

## **QUESTIONNAIRE FOR THE PUBLIC CONSULTATION ON THE OPEN INTERNET AND NET NEUTRALITY IN EUROPE**

NNSquad Italia, an Italian association devoted to the promotion of network neutrality, born as an independent group inspired by the global network neutrality effort NNSquad, would like to submit its contribution in response to the European Commission's consultation on the matter. The responses have been developed with the aid of some of the leading Internet policy experts in Italy and we are confident that they can bring some interesting facts and analyses into the discussion.

We consider the Internet to be the keystone for a fair and positive development of the European society in terms of innovation, economic wealth, free information, self-fulfillment opportunities and human rights for the citizens of Europe. We stress that network neutrality is by design a fundamental element of the Internet which, if removed, will deprive it of most of its capacity to promote these positive effects.

**Question 1:** Is there currently a problem of net neutrality and the openness of the internet in Europe? If so, illustrate with concrete examples. Where are the bottlenecks, if any? Is the problem such that it cannot be solved by the existing degree of competition in fixed and mobile access markets?

We first have to define what we mean as a violation of network neutrality.

In our opinion, net neutrality is violated if the network management and/or traffic management practices of a first network operator are such that they can unfairly discriminate against other operators (with which the operator exchanges traffic, either directly or indirectly) or against service providers whose service is delivered on said first network. But not all networks environments are equal; the fundamental difference between fixed (1) and wireless (2) is that the access loop of the fixed access network is dedicated to a subscriber whilst the access loop of a wireless access network is shared amongst different users. A further difference is that the capacity of the access link is de facto limited on a wireless access (2.1) while it can be virtually unlimited on a fixed fiber loop (1.1). When we address the issue of network and/or traffic management it would be unreasonable not to take into account these differences.

One more issue which should be taken into account is the nature of the backhauling to the access portion: a local exchange with fiber backhauling (1.2) can be quickly and cheaply upgraded by changing the exchange equipment in order to satisfy access capacity demand, whilst local exchanges with copper or wireless backhauling (1.3) are very limited in their upgrading possibility: in this latter case, not only the equipment needs to be upgraded but also the backhauling access, by upgrading from copper/wireless to fiber, implying a significant investment. This difference is particularly relevant for the fixed network, whereby the difference between access capacity and backhauling capacity can be very significant; the limitation in the spectrum on wireless access makes this difference between access and backhauling capacities less relevant.

We will focus on the Italian situation, which we know best and where, due to the strong financial constraints of the incumbent operator, these issues have been faced earlier than in other countries, as the incumbent was seeking significant EBITDA increments.

We must highlight that openness is not equivalent to neutrality; a network can be open, meaning that all protocols are admitted to/from any source/destination endpoint, while not being neutral (e.g. discriminating traffic based on content, source, destination, kind of service).

In Italy we have faced many neutrality violations in the past, starting from "La Casa di Alice", a retail broadband offer by Telecom Italia which was brought to the attention of DG COMP, and going on with the blocking or degrading of P2P traffic by some operators and the filtering of VoIP traffic by others.

Another interesting case was a retail broadband offer by the incumbent called "Ring", whereby Telecom Italia enacted a price-based discrimination of traffic: Users were charged different prices per MB of traffic according to the source of the traffic (traffic coming from Telecom Italia's customers was priced approximately half the price of traffic coming from non-Telecom Italia users). A discrimination of source/destination traffic based on price.

Telecom Italia is degrading P2P, video and other kinds of heavy traffic on an "experimental basis" on all retail DSL lines that belong to 44 exchanges (<http://www.187.alice.it/cda187/c/assistenza/newsPopupAction.do?ID=19784>).

Both largest wireless operators (Vodafone and TIM), which account for more than 65% of the market, are still degrading P2P traffic and blocking VoIP, unless the subscriber pays an extra fee to have his VoIP allowed. H3G in September 2010 has released details of its traffic management policy in case of low performance in the network.

