THE DEVELOPMENT OF BROADBAND RESEARCH NETWORKING IN EUROPE - THE POLITICAL CHALLENGES

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Rapporteur: Jim Smith

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The development of broadband research networking in Europe - the political challenges.

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UKERNA

- Not-for profit Company
- 'Owned' by the Higher Education Funding Councils
- Management of the Networking Programme

JANET

- Joint Academic Network (established in 1984)
- Wide-area (inter-site) data communications network
- Supports UK Higher Education and Research community
- About 200 sites connected
- Connections from 9.6 Kb/s to 2 Mb/s

JANET Applications

- Remote access to (large) computers
- File and document transfer
- Data base access
- Information services
- Electronic mail
- Part of the Internet

SuperJANET

1989-91   Initial proposals

     £20 M over 4 years granted by DES

1992   Competitive procurement won by BT

1993   Pilot network, application development

1994   Service data network (>50 sites @ 10/34 Mb/s)

     Pilot video network (14 sites @ 34-155 Mb/s)

1995-97   Additional funds - roll out to all HEIs

SuperJANET Sample Applications

Supercomputing	Remote data visualisation
Information services	Document sharing Access to rare documents Electronic publishing
Remote consultation	Pathology network
Remote access	Brain imaging, Earth imaging
Group communication	Collaborative modelling Video conferencing (seminar) Video communication (personal)
Teaching/Learning	Distance teaching (e.g. Surgery) Multi-media facility

European Connectivity (2 Mb/s)

EMPB (DANTE)

Research Networks
in most EU
countries

Other European RNs

Gateway to E-bone

USA link

E-bone

Mixture of Research
Networks and
Commercial
Internet suppliers

USA link

Ad hoc links

e.g. UK - France

U.S.A. Connectivity (2 Mb/s)

'Fat Pipe'

2 x 2 Mb/s

UKERNA/NSF
funded

Interim plan

8 Mb/s ?

The essential problem

- We have broadband nationally for IP
- 25% (at least) of traffic is international
- We need broadband internationally for IP
- Multi-media services required also
- PNOs reluctant to make international broadband available
- Prices are ridiculous

Background to TEN-34

- DG III and DG XIII call for proposals
- Interconnection of European Research and University Networks at 34-155 Mbit/s
- EU part funding
- 7 February 1995 meeting of heads of National Networks
- Draft Memorandum of Understanding

Management

- TEN-34 (Trans-European Network operating at 34 Mb/s) - working title that stuck
- TEN-34 Networks are those National Networks that subscribe to the Memorandum of Understanding
- TEN-34 Steering Group - Heads of National Networks
- Sub-structure being discussed

National Networks involved

Austria	ACOnet
Belgium	BELNET
Denmark	UNI-C
Finland	FUNET
France	Renater
Germany	DFN
Greece	ARIADNE
Iceland	SURIS
Ireland	HEAnet
Italy	GARR
Netherlands	SURFnet
Norway	UNINETT
Portugal	FCCN
Spain	RedIRIS
Sweden	SUNET
Switzerland	SWITCH
United Kingdom	UKERNA
	Nordunet

Technical Objectives

- Leading-edge interconnect
- Initially 34Mb/s IP and ATM trial network aimed at production service
- Expansion to 155 Mb/s and higher
- Seeking collaborative/ special deals with PNOs; opportunistic approach
- Intercontinental requirements

The Problems - European Collaboration

- Sheer size - > 15 nations
- Different state of development
- National aspirations
- The Commission
- Language

The Problems - Research Networking

- Technical problems to solve
- Relationships with communications research
- Providing a service but remaining leading edge

The Problems - PNOs

- Culture
- Infrastructure and Applications
- International phone business
- Fear of re-sale
- Liberalisation

The Problems - PNOs

- 34 Mb/s availability
- 34 Mb/s tariff
- Derogation
- ATM development
- Collaboration

Policy Issues

- Research Networks provide an environment for innovation
- Commercial providers lack both expertise and business imperatives

Policy Issues

- Computer industry revolution

    Commodity equipment

    Systems services (standard)

    Generic applications (few)

    High value applications software (very many)

Policy Issues

- Communications industry revolution?

    Commodity bandwidth

    Systems services (standard)

    Generic applications (few)

    High value applications software (very many)

Policy Issues

- Monopoly suppliers

    Computer (mainframe) suppliers

    Telecommunications suppliers

- Slow applications development
- High mark-up prices
- Protective of competition

Policy Issues

- Physical infrastructure (duct and cabling)
- Managed bandwidth
- Network services
- Applications Services

Policy Issues

- Need

    **Separate network suppliers
    from application service
    providers**

- How

    Central control (c.f. Rail Track)

    Market Forces

    Regulation

Conclusions

- The Information Superhighway must <u>not</u>
  be the province of a few monopoly
  providers
- The benefits of advancing technology
  must be made available to industry,
  education and society at large
- Everyone must be free to experiment, to
  establish new ventures
- The winners and losers will be found only
  through practical application

Conclusions

- International collaboration is very difficult
- International bandwidth is highly protected by commercial/national interests

DISCUSSION

Rapporteur: Jim Smith

Professor Tedd asked if difficulty in obtaining broadband provision from PNOs is mainly attributable to fear of competition through resale, since the PNOs are not allowed to sell with an attached prohibition on resale of bandwidth for telephony traffic. Dr Hartley agreed suggesting the problem may only be soluble through political measures though it is in fact a business problem. Mr Ainsworth commented that much of PNOs revenue currently comes from large businesses who need large numbers of low volume lines to meet their telephony requirements. Dr Hartley agreed and added that a fear of new business is a force for stagnation.

Dr Lesk described an approach to encourage innovation in the field of radio communication within the US, by which preference is given in bandwidth allocation to users who have new technology for better use of bandwidth. Dr Hartley suggested that the characteristics of radio communication warrant such an approach but that data communications over line as considered here perhaps don't. Professor Gladman suggested that one application which might be relevant is the use of mobile equipment. Dr Lesk mentioned the use of radio communication as an option for the local connection of equipment within a building.