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Esprit Information Exchange System

iesnews

Issue No 30, October 1990

LATE NEWS

Y-NET Launched.

The ESPRIT IES Y-NET project introduces OSI based communication services for researchers in ESPRIT and other EC R&D programmes. Further details will be provided in the next issue of IES News.

CEC Directives and Actions.

The Open Network Provision Directive was adopted by the Council of Ministers on 28 June 1990. A Communication to the Council dealing with Personal Data Protection in a Single Market was adopted on 18 July 1990. More in the next issue of IES News.

New ISO Standard for OSI.

ISO/IES 10022: Open Systems Interconnection: Physical Service Definition has just been published.

Dictionary of Computer Science: English - French.

A 400-page dictionary produced jointly by AFNOR and ISO is now available.

Communication is an important key within the ESPRIT environment, and the Information Exchange System (IES) provides communication and information services for European researchers to support their involvement in ESPRIT projects. At this years' ESPRIT Conference, IES will have the following events:

IES Users' Forum, Tuesday, 13 November 11.00-12.30

The aim is to explain the IES services to the user and explore how these services could be further developed.

Introduction (H. Hünke, CEC)
Short reports on IES Services
-EuroKom (D. Jennings, UCD)
-IXI (J. Pérez Vidal, CEC)
-Y-NET (P. Corte, TELEO)
-Interrelations of IES Services (K. De Vriendt, CEC)
Discussion: Future development and perspectives

IES at the ESPRIT Conference 1990

Computer Networking, Wednesday, 14 November 09.00-10.30

IXI, the new pan-European X.25 backbone service for researchers (J. Devoil, IXI Project Team)
The COSINE project (H. Davies, COSINE Project Management Unit)
High Speed Networking in Europe (P. Van Binst, University of Brussels and RARE WG6)
Upgrading an International Link for Research Collaboration (P. Kirstein, University College London)
Primary Rate ISDN OSI Office facilities (B. Patel, 3NET Ltd.)

COSINE Users' Forum, Wednesday, 14 November 14.00-17.30

A major topic to be discussed will be a paper on support for International Users Groups. Further details are provided in the COSINE section on Page 11

Exhibition

Visitors at the Conference will have the opportunity to familiarise themselves with the work of IES. The IES stand in the Exhibition area is also hosting other DGXIII information services. At the IES stand there will be:
EuroKom, Y-NET, IXI, COSINE, ECHO, PROTEAS and CORDIS.

Esprit
DGXIII
Telecommunications
Information Industries
and Innovation

THIS ISSUE:

COSINE NEWS

CENELEC ELECTRONIC COMPONENTS COMMITTEE

Introduction

The CENELEC Electronic Components Committee (CECC) System for electronic components of assessed quality became operational in 1973. Its object is to facilitate international trade by the harmonisation of the specifications and quality assessment procedures for electronic components and by the grant of an internationally recognised Mark, and/or Certificate of Conformity. The components produced under the CECC System are acceptable in all Member Countries without further testing. There are currently 15 countries participating in the CECC System.

Towards 1992

The work of the CECC has been significantly influenced in recent months by a growing realisation both within Western Europe and further afield, of the implications of the Single European Market of 1992 and beyond. In particular, attention has focussed on the urgent need to expand the existing structure of European Standards into a comprehensive set of technical requirements to assist cross-border trade. Coupled to this has been the increasing wish to reduce the delays and duplications resulting from a lack of coordination of national certification arrangements. The CECC System, having already established a broad-based set of standards for electronic components and full mutual recognition of approvals, is well equipped to support these moves to lower barriers within Europe. Nevertheless, much additional work is necessary to further expand the existing CECC specifications and to ensure adequate coordination between the work of the CECC and other European activities in the field of standards and certification.

Enhancing the Status of CECC

The CECC has taken the decision that many of its specifications will in future be proposed for adoption as European Standards (ENs), within the CEN/CENELEC framework. This implies that CECC-prepared ENs will in future be adopted as national standards in all 18 countries of the European Community and EFTA. As CECC ENs are implemented, conflicting national specifications will be withdrawn, with the consequence that the national and industrial implementation of CECC throughout Europe will be greatly enhanced.

Streamlining the System

To cope with its growing responsibilities, whilst at the same time accelerating the progress of its work, CECC has carried out a far-reaching review of its resources and working methods.

The outcome of the study is a set of measures to improve efficiency, provide additional manpower and to assist speedy decision making. So that CECC can continue to demonstrate a willingness and ability to respond to the fast-moving developments in electronics technology, a number of new initiatives has been taken both in relation to specific technical requirements and to ensure improved liaison with other authorities interested in standards and certification.

Brief View on CEC's Future Policy on Standardisation

CECC has established a Working Group on Quality Assessment Procedures (WG-QAP) with the task to continuously monitor the developments in the European electronics industry and to review the relevant CECC Rules of Procedure to ensure that they reflect modern industrial concepts such as "Statistical Process Control" (SPC), "Total Quality Management" (TQM) for example.

The new concept of "manufacturing"

The advent of EN 29 000 and EN 45 000 series documents and their implementation in the related CECC Rule of Procedure will have a major impact on approvals in general and will make it even more necessary to reflect actual practice in manufacturing operations. These increasingly focus on individual manufacturing processes which contribute to the finished product, rather than on the testing of products at the end of the manufacturing line. To reflect this, it is desirable to consider the separate approval of individual phases of manufacture as an alternative to the existing CECC "subcontracting" arrangements. This implies that it would be necessary to develop a new definition of the concept of a "manufacturer" and to provide for all stages of manufacture to be carried out, where possible, in premises approved to EN 29 000 series documents, or at least assessed to equivalent requirements.

CENELEC ELECTRONIC COMPONENTS COMMITTEE

Reliability methodology

Reliability is becoming increasingly important to virtually all users of electronic components. At the same time, CECC is trying hard to develop its standards to reflect the needs of all users of component standards, both technically and economically.

Whereas the prevailing concept of component reliability can be summarised as "The failure rate of a component type", which implies that a given component type has an inherent, and constant failure rate, CECC is moving towards a new approach in this respect and defines component reliability as "The ability of a component to perform a required function under stated conditions for a stated period of time", thus implying a "Zero failure rate" through the useful life of a component.

However, when trying to ensure a "Zero failure rate" of a component by an approval system, it cannot be achieved by traditional methods such as "end-of-line product" testing, but with modern concepts such as SPC and TQM (i.e. prevention during manufacturing that any component will be outside the limits) applications. These concepts are at present under consideration within the CECC and are due to be incorporated in the CECC Rules of Procedure. It is expected that the new CECC approach to reliability and its realisation by modern concepts such as SPC and TQM will result in a significant step forward in the field of component reliability.

Further information may be obtained from:

CECC General Secretariat
Gartenstr. 179
D-6000 FRANKFURT/M. 70
Germany

Tel. +49-69639171
Telex:4032175 cecc d
Fax:+49-69639427

Summary of Statistics

Qualified Products List (QPL)

Summary of contents of CECC 00 200 Issue 2, 1990

Information current to: 31 March 1990Published: July 1990

2605 qualification approvals (an increase of 10 qualification approvals since the previous issue)

126 capability approvals (an increase of 6 capability approvals since the previous issue)

245 approved manufacturers

49 approved manufacturers with capability approval

126 approved distributors

35 independent test laboratories

CECC Publications and their Related National Documents

Summary of contents of CECC 00 300 Issue 25, 1990

Information current to: 15 May 1990 Published: June 1990

6405 entries (an increase of 57 entries since Issue 24)

3194 harmonised national specifications (an increase of 34 entries since Issue 24)

2768 detail specifications (an increase of 20 entries since Issue 24)

443 CECC Specifications (an increase of 3 entries since Issue 24)

EXACT - THE INTERNATIONAL TEST DATA EXCHANGE SYSTEM FOR ELECTRONIC COMPONENTS

Modern electronic equipment contains a large number of components and its ability to function reliably depends on the behaviour of every individual component. In order to achieve high reliability, equipment manufacturers therefore test the components they intend to use and such tests are time consuming and expensive.

Once the test results have been reported, analysed and acted upon, these results may then be filed away and possibly never referred to again. The results will almost certainly contain data which would be of considerable interest to other equipment manufacturers who may be investing in exactly the same tests to achieve what are virtually the same results. There may also be occasions where similar tests have achieved different results - a possibility that all parties concerned may want to analyse, provided they were aware that discrepancies had occurred. With the advances in electronic technology, information becomes a vital commodity required across the breadth of industry. To make the supply of data between companies an acceptable procedure, it must be equitable and the best method has proved to be an exchange of information.

A number of companies already have private agreements to exchange information with each other, but these are exceptions. Indeed, within some of the larger companies, information is not always circulated internally, let alone to outside sources.

It was for these reasons that EXACT (International Exchange of Authenticated Electronic Component Performance Test Data) was formed in 1967 following a proposal by the OECD (Organisation of Economic Cooperation and Development). The companies participating in the scheme provide data generated by their own test and evaluation procedures and the data are then circulated to other members, who obtain the benefit of each others test work. The components tested cover a wide range from capacitors and resistors to semiconductor devices, from connectors and switches to printed circuit boards. Reports on topics allied to the testing of components are also circulated.

Every month the reports are circulated to members. A newsletter which contains a "Forum" section where members can exchange views on matters of mutual interest is also distributed.

A scheme of this type can only be as good as its index. Both monthly and annual hard copy indexes are produced but perhaps the easiest method to access reports is by using index data on computer diskettes. Diskettes are circulated every 3 months. Software to search the database is available to members to enable them to access reports quickly and easily. Search screens allow reports to be found using criteria such as the Product Description, Manufacturer, Type No. and Date. Browse screens show more than one record at a time and provide the means of searching any field on the database.

In order for all members to understand the subject of each report, a special Component Classification Index based on Major Classifications, e.g. CAPACITORS FIXED, followed by a series of wordblocks which build up a total description of a component, has been developed. This Classification is kept under constant review to take account of technical developments. The Component Classification Index is also used for the hard copy indexes and is a vital tool in using the Report Index Search Software.

The reports consist of a cover sheet in English and the body of the report in English, French or German. Different companies prepare their reports in different ways and time spent in evaluating data received may be relevant. Standard forms for the preparation of reports to make the exchange scheme work efficiently are available.

Reports can be produced entirely on these forms or with a standard cover sheet on an internal report. Many members use the standard forms developed by the organisation for their internal reports which facilitates their circulation in the scheme. At the request of the membership, software is at present being developed to enable reports to be produced using a menu-driven data entry system linked to a module which will output to laser printers the text and drawings together with standardised graphics.

Before reports are circulated, results are submitted to the manufacturers of the products which have been tested and any comments made by the component manufacturer are circulated with the report.

Some members have stated that if one report can be used in their component evaluation procedures instead of carrying out their own tests, the saving will be more than the annual membership fee. They can often use some 5-10% of the circulated reports (500-700 per year), thus giving significant savings.

EXACT
THE INTERNATIONAL TEST DATA EXCHANGE SYSTEM FOR ELECTRONIC COMPONENTS

Reports are based on the results of type tests, qualification tests, quality verification tests, reliability tests, endurance tests, application tests, failure analysis and incoming inspection. Direct dialogue between participating companies within the scheme is encouraged, thus allowing amplification of reports to be achieved and problems to be discussed.

The laboratories of members have a wealth of test equipment. Later this year a directory of the test and environmental simulation equipment in these laboratories is to be published. This will enable members to establish personal bilateral contact to give each other their experience with specific pieces of equipment. The directory will also show whether participating companies are able to accept orders for test work from other members.

Further information can be obtained from:

M.E. TRENCHARD
EXACT Central Office
Burroughs House
The Burroughs
LONDON NW4 4AP
UNITED KINGDOM
Tel. +44-81-202 0937
Fax. +44-81-202 3383

(EXACT is a non-profit making organisation with the status of a technical association. It has participating companies in 15 countries in Europe and the Far East.)

Announcement and Call for Papers

RARE

(Réseaux Associés pour la Recherche Européenne)

with the support of the

CEC

(Commission of the European Communities)

is holding a

Symposium on High Speed Networking for Research in Europe

in Brussels on 24 January 1991

This Symposium follows up the successful RARE/CEC User Meeting on High Speed Networking in Europe organised in February 1989.

The 1991 event will specifically address the international situation, in Europe and worldwide, for data rates of 1 Mbps and above; the following topics will be covered, for which papers are now invited:

- present user needs (scientific and industrial)
- existing and planned high speed telecommunication infrastructure and networking activities
- suppliers points of view (switches, multiplexers..)
- network operators point of view
  - public
  - private
- potential usage of high speed networking by industry at large
- actions, strategies, policies; economic constraints and possible impact

Participation is invited and contributions are sought from the various interested parties: users, suppliers, operators, political bodies.

Contributions should be sent to the RARE Secretariat (attn. M. Dekker) before 30 October 1990. All contributions will be reviewed by a Programme Committee (a subgroup of RARE Working Group 6); some contributions will be selected for oral presentation and/or publication in the Proceedings.

Participation is free of charge; attendance will be limited to about 200 persons; registration forms can be obtained from the RARE Secretariat, attn. M. Dekker, Postbus 41882, 1009 DB Amsterdam, fax. no. +31 20 5925043.

Further information can be obtained from:

Jacques Prévost, Chairman RARE WG6
(c=fr;a=atlas;p=cea;o=ces;ou=routx400; s=prevost)

Paul Van Binst, Deputy Chairman RARE WG6 and RARE Executive Committee
(c=be;a=rtt;p=iihe;o=helios;s=vanbinst)

Marieke Dekker, Executive Officer RARE Secretariat
(c=nl;a=400net;p=surf;0=nikhef;ou=nikhefh; s=marieke)

OSTC
(Open Systems Testing Consortium): The First Year

When OSTC was set up about a year ago (see IES News, No. 25, p. 9), the objectives were formulated as follows:

> To support harmonised test laboratory operation, and at the same time, to encourage competition and innovation;
> To provide a framework for mutual recognition of OSI (Open Systems Interconnection) testing and to work towards practical OSI Certification in Europe; and
> To provide economic and fair solutions in Conformance Testing.

Harmonised Test Laboratories

During the past twelve months much progress has been made. Tele Test of Sweden and OSI Lab of Switzerland have joined the original seven member organisations so that harmonised testing is now available in France, Germany, Italy, Spain, the United Kingdom, Denmark, Sweden and Switzerland.

For additional organisations to qualify as an OSTC laboratory it is necessary to follow certain basic principles. As a first step, it is mandatory to join OSTC as a Full Member and participate in the relevant technical committees to attain a common understanding of harmonisation techniques. Next, OSTC harmonised procedures and technology must be applied in the laboratories of the new member. (Through its publicly available validation techniques, OSTC will help with this.) Finally, the laboratory must be accredited nationally to ensure compliance with European requirements.

