There's No Such Thing as a Free Internet

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Abstract

The cost of providing Internet services globally is significant yet it is sometimes asserted that the Internet is free. This paper considers the economic costs of providing Internet services from a European perspective. It reviews the implications of the lack of charging mechanisms both from the point of view of today's services and the future development of services for the Research Community.

I. Introduction

It is such a well worn phrase that "Nothing in life is free" that it is surprising that anybody can be asked to talk on the theme that there is no such thing as a free Internet. A simple calculation will show that there are very significant amounts of money invested in Research Networking globally. In Europe alone the direct cost of National and intra European networking infrastructure exceeds 50 Million ECU per year (60 M$). Divide this by the number of European researchers and you get a relatively small if rather meaningless number. The reason is that the calculation takes no account of the cost of Local Network access which is required in any case and, more importantly, that the numbers of Researchers capable of international exploitation are disappointingly low. The fact remains that 50 MECU is a conservative estimate of the European cost and that if the benefits were more widely available outside the ranks of the computer and communications literati the cost would be very significantly higher.

In the USA you may get more bits for your buck but the same cost magnitudes apply. Why then is there a debate at all about the "freeness of the infrastructure" as somebody must be paying and if the Tooth fairy exists he/she/it does not work for the phone company. The argument is in fact not about whether the Internet is free but rather an argument about who should pay and a further argument among those who are currently paying as to whether in fact somebody else should be paying.

Developments in networking technology and particularly in the area of Multi media mean that the quality and value of information that will potentially be accessible via the Internet will increase dramatically. If these are to be exploited in a networked manner there will need to be reasonable ways of paying for these services or they will just not be provided. Nobody objects to paying for books except those who misappropriate them. Why should people object to paying for Networked Books? There has to be some incentive for the authors' creativity.

DANTE was created by the European research networks to procure pan-European services to complement the national services they provide. Its role is as a procurer of services and it is organised somewhat along the lines of a co-operative. From this role it is interesting to consider the true meaning of a free Internet. It is, I think, axiomatic that if the Internet were truly free DANTE would not exist. The reality which we see is very different: what we have been able to do is to organise European demand at an aggregate level and therefore reduce the price for backbone network services. The economics of networking favour scale. Whilst technology prices have fallen dramatically in the last twenty years both from the point of view of switching hardware and transmission, demand has expanded to fill the bandwidth available for consumption.

II. Pricing the Internet

A major question is the practicality of charging. Whilst nobody likes usage based charging the absence of any charging mechanism gives no incentive to invest in increased network capacity to carry ever growing traffic levels. This leads to access by rationing and as traffic levels rise the quality of service suffers eventually leading to the unstable situation where increasing the offered load actually leads to a reduction in the capacity of the network to handle traffic. This paper is in a set which is actually primarily about Quality of Service. It is apparent that if users are to experience reasonable Quality of Service there needs to be a way of upgrading network capacity in order to maintain overall Quality of Service.

This has been achieved in EuropaNET, the pan-European multiprotocol backbone, organised and managed by DANTE for the European Research Community by associating network upgrades with the average and peak traffic at a user interface. The charging model for EuropaNET is based on an annual subscription for access capacity. This avoids a major user concern of volume related charging. The tariff model for interface charging is also progressive so that a 2 Mbit access only costs just over 11 times as much as a 64 Kbit access.

Nevertheless the need to maintain access capacity to carry average and peak traffic and a corresponding obligation on the backbone network operator to provide appropriate backbone network capacity has worked well; with users taking seriously the obligation to maintain an overall Quality of Service. It proves an acceptance of the principle that there is no such thing as a free Internet and equally important that if services are to be provided there needs to be adequate Quality of Service associated with them.

The issue of Quality of Service is of particular importance. Control by rationing has one very serious side effect. It affects Quality of Service very adversely. If all users are interested in the minutiae of network design and take delight in continual pinging to see what the actual performance really is, thereby incidentally degrading it, this is not an issue. In reality most researchers just want a reliable service. If this is the case, very much more network capacity has to be provided and levels of usage have to be kept at significantly lower levels of the total capacity available. This is the only way to improve real time performance to the point where "ordinary users" will take advantage of what is currently a facility for the Aficionados.

Economists will argue about the allocation of costs and the appropriateness of pricing models. Once you have mastered that the details of pricing are a black art and its purpose is to maximise the value being extracted from the person being charged the subject holds little interest except for the devotees of marketing or economics. Pricing does however have one virtue. It encourages rational economic decision making. The problem with things that are "free" at the point of consumption is that they have no demand elasticity and so in principle demand expands to overfill the supply available.

The most obvious and well developed manifestation of this problem is road transportation. As with Internet services demand expands to fill the capacity available and control is by rationing. It is not surprising that research is going on into developing the technology for rational road pricing. It is perhaps not obvious, but when you are sitting in a queue on the motorway you are a victim of rationing. The same thing occurs when the response time on that interactive session is poor. Rationing by queuing is the ultimate and arbitrary way of controlling access.

In general if the perceived cost of an activity is zero it encourages unnecessary consumption. For example it is easier to FTP that file again rather than taking a copy of it. It is fun to go around and see what information sources are available. The difficulty is that it costs something. Each marginal use is of course "free". One of the difficulties with charging for networks is that every use is in a sense marginal. In Britain the telephone service provider used to get around this problem by prosecuting people who were caught fiddling the phone system with the offence" Stealing electricity to the value of fourpence the property of her Majesty's Government. Research and progress do not just take place in networking but also in the law and today the charge is "Obtaining pecuniary advantage by deception" But it is the same offence of getting something for nothing when it is actually costing somebody something to provide.

III. Conclusion

The idea that network services should be free to all is appealing. It is sordid to argue about money. It is much more fun to obscure the true reality of cost by seeking to put the argument on a higher moral plane. The freedom of information, not to mention the right of every citizen to flame those whom he/she does not like - and cannot see - in the interests of freedom of expression is obviously important. It will be interesting to see if the introduction of Multi-media services will improve network behaviour whilst not destroying freedom of expression.

When it comes to free things why just network services, why not Hamburgers or PC's both of which can be argued to contribute to intellectual creativity. The concept of a free Internet has an intellectual speciousness that makes it easy to reject. Freeness leads to lack of respect for facilities and discourages investment. The problem that needs to be addressed is a creative approach to pricing. Usage based charges are unpopular and difficult to implement today. In reality there must be an incentive for investment and an incentive for use. There is no such thing as a free telephone call but there are some very creative pricing schemes out there. The challenge for the Research Community is to address the commercial question raised by Internet not to seek to argue them away.

Biography

Dai Davies is (joint) general manager of DANTE, the company set up by the European National Research Networks to provide international network services. From 1991-1993 he was Director of the COSINE Project Management Unit. Before that he worked for British Telecom for over 15 years, in a number of technical as well as commercial positions.