoami` Displays who your are

`write <user>` Sends a message to the user <user>

# Chapter 5:
# Electronic Mail

## Mail in the Internet

Using Internet you can communicate with anyone around the world who has a computer account. To mail someone type “mail” and then their address. To mail someone you need to know their login (The name you use to identify yourself to the computer) and the name of the computer system they are using. The Internet standard for naming computers is called the "domain system." This hierarchical system references values such as country, type of organization, organization name, division name, and computer name. Below is an example:

joe@bitsy.mit.edu

The information in a mail address becomes more global as you read from left to right. The user’s name is always to the left of an @ sign. Computer and organization names are always to the right. In the example above, the person, Joe, receives his mail on a computer called "bitsy" at MIT. Because MIT is an educational organization, it is included in the top-level domain "edu". Other top-level domains are listed below:

| | |
|---|---|
| com | commercial |
| gov | government |
| mil | military |
| org | nonprofit organization |
| net | network operation and informational centers |

Outside of the U.S., top-level domains are two-letter country codes such as these:

| | |
|---|---|
| au | Australia |
| il | Israel |
| p | Japan |

| | |
|---|---|
| uk | United Kingdom |

## Finding Mail Addresses

You can learn the electronic mail address of another person by asking him or by using one of the following resources:

- A “postmaster” at the recipient’s organization can provide the correct address when you know the domain name of the organization. Send a message requesting help to postmaster@domain.

- The DDN Network Information Center (DDN NIC) in Menlo Park, California, maintains a "white pages" directory of computer users, hosts, and domains on the Internet. You can use Telnet to access this database on a computer called nic.ddn.mil. Many computers also have a program called whois, which automatically accesses the DDN NIC database. NCSA machines have this program.

## Mail Program for UNIX

This is an abbreviated manual entry for mail, a common electronic mail system.

NAME

mail - send or read mail

Sending mail. To send a message to one or more persons, type mail and the names of the people to receive your mail.

Press the return key. You are then prompted for a subject.

After entering a subject, and pressing the return key, type your message. To send the message, type period (.) on a blank line.