To ensure wide acceptance of OSTC work, all OSTC OSI test laboratories must follow the ISO standard on OSI Conformance Testing Methodology and Framework (ISO 9646). The harmonised procedures implemented in the test laboratories cover the usual test sequence of events: PICS/PIXIT processing, static conformance review, test case selection, test execution and verdict assignment and test report generation.

Table 1

	Denmark PTT-DK	France SEPT	Germany FTZ	Italy CSELT	Spain Telefónica	UK BT	UK NCC	NEW Sweden Tele Test	NEW Switzl'nd OSI LAB
X.21 Bis 1	■		▨	▨	■				
X.21 DTE	▨		▨						
X.25 2/3			▨	▨	■			▨	
X.75	▨		▨						
T (0-2)		▨					▨		
S		▨					■		
TTX (4-7)	▨		▨		■				
MHS (4-7)			■	▨			■		■
MHS (6-7)		▨	▨	▨		▨	■		■
FTAM (6-7)			■				■		

▨ now accredited to EN 45000 ■ pending accreditation to EN 45000

Test reports produced by OSTC test laboratories will carry the OSTC logo thereby guaranteeing mutual recognition.

OSTC welcomes further applications from the OSI community to operate new harmonised test laboratories.

Accredited Services
(Table 1)

OSTC work addresses the key OSI technical areas of MHS, FTAM, Teletex, Transport and Session, and Network (X.21, X21bis and X.25).

All test laboratories have undergone accreditation at a national level. This independent assessment helps to ensure that OSTC's testing is carried out to the highest professional standards. In most cases, the accreditation has been carried out successfully to the EN 45 000 series. In fact fully accredited services have been in place since December 1989 (for example, the French SEPT MHS service).

As all test reports produced carry the OSTC logo this guarantees that the service is harmonised and the resultant test report is mutually recognised under the OSTC Recognition Arrangement which in turn is fully approved by ECITC (European Committee for IT Testing and Certification).

Test Tools
(Table 2)

One of the key advantages of OSTC is its dynamic outlook on test tools. Each technical area provides more than one commercially available test tool so that the clients are not locked into one expensive or outdated tester. Each technical area maintains a reference implementation, capable of testing new testers to assess their state of harmonisation with current OSTC technology and allowing their introduction into OSTC, which provides technical documentation and

expertise to evaluate the result.

During the last year, four new test tools have been submitted to OSTC for validation. Harmonised technology is available in the MHS and X.25 technical areas. More choice is shortly to be available in Transport and Session and MHS.

Viable Mutual Recognition

ECITC has described the criteria for mutual recognition of OSI test reports. These rules are listed in ECITC N120 and focus on managerial and technical issues. The latter include availability of specifications, means of testing (test tools and executable test suites) and the need for accreditation to the EN 45000 series. Managerial rules cater for a fair and balanced solution in attaining mutual recognition.

The work of OSTC and ECITC is closely interrelated. Through ECITC (and, in the future, EOTC) EC Member States and EFTA countries arrange for the mutual recognition of certificates. OSTC provides the technical basis for fair and open OSI recognition in a cost effective way by providing a structure for maintaining the harmonisation achieved in CTS.

Documentation

As the usefulness of conformance testing becomes more widely understood, there has been a considerable interest in OSTC technical documentation, particularly from manufacturers.

In the past year many important publications relating to the validation of new tools and services, experience gathered during independent accreditation of participating laboratories and control documents for technical areas have been prepared to supplement the already existing array of technical information available from the Secretariat.

Within OSTC technical areas Full Members aim to provide input to improve the quality of the OSTC test specifications, whilst outside OSTC, expert groups and project teams are being established to meet the challenges of standardising conformance testing.

Initial efforts has focused on the EWOS Expert Group for Conformance Testing, the EWOS Lower Layer Expert Group and the new Project Team for FTAM.

On the other side of the Atlantic, NIST will use OSTC FTAM and Session specifications for U.S. GOSIP testing.

OSTC
(Open Systems Testing Consortium): The First Year

Members

OSTC membership has increased from seven to twelve, of which three so far have the status of associate members. Associate Membership is for organisations wanting to be kept informed of innovative developments within OSTC: free copies of technical documents are supplied and status can be regarded as a stepping stone to Full Membership while evaluating the work of OSTC.

Full Membership is designed for organisations wishing to offer harmonised testing services equivalent to those offered by OSTC. The most important reason for joining as a Full Member is the recognition that long-term commercial viability depends on wide mutual recognition of test reports. In addition to mutual recognition, Full Membership of OSTC helps the credibility of test services, since the open and transparent approach, without concealing or confusing technical facts is now widely known.

Economic aspects are also an important consideration. Full Members share costs because they understand that technical work, in this area, is a very expensive business. OSTC's co-ordinated approach (for example to validation and control of harmonisation) is a key ingredient to help save valuable resources.

The free use of the OSTC logo on validated services and test reports by Full Members helps to control recognition by Member States and ensures visibility of resources. It also provides a vehicle for

Table 2

Technical Area	OSTC Test Tools	New Tools under validation	New Tools validated
Network X.21	MOSES		
Network X.25	OSITES/X.25 NCT 1		IDACOM PT 500
Transport & Session	NCC T & S Tester RTLE-OSI	X RTLE	
Teletex	TPS RTLE-TTX TLTTX		
MHS	OSITEST/400 GENEPX 400	GENEPX 400 PC	NCC/COS MHS Tester
FTAM	NCC FTAM Tester OSITEST/FTAM	NEW	NEW

OSTC
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demonstrating members' commitment to truely open solutions.

Other advantages enjoyed by Full Members are effective co-ordination and liaison activities with immediate access to a network of OSI colleagues; a flexible management structure; an established Secretariat; centralised legal assistance; and joint publicity in brochures, at exhibitions or conferences.

Finally, the contact with OSTC engineers and consultants should also be considered as an added advantage. Indeed, involvement with OSTC's technical committees can only strengthen expertise and help to expedite economic solutions in conformance testing for the benefit of all.

Commercial Responsibility

The recent progress by OSTC in testing is attributed to a strong technical team. Much experience in harmonisation was gained in the CEC funded CTS-WAN programme. However, with the completion of the contracts, commercial responsibility now rests with the test laboratories themselves. This puts the onus on each test laboratory to maintain the necessary high standards to ensure continued mutual recognition of test reports.

Technical Scope
(Table 3)

During 1991, the OSTC members involved in the CTS-2 ISDN Technical Area plan to establish a new ISDN technical area within OSTC. This is regarded as a necessity to ensure continued harmonisation of operational test services when the CEC funded contracts have finished.

A further technical area, encompassing ODA, is also under discussion. It is anticipated that this area would be known as the "Information Interchange" technical area. Initially, work will focus on ODA itself but this could be extended to cover SGML, EDI, CGM and IGES as OSI based applications expand.

Setting up a technical area in OSTC is not difficult. However, there are some basic prerequisites. Services should be operational and should test European and International OSI standards. Test specifications should be in the public domain and test tools commercially available; the related reference implementation must also be identified. Budgetary information and the workplan explaining how harmonisation will be maintained must be available to the OSTC Management Board for approval. And, in line with all other technical areas, organisations offering testing services must be Full Members of OSTC.

Progress in Certification

Certification of products is an essential component for the achievement of community initiatives in both standardisation and testing. It is widely recognised

Table 3

Technical Area	Functional Profiles and ETSI Standards	ENV	CCITT Recommendations & ISO Standards
Network X.21	T/41, T/42	41 106, 41 107	CCITT X.21, X.21bis
Network X.25	T/31	41 104	CCITT X.25
T & S	T/31	41 104	ISO 8073, 8327
Teletex	A/221	41 203	CCITT: F.200, T.60, T.61, T.62, T.70, T.64, X.75/2, X.21, X.25
MHS	A/311, A/3211	41 202, 41 201	CCITT X.400
FTAM	A/111, A/112, A/13	41 204	ISO 8326, 8327, 8224, 8225, 8222, 8823, 8649, 8650, 8571
NEW ISDN	D-ch: ETS/LO3-07, T/S 46-20, T/S 46/30 incl. NET 3, NET 31, NET 32		ISO 8208, ISO 9846 X.75 (SLP) T.70, T.62/T.62bis, T.60/T.61, T.503/T.521/T.563/T.6
NEW Information Interchange ODA		41 509, 41 510	ISO 8613

OSTC
(Open Systems Testing Consortium): The First Year

that preference will be given to products the conformance of which to standards has been certified.

Understanding the importance of certification, OSTC has been working with national bodies interested in certifying products tested in OSTC laboratories. The objective of this work is to specify the technical criteria and procedures necessary for the harmonised award of a mark or logo to both type and product certificates.

In line with ECITC requirements, OSTC will only licence fully accredited independent certification bodies to administer these criteria. This qualification is necessary to preserve the integrity of the OSTC fully approved recognition arrangement.

OSTC logo licences are now available for use on harmonised tools and services. Independent certification bodies will be ready to issue certificates in 1991 for products that have been successfully tested in OSTC laboratories.

Finally, OSTC is not a certification body, but a consortium of laboratories providing harmonised open economic solutions for conformance testing.

For more information please contact:

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THE UK NETWORKING ASSOCIATION

Over the past decade the UK academic community's networking programme has developed to serve a large and increasingly diverse user community. The existing organisational framework is largely improvised having been created over ten years ago to support a relatively small collaborative networking venture between the Computer Board, SERC and the other Research Councils. The programme is managed by the Joint Network Team located at the SERC's Rutherford Appleton Laboratory. This group forms part of, and reports directly to, both the SERC and the Computer Board. In addition the Group reports to the Network Advisory Committee which advises the Computer Board and has no executive powers.

After much discussion, including widespread consultation in the academic community, the Computer Board has agreed that the present structure is inappropriate for the size and complexity of the current networking programme; it increasingly acts as an inhibitor to progress, which puts the whole programme at risk. Several other countries have gained a significant advantage by creating better adapted organisational structures, and the Board has decided that the time is ripe for a re-structuring for the benefit of the UK academic community's current and future needs.

The Computer Board has therefore agreed the principle to the formation of an autonomous Networking Association, and has set up a Steering Group under the chairmanship of Dr. David Hartley to prepare detailed proposals. The terms of reference and membership of the Steering Group are given on the following page. The Board is concerned that the proposals should be developed with further consultation with appropriate representatives of academic community interests and that they have the full support of the academic community. A Consultative Group has been set up to provide this liaison, the membership of which consists of representatives from different interests in the academic community. A list of the organisations involved in the Consultative Group is shown overleaf. The first meeting of the Consultative Group was held on 29 June 1990.

In general terms the Networking Association will take responsibility for the UK academic community's networking programme. The intention to make it autonomous refers to its relationship with the funding bodies and not the institutions of the community itself. Indeed, it is desirable that the Association is owned and controlled ultimately by those in academic institutions which have a direct interest in its activities and services. The networking programme is now large enough to require an organisation and management structure which is sufficiently independent of the funding authorities and which can act in the best interests of the community's networking requirements.

The major benefits resulting from the proposed changes are expected to be:

a. A better management structure at the top level. The existing structure lacks a senior management body with the authority, flexibility and resources to address the serious problems that inevitably occur in a collaborative and rapidly developing programme.

b. A better representation of academic interests in the programme. The community served by the networking pro-

THE UK NETWORKING ASSOCIATION

gramme is very large and continues to expand, and the present organisational structure does not provide a consistent scheme which enables all parts of the community to participate in shaping the programme. Involvement is ad-hoc and partial which tends to lead to complaints of lack of consultation.

c. Access to additional sources of funding. The present organisational structure is based on the two original funding partners, and other parts of the community have expressed a wish to fund activities; the present structure is not well-adapted to include these developments and is unable to respond adequately to the changes in staffing and support required.

d. Industrial participation in collaborative projects. Subject to appropriate safeguards, this is an essential requirement for the future and the UK is already falling behind other countries in this area. Close collaboration with appropriate industrial organisations in specific projects should yield substantial benefits for the networking programme, particularly with major new initiatives such as SuperJANET. With the current arrangements there is no single organisation responsible for the networking programme; external organisations perceive a diffuse collective responsibility involving several bodies each of which has the networking programme as a small part of its overall range of interests. This does not provide sufficient focus and status to encourage collaborative initiatives with industry.

It is intended that the Association will be responsible for managing all the activities, projects and services which comprise the current networking programme, which will continue to be funded via grants or contracts from the appropriate funding bodies. The Association will employ staff to undertake this work and would replace the existing Joint Network Team and Network Executive. The Association will be responsible for promoting the networking programme and encouraging collaborative participation with appropriate external organisations.

The Steering Group intends to use the Consultative Groups as a sounding board; draft proposals will be submitted for comment and discussion, and although the frequency of meetings and the time table are difficult to predict at this early stage, it is likely that more than one round of consultation will need to take place. The timescales are not yet well defined but the aim is to ensure that any course of action which the Computer Board and Research Councils decide to take can be put into effect by 1 April 1991.

Bob COOPER
Director of Networking
Joint Network Team
c/o Rutherford Appleton Laboratory
Didcot
OXON OX11 0QX

Terms of Reference for the Networking Association Steering Group

1. Review requirements and objectives of the proposed Networking Association.
2. Consider comments already received and seek further views as required.
3. Refine the draft model developed for the Association taking into account (1) and (2) above.
4. Prepare draft Articles and other formal documents for an Association which meets the requirements of the UK higher education and research community.
5. Develop a costed plan for the rapid built up of Association membership to create an effective and representative organisation.
6. Develop a costed plan for the transition of the current and planned work on the JNT and NE to the Association.
7. Maintain close liaison with the higher education and research community and establish widespread support for the proposals.
8. Establish liaison with appropriate external organisations which can provide guidance in establishing the Association, e.g. the DFN and NAG.
9. Subject to maintaining the interests of the higher education and academic research community, seek support and comment from appropriate commercial organisations on appropriate participation from this sector.
10. Report to the funding bodies via the Computer Board at appropriate milestones.

Organisations Participating in the Networking Association Consultative Group

The Advisory Board for the Research Councils (ABRC)
The University Funding Council (UFC)
The Polytechnic and Colleges Funding Council (PCFC)
The Scottish Education Department (SED)
The Welsh Office
The Department of Education Northern Ireland (DENI)
The Agriculture and Food Research Council (AFRC)
The Economic and Social Research Council (ESRC)
The Medical Research Council (MRC)
The Natural Environment Research Council (NERC)
The Science and Engineering Research Council (SERC)
The Committee of Vice Chancellors and Principals (CVCP)
The Committee of Polytechnic Directors (CPD)
The Conference of Scottish Centrally Funded Colleges (CSCFC)
The Inter University Computing Committee (IUCC)
The Polytechnic and Colleges Computing Committee (PCCC)
The British Academy

COSINE NEWS

Cooperation for Open systems Interconnection Networking in Europe.