Other kinds of violations are emerging throughout Europe: for example, there is a trend towards the establishment of special rates for wireless Internet connectivity that are either limited to accessing specific content (e.g. specific websites and services) or favour certain service/content providers over others by applying special rates (or free access) only to traffic directed towards them, under specific agreements between the operator and the service/content provider itself. See as an example the "Facebook Zero" service by Facebook, where users from 45 countries (including several European ones) can gain free wireless access to the service. Of course, this creates a very high entry barrier to any service provider willing to compete with Facebook for the provision of social networking services. This trend could be especially troubling if it started to be applied to content-providing services which are able to shape the public opinion, such as newspapers and Internet television services.

**Question 2:** How might problems arise in future? Could these emerge in other parts of the internet value chain? What would the causes be?

The behaviors exposed above are the first examples of pricing differentiation based on the type of application used (not on priority). An application not liked by the access operators gets discriminated and de facto inhibited with a specific pricing policy.

On one hand, if this type of business practice got more widely adopted, the consequences would be severe, as the operators would become gatekeepers determining which applications can flourish and which ones will starve. On the other hand, some Italian application providers are developing VoIP clients that obfuscate their traffic by encrypting it at the endpoints and transmitting it as if it were standard web traffic (using port 80) thereby providing a voice service which cannot be intercepted by law enforcement agencies. A similar approach, as a natural reaction to discriminatory behavior by the operators, could easily develop for P2P or other forms of heavy file sharing, posing a significant hurdle to law enforcement (most notably child protection).

**Question 3:** Is the regulatory framework capable of dealing with the issues identified, including in relation to monitoring/assessment and subsequent enforcement?

In principle, the interpretation of the regulations, both telecommunications and more specifically antitrust, could allow for an ex post intervention to sanction these behaviors. It seems that Italian regulators, who are understaffed and with limited resources, are unlikely to sanction the behaviors described above timely and effectively. For example, the economic discrimination of VoIP traffic is a practice started a long time ago and AGCOM has not taken any measure so far.

Therefore, specific ex ante regulations is still necessary in addressing these problems in a more timely and effective way and cannot be substituted by an ex-post intervention, which is very dangerous to "winner-takes-it-all" markets.

**Question 4:** To what extent is traffic management necessary from an operators' point of view? How is it carried out in practice? What technologies are used to carry out such traffic management?

Fixed network can have backhauling in fiber or copper; in fiber network, removing congestion is cheaper than managing it; copper networks need fiber as a backhauling upgrade. Policies should favour investments to remove bottleneck on backhauling; without policies to promote or require investments, operators could find a more convenient solution in traffic management, inducing scarcity to leverage on it with anticompetitive practices.

The situation regarding wireless access is different, due to cell access sharing. It is impossible to know how many users are actually connected to a cell in a given moment, but the figure is statistically known.

To be precise, wireless capacity can be limited but it is not physically scarce. Available wireless per-user capacity can be increased by increasing the number of the cells and reduce the size of their coverage, in order to reduce user contention.

Presently, in Italy, the congestion of the wireless access network is widely considered to be a huge issue, due to a significant promotional push by the operators to gain customers to Internet access services which was not backed by adequate expansion of the network itself. Customers often complain about very slow actual connection speeds, in the range of a few hundred kilobits or even of a few kilobits, which actually hamper those who made the bad decision to switch from fixed to wireless access, lured by advertising and promotional rates. In fact, many business users who made this switch have seen their businesses severely stifled. Under this situation, operators claim to be "forced" to implement traffic management practices and to filter out heavy traffic by application type. In fact, this is a situation that was actively created by the operator themselves, and should not be allowed as an excuse to introduce anti-neutral behaviors: operators should not oversell their transport capacity and then cut out specific traffic to cope with the problem.

Instead, a push towards the increase of the number of wireless network cells is desirable; their backhauling connectivity can be managed via fixed or even wireless point-to-point connections. Policies should be directed to this effect.

