Esprit
Information Exchange System

iesnews

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In the last issue of IES News we reported briefly on the IES Workshop which took place during the ESPRIT Conference, with a promise of a more detailed account to come in this issue.

The 1987 IES Workshop was held on 1 and 2 October. The objective of this year's workshop was, as in previous years, to look at the status of IES and to consider the short- and medium-term future of the services.

The emphasis during this year's workshop was on the IES user population, providing as it did a forum for debate on the existing IES services and what IES should aim to add or improve in the future. A wide cross-section of interests was represented at the workshop and out of the 51 participants 22 were current IES users, 12 were contractors with ESPRIT projects, 8 were service supporters and 11 came from the IT

LATE NEWS

The DELTA Program

Early approval of this program, one of three proposed collaborative R&D thrusts to promote the application of IT and telecommunications in key social and economic areas, is expected so that a call for proposals could be scheduled for early in the new year.

STET in the U.S.A.

STET, the Italian telecommunications and electronic group, are about to present to U.S. companies the Mediatel system, used in Italy to manage and distribute advertising-supported online services.

Updateable CD-ROM.

ECCTIS (Educational Counselling and Credit Transfer Information Services) of London has joined BBC Datacast to develop and test a system that combines CD-ROM with a data-broadcasting system to produce a low-cost information tool (more information in a future issue).

Esprit Conference Week 1987:
IES Workshop

manufacturers. Some 14 commercial and 6 academic organisations were represented. Delegates included representatives from all Member States from organisations such as CECUA, SPAG Services, RARE and CEN/CEN-ELEC and CEPT, as well as from public bodies such as the Alvey Directorate and CCTA, academic institutions including UCL, ULB, CWI and industry, including GEC, BULL, CASE, PACTEL, TECSIEL, SELENIA and British Telecom.

An introduction by Mr Hunke described the intentions, purpose and status of the IES. The IES has three main action lines: development projects to push OSI – now being transferred to projects under the ESPRIT workplan; harmonisation of national activities – now being pursued in a more focussed way through participation in COSINE; and service provision, which continues to gain importance with the growth of ESPRIT and the growing requirements of results dissemination activities. Further presentations were given on the COSINE project and its possible relationship to IES (Mr

Esprit Conference Week 1987: IES Workshop

Tindemans) and other CEC activities impacting on IES (Mr Newman) such as the INSIS Programme, Videotex, OVIDE, standardisation, etc. This set the scene for the proposed IES evolutionary plan.

The evolutionary plan had been formulated on the basis of the results of a recent CEC survey on all aspects of IES; its objectives, user requirements, and various networking and service options which would improve both connectivity and system response. This relates to the recommendation made in the 1986 Workshop that IES should become open to other CEC Programs with related activities (see Issue no. 7). The resulting evolutionary plan suggested a development strategy to cope with a growing user population demanding increased functionality. Recommendations for short-term developments focussed on 1988 and for medium term on 1989 and beyond.

It was generally accepted by the workshop that in the longer term, for general computer communication, the IES users will migrate to the infrastructure provided as a result of the COSINE project, at which time the IES will concentrate on providing particular services which are specific to the needs of its particular user base. In the meantime, practical solutions to resolve the problems encountered today need to be identified and implemented.

The following report of the Workshop proceedings summarises the conclusions which were reached and has already been circulated to the participants.

i) The present services (conferencing, mail and database) should be continued but that definite action should be taken:

   a) to improve quality of service;

   b) to improve access mechanisms and make them uniform throughout Europe;

   c) to improve quality and consistency of the information provided.

ii) Actions to improve access should take account of:

   a) the need for cost-effective access provision; a study should be made of the possible Pan-European Managed Data Network Service to determine its applicability and whether interim measures are needed before it becomes available;

   b) the Commission should not, if possible, become involved in the provision of basic communication services, and any measures taken should be limited to short-term solutions of immediate problems with a clear end-date;

   c) the possible reduction of access problems by the provision of local intelligence to minimise the real-time involvement of users in communication with the remote services should be studied. One proposal presented was to link the IES hosts (such as EuroKom and ECHO) by permanent virtual circuits in order that:

   a) users could SWAP indiscriminately between services without the need to log-off and log-on each time;

   b) Some integrated operations could be investigated It is understood that such an operation would not contravene future regulations concerning third-party switching.

   c) the access strategy should be chosen to allow the introduction of new services at new locations with minimum entry costs.

   d) monitoring facilities should be improved so that the performance and use of the network and services are known in order to identify the priority of each problem.

   e) the number of gateways operated directly by IES should be minimised so as to simplify management of the services; investigation should be made of the facilities provided by commercial services for, e.g. X-400 and a Kom to Fax gateway.

   f) Teletex will soon be accessible via X-400 conversion mechanisms so no particular action should be taken regarding Teletex.

   g) The trend of replacing telex by Fax is now underway, and the possibility of providing support for the use of Fax should be investigated.

iii) There was a perceived need for a central file repository to assist the exchange of documents and tools; provision of this service as a component within the IES should be investigated.

iv) The provision of widely available remote advisory information and consultancy services raised the prospect of genuinely new and interesting ways of working and a pilot study should be carried out; however

Esprit Conference Week 1987: IES Workshop

the resource implications need to be studied before a widespread commitment is made. The necessity for a directory service was questioned. Such a directory would be relatively small (compared to one for, say, COSINE) and would take effort to set up and maintain.

Any advisory service for standards should be done in collaboration with the relevant officials of the responsible bodies, (including elsewhere in the CEC).

v) There was strong support for a significant extension of channels of communication to and from the users; proposals for additional user support and representative user groups were welcomed.

vi) The importance of UNIX as an OS and a development environment was recognised; however it was felt that such facilities were now widely available on a national level, so that provision of a service UNIX environment within IES received little support from those present at the workshop.

vii) The provision of project management facilities for resource and financial controls of the distributed aspects were urgent and should be implemented rapidly; this initiative should be tightly controlled to assure the timely provision of exactly those tools which are required urgently. The deadline set by the start of the ESPRIT II program must be borne in mind. The Biotechnology Action Programs were particulary insistent on this point, because their collabora-

tors are mainly academic and so have no recourse to program management tools in the normal course of events.

3. General Conclusions

1. The position of the IES within the framework for coordination of European network exploitation provided by RARE/COSINE had been greatly clarified. The workshop welcomed this trend and encouraged the continued participation of the IES in this activity to ensure proper coordination.

2. The workshop reconfirmed the importance of the OSI standards platform as a basis for IES development and encouraged the early adoption of standards such as X-400 and FTAM as a key element for access to IES services.

3. It was acknowledged that the nature of the IES activity had matured into a predominantly service role; future R&D had been subsumed into other parts of the ESPRIT program and the telecoms policy aspects channelled via COSINE; this concentration on services was welcomed and formed the basis of the discussions during the workshop.

4. The maximum benefit from IES will only be achieved if use of its services is almost universal within ESPRIT and related Community programs. In particular, the need for additional user support in both Italy and Germany was noted. In order to expand the connectivity, the gateways provided should be documented and publicised. This implies the outstanding issue of how to charge for a gateway must

be urgently resolved. This implies a level of commitment on the part of ESPRIT project participants and project management, not just within the IES management.