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

Support for International User Groups.

A major topic to be discussed at the COSINE Users' Forum during the ESPRIT Conference 1990 will be a paper on Support for International User Groups prepared jointly by Jill Foster, Maria Heijne and Shirley Wood of RARE Working Group 3.

To ensure the widest distribution possible, the COSINE Project Management Unit has produced a synopsis of the paper for publication in this issue of COSINE News as a basis for further discussion at the Users' Forum on Wednesday, 14 November 1990.

SUMMARY

RARE Working Group 3 (WG3) (Information Services and Directories) believe that good user support is vital to the success of the COSINE network. The users are the "customers", who ultimately will influence the level of continued funding. For the networks to be attractive, it is necessary to provide good user support in the form of human advisers, networked services that are easy to use, information both on paper and on-line, and enhanced facilities for group communication.

The Information Services Subgroup of RARE WG3 started by preparing a proposal for a European information Service (EIS). IT was used to support the requirements for the COSINE Subproject P2.2 (Pilot Support and Information Services), due to start in the near future. The planned activity would provide central information services and tools for structured group communications. Part of the preparatory work included a survey of network user support and information services which highlighted a need for good facilities for user groups.

The following paper sets out recommendations for a project for pilot activities to support International User Groups (IUGs), and outlines the main problems faced by these groups. The project would be called the "IUG project".

The main objectives of the IUG project are:

- To provide a general framework for support of IUGs based on a system of international, national and local user support.

- To provide the means to co-ordinate the activities of user groups at an international level.

- To make use of the services provided by the COSINE sub-projects P2.1 (Pilot International Directory Services) and P2.2 (Pilot Support and Information Services) and to provide positive input to them

- To build on the experience of existing user groups (national or international).

- To promote and publicise the COSINE services to the European research community.

- To encourage use of the COSINE services by the European research community for enhanced group communication and thereby improve the quality of European collaborative research.

In the context of the paper, "user groups" are groups of users or potential users of the COSINE network facilities who are linked either formally or informally by their common area of research. A "user" is anyone in the European research community (industrial, public and academic), including those involved in the support of research (e.g. administrative staff, librarians).

Introduction

The aims of the COSINE Project are to establish an OSI-based networking infrastructure and associated pilot services to enable European researchers to benefit from improved communications and better access to information.

During the COSINE Specification Phase, it was recognised that providing the framework for such communications would not be sufficient (see the COSINE Specification Phase Report 7.11: "User Support") and therefore it would be necessary to encourage users to use the networks. COSINE sub-projects P2.1 (Pilot International Directory Services) and P2.2 (Pilot Support and Information Services) are aimed at doing just that. The IUG project would be an effective way to promote the use of COSINE services and to develop tools for user groups. The project would concentrate on encouraging groups who currently make minimal use of networks.

International User Groups: The Current Situation

"Networks" of researchers exist in all disciplines worldwide; they have various kinds of links with other researchers in their specialised field. Some researchers communicate via face-to-face meetings and annual conferences, whilst other communicate on a daily or weekly basis by utilising existing data networks. Special Interest Groups (SIGs) or (potential) user groups communicate in an ad hoc manner. Although they may be organised to a certain extent at a national level, they lack the necessary framework for coordination on an European level, placing them at a disadvantage compared to their colleagues in North America.

The High Energy Physics (HEP) community is an example of an international group of researchers who are highly organised and utilise computer networks for effective collaboration. However, most user groups find it difficult to set up the organisational framework needed. The IUG project aims to address this problem.

Links with COSINE Sub-Projects

The IUG project is aimed at passive IUGs with regard to the use of computer networks for data communication. In comparison, COSINE sub-project P4 (Pilot projects on the migration to OSI by existing networks or user groups) aims to address the needs of the active IUGs. There should be close co-operation between the IUG project and the COSINE P4 sub-project.

The proposal for the COSINE sub-project P2.2 (Pilot Support and Information Services) to set up an EIS has been accepted. It is intended to provide central user support and tools for user groups to manage their own information services within the overall European information infrastructure. Access to X.500 directory services will be provided by COSINE sub-project P2.1.

The user communities to be targeted by the IUG project activities are expected to make use of, and provide feedback on, the usability of the tools.

The assumption is that, although individual IUGs would have specific needs, the general requirements for group communication tools would be similar enough so that tools could be developed that would help enhance group communication in all fields.

Outline of the IUG Project Proposal

The IUG project would form part of the COSINE education and promotion work. The project would be in two phases:

Phase I: Requirements studies of particular communities.

The initial study would select a number of user groups who make little use of electronic means and examine the methods of communications used. It would also investigate the experience of existing international and national user groups who do use computer networks for collaboration.

Phase II: European demonstrator projects with selected IUGs.

A small support team would work with about eight IUGs to develop the necessary facilities and support framework. These facilities would be based on the services provided by COSINE sub-project P2 (Directory Services and Information Services, including the tools for SIGs).

IUG Project Phase I: Initial Requirements Study of Particular Communities.

It is proposed to study at least 8 international user communities, who do not make significant use of computer communications. Their data communication and interworking requirements would be analysed.

The selected groups would represent a broad spectrum of the research community in order to ensure that the needs of the potential user population are catered for. The selected groups should already communicate, e.g. by telephone, fax and conferences. They should also be prepared to adopt the use of electronic communications.

It is considered extremely important that the IUG project builds on the experience of existing international and national user groups.It is not intended to fund these groups as part of the project.

Early contact would be made with the national user support staff of the various European networks, and any national or international organisations connected with the particular user groups, to ensure awareness of the IUG project activities and to promote closer cooperation.

Also, early contact should be made with any existing national user groups to allow coordination at an European level.

All groups of users studied would be asked to comment on the COSINE sub-project P2.2 tools for SIGs.

Phase I of the project would draw up guidelines for the selection of user groups to participate in the IUG project's pilot activities. Criteria for measuring the success of user groups would also be developed. A condition for continued funding of the groups selected for support as part of the pilot activities would be that their progress, monitored by the IUG project team, meets the criteria at given milestones.

The result of the study would form recommendations for activities to support IUGs,

and suggestions as to which user groups to work with in Phase II.

IUG Project Phase II: European Demonstrator Projects with Selected International User Groups.

The main objective of the IUG project is to encourage use of the COSINE services by the European research community for enhanced group communication and thereby improve the quality of European collaborative research. Following the initial requirements study there should be experimental provision of the identified OSI services in support of these groups. These would be based on the services provided by COSINE sub-project P2 (Directory Services and Information Services, including the tools for SIGs).

The IUG project would provide support for a small number of pilot user communities which would be selected according to the criteria defined during Phase I of the project. In addition, consideration would be given to other groups who can provide their own funding, to benefit from the results of the IUG project.

A project officer would be appointed for each IUG chosen for the pilot activities, ideally a member of the group seconded for the duration of the project. The pilot groups would be involved in the choice of project officer to ensure a successful appointment.

An IUG Project Team would liaise between the national research networks user support groups and the individual project officers and would ensure that good working relations were established between these parties.

The establishment of the project team and project officers should be funded as a part of the IUG project. The extent of funding would be determined during the initial phase of the project.

After initial training by the IUG project team, the project officer of each group would be responsible for:

-Knowledge dissemination: instruction, demonstrations, training.
- Provision of group specific documentation, preferably using tools and materials developed by EIS.
-Organising an electronic mail distribution list (as a minimum).
-Encouraging participation in existing services.
- Project progress reports to form the basis for decisions on whether or not to continue funding the pilot activity.
- Publications on the project in network-related and discipline-related journals.
- Presenting the project at conferences, seminars, etc.
- Liaison with other project officers and the national network user support centres.

The IUG project would provide general mechanisms plus guidelines which would be usable by ANY geographically dispersed user group.

Main Problems and Suggested Solutions.

RARE WG3 Subgroup on Information Services have identified the following as being the main problems faced by IUGs:

- Different European languages impairing effective communications;
- Limited awareness of computer communications amongst researchers;
- No natural pan-European organisational framework;
- No central point of contact for introductory information and for the user to discover what is available;
- Lack of available tools for group communication and information dissemination;
- Lack of tools to manage their own information;
- Lack of good user interfaces to cater for all levels of user: from novice to expert;
- Lack of facilities for researchers "in the field", with no local user support or network connection;
- Sense of isolation: the user often lacks sufficient local or national user support. Some local computing centres discourage non-scientists from using the local computing and networking resources.

Those problems need to be addressed by providing:

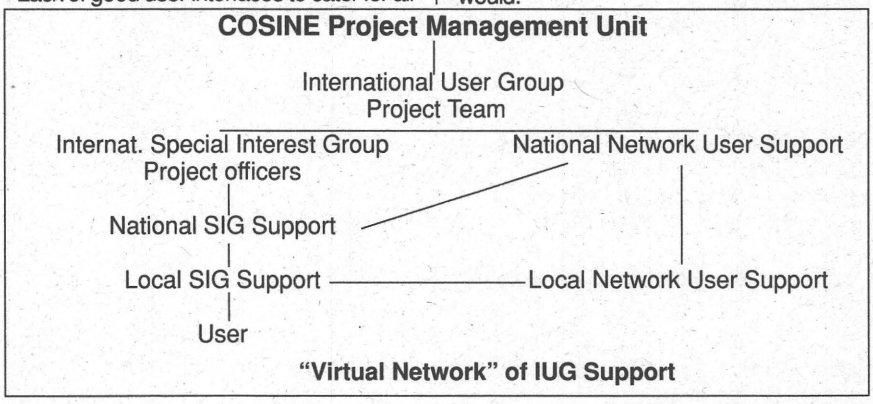
- publicity,
- a central point for help and information,
- a framework for user group support,
- tools for group communication.

There are already several initiatives which could provide solutions to some of these problems, and the IUG project should take advantage of those initiatives.

An urgent action would be to promote and publicise the COSINE services throughout the European research community, to ensure that all researchers are aware that the services exist.

The major problem facing IUGs is the lack of a natural pan-European organisational framework. The IUG project teams main task would be to develop that framework in close cooperation with the EIS staff and also with national user support staff. The role of the project team would be to co-ordinate a "virtual-network" of national and local user support staff and discipline related experts as a cooperative venture on IUG support. It should be stressed that this is seen as a cooperative venture with input from all parties.

In order to establish this framework of international SIG support, the IUG project team would:



- Select and train project leaders for each of the target SIGs who are to take part in the IUG project's pilot activities. There would be regular coordination meetings between project leaders and the IUG project staff to enable them to report on progress, and to exchange ideas and experiences.
- Each project leader would educate a network of national and local "experts" within their SIG, taking care to bring in existing expertise.
- The IUG project team would hold coordination meetings between the EIS staff, national user support groups and the various pilot project officers.

Continued Support after the End of the IUG Project

The IUG project would result in an European framework for IUG support which would be built on the cooperation between national network user support groups and the international SIGs.

A set of guidelines and services would be developed which would be usable after the completion of the project. Mechanisms for funding and/or cost recovery would be investigated. Research funding bodies would be contacted and shown the results of the pilot activities. If successful, the funding bodies would be encouraged to continue funding the project officers and the pilot activities.

The full version of the paper may be obtained from:
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Notification of Invitation to Tender

COSINE Service S1.1 (X.25 Service Provision)

The Eureka Project COSINE is funded by the COSINE member countries (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom, Yugoslavia) and the Commission of the European Communities, with the aim of establishing a pan-European OSI standards conformant computer communications infrastructure for academic, industrial and public research and development workers.

As part of the implementation phase of COSINE tenders will be sought from organisations for the COSINE X.25 service provision. The objective is to provide an international X.25 interconnect backbone network service interlinking packet switched public data networks and private research networks in the COSINE countries. It is expected that the initial contract will be for three years of service. This service will replace the existing "Pilot International X.25 Infrastructure Service" which is provided by PTT Telecom (Netherlands) under contract to the Commission of the European Communities.

Complete or partial tenders will be sought to achieve the service objectives, which are in summary:

1. The service will be made available for use for non-commercial traffic in connection with academic, governmental and industrial research and development activities. It will be available also for non-commercial traffic in the context of other programmes and projects of the members of COSINE, the European Community programme.
2. The service providers will ensure that the project does not infringe any European laws or regulations. In particular this service must be set up with due regard to the Telecommunications and Standards Policies in the COSINE countries and care must be taken to ensure that the Open Network Provisions and competition law are respected.
3. The proposed prices should be related to the capacity of the network and not to the amount of traffic carried.
4. The backbone subnetwork must be capable of offering a variety of access link speeds between 64 Kbps and 2Mbps.

The tendering organisation(s) must be based in one of the COSINE countries.
It is expected that the successful organisation(s) will have as a minimum the following characteristics:

- experience in the implementation and the management of major international projects;
- experience in OSI standards, applications and related products;
- experience of multi-vendor systems and environments;
- experience in the implementation and management of X.25 conformant networks is highly desirable.

The working language of the COSINE Project is English.

The closing date for the receipt of completed tenders is expected to be late in January 1991.

To receive a copy of the Invitation to Tender, organisations should send the following information to the address below for entry into the COSINE register used for administrative and management purposes, organisations which already have an entry in the COSINE register must reconfirm their interest in this service to receive a copy of the Invitation to Tender:

Name of organisation, address, telephone, fax, e-mail, and name of the contact person.

Areas of primary and secondary technical expertise, plus references to other OSI projects undertaken.

The register is a non-exclusive computer database containing similar references to all organisations that have expressed an interest in the COSINE Project. Collaborative ventures will be welcomed for this project where the tenderers are able to show the benefits to be gained from the collaboration. The COSINE Project Management Unit may assist, on request, with the creation of suitable collaborations.

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THIRD COSINE USERS' FORUM

You are cordially invited by the EUREKA COSINE Project to attend or send representatives to the third COSINE USERS' FORUM for users and interested parties in the COSINE project. See agenda.

DATE AND LOCATION OF MEETING

This meeting will take place on Wednesday, 14 November 1990, starting at 14.00 hours, and ending at approximately 18.00 hours. The location will be the Dynasty Room A, Palais des Congrés, Coudenberg 3, Brussels.

The meeting will be organised by RARE (Réseaux Associés pour la Recherche Européenne) and the Commission of the European Communities, on behalf of the COSINE Policy Group. The date and location have been chosen to provide continuity with the ESPRIT Conference 1990 organised by the European Commission, during which there will be a presentation of the current status of the COSINE Project.

OBJECTIVES OF THE MEETING

The main emphasis of the User' Forum this year will be the presentation of those COSINE pilot projects and services with a direct impact on the users - particularly the sub-project P3 (Pilot Activities to Support International User Groups) where there will be a presentation and discussion of a paper "Support for International User Groups", prepared by members of the RARE Working Group on Information Services. (See also p. 11)

If you would like to attend please complete the registration form below and return it as indicated.