Another way to address the issue of wireless access network congestion could be similar to what used to happen in the early years of mass fixed Internet connectivity, where the scarce resource was the number of telephone lines and modem devices at the service provider's access point. In the late 90's, the subscribers-to-modems ratio was one of the qualifying parameters to evaluate Internet access providers; one could subscribe to a cheap but very overbooked service, where it was hard to find a spare line at peak times, or to a more

expensive but less overbooked service, where the user was quite sure to always find an available line. Even the same provider used to offer different subscriptions (typically a "consumer" and a "business" one) with different subscribers-to-modems ratios. In this model, the HDSPA frames could be used as different channels with different overbooking levels and different pricings; this would include a prioritization based on different service quality levels without accepting the concept of discrimination by application type, content or service.

**Question 5:** To what extent will net neutrality concerns be allayed by the provision of transparent information to end users, which distinguishes between managed services on the one hand and services offering access to the public internet on a 'best efforts' basis, on the other?

The fact that consumer choices can be significantly shaped by the terms and conditions of the service contract or by the information received about the service is by and large a myth. Average consumers are not expert enough and do not have enough time to evaluate all these factors when picking a service: their choice is based on advertising, emulation, critical mass effects (e.g. "I use that service because all friends of mine use it"), and even on impulse decisions; and on lock-in and co-marketing commercial policies.

It is thus necessary to require operators to provide a base service which is neutral, non-discriminatory, not unreasonably overbooked, and based upon best effort transport policies; any services prioritizing specific services, content or applications should just be additional, for people who really need connectivity of higher quality than the best effort one. The base service must be the cheapest one, otherwise operators will force their customers into cheaper walled gardens or into using only a limited range of predetermined services, thus stifling any chance of third-party innovation. The degree of overbooking could still be used as a way to provide access services of different quality at different prices.

**Question 6:** Should the principles governing traffic management be the same for fixed and mobile networks?

Due to the difference in the nature of access loops - shared for mobile networks, dedicated for fixed networks - the principles can be different, as described above. However, if fixed network access loops were shared rather than dedicated (e.g. in access through cable TV networks) then the policies should be the same of the wireless access network.

**Question 7:** What other forms of prioritization are taking place? Do content and application providers also try to prioritize their services? If so, how - and how does this prioritization affect other players in the value chain?

Other forms of prioritization are managed services directed to business customers. These forms of management of IP traffic are present in the marketplace since the introduction of the MPLS technology and should clearly continue to be allowed (provided that dominant operators provide them also at wholesale level on non discriminatory terms). We must point out that these services are employed for intranets or extranets among business customers with stable relationships for specific applications; not for connectivity to support occasional, sporadic relationships and, most notably, in business to consumer markets, all conditions that could lead to market abuses, limitation of innovation, etc.

**Question 8:** In the case of managed services, should the same quality of service conditions and parameters be available to all content/application/online service providers which are in the same situation? May exclusive agreements between network operators and

content/application/online service providers create problems for achieving that objective?

There is a need to differentiate between services oriented to private, business customers (e.g. VPNs, intranets) and services aimed at the general public. Private services exchanged on the business-to-business market can be managed as described in the answer to question 7, but Internet access services aimed at consumers should instead be absolutely neutral. In particular, and in any case, the idea of exclusive agreements between access providers for the general public and content/service providers is extremely worrying and could easily destruct the Internet as we know it, and its potential for innovation, development, free communication and even democracy. These direct agreements could even become a source of private regulation which most countries, and their citizens, would have no means to influence, effectively submitting the Internet to the private control of a few oligopolistic players in the various markets (e.g. search engines, media distribution channels, e-mail platforms, social networks...).

The same conditions should always be applied to similar service/content providers aimed at general public and regulatory authorities should ensure and enforce this rule. However, this situation could easily end up in controversies over what constitutes "similar service" or "similar content", and the cost of enforcement would be high - thus it would definitely be better to avoid going down this path.

