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UNITED NATIONS EDUCATIONAL, SCIENTIFIC AND CULTURAL ORGANIZATION
INTERNATIONAL CENTRE FOR THEORETICAL PHYSICS
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FIRST INTERNATIONAL SCHOOL ON COMPUTER NETWORK ANALYSIS AND MANAGEMENT

(3 - 14 December 1990)

Joint Network Team

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The Computer Board and Research Councils

Joint Network Team

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JANET

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References

1. RARE

   Contact RARE Secretariat
   Postbus 41882
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   - list of available documents
   - list of newsletters
     many free subscription

2. Proceedings of RARE Networkshops + Joint Conference in Killarney

3. Reference Books

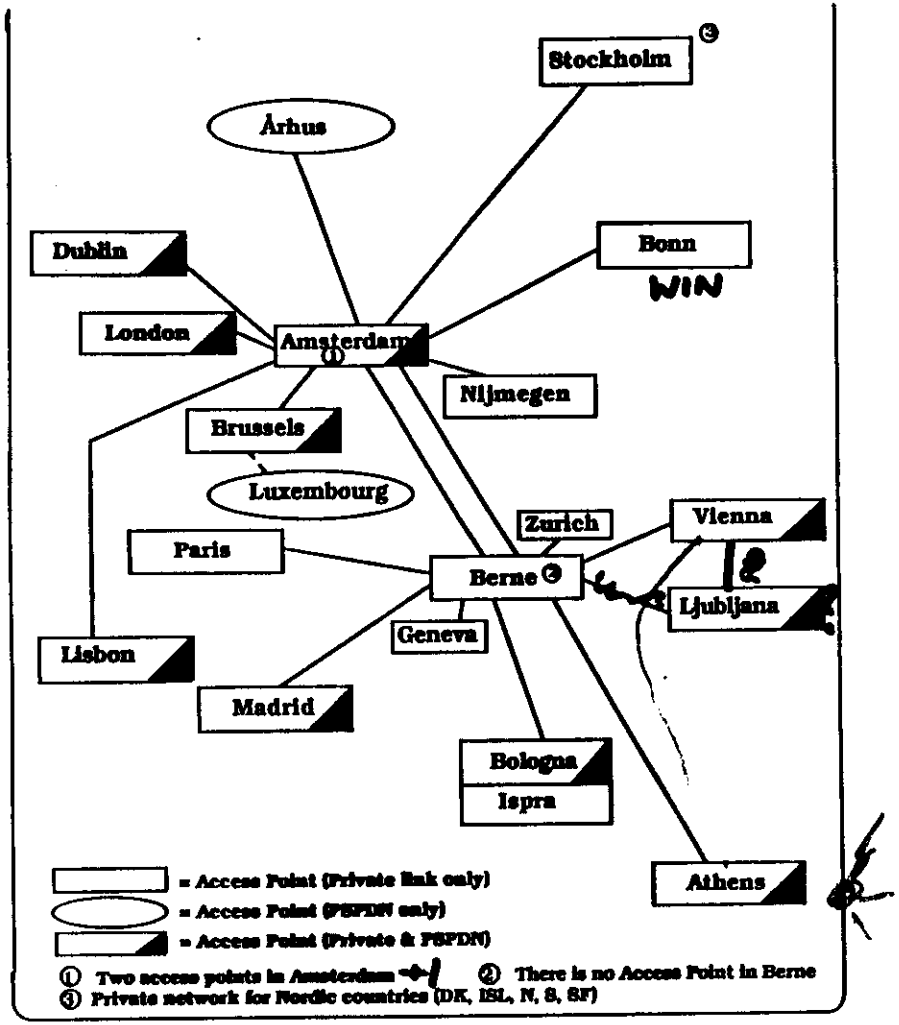
   Communication Network Protocols
   B. W. Marsden
   useful analysis of the problems

RARE

COSINE

Pilot IXI Service

PROPOSED TOPOLOGY - Phase 1



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IXI DNIC

2043

JANET Introduction

The UK Joint Academic Network

JANET, the UK Joint Academic Network, provides the UK Higher Education and Research Community with a computer communications infrastructure enabling collaborationve with colleagues in other parts of the country equally as well as with those at the same campus or institute. It also provides access to resources, ranging from supercomputers to library catalogues, which for cost of efficiency reasons are best provided on a national or regional basis. JANET itself is a backbone network which connects into every University and Research Council such as SERC, NERC etc.

