Adventures in Cyberspace: An Inspector General's Guide to the Internet

by Jerry Lawson

Jerry Lawson, Counsel to the Inspector General, National Archives and Records Administration

What is the Internet, and why should I use it?

The Internet is a global linkage of large computers, mostly owned by businesses, universities, and governments. Most of these larger machines have smaller computers attached. The key connections are special high capacity leased telephone lines capable of carrying large amounts of data. The fascination of the entertainment and news media communities with the sensational and trivial aspects of computer telecommunications has created some widespread misperceptions. The truth is that the most significant part of the online world, the Internet, was originally designed by the Department of Defense as a means of enhancing the productivity of government officials (originally mostly military, with a sprinkling of users from the academic community and high tech businesses).

The Internet is no longer managed by the Federal Government, and literally millions of other people have found that it can be used for other purposes, ranging from political organizing to disseminating rock videos. The same power that makes the Internet well suited to accomplish these diverse tasks makes it also eminently well suited to accomplish its original purpose: helping government employees communicate and perform their work more efficiently.

Exactly how would it benefit me if I could go online with Internet?

By learning at least the bare minimum necessary to let you use electronic mail (e-mail), and/or the Internet, you can work more productively. For most Federal employees, e-mail is by far the most valuable online function. For little or no charge, you easily can send and receive messages almost instantly from people across town—or on another continent. If your organization has widely dispersed geographical components or your employees travel frequently, obtaining Internet accounts from a service provider with many local access telephone numbers can result in major savings on telephone, fax and postage bills. Aside from often being cheaper than the alternatives, e-mail is qualitatively superior in some ways, and more and more people are deciding that they prefer e-mail to paper or telephone communications for most purposes. No postal delays. No illegible faxes. No voice mail. No telephone tag.

Recently the National Archives and Records Administration (NARA) Inspector General (IG) decided that he should coordinate with the Office of Management and Budget (OMB) before implementing a particularly innovative approach in his agency. Using e-mail, the IG in question had his idea completely reviewed and approved by senior OMB management in 12 hours. As we all know, in the Federal Government, paper does not flow at that speed. E-mail can.

There are several reasons to prefer e-mail rather than telephone communications in most situations. E-mail is less intrusive for the recipient. I know my message won't interrupt the recipient at an inconvenient time, as a telephone call might. People read their e-mail only when they want. Another advantage of e-mail is that being brusk and

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An Inspector General's Thumbnail Guide to Key Internet Features

Feature	Purpose	Drawbacks	Comments
E-mail	Easily send and receive electronic messages.	Not everyone has an e-mail address (yet).	Most valuable Internet feature for most business users. Can send and receive e-mail to and from other networks (CompuServe, etc.).
Mailing Lists	System under which e-mail sent to a central location is "echoed" to "subscribers."	Can be difficult to learn about relevant ones. Some have low "signal to noise" ratio (i.e., there's a lot of chaff).	Extremely useful for keeping in touch with others who are interested in the same topics. May be public or private, moderated or unmoderated. "IGNet" runs many lists dedicated solely to IG topics.
Newsgroups	Collections of e-mail messages on special topics (over 12,000 at last count).	Most have low "signal to noise" ratio. So many interesting topics, it's easy to get distracted.	Excellent way to get free technical support, do research or get in contact with experts on specialized subjects.
FTP (File Transfer Protocol)	Transfer files to and from distant computers.	Can be difficult to use unless you have good interface software. Often hard to learn about good files.	Can download wide variety of free files, including: software updates and bug fixes, copies of Supreme Court decisions on day of issue, etc. Related search tool known as Archie will rapidly search for a particular file world wide.
Gopher	Finding aid that adds user-friendly menus to help find Internet resources.	Can only use data that someone has linked to a gopher site.	Fast operation. Related search tool known as Veronica will search gopher menus world wide easily.
WWW (World Wide Web)	A "turbo-charged gopher" system: very easy to use "point and click." "Hypertext" adds graphics, sound and even video to the gopher text interface.	Operates slowly if graphics feature is used. Difficult to find WWW sites with much useful legal information.	Sometimes called the "Swiss Army Knife of the Internet" because it can be used to access ftp, Telnet, mail, etc. Easiest to use, most spectacular and fastest growing Internet feature. You can speed up operations by turning off the graphics feature. Can be used to inexpensively present information to the public through "posting" of a WWW page.
Telnet	Can log into a remote computer and operate it as if you were at a terminal directly connected to that computer.	Most of the destination computers that allow telnet access require the use of the difficult UNIX operating system.	Can be difficult to navigate after logged into the remote computer.