AGENDA

14.00 Welcome, by the chairman of the COSINE Policy Group, Dr. Peter TINDEMANS, Min. of Education and Science, P.O.Box 25000, 2700 LZ Zoetermeer, the Netherlands
14.15 "COSINE Status Update" by Dr. Howard DAVIES, Director of the interim COSINE Project Management Unit.
14.30 "The Pilot IXI Backbone Service", by Mr. John DEVOIL of the IXI Project Team.
14.45 "Support for International User Groups", by Ms. Jill FOSTER, Chairperson of Working Group 3 Subgroup Information Services.
15.10 Discussion
15.30 Presentations by Potential COSINE Users.
16.00 Coffee/Tea
16.30 Further Presentations by Potential COSINE Users.
17.00 Presentations by Industrial Companies with an interest in COSINE service provision.
17.40 Discussion
18.00 End of meeting.
19.00 Cocktail

REGISTRATION FORM

Surname: _____ **First Name:** _____ **Title:** _____

Organisation or Company: _____

Business Address: _____

Fax Number: _____ **Telephone Number:** _____

Please register me for the Third COSINE Users' Meeting

I shall/shall not attend the cocktail party

Signed: **Date:**

PRESENTATION

Would you like to give a short presentation (10 to 20 minutes) at the Users' Forum either (if you are a network user) on your envisaged use of COSINE, or (if you are a network service provider) on the services which you are interested in providing? If so, please specify the title of your presentation.

Title: _____

Please return completed form to:

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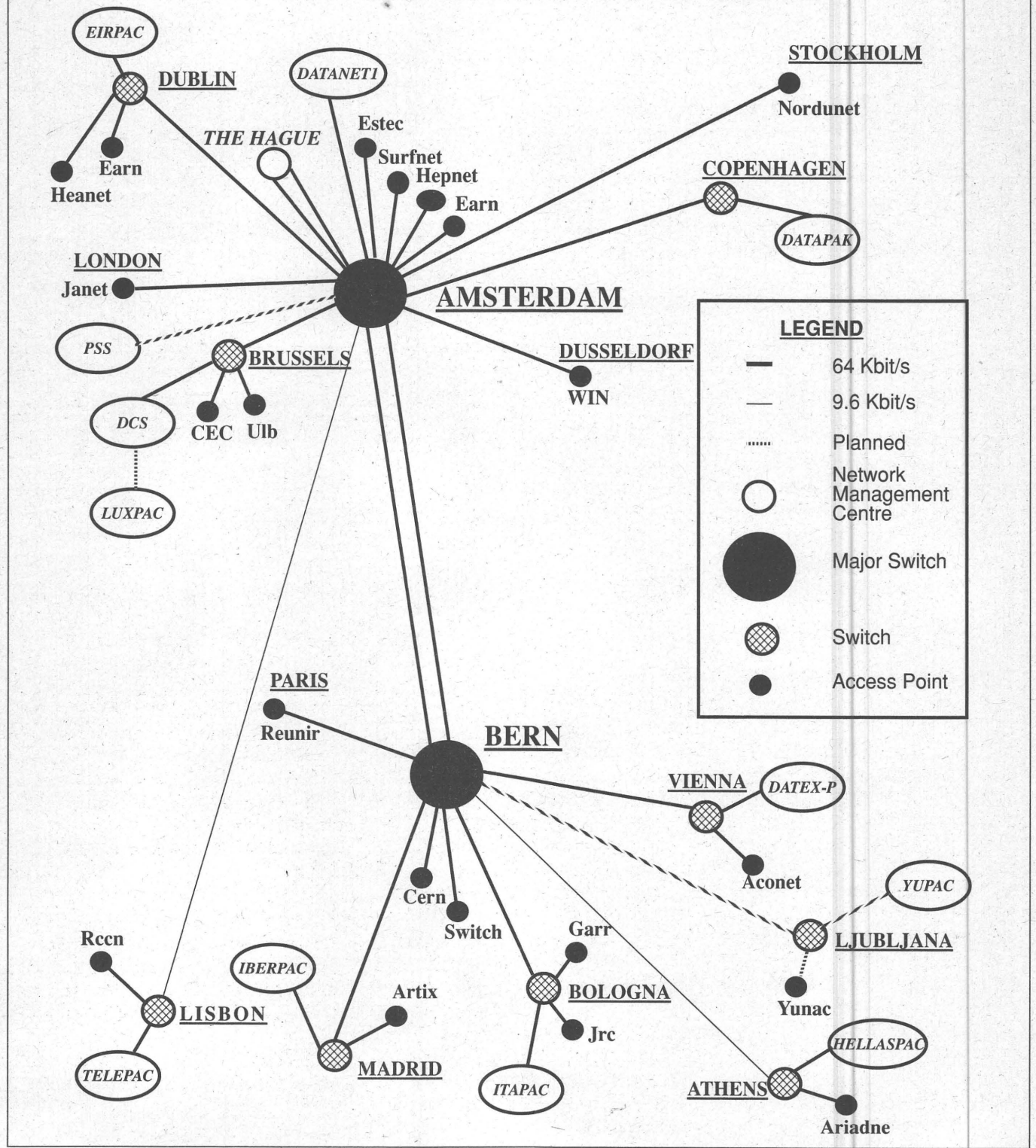
Information correct at time of going to press.

Pilot IXI Service



OSI (OPEN SYSTEMS INTERCONNECTION): THE COMMERCIAL BENEFIT

OSI is not about selling more products to new markets. For a supplier, it is about achieving and maintaining access to large core business markets. During the 1990s OSI, in its various facets, will increasingly become a requirement of users from suppliers. Already the picture is emerging. For example, today no major systems supplier would be credible without supporting X.25 for wide area networking and either Ethernet CSMA/CD (Courier Sense Multiple Access/Collision Detection) or Token Ring type LANs (Local Area Networks). By the end of the century, support for a wider range of OSI standards will be taken for granted.

OSI is needed by users. Not only does it form the heart of the much vaunted drive to open systems, but it has value in its own right. OSI provides the means of extending communications between hitherto isolated systems, within the company and outside with customer and supplier organisations. It increasingly features as an essential requirement of government IT contracts. The data collected for this publication show that over 55 per cent of large commercial companies in Europe and the USA already have or are considering an OSI strategy.

The strategic importance of OSI

A. Users

OSI is important strategically to both users and suppliers. Neither party can afford to ignore it as it offers them the opportunity to operate more effectively as businesses.

The use of IT continues to grow as it proves to be an increasingly vital element of a successful business. With this growth, the probability of the need for interconnecting different systems also grows. This is especially true as organisations seek to exploit fully their investment.

Strategic business issues are driving the need for companies to communicate across boundaries - geographic, departmental, application and corporate. Inevitably, this leads to a growing need for multivendor systems interconnection.

One of the most effective ways of improving efficiency and reducing costs is automation. In the past, automation has been confined largely to well-defined areas: manufacturing, management services, distribution, finance etc. In each of these it has brought many benefits and improved efficiency. However, if companies are going to continue to improve efficiency and reduce costs, they will need to link these isolated but related systems. Inevitably, these systems will be from a multiplicity of vendors and support a variety of protocols. OSI offers the only long-term key to multivendor connectivity in such an environment.

In addition to being strategically important to users, OSI also brings a further important benefit to users. It gives them supplier independence. No longer is an organisation locked into a supplier through proprietary communications protocols. Instead, it can choose the best system for the problem. Users are already exercising this power.

B. Suppliers

For the suppliers, OSI is especially important strategically. The overriding reason is the demand for multivendor interconnection from customers. Increasingly, heterogeneous systems are becoming inevitable. In order to supply successfully in such an environment, a vendor needs to be confident it can impose its network architecture on the industry or adopt the next best option by implementing an independent standard - OSI. No supplier, with the exception of IBM, sufficiently dominates the market to hope to impose their own architectural solution. Although it will take many years, the foundations are in the process of being laid for an industry where only two communications architectures survive: OSI and SNA.
There are two supplementary reasons for adopting OSI:

the cost to individual suppliers of retaining multiple product ranges with different network protocols and architectures is prohibitive.

OSI provides an opportunity for suppliers to enter new markets where they have not been strong traditionally. With open communications they can supply a small part of a system without needing to have total capability.

User needs

The figure shows when users expect to begin using individual OSI standards during the next five years. It is based on the results of a survey of over 100 users in Europe and the US.

Based on this analysis, standards can be split into four groups according to the speed with which users expect to start using them. These are:

established standards which organisations are already using in large numbers. They include X.25, 8802/3 CSMA/CD, 8802/5 Token Ring

emerging standards which organisations are just beginning to use. They include FTAM and X.400

new standards which organisations are keen to use. They include FDDI, OSI network management, X.500, OSI security and EDIFACT

new standards which organisations are uncertain about. They include Virtual Terminal, OSI Transaction Processing, JTM and ODA.

The key OSI standards of 1990 to 1995 will be those in the second and third categories, with the addition of ODA and exclusion of OSI security. ODA will play an important role in raising the functionality of OSI. OSI security, on the other hand, is unlikely to reach technical stability early enough to have a significant impact during this period.

OSI (OPEN SYSTEMS INTERCONNECTION): THE COMMERCIAL BENEFIT

Adopting a standard is only the first stage for users. Experienced users of emerging standards such as X.400 and FTAM, raise two additional issues:

how to extend the use of the standard throughout the organisation. This process is typically expected to take more than five years

how to extend the functionality of standards already in use by the adoption of higher layer standards, such as EDIFACT and ODA.

Supplier response

Supplier OSI strategies can be split into two groups:

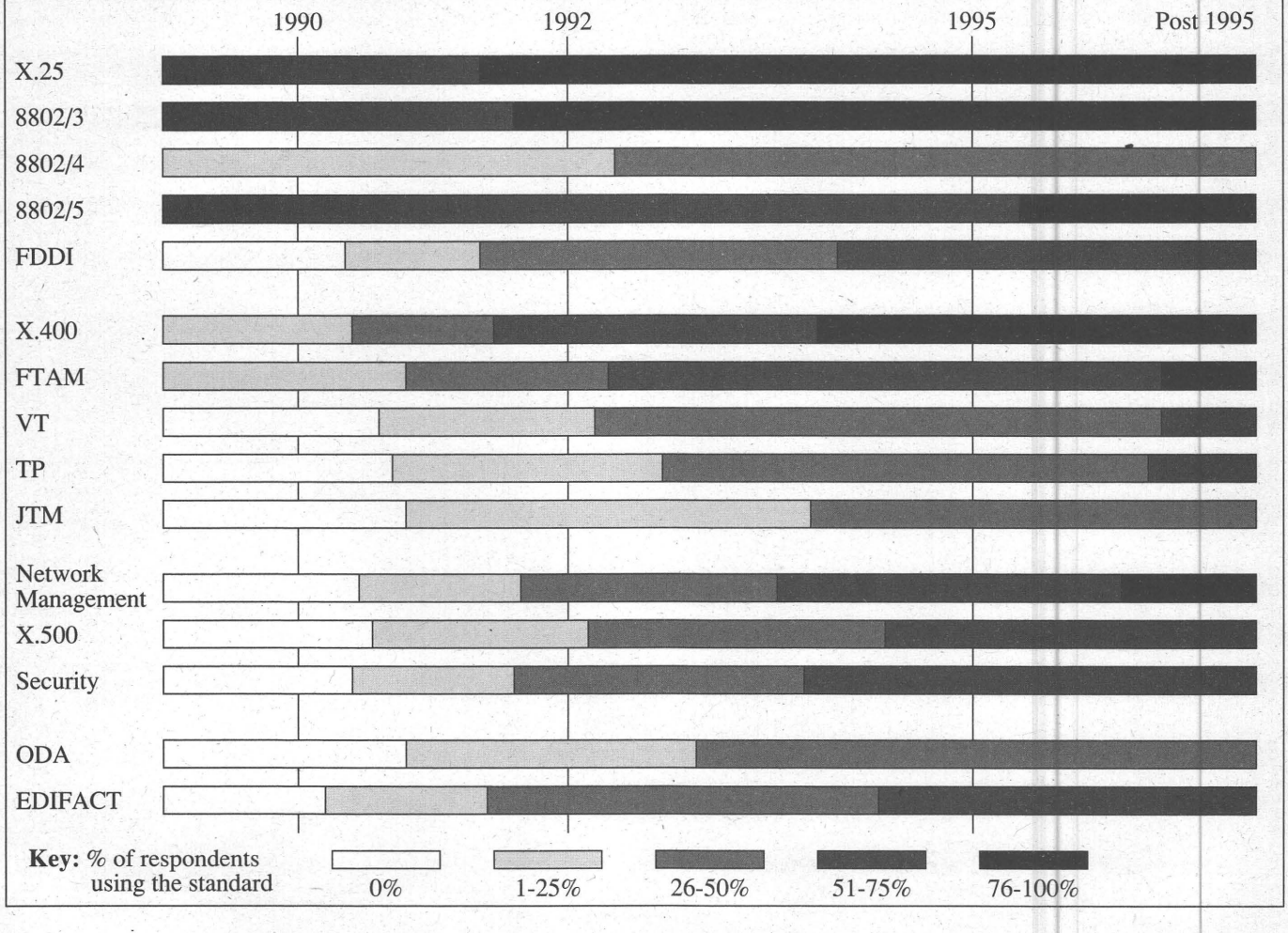
those adopting an architectural approach

those adopting a gateway approach.

The first group comprises all major systems suppliers with the exception of IBM which falls into the second group. IBM sees SNA and OSI as complimentary. Both are considered part of IBM's Systems Application Architecture (SAA). SNA is intended for IBM-to-IBM communications. OSI is intended for non-IBM-to-IBM communications.

In the first group, suppliers are migrating their own proprietary communications architectures towards OSI. So, for example, DECnet Phase IV becomes DECnet/OSI Phase V. Most suppliers have reached the stage of integrating OSI protocols in their architectures up to and including the transport layer. Proprietary applications continue to be supported by additional proprietary protocols on top of the transport layer. OSI applications are supported by full seven layer OSI stacks.

It is unlikely that suppliers will migrate their proprietary architectures to full OSI before the end of 1995. The first stage towards this is when upper-layer implementations, such as X.400, become native rather than gateway solutions. This is when proprietary applications use X.400 for messaging rather than proprietary protocols. Such developments are only likely towards the end of the five-year period and the migration is unlikely to be complete, with proprietary protocols being retained for more complex procedures such as transaction processing.



OSI (OPEN SYSTEMS INTERCONNECTION): THE COMMERCIAL BENEFIT

The market

The table provides projections from 1990 to 1995 for the OSI market in France, Germany, the UK and USA. Each figure represents the proportion of International Standard (IS) conformant shipments to large organisations, in all of the countries, that require a supplier to support each OSI standard. This measure illustrates the proportion of the IS markets that suppliers will be barred from if they do not support a particular standard.