**Question 9:** If the objective referred to in Question 8 is retained, are additional measures needed to achieve it? If so, should such measures have a voluntary nature (such as, for example, an industry code of conduct) or a regulatory one?

See the above answer. In particular, it would not make sense to rely on self-regulation by industry players which have every interest in violating the code of conduct that they just laid out, unless strong and effective oversight and lobbying by governments could be applied (which is not always the case). Rules should be discussed in a multi-stakeholder fashion, including representatives of user interests and of the general public, and be enforced and guaranteed by the States.

**Question 10:** Are the commercial arrangements that currently govern the provision of access to the internet adequate, in order to ensure that the internet remains open and that infrastructure investment is maintained? If not, how should they change?

We believe that the Commission's efforts should focus not only to ensuring networks are open and interoperable but also aim to achieve the maximum possible level of network neutrality by promoting policies to address possible congestions removing them.

Most of net neutrality concerns can be addressed by ensuring a vibrant market at retail level with many competing retail operators that use well regulated wholesale services.

ULL competition ensures that access loops cost is not directly related to throughput. Bitstream ensures that smaller operators can compete at national level, although achieving lower margins than infrastructured operators, thereby having an incentive to step up the ladder of investments.

Backbone capacity is rarely a bottleneck as upgrade investments are achievable by all backbone operators; local loop capacity is exclusively assigned to a customer and its cost is unrelated to throughput thanks to ULL. In those areas where there is fiber backhauling the bandwidth cost is very loosely related to throughput and the investment to remove scarcity by increasing throughput tends to be lower than to that required to manage congestion (and the gap will widen in the next years).

In the above conditions, the presence of ULL based competitors tends to determine that there are retail offers unrelated to traffic levels, something that all competing operators need to adapt to; the presence of many retail competitors ensured by bitstream allows users to find operators who do not manage traffic, something that all competing operators need to adapt to. (regulated bitstream should include cost-plus backhauling).

In the above conditions, as a general rule, if properly regulated, network neutrality derives from the access market structure at wholesale level.

The possible need for traffic management would then be limited to inadequate infrastructure at the backhauling level. Specific incentives should be envisioned in order to ensure that all backhauling is fiber based.

Re. wireless networks, as described above, the access segment is always shared and hence subject to congestion; in order to ensure, as a minimal feature, that the network stays open, regulated wholesale cost plus bitstream offers could be imposed to SMP operators.

**Question 11:** What instances could trigger intervention by national regulatory authorities in setting minimum quality of service requirements on an undertaking or undertakings providing public communications services?

NRAs should intervene by regulating ex-ante those cases where management of traffic could lead to distortion of effective competition between operators or service/application providers or limitation of users' ability to use the devices and applications of their choice.

One "vertical" distortion can happen when a managed access is sold at a price lower than the best effort access. This could be the case of an access provider selling access products with QoS for an ECS (e.g. videocall) that the operator himself is providing. All users would choose the lower cost access product and therefore would end up using the videocall service offered by the provider itself.

This can be considered a case of Antitrust regulation infringement and national Competition Authorities can intervene by considering an access operator has market power on his access subscribers for downstream services; yet this kind of ex-post interventions are likely to have limited effectiveness as dominant market positions could have already be consolidated by the time the decisions are taken by the Authority. (this is specially true in "winner-takes-it-all" kind of markets).

Another distortion can happen when a best effort "Internet access" is provided with limitations of a specific type of traffic as a base offer and "full internet" is provided at an extra cost. This is effectively happening in a growing number of member states where VoIP (RTP) traffic is blocked by wireless operators in order to mitigate the risk of a reduction of their voice revenues.