Intentions for 1988

1. Continue present services in Dublin and Luxembourg
2. Improve services access
   - An initial pilot network
   - Investigate the managed data network option
3. Test & Implement services enhancements
   - Improved electronic mail and conferencing
   - Improved text-file transfer
   - Improved gateway connectivities (X-400)
4. Enhanced information & news services
5. Launch national user support points
6. Establish IES user groups
7. Evaluate future of UNIX environment
8. Studies & preparation for 1989 implementations

Intentions for 1989

0. Continue existing Services
1. Link Echo Host (Lux) with EurKom Host (IRL)
2. Transparent E-Mail/Database environment
3. Implement new services
   - Project management tools
   - General data processing services
   - Document archiving service
4. Improve interfaces and facilities related to machine language translation service
5. Launch pilot FTAM service
6. Provide OFFNET services
7. Planning for the years ahead

5. The services should be provided so as to offer a uniform image to

Esprit Conference Week 1987: IES Workshop

their users. This should be balanced against adoption of flexible internal mechanisms to allow the adoption of and transition to distributed solutions for the provision of the services.

6. The key motivation for the IES is to facilitate the exchange of information between ESPRIT participants. The services required to achieve this should be given priority and the available resources should not be diluted by the provision of services to participants which are not in their essence necessary to promote the exchange of information.

7. In planning future actions sufficient flexibility should be retained to allow rapid action to be taken when barriers to effective exchange of information arise.

8. The workshop noted that many of the judgments it was asked to make involved selection from a large list of generally desirable options. While it was agreed that most of the proposals had some merit, it was impossible to make a reasoned selection without information as to the resources required to implement each option and clear guidance as to the total resources likely to be available.

9. In general the proposals presented to the workshop covered tactical actions over the medium term without an establised strategy. The IES management are strongly urged to elaborate and publish its long-term strategy to aid future discussions.

IES is, of course, addressed primarly to the users. We would therefore welcome your comments, questions and suggestions relating to this article. Please write to:

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* Acronyms:

CECUA	Confederation of European Computer Users Associations
SPAG	Standards Promotion & Application Group
RARE	Reseaux Academiques ét miques et de Recherches cherches Européennes
CEPT	Conference Européenne d'Aministration des Postes & Telecoms
CCTA	Central Computer & Telecoms Agency
UCL	University College, London
ULB	Université Libre de Bruxelles
CWI	Centrum voor Wiskunde en Informatica
CEN/CENELEC	Organisation Commune Européenne de Normalisation / European Committee for Electrotechnical Standardisation

Computer Crime: The View of the Confederation of British Industry

The disclosure, that computer fraud was costing British businesses approximately 30 million pounds a year – a figure which seems lower than assumed – coincides with the publication by the CBI of a statement on computer crime. Since this refers to "hacking", it may be of general interest:

(i) We believe it is vital that the criminal law keep pace with changes in technology and with the abuses to which it is peculiarly vulnerable.

(ii) The potential for large-scale computer fraud and disruption of computer services is a source of great concern to industry which depends for its success on public confidence in the security of its operations.

(iii) The current available evidence on computer misuse suggests that hacking by itself does not constitute, at present, a major threat to industry. But hacking is objectionable on social and moral grounds and is of concern when used as a means to some other misuse, especially where that further misuse – for example, taking of information – does not itself constitute an offence.

(iv) Industry could do a lot more to protect its own computer systems from unauthorised access from outsiders and unauthorised use by "insiders", particularly current and former employees. At the same time, the obligations on data users to keep personal data secure should be balanced by corresponding deterrents to those seeking access to computerised data without authorisation.

(v) There is the danger that existing criminal law will sometimes prove incapable of adaptation to cases involving the new technologies.

Recommendations of the CBI:

On balance, and in view of the fact that the unauthorised taking of information from a computer is not a crime, we would support the creation of a new offence of obtaining unauthorised access to a computer. But this change should not be made in isolation. First, any change to the law should be made on as broad a front as possible. Second, the introduction of the new offence should be effected as part of a new comprehensive computer crime statute.

(Courtesy "Computer Law and Security Report")

In IES News n° 3 (April 1986) I reported on the use of EuroKom in the Eurotra Machine Translation Project. In that report the need for regular assessments of the effects of using electronic communication was stressed, and the present article aims at meeting that objective.

Electronic Communication

It was assumed at the outset that the use of electronic communication in a decentralised R & D project like Eurotra (approx. 120 persons working at some 20 sites spread over all Member States) would lead to some reduction in the overall travel costs. This has turned out to be only partly true. Apparently, travelling had aheady been reduced to the bare necessities before electronic communication was introduced, and we have seen only a few occasions where meetings have been deemed unnecessary because of improved communications.

As against this, electronic communication has reduced the importance of surface mail to a considerable degree, and it has become a significant supplement to the use of the telephone, because it works independently of the immediate presence of the receiver. In fact, a few of the groups participating in the Eurotra project are going through a very difficult period right now because, due to the inefficiency of their national PTT's, they are still waiting for a connection to the national PSN, while all other groups are making maximal use of electronic communication facilities.

The heavy use of EuroKom is due to all our groups, after a fairly long introductory period of almost a year where some of them needed special persuasion to join the network, having discovered the fundamental benefit of electronic communica-

tion: it speeds up procedures. EuroKom has become more or less indispensable to our project, because a lot of work could never be done without this kind of communication. We can take decisions by written procedure without depending on the extreme slowness and inefficiency of certain national postal services. We can distribute discussion papers at short notice and agree on the agenda and content of a meeting before it takes place, so that precious meeting hours are not wasted on procedural matters. Very few deadlines could be kept without access to electronic communication.

Electronic Conferencing in a Decentralised Project

This means that the use of Euro-Kom in Eurotra has led to an "expansion" rather a "reduction". Surface-mail expenses have been reduced, and travel expenses may not have gone up as fast as they would have if no electronic communication had been available, but the essential effect of using EuroKom is the enhanced speed and efficiency of our procedures and, in consequence, the larger amount of work with which we are able to cope.

Further Needs

It is a probably a typical effect of such a success that it creates the need for even more sophisticated, cheap and efficient communication.

The Eurotra groups have reached a point now where they want every-

thing to pass through electronic communication channels, including the source code of our prototype software, reports of 100 pages or more, machine-readable information from other media like tapes, floppies etc.

This produces some problems because EuroKom is not an optimal channel for file transfer. Conferencing systems are basically made for the exchange of relatively short entries of an ephemeral character and not for storing reports over possibly a longer period of time. The availability of Kermit on EuroKom has helped to alleviate this problem, but it is nothing like a real solution (see below).

Furthermore, the extended use of the system due to the transfer of ever more and ever longer files is a rather expensive adventure for a Community R & D project with a fixed budget. We understand that EuroKom must become a financially independent and economically sound business and that financial support from public sources should not be perpetuated, but in order to be able to offer a professional service at a reasonable price you must reach a certain size, and we think that it is essential that EuroKom expands in such a way that it is able to offer a broader service at a lower price per unit.

Expanding and professionalising the service also means improving its availability and stability.

The use of EuroKom has become an integral part of the daily work and management of the Eurotra groups to such an extent that any nonavailability because of floods, thunderstorms, electricity cuts or other unexpected "natural" events hits us very hard.

Our working procedures depend on the availability of electronic communication, and delays due to non-

availability are normally very long because alternative communication channels are not immediately accessible (of course a letter may be sent by surface mail instead of Euro-Kom, but if you are used to the speed of electronic communication the letter will normally be written so late that there is no chance of getting it through on time by surface mail).

In the process of integrating the use of EuroKom into our structure and procedures we have learned that it is very important for the organisation of the electronic mail system to fit into the organisation of the user groups. Normally, user groups are not organised on the basis of their participation in electronic communication systems, they have other primary aims, and no electronic communication system can be organised in such a way that it satisfies the needs of each and every user group.

In consequence, special measures must be taken in order to organise the use of electronic communication within a user group.