The major conclusions arising from these projections are:

the penalties of not supporting individual OSI standards can be extremely high. For example, if a supplier does not offer X.25 on its systems in these countries today, it is effectively barred from 30 per cent of the IS market amongst large organisations

these penalties are growing in two respects. Firstly, an increasing number of organisations will require support of each individual standard. For example, 3 per cent of IS shipments to large organisations require FTAM support today, by 1995 this will have grown to 42 per cent. Secondly, organisations will require support for an increasingly wide range of OSI standards. For example, by 1992 suppliers will be required to support OSI network management, X.500, and ODA in addition to the standards supported today

the most important standards to support today are established network standards such as X.25, 8802/3 CSMA/CD and 8802/5 Token Ring. These standards will remain important over the next five years

by 1995, X.400 and FTAM will have reached the same level of requirement that users have for X.25 today

a significant number of users will require their suppliers to support OSI network management, X.500, ODA and EDIFACT by 1995. For example, by 1995 some 20 per cent of IS shipments to large organisations will require support for OSI network management

OSI Transaction Processing will not begin to have an impact until after 1995.

Proportion of annual IS shipments to large organisation in France, FRG, UK and the USA that require a supplier to support each individual standard (%).

	1990	1991	1992	1993	1995
X.25	30%	39%	50%	60%	71%
8892/3 CSMA/CD	34%	39%	43%	47%	52%
8802/4 Token Bus	5%	6%	8%	10%	12%
8802/5 Token Ring	23%	29%	35%	39%	47%
FDDI	0%	1%	2%	5%	17%
X.400	6%	10%	17%	27%	48%
FTAM	3%	7%	14%	22%	42%
Virtual Terminal	0%	0%	1%	2%	7%
OSI Transaction Processing	0%	0%	0%	1%	4%
OSI Network Management	1%	1%	3%	6%	20%
X.500	2%	2%	4%	8%	23%
ODA	0%	1%	2%	6%	15%
EDIFACT	0%	1%	2%	3%	7%

Implications

Some of the implications of OSI are:

users and suppliers cannot afford to ignore OSI,

users must convey their OSI requirements to suppliers,

for external communications requirements, users should always explore OSI options,

for multivendor internal communications, users should consider OSI options, especially where more than two vendors systems are involved,

users should make sure they are aware of OSI developments and opportunities,

suppliers should make certain they have a coherent OSI strategy with products to back it up,

suppliers should support standards across all their key product ranges

suppliers can afford to migrate their communications architectures towards OSI at a steady pace,

suppliers should continue to invest effort into the standards making process as OSI is the long-term future for data communications,

suppliers should continue their efforts to reassure and educate users about the viability of OSI through such initiatives as EuroOSInet, OSINET and their numerous OSI primers.

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Interoperability and Conformance Testing in TT-CNMA

(Testing Technology for Communication Network for Manufacturing Applications)

Esprit Project 2292

Interoperability testing and conformance testing technology in an industrial environment (CIM - Computer Integrated Manufacturing) are the tasks under Esprit project 2292 (TT-CNMA). There are two research topics which are linked to the CNMA Esprit project: Manufacturing Messaging Specification (MMS) and Network Management (NM) protocols. In these two areas, interoperability testing has also been developed; in conformance testing, a new technology for testing the interface to MMS (MMSI) has been developed.

The TT-CNMA project concerns developing testing technology for equipment forming part of a communications network in an industrial environment. Networks used in factories include 802.3 and 802.4 networks. This project is closely related to the CNMA Esprit project 2617, the main interests of which are industrial exchanges exemplified by a protocol such as MMS); there is also a strong interest in network management.

The project includes a number of topics which are a continuation of the testing activities of Esprit project 955 known as CNMA phase 3. They include:

- testing of Routers and Mac Bridges;
- automatic translation of TTCN test cases to executable language statements

Specific attention will be given below to those tasks which are more closely connected with CNMA and which introduce entirely new features, namely: interoperability testing and interface testing.

The TT-CNMA project partners are:

ACERLI
Alcatel-TITN-ANSWARE
BMW
Frauenhofer-IITB
Swedish Telecom
SPAG
TNC.

They represent a test centre, development companies, and one user.

From conformance testing to interoperability testing

Conformance testing is now a well advanced technology. There are testers for layers 1 to 7 of the OSI architecture and for different profiles (industrial and office). Conformance testing can be defined as verifying that a given implementation conforms to be a standard. Every detail of the standard should be checked. Conformance testing increases the probability that implementations will interoperate.

Interoperability consists of verifying that two or more implementations are able to communicate which each other. In the main it is valid behaviour that is checked; invalid behaviour is the subject for a conformance tester. Interoperability will also cover those areas which are not in the realm of conformance but are more relevant to real environments (like multiple connections and load testing).

Interoperability testing has, until now, been performed relatively informally. Some manufacturers have interoperability platforms which are equipped to exercise interoperability in an homogeneous environment. However, problems often arise when different equipment from various manufacturers has to intercommunicate. Generally this happens in the course of a project in the final integration phase. Often, there is limited time available to perform this task. So in most cases, the application will be performed directly, and, sometimes, when circumstances are favourable, test programmes will be run. A protocol analyser will be used at this stage.

Some large exhibitions have provided occasions to demonstrate the interoperation of equipment from more than one source. To ensure the success of these demonstrations, rigorous project planning and test definition have been required. For instance, the exhibition ENE '88 incorporated conformance testing, followed by interoperability testing.

A preliminary phase, before attempting interoperability, is to submit implementations to conformance testing. It is useful to detect as many potential problems at as early a stage as possible. The particular difficulty in interoperability testing is that it is not easy to detect, at first, which of the implementations is responsible for failure. In conformance testing, when a fault is detected it is generally the implementation under test which is responsible. Thus, a conformance testing campaign will allow of the elimination of the initial problems, and provide a "safer" environment for subsequent operation.

Interoperability testing

The task of interoperability testing in the TT-CNMA project involves three partners:
- a test centre - ACERLI;
- and two development companies -

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Siemens and Alcatel-TITN-ANSWARE.

Before commencing the interoperability work, the partners had to select to which protocols it would apply. Preference was given to an application level protocol which would exercise a complete seven layer profile and thus be a more significant exercise. The natural candidates were the MMS protocol, which is prevalent in industrial communications, and network management, one of the main interests in the current phase of the CNMA project. Two different teams worked on each of the two interoperability test tools, and relative freedom was left to them for the choice of architecture. Too many constraints were not imposed, because, since it is a new area of research, it was valuable and interesting to have different approaches for later comparison. As will be seen, there are specific constraints with these two protocols, which give rise to differences in the architecture of the tester. The generic architecture will first be presented and then its adaptations to different environments (Fig. 1: Generic Tool Architecture).

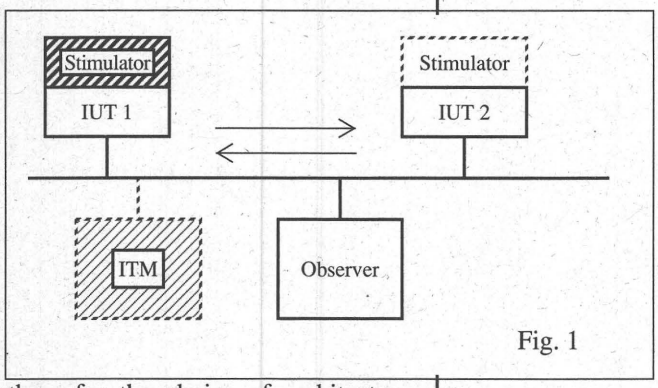

Fig. 1

Stimulators

The stimulators are the test programs that are implemented on the implementations under test (IUTs) and activate requests through the upper interface. Thus exchanges are created over the network according to predetermined scenarios. Stimulators can be realised in several ways.

The basic way is to implement the stimulators directly according to the specifications. This is easy to achieve when the interfaces consist of a limited number of requests. It is more complicate if the interface consists of a large number of requests, as is the case with MMS. Then it is advisable to use a prewritten program and to port it onto the equipment to be tested. There are some conditions which must be observed in order to achieve the porting:

- the program must be written in a portable language (e.g. C language);
- the stimulator must use a minimum of system functions;
- the stimulator must be written to an ideal interface with the implementation to test.

Observers

The way to resolve an interoperability problem is to use a line analyser that will display the protocol data units (PDUs) exchanged. There are line analysers available for 802.3 networks, fewer for 802.4 networks. Most of them present an elementary decoding of the data, for instance an hexadecimal presentation of the data. This is not sufficient to help the interoperability troubleshooter. A more sophisticated tool would give a clear decoding of the data at the various ISO layers. In addition it would give an initial analysis of the problem detected (for instance no response to an MMS read variable). Such a tool, observer or protocol analyser is currently being developed in this project.

Interoperability test manager

The equipment being tested belongs to the factory world. It is not a mini-computer but more frequently a programmable controller or a numerical controller. Generally, there is neither a printer nor a mass storage unit attached to such equipment. So the test programs cannot be stored locally but must be loaded from a special system. The results of the tests also cannot be printed locally but have to be transferred to a remote system. Generally a programming console would enable remote loading of the programmable controllers. However the environment here is heterogeneous, and instead of having one programmable console for each device, it is preferable to have one central system, the interoperability test manager, which stores all the test programs.

When such a central unit is specified,

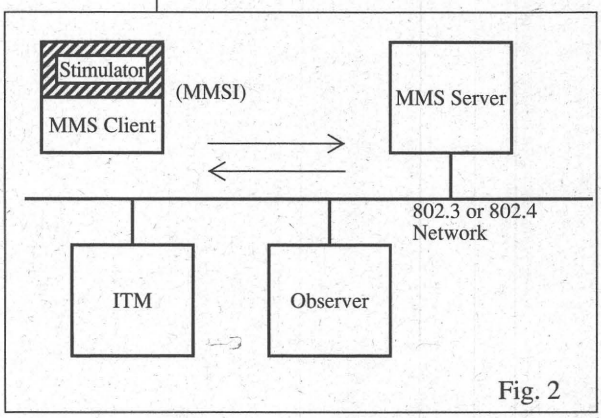

Fig. 2

Interoperability and Conformance Testing in TT-CNMA
(Testing Technology for Communication Network for Manufacturing Applications)
Esprit Project 2292

a protocol has to be defined for communication with the devices and support of the downline load. In this latter case, the stimulator only has the role of initiating the communication and loading the test program.

MMS interoperability tool

There is one difference compared to the generic architecture presented above: the MMS client, which is described below (see under MMSI (Manufacturing Message Specification Interface) conformance testing), will provide an MMSI open interface, and can be accessed by the test program. However on the server side, the system does not provide access. Therefore the application program itself will be used to respond to the sequence generated by the client (Fig. 2: MMS Interoperability).

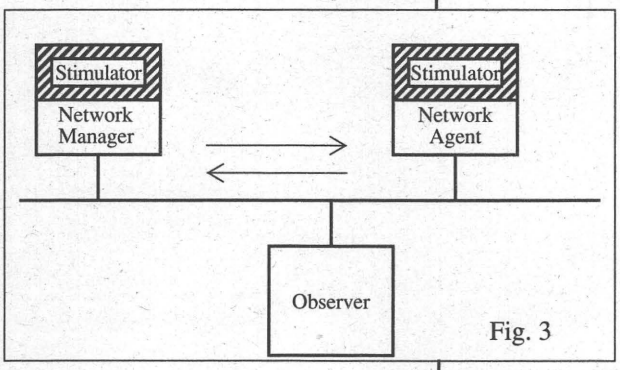

Fig. 3

NM (Network Manager) interoperability tool

The first architecture proposed is described (Fig. 3: NM Interoperability Architecture: First Proposal). There is a stimulator on both sides of the interaction.

The specific characteristics of network management protocols are:

a limited number of network managers on a given network, in fact, users would like to have only one. Generally the network manager systems come with local storage facilities and printers. So, there is less incentive to provide a separate interoperability test manager, as in the testing MMS;

the network agents do not provide an open programming interface.

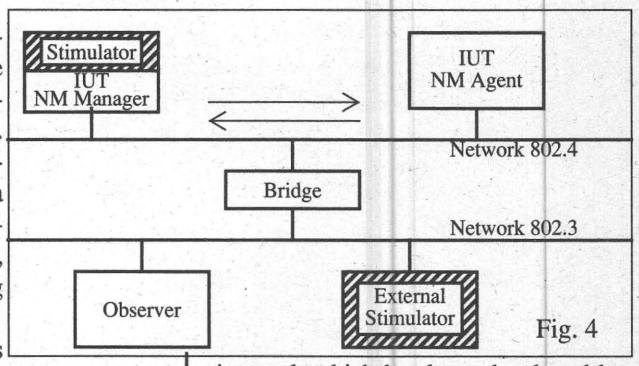

Fig. 4

Discussion about the latter characteristics with the partners in CNMA led to another proposal which is described (Fig. 4: NM Interoperability); this includes an external stimulator. This proposal was made possible because of the nature of Network Management. It is possible to create stimulation of this protocol by way of an external action. For instance by repeating an error a certain number of times, it will be possible to test the detection of a threshold (e.g. number of CRC errors).

Calendar

The first version of a prototype of the interoperability test system has been under test at the CNMA project pilot site in Stuttgart. A second version will be designed and developed late in 1990 and will be installed at the end of the year in a trial environment at ACERLI.

From MMS to MMSI Conformance testing

The MMS interoperability tester described above shares some common features with the MMSI conformance testing tool, which has been developed by Frauenhofer-IITB.

The MMS protocol is used to communicate between industrial equipment. It specifies a series of actions such as reading a variable and downloading a program. Different types of variables are defined.

The two entities communicating through MMS are the client and the server. The client issues requests (for example, to read a variable) and the server responds to the request (for example, by returning the value of a variable). The "MMS provider" is the layer that provides the coding services enabling the transformation of an internal request into a PDU that is transmitted on the network (see Fig. 5: MMS Model)

An MMS conformance testing tool already exists from a previous related Esprit project (CNMA Phase 3). The principle of the testing is simple: it consists

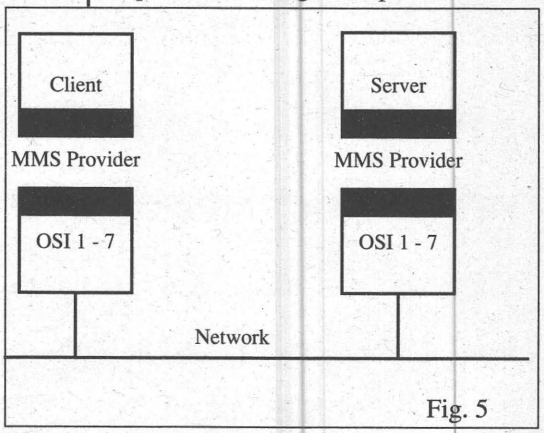

Fig. 5

Interoperability and Conformance Testing in TT-CNMA

(Testing Technology for Communication Network for Manufacturing Applications)

Esprit Project 2292

in verifying the coding function by sending both correctly and incorrectly coded PDUs. A "lower tester" will generate the PDUs and send them on the network; it will also receive the responses from the other party in the exchange. An "upper tester" has to be programmed in the IUT and will receive or send the primitives at the provider interface (Fig. 6: MMS Tester).