Services

JANET is able to carry the following services:

- electronic mail
- file transfer
- remote terminal access
- job transfer and manipulation

To provide the interworking capability described above, the computer systems have to use the same communications protocol for a given service, i.e. they have to speak the same language and follow the same conventions. The recommended and supported protocols are known as the UK Coloured Book protocols and a transition is underway to use the internationally agreed ISO OSI-based ones instead. These protocols are available for a wide range of computers, from PCs to large main-frames.

A central support group known as the Joint Network Team, JNT, manages the JANET services and supports the community in their use. The JANET backbone network is based on 2 Mbps trunk circuits leased from British Telecom and Mercury. Currently there is a JANET II programme underway to install 2 Mbps access circuits to all Universities and the larger Research Council institutes. For the future Super JANET will match on the Wide Area Network the 100 Mbps campus LANs which are being installed. Other JANET services include the NEWS machine, NISP (the Networked Information Services Project) and the convertors and gateways, some of which are listed below.

Organisation

The Director of Networking and his Joint Network Team operate under the reponsibility of the UK Department and Education and Science's Computer Board for Universities and Research Councils. Policy is determined by the Computer Board but technical advice is prepared by groups which draw on the expertise and experience of the community to provide the appropriate basis for decision making.

Regional ans Special Interest User Groups are represented on the JANET National User Group which in turn is represented on the Networking Advisory Committee. The Joint Network Team provides technical advice on networking aspects of computing procurements made through the Computer Board and initiates the development and evaluation of new technologies for the

JANET services are provided under contract by institutes within the community, in particular the trunk network itself is operated by the 8 Network Operation Centres to which individual sites are connected.

Technical Aspects

JANET communications services are supported via the UK Coloured Book protocols which form an open, ie. non proprietary, architecture. Computer Board policy is to make a transition to the ISO OSI protocols as these are finalised. Table 1 summarises the protocols used to provide each service currently and the transition target.

Table 1 - JANET Services

Service	Coloured Book	OSI Target Protocol
electronic mail	Grey Book	MOTIS - X.400(88)
file transfer	Blue Book - NIFTP	FTAM
terminal access	Green Book - TS29	XXX - no change
full screen access	Fawn Book - SSMP	VT or X-windows
job transfer	Red Book - JTMP	JTM enhanced
network level	Yellow Book - YBTS	CONS - X.25(84)
Ethernet	-	Pink Book - X.25 over LLC2
Cambridge Ring	Orange Book	Peach Book - ditto

Copies of the Coloured Books and the OSI Transition Plan can be obtained from the JNT at the address given below.

The Name Registration Scheme provides a central database with entity (computer system) names and YBTS addresses for each service. This gives the user a consistent user friendly name to use in all contexts and protects him from any technical addressing changes.

A pilot project is underway based on the CCITT X.500 series directory recommendations to provide a community wide directory service.

International Communications

International communication is provided via the UK's 128 Kbps transatlantic connection to the USA and a 64 Kbps connection to the COSINE International X.25 Infrastructure (IXI), connections to EARN and Eunet as well as to British Telecom's PSS/IPSS network.

Convertor gateways are provided to enable users to access other countries where different protocol architectures are used and to smooth the transition path to international standards. The move to international standards will reduce the need for such convertors for international communications. Current service convertors which are operated on behalf of the community or to which the community has access are:

NSFnet-relay	gateway to SMTP Mail,ARPA FTP and Telnet
MHS-relay	gateway to X.400(84) mail services
EARN-relay	gateway for mail and file transfer on the EARN/BITNET networks
UKC	gateway to BIInet for the UUCP mail network

The JNT was a founder member of the RARE Association, which brings together the European research networking organisations and their users. RARE has technical responsibility for the COSINE project which is seeking to construct an international infrastructure based on international standards to support the computer communication needs of the European research community.

Further Information

More detailed information on JANET and the associated services is provided on the JANET Starter Card and JANET Starter Pack.

The JNT publishes a regular newsletter, Network News. Please contact the JNT at the address below for a free subscription.

Each year a Networkshop is organised to review the developments of the previous year and discuss ideas and plans for the future.