Organisation

Eurotra is a large-scale decentralised R & D project. All Member States have created national groups, some of them even dencetralised national groups dispersed over two, three or four different sites. Various working groups with the participation of members of national groups and Commission employees from the coordinating Project Team have been created for special purposes like the writing up of specifications for the system modules.

We have learned that electronic conferencing fits very well into this organisational scheme. The possibility of creating a conference for every working group and for every activity involving members of various na-

tional groups corresponds exactly to our communication needs.

The wisdom of appointing one person to be responsible centrally for the use of EuroKom in our project has been confirmed. Various technical problems with terminal equipment, with the national PSN's, the EuroKom or the Euroies machines have been solved fast and in a satisfactory way because one central person has been the switching point been EuroKom, PTT's and users. This has also meant that administrative and accounting problems have been solved in a smooth and unproblematic manner (if 15 or 20 groups should have done this indi-

Electronic Conferencing in a Decentralised Project

vidually, it would probably have led to quite a few incidents).

The present EuroKom user population in Eurotra has reached a stable number of about 60, but during the two years in which we have been using EuroKom we have had 100-120 different users, and especially during the first year, the majority of the users at any given moment had only a few hours experience with EuroKom. This meant that we had an enormous training problem which was solved partly by creating a number of central conferences to help and guide newcomers.

These conferences contained abbreviated manuals, lists of all Eurotra conferences on EuroKom, the names of all users belonging to Eurotra and people responsible for the local use of EuroKom in our na-

tional groups. With growing experience and stabilisation of the user population these conferences are no longer needed. Furthermore, the average lifetime of a EuroKom entry has fallen from eleven to four months since mid-1985, and this means that the content of such central conferences has to be renewed frequently. This is a fairly big problem for us, so we have chosen to abolish them now, assuming that they have served their purpose.

The "EuroKom Manager" in Eurotra, howewer, has been institutionalised. The functions of this person have shifted slightly from training and maintenance of central conferences towards reducing costs and optimising the use of the electronic communication (e.g. checking whether our users are actually using EuroKom, or whether they are keeping userid and password "just in case").

A R & D project is not a static thing, once it has been created. It goes through various phases, its aims may be reformulated or changed on the basis of evaluations made in the middle of the project period, and it may have to react to a changing environment due to, e.g. modified budgets. In this situation a "EuroKom Manager" is indispensable. A centrally controlled use of electronic communication is much easier to adjust to new conditions than a system where the users just rely on the accessibility of the communication channel and the availability of the money to pay for it, and have to resort to crisis management if any of these conditions are not met.

Conclusions

After two years of using EuroKom for electronic communication in Eurotra we think that we may conclude that electronic conferencing satisfies the communication needs

of a large-scale decentralised project extremely well.

The introduction of electronic communication channels into a project leads to a considerable speed-up of project procedures, and also to a high degree of dependence upon this form of communication. In consequence, the stability and accessibility of the communication channels become of utmost importance. Of course, it is possible to implement back-up procedures by getting access to more than one network, by installing telex, telefax etc, but this is very expensive (at least in a project distributed over 20 sites), it leads to a diversification of the communication investments and thereby it also prevents single suppliers like EuroKom from reaching a size which makes it possible for them to offer a broad range of services at a low price.

One of the additional services which is now much needed in Eurotra is file transfer. EuroKom is not an optimal vehicle for this form of communication, especially because the disk capacity of the system was not planned to allow for several thousand users storing long files for shorter or longer periods of time. At least for our purposes an average lifetime of four months for an entry is rather short. We would like to be able to keep conferencing and the transfer of longer files apart in two different systems or subsystems. Whether or not these two services are offered by one supplier is not essential to us. Due to the central management of the use of electronic communication in our project we can cope with more than one supplier, provided that the price is acceptable.

This takes us to the last conclusion. We have become highly dependent on electronic communication and our national groups want to expand their access to this form of communication. In this situation we have become very sensitive to the tariff rates of the different suppliers. A budget of some 50.000 ECU per year for electronic conferencing may not seem excessive considering that it covers 120 persons at 20 sites, but if you think of the fact that you can buy your own mini-computer for the same amount, you may start thinking about establishing your own network. However, a network takes more than some hardware. You need appropriate software and an organisational framework which caters for maintenance, up-dating, help-desk functions, repairs etc, and in a project where everybody has a heavy workload you are nor-

Electronic Conferencing in a Decentralised Project

mally not looking for extra jobs to take over.

Consequently, we are happy with being able to use a system which is being managed, maintained and repaired by somebody else as long as we can pay the bills. We know that our lives would be very difficult without electronic communication, and that a lot of work could not be done or would be so delayed that it would be of limited value.

Electronic conferencing has increased the quality of our lives and the work we are doing, and we want to expand our use of it rather than reduce it.

P. LAU
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Migration of EuroKom within evolving IES

Why Migration

The EuroKom service was initiated in 1983 as part of a contract with the Directorate General for Telecommunications, Information Technology and Innovation of the Commission of European Communities and the University College of Dublin, to provide Electronic Mail and Conferencing services to the participants of the ESPRIT program. The service has been running since the beginning on a DEC 20 – Model 65 mainframe which is approaching 9 years of age.

In 1986 Digital Equipment Corp announced the discontinuation of the DEC-20 series in the midst of the new line of VAX machines. The cost of maintenance of this old hardware was disproportionate to its value. In addition the Kom software itself was not the focus of maintenance by QZ (Sweden) as emphasis was on the development of newer versions and support of the newer PORTACOM software. It became obvious that the overall environment needed an overhaul with migration to a more efficient system. The costs for such migration needed to be justified and that depended on the future of the service.

Migration of EuroKom within evolving IES

Migration in the Light of IES Evaluation

The approval of the Community framework research program meant that a second phase of ESPRIT would shortly be in operation. In addition, several other major research programs in information technology applications (AIM, DELTA, DRIVE) and the telecommunication program RACE are expected to be launched under the framework program and administered by the Directorate General XIII of the Commission. The multi-partner and multinational emphasis on these programs generate the same requirements for information exchange among the participants as it did with ESPRIT.

In the 1986 IES Workshop and within several other high-level management and advisory bodies, the opening of IES to serve these program user communities was already endorsed. The number of potential new users from these programs during the period 1988-1992, provided the additional justification needed for the migration.

There are, however, further reasons to support investments towards a more efficient EuroKom service and an expansion of the IES (see article on IES Workshop). The Council of Ministers and representatives from various governments have requested that the Commission makes certain that timely and appropriate information about the programs, as well as the results from the programs, flows back into the member states so that they can take maximum advantage of the programs and their results. To satisfy this requirement an Information Service is presently being planned. IES and its services may contribute towards the effective implementation of such an initiative along with other ongoing related activities within the Directorate for Telecommunications, Information Technology and Innovation (DG XIII). The difference between now and 1983, when the community cooperative research program started with ESPRIT, is that now a number of services are in place and a considerable amount of accrued experience exists. That can be an excellent basis to build upon, improve and enhance presently available facilities in offering both information exchange and dissemination services supporting the framework program participants and its objectives.

How Migration of EuroKom Evolved

Migration planning was started by EuroKom at the beginning of 1987. The requirement for an electronic mail and conferencing service remained the same as the most suitable for the many-to-many communication and message storage needs among multipartner project participants. To satisfy this requirement a number of known software packages were investigated. Finally PORTACOM, after exhaustive stress and performance tests, was selected. This alternative had the advantage of being very similar to the older Kom version and would minimise migration efforts for both EuroKom and its users.