The upper tester is made by the vendor which offers the implementation for testing. The MMS protocol includes as many as 85 services and the production of a testing program for all these can be very tedious. It would be preferable to have a testing program available in source code and port it onto IUT. However, until now, this has not been easy to achieve because the interface with the MMS provider was not defined. This is changing in the new MAP specification. Normally, the OSI 7-layer model requires conformance to the rules of the exchange, to the protocol. There is no obligation on conformance in how a service is offered by the layer. This rule applies to all layers from one to six; it changes at layer 7, the top level. The application sits on layer 7. Users wish to be able to port their application program from one system to another; therefore, a standard programming interface is needed. For MMS such an interface has been defined and is called MMSI.

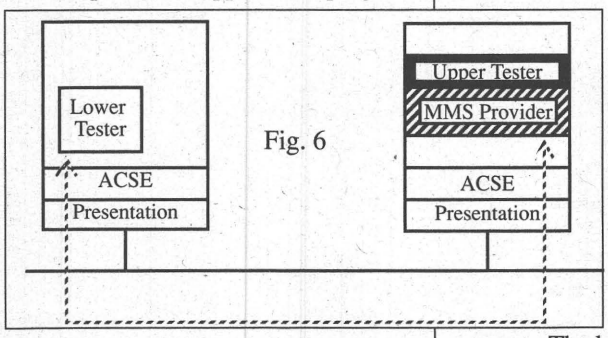

Fig. 6

The Esprit project TT-CNMA includes a new tool, an MMSI conformance tester.

The range of problems confronting this tool differ somewhat from those dealt with by other protocol conformance testing tools. How does one test an interface? The primitives at the MMSI have to be generated; two kinds of action will follow. The first type of action will remain local (for instance, there is a whole set of actions which implement local internal representation). The second type of action will cause the issuing of a PDU over the network and, therefore, resemble the MMS testing sequences. The availability of a standardised interface, such as MMSI, makes it possible to build a test program for the 85 MMS services, which can be ported onto the target system to be tested. Hence, the vendor is freed from writing a large upper tester program.

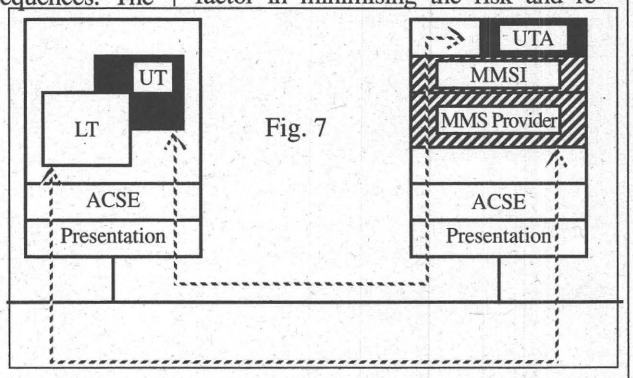

Fig. 7

The test program communicates with the test system; it receives commands, which represent primitives that have to be passed to the interface. When the test system receives the response, it sends it back to the test program. This communication is achieved using a so called test management protocol (TMP). The two communicating entities are on one side the test program (upper test agent UTA) and on the other side the upper tester (UT), which is located in the test system. The lower tester performs identical functions to those of the MMS conformance tester, i.e.generation and reception of PDUs. Of course, the upper tester and the lower tester have to synchronise their actions; this is done using an internal communication protocol (see Fig. 7: MMSI Tester): for instance, the lower tester should generate a PDU only after the upper tester has prepared the UIT to expect it.

Conclusions

The experience of previous CNMA phases and the current TT-CNMA project shows that conformance and interoperability testing improves the quality of implementations and is a vital factor in minimising the risk and resources involved in commissioning a multi-vendor pilot.

This project incorporates several varieties of testing tools, depending on:
- the type of protocol (NM, MMS);
- the availability of an interface (MMSI);
- the type of testing (conformance, interoperability).

Consequently, the architecture of the tools can be seen to be significantly different and worthy of note. The experience gained during the trials both in Stuttgart and then at ACERLI will provide a basis to draw conclusions and to determine the most appropriate direction for improvements to the tools.

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NETWORKING IN THE FORMER GERMAN DEMOCRATIC REPUBLIC

It will be of interest to readers of "IES News" to be informed of the present state of research networking and plans for improvement, particularly linkages with DFN and WIN (the German Network for Science, see IES News, No. 27), in the new German Federal States, the former German Democratic Republic (GDR). The information below is based on two articles published in DFN Mitteilungen, June 1990.

In contrast to their colleagues in the West, researchers in the former GDR at present have virtually no possibility of rapidly accessing public databases or information, whether the sources are located in the former GDR or outside. There are also obstacles to a free exchange by electronic means of research ideas or information between research groups at different locations. This makes participation in international research programmes such as high-energy physics, virtually impossible.

There are point-to-point interconnections between research institutes by means of leased PTT lines and operator-assisted dial-up access is possible to national databanks. This method is also used to access via a PAD and the Moscow X.25 node, databanks of other CMEA (Council for Mutual Economic Assistance) countries. Some experience has been acquired in Local Area Network (LAN) techniques and office automation.

A public data packet network was planned to become available during 1990 with some 4000 connections, of which 40 are intended for the Academy of Sciences [Akademie der Wissenschaften (AdW)] and 75 for universities.

There are two principal organisations responsible for networking, the Institute for Informatics and Computer Science (IIR) of the AdW and the Technical University at Dresden (TUD). It is estimated that the 50 institutes of the AdW have 25 000 researchers, with universities accounting for approx. 30 000 and 100 000 students, all potential users of a research network.

Work on networking commenced in 1973, leading to the establishment of the computer network DELTA in 1980. The impetus to this was given by the necessity of interconnecting the two Soviet main-frame computers BESM-6 (1 MIPS, 750 kbytes memory) of the AdW at Zeuthen and Berlin. At about the same time, the applied research branch of the Data- processing Combine began working on the development of a computer communication network which was derived from the operator-assisted manual dial-up system to allow daily routine communication between the computers of this Combine throughout the former GDR. It was possible to transfer files between smaller computers to IBM-360/370 Ryad computers and between these. The DELTA network, using a packet switching system called KOMET, developed at the IIR, but based on the OSI reference model, involved three nodes in the Berlin area and one each in Potsdam and Dresden. A further node in Prague was connected from time to time allowing interconnection to Sofia, Bulgaria. The nodes were interconnected by leased lines of 2.4, 9.6 or 48 kbits/sec.

The network was used for file transfer and interactive messaging (messages of restricted length). Remote job queuing and return of output was possible.

The DELTA network was the first such facility in the CMEA countries and there were several abortive attempts to link DELTA with research networks in other countries. Following the taking out of service of the many connected computers, especially the BESM-6s at the end of the 1980s, DELTA was taken out of service.

IIR commenced in the early 1980s to develop a bus-oriented multi-microprocessor system which also allowed connection to X.25 (80). This technology was then applied to set up an experimental data network with three nodes (2 in Berlin and 1 in Dresden) interconnected by means of leased lines (2.4, 48 and 64 kbit/sec.). The performance however did not allow making this available publicly. A modular system to meet the expected demands is currently under development.

Conformance testing too has received some attention and the TEKOS conformance test system has been developed for this application. This is implemented on a VAX/VMS compatible computer and has been used to check conformance of an OSI session implementation with ISO 8327.

Contact was established in November 1989 with DFN-Verein with the

NETWORKING IN THE FORMER GERMAN DEMOCRATIC REPUBLIC

aim of using the DFN experience to provide intercommunication both between researchersin the former GDR and others outside the former GDR, especially in the FRG. The first result of this contact was the proposal for a research project to make DFN service available to researchers in the former GDR.

The project has the following main objectives:

setting up a communications infrastructure for research institutes and organisations

introduction and application of OSI-conformant services

acquisition of experience in using the DFN services and X.25 connectivity

setting up of a model for exploiting communication services for other sectors of the economy based on using a public packet-switched data network.

In the short term, using the existing leased lines, IIR, the Humboldt University in Berlin, the Institute for High-Energy Physics at Zeuthen and TUD are to have access to the DFN services. The time scale was mid-June 1990, and a start was made during the Industry Fair at Hannover when a demonstration of E-mail between IIR and DFN and FTAM between TUD and DFN was successful.

In the mid-term, access of research centres in the new German Federal States to partners in the FRG, using WIN, is a project proposal which is being examined by DFN Verein and AdW with support of the respective Research ministries. The proposal envisages connection (to DFN) for the most important research centres, i.e. Berlin, Dresden, Leipzig, Potsdam, Chemnitz, Jena, Magdeburg, Halle and Rostock, and DM 1.5 million have been made available by the two ministries (BMFT, the Bundesministerium für Forschung und Technologie -the Ministry for Research and Technology, contributing two-thirds). The infrastructure is to be established in collaboration with the PTT administration, allowing for the availability dates of the public network.

In the long term, the pilot project should establish the parameters for interconnecting the research centres in the former GDR and institutes with WIN.

The practical realisation of this project is planned as follows:

connection to WIN is via a 64kbit/sec line to the DFN-Verein premises. Costs are allowed for in the project budget.

X.25 connection (UV) to the 9.6 kbit/sec. leased lined to the other partners

this to be designed such to allow separate network management with access control and accounting

two communication servers for DFN services are connected to UV. One server is intended primarily for research areas with high communication needs (file transfer, remote job entry), whilst the other is earmarked for E-mail and databank access

connection to other centres will be by provision of further X.25 UVs with leased lines and PADs.

Based on articles by Claus SATTLER and Hans-Martin ADLER.

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To Our Readers

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All communications should be addressed to

The Editor

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EuroKom NEWS

UUCP File Transfer

In response to requests from EuroKom users, a new file transfer protocol has recently been made available. The protocol - uucp - will be familiar to Unix users; it was designed for transferring files between two physically linked Unix machines.

The facility can be used by any EuroKom user who wishes to send a file to a user on a Unix system which is registered with and linked (directly or indirectly) to the EuroKom host computer. Similarly, any user of such a Unix system can transfer files to any EuroKom user.

The addition of uucp to the range of EuroKom transfer options will be of significant benefit to users who use Unix machines to access the system, and also to those whose work brings them into contact with Unix users who are not on EuroKom. Unlike other file transfer protocols, uucp enables you to queue files for transfer at a later time - you do not have to oversee the operation.

From EuroKom to a Unix machine

From the EuroKom Services Main Menu, select file transfer. Choose the new option uucp from that menu. You are asked for the name of the file you wish to transfer, the name of the machine you wish to send it to, the name of the recipient, and, optionally, the name by which the file is to be known at the receiving end. You are then informed that the file is queued for transfer, and returned to the menu. Note that you can log out from EuroKom at that stage. When you next log in to EuroKom, a mail message will inform you that the file has been delivered to its destination.

From a Unix machine to EuroKom

Before you can send a file from your Unix system to EuroKom, a link must be established and registered with EuroKom. This need only be done once, and would normally be done by the Unix expert at your site. (The EuroKom Help Desk will provide any assistance needed.) Your machine will then poll the EuroKom computer at regular intervals, both to deliver outgoing files and to collect incoming files. The Eurokom Help Desk will send you a shell script on request, which simplifies the sending process. This script, called uuek, should be placed in a directory on your path.

From this point on, file transfer is simply a matter of entering the following command at your Unix shell prompt:

uuek filename recipient's_EuroKom_name

The recipient is notified that the file has arrived in his EuroKom directory when he next logs in to the system.

Note, however, that because the system depends on polling between the two machines, file transfer with uucp is not immediate: it may take a number of hours to complete its route

In order to use the uucp facility, your version of uucp must support the 'f' protocol, which works over X.25. Users of Sun workstations should note that SunOS Version 4.1 supports this protocol, whereas earlier versions did not.

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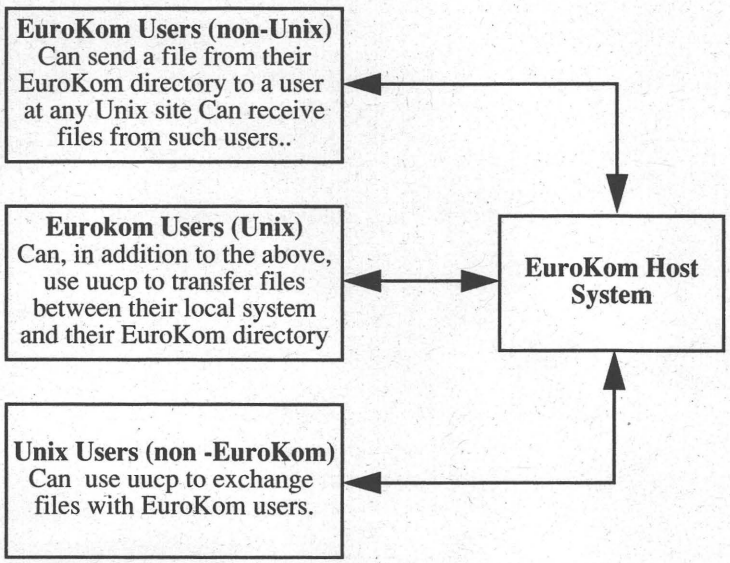
Fax: +32 2 513 2853



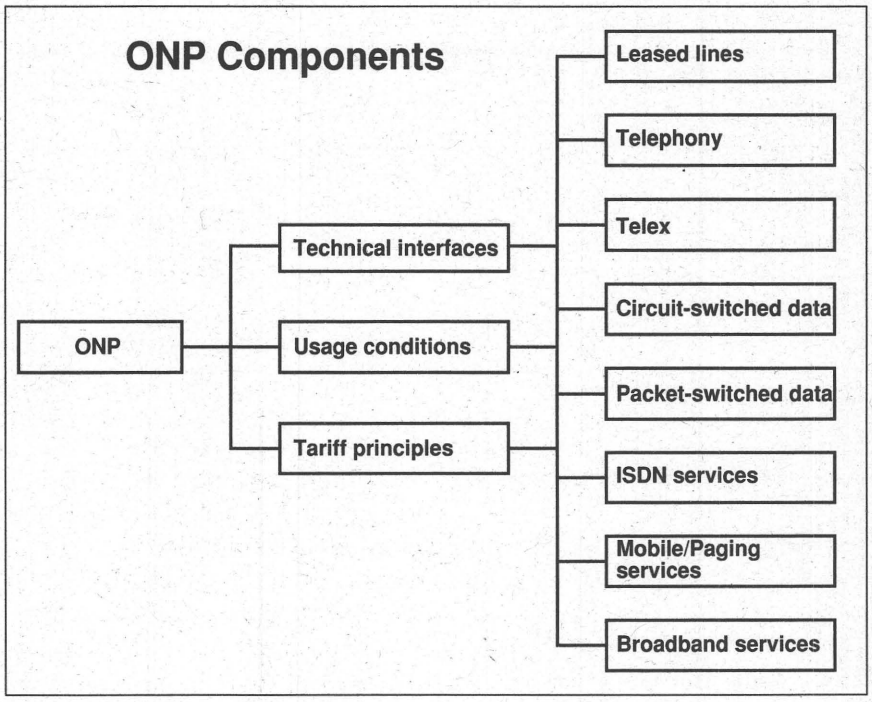
Some Telecom Facts about TEDIS

(Trade Electronic Data Interchange Systems)

This is the second of a series of articles in which the activities of the Commission's TEDIS programme are described in greater detail.

