AAUS ENTERS CYBERSPACE

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AAUS has leaped from the aquatic realm to the information superhighway with the purchase and installation of a Sun Microsystems Sparcstation. Your annual membership will give you access to a number of services on this machine.

1. List service: You will be able to reach a desired group of AAUS members by addressing your e-mail message to a single address. This will greatly facilitate the exchange of information between members.

2. FTP: Pertinent AAUS documents, e.g. members directory, Bylaws, Standards, and Symposium presentations, will be available for downloading via FTP.

3. WWW: Future plans include a World Wide Web homepage for AAUS.

This paper describes these services in depth, along with a basic explanation of how to use them.

Keywords: Internet; computer; AAUS; WWW

INTRODUCTION

Cyberspace, technically speaking, is the information-space loaded with visual cues and navigable with brain-computer interfaces, or sometimes the metaphorical location of the mind of a person in hacker mode (de Wolf 1993). In layman’s terms it is the parallel universe made up of the innumerable miles of cable and countless number of microcomputers, workstations and mainframes referred to as the infamous Internet.

Once upon a time there was the ARPAnet. The ARPAnet was an experimental network designed to support research of the U.S. Defense Department. A major objective was to find out how to build networks that could withstand partial outages (like bomb attacks) and still function. This was possible by designing the network so that every computer could talk, as a peer, with any other computer. A small number of mainframe computers were the only ones existing at this time, so the ARPAnet connected these few sites.

Other networks came into being as the number of computers grew and large organizations, e.g. federal research agencies and large corporations with federal research contracts, built their own networks to connect them. It soon became obvious that if the networks used the same protocols as the ARPAnet, users on one network could communicate with those on another and everyone would benefit. Up to this point the world's most powerful computers were only available to Defense Department contractors and a few researchers from large corporations. In response, the National Science Foundation decided to build five supercomputer centers for academic research. The NSF first tried to use the ARPAnet to connect these supercomputers, but this failed because of bureaucracy and staffing problems. The NSF built its own network, NSFnet, and connected the supercomputer centers with 56,000 bit per second leased telephone lines.

About this same time UNIX workstations, with built-in networking capabilities, and Ethernet local area networks (LAN’s) began to flourish. Neighboring local area networks were joined to form regional networks. The regional networks were chained together and connected at one point to a supercomputer.
Because the supercomputers were connected by the NSFnet backbone, it became possible for any computer to communicate with any other computer by passing its message through regional networks to the NSF net and then having the message passed on through regional networks at the other end to the destination.

This worked well until the network traffic increased to the point where the telephone lines and the computers controlling the network were overloaded. The NSF again intervened and provided funds to replace the old network with faster telephone lines and faster computers to control the traffic. Continued support is coming from the NSF via funding for more academic connections including colleges, public schools and libraries. Corporations are seeing the benefit and are paying for their own connections. This is the present day Internet.

Even though people use numbers to dial and communicate with each other via telephone, it was decided to use the power of the computer to alleviate the need for Internet users to memorize or keep track of computer addresses (IP numbers). The Domain Name System was formed to logically name computers and insure that no two computers are given the same name. A computer's name is comprised of a series of domains separated by periods, e.g. odf.ucsd.edu. There were 6 high-level domains originally formed in the United States:

- **com** - for commercial organizations
- **edu** - for educational organizations
- **gov** - for government organizations
- **mil** - for the military
- **net** - for network resources
- **org** - for other organizations

As the Internet became international, two-letter country codes were established as the top level domain for foreign computers, e.g. **ca** for Canada. The domains get smaller moving from right to left until the specific computer is named, e.g. **odf.ucsd.edu** translates to the ocean data facility of the University of California at San Diego, an educational organization in the United States of America.

One of the first and most widely used services of the Internet is electronic mail (e-mail). E-mail has certain advantages over other means of communication. Similar to the telephone, e-mail is a speedy way of delivering messages. E-mail can be sent half way around the world in a matter of seconds, and unlike the telephone there is never a busy signal. Of course, delivery cannot go through if the destination computer or its local network is down, or if the message is addressed incorrectly. There is no long distance charge for communicating over long distances. It costs no more to send a message across the country than it does to send it to the next building. Messages can be read and saved to disk for future reference. The message can be edited and sent back to the sender or forwarded to others in a matter of minutes. The same message can be delivered to one or a large number of people with very little additional time and effort on the part of the sender, i.e. the time it takes to type a few more words.

