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Esprit Information Exchange System

ies news

Issue No 6, October 1986

This anniversary issue of 'IES News' appears at a specially important time for ESPRIT and for the Community team who are driving ahead with European information technology, telecommunications and innovation strategy.
It is important for ESPRIT because we must now move into an expanded new phase. This year's ESPRIT Conference is effectively the last under the initial funding made available for the program. The ESPRIT approach has proved successful. The Commission's proposals for building on this success, now before the Council of Ministers, reflect the great demand for participation which has been consistently expressed from the beginning by the European IT industry and research community.
While European collaboration in advanced research must be continued and strengthened, new information technology must also be developed and put to work for Europe. That is why the Commission has designed a Directorate-General for Telecommunications, Information Industries and Innovation, covering the wide range of cooperation needed to bring research results through to the user and the developing European market.

A Birthday Message

'Turning the Tide' — the theme of this year's ESPRIT Conference IT Forum — will need close partnership with European industry and universities, public authorities and users. That partnership is what I mean by *the Community team* now meeting this critical challenge. The ESPRIT Information Exchange System and 'IES News' have an important role to play, by helping to link the participants in what is emerging as the most promising mobilisation of European high technology so far undertaken.
Information is the key to innovation throughout the economy. It is equally essential to the innovation we have introduced by linking up European expertise across frontiers through Community initiatives. By helping to put the information into information technology, the IES provides significant support for the development of technology itself. As new participants join the increasingly far-reaching strategy developed by the Community team, information and communication within our partnership will be of major importance to the success of that strategy.

Michel Carpentier
Director General DG XIII

LATE NEWS

New Deputy General Director for DG XIII

The appointment has been announced of Senor Vincente Parajon Collada, formerly of the Spanish Foreign Ministry, to take up the above post as of Sept. 15, 1986.

New Initiative on Book Prices.

According to recent newspaper reports, a new attempt is to be made at the initiative of the Commission, to harmonise book prices. One of the aims will be to bring the official book exchange rates more into line with actual exchange rates, resulting in a lowering of prices to consumers of imported books, and to simplify the mechanism for collecting VAT, where this is imposed.

DFN (German Academic Network).

The NUA of DFN is 453 000 202 05 and the network command is 0 $ Dialog, 2/0 (See note in issue 4)

LATE NEWS,

Swiss Academic Network

Discussion has started in Switzerland on setting up a formal Swiss Academic Network instead of placing exclusive reliance on Earn and other non-Swiss services.

(U.K.) Stock Exchange Automated Quotations.

The above system (SEAQ) will be introduced to support the deregulated stock market which will be created in Oct. 1986. Affectionately referred to as „This Big Bang", much effort has gone into the telecommunications side of this venture. (An article giving details will follow in an early issue).

EURO-CONTACT

AN ONLINE RESEARCH BROKERAGE SERVICE OFFERED THROUGH ESPRIT/I.E.S.

Have you been faced with the problem, three weeks before a deadline for an ESPRIT Call for Proposals, with having to find an additional partner? Have you wished that you had a way to identify contact points in Europe, representing organisations who not only were able, but also willing, to cooperate with other R & D projects? Do you often wonder who else is active in your field, or who has an expertise you lack?

The ESPRIT program has had the requirement that contracts will be awarded to research teams with organisation from at least 2 European Community countries and of which 2 had to be industrial or commercial concerns. The objective of this requirement was to establish cooperation among European concerns and to establish teams capable of managing large and complex research problems in Information Technology. From the experience of ESPRIT to date, it is a fact that finding the right research partners to satisfy the multinational, multipartner requirement has not always been easy.

To assist interested parties to identify suitable organisations with a complementary role in a consortium prior to submitting proposals, the Commission initiated the EUROCONTACT activity. This was used on three previous occasions prior to each Call for Proposals. It consisted of an entry form submitted by organisations with an interest in identifying or being identified as a potential partner to an ESPRIT project. The set of forms received was then circulated to all those interested in obtaining it. The results of this effort were successful. The concept was considered very good and many expressed interest in seeing it continue. Projects in ESPRIT resulted through partnerships established via EUROCONTACT.

Since ESPRIT was launched, a number of other research programs, with similar conditions for participation, were initiated in the Community. Occasionally it is difficult, even for the larger organisations, to find the appropriate expertise for specialised areas of research among themselves. It became apparent that EUROCONTACT could contribute considerably to those interested in participating in these programs and other activities in Europe with comparable requirements. For this reason, the original concept was redesigned and it is being launched as an online computerised service to be operated all the year round.

The new EUROCONTACT service will be based on a database management system on a UNIX host. The database will contain three groups of information:

— Organisation and Contact Point identification

— Organisation profile information

— Research interest description

The information will be submitted through a special data entry form, which can be obtained from the sources indicated below. The database can be accessed and searched with two modes:

— A full screen mode with function keys, simple enough for non-technical users

— A line mode with higher complexity, but also higher flexibility

As these activities are funded by the ESPRIT (I.E.S.) program area, the database will accept entries in the area of Information Technology and related fields.

This service is implemented at the University College Dublin and the same team providing the EUROKOM and EUROIES (Unix-Mail) host services. It is envisaged that electronic mail can be used in synergy with EUROCONTACT by users to exchange initial information and possibly use such means in cooperation for the creation of proposals and eventually for inter-project communications.