The number of organisations using electronic data interchange within the Community is currently doubling every year. In the past few years, this rapid growth has highlighted several issues and areas where a European solution is needed if the full benefits of this new way of doing business are to be realised. The European Community's TEDIS programme aims to resolve these issues in the interest of individual organisations and in the interest of the community as a whole. TEDIS encourages the implementation of EDI standards, the improvement of the European telecommunications infrastructure, the promotion of adequate security measures and appropriate harmonisation of national laws.

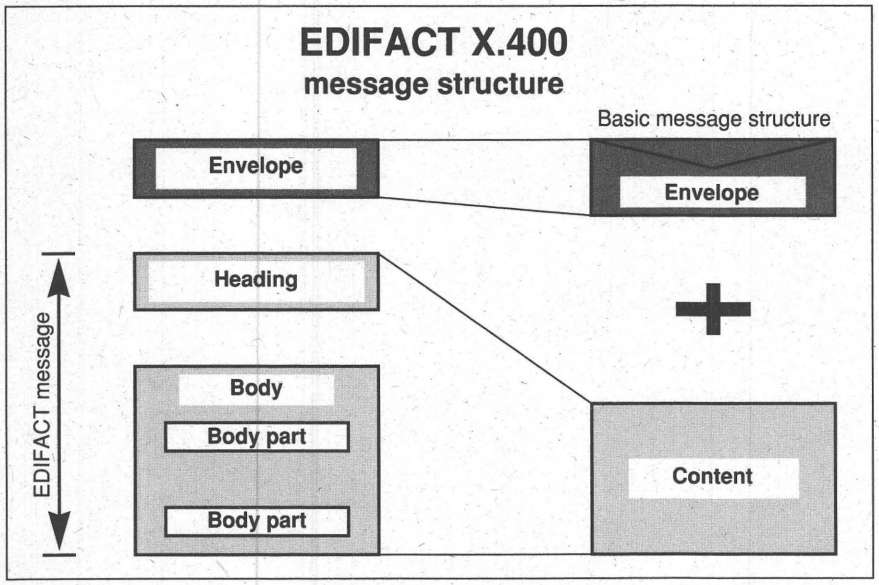
In the field of telecommunications, TEDIS concentrates on four areas: deregulation, standardisation, coordination and stimulation.



European telecom markets

At the company level, and even more at the level of the economy as a whole, full use of EDI can only develop if there is a large number of participants. This 'critical mass' of users can only be achieved if the cost of telecommunications is kept as low as possible. This means, first, use of the widespread existing telecommunications infrastructure primarily public networks and services. Further, the tariffs must be such as to encourage the use of EDI as a commodity. Finally, these requirements must be harmonised at a European and international level.

The CEC is working together with post and telecommunications administrations to make proposals to resolve these issues with regard to leased lines, PSDN, ISDN and satellite communications.

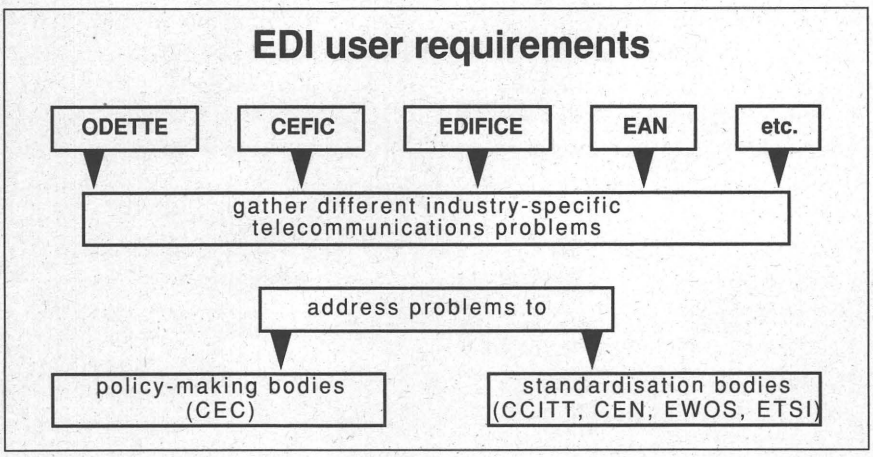


Standard interfaces.

The basis for open communication between different computer systems is the OSI reference model and conforming protocols. For the user, OSI standards such as those for message

Some Telecom Facts about TEDIS

(Trade Electronic Data Interchange Systems)



handling systems (MHS), file transfer, access and management (FTAM), directories (X.500) or transaction processing (TP) form the basis for the exchange of EDI messages.

Current activities focus on the integration of X.400 MHS and EDIFACT standards. The long-term development of a specific Pedi protocol by the CCITT is supported while, as an interim solution, use of the interpersonal message (P2) protocol is recommended.

EDIFACT standards, working together with MHS, FTAM, and directory services have been demonstrated by a number of vendors and user groups. Support for the development of interactive EDI standards is also planned.

Coordination of user requirements.

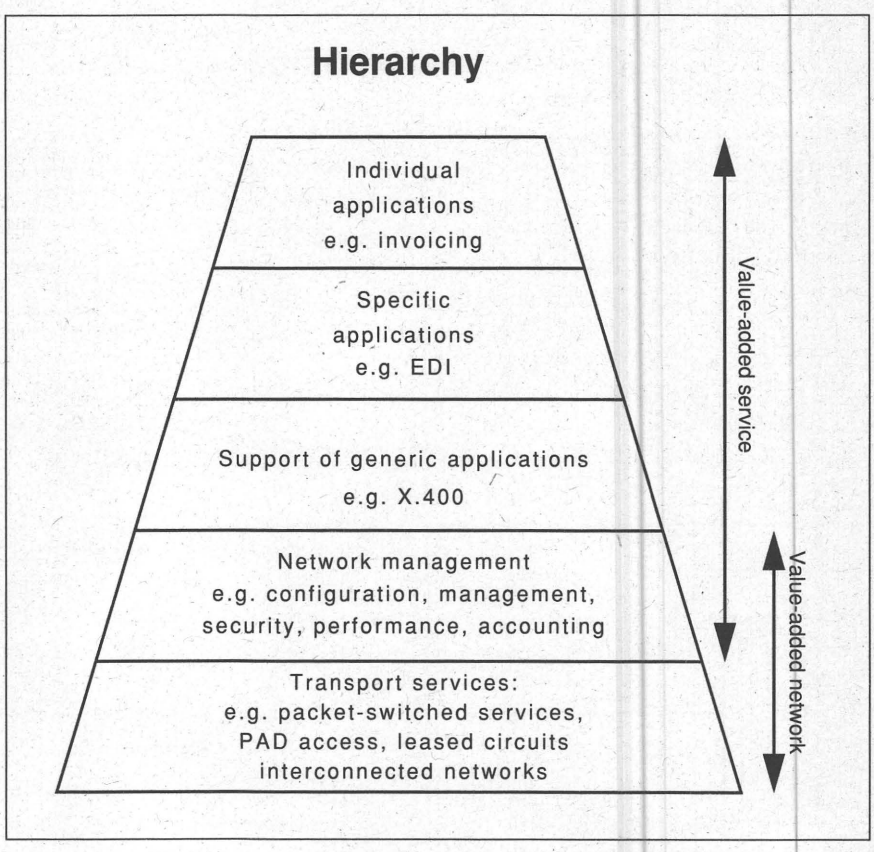
Several industry-specific EDI user groups have recognised the fundamental importance of telecommunications questions and set up working parties to answer them.

Basically, it has been established that the interests of large cooperations in the automotive, chemical or electronics sector, for example, are quite different from those of small or medium-sized enterprises. Yet the implementation of EDI among large cooperations can hardly be imagined without the inclusion of small and medium-sized enterprises. Trade or transport companies who have been interchanging data since before standards became available, have different telecommunications requirements from companies who are just beginning to look at EDI.

The aim of the TEDIS programme's activities within the telecommunications area is to bring together the different criteria, to coordinate and support the demands of the different user groups and to ensure their needs are met. The formation of a European user forum across all industries will be a valuable contribution to this process.

Stimulating market development.

EDI has two side effects on the devel-



Some Telecom Facts about TEDIS

opment of the telecommunications market:

1 Use of EDI increases demand on potential data communications facilities, both public and private.

2 EDI increases demand for additional user orientated services (value-added services).

On the basis of the needs expressed by the different industry sector user groups, the TEDIS programme will concentrate on:

(a) setting up pilot projects to gain user feedback from real situations about the need for additional telecommunications services;

(b) encouraging small and medium-sized enterprises in particular to make use of EDI in order to make European business more competitive;

(c) publishing case-studies so that through their experience future implementations of EDI projects can be made easier.

The results of these activities within the TEDIS programme will provide a firm base from which a comprehensive set of measures for the support and promotion of EDI within Europe can be developed.

Further information from:

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DiagnOSIs: AN OSI PROTOCOL ANALYSER

The National Computing Centre Ltd. (NCC) has been active in Open Systems Interconnection (OSI) since 1984, and is known in the field of OSI Conformance Testing. NCC recently launched a product called DiagnOSIs, an OSI protocol analyser for the top layers of the OSI stack, described below.

The aim of the software is to eavesdrop on the network and monitor the traffic in real-time, showing the flow of protocol data units on the screen. Simultaneously, the traffic may be logged to disk for subsequent off-line analysis. Any Protocol Data Unit (PDU) at Transport layer or above may be selected for analysis, during active monitoring or when retrieved from a file. The elements of the PDU are displayed in a user-friendly format and a comprehensive user guide to help interpretation of the decoded data is supplied. The onscreen help menu is accessible at any stage of monitoring or analysis as a further aid.

The software automatically ignores the profusion of traffic on the network, concentrating attention on the relevant OSI packets. Additionally, further options are available to ensure that users receive only the information of direct interest. A toggle switch will "turn-off" Transport, Session or Internet decoding; another toggle allows selection of upper layer application decoding. The address menu, which can be edited, enables filtering of packets so that only those where the source or destination address has been selected will be logged. Furthermore, by using a toggle switch, the user can choose to display data from one or more layers or applications and exclude others.

DiagnOSIs is a sophisticated software package incorporating Internet, Transport and Session decoding which runs on an IBM PC AT Class (or compatible) machine. The package comprises Microsoft Windows software and a communication card. Furthermore, users can choose the decoding capability particularly suited to their needs or add new application decoding capability as their requirements change.

Initial response to the product indicates that it is of interest to a wide range of users. Support and development engineers can benefit from precise detection and correction of faults on the system. Systems integrators can use the analyser to seek out interoperability solutions in a variety of situations. The tool can be of considerable benefit to network managers in many ways from speeding up the installation process to increased efficiency in the maintenance cycle. Finally, DiagnOSIs can be used most effectively as an educational tool, enabling the viewing of otherwise "invisible" communications exchanges.

Further information from:

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Oxford Road
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UNITED KINGDOM
Tel: +44-61-228 6333
Fax: +44-61-236 4715

ELECTRONIC NETWORKS FOR EUROPEAN DISTANCE TEACHING AND TRAINING.

In order to meet the challenges of developing a Europe-wide system of distance teaching and training using high, but appropriate, levels of information technology, the European Association of Distance Teaching Universities (EADTU) is seeking close collaboration with all interested parties, but especially with relevant CEC Programmes such as COMETT and the DELTA Exploratory Action. It should be noted that Distance Teaching Universities are but one model of open and flexible learning, and many other modes of operation involving different institutions and enterprises are directed towards the same aims. EADTU evolved from one of the activities under the "Operation 1992" initiative of the Commission with the object of further actions in the field of Distance and Open Learning (DEUCE - DELTA Electronic University for the Citizens of Europe).

EADTU considers that new forms of educational technology require essential support but that progress towards an electronic network to implement a distance learning programme should be led by educational pull instead of technology push. Students' use of computers and new media may affect their motivation to learn in both desirable and undesirable ways.

Technological Infrastructure.

The following points must be considered in establishing a technological infrastructure for distance learning:

technology should serve rather than lead the development of distance learning programmes. Educational and training needs must be the prime factor in the development of a technological infrastructure and not the other way around;

the technological possibilities for communication must be emphasised. Making information available is not the only consideration in education and training, and teachers cannot be simply replaced by so-called intelligent or adaptive systems easily and cost-effectively. In point of fact recourse to modern technologies will enhance tutor status with personal communication between teacher and pupil still being paramount;

experience to-date with distance learning indicates that the logistics of designing, producing, delivering and supporting distance courses are crucial. This suggests that there are two distinct levels of infrastructure support require;.

delivery of teaching materials and programmes. The existing differences in technological facilities in Europe will require time and substantial effort to be brought to the same high technological level;

the development of communication systems between institutions is even more urgent, but will in all probability be achieved sooner, so facilitating course production and other cooperative ventures;

the orientation of the infrastructure programme to the nature of education and the related needs for an integrated communications technology provide strong arguments for building the required infrastructure on existing open and distance learning organisations, but not excluding possible new participants.

Essential Communication Channels.

A wide palette of existing technologies and facilities will be involved in providing the means for interactive distribution of distance learning and training programmes.

At present very large geographical areas are covered by satellites, but currently the satellites available for distance learning do not serve all Europe, but principally West European regions. A truly pan-European satellite coverage remains to be created. Furthermore most satellites available today or in the near future are oriented towards one-way transmission of information. Such satellites need to be augmented with terrestrial two-way services to provide full interactive teaching and training applications. A newer generation of European satellites will be technically able to offer two-way speech and data services, but several regulatory issues remain to be resolved.

Satellites at present are also not fully capable of transferring all forms of information required in current distance teaching and learning configurations. One example is large-volume printed information. This still is and will remain so for some time yet the prime form of information in distance education. In theory, satellites could be used for electronic publishing, but this would not cost-effectively provide the mass of written material needed.