An electronic mailing list is an extension of e-mail and used when groups of people wish to communicate on a regular basis. A single mail address is set up as a mail reflector and any messages addressed to that address are automatically resent to every member of the list. There are thousands of mailing lists on the Internet covering a wide variety of topics. Electronic mailing lists have proven to be valuable to many Internet users and it is hoped will prove likewise to AAUS members.

Another service used on the Internet permits moving files from computer to computer. The application to do this is File Transfer Protocol (ftp). The two computers need not be of the same type, e.g. a Macintosh and an IBM PC, as long as both are running ftp software. The Internet is a virtual treasure chest of information and with a little searching, one can find free software, government documents, scientific databases, recipes, weather reports or almost any other piece of information.
IMPLEMENTATION

Sutherland: AAUS Enters Cyberspace

The idea of providing services to AAUS members via the Internet has been proposed before (Rioux 1994). To this end, a refurbished SUN Microsystems ELC sparcstation was purchased with funds generously donated to AAUS for operating expenses and set up at the Scripps Institution of Oceanography, University of California at San Diego. The workstation was registered with the domain name of aaus.ucsd.edu. Mailing list management software has been installed and four AAUS lists have been established:

- scidiver@aaus.ucsd.edu - for issues relevant to all scientific divers
- dso@aaus.ucsd.edu - for diving safety officers
- om@aaus.ucsd.edu - for organizational members
- bod@aaus.ucsd.edu - for the Board of Directors

AAUS members may subscribe to any of the four lists which are appropriate to their level of membership. Although members will only receive messages addressed to the lists to which they are subscribed, members which are subscribed to any one of the lists are permitted to post messages to all four. The advantage of this will be discussed in the next section.

AAUS documents will be placed on the workstation and made available on a user-appropriate basis. Any Internet user will be able to access general information about AAUS. Members will be able to search a membership directory. Organizational Members will be given access to each other's on-line Standards. Any number of documents or files can be made available as the need arises.

All of the information presented thus far assumes you have a computer sitting in your office or lab which is already interfaced to a local area network and through this to the Internet. Not all AAUS members are affiliated with universities or large corporations that offer Internet access. However, the resources of the Internet have become so valuable and popular that companies are starting to offer dial-in service. For a monthly fee, you can use a modem (a fairly inexpensive piece of computer hardware) to dial a usually local number. By using a high speed modem, e.g. 14.4 kilobytes/second, one can experience performance near that of those directly connected. You should have a list of companies to select from with a simple inquiry to a few of your computer-literate friends or colleagues. Most dial-in services provide the necessary software for your model of computer and telephone support to install and get started.

DISCUSSION

A few hypothetical examples will be given to show the proper use of the AAUS mailing list and ftp server. It is hoped these examples will likewise demonstrate the usefulness and value of these services to AAUS members.

Example 1. After attending the 15th annual AAUS Symposium and hearing of the AAUS workstation, Professor Suckair decides to subscribe to the scientific diver mailing list. He returns to his university office and sends an e-mail message to postmaster@aaus.ucsd.edu requesting to subscribe to the scidiver list. The postmaster checks the membership directory, finds that Professor Suckair is a member in good standing, and subscribes him to the list. Now Professor Suckair receives a copy of any and all e-mail messages addressed to scidiver@aaus.ucsd.edu.

Professor Suckair, a noted algal physiologist from the northwest U.S., decides to do a comparative study. A quick scientific literature search reveals that an algal species with which he is very familiar has a tropical counterpart. He sends a brief message to scidiver@aaus.ucsd.edu to see if any AAUS members know of a location where this tropical alga is abundant. In a matter of hours there are 6 responses to the message stating that this particular alga grows profusely around one of the middle keys of Florida. Professor Suckair is especially intrigued by the description given by John Slick, a graduate student at the University of Miami. Professor Suckair and John Slick use each other's personal e-mail.
addresses as the dialogue between them becomes more specific and less appropriate for the entire scidiver group. In a matter of days, arrangements are made for Professor Suckair to travel to Florida where John has offered to dive with the Professor and show him a dense crop of the alga.