This behavior not only constitutes a "vertical" discrimination whereby an access provider discriminates competing services favouring his own leveraging on his control of the access layer; it also limits the possibility of innovation: users who are not interested in RTP traffic at the moment of their access subscription will choose to spend less and therefore will have RTP blocked. Application developers will be discouraged to build innovative apps based on RTP, as the user base will be limited; should in any case a new disruptive app be developed, users will not be able to try and buy it. This disruptive app could never be born.

Best effort Internet access (please see answer to question 14 below) should be the basis of all operators' offers. Managed access, consumer-requested prioritization of specific types of traffic on the network access segment should always be an incremental commercial proposition. Any prioritization of specific types of traffic on the network access segment should always be

requested by the user and not imposed or induced by the operator with technical or commercial practices.

A third type of distortion can happen caused by direct or indirect (typical of two sided markets) network effects when operators provide QoS for specific types of traffic to their users. Consider the situation where both Provider Big and Provider Small offer QoS on their network for standard Videocalls at an incremental price on best effort, usable with all Videocall ECS. The critical point will become the peering point between Provider Big and Provider Small where best-effort peering will cause a degradation of the traffic when a user of Provider Big videocalls a user of Provider Small. Provider Big will benefit from a network effect because subscribing to Provider Big will offer subscribers the highest probability of having the best overall videocall experience. This kind of distortion can affect service/content providers as well favouring concentration of service/content providers on the network of Provider Big.

This again can be considered a case for Antitrust intervention, but it is even more difficult to approach than the example above, not only because of path dependence of the process and its velocity, but also as traffic is not blocked between the two providers and the network effect is built by leveraging on "user experience" which is hardly (if at all) measurable, even in statistic terms.

It is easy to conceptualize: imagine PSTN operators with best effort and no QoS interoperability whereby at the peering points between TeleBig and TeleSmall voice calls are squeezed to 4kbps and with no jitter control, while inside the operators' network the voice calls are standard 64Kbps with no jitter. Users would naturally flock to TeleBig).

A generic obligation of interoperability between operators based on best effort is not sufficient in the case that one of the operators offers QoS on its network. In such case that operator must provide the same QoS at its peering points to any other operator requesting it, on commercial terms which allows other operators to compete effectively.

Not only it is necessary that there is no discrimination on interoperability at peering points based on QoS but also there is no discrimination based on price conditions of the QoS at peering points.

**Question 12:** How should quality of service requirements be determined, and how could they be monitored?

The most effective way to determine quality of service levels (from a user experience perspective, not to be understood in technical/protocol terms) is by ensuring a vibrant, competitive and efficient market with many competing operators. The effective implementation of bitstream wholesale access is therefore very important.

The actual experience in Italy shows that, if some operators in a specific area violate net neutrality principles, the most options the consumer is offered, the most likely that she will be able to find some alternative offers by operators which do not implement those practices. The most important issue for NRAs is therefore to monitor competition and efficiently intervene in cases abuse of market power and to determine the conditions for a strong competition.

Replicability calculation of incumbent's retail offers based on wholesale inputs are often based on improbable statistic conditions (e.g. few kilobits of throughput per user) which are not consistent with real-world experience by the users who experience much higher performances. An alternative operator who, in the marketplace, needs to compete based on real-world customer experiences, will need to provide significantly more bandwidth than those few kilobits thereby incurring in higher costs.

Replicability calculations based on statistics allow for a margin squeeze of smaller operators.

The preferred basis for wholesale bitstream offers should be cost of replication by an efficient alternative operator; as a second choice replicability calculations should be based on effective measurements of real-world bandwidth provided.

**Question 13:** In the case where NRAs find it necessary to intervene to impose minimum quality of service requirements, what form should they take, and to what extent should there be co-operation between NRAs to arrive at a common approach?

In order to foster the development of the single market, we deem necessary to impose the provisions of interoperability with QoS detailed in the answer to Question 11 also to cross-border peerings. The monitoring procedures and sanctions need therefore to be harmonized by all NRAs at the EU level.

**Question 14:** What should transparency for consumers consist of? Should the standards currently applied be further improved?

