Eastern Region Training and Applications Note No. 11

ER TAN-11

A WORLD WIDE WEB PRIMER

JONATHAN BLAES

National Weather Service Forecast Office

Albany, New York

Scientific Services Division

Eastern Region Headquarters

Bohemia, New York

March, 1997

Mention of a commercial company or product does not constitute an endorsement by NOAA/National Weather Service, Eastern Region. The use of this information from this publication for publicity or advertising purposes is not authorized.

1. INTRODUCTION

This Paper will provide a general guide and introduction to the Internet, especially the World Wide Web (WEB). The Internet is a rapidly expanding, universal communications and information network. Located within the Internet is the WEB which is becoming the most commonly used application of the Internet. The WEB has become increasingly popular because it is extremely user friendly. Through the use of a mouse you can navigate throughout the world on the WEB. Its ability to use and display impressive graphics, its increasing capability to display multimedia information, its ability to incorporate application programs, and finally, its ability to adapt will lead to the WEB's continued expansion and acceptance (December

and Randall 1995). Due to the large and time-dependant nature of meteorological data, a convenient means for the transmission and acquisition of data is needed. The Internet and especially the WEB offer a relatively reliable, cost effective, and easy means to share and receive large quantities of meteorological information. The WEB contains an incredible amount of material on other subjects as well. Becoming proficient in utilizing the WEB and its resources will enable the user to search, receive, and exchange vast amounts of information.

2. THE INTERNET

The Internet was conceived during the 1960's by the U.S. military as an efficient and reliable method to maintain communications during or after an enemy attack. The original network was given the name ARPAnet for the Advanced Research Projects Agency of the U.S. military which developed it. During the next several years, an increasing number of research institutions and universities began to connect to this network. Because of this, the military organized a second network called MILnet to concentrate on military communications alone. During the 1980's the National Science Foundation established the NSFnet. This network linked several supercomputer centers and began to take over the ARPAnet, eventually leading to the Internet. In 1991, the U.S. High Performance Computing Act established the National Research and Education Network (NREN). NREN then proceeded to expand and maintain the NSFnet. NSFnet has become the high speed, high capacity network for research, education, and commercial purposes that we now call the Internet (December and Randall 1995). The Internet can be utilized by all sorts of applications including E-mail, Telnet, FTP, and WEB browsers. Its purposes include education, communication, commerce and entertainment.

The World Wide Web is just one way of accessing this massive Internet network. The WEB features an easy to use method to navigate through the enormous world wide network. The WEB encompasses a vast amount of real time, research, reference and general meteorological information, as well as information on nearly any other subject. The World Wide Web offers a tremendous potential for research and professional development.

3. GETTING CONNECTED

a. Connecting directly to the Internet

There are quite a few ways to connect to the Internet. Probably the most logical way is through a direct connection. This involves having a dedicated, high capacity line that connects your computer to the Internet. If you have direct access to the Internet through an educational institution or commercial service, the process is quite simple. All that it involves is plugging in the hardware, connecting the communication line, and configuring your system.

Connecting directly to the Internet provides an unlimited potential for exploration and development. One of the most obvious capabilities is the potential to have your own WEB server. The Scientific Applications Computer (SAC), available at most NWS offices, is a good candidate to use in WEB exploration and development. The SAC is the cornerstone of the SOO/SAC Program, a NWS program providing the Science and Operations Officer (SOO) at each NWS Weather Forecast Office with tools for on-station research, training, and professional development (Bruehl 1996). Instructions on connecting the SAC to the Internet (see Bruehl 1995a) are available on-line from the SOO/SAC Homepage at:

http://www.comet.ucar.edu/pub_html/sac_html/README/
internet.html.

b. Connecting via a dial-up connection

If you do not have a direct Internet connection, selected software options allow you to perform many WEB tasks, such as browsing and other applications, through a dial-up connection. To ensure the brevity of this document, instructions for setting up such a program have not been included. However, more information can be found at: http://www.morningstar.com.

c. Connecting via an Internet access provider

Connecting via an access provider is easily done through UNIX, DOS, and other platforms. Access providers grant Internet connectivity by dialing into their system as well as other connection methods. Once connected to their system, it is easy to exchange files, connect to other Internet hosts, and perform most other common Internet tasks. Access providers are easily found in the computer world. There are the familiar national providers such as America On-Line and Compuserve as well as numerous local providers. They often supply all of the software needed including the dialing and connecting software as well as the WEB browser itself.

4. SERVERS

a. Finding Space for WEB Pages

The WEB server is a program that enables you to distribute WEB pages directly off a machine. To have a presence on the WEB you will need the capability to produce and display information on-line

via a WEB server. If you do not operate a WEB server, you will need to gain access to one. Finding a host to keep your WEB files is not that difficult. There are several ways one can obtain space on a system with a server. Organizations with existing servers often allow the use of their space for free or for a small fee. Some Forecast Offices, River Forecast Centers, and even Regional Offices may allow you to use space on their server. Local government and non-profit organizations often provide use of space on their server at no cost if you provide information that is of service or value to the community.