To join EUROCONTACT, one should be a contributor. Once an entry is submitted, the contributor will receive a password and a user guide to the EUROCONTACT service. Following this, he can submit as many entries as he pleases. To access the facility, one will need the normal telecommunication infractructure (asynchronous terminal, modem, access to the public networks). Those wishing to make use of only EUROCONTACT can do this, although they have the option of subscribing as EUROKOM or EUROIES users, assuming they are not so already.

The EUROKOM Help Desk (+353-1-697890) and the IES Help Line (+352-453030) may provide additional information to those interested in EUROCONTACT.

The EUROCONTACT service will be operated for a trial three-months period, during which time there will be not cost to the users. Depending on its success and maintenance requirements, a small fee covering operating costs may be charged.

It is hoped that through the EUROCONTACT service, qualified research teams in Information Technology will be formed in response to requirements of Community-funded research programs. Furthermore, it is expected that this facility will assist in linking the many specialising smaller firms with the larger industrial organisations and the academic establishments towards cooperative efforts, fostering research partnerships leading to future product developments and commercial ventures in a wider European context.

To obtain data entry forms, please write to :

CEC
DG XIII/A2, A25-7/12
200, rue de la Loi
B-1049 Brussels

or

University College Dublin
EUROKOM Project
Belfield
Dublin 4
Ireland

THE ARIADNE PROGRAM

1. Introduction

The Ariadne program has as its main objective the development of an experimental computer network for the interconnection of the central computer systems of the universities and research institutes in Greece. The network is being developed in accordance with current ISO/CCITT recommendations and practices and will eventually provide the necessary infrastructure on which selected services will operate.

The program is administered by the General Secretariat of Research and Technology in Greece and it is now in its second year of development. The first year (1985) was mainly devoted to planning and acquisition of network equipment (which was based on a feasibility study concluded in the previous year), while the second year (1986) is more a period of applying experimental connections. The above two-year period constitutes the first phase of the program, and a second (expansion) phase will follow during 1987 and 1988.

In mid-1987 the national packet-switching network Hellaspac will come into operation, and the resulting academic network will be connected to it via a gateway. At present there is a gateway available to NTI in Paris which will also remain operational in the future.

2. Network Structure

The network will be developed according to the two-phase plan outlined above.

2.2.1 First Phase

Initially, there will be a one-node (star) configuration with a 12-port Telepac module which is a Unix-based communications processor with expansion possibilities. Two of the ports are reserved for two LSI.X-25 PADs, each of which can accommodate a total of 16 channels. The rest of the ports will be linked to various central computer systems (types : Cyber, Prime, Perkin-Elmer, VAX) as well as to some smaller machines. One of the ports is reserved for a link to NTI in Paris which will be effected via a local concentrator.

There are also available two more machines which are meant to be used mainly as X-25 carriers : one BULL SPS7 and one TELMAT

SM90 which are both Unix-based machines. In fact it is envisaged that all this will eventually lead to a total Unix environment.

At present only a few of the links are operational, but it is expected that before the end of this phase most of the ports available will be linked to various computer systems.

2.2.2 Second Phase

Two more Telepac nodes are planned to be installed, in addition to the Athens central node, one in Thessaloniki (north) and one in Patras (south-west), thus making up a communications triangle which will cover Greece, adequately.

Each node will have ports connected to local or regional computer systems, i. e. each node will act as a star network within a certain geographical region. Network management and control will initially be exercised from Athens, but as the whole networking system allows decentralisation of operations, some of the tasks will eventually be operated from the other two nodes.

Line speeds available at the moment are at the 4 800 bps level but they are expected to increase to 9 600 bps or higher during this phase.

3. Planned Services

User responses to a questionnaire about preferred services throughout the network have indicated remote computer access as a first priority, followed by file transfer and access to other networks. Additional services such as electronic mail, videotex and other specialised services are also desirable.

As regards applications for which standards or draft standards are (or will become) available, e. g. teletex, message handling systems, all these will be considered as potential network applications.

Also, European initiatives which aim at the establishment of international services for large user communities (such as the high-energy physics community — CERN initiative) will be followed with great interest, as they practically lead to interworking among national academic networks in Europe and probably elsewhere.

4. Conclusions

In conclusion, it may be said that the Ariadne program has so far been successful in that it has been accepted as a worthwhile initiative by a large number of researchers in Greece (who are the future users), and also in that it has generated a rather high degree of interest both inside and outside the academic community.

Its main objective, however, which is the provision of services for the academic and research community, will be realised after the elapse of a rather long period of time.

In the mean time, the network being developed will remain experimental, and it is expected that the experience which will finally be accumulated over this period will eventually lead to certain concrete actions, which will follow the conclusion of the second phase.

G. C. PENTZAROPOULOS
MINISTRY OF INDUSTRY, ENERGY AND TECHNOLOGY, GREECE.

Appendix : List of Participating Organisations

General Secretariat of Research and Technology (Ministry of Industry, Energy and Technology)
National Research Centre Demokritos
National Documentation Centre
University of Athens
Technical University of Athens
University of Patras Institute of Computer Technology
University of Thessaloniki
National Telecommunications Organisation (OTE)

RARE and National Academic Networks

The last two issues of IES NEWS reported on the formal foundation of the RARE Association in June and the Copenhagen meeting in May. It is therefore appropriate that a major part of the current number should be devoted to describing three national networks who are represented in the RARE Association, viz. Ariadne of Greece, Reunir of France and Surfnet of The Netherlands. Whilst there are differences in structure, all have the same fundamental purpose and aim, to speed and improve communication between members of the IT communities (and others) in their country, and through RARE, internationally. IES NEWS had previously given details of activities by DFN in the Bundesrepublik, and of Spanish and Austrian networks. (We look forward to receiving details of others for future publication.) The important contribution made by such networks to I.E.S. and hence to ESPRIT cannot be underestimated.