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JNT file ref 34/xx - SSL(90)3 dated 15 Nov 90

Comment

This is a first draft for an introductory Information Bulletin on JANET, please let me have comments - in particular whether there are aspects that I have missed: James Hutton, JNT - as above.

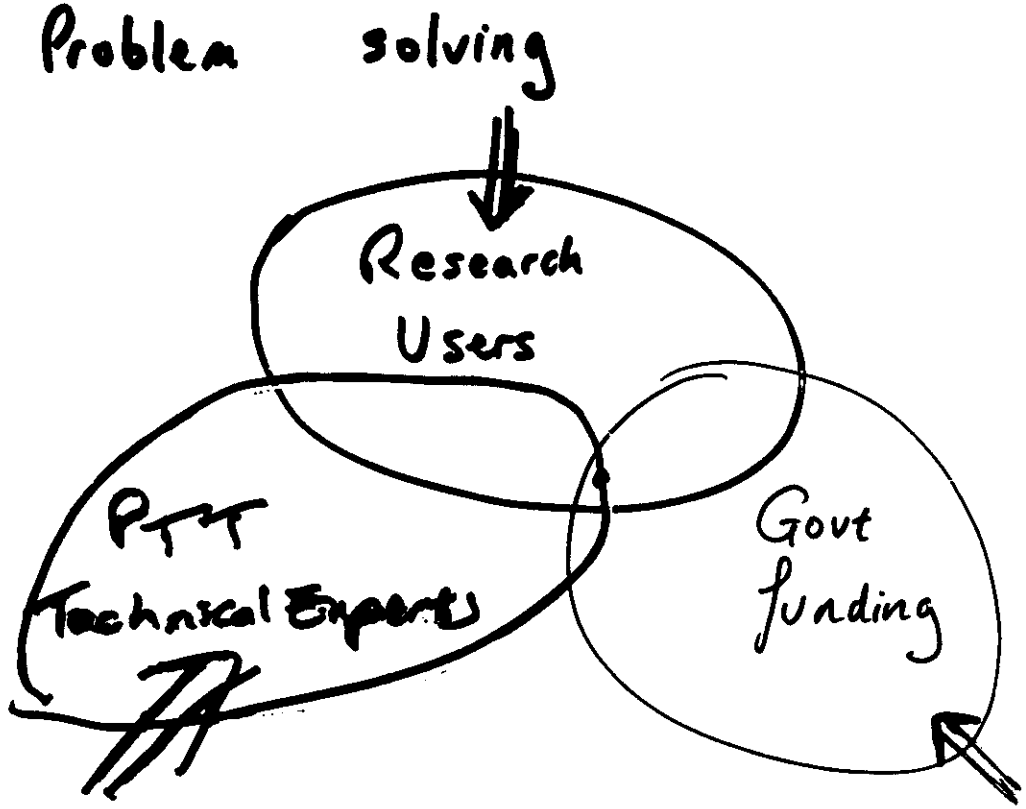
From JANET to

Super JANET

Dr James Hutton

Joint Network Team

1. Current UK Scene
2. JANET MkII
3. Super JANET



All can bring in outside help.

to solve the problems

You must decide - choose.

Access mechanisms

Options:

direct

indirect - ie. via other connections

Low level:

over PSTN - dial-up

permanent circuit 2400→

ground or satellite link

microwave ?