Various parameters were considered for a machine selection on which the selected software would run. The decision was taken for a VAX 8550, as in addition to satisfying the various parameters, it was certain of a good service in Dublin, and could be better supported by an already existing knowledge of the VAX/VMS operating system within EuroKom.

The hardware was installed in August and since then an internal migration, implemented with the assistance of outside experts, has been meeting its schedules. Those who have experience in major double migration with hardware and software changes ought to appreciate the considerable challenge which such a migration effort entails.

Migration Process Status

In mid-November a pilot migration environment was set up on the new machine with about 50 users from all over Europe who volunteered to participate. A very smart, well thought-out instruction package was delivered to these users with a test schedule and interim demonstration documentation giving the differences in the mail application commands. The tests shall allow EuroKom to fine tune the new environment. In parallel, additional software adaption for gateways, accounting and user registration, is progressing along with the new documentation to be released when the service is approved for the wider user population some time in January.

Every effort is being made by the EuroKom team to maintain the quality of the services currently provided to participants in Community Research Programs during this migration, and to be on schedule to open the new service by the target date of 11 January 1988.

COSINE NEWS

Cooperation for Open systems Interconnection Networking in Europe.

COSINE News intends to cover viewpoints of all parties with interest in COSINE.

Rationalisation of Trans-Atlantic Links

COSINE participated in the first meeting of what became provisionally known during it as "The Necessary Ad-Hoc Co-ordinating Committee" or NACC. This was convened at the initiative of William Bostwick of the U.S. Department of Energy and James Hutton, Secretary General of RARE, who where co-Chairmen, and followed an earlier exploratory meeting. The aim was to explore problems and possible solutions in the area of medium to high speed trans-Atlantic data communications links.

The meeting was attended by representatives of the Department of Energy, the National Science Foundation, the Defence Advanced Research Projects Agency (DARPA), the Internet activity, NASA and the Department of Health and Human Sciences on the American side, and by representatives of RARE, COSINE, EUNET, EARN, University College London, the U.K. Joint Network Team, DFN, and the Commission of the European Communities on the European side.

Amongst the problems mentioned were the cost of multiple trans-Atlantic links and their general co-ordination and management, patents, copyright of transmitted data and security. Until now, each individual U.S. agency has tended to install lines to each individual European country of interest and vice versa. This was deemed wasteful of resources, hard to manage and should be rationalised.

It was agreed that there should be a common open infrastructure, open to other countries to join, for the co-ordination of intercontinental links in general. It would need to recognise the three dimensions of the policy, management and organisation, and technical issues, and act as a pole of attraction for other parts of the world. It would need global vision and yet achieve practical results on the links most immediately important, in particular between the U.S. Internet and the U.K. and Germany for particular requirements. The meeting was seen by its participants as being of great seminal importance for future intercontinental co-ordination, following on the intracontinental coordination which Europe had already embarked on (RARE and COSINE) and which the U.S. was currently embarking on.

The meeting defined its activity as follows:

"The purpose of this committee is to agree and progress a program to achieve interoperable networking services between participating entities (initially U.S. and Europe) to support open research and scholarly pursuit. Policy, management and technical issues will be examined, based on agreed requirements."

There will be a further meeting in approximately six months time. In the interim, tasks will be identified and carried out by each side; it was suggested that RARE should co-ordinate the European side.

N.K. NEWMAN
DG XIII, Brussels

COSINE to Extend Choice of Public Networks
Liberalisation of data-communications services will also benefit researchers

European research networks will be taking advantage of the liberalisation of data-communications services. The president of RARE, Peter Linington, presented a paper on this issue to the EUREKA COSINE Workshop 1987, and it was adopted by COSINE during the COSINE Policy Group (CPG) Meeting on November 5-6. "The in-

creased choice of services and tariff options made available by increased competition can only benefit the users," according to the 'Statement of the RARE position on the provision of Network Services.'

This position has developed since the survey 'Tariffs and Availability of PPSDN's in Europe' was completed by RARE in September. Its adoption by RARE and the CPG represents an enlargement of their policy, and a broadening in potential suppliers. Thus far it was a matter of principle that only data networks provided by PTTs and PTOs (Private Telecommunication Operators) should be used in the COSINE framework. "We will study now what legal possibilities we have" said John Beale of the Commission and COSINE's Project Officer in his address to the EUREKA COSINE Workshop.

Discussion on network properties opened

End-system managements should be free to select publicly offered subnetwork providers on the basis of usage and tariffs, and with the ability to join or leave any given network after a reasonable period of notice. In its public statement to COSINE, RARE has consistently used the term 'subnetwork', to emphasise the need to establish a unified overall service based on independent components. RARE has opened the discussion on the necessary properties of an OSI subnetwork. This will help the process of harmonised convergence of components of the European infrastructure.

RARE has listed the following categories of subnetwork:

- Public data subnetworks operated by a PTT or PTO;
- Transnational public managed data network services, like those currently under study within CEPT;
- National public managed data network services;
- Private managed data network services für specific user communities, such as the X-25 subnetwork proposed as the basis for the OSI transition of the EARN organisation;
- Local area networks giving access to a common point of exit from the telecommunication facilities of a particular site.

Subnetworks to be incorporated in COSINE Specification Phase

RARE aims at the provision of OSI-based datacommunication services to all network users, without any geographical or regional barriers imposed by the available carrier services. In order to ensure universal coverage, all subnetworks catering to COSINE users should provide access to and from the X-25 networks operated by the PTT's and PTO's. A subnetwork service provider should offer a single point of access, together with a single bill for services with enough information to allocate costs to end users. Such functional requirements should be defined and decided upon at the RARE Networkshop in May 1988, so that they can be part of the COSINE Specification. These requirements will be established in cooperation with the CEC and CEPT.

At the COSINE Workshop 1987, John Beale warned that private networks might not offer the required connectivity. On the other hand, he expressed concern that the transnational service concept under development with CEPT cannot be provided at affordable cost. This concept of a Managed Data Network Service (MDNS) had been elaborated during the Workshop by Mr. J. Rasmussen, who is working in the Commercial Activities Committee of CEPT.

Yugoslavia, becomes 20th Member Country

Yugoslavia has officially joined COSINE at its 20th member country. The representative of the Yugoslavian Jozef Stefan Institute in Ljubljana, Prof. Dr. Tomaz Kalin, signed the participation document on the occasion of the COSINE Policy Group Meeting of November 5-6. The first international data-communication links are expected to be operational shortly; Yugoslavia has two planned data network connections to foreign countries.

The following parties are now participating in COSINE: Austria, Belgium, Denmark, the Federal Republic of Germany, Finland, France, Greece, Iceland, Ireland, Italy, Luxemburg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, the United Kingdom, Yugoslavia and the European Community.

Survey of COSINE National Activities: Waiting for OSI-Products

Many COSINE member states have established, or are about to establish, agencies or projects to operate national academic networks. Most of these are in favour of adopting OSI, but are awaiting the availability of stable industrial products before making the transition. Because the emergence of such products cannot at present be predicted, firm plans have not yet been drawn up. This raises the question of whether sufficient market pull will be generated to induce industry to produce the proucts, in the absence of clear demand. These pragmatic constraints prevent governments or network operators from imposing OSI conformance in procurement policy.

Most agencies have stated that OSI procurement will not be made mandatory until sufficient products are available. The following are some facts collected in the Management Summary of the COSINE na-

tional activities report by Dr. John Beale, COSINE's Project Manager.

In all countries researched, overall responsibility for academic research networking lies with the Ministries charged with education, research and technology. All national agencies or projects preparing operational national academic research networks expressed requirements for electronic mail, file transfer, remote login and remote job entry.

