

# RAL

## DESIGN & DISCOVERY

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## Directory Services Across JANET

For many years the main stumbling block in the widespread use of electronic mail has been the difficulty in finding out the correct format of address to use to send mail to a colleague. It is rather like using the telephone network without telephone directories. There is a need for a *white pages electronic mail address directory* to allow users to find out how to send mail to their colleague. This need has grown over the last few years as more and more users, particularly those that are not computer literate, begin to use electronic mail.

The Academic Community considered whether it should develop an interim standard for the provision of directory information, but decided against principally because the international standardisation work on Directory Services was then underway. It was felt that it would have taken at least as long to develop an interim as it was going to take to produce the first version of the International Standard. Therefore the community decided to use the earliest available implementations of the International Directory Standards to meet its requirements.

### Brief overview of the International Directory Standards

The joint ISO/IEC 9594 and CCITT X.500 Directory Standards model the user interacting with the Directory through a *Directory User Agent* (DUA). The DUA communicates with the Directory by means of an OSI protocol, the Directory Access Protocol (DAP). In this conceptual model the Directory is a single entity containing all the information its users might ever require. Clearly it is not feasible to implement the entire global Directory in one single centralised system. Therefore the conceptual Directory model is refined, giving a Directory Service which is provided by the co-operative efforts of many Directory Service Agents (DSAs). DSAs communicate through another OSI protocol called the Directory System Protocol (DSP). The result is a global distributed Directory.

### Uses of the Directory

The principal aim of the Academic Community's Directory Service is to provide information about people, and in particular information for other people on how to establish communication. The initial user requirement came from the difficulty in determining electronic mail addresses. However, the advent of sophisticated telephone systems with direct dial in to the office phone together with the widespread use of FAX have introduced new requirements. While most organisations have an internal paper telephone directory, finding a direct dial phone number in another organisation is very difficult. This information is currently seldom published.

In addition to electronic mail address and telephone number, the directory will include Room Number, Postal Address, and Fax and Telex numbers.



## Principal Problem

The principal problem envisaged is the acquisition and maintenance of the data. While initial enthusiasm may be sufficient to get data loaded into a new DSA, unless adequate maintenance mechanisms are defined and incorporated into routine procedures continued accuracy of the data is highly unlikely. Therefore it is imperative that Directory maintenance tasks are assigned, probably to those whose job is to maintain that part of the data, and that individuals responsible are aware of the benefits achieved from the provision of accurate Directory data. One difficulty is that the data is usually currently held by several disparate sources: there is one administrative department holding basic staff records; another maintaining student records; telephone number records are often the responsibility of the telephone operators; room allocation responsibility and records are frequently devolved to departmental level; and electronic mail addresses are often administered by the relevant computer system administrator (some users will use University Computer Service electronic mail facilities while others will use departmentally administered systems). Maintenance of the Directory thus requires the co-operation of several parts of the University Administration, each of which needs sufficient motivation to ensure that Directory maintenance is regarded as an integral part of the relevant data maintenance task for which it is responsible. Another impediment to Directory maintenance is that universities usually have Administrative Computing Departments which are totally separate from the Academic Computing Service. Frequently the Administrative computers are not even networked. An unexpected problem is that there are a few Universities which have not yet computerised their staff records.

## User Interfaces

There are a number of Directory User Agent implementations giving a variety of differing user interfaces. However, all these interfaces are aimed at the computer literate user who is familiar with the Directory standards. User requirements have been identified for better fuzzy matching techniques, and for a user interface suitable for non-specialist users. A project is underway which aims to design and implement a user interface targeted at users who are not familiar with the structure and terminology of the Directory. The design goal is to produce an interface capable of implementation on a variety of WIMP environments (e.g. X Windows, Microsoft windows, Macintosh) which will as far as possible follow the look and feel appropriate to each environment whilst remaining recognisably the same interface in all cases.

## Pilot Directory Services

In 1988 the Joint Network Team invited all Computer Centre Directors and Registrars to nominate participants to a discussion group, which would tackle the problems of establishing Directory Services in the Academic Community. A pilot project was discussed and the Computing Service members were invited to submit proposals for participation in the Directory Pilot. Twelve proposals were initially received and funding was approved to provide a computer system at each of these sites to mount a pilot Directory Service. Subsequently other universities have applied and received funding for the hardware for a Directory Service. The project community covers over 20 universities and research council sites and has links to similar projects in other countries.