PSPDN access

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UK scene

Centralised management approach

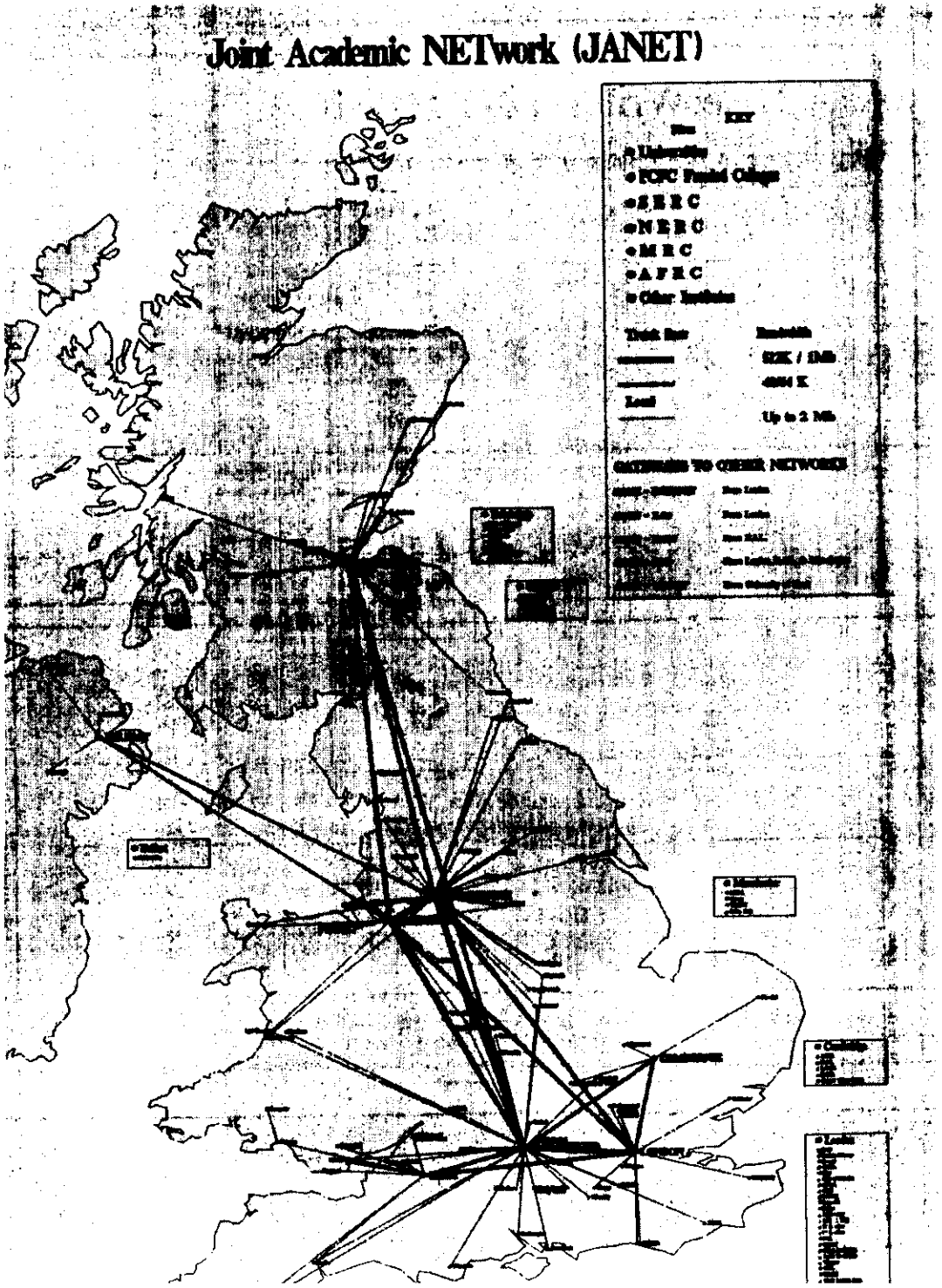
Funding followed strong technical recommendations