An Introduction

SURFnet

OBJECTIVES

SURFnet, the Dutch national research network, interconnects all major research establishments in The Netherlands, aiming to facilitate cooperation between researches by offering a national infrastructure for telecommunications. The network, now in its early stages, is initially based upon the use of commercially available products, and will migrate to international standards as soon as their definition results in proven products.

SURFnet's main objective is to stimulate, advance and support cooperation in Dutch research and education. The stable, reliable infrastructure created by SURFnet offers users within the scientific community faster, cheaper and more effective access to information and services needed and required by research and education.

To achieve this, the development of SURFnet is, based upon :

— speedy realisation of an integrated telecommunications infrastructure, thereby limiting the use of ad hoc solutions
— optimal employment of scarce expertise
— close cooperation with the Dutch PTT, trade and industry
— cooperation and interconnection with international and other national research networks, and
— a high degree of user facility accessibility.

Background

In early 1984, the government of The Netherlands announced a plan to stimulate the national effort in informatics and telecommunications. The plan, well received by both public and private organisations, triggered the universities to further develop their own part of the plan. Mid-1985 this resulted in a number of proposals for combined actions, with the development of SURFnet in cooperation with trade and industry as one of the central issues.

Current status

In the spring of 1986, an organisation was built to manage and execute the further development of SURFnet. In this organisation representatives from universities, research establishments, PTT, the computer and telecommunications hardware industry and software houses cooperate closely to further enhance and expand the SURFnet facilities, backed by government, industry and university funding.

It was thus made possible to provide PAD and PSE connections to all 14 universities, enabling them to use the X-25 services provided by PTT's Datanet 1, the national packet-switched network.

In addition, Digital Equipment MicroVAX systems installed in all participating institutions serve to create a nation-wide DECnet, with more than 200 DEC-nodes participating in the network by the end of 1986, and users on other equipment having access to the network via gateways.

The major tasks for the SURFnet organisation in the near future are :

— to coordinate and standardise the connection of local systems to the national network
— to develop facilities for network management, including directory services, accounting facilities, security measures and performance monitoring
— to further define the future architecture of SURFnet
— to develop and provide information and training services for users and for local support personnel
— to stimulate and support the connection of non-academic (including commercial) R & D organisations and of non-academic institutes for higher education to the network
— to participate actively in international networking developments, specifically in the RARE and COSINE activities.

Development Strategy

The bearer services offered by Datanet 1 and the value-added services provided by the nation-wide DECnet create the basis for further expansion.

Initially, conversion services and gateways to facilitate access to

other networks will be required. However, SURFnet fully supports the Open Systems Interconnection standard as defined by the International Standards Organisation and functionally specified by CEN/CENELEC and CEPT. The network will not only implement these standards as they become available commercially, but shall actively participate in their development by initiating pilot implementations of new products and services.

Within this context, pilot projects to be started in the autumn of 1986 are :

— testing of message handling services based upon the X.400 standard, provided by multiple suppliers

— testing of (the organisational, technical and economic consequences of) the use of data-switching facilities in combination with voice traffic on a PABX telecommunications exchange, in preparation of future ISDN development (ISDN = Integrated Services Digital Network)

— investigating the availability of new products with increased network management, value-added services and switching capabilities.

In addition to the two-thronged approach of using existing products and testing new facilities, the research organisations participating in SURFnet, will develop plans to further extend their local telecommunications infrastructure, aimed at connecting all individual workstations to the national network. Thus, every researcher — whatever his or her field — in The Netherlands will be able to communicate with, use facilities of, or offer support to any colleague, at home or abroad.

For further information, please contact :

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telephone : + 31 30 31 12 34

E-mail addresses :
Memocom : NL (Telecom-Gold)
(124) 27 : SIROO2
EARN : U808001@HNYKUN11.EARN

REUNIR

REUNIR (REseau des UNIversités et de la Recherche, in English : Network of Universities and Research) is the French academic and research network. This name was officially given in February 1986 to the network which was developed over the past few years by the Universities and the National Scientific Research Centre. At that time, it was decided to extend immediatly the network to the other public research establishments (Etablissement Public Sous Tutelle). The aim was to connect the various computing facilities used by researchers.

By its nature REUNIR is an open network and is able to open communication with other French research organisations. In fact some connections already exist (e. g. with CNET and INRIA via Cosac).

REUNIR is also connected to some of the main international academic research networks and will gradually link to other such networks.

At the European level, REUNIR participates regularly in the RARE working groups on Message Handling Services and FTAM, and took part in the last European networkshop in Copenhagen where it requested the statute of a founding member. Experimental connections with other European networks members of RARE are one of our priorities and are planned for the end of 1986.

Partnership

REUNIR is constituted primarily by the two main academic and research bodies in France :

— Universities (National Education)

— CNRS = Centre National de la Recherche Scientifique (National Centre for Scientific Research)

together with several specialised research centres :

— INRA = National Agronomical Research Institute

— ORSTOM = Organisation for Scientific Research in Overseas Countries
— INSERM = Health and Medical Research Institute
— CIRAD = International Cooperation Centre in Agronomical Research for Development

Objectives

REUNIR is concerned with the promotion and effective realisation of computerised communication supporting academic and research activities.