to the point is not considered rude. When calling someone on the telephone, most people feel at least some slight sense of social obligation to chitchat for at least a while before getting down to business, and socialize a little more after conducting business. With e-mail, by contrast, if someone asks you a question, all you have to do is hit the "Reply" button to quote the question, and enter "Yes" or "No," as appropriate. You can be more expansive if you wish, but in this environment no idle chitchat is necessary. People won't think you are rude, just efficient. Finally, I like to make notes of what was said in important communications. With telephone conversations, this means hasty, illegible scribbling and hoping I can remember all the key points. With e-mail, all I do is select the "Print" command. It's even more efficient if you have a good e-mail program that lets you organize and store old messages on disk with a "drag and drop" filing system. Instead of rummaging through a file cabinet, you can use powerful automated sorting and searching tools to find the data you need.

Another benefit from having an e-mail connection is the ability to subscribe to free Internet mailing lists that relate directly to your work. An Internet mailing list allows a message sent to a central address to be automatically forwarded to all subscribers. There are literally thousands of such Internet mailing lists for various special interest groups.

IGNet, an interagency working group, operates 12 mailing lists, some general and others for specialized groups within the Office of Inspector General (OIG) community. There is a list for investigators, one for auditors, one for Executive Council on Integrity and Efficiency discussions, one for President's Council on Integrity and Efficiency discussions, and so on. These lists provide an easy way of keeping up with new developments in your field, sharing with others innovative approaches that you have discovered, and obtaining ready guidance from subject matter experts.

Newcomers to the online world are most likely to find e-mail the online feature that immediately becomes indispensable for them, but depending on the nature of your work, you may eventually find even more useful one or more of the Internet's other features, such as:

- Usenet Newsgroups, collections of e-mail messages on over 12,000 different topics,
- File Transfer Protocol (ftp), which allows easy transfer of large amounts of data,
- Telnet, which provides the ability to log in as a user of a remote computer,
- Gophers, programs that use a text-based menu structure to make it easy to find information on remote computers,
- Internet Relay Chat (IRC), real time online conversations, which can be used as an easier, cheaper alternative to face-to-face meetings or conference calls, and
- The World Wide Web (WWW), which enables you to navigate through distant computers and find data by using hypertext and easy to use "point and click" software.

Due to its ease of use and power, the World Wide Web is by far the fastest growing part of the Internet, and this is where American businesses are beginning to set up shop in great numbers. World Wide Web access programs (browsers), like Mosaic and Netscape have been called the "Swiss Army knives" of the Internet because they can perform most of the other Internet functions, using one common user interface. Training time can be reduced even further through the use of customized "home pages," which can contain hotlinks for instant access to Internet features of interest to people working in a particular field, such as auditing, investigations, or law.

If we get an Internet connection, won't people in my office waste time "surfing the Net" instead of working?

This year we discovered that an employee of our agency had made nearly $2,000 worth of calls to several 900 number voice sex lines. No one would seriously suggest that, because telephones could be abused, our agency should try to operate without telephones.

Poor employees will find a way to waste time whether or not you are on the Internet. The solution is good supervision, not depriving your organization of a tool of great potential power. At NARA, we have found that one key to avoiding problems is a written policy that spells out clearly what, if any, forms of personal use are appropriate.

This sounds good, but it doesn't apply to me, because no one in my office knows much about computers and I can't get any help from my agency's computer support staff.

Five years ago, even a year ago, you might not have had any satisfactory options for taking your office online. The major commercial online services offered only limited Internet access, if any. Setting up a full service Internet account was primarily the realm of technical gurus. Things have changed.

The recent development of new, easy to use software and an improved communications infrastructure (including the growth of commercial services like America Online, Prodigy, etc.) have radically changed the situation. It is now possible for even people who know next-to-nothing about computers to quickly and easily join their colleagues online, including the Internet, at minimal cost. Millions are doing so.