As today standards relating transparency are minimal, if not completely lacking. In very few member states there are initiatives to systematic widespread measurement and dissemination of on-field performances.

The first and foremost issue is to agree on and then adopt at the EU level a definition of what "Internet access provision" means. "Internet access" should mean the possibility for the user, with the device of her choice, to use the application/service of her choice to interact with any other peer of her choice by exchanging traffic on networks which are interconnected based on the coordination activities set forth by IANA.

Any network access service not compliant with the above, should not be allowed to use the label "internet" in its name (e.g. internet service, internet access, internet connection, etc.). There are now many access services which do not comply with the provision above and yet are marketed and sold as "internet access".

In the purchase of an "internet access" like defined above, throughput (although being the major choice driver together with price) is not the only parameter that should be made transparent. Capacity planning policies, network architecture, security and privacy practices, network management policies, etc.

Some basic information should be mandatory for all access providers while some other information could be published on a discretionary basis by willing ISPs, yet is important that all information published are simple to understand and are all in a comparable format. There are some best practices in Italy of minor ISPs which autonomously publish their network management policies, the absence of DPI on their network, under a common logo and similar descriptions; some ISPs publish network monitoring data from their management systems, for each DSL area, so users are adequately informed on what they can expect, see network upgrades, congestion, etc.

The quality of the data needs to be ensured: relevant stakeholders like operators, consumer associations and NRAs should be involved in the definition of types of information provided and definition of formats; NRAs should ensure sanction cases of false or incomplete information.

After an initial period, best practices can be accessed and standardized at the EU level.

**Question 15:** Besides the traffic management issues discussed above, are there any other concerns affecting freedom of expression, media pluralism and cultural diversity on the

internet? If so, what further measures would be needed to safeguard those values?

The neutrality of the network, as emerging from our replies to the questions above, is a fundamental aspect to ensure a fair market develops, with equal opportunities for all players; it is paramount to ensuring a free flow of ideas and information. The Internet is today the most uncensored and the less concentrated media of all; in countries with a media system which is not entirely free (as Italy is, according to Freedom House's reports on the freedom of the press) the Internet is the main instrument for the circulation of free information and news that would not appear in mainstream media.

It can be expected that attempts will be made to introduce controlling points over the flow of information over the Internet, with excuses related not only to traffic management, but also to the prevention of unlawful activities or of activities which, while not illegal, affect the business of the operators; this could easily happen outside of the public sphere, through market consolidation efforts or through private deals between operators, content providers and other powerful private parties. It is paramount that any kind of filtering or controlling activities over the Internet are managed in the public interest and respecting free communication principles and other human rights – in some cases, even direct governmental control may not actually work to that effect.

There is another area of concern related to the technologies employed in the traffic management: in order for the operators to be able to manage traffic to some significant effectiveness, the payload of the sequences of data packets needs to be collected, reassembled and examined. Examining the headers or single packets is simply not effective. The widespread, uncontrolled deployment of Deep Packet Inspection technologies on operators' networks, absent any policy, can expose the user's traffic to privacy threats.

Financial regulations teaches us that there are various kinds of financial intermediaries, operating various types of services which are bound to specific regulations. In order to ensure the proper functioning of the free financial markets, some intermediaries which choose to act in a specific role in the value chain are either obliged to implement chinese walls or they are simply not allowed to perform other functions in the value chain.

A similar approach could be envisioned for information intermediaries, for example by defining a taxonomy of operators and then posing specific obligations re. isolation/separation of activities, transparency obligations, data securization, etc.

For example, in order to mitigate this risk, those entities that in the value chain are acting as transmission operators should have specific obligations related to the collection and analysis of data flowing through their pipes.

Financial regulation best practices and methodology can help in the process of drafting a framework to increase users confidence in the services they are using, mitigating their concerns, thereby helping the development of a vibrant market that otherwise could be jeopardized by growing concerns and fear over privacy and security.