REUNIR has the following objectives :

— manage the basic communication network between the computer centres and the laboratories administered by its partners,
— extend this basic network to other interested research organisations,
— establish connection with other national and international academic research networks.

Activities

The current activities of REUNIR are of two kinds :

— immediate action to improve the communication between the users of the REUNIR community, with an ever growing openness towards international networking.

  This is achieved through specific projects coordinated by the REUNIR Technical Team.

— middle- and long-term planning for effective application of communication standards.

  This requires following closely the evolution of the OSI standards and checking their implementation by the manufacturers. To be effective these tests have to be done at an international level, and REUNIR intends to participate fully in the activities of European organisations and projects such as RARE and COSINE.

It is obvious that those two activities are strongly correlated. The immediate action sometimes requires the use of non-standard communication protocols but directly available, in which case the cost of future migration towards ISO standards is an important factor of choice. The needs of the users must be screened carefully to separate the really urgent ones from those which can wait for coming standards. And when new standards become stabilised, current projects should be used as incentive for the manufacturers to implement them on their systems.

The current scope of activities extends to :

— message handling systems,
— file transfer,
— interconnection of main computing centres,
— direct access to computing and documentation services.

Status of the network infrastructure

Users of the REUNIR network have access to many heterogeneous computers.

These computers are installed in various computing centres :

— national centres, linked together by high-speed lines :

  CICRCE, PSI (Paris area)

  CNUSC (Montpellier)

  CCS (Strasbourg)

— regional centres, linked together and with the national centres :

  CITI (Lille), CIRIL (Nancy), CICB (Rennes), CICRP (Paris), CICG (Grenoble), CICT (Toulouse)

— specialised centres, such as :

  CCVR = super computer Cray 1 in Paris area

  CCPN = nuclear physics computing facility in Lyon

  SUNIST = scientific and technical documentation centre

— access points, spread around the country. They allow the connection of users in laboratories and campuses to the above centres, either directly or through local area networks.

Currently, the network structure includes several components :

— private X-25 networks connected to Transpac
— a large proprietary network between mainframes and user workstations
— local area networks inside laboratories or campuses
— hyperchannel connections for high-speed file transfer services (access to CCVR from CIRCE and CNUSC, and between CIRCE and PSI).

To establish these connections, REUNIR is using :

— public X-25 network (Transpac)
— leased lines :

  medium speed for user connection to computer services

  high speed links (up to 2 Megabit/s, via Telecom 1) to provide connectivity between main centres

International communications are available through :

— specialised international networks (Eurasnet, Space, Nascom, Cernet, . . .)
— general purpose networks (EARN, Arpanet).

REUNIR current work items

After a full discussion of the current needs, an eighteen months program has been established. The retained choices were based on the relative priority of each need, the technical possibilities of meeting this, and availability (either immediately or in the near future) of corresponding international standards.

Six main work items are currently in hand.

They are organised as projects associating network analysts from REUNIR nodes under management and coordination of the REUNIR Technical Team.

Project 1 : Message Handling Services and File Transfer

Several communication systems offering both services exist in the network today, none of them using the X-400 standard. The inter-Multics system is connected both to FNET (via Cosac) and to EARN (directly).

File transfer at high speed is currently operating between some of the main centres.

1.1 Interconnection of current mail services on X-400 basis using Cosac implementations

The MHS interconnection system Cosac has been chosen as the backbone of our mail and file transfer services. The experimental implementation currently in operation will be completed by the installation of new nodes and the connection to external networks (e. g. EARN).

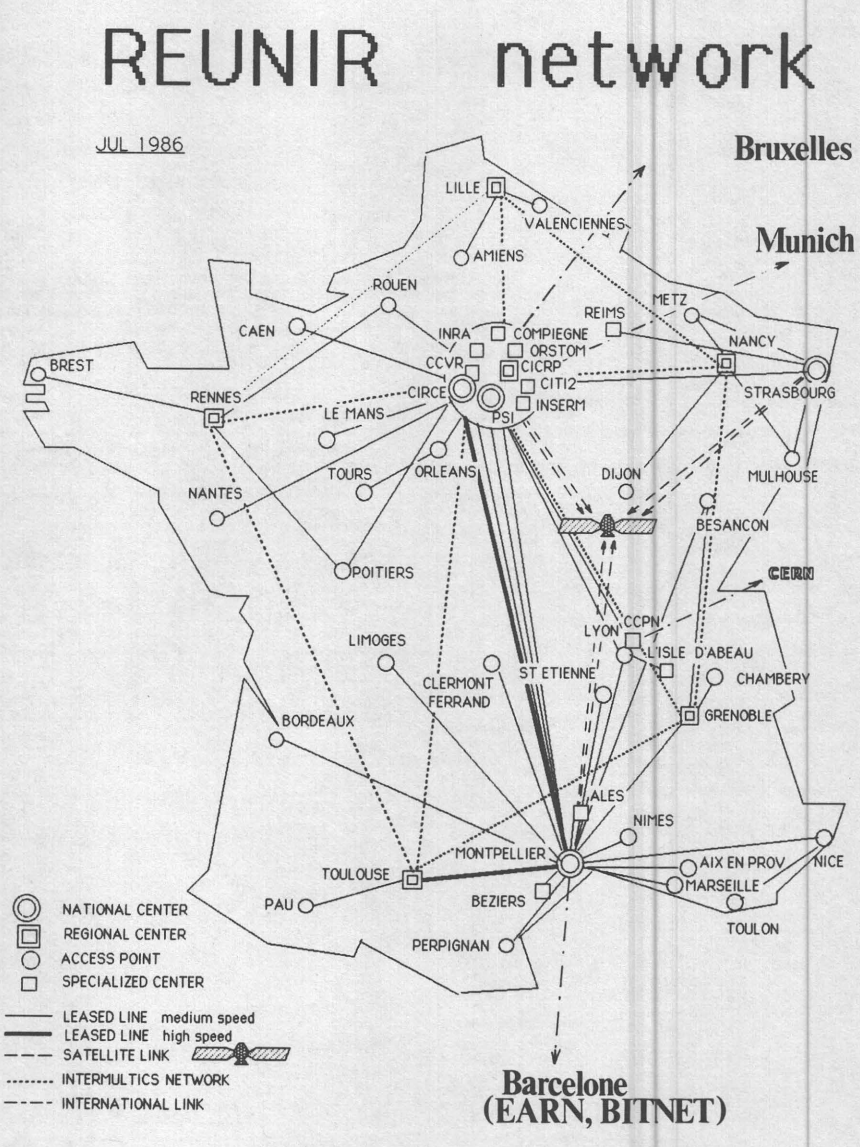
1.2 High-Speed Data Transfer Services between nodes