Current infrastructures vary considerably

Existing infrastructures vary greatly in topology and organisation, but show a degree of commonality in the services offered. All countries have networks which offer electronic mail, file transfer, terminal access, and remote job entry, although these services are not all offered on all networks. Extensive use is made of existing international research networks, most notably EARN and EUNET. Most networks are constructed from a combination of leased lines, dial-up lines and X-25 public networks.

In Austria, France, Italy, Norway, the Netherlands and Switzerland one or more of the networking communities will migrate to OSI on an experimental or demonstration basis. The expectation is that the benefits gained by these communities will encourage other groups to move to OSI, and that the OSI software that they acquire or develop will form a product base available to other groups.

In all countries surveyed, it will be impossible to migrate all machines within the community at the same time; gateways will be required. To avoid disruption to users, routing to conversion gateways should be automatic when it is required. Therefore a directory service should be set up to provide necessary routing information both to end systems and to converters.

How to involve industrial reseachers?

From the survey findings it is clear that the majority of CPG representatives have focushed on their respective academic communities. The question of how to involve

industrial researchers in the project has not yet been fully addressed, John Beale concludes in his Management Summary.

It is also clear that, while commitment to OSI in principle is wide ranging, commitment in terms of resources is not. In general, network providers see the provision of services to their users as the highest priority, and do not wish to risk the disruption they anticipate in a move to OSI until the net advantages are clear. OSI must be supported by stable and reliable products if its advantages are to be exploited.

Most networks are currently based on leased lines or a mixture of leased and publicly available (packet) switched lines. Leased lines are generally favoured for reasons of cost, capacity and reliability. If the COSINE objective of utilising public data networks is to be achieved, then a

cost performance benefit must be demonstrated to operators. This may require detailed analysis of costs currently incurred in operating private networks over and above the transmission charges, so that true comparisons can be made.

Serious consideration must be given to the way in which the market pull effect required for the success of COSINE will be generated. It will be necessary to motivate local managers sufficiently to make suppliers clearly aware of demand. To do this will require that managers see not just the theoretical OSI advantages of open communication and supplier independence, but also a practical advantage of access to a large community of other users and services. A user community which is providing a good demonstration of use is the Finnish FUNET. Here, a large number of users share a network providing useful services. Potential users in both universities and industry are requesting connections at a great rate because they see the benefits enjoyed by existing users.

Moves to OSI Networking in Italy

In Italy the evolution of academic networks is not yet being planned by an officially recognised organisation. But everybody agrees that this must be done and that migrating to OSI protocols is the best choice. This statement was made in a report which Dr. Stefano Trumpy of the CNUCE Institute of CNR (Consiglio Nazionale delle Ricerche) submitted to the COSINE Policy Group (CPG) Bureau. The CPG Bureau has assessed the current status of networking in the participating countries. To promote coordination in OSI migration activities, GARR (Gruppo Armonizzazione Reti per la Ricerca) was created, a committee with delegates from the three major research organisations and from the main academic computing centres in Italy.

Although GARR has not yet prepared a detailed plan for OSI migration, it is reasonable to foresee that there will be an intermediate phase in which SNA and DNA protocols will be used over X-25 leased lines. As soon as OSI products are available, they will be used initially via the private X-25 network and in parallel with SNA and DNA. In a second phase, usage of SNA and DNA protocols will be limited to the sites

that require a centralised network management. At this point it is anticipated that the part of the private X-25 network will be replaced by public PSDN connections.

GARR forum for COSINE

GARR is the forum where coordination of the activities of the different institutions involved in OSI migration takes place. Although presently money is budgeted and spent by each organisations, GARR is proposing measures for the rationalisation of the expenses for current infrastructures and for development of projects. This includes participation in international projects such as COSINE and RARE. GARR was set up by the Ministry of Scientific Research and Technology. In addition to organisations that operate networks, the harmonisation activities are directed at the Italian PTT and some Ministries, public organisations and institutions such as ENEA (Ente Nazionale Energie Alternative), INFN (Instituto Nazionale Fisica Nucleare), CREI (Centro Rete Europea Informatica) and the Forum Telematico. Also included in the scope of harmonisation are companies

with public funds such as ITALCABLE and TELESPAZIO, as well as private companies already participating in the project OSIRIDE. That group includes IBM and Olivetti. Among the user groups affected by the standardisation and migration policy making are universities, research institutions and companies, as well as institutions in the public sector. The services these groups use at present are electronic mail and computer conferencing, file transfer, remote job entry and remote login.

Harmonisation work on the way

Historically, three major independent research organisations coexisted at national level; the CNR (Consiglio Nazionale delle Ricerche), the Ente Nazionale Energie Alternative (ENEA) and the Instituto Nazionale Fisica Nucleare (INFN). Each organisation has independently built its own network and only recently have these networks started to interact, with the consequence that some harmonisation work is developing. Furthermore, there are three networks provided or planned by the major computer centres or consortia of computer centres used by the academic community, CILIA, CINECA and CSATA. These networks were built in order to provide access to the facilities of the centres for remote users around the country.

In the past, the three governmental research organisation CNR, ENEA and INFN and the universities had independent plans for networking. This led to the creation of uncoordinated networks based on different protocols. In recent years, the various networks have increased considerably. Their nodes are not necessarily members of the parent organisation. In many cases the same site is a node on more than one network.

Usually, the institute that maintains the international connections is considered responsible for the evolution of the network within the country. The following table lists the institutes responsible for each international network:

ARPA	CNUCE (CNR)	– Pisa
EAN	IASI (CNR)	– Roma
EARN	CNUCE (CNR)	– Pisa
SPAN	INFN (CNR)	– Bologna
UCCP	Systems & Management (Private company)	– Torino

Besides the international networks, there is a complex series of anarchical VM/Pass-thru networks connecting most VM nodes of EARN and SNA network of ENEA. This has been kept separated from the rest of EARN until now, although there are plans for a connection.

Waiting for OSI products

The CNR networking is intended to be an instrument for experimenting with and validating new OSI products within the OSIRIDE project, which is a program carried out by suppliers. OSI levels 4 and 5 and MPS implementations are already being tested. OSIRIDE is also currently defining FTAM options, functional units and document types, based on the latest DIS version of ISO 8571. Definition of test sequences and test scenarios for level 5 implementations has just started. A study is being made to examine the X-25 switches available on the market, in order to build an X-25 network. Preference is being given to low cost switches which allow an easy integration of private and public networks.

INFN has already announced its commitment to OSI standards. However, the actual migration will be delayed until the OSI products commercially available have reached a sufficient level of reliability and performance. The migration is expected to take place during 1988.

ENEA will soon have in two nodes with software interfaces to X-25. The organisation has made no commitment, for the time being, to move to OSI. Again, final decision is subject to the general availability of commercial products.

CINECA has built a private X-25 network, interconnected with the public communications facility ITALPAC. The principal use of this kind of network it its remote login function, but it can also be used for transporting SNA and DECNET traffic. Furthermore CINECA is using a private NETWAY network for a Virtual Terminal function, waiting for standards to be released. Plans for migration to OSI have already been defined. They involve the installation of standard products, as soon as these are officially released and reliable, on the various machines (IBM, CDC, DEC, CRAY) and on the NETWAY network.

CILEA agrees with the proposed policies for OSI migration. However, as is the case with the other network systems, the actual migration will be delayed until the commercially available OSI products have reached a sufficient level of reliability and performance. The first service expected to be implemented in the heterogenous CILEA environment in the near future, is an X-400 Message Handling System. This service can usefully serve as a gateway between different mail systems as implemented in CERN.

