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network infrastructure for
the European research
community: the commercial
challenge**

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Setting Up a High Speed Network Infrastructure for the European Research Community: the Commercial Challenge

Dai Davies

Abstract

Research networking in Europe is developing fast at a national level. A number of national research networks have well established plans for higher speed services (34 Mbps and higher speeds) to their users. At the same time the pan-European services procured by public tender two years ago which form the basis of EuropaNET are already reaching saturation. A major extension of pan-European connectivity is planned by DANTE, the organisation set up by the European national networks to organise and purchase international services on their behalf.

Despite a market place where the suppliers are threatened with liberalisation, it is likely to be very challenging to organise higher speed research networking on a pan-European basis. This paper examines the commercial factors that will affect the provision of service and suggests a way through the maze of the European telecommunication service supply industry threatened by changes which it does not fully understand.

I. Introduction

In October 1992 RARE, on behalf of the European research network community, contracted for the provision of a pan-European backbone network to interconnect the national research networks of Europe. The maximum speed of connection was to be 2 Mbps. After one year of this contract it was apparent that 2 Mbps of access was insufficient for some countries and in at least two locations the aggregate access bandwidth is in excess of 4 Mbps. The traffic growth on the network (EuropaNET) in the twelve months to November 1994 has been 20 % per month. At the same time technology changes planned or already implemented in a number of

European research networks envisage much higher speed national backbone networks with transmission speeds of 34, 155 Mbps and 622 Mbps.

In this context it is not surprising that plans are well advanced for the procurement of a successor network to EuropaNET. To a first order technology is not a problem with the availability of fibre optic transmission and fast switching systems and the emergence of ATM technology. Transforming technology to service is a challenge that engineers consistently underestimate. Nevertheless it is a known challenge and by concentrating on user needs rather than the beauty and idiosyncrasy of the technology it is a challenge that can be met.

Despite the availability of technology and clear demand evidenced by national developments, enhancing the European backbone will be a much greater commercial challenge than in 1992. This is paradoxical. The European research community is better organised today than it was in 1992. In 1993 the community created DANTE, a company that was set up to organise the procurement of international network services on their behalf. Nevertheless the service side of the European Telecommunications supply industry will be less capable in 1995 to meet the challenge of supplying the research community than it was in 1992.

To understand this paradox it is necessary to look in more detail at the commercial and political forces that are shaping the development of the industry. In 1991 it was possible to organise an open public tender for the provision of 2 Mbps service to the community and to receive at least six sensible responses for ubiquitous pan-European service. Three years later it is difficult to believe that such an approach to procurement would be successful.

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II. Service Suppliers

The starting point for a replacement will be a 34 Mbps service. The research community would be capable of exploiting higher speeds and planning will include them. Nevertheless, the building blocks for such a service, international leased circuits, are not available at such speeds. In a survey, carried out by DANTE at the end of 1994 of all the European Public Network Operators (PNOs), it was apparent that they were unwilling and hence unable to make such capacity available. Although nearly all PNOs publicly claimed to be in a position to supply such circuits no European PNO was able to provide prices or a reference sale. Informally some would admit that there is a general reluctance to see such international transmission capacity offered on the European market.

There are a number of reasons why the PNOs who form the supply side of the telecommunication services in Europe are less forward looking and go-ahead than they were three years ago. One of the major causes for this change is the very real threat of impending liberalisation of the PNO's markets. With certain notable exceptions (the UK and Sweden) the European telecommunications market is dominated by sovereign national monopoly suppliers. They control the market for nearly all aspects of service both nationally and trans-border.

III. Liberalisation of Telecommunications in Europe

In order to understand why this group is becoming more conservative in an environment which has a clear timetable for liberalisation it is necessary to understand a little of the commercial dynamics of their business. The major revenue earner for European PNOs is international voice telephony. International voice telephony probably represents only between 15 and 30% of the turnover of a typical European PNO but between 30 and 60% of its profits. Given this extremely high level of profitability from a single service there is pressure to try and allocate as much of the overall PNO costs as possible against such a service. It is likely that the creativity of accountants has been brought to bear on the apparent level of profitability. The actual overall contribution of international voice telephony to profitability of a PNO could well be even higher.