This is a relatively advanced area and the experience obtained from the systems currently operating must be shared in order to make the best use of the few operational systems available today. Two services are currently used in REUNIR :

— Netex services,
— proprietary network services.

1.3 FTAM Migration

The evolution of the FTAM standard is closely followed to prepare its use as soon as industrial implementations will be available.



Projects 2 and 3 : Hierarchical Network Development for Universities.

The Universities hierarchical network must be opened more widely.

Project 2 : Local Nodes Services

New common access points will be installed.

Project 3 : Regional Nodes Services

The interconnection of the present proprietary network to other existing networks is under study.

Project 4 : Local Area Networks

Several important LANs exist or are currently installed in different places. It is important to coordinate these actions to avoid any replication of work and waste of know-how. The concerned areas are :

— development of LANs in laboratories or campuses

— connection of LANs to REUNIR nodes

Project 5 : International Communication and Gateways

If the need to communicate between French laboratories is fundamental, the need of international exchange of data is more and more critical as the scientific research teams become more and more multinational. The connection of REUNIR to international networks and specially to its European neighbours is of high priority. The present use of EARN will be extended. Experimental connection with European networks of the RARE community is in hand.

Project 6 : Graphics and Image Distribution

Although not properly a 'network' item, it is directly related by its specific needs in data transfer. Also, the possibility of exchanging images between heterogeneous systems should be viewed by the user as one of the services offered by the network.

Organisation

Janine CONNES and Jean-Claude IPPOLITO assume the direction of the network. They are assisted by :

— the Nodes managers,
— the End-User group,
— the REUNIR Technical Team.

Contact

To obtain more detailed information about REUNIR, please contact :

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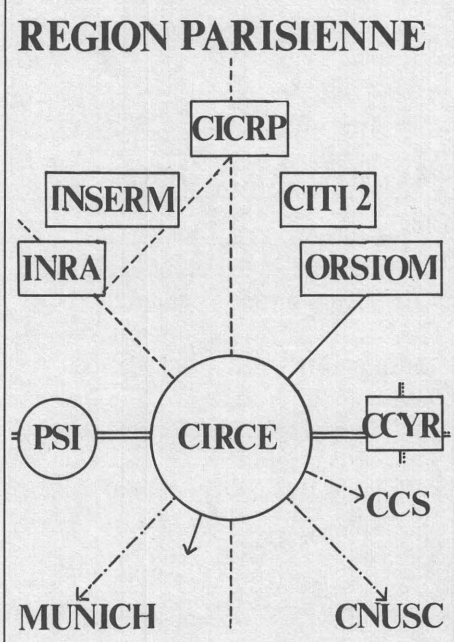

A REMINDER.

I.E.S. HELP-LINE IS NOW AVAILABLE
FOR YOUR ENQUIRES.
TEL. NO. + +352-45-30-30
(SEE IES NEWS, No 4. pg 16)

Communication Systems Architecture

1. Introduction

Communication Systems Architecture (CSA) is concerned with the development of an architecture to satisfy the communication requirements in the office. The main requirements are to cater for distributed and integrated services where the services are expected to include voice, text, graphics, image and data.

CSA is being developed by a consortium of five organisations : these are Bull (F), MARI Advanced Microelectronics Ltd. (UK), Philips GmbH. Forschungslaboratorium Hamburg (D), Société Générale de Service et de Gestion (F) and Plessey Networks and Office Systems Ltd. (UK) who are the prime contractor. The work is being part funded by the Commission as part of ESPRIT.

Communication architectures fall into two major categories : those that are heavily oriented towards technology and those that are heavily oriented towards services. The former we refer to as tactical architectures and the latter as strategic architectures. CSA is a strategic architecture and as such is technology and manufacturer independent.

CSA is being designed to support office application systems, i.e., it provides a set of common distributed processing and communication access services which will be used by these application systems and as such will not be visible directly to office users.

CSA is designed around the concept of a Domain. A CSA Domain as an organisational unit is a set of interconnected systems that provides the appearance, to office application systems and thus to office users, of a single resource-sharing system. CSA will provide solutions to communication within a domain and provide facilities to enable extra-domain communication to other CSA domains and to OSI and non-OSI systems. With respect to extra-domain communication, a CSA domain will present the appearance of a single end-system. It should be noted that there is no fixed relationship between a CSA domain and a sub-network, in fact a CSA domain may extend over a number of private and public sub-networks or a number of CSA domains may share a common sub-network.