Not possible to have UK-only solutions

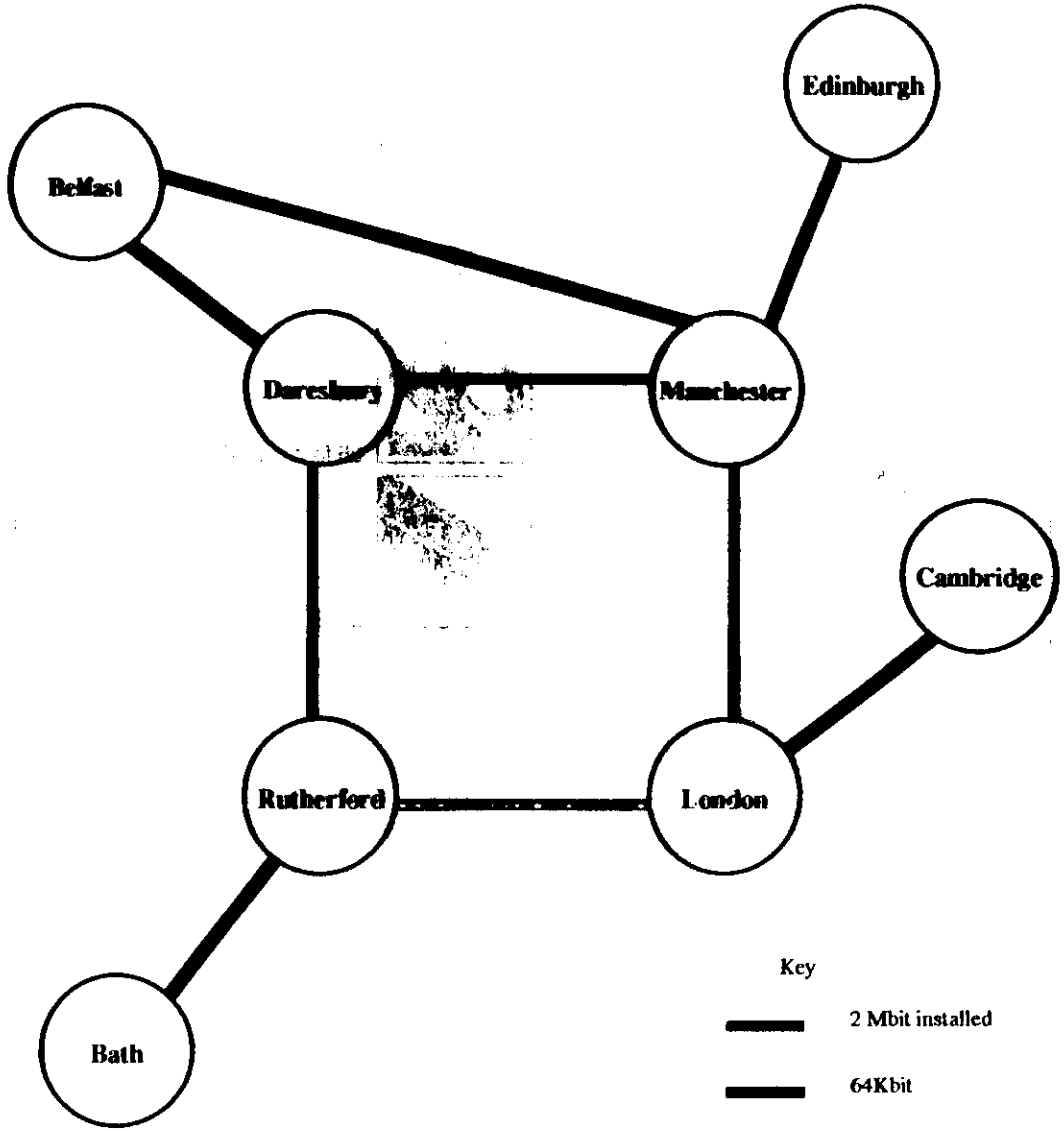
Transition to OSI

Protocol conversion

- management boundary as well as technical one



JANET MKII Backbone



Local-Area Network Initiative

- **Pump priming initiative**
- **Aim to provide a 100Mbps+ backbone LAN on each university campus**
- **Funding approved**
- **Pilot sites chosen**

Super JANET should bring together

- data communications service
- video conferencing
- research in IT / comms + development
- voice

SuperJANET

- Long term
- Aim to create a network with 100Mbps + access within 5 years
- An Opportunity for Collaboration
- New Requirements
- Technology now available
- No Funding

An Opportunity for Collaboration

- A Collaborative Project
- Collaboration with Industry
- Access for a Wider Community
- Collaboration with Other Countries

SuperJANET

High Performance

Optical Fibre

Wide Area Network

to support

UK Research

and

Education

SuperJANET

High performance data communications network

Multi-media electronic mail

Advanced visualisation techniques

Electronic libraries and multi-media information services

Distributed systems

SuperJANET

Video network

Distance learning

Distributed meetings and conferencing

Remote observation and control of experiments

Remote medical diagnosis

SuperJANET

IT research network

Testbed for UK research in advanced networking and Information Technology

Support UK participation in ESPRIT, RACE, etc

Pilot new services in a user environment

Faster transfer from research to service

SuperJANET

Beyond imagination

The most important uses of SuperJANET are likely to be uses that we have not yet identified