Professor Suckair contacts his diving officer, Sue Fish, and informs her of his plans. Sue does not know the diving officer at the University of Miami, so she checks the most recent AAUS Organizational Members directory that she has downloaded from the AAUS server. She calls the Miami diving officer, introduces herself and talks of Professor Suckair’s plans. She then e-mails the reciprocity forms she has on file for Suckair to the diving officer at Miami, and all is set for the Professor to visit and dive with John.

Example 2. The diving control board at Professor Suckair’s institution wonders if their program would benefit from diving with enriched air nitrox. Sue Fish sends an e-mail to dso@aaus.ucsd.edu asking opinions on the advantages and disadvantages of using enriched air nitrox. There are a dozen responses to her inquiry. From these she prepares a report for the next DCB meeting. It is then decided to pursue this diving technology. Sue has at her disposal the names and addresses of those who responded to her initial message. She can use them to gather information on how to properly get started with developing the use of enriched air Nitrox in her program. She also has available the Standards of these institutions to use in revising hers to include this additional diving technology.

Example 3. It is four weeks before the annual AAUS Symposium. Sam Shell is extremely busy, but really wants to attend. He is especially interested in one of the workshops being offered. He ftp's the current Symposium schedule from aaus.ucsd.edu and discovers that the workshop has been moved from Thursday afternoon to Saturday and a paper he wants to hear is being presented on Saturday morning. This is good news. He can work through Friday morning, travel on Friday afternoon and still catch the two presentations of most importance to him.

Example 4. It is an election year and Nancy wishes to nominate her diving officer for a Board position. She sends an e-mail with her nomination to bod@aaus.ucsd.edu. Her message is distributed to all members of the Board of Directors even though she is not subscribed to the BOD mailing list. Her subscription to the scidiver list gives her this capability. She receives a response addressed to her personal e-mail address from the Chair of the Nominations Committee thanking her for the nomination.

Example 5. You are going on vacation for three weeks. You know from experience that there are about 10 messages per day distributed on the scidiver mailing list. You do not want your electronic mailbox to fill up with these 150 (5x3x10) messages while you are gone. You send an e-mail to postmaster@aaus.ucsd.edu asking to temporarily unsubscribe from the scidiver mailing list. You go off and have a great time on your vacation. When you return you send another e-mail to postmaster@aaus.ucsd.edu requesting to resubscribe to the list.

The above examples demonstrate how to subscribe to an AAUS mailing list and how one may benefit from using a list. There are a couple of examples of files that may be appropriate to have available for ftp from the AAUS server. Now it is up to you to give it a try.

INSTRUCTIONS

Subscription - to subscribe or unsubscribe to any AAUS mailing list, send your request to postmaster@aaus.ucsd.edu.

FTP - you will be sent the appropriate login name and password when you subscribe to an AAUS mailing list. The password will change from time to time for security and the new password will be sent to the lists.

Updates and further instructions will be distributed via the mailing lists. Remember this service is a benefit of membership in AAUS. As with any system, please do not share the username and password with your friends and colleagues. Anyone caught abusing the AAUS system will be denied access.
FUTURE PLANS

The World Wide Web (WWW) is the newest service to arrive on the Internet. Most of the early development for the WWW took place at CERN, the European Particle Physics Laboratory, in Geneva, Switzerland. There are two concepts that make the WWW so attractive. The first is the ability to work with text and graphics simultaneously. You can see a picture of an item and read the description at the same time on your screen (provided you have the proper software and hardware to take full advantage of the WWW). The second is hypertext technology. Each piece of information is linked to another piece of information. By simply clicking a mouse button, you can move along a set of links that give different data on a common topic.

World Wide Web service will be added to the AAUS workstation when time becomes available. There will need to be an evaluation of the demand on the workstation from the mailing list and ftp services to see if any hardware upgrades are needed to add WWW service. Notice of WWW development will be posted to all AAUS mailing lists.

LITERATURE CITED


OTHER USEFUL REFERENCES