In parallel to the development of the architecture, a study of tools to aid CSA in the areas of protocol development, network simulation/ modelling and object-oriented programming languages is being carried out.

2. The Architecture

The architecture consists of two major components, these are the Abstract Object Machines and the Abstract Network Machine. The Abstract Object Machines provide facilities for distributed applications within CSA Domains. The Abstract Network Machine provides network services for both CSA and non-CSA systems.

2.1. The Abstract Object Machines

The problems of heterogeneity and distribution within a CSA domain are solved by the use of a recursive architecture based on a set of abstract object-oriented machines. These machines are based on an adaptation of the object-oriented approach ⊣ referred to as the CSA object model. In this model an object is a conceptually distinct unit that has some abstract significance to users of the system. An object is a collection of information and a set of operations on that information. Operations are functions or procedures which are applied to the information and which are the only way to access it. Objects can be identified and managed as distinct entities by an object management system which is present at execution time and which is responsible for the creation, replication, binding and destruction of objects. Objects are instances of object types. Each instance is created and encapsulated according to the template represented by its type description. The set of CSA object-oriented machines is referred to as the Fine-, Medium- and Coarse-grained Abstract Object Machines. In addition to the abstract object machines, the CSA architecture also provides a collection of system services, at each level, which extend the functionality of these basic object machines.

- The Fine-grained Abstract Object Machine

On each individual system a

fine-grained abstract object machine is implemented which, for the sake of portability, consists of two parts. The first part „the abstract local operating system" deals with the problem of heterogeneity and provides a system independent service module interface, the second part provides the CSA-object view to the next higher level.

- The Medium-grained Abstract Object Machine

A medium-grained abstract object machine is built on the collection of systems that constitute a CSA domain. This distributed machine is constructed from fine-grained objects. It provides the application systems above this level with the view of a single resource-sharing system, thereby providing abstraction from distribution.

- The Coarse-grained Abstract Object Machine

A coarse-grained abstract object machine is also built on the collection of systems that constitute a CSA domain. This machine provides facilities for the various categories of extra-domain communication and is constructed from fine- and medium-grained objects.

The above abstract object machines each consist of a number of managers which apart from the tasks of name resolution, type and instance management and inter-object communication provide a system wide capability oriented protection mechanism.

- System Services

The system services provide a framework for object composition by providing, for example, support for atomicity, the expression and control of parallelism and synchronisation, and for the facility which allows the user to provide their own set of communication abstractions.

2.2. The Abstract Network

The Abstract Network Machine provides network services to CSA and non-CSA systems. The Abstract Network Machine consists of the Abstract Network and the Network Domain. The Abstract Network provides the network traffic carrying services and the Network Domain provides facilities to manage and administer the resources of the network.

- The Abstract Network

The Abstract Network is a distributed machine that provides standad ISO OSI and CCITT ISDN network services for both CSA and non-CSA systems. The ISDN type isochronous connection service provides suitable bearers for real-time voice and video services and the OSI type non-isochronous service provides suitable bearers for text, graphics, image, data and non-real-time voice and video services. This machine will provide standard network service access for higher levels of CSA systems via standard object oriented inter-layer interfaces and standard layer 1 to 3 network access protocols for non-CSA systems. In addition to providing facilities for communication in local networks the Abstract Network will also provide for communication through public wide-area networks.

- The Network Domain

The Network Domain is a Network Management and Administration System built of medium-grained objects which are supported by a medium-grained abstract object machine distributed across the network nodes. The Network Domain will provide a wide variety of facilities necessary for the medium-term management and longer-term administration of a network. The following list indicates the type of facilities provided by a Network Domain :

Network access and usage control.

Network service usage logging and analysis.

Network service accounting and billing.

Network traffic analysis.

Network configuration control.

Network maintenance.

3. Use of CSA

CSA provides facilities for sharing resources within a domain. It is envisaged that the collection of systems that constitute a domain will vary considerably from one organisation to another. For example, one organisation may choose to configure the systems belonging

to individual work groups into domains, another may choose to configure all of the systems on a site into a single domain.

As was stated in the introduction there is no fixed relationship between the CSA domain and networking. Therefore, a single abstract network machine could provide network services for a number of domains and a number of non-CSA systems thus providing networking facilities for intra, inter and extra domain communication.

4. Realisation

As stated in the introduction, CSA is a strategic architecture and as such is technology independent. However, it will be necessary to demonstrate the architecture. This will be done at a later stage in the project using the most appropriate and currently available technology such that the architecture can be proved and refined before possible commercial realizations are developed.

5. Current Status

The CSA Project is a five year project. The architecture described above summarises the results of the first 18 months of an initial 2 year contract. The remainder of the initial contract will be spent refining the architecture such that it will be possible to produce a prototype implementation in a subsequent contract.

GRAHAM CRISP
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INFORMATION TECHNOLOGY AND TELECOMMUNICATIONS:

What about the poor user?