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Ways to go Online Compared

Type of System	Examples	Structure	Owner/Manager	Fees	Advantages	Disadvantages
BBS (Bulletin Board System)	OPM Mainstreet. World Data Network in Reston.	Typically a PC with one or more attached modems and telephone lines allowing outsiders to call in.	Mostly individuals, including many hobbyists. Called "Sysops" (System Operators).	Some charge fees, usually low, but most are free.	Low cost. Easy to contact. Some have gateways for Internet e-mail.	Typically not as many resources or as well organized as the major commercial on-line services.
Commercial OnLine Service	CompuServe, America Online, Prodigy, GEnie, Delphi.	One or more large computers linked to telephone network with many POPS (local "Points of Presence") so users avoid long distance charges.	Corporations. For example, GEnie by General Electric, Prodigy by Sears & IBM, CompuServe by H&R Block.	Monthly fee in $8 to $15 range that includes some "free" hours. Fee for extra hours and "premium" features.	Easy to log on. Management usually provides easy to use software and user support. Most now offer a few Internet features.	High cost. Fewer available resources than on the Internet. None offers full Internet access.
Internet	There is no "example," because there is only one Internet.	"Network of networks." Key machines are large computers owned by universities and large businesses that are linked by leased high-capacity telephone lines.	The individual computers on the Internet all have owners, but there is no real owner or manager of the Internet as a whole.	There is no fee for Internet use itself. If you have to get access through a commercial service provider, you pay a fee of $15—$35 month. for assistance in getting connected.	Lower cost than the commercial services. Extraordinarily rich in resources. Some accounts include privilege of posting material on World Wide Web.	System appears chaotic to new users (no owner/manager). Limited user support. Sometimes difficult to connect to popular sites.

Individuals typically get Internet access by going through a "service provider." These are mostly local businesses you can reach with a local telephone call who already have a large computer and high capacity telephone line. They will let you piggyback on their connection, usually for a fee.

Within a couple of years, maybe less, not having an e-mail address will cause people to react the same way they do today if you tell them you don't have a fax number.

I can already send and get e-mail from Prodigy (or America Online, or CompuServe, etc.). Why do I need to worry about the Internet?

You may not. Nearly all government officials can benefit by having an e-mail account, but that does not mean they need to be "on the Internet." Just as an MCI telephone customer can call someone on the Sprint system, or AT&T, today all the major commercial online services can send and receive e-mail to and from the Internet, and vice versa. If your message needs to go over the Internet to reach its destination, your system should route it for you automatically, without any further involvement on your part, aside from possibly addressing it a little differently.

If you find that Prodigy or one of its competitors meets all your needs, and you are comfortable with it, there is probably no compelling reason for you to switch. On the other hand, many people find that they like the extra flexibility and power that they get from accessing the Internet more directly, instead of going through a commercial online service. For example, you are more likely to find sophisticated e-mail handling features like threading, "kill files" and "bozo filters" in software designed specifically for Internet usage. These features can save you time by automatically grouping your message by topic or sender, and screening out messages on topics that don't interest you or from senders who don't interest you.

Above and beyond better e-mail handling, the Internet offers other powerful features and a depth of resources that no commercial online service can match. Finally, for all except extremely low volume users, an Internet account will probably be cheaper than going through one of the commercial online services.

What kind of equipment is needed?

No state-of-the-art, expensive hardware is necessary to set up individual Internet accounts through an Internet service provider. All you need is a computer, an ordinary telephone line and a modem. Essentially all modern government offices already have personal computers and telephone lines. A modem is a device that lets your personal computer send and receive data over a telephone line. Modem prices range from $80 to $120 for a 14,400 bps model, today's most common for business use (bps = bits per second, a measure of data transmission speed), to $150 and up for a high speed 28,800 bps type. (These prices are for ordinary voice grade telephone line modems. If you have only one of the newer digital telephone systems, you will need a more elaborate interface.) Your modem can share a voice line, and callers to the number will get a busy signal only when you are actually using it, normally only a short time each a day.

If your organization is large enough, you may want to establish a direct connection to the Internet, and route it through your office Local Area Network (LAN). This approach could be cheaper in the long run, depending on the size of your organization, but it introduces some security risk, and requires technical knowledge and an initial investment in routers, firewalls, etc.

How can I use the Internet if I don't know Unix and I don't have 4 years to spend learning about it?