The CSATA network will support a full OSI environment when OSI products become commercially available and there is a guarantee of reliability and performance. The migration date for IATINET is also expected during 1988. The OSI services to be supported are file transfer, message handling and directory services.

EUnet
A Pan-European
Cooperative Network

Started in 1982

EUnet is a pan-European cooperative computer network for information exchange comprising almost a thousand sites in 19 countries. Like many other cooperative networks it originated from a limited community of users with similar interests, in EUnet's case the UNIX operating system. It was started in 1982 when some of the few UNIX sites in Europe connected to each other and set up a link to a similar network in the United States called Usenet.

For Research and Development

Due to the lack of networking facilities for the research and development community in Europe, the scope of EUnet widened almost immediately as mathematics and computer science researchers in general discovered it as a convenient means of communication with colleagues worldwide. Now researchers in fields not directly related to computer science also are making use of EUnet as the "critical mass" of people with access is reached.

EUnet was never limited to the academic community alone, and very soon became a vehicle for technology transfer supporting joint projects of academia and industry as well as enabling researchers of both communities to exchange information quickly and informally. Because of its cooperative nature and low initial connection overhead, EUnet has also been available to small and medium size companies without much capital which are common in the software industry. For them it is especially imp-

ortant to keep up to date with developments in their fast paced industry.

Electronic Mail

EUnet is a vehicle for information exchange rather than for sharing computer resources. It provides two services: Electronic Mail and News. No interactive services like remote login are currently provided.

Electronic Mail enables users to send messages to each other much like postal mail, but more quickly and conveniently. As important property of Electronic Mail messages is that they are sent in "machine readable" form. This makes it possible to exchange software and documentation easily as well as facilitating the production and review of documents by geographically dispersed groups.

Electronic News

The News is a distributed bulletin board and conferencing system. It is organised in more than 200 "newsgroups", each covering a distinct area of interest. This service has very much replaced the printed newsletter as a means of communicating time-critical information in the computer science community. The advantages are speed as well as the ease of participation. This had lead to an explosion in the volume of available information. Much of the information is now "moderated" or edited giving higher quality electronic publications. The News service has often opened communications in areas where no formal channels existed previously. For example, discussions take place on computer products, both software and hardware. Since vendors use the network as well as users, the discussions help both communities.

The News service is also used to publish software. Newsgroups exist for software running under Unix as well as several PC and workstation operating systems. This way public domain compilers, mailers, the News system itself, networking software (including ISO/OSI) can be spread quite quickly.

Although there is no official support for most of this software it is in widespread use in the R&D community because it comes in source form and can thus be maintained by the users themselves. Bug fixes and enhancements are shared using the network and sometimes the authors or volunteers gather them and publish new releases from time to time.

Loosely Coupled Organisation

EUnet has a loosely coupled distributed rather than centralised organisational structure. It is run by agreements between the participants which are kept as informal as possible, especially no one enters a formal obligation to provide service to others. While this mode of operation may not be adequate for commercial networks, it fits the cooperatively minded R&D community very well because it reduces necessary investments and running costs of the network considerably as well as minimising the economic risks for those actually providing a service to others.

EUnet as a whole is represented by the European Unix User Group. Formal decisions affecting the whole network are taken during the two annual meetings of that group.

The Users Pay!

Each EUnet site bears its own costs of connecting and operating the network connection. Some nodes in the network incur a disproportionate amount of the communications costs by relaying data and supporting the network in general. These costs are distributed to the individual users by a hierarchy of local and international arrangements customised to local conditions and designed to minimise overhead. Apart from donations of equipment and volunteer work by individuals EUnet receives no support from third parties. Thus the users themselves pay for EUnet services they use.

EUnet
A Pan-European Cooperative Network

About a Thousand Sites

It is not easy to give the size of EUnet since the measures used to express network sizes differ and some data are purposefully hidden by local entities to make routing easier. To give the number of nodes is misleading because a node can be anything from a single user Unix machine to a local area network with dozens of machines and hundreds of users. The numbers of machines is not known because any number of machines can be hidden behind a gateway node. Therefore we let the number of sites refer to geographi-

Number of EUnet sites per Country October 1987	
23	Austria
16	Belgium
29	Switzerland
140	Germany
46	Denmark
1	Spain
53	Finland
96	France
244	United Kingdom
7	Greece
6	Rep. Ireland
11	Iceland
28	Italy
2	Luxemburg
110	Netherlands
20	Norway*
1	Portugal*
144	Sweden
1	Yugoslavia
978	EUnet

*The Norwegian part of the network is currently under reorganisation. The Portugese backbone site is being established.

cally and/or organisationally separate entities.

Of all 978 EUnet sites, 132 are currently official subscribers to the News service receiving a varying scope of newsgroups.

Another measure of network size is the volume of traffic. Because of the high interconnectivity inside EUnet this cannot be measured centrally and is therefore difficult to obtain. The throughput figures for larger national backbones at the moment are well above one Gigabyte per month.

Interconnections

From it's inception EUnet has actively sought to make communication with users of other networks and communications services in the research and development community as easy as possible. EUnet currently is operating direct Electronic Mail gateways to the DARPA Internet (only part of which is the ARPANET), CSnet, EARN/ BITNET, JANET, ACSNET, UUCP, JUNET and RARE experimental MHS service. All other major networks used in the research and development community are reachable from EUnet.

The News service has gateways to Usenet and the DARPA Internet.

ESPRIT Connections

The ESPRIT Information Exchange System is represented on EUnet by the node "Euroies".

This node also connects EUnet with the EuroKom service and enables EuroKom users to exchange mail messages with EUnet users. "Euroies" also receives a comprehensive set of EUnet newsgroups. A lot of ESPRIT participants are also directly present on EUnet and quite a few give "communication" with ESPRIT partner's as a reason for connecting to it.

Directory information about EUnet sites is regularly made available to both "Euroies" and the IES data collections service offered on the ECHO information system.

Towards International Standards

EUnet grows by about 100% a year both in terms of sites and in terms of traffic. The large amount of traffic makes the use of public X-25 networks for international connections very uneconomical. EUnet will therefore restructure it's international infrastructure soon. An improved infrastructure is expected to provided additional services to sites which are willing to pay for them.

In the long term, EUnet plans to move to the use of internationally standardised protocols in order to achieve even higher connectivity and better services such as non-textual mail. This move however will be made gradually and with all due care to preserve the current level of service to the users.

Both these developments present a lot of problems and need careful planning. EUUG and the European Commission have jointly financed a study into migration strategies towards the use of ISO/OSI protocols.

Cooperation

The most important issue that faces all European networking efforts is cooperation, because it is very important to present a homogenous view of the European networking infrastructure to the R&D community inside but especially outside of Europe. EUnet has always cooperated flexibly and pragmatically with other networks, which resulted in an outstanding amount of connectivity that could be exploited by EUnet users and frequently by users of third networks as well. EUnet will actively continue to pursue cooperation in order to improve the networking infrastructure in Europe.

DANIEL KARRENBERG
Centrum voor Wiskunde
en Informatica Amsterdam,
The Netherlands

TED: Tenders Electronic Daily – Invitations to Tender now Online

Over the past ten years, all who have an interest in responding to Commission and other public calls for tender have become familiar with the "S" Supplement to the "Official Journal of the European Communities" which appears daily in the official Community languages. All public invitations to tender for supplies worth more than about 175.000 ECUs and public works contracts worth more than about 1 million ECUs are published in this medium. The subjects of tenders are very wide, ranging from, e.g. office furniture or road works, to hospital equipment, deep-fronzen food, fuels, or clothing.