When Gutenberg, or was it Caxton, invented movable type, it brought with it as ultimate consequence for the broad public, spread of and access to knowledge. However even in those early days of IT, governments saw in this a source of revenue and a means of control : stamp duties on printed material and restrictions on free movement of books or even lists of forbidden reading were commonplace. As means of communication evolved from letter post to telegraph to telephone, governmental control and imposition of dues, at least in Europe, became the accepted norm. Noseyness of authorities also increased with the growth of such traffic : whilst much ingenuity was required to peep into sealed letters without breaking the seal, the technical stage of development of telephone and telegraph made 'eavesdropping' a simple matter. It must however be noted marginally, that inspite of such third-party participation, services functioned superbly : in cities, letters posted up to late in the evening were on the recipients breakfast table by early morning, telegrams were delivered worldwide within the hour, and even the manual telephone exchange performed near miracles — the good old bad days.

The advent of wireless again brought a notable improvement to the user, but headaches for our early big brothers : how to prevent someone listening to something you did not want him to hear. Jamming and severe penalties proved no real answer, and matters became even worse for the watchers when television took over as the medium of (tele-)communication - satellite broadcasts here proved the last straw and a total rethink in means of 'protection' of citizens was required (go to East Berlin and watch their television : the most violent and sex-explicit broadcasts originate in the DDR to woo their viewers from the Western stations).

A totally new area was opened up by what we today call Information Technology — read modern telecommunications with high-speed data links, large information stores, expert systems etc. This is the sector of the communications industries that is attracting the most attention, the greatest control and the highest investment. It also has become a matter of national pride and prestige, with much international activity and support. The obstacles put in the path of potential users are however enormous. Leaving aside the important question of standardisation and compatibility on national or international levels, the difficulties for the little man to enjoy the fruits of modern technological developments are startling.

Lets' look at a few examples. Someone living in deep country wishes to have a telephone — it may be years before his wish is fulfilled, irrespective of the high installation charges levied, and a radiotelephone will not be allowed (yet you can have a telephone in your car). You want to use electronic mail and need a modem — you have virtually no free choice — the item must be licensed and approved (and usually also supplied) by your friendly postal authority or licensed operator (naturally you get the best and cheapest). You have spent a considerable amount of money and effort in developing interactive Videotex for home-banking or home-shopping — introduction will be delayed or prohibited on the flimsiest grounds (you might break shopping hour rules by placing an order on a Sunday — what about mail order houses ?). Your employer has his main office in a country other than the one you reside in and you need some personal data from his files or possibly some technical details : you have guessed it, you may not use a computer link to find out — that dreadful transborder data flow thing could happen. On top of all that, you are made to pay artificially high tariffs for all the restrictions you have to put up with : the argument advanced usually that all users of a service are treated equally is a hollow excuse ; for years telecommunications have subsidised other services and the extent to which this has happened has now become public with the income figures of Brit. Telecom : charge scales taken over from the Post Office have yielded such a high profit (in spite of massive investments in modern equipment), that the U.K. government has required a lowering of tariffs. At the same time the loss made by the Post Office has increased dramatically. It does not require a superbrain to deduce what used to happen and is happening in other countries.

Where does all this lead to ? The massive industrial and other research efforts, supported by international funding such as ESPRIT, are helping to perfect and establish a technology which is much needed and would find a wide user population, if the regulatory infrastructure and charging structure were such as to encourage use of the new services. What would the number of electronic mail users be, if charges were comparable to telephone or mail ones ; how many more PCs would be in use if intercommunication were easy and cheap — who only wants to have a PC for computer games or personal accounting ?

We all believe in the various great European research efforts, ESPRIT, EUREKA, etc. Their technological achievements are and will be considerable. Much will have been done to ensure compatibility and uniform standards. The market, that is the pay-off, will however only come when everyone can benefit freely from these advances with the choice of equipment left to the individual, the absence of restrictive regulations and an attractive charging rate. Many small users mean a large number of customers requiring equipment and providing in total a good income for the operators. It is this lesson which has to be brought home to all concerned.

P. Popper

A Guide to Acronyms

The increase in the number of Commission-initiated programs has brought with it a number of new acronyms, which may not be familiar (some older ones are included in the list for the sake of completion) :

BRITE — Basic Research in Industrial Technologies for Europe

COMETT — Community in Education and Training for Technology

DELTA — Developing European Learning through Technological Advance

DIME — Development of Integrated Monetary Electronics

ERASMUS — European Action Scheme for the Mobility of University Students

ESPRIT — European Strategic Program for R & D in Information Technology

EVCA — European Venture Capital Association

FAST — Forecasting and Assessment in Science and Technology

RACE — R&D in Advanced Communications Technology in Europe

SPRINT — Strategic Program for Research in Innovation and Technology Transfer

STAR — Special Telecommunications Action for Regional Development

TNBB — Transnational Broadband Backbone for European Telecommunications

BOOK REVIEW

Standards for Open Systems Interconnection.

Information Technology in the (U.K.) Civil Service.

London : H.M.S.O. '1986, 43 pp. Published as IT Note 12 on behalf of H.M. Treasury (Central Computer and Telecommunications Agency).

This occasional paper arises from CCTA's program of exploratory work in the use of information technology and describes the current status of OSI with the aim of providing guidance to government departments on the approach to be taken in the adoption and application of those standards, their value and their effective use in procurement. Whilst not covering the fine detail necessary for implementors of OSI standards there is advice on the need to plan strategically for the effective use of IT and in the context of OSI this leads naturally to the need for a communications strategy. The U.K. government's committment to support for OSI standards is reiterated and the CCTA's statement of intent in relation to OSI is reproduced : in this, dating from October 1984, the expectation is expressed that within an 18 months period (i.e. by now) it will become mandatory for suppliers of IT equipment to have implemented existing OSI standards and to provide implementation to progressively higher levels of the ISO model as these are fully developed. Certification by a national or international product validation scheme is expected to play a key part in government acceptance procedures.

