Response to Questionaire for the Public Consultation on the Open Internet and Net Neutrality in Europe

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1 Introduction (Other Issues)

The concept of network neutrality has been seen by many observers as a vital prerequisite to the "goodness" brought about by the Internet – the first explicit concerns about potentially adverse developments being having been voiced by ca. 1999 (Saltzer 1999). It is thus apt for the European Commission to share a part of those concerns and inquire into possible problems with the "goodness" of the Internet. However, the precise content and the defendable merit of the principle have remained distinctly vague, the efforts of Wu and other scholars notwithstanding. Also, the continuous reference to the end-to-end arguments (Saltzer, Reed, and Clark 1984) as an intellectual predecessor to the network neutrality notion may be questioned for its reasonableness – the end-to-end arguments have never held that a network ought to be "neutral". My account, compiled in my capacity as an academic researcher, is thus likely more sceptical than those of typical network neutrality advocates.

2 Answers to Questions in the Questionaire

Question 1 Some argue that ISPs have the potential to discriminate Internet traffic so as to prejudice end users, and indeed such discrimination has been observed in the past (Dischinger et al. 2007; Dischinger et al. 2008). However, as of today – especially following the late 2007 Comcast TCP RST message incident (Soghoian 2007; Svensson 2007), its repercussions (FCC 2008; Zachem 2008*a*; Zachem 2008*b*) and the

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increasing attention in the technical community to empower end users to observe any such clandestine discrimination measures (Dischinger et al. 2010) – it is fairly unlikely for an ISP to resort to such measures if they go against the interests of the end users affected.

Question 2 Not qualified to give an informed answer here. [Aside: I do not see the notion of "Internet value chain" as an adequate means of describing the broader reality of ventures based on the Internet infrastructure. As Bresnahan (1998) has noted, there may be highly malleable and dynamic "layers" in the overall value landscape (p. 21), and "defendable home monopolies" may well be crucial prerequisites to "participate at all effectively in epochal vertical competition" (p. 36).]

Question 3 Not applicable / Not qualified to give an informed answer here.

Question 4 Some traffic management is generally necessary whenever the premium for inefficient usage/management is large enough – which is typically so in networks subject to possible overuse due to stochastic sharing. Techniques for doing so have been legion, several companies offer such boxes, and various software can be used to such effects (e. g., netfilter/iptables). Also, traffic discrimination – giving lower latency to interactive terminal sessions – based on (shallow) "packet inspection" can be found in earlier operational networks such as the Arpanet and (more to the point) the early NSFNET (Mills 1988; Mills and Braun 1988).

Question 5 Transparency is often cited as an important prerequisite to informed consumer choice. However, getting the relevant information to the consumer is no easy task indeed, nor is it a trivial task to do anything sensible based on such information. Nowadays there is usually but one item on the service menu: best effort IP without strict guarantees beyond statistical averages. All else is left to application level elaboration – if more information about the state of the network(s!) involved was available to the application end points, applications and app level protocols would obviously have to change in significant ways, presumably maintaining out of band extra communications with some network entities, computing relevant trade-offs on behalf of the applications and users, and, most of all, getting right all the interfaces necessary to do so. The overhead added by all those complications may well not be worth the benefits afforded by such a scheme.

As an aside, it is instructive to note that ICMP messages (which have been just such a means of getting control information from the network to the end hosts) have become almost completely useless due to (1) security concerns and the lack of incentives for truthful use, and (2)

the premium of inflexibility added by intertwining the operations of end hosts and network – a pattern that may be found in the history of IP fragmentation control as well as congestion control, both of which have moved from joint schemes (linking the end point and the network) to end based schemes (sitting in the end points only, with little to no reliance on any explicit control input by the network) – see Bärwolff (2010, sections 5.3 and 5.4).

Question 6 I feel that the general principles for governing networks should be the same regardless of whether they are "fixed" or "mobile". For one, the distinction between those types of networks is somewhat arbitrary and one of degree only – it is end users/devices that are mobile or fixed, not the networks. For another, the economic problems may well be similar for either type of network – scarcity due to large utilization rates, congestion due to stochastic sharing, the need to proxy some control to the network on behalf of end users (mitigating DDOS attacks, curbing malicious end hosts, etc.). Different governance regimes may thus only serve to unnecessarily cement some status quo.

Question 7 This is an odd question. One of the crucial points of the Internet as an infrastructure to me seems to be that applications may generally do as they please, and any application level structure sophistication should be allowed and catered for – there is very little prejudice to competing applications by applications implementing priority schemes. The issue seems to be no different from 'prioritization' (and the legal treatment of such) in other industries.

Question 8 I do not see what this question is getting at. How would anyone want to judge whether and to what effects a "content/application/online service provider" is "in the same situation"? With a nod to von Hayek (1973), why would we want pose such question in the first place?

Questions 9–15 Not qualified to answer.

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