WWW: New Modes of Interaction

Zak Smith

The World Wide Web (WWW) has become a ubiquitous part of modern culture. Since its introduction several years ago as the first easy–to–use network interface, it has rapidly become one of the most popular ways to retrieve information while creating a new mode of publishing to the masses.

The Internet as we know it grew from roots in the defense department and academia. The users were for the most part university students, faculty, and other researchers. These users were at ease creating their own tools for their own needs.

Historically, there have been different methods of publishing and retrieving data from the network: email, Usenet, FTP, and gopher. In the beginning, dedicated connections were rare, and computers would have to store collections of out–bound news and email until it was time to establish a connection. Most often, these connections were a form of telephone dial–up line, although some remote sites had mail and news distributed by someone physically carrying a magnetic tape spool from one site to another. This "store and forward" system was called UUCP, which stands for Unix to Unix CoPy, and is still used some places.

As dedicated connections proliferated — that is, as more and more sites were connected to each other all the time — a new protocol suite was adopted for communication. The Advanced Research Projects Agency (ARPA) had been developing a network control system which would notice network failures and adapt the routing of information around these failures. This was intended to allow a network to continue functioning when, for instance, one of the computer sites was bombed during war. This protocol suite was called the Transmission Control Protocol and Internet Protocol (TCP/IP), and is the current standard for internet communications.

Now that machines were connected all the time, a method for accessing information real–time was required. These interactive systems are composed of a "server" program running on one machine, and a "client" program running on the other. The client sends requests to the server, and the server replies with the information requested. This is the general model for all internet communications. All of these client and server programs communicate using TCP/IP as their lowest layer.

The most basic method of accessing files over one of these networks is using the File Transfer Protocol (FTP), which allows users to copy files to and from different machines on the network. The interface for most FTP clients is similar to the DOS or UNIX command line: the user must type in specific commands to get files from a remote machine. Most people do not have the patience to learn and use this type of interface.

Later, a more browsable interface was developed at the University of Minnesota, termed "gopher," in which the user is presented a hierarchical view of information available. Instead of typing in cryptic commands, all they had to do was type in the number of the selection on the screen that they wanted to see. A menu in gopher could have entries, or links, which took the user to other gopher servers around the world.

In the early 90's, there was a need for a system which allowed text and graphics to be mixed, in a friendly interface. Thus the World Wide Web (WWW) was created. The WWW was the first place in which pictures and text could be mixed and presented in a natural way. The WWW also first allowed users to simply click on text defined as a "hyperlink" to take them to a different place in "web-space." The WWW is composed of hypertext, which means that instead of having a linear order like a book, it has links which connect different portions of the document. Hypertext systems have been around for years in the form of on–line help, but the advent of the WWW was the first time it existed in a wide–area network environment.

People were quick to see the potential of the web, and proceeded to put music, art, and technical databases online for public consumption. Many people have a "home page" which contains some information about themselves, and invariably, a list of links to other pages like their own. It is surprising what seemingly useless information is published on the web — someone has published a real–time yo–yo status indicator, and another has a list of all the words whose letters are in alphabetical order.

As popularity grew, it has become a necessity for companies to have a presence on the web. It is common for consumers to do much primary research on the WWW. For instance, automotive consumer report data is available on–line, making car research easier than ever. A company's web site has great impact on their image to the modern consumer. Well designed pages allow a consumer to locate the data they require about the product, while poorly–designed pages frustrate users and steer them away to another company's product. Almost overnight, a startup industry has been created to fill this need for competent web–designers.

Ever since this explosion of on–line data, the global internet, accessed through the WWW, has become an indispensable tool for searching and gathering data. Using any one of the on–line search engines, such as http://altavista.digital.com/, a person is able to search all of webspace and find just about any information she could possibly want.

In the future, the global internet will be used for more and more collaboration between companies. It will be viable for remote offices to route their communication through large public data backbones instead of leasing private data lines. People will be able to use voice and video in a transparent way over the network.

Before this integration happens there will be a massive re–engineering of the network structure including the hardware, software, and protocols that drive the Internet. The high–end computer systems designed only to handle the routing of data over the internet are currently operating at their limits. The protocols of 20 years ago were not designed with requirements for secure, encrypted, communication, nor were they designed with commerce or security in mind. A new generation of internet protocol has been standardized and will be deployed in the next few years.

In the few years since its creation, the WWW has revolutionized the way people read and publish information. The multimedia aspects of the web offer a hint of what will be available in the next 20 years: high–quality video conferencing, network–transparent file–systems, and large repositories of easily searchable online data.