Indications are provided in the report of the general willingness by suppliers to meet these requirements. A chapter is devoted to drawing attention to some technical constraints such as memory requirements which may make some small machines unsuitable. Attention is also drawn to relays and gateways and LAN-WAN internetworking where standards problems can become acute. The section dealing with the Intercept Strategy formulated by the Department of Trade and Industry is also of much interest. In addition the report provides a model tutorial on OSI standards, an up-to-date listing of OSI References and a useful glossary. Overall, an excellent report and well presented.

(It would be useful to know whether equivalent publications are available in other Community countries).

IES News is your newsletter. We want your comments, views and contributions. The next issue will again have a Correspondence column. All communications to

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Some More Details about ISDN

In the last issue of IES NEWS (pg 15) Prof. T.M. Schuringa made reference to the Commission Recommendation to the Council of Ministers relating to the introduction of ISDN (COM 86 (205)). A brief summary of this document may be of general interest. The proposal has two objectives :

promotion of the rapid introduction of ISDN as a basis for a Community-wide telematics market ;

and

provision of more certainty for European industry and for the European investors in the telematics field about future network support : interface specifications, services offered and their timing, and geographical coverage.

The evolution of telecommunications in the Community can be seen as the development of three generations. The first is the present telephone network which still is the major revenue source of network operators. The second involves the upgrading of the existing telecommunications network by integrating the whole range of new data services — the ISDN with a basic user access of 144 kbits/sec allowing simultaneous use of two 64 kbits/s voice or data channels and of an additional 16 kbits/s channel. The third generation will be the emerging broadband networks at speeds of 2Mbits/s and above, including cable TV systems.

ISDN will therefore be the main support for multifunctional terminals for both voice and data, ensuring both business and private communications. Thus there will be support for the developing private terminal markets. ISDN will offer many new or improved services such as high-quality telephony, high-speed facsimile, packet-swiched data networks, teletex, videotex, combined use of voice and data, etc. The benefits will be available also to small- or medium-scale users, who hitherto have suffered some disadvantages in use of telecommunications.

However some of the technical premises for the wide-scale introduction of ISDN are lacking and it is the aim of the Recommendation to smooth the way for the rapid introduction of ISDN, overcoming present compatibility and related problems.

TELECOMMUNICATIONS TO BECOME DEARER IN THE FRG

The Bundespost in its most recent (29th) tariff changes announced for implementation on 1. April 1987 has raised drastically connect charges for dial-up to Datex-P pads. At present, a charge of 0.23 DM gives a connect time of up to 8 minutes during daytime and 12 minutes a night or at weekends. The new tariff reduces the time to 50, respectively 75, seconds — i.e. by a factor of virtually ten.

This will greatly disadvantage the small user who has not a P10H or P20H main connection to Datex-P. The justification offered by the Bundespost for this increase is that because of their monopoly position, one service (i.e. the telephone) should not subsidise another (Datex-P), and that consequently a national uniform rate for Datex-P usage must be introduced.

Datex-P usage is one of the services showing rapid growth, but it is more than questionable whether a tenfold increase in charges is likely to give sustained growth (or even increased income). It should also be noted, that charges for usage of Videotex are based on an eight-minute period with uniform (low) national rates.

It is to be hoped for that the Commission, which has been informed of the impending charges, will act quickly and remind the Bundespost of its undertaking on taking over Euronet, the predecessor of the Datex-P network, to provide at least as good a service under comparably user-friendly (read including cheap) conditions.

Esprit
Information Exchange System

ISSUE NEWS

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The announcement of Commission action to ensure free and unhindered access within the Community to television programs transmitted from Community-based stations (and satellites) may well represent the first welcome step in removing restrictions governing transborder flow of information, data and entertainment carried by electronic means. It has always seemed somewhat strange that the carrying medium was considered to be the deciding factor of whether transborder flow was permitted or not. In democracies, such as the member states of the Community, free flow and access to print media, has always been one of the fundamental tenets. The same has applied to telephone, telegram, telex traffic and naturally also wireless.

Liberalisation in European Telecommunications ?

Why then the reluctance until now to apply the same principles to television and the strange attitudes to computerised data flow or access across frontiers. It has always seemed odd that interpretations of the various national 'Freedom of Information Acts' or of the UNESCO report 'One World, Many Voices' have tended to be restrictive — understandable perhaps, but not really acceptable, in some parts of our world. It should be an unassailable principle that restriction in access to published material in whatever form imposed on citizens by their own or other governments is a clear breach of human rights — it is equally wrong for country X to deny its citizens access to wireless broadcasts from country Y, as it is for the government of country Y to deny citizens of country X access to computer-stored published data. Thus to misquote 'One small step .....'

P. P.

Future Events

Electronic Message Systems. Online, London, Oct. 27 - 28, 1986.

International Conference on Computer Languages, I.E.E.E., Miami Beach, Oct 27 - 30, 1986.

International Symposium on Local Communication Systems, I. F.I.P., Toulouse, Nov. 1986.

Computers in the City. Online, London, Nov. 18 - 20, 1986.

Future Events

International Online Meeting. Learned Information, London, Dec. 2 - 5 1986.

Expert Systems 86., British Computer Society, Brighton, Dec. 16 - 18, 1986.

Expert Systems and their Applications. Aginfor, Avignon, May 13 - 15, 1987.