Another possibility is to use a commercial service. Many commercial Internet access providers offer low rates and sometimes free space on their server. Low rates are usually easy to get if you are providing a public service or displaying quality products that are sought after by the public. These providers may even compete for your services since they can boast that they have your service on their system. Many educational institutions will allow you to use their server at no cost if you have some affiliation with them. If your proposed project is in harmony with their goals they will likely want you to come aboard. High quality content is a valuable product in the academic WEB-world (Proudfoot 1996).

5. WEB BASICS

a. WEB Addresses

The Internet has its own method of identifying users, servers or other entities. The Uniform Resource Locator (URL) and Uniform Resource Identifier (URI) are the addressing system for the Internet. The following discussion of the structure of the Uniform Resource Locator is based on the on-line documents A Guide to URL's (see Baker 1995) and HTML Reference Manual (see Hannah 1996). The

URL consists of four basic parts identified by the letters a, b, c, and d as follows: aaaa://bbb.bbb.bbb/ccc/ccc/ccc?ddd

1) The aaaa is the part of the URL that specifies the access method. The access method defines which mechanism is used to communicate and connect with the particular Internet resource. There are numerous mechanisms including telnet, gopher, news, and http.

The acronym http stands for HyperText Transfer Protocol and this access method is used exclusively with the World Wide Web. It requires the presence of a program running on the destination computer, called a WEB server, that understands and responds to this protocol.

For example, The URL of the NWSFO Albany's World Wide Web site is: http://nwsfo.atmos.albany.edu/www/wx.html. Note the http which signifies the site is accessed through HyperText Transfer Protocol.

2) The second part of the URL, indicated by the "b's," is the fully qualified name of the computer running the WEB server. It can be divided into three parts: the machine name, the sub domain name, and the domain name. More information on URL's and hostnames is available on-line at http://www.ncsa.uiuc.edu/demoweb/url-primer.html.

For example, the fully qualified name of NWSFO Albany's machine on the Internet is nwsfo.atmos.albany.edu. The name of our machine is nwsfo. It is located on the atmos.albany sub-domain, which is the node at the Atmospheric Science Department of The State University of New York at Albany. Notice the edu, which is the domain type for an educational organization. The fully qualified name is synonymous and interchangeable with the Internet Protocol or IP address. The IP address is simply a unique set of four groups of numbers which is used in the actual addressing process. For example, Albany's IP address is 169.226.4.35.

3) The third part of the URL, designated by the "c's," is the file path. It is the path name of the file to be retrieved, including the directories, subdirectories, and filename.

For example, The URL of the NWSFO Albany's World Wide Web site is: http://nwsfo.atmos.albany.edu/www/wx.html. The file path /www/wx.html comes after the node. It includes the www directory and the filename wx.html.

4) The last part of the URL, designated by the "d's," signifies arguments which are used for specialized processes. Depending upon the access mechanism and the file being accessed, extra characters can follow the file name. They are separated by predefined special characters, such as: #, ?, and &.

b. Acquiring a WEB Browser

The WEB browser allows retrieval of the HyperText Markup Language (HTML) file, which is the basic file type of the WEB. The browser also allows the retrieval of many other file types including graphic, sound, animation and multimedia files. WEB browsers are available for nearly every kind of computer platform. Commercial versions are available for free or at relatively inexpensive prices. The three most popular Internet browsers are Internet Explorer from Microsoft Corp., Netscape from Netscape Inc., and MOSAIC from the National Center for Supercomputing Applications (NCSA).

c. WEB Pages

WEB pages are written in the HyperText Markup Language (HTML). HTML is composed of a set of elements that enhance and determine the display of a simple text document. There are numerous versions of HTML, each new version is usually an expanded version of an older one. Different browsers and different versions of a particular browser allow different versions of HTML to be read with nearly all

browsers capable of reading the earliest versions of HTML. Descriptions of the most commonly used elements and features are avialable in on-line documents. Two that are recommended include HTML Quick Reference available at: http://kuhttp.cc.ukans.edu/lynx_help/HTML_quick.html (see Grobe 1995) and HTML Elements List available at: http://www.sandia.gov/sci_compute/elements.html (see Hannah 1995). It is important to keep in mind that HTML is an evolving language, and different WEB browsers may recognize slightly different sets of HTML elements.

d. WEB Browser Basics

The following list contains some of the most commonly used features or tools associated with WEB browsers, which are often located on the browser as a button. The most used frequently used features listed below were compiled with help from The Mosaic Handbook (see Dougherty et. al. 1994).