Most of the large computers on the Internet use the operating system known as Unix. While it's quite difficult to become a Unix expert, it's fairly simple to learn the minimum number of Unix commands needed to operate a Unix shell Internet account. Furthermore, if you don't want to face this simple challenge, there are even easier alternatives. With the right interface software, the average government employee computer user can accomplish anything he or she might need or want to accomplish without ever looking at a Unix command line. Unix is still there, underneath the simple menus, but modern software shields users from its apparent difficulty. You can now navigate the Internet using simple menus and point and click software.

How much would the service cost?

You can get an individual Internet account for from $15 to $30 per month in the Washington area, which has a high level of competition among service providers. This price would typically include anywhere from 2 to 6 hours of service a day, far more than most government employees are likely to need. Commercial online services like Prodigy, etc., tend to be more expensive overall, because they charge hourly fees, plus have the disadvantage of offering only limited Internet access.

Who is the best service provider and what is the best software?

There is no single best service provider or software package for everybody. The optimum solution in a particular situation will depend on a variety of factors, including geographic location, the hardware and operating system available, expertise of the prospective users, cost, and most important, what the users need or want to get from the connection.

One fact makes the process of selecting a service provider a little easier: with Internet e-mail, all roads lead to Rome. After e-mail gets onto the Internet, it all travels the same way, and is substantively the same on receipt, though it may look slightly different to recipients using different types of software.

An Inspector General's Thumbnail Guide to Types of Internet Accounts

Account Type	Examples	How Does It Work?	Advantages	Disadvantages
Specialized Mail-Only Account	WinNet. Some local BBS's, including OPM Mainstreet.	Users send and pick up mail by calling a computer that is connected to the Internet.	Can be cheapest, depending on usage pattern. Can use mail to access ftp, some other Internet resources.	Limited access to some of the Internet's other useful tools.
"Dial Up" Shell Account. Could be on a BBS, a commercial service, or with a commercial Internet service provider.	Some local BBS's. Delphi (more extensive shell access than any of the other major services). Netcom shell account.	User dials into an Internet-connected computer that treats user as if he or she had a terminal on that computer. User not directly connected to the Internet.	Connection sometimes cheaper and easier than other alternatives, depending on usage pattern.	Limited choice of interface software. Often must use difficult UNIX commands. Usually, no graphical access to WWW feature.
Specialized "Dial In" SLIP/PPP type account (Serial Line Internet Protocol/Point to Point Protocol) on commercial Internet service provider	Netcom's "Netcruiser" account. The Pipeline.	A service provider gives users free interface software that is pre-configured for easy set-up and use.	Extremely easy to use. Price is competitive.	Must use provider's software, which has some limitations.
Regular "Dial In" SLIP/PPP account on commercial Internet service provider	Netcom regular PPP account.	User goes through service provider's equipment, and once on Internet, is treated as an Internet "host" machine.	Full Internet service. Wide choice of available software, much of it free.	Depending on the software and service provider selected, can be difficult to set up. Often more expensive than shell account.
Dedicated high capacity SLIP/PPP account	Large businesses, universities, and government agencies.	An organization that has linked its internal network to the Internet through a large high capacity leased telephone line.	All the advantages of a dial up SLIP/PPP account, plus extremely fast data transmission.	Only a few organizations have such connections.

As Federal Government officials, we have some options not available to private business. The Office of Personnel Management (OPM) operates "OPM Mainstreet," a Bulletin Board Service (BBS) for use by Federal employees conducting official business. It is a large computer that allows "dial up" accounts by modem and has a gateway to send and receive Internet e-mail. You may not find it as flexible or as easy to use as some other alternatives, but it is a tool that many in the government have found invaluable.

If your organization has very little computer expertise, another option is a commercial online service like America Online, Prodigy, CompuServe, Delphi, GEnie, etc., which are usually relatively easy to set up and use. For more power and flexibility it is best to go to a commercial Internet service provider.

The pros and cons of these approaches are discussed in more detail in a set of white papers prepared by the NARA OIG specifically for IGs. Your office can get a copy by sending an e-mail message to jerry.lawson@arch2.nara.gov with the phrase Get Internet Docs as the only text in the message block. If you don't have access to e-mail yet, call (301) 713-6666 and we will send you a copy by postal mail.❑