Currently the Official Journal appears daily, except Sundays and Mondays, but not all may know that the same information is available online for 20 hours daily, Monday to Friday. The data bank providing this information, TED, is mounted on ECHO, the Community host in Luxembourg, and is updated daily.

It must be realised that for both the printed version and the data bank an enormous amount of work is needed to overcome the Community's language problem. The idea is that a tender from Italy, for example, should also be available to a Dane in his own language. Although in certain cases it is possible, by means of an "urgent procedure" to leave parts of the tender in the original language, other countries are thereby put at a competitive disadvantage, and firms in the various countries no longer enjoy equal opportunity.

This is why the publisher, the Office of Publications of the European Communities, began years ago to use data processing for all stages of production.

The European Commission's translators work directly online in order to transmit the texts to the contractor responsible for the printed and electronic versions, which are then produced overnight, and next morning a magnetic tape is delivered to the ECHO Computer Centre, at present by motorised messenger service. The tape normally arrives at the Computer Centre at 7.30 am., after which the data bank can be updated, i.e. the individual dictionaries (inverted files) for the search are created. Between 8.30 am. and 9.00 am. local time TED is available for consultation on ECHO worldwide in all the official languages. Work is in progress on a system whereby data are transferred directly from the computer in Saarbrücken to the computer in Luxembourg by means of file transfer in order to save time and make the data available even earlier.

What ECHO offers

ECHO currently offers TED in two forms:
– as an online service for information retrieval by the customer himself
– as a telex service for computerised profile delivery to the customer.

TED online

The ECHO computer is linked to the Luxembourg LUXPAC network, which is in turn linked to all existing packet switching networks.

Thus ECHO and hence TED are accessible from all countries which offer this type of data transmission.

In order to access the TED data bank at ECHO, users must sign a customer contract, after which they receive an access code in the form of a personal password and a user manual with a description in English of the interrogation language and structure of the various ECHO data banks, including TED.

The customer naturally needs to know the interrogation language, the Common Command Language (CCL), which offers the possibility of scanning the data bank according to a wide range of criteria and also of logically combining different aspects.

TED-Telex

This data bank profile service must surely be one of the few innovative services offered by a data bank (the role of ECHO) which also gives small and medium-sized firms a chance to take advantage of what data banks have to offer.

The technical solution is as follows: a special telex machine is connected to the ECHO computer, in which an interest profile previously described on forms by the customer is stored. Following the daily update, all the profiles are run and the customers are informed in brief by telex whether there are any invitations to tender in their field of interest. If they want the full text, they request it from ECHO by telex and receive it the same day or the next day (once again by telex).

Cost of the service

There are 3 different tariffs:
a) A special tariff for Chambers of Industry and Commerce which pass on the information to their members free of charge (approx. 600 ECUS a year). In this case there is no extra payment for connection time.

TED: Tenders Electronic Daily – Invitations to Tender now Online

b) **TED online**
Per hour connect time is around 25 ECUs.

c) **TED Telex**
There are three different tariffs for the telex service according to the amount of information the user wishes to have
1. 1,25 ECUs for a short telex
2. 2,50 ECUs for a standard telex
3. 5,00 ECUs for a full text.

In the case of b) and c), information brokers who charge for passing on the information must pay a 20% surcharge on all tariffs. Although TED online is basically the only suitable solution for information brokers, solution c) may also be suitable when the receiver used is not a telex unit but a teletex unit or a mailbox with telex interface.

Tariffs for all services are currently under discussion, and ECHO is seeking to abolish the annual subscription and possibly increase the hourly tariff. Customers will, however, only have to pay for actual use.

Advantages

Even though the Official Journal is available daily at about noon, it still takes a day or two to reach the desk of those interested, whilst the online version is ready for consultation at 9 am. on the day. What is more, instead of browsing through a whole issue of a journal, online users only need to look at their areas of interest.

Content of the TED data bank

At present the data bank contains about 900 invitations to tender. In recent months the number has varied between 600 and 900 invitations to tender the deadlines of which have not expired. It should be noted that old tenders, i.e. those the deadlines of which have already expired, are regularly removed from the data bank. Since the beginning of 1986 the English versions of previous tenders have been compiled to form an historical TED data bank.

The individual invitations to tender in the data bank are coded according to the four-digit NACE codes (General Industrial Classification of Economic Activities within the European Communities).

Future of the TED data bank

The following developments are currently planned in order to improve considerably the content and technical quality of the TED data bank and the advantages it offers.

File transfer to ECHO

Development work is due to start very soon on replacing the system of transporting a magnetic tape from Saarbrücken to Luxembourg every morning by a system of electronic transfer via a computer link. ECHO hopes that in this way it will be possible to make TED available earlier in the day.

Inclusion of invitations to tender from Scandinavia and the USA

Negotiations are under way to include in the data bank invitations to tender from the non-Community Scandinavian countries and the USA.

The political negotiations with the USA are providing lengthy, with numerous obstacles, while the negotiations with the Scandinavian countries are likely to produce positive results sooner.

Calls for research proposals in TED

The Commission's Directorate-General XII decided on 30 January 1986 that in the near future calls for research proposals should also be available via TED so that they are more accessible to small and medium-sized firms.

Reduction of the financial threshold

In a recent market study on TED one of the suggestions made was that the financial threshold for invitations to tender should be reduced so that more invitations could be included in TED. However, this could not be achieved without lengthy negotiations with the Member States, so nothing is likely to come of this in the near future.

For further information please contact:

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      00352 - 49 928-2564
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Described by Finnish PTT Director-General Pekka Tarjanne as a momentous step for Nordic telecommunication, the formation of the Scantel organisation will be the first concrete example in Europe of the concept of one-stop shopping for data services and could presage the more ambitious CEPT project on Managed Data Network Services that it will be in operation within 6 months. Kjell Holler, Director-General at Norway's NIA agrees – 'The bypass problem is now so strong', he says, 'that to wait for a Europe-wide solution could mean that we lose the train.' Nevertheless, the CEPT MDNS will be a natural evolution for Scantel – 'I am very hopeful for this', says Hans Wertzen, Director-

Scantel Blazes the Managed Data Network Trail

(MDNS). Jointly owned by the PTT administrations of Sweden (48%), Finland (16%), Norway (16%), Denmark (16%) and Iceland (4%), Scantel will be headquartered in Stockholm and offer end-to-end intercontinental communication links primarily for the Scandinavian business community.

Initially, connections will be made on a leased line, non-voice basis to Europe, the US, Japan, Australia, Hong Kong, Singapore and other countries, although a switched service could begin within two years. If this was the case certain problems could arise regarding CEPT/CCITT representation, but the environment in Europe is likely to have altered radically by that time. While Scantel will first be aimed at the Nordic market and will not sell services outside Scandinavia, the organisation could, in theory, develop as international carrier to challenge the likes of Mercury and British Telecom.

Tony Hagstrom, Televerket's Director-General, comments wryly that a major difference between the CEPT MDNS project and Scantel is

General at the Danish PTT, 'after discussions with a number of US companies I feel that the MDNS concept could be an extremely valuable tool for large corporations as well as smaller frims.'

Among the value added services offered by Scantel will be X-400 Message Handling (P1) and store and forward facsmile. The company is also looking closely at the potential VSAT market in Europe. Services provided at the moment by Swedish Televerket's Teleinvest subsidiary – including videotex, electronic mail, card evaluation, computer office automation, and the Volvo-Televerket-Gothenburg Harbour Authorities data network – will be subsumed within the Scantel organisation. The Mailstar low polar earth orbit satellite system announced last year for Swedish business is also likely to be an element in the Scantel network.