Open:
Use the open feature to go to a particular site or Home Page on the WEB. To do this, click and hold down the left mouse button on File, then move down to Open URL and let go of the mouse button. A window will open, and then click the left mouse button inside the input window and type the URL of your choice.

Open File:
This will allow you to view a file that is located on your local system through the WEB browser. This is handy when you are creating an HTML file and you wish to view it before placing it on a server.

Back:
This button will take you back to the last location in which you moved forward from.

Forward:

This button will move you forward to the last location you moved back from.

Reload:
This button will reload the most recent version of the URL in which you are located at. This is useful when the page may have loaded improperly or if the page changes frequently and you need to view the most recent version.

View Source:
This button will allow you to view the source code which is the actual HTML file. To view the source code, simply click on the view pull-down menu and select view source. This will open up another window containing the source code in HTML. This is a good feature if you are curious to see how a WEB author created or setup a particular WEB page. It's very handy for the beginning WEB author.

Hot List, Bookmarks or Favorite Locations:
After you find a URL of interest you can add it to your Hot List, Bookmarks or list of Favorite Locations. These different names refer to the same type of feature; the ability to compile a list of the WEB sites that you find most interesting and visit most frequently. By using this feature, you will not have to remember the often lengthy, specific URL address; instead, you can just click on the name of your favorite location.

Home Document:
If you do not want to return to the default Home Page each time you start up your browser, the Home Page option is adjustable. Refer to the Help menu for more information.

Help:
The Help feature will provide additional information on common questions and features regarding the WEB browser.

e. Meteorological Information

There are numerous sources of real time, reference and research related meteorological material available on the WEB. An easy way to locate meteorological and any other information is to use search engines such as Yahoo, Web Crawler or Lycos. Search engines are WEB sites that allow you to enter keywords on a particular subject, and generate a list of addresses which include information regarding those subjects. A few suggested WEB sites include:

NWSFO Albany, NY..... ..... http://nwsfo.atmos.albany.edu
NOAA Home Page..... ..... http://www.noaa.gov
National Weather Service Home Page.......... http://www.nws.noaa.gov
Office of Industrial Meteorology..... .....
http://www.nws.noaa.gov/im/index.html/
The SOO/SAC Home Page..........
http://www.comet.ucar.edu/pub_html/sac_html/index.html
Yahoo .... http://www.yahoo.com
University WEB Sites..........
http://www.unidata.ucar.edu/community/community.servers.html/

6. SUMMARY

This training and applications note contains a general introduction to the Internet, particularly the World Wide Web. The WEB encompasses a vast amount of real time, research, reference, and general meteorological information as well as enormous amounts of information on nearly any subject. The World Wide Web offers a tremendous potential for community outreach and for public relations. In addition, the WEB offers an easy way to acquire and display large amounts of meteorological and other types of data, including text and graphics products. The possibilities are unlimited

and it's now easier than ever to become a member of the on-line community. The best way to learn about the WEB is to explore it.

REFERENCES

Baker, D. W., cited 1995: A Guide to URL's. [Available on-line from http://www.netspace.org/ users/dwb/url-guide.html.]

Bruehl, P., National Weather Service-Office of Meteorology, cited 1995a: Connecting your SAC to the Internet. [Available on-line from http://www.comet.ucar.edu/pub_html/sac_html/README/ internet.html.]

_____, P., National Weather Service-Office of Meteorology, cited 1995b: How to Access and Download Mosaic from NCSA. [Available on-line from http://www.comet.ucar.edu/pub_html/ sac_html/ README/mosaicget.html.]

_____, P., National Weather Service-Office of Meteorology, cited 1996: SOO/SAC Home Page. [Available on-line from http://www.comet.ucar. edu/pub_html/sac_html/index.html.]

December, J., and Randall, 1995: The World Wide Web Unleashed. Sams.net Publishing, 1346 pp.

Dougherty, D., R. Koman, and P. Ferguson, 1994: The Mosaic Handbook. O'Reilly & Associates, INC., 262 pp.

Grobe, M., Academic Computing Services, The University of Kansas, cited 1995: HTML Quick Reference. [Available on-line from http://kuhttp.cc.ukans.edu/lynx_help/ HTML_quick.html.]

Hannah, M. J., Sandia National Laboratories, cited 1995: HTML

Elements List [Available on-line from http://www.sandia.gov/sci_compute/elements.html.]

_____, M. J., Sandia National Laboratories, cited 1996: Uniform Resource Locator (URL) [Available on-line from http://www.sandia.gov/sci_compute/html_ref.html.]

Proudfoot, B., cited 1996: Finding a WWW Host for Your Project [Available on-line from http://www.ucsc.edu/civil-war-letters/host.html.]