18-Data Bases and Communications

18.03 Electronic Diffusion of Information

DS-18.03.01 COMPUTER NETWORKS: THEIR USE AND LIMITATIONS. By Y. Epelboin, Laboratoire de Mineralogie-Cristallographie, URA 079 CNRS, Universités P.M. Curie et Paris VII, 75252 Paris Cedex 05, France

The establishment of a computerised World Directory which is now under way has lead to a general thinking about the use of networks in information exchanges between scientists. In this talk we will describe how the networks can be used and the limitations arising from their topology and technology.

The most widely used technology, nowadays, is an extension of the local area network protocol TCP/IP better known (but improperly) as Ethernet networking. Its development is linked to the diffusion of Unix. The second one is an IBM technology used in the famous Innet network. ISO protocols such as X25 have been installed in United Kingdom (Inet) and are developing in other European countries. In other communities such as astronomy (SPAN) a Digital Technology is used everywhere. This diversity restricts the exchanges between the different networks. Electronic mail is the only flow of data which circulates easily between networks and other information (software, data,...) are often encapsulated in messages which severely restricts the possibilities of communication.

However more and more people have a transparent link to the TCP/IP world which allows various communications which will be discussed in this talk:

- e-mails which pass through all networks and which may be used to address a query to a server. The World directory will be available to everybody by this means, sending queries in messages and receiving the answers from the server in the same manner.
- lists servers where people are registered on a list and receive all the information, moderated or not, which is addressed as messages to the list. The use of lists servers is compatible through different networks.
- bulletin boards where people establish a connection to a server and consult a given information menu by menu. It is restricted to the feasibility of establishing a connection to the server and retrieving a piece of data may be limited since file transfers are limited or impossible between different networks.
- direct connections and use of dedicated software such as access to a database. The user works directly on the remote server and the restrictions are the same as for bulletin boards. Scientists will have access to the World Directory by this means.
- anonymous ftp, mainly restricted to the TCP/IP world, which allow to retrieve character and binary files.

A new technique is developing, based on a client-server protocol where part of the software is resident on the user's machine, part on the server.

Other limitations appear when exchanging formatted documents which contain text, formate and drawings. However one may foresee the day when the IUCr Newsletter will be available through the network.

The advantages, possibilities and limitations in the use of networks will be discussed explaining the choices for the World Directory of Crystallographers.

DS-18.03.02 DISTRIBUTED NETWORK INFORMATION SERVERS. By B. McMahon, International Union of Crystallography, 5 Abbey Square, Chester CH1 2HU, England

It is almost a commonplace in the modern world that valuable and useful data may be accessed and retrieved from databases, file transfer archives and electronic bulletin boards. Crystallographic structural data are now archived on the IUCr Editorial computer system, thus making feasible the concept of an electronic journal of crystallography. The logistical extension of these ideas is the provision of an electronic library, a facility for retrieving diverse information from any of a collection of sites providing data.

Already, the use of standard protocols across the global Internet has given rise to several tools for drawing together the library resources of various archives. Grapher, developed at the University of Minnesota, provides a hierarchy of menus allowing structured access to data categories. Each entry in the menu may represent data stored on a different machine, anywhere in the world. The casual user may choose a menu item without knowing or needing to know the location or information sought.

The WADS (Wide-Area Information Server) system is a standard way of indexing the textual content of files stored at an archive site. A WADS request can select from a document collection all files containing a requested word or term. It can rank the selected files in order of likely relevancy by applying a heuristic test based on the number of occurrences of the target term, and is in principle possible to perform searches based on context. WADS is often used to supply index services to a data collection initially accessed through Grapher.

A third global information dissemination system, WWW (World Wide Web), developed at CERN, provides for formatted documents to be read on-screen at though typescript. Hypertext links within the document allow cross-references to be followed as the document is perused. As with the other tools, the links in the hypertext chain may reside on geographically remote computers.


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