Information Exchange and Acquisition, and Reading Habits

Over the years, many national and international efforts have been made to improve information flow to scientists of all disciplines, whether this takes place conventionally (i.e. hard copy) or electronically (e.g. Docdel). Various approaches have been tried to see where the real bottlenecks are, what barriers exist, etc. The results of one such study undertaken by the International Council for Scientific and Technical Information, a member of International Council of Scientific Unions, have just been published. Leaving aside the general aspects of this useful report, there are some strange facets relating to the IT industry and parish. An analysis of over 150.000 document requests on 5 major national document supply centres showed not unexpectedly that whilst the number of different journal titles exceeded 60.000, a mere 1.041 accounted for 30% of all requests, with the most frequently required periodical reaching nearly 6.000 individual requests. Looking through the list of journal titles the highest ranking IT journal, well down into the two hundreds, is Byte with 825 requests, followed by International Jnl. of Man-Machine Studies (815) and Computer Jnl. (785).

The question that arises is: Are IT workers so well supplied with journals that they do not need to borrow material, or are they so well-informed that what is published is no longer of interest, or do they not read? An answer or comment would be interesting.

ISO 4335: 1987	Information processing systems – Data communication – High-level link control elements of procedures	
ISO 7478: 1987	Information processing systems – Data communication – Multilink procedures	
ISO 8208: 1987	Information processing systems – Data communications – X-25 Packet Level Protocol for Data Terminal Equipment	
ISO 8326: 1987	Information processing systems – Open Systems Interconnection – Basic connection oriented session service definition	
ISO 8327: 1987	Information processing systems – Open Systems Interconnection – Basic connection oriented session protocol specification	
ISO 8372: 1987	Information processing – Modes of operation for a 64-bit block cipher algorithm	
ISO 8632-1: 1987	Information processing systems – Computer graphics – Metafile for the storage and transfer of picture description information – Part 1: Functional specification	
ISO 8632-2: 1987	Information processing systems – Computer graphics – Metafile for the storage and transfer of picture description information – Part 2: Character encoding	
ISO 8632-3: 1987	Information processing systems – Computer graphics – Metafile for the storage and transfer of picture description information – Part 3: Binary encoding	
ISO 8632-4: 1987	Information processing systems – Computer graphics – Metafile for the storage and transfer of picture description information – Part 4: Clear text encoding	
ISO 8652: 1987	Programming languages – Ada	
ISO 8790: 1987	Information processing systems – Computer system configuration diagram symbols and conventions	
ISO 8877: 1987	Information processing systems – Interface connector and contact assignments for ISDN basic access interface located at reference points S and T	
ISO 8878: 1987	Information processing systems – Data communications – Use of X-25 to provide the OSI connection-mode network service	
ISO 8885: 1987	Information processing systems – Data communication – High-level data link control procedures – General purpose XID frame information field content and format	
ISO 8907: 1987	Information processing systems – Database languages – NDL	
ISO 9067: 1987	Information processing systems – Data communication – Automatic fault isolation procedures using test loops	
ISO 9075: 1987	Information processing systems – Database languages – SQL	
DIS 7498-2	Information processing systems – Open systems Interconnection Reference Model – Part 2: Security architecture	1987-12-18
DIS 7498-3	Information processing systems – Open systems Interconnection – Basic Reference Model – Part 3: Naming and addressing	1988-03-10
DIS 8807	Information processing systems – Open systems Interconnection – LOTOS (Formal description technique based on the	

	temporal ordering of observational behaviour	1988-03-10
DIS 8880-1	Information processing systems – Protocol combinations to provide and support the OSI network service – Part 1: General principles	1987-12-25
DIS 8880-2	Information processing systems – Protocol combinations to provide and support the OSI network service – Part 2: Provision and support of the connection-mode network service	1987-12-25
DIS 8880-3	Information processing systems – Protocol combinations to provide and support the OSI network service – Part 3: Provision and support of the connectionless-mode network service	1987-12-25
DIS 9066-1	Information progressing systems – Text communication – Reliable Transfer – Part 1: Model and service definition	1988-03-10
DIS 9066-2	Information processing systems – Text communication – Reliable Transfer – Part 1: Model and service definition	1988-03-10
DIS 9072-1	Information processing systems – Text communication – Remote Operations – Part 1: Model, notation and service definition	1988-03-10
DIS 9072-2	Information processing systems – Text communication – Remote Operations – Part 2: Protocol specification	1988-03-10
DIS 9074	Information processing systems – Open systems Interconnection – Estelle (Formal Description Technique based on an Extended State Transition Model)	1988-02-27
DIS 9314-1	Information processing systems – Fibre Distributed Data Interface (FDDI) – Part 1: Physical Layer Protocol (PHY)	1988-01-30
DIS 9315	Information processing systems – Interface between flexible disk cartridge drives and their host controllers	1988-03-10
DIS 9316	Information processing systems – Small Computer System Interface (SCSI)	1988-01-30
DIS 9318	Information processing systems – Intelligent Peripheral Interface – Physical level	1988-02-13
DIS 9319	Information processing systems – Intelligent Peripheral Interface – Device specific command set for magnetic disk drives	1988-02-13
DIS 9319	Information processing systems – Intelligent Peripheral Interface – Device specific command set for magnetic disk drives	1988-02-13
DIS 9542	Information processing systems – Data communications – End system to intermediate system routing exchange protocol for use in conjunction with the protocol for the provision of the connectionless-mode network service	1988-01-09
DIS 9543	Information processing systems – Information exchange between systems – Synchronous transmission signal quality at DIE/DCE interfaces	1988-02-06

ISO, which is in the process of publishing the series of Interna-
tional Standards for the computer world known as the ISO
Open Systems Interconnection Basic Reference Model, has just
issued two more which are of key importance:

ISO 8326 *Open Systems Interconnection – Basic connection
oriented session service definition*

ISO 8327 *Open Systems Interconnection – Basic connection
oriented session service protocol specification*

The two standards provide the essentials of interconnection at
the Session Layer of the Reference Model.

Session layer OSI standards

The Open Systems Interconnection series is a set of Internatio-
nal Standards which allow the highest practical degree of compa-
tibility in future hardware and software products. Attainability
of this ideal is represented by the conceptual seven-layer "mo-
del" published as ISO 7498. The model identifies standardisa-
tion requirements in an hierarchy of seven layers. There are two
types of standards associated with each layer of the model: the
service specification defines the functions and facilities offered
to the layer above, while the protocol definition defines the ac-
tions and responses exchanged between systems in order to pro-
vide the service.

ISO 8326 and ISO 8327 thus specify the essentials of intercon-
nection in the Session Layer. This layer itself has special signifi-
cance as it provides facilities for managing and coordinating the
dialogue between systems. An important part of the partition-
ing of the OSI reference model is that it separates communica-
tions-oriented functions (the lower layers) from the more user-
oriented functions. The Session Layer, is in the central position
between the higher level Presentation and Application Layers
and the Transport Layer immediately below.

Several International Standards are needed in each Layer of the
OSI Reference Model. The service and protocol standards for
the Transport Layer were published in 1986, and the service
standard in the Network Layer appeared recently (six others in
the Network Layer are at advanced stage). Standards are well
advanced (i.e. at Draft International Standard stage) through-
out other Layers, including six relating to the Application Layer,
four for the Presentation Layer and a series (to be ISO 8802) re-
lating to local area networks (LAN); this family of International
Standards links the Datalink Layer with the Physical Layer.