The PNOs are faced with a significant future threat to their most profitable activity.

Liberalisation will allow companies to build bypass facilities that offer international voice telephony at a level much closer to cost. These companies will resell capacity on international circuits. With this background it is easy to understand the reluctance of PNOs generally to make high capacity international circuits available. A 34 Mbps circuit can carry at least 1000 simultaneous voice circuits at high transmission quality. It is the logical building block for an international voice resale business which would hit at the very profitability of most of the European PNOs. If one assumes that 34 Mbps circuits would be made available at prices that were an extrapolation of lower speeds circuits and continued the economies of scale currently available, a simple calculation shows that an average usage of around 3% would cover in fact all the direct costs of an international voice resale business in Europe.

There is a second factor which threatens the current complacent monopoly of the PNOs. The major corporate business customers have long sought pan-European service providers to take care of their international service provision. The failure of one stop shopping and Euro ISDN to meet the needs of this sector of the market has intensified demand. The creation of groups of European customers with the sole purpose of purchasing voice services is a manifestation of this frustration. The obvious commercial solution to this would be the emergence of true pan-European service providers aiming at the business community. However, for such operators to create a viable business, they need access to infrastructure building blocks. The most important of these is high capacity international circuits. Although the major corporate market is relatively small compared with the international voice market it is psychologically important to the PNOs as it involves large and influential customers.

IV. The Research Community Response

The major inhibitors to the development of a pan-European research network to match the facilities being deployed nationally are the structural changes to the telecommunications market which will create a climate for liberalisation before the year 2000. The challenge for the research community is to overcome these inhibitors in a way that will be beneficial both for the community as a whole and for the PNOs.

The current PNO position is wholly defensive. In practice, however, liberalisation will come. It has

moved off the political agenda and onto the implementation path. The consequences will be lower prices for services. It need not, however, lead to lower profits if demand can be increased. The research networking community is in a unique position to assist the PNOs to stimulate new demand. Because it is a technologically advanced community it is already starting to trial, on a national basis many of the advanced applications that will represent the basis for future growth. In addition the research community is unique in having virtually no interest in switched voice (why speak to someone and risk human interaction when you can have a more interesting debate by despatching rude e-mails to hundreds of people simultaneously instead). Thus in terms of the perceived commercial threat of voice resale the community can easily give reassurance to the PNOs.

The commercial positioning of the research community needs to be carefully defined. There is a danger that the PNOs will perceive us as a threat to their commercial development. The important area of acceptable user policy needs to be addressed. The academic research community is not a closed community. There is a need to communicate with industrial researchers and to access and be accessed by the Internet. The recent liberalisation of the Acceptable Use Policy on EuropaNET is a practical recognition of this need.

Nevertheless by seeking a collaborative relationship with the PNOs the community has to avoid the temptation of exploiting this relationship commercially by reselling the benefits outside the community. There is a need for connectivity but the community must establish a clear and defensible positioning in respect of its relationships with commercial network operators other than the PNOs. Researchers' primary need is to have access, at affordable prices, to high capacity circuits and services to facilitate communication within the research community both in Europe and world-wide.

V. Conclusion

The research community must be clear in its policy for procurement of high-speed services. It is a special community with special needs and with the ability to deliver benefit in terms of its technical knowledge and willingness to try new things. It should utilise these strengths in order to establish a mutually beneficial relationship with the PNOs. This should be relatively easy to achieve.

The national research networks are an easily identifiable group by restricting collaboration to this group, having an agreed policy on interconnectivity, and avoiding resale it will be possible to organise collaboration in a way that is beneficial to both the community and the PNOs.

Author Information

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