ELECTRONIC NETWORKS FOR EUROPEAN DISTANCE TEACHING AND TRAINING.

There is therefore an essential need for both voice and data links, which are quickly available at relatively low cost, between staff and learners, and between staff at different sites. Data networks are also essential to provide access to electronic databases and to offer the facilities for data and text transfer for assignment exchange, tutorials, cooperative problem solving activity, etc., involving the use of E-mail, electronic publishing, conferencing and computer-mediated communication.

The introduction of ISDN is a welcome means of providing a high-quality and integrated speech and data service which will in time be available across Europe. It will also offer possibilities of audio-graphic teleconferencing and cooperative computerised problem solving. The ISDN service will also add a two-way capability to a one-way satellite service. It can also extend the coverage of a satellite service to regions outside the "footprint" of the satellite. A combination of ISDN and satellites is seen as forming the technological basis of the evolving electronic distance learning network.

Primary Application Areas.

The experimental set-up and prototype development of electronic distance learning networks should concentrate from its inception upon functionally strong and cost-effective applications. Apart form administrative communications, these should be mainly in the fields of joint course production, student support at a distance and language teaching.

The first of these uses is already the subject of a planning exercise: a Joint Academic Network Using Satellites (JANUS). Its purpose is to prepare for the infrastructure needed to link up European institutions wishing to work together to produce jointly distance teaching materials for European wide delivery and for credit transfers.

Student support at a distance will naturally require even more intensive recourse to interactive computer usage which has become a vital or even crucial prerequisite for most higher level profession-oriented areas of education and training. In many cases this takes the form of powerful, complex and highly sophisticated interactive systems for computer-aided design or manufacturing, dynamic simulations and process control, to name but a few uses.

To be mastered, these techniques have to be taught and training facilities provided by instruction and exercise. In distance teaching and open learning situations, the traditional approach involving group sessions under the personal guidance of teachers is not feasible. Even very good manuals and work books cannot provide the individual feedback and help needed. Also their flexible and adaptive provision would be expensive and time-consuming.

A solution here is offered by the availability of an advanced electronic network when needed. Students work through their printed manuals and start their interactive assignments on an individual basis - at home, at work or on a campus. In need of help, they can enter from their personal computer or terminal into a network connection with a remote teacher. At the moment of connection both teacher and student will have the interactive application on their screens. Communication can be by voice or E-mail, and once help has been provided, the student disconnects and continues alone. This exploits the technological added-value capabilities of electronic networks and will be cost-effective.

It may be helpful to summarise the communication functions considered as essential within and between distance teaching universities. These are:

a. **Interinstitutional** (at each site - two-way)
   - Individual two-way E-mail and voice facilities to any point on campus
   - Remote meetings
   - Text (and structured document) transfer
   - Remote Editing
   - Access to remote databases

b. **Internal campus networks** (two-way)
   - Individual two-way E-mail and voice facilities to any point on campus
   - Text (and structured document transfer)
   - Remote editing

c. **Central campus/individual student**
   - Campus to student: point to multipoint (one-way)
   - Delivery of textual, audio and video materials
   - Delivery of computer data/software
   - Student to campus: two-way
   - Individual two-way E-mail and voice facility to any point on campus (administrative

ELECTRONIC NETWORKS FOR EUROPEAN DISTANCE TEACHING AND TRAINING.

enquiries; direct contact with course team)
Registration and fee payment
Access to remote database for course information and regulations
Assignment/examination submission and marking

d. Central campus/regional offices (two-way unless otherwise stated)
Individual two-way E-mail and voice facilities to any point on campus/at regional offices
Remote meetings
Text transfer (central information to all regions; regionally originated material to centre)
Access to remote databases (student records)
Delivery of textual, audio and video material
Delivery of computer data/software

e. Regional offices/students and tutors
Individual two-way E-mail and voice facilities to any point on campus/at regional offices
Remote meetings
Access to remote databases (student records; course information; tutorial arrangements)

f. Regional offices/study centres
Individual two-way E-mail and voice facilities to any point on campus/at regional offices
Remote meetings
Access to remote databases (student records; course information; tutorial arrangements)
Delivery of textual, audio and video material
Delivery of computer data/software
Registration and fee payment

g. Student/tutor; student/student; tutor/tutor; (home to home)
Individual two-way E-mail and voice facilities to any point
Remote meetings
Text transfer
Remote editing
Access to remote databases
Assignment/examination submission and marking.

NB Campus here is taken to include not only location on or in university grounds or buildings, but the location of any registered student or course participant.

Further information:

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Fax. +31-45 711486

or

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DELTA Central Office
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Fax. +32-2-236-2392

OSI and LIBRARY SERVICES

A research paper (No. 85) published by the British Library R&D Department answers such basic questions as "What is OSI and why is it important to the library and information services community?", "How can OSI systems be implemented?" and "Who are the active parties involved in defining, implementing and using OSI standards?"

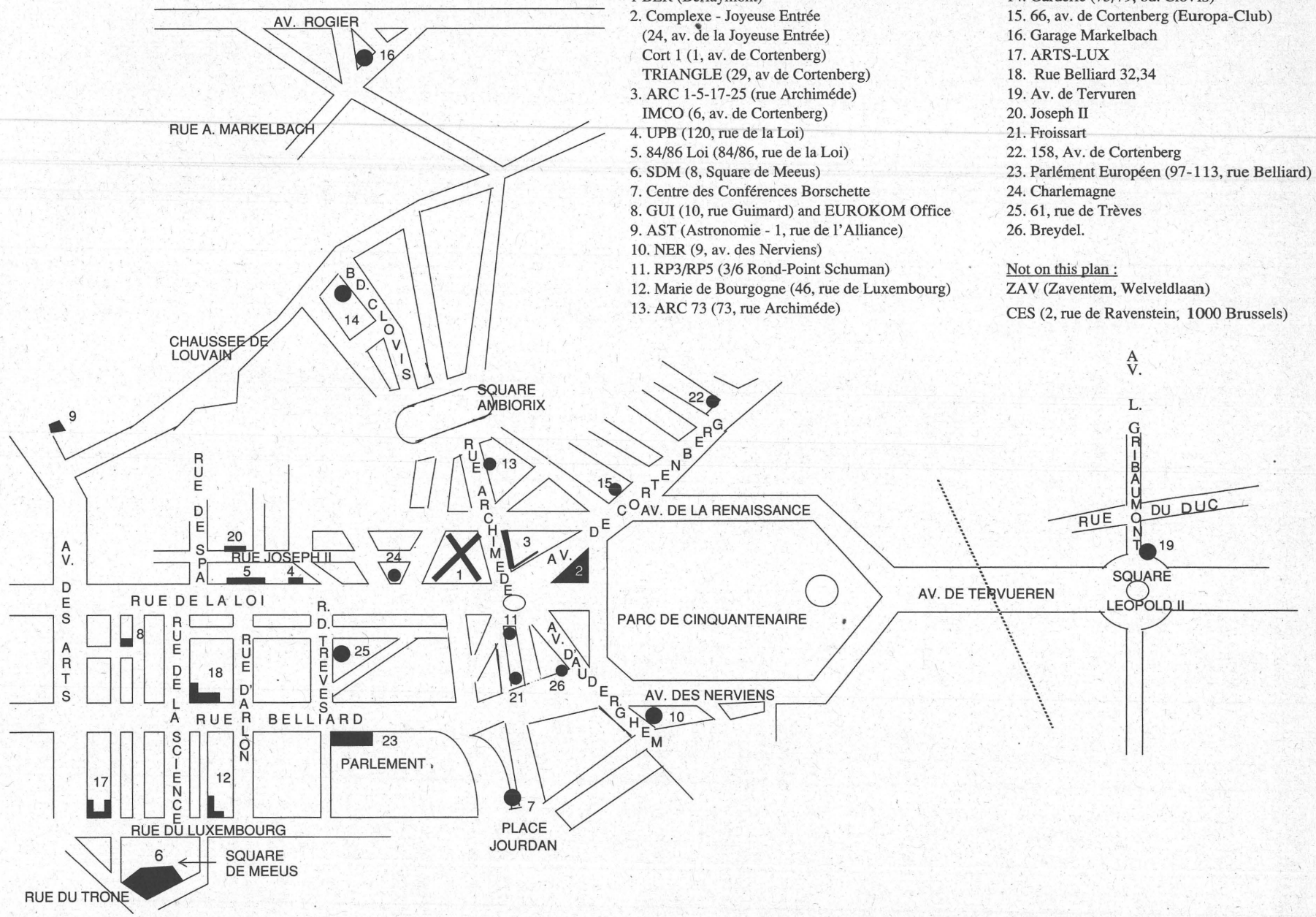
The individual work packages combined in this report include:

1. A general paper on standards. This is wider-ranging than just a list of OSI protocols and should serve as a general introduction to the whole area.
2. A detailed survey of current OSI standards and an analysis of their relevance to library and information services.
3. Strategies for moving towards OSI: a survey of current OSI products and an analysis of various technical strategies for implementing OSI systems within the library and information services domain.
4. A consideration of who are the active parties in OSI. This includes a study of the ISO and BSI (British Standards Inst.) committee structure, particularly as it relates to the library standards. The paper also considers the role of the manufacturers, promotional activities by government organisations and a survey of current users.

The readership is assumed to be not necessarily technical but to require a strategic overview of the way OSI is developing and the implications it may have for library and information services.

Copies can be obtained from:
British Library
Boston Spa
West Yorkshire LS23 7BQ

BRUSSELS LOCATIONS OF THE EUROPEAN INSTITUTIONS.



1 BER (Berlaymont)
2. Complexe - Joyeuse Entrée
(24, av. de la Joyeuse Entrée)
Cort 1 (1, av. de Cortenberg)
TRIANGLE (29, av de Cortenberg)
3. ARC 1-5-17-25 (rue Archiméde)
IMCO (6, av. de Cortenberg)
4. UPB (120, rue de la Loi)
5. 84/86 Loi (84/86, rue de la Loi)
6. SDM (8, Square de Meeus)
7. Centre des Conférences Borschette
8. GUI (10, rue Guimard) and EUROKOM Office
9. AST (Astronomie - 1, rue de l'Alliance)
10. NER (9, av. des Nerviens)
11. RP3/RP5 (3/6 Rond-Point Schuman)
12. Marie de Bourgogne (46, rue de Luxembourg)
13. ARC 73 (73, rue Archiméde)
14. Garderie (75/79, bd. Clovis)
15. 66, av. de Cortenberg (Europa-Club)
16. Garage Markelbach
17. ARTS-LUX
18. Rue Belliard 32,34
19. Av. de Tervuren
20. Joseph II
21. Froissart
22. 158, Av. de Cortenberg
23. Parlément Européen (97-113, rue Belliard)
24. Charlemagne
25. 61, rue de Trèves
26. Breydel.

Not on this plan :
ZAV (Zaventem, Welveldlaan)
CES (2, rue de Ravenstein, 1000 Brussels)

Esprit
Information Exchange System

IESNEWS

Issue No 30, October 1990

Future Events

VSAT 90: EUROPEAN SATELLITE USERS' CONFERENCE. Johannesson & Associates. Luxembourg, 12 - 13 November 1990.

NEURAL NETWORKS AND THEIR APPLICATIONS. EC2. Nimes, 12 - 16 November 1990.

OFFICE DOCUMENT ARCHITECTURE. AFNOR. Paris, 14 - 17 November 1990.

MAKING PAPERLESS TRADE LEGALLY SECURE. Blenheim Online. London, 14 - 15 November 1990.

IINTERNATIONAL MEDIA MARKET. Internationaler Medienmarkt. Munich, 14 - 17 November 1990.

OPEN SYSTEMS: FREEDOM OF CHOICE? Pergamon Infotech. London, 19 - 21 November 1990.

THE ROLE OF IT IN BUSINESS SUCCESS TODAY AND IN THE 1990s. Hellenic Management Association. Athens, 22 - 23 November 1990.

CITIES AND NEW TECHNOLOGIES. Association des Maires de France. Paris, 26 - 28 November 1990.

RESEARCH AND INNOVATION IN THE EUROPEAN COMMUNITY. Centre d'Etude et de Prospective Strategique. Paris, 27 - 28 November 1990.

This year the emphasis of the ESPRIT Conference will be on the results, achievements and new perspectives of Information Technology within the ESPRIT programme.

During the first three days (12 - 14 November), project results will be presented in plenary and parallel sessions. These will be complemented by panel sessions and workshops, where invited speakers will discuss issues relevant to ESPRIT. The six topics to be presented are (Details of the IES sessions are reported on P. 1):

Microelectronics: the central theme here is ASIC, with special attention to service applications, the making of ASICs suited for target application areas and the pursuit of cost-effectiveness and performance.

The ESPRIT CONFERENCE 1990

Information Processing Systems: generic technologies, such as systems design, advanced systems architecture, knowledge-based systems and human/computer interfaces, supporting the development of IT products during the next decade will be discussed.

Computer Integrated Manufacturing: advances in this technology and its impact on industry and the environment are the main subjects.

Office and Business Systems: user requirements and enabling technologies will be dealt with at length with due attention on how technology and users can interact.

Basic Research: results of actions having a long-term research character upstream from the fields of microelectronics, computer science, cognitive science and artificial intelligence will form the core of this area. A Symposium on Computational Logic (13 - 14 November) will include lectures by world leading experts. There also will be a number of workshops on selected topics.

The Conference will be complemented by the **Information Technology Forum** on Thursday, 15 November when a number of prominent speakers from industry, politics and science will address the Conference.

Esprit
DGXIII
Telecommunications
Information Industries
and Innovation

Future Events

ISDN MEETS THE MARKET. Deutesche Congress. Frankfurt, 27 - 29 November 1990.

EUROPEAN CONFERENCE ON HYPERTEXT. INRIA. Paris, 27 - 30 November 1990.

CABLING CONFERENCE 90. Deutsche Congress. Frankfurt, 28 - 29 November 1990

EDI and X.400: X.435 - THE PEDI PROTOCOL AND FUNDAMENTALS EXPLAINED. Technology Appraisals. London, 29 - 30 November 1990 or Geneva, 17 - 18 January 1991

SOFTWARE ENGINEERING AND ITS APPLICATIONS. EC2. Tououse, 3 - 7 December 1990.

EMERGING INFORMATION TECHNOLOGIES. European Institute of Technology, 5 - 7 December 1990.

LIBERALISATION OF EUROPEAN TELECOMMUNICATIONS. IBC. London, 7 December 1990.

ONLINE 90. Learned Information. London, 11 - 13 December 1990.

EUROCOMM 91. Organisatie Bureau Amsterdam BV. Amsterdam, 22 - 25 January 1991.

CONCURRENT ENGINEERING AND ELECTRONIC DESIGN AUTOMATION - CEEDA 91. CEEDA. Bournemouth, 26 - 28 March 1991.