Joint GSMA / ETNO response to BEREC Consultation on

Net Neutrality Regulatory Assessment Methodology

5 July 2017

1. Executive Summary

ETNO and the GSMA, who represent the telecoms sector in Europe, welcome the opportunity to comment on BEREC's Draft Net Neutrality Regulatory Assessment Methodology. The methodology will provide important guidance on how to monitor Quality of Service (QoS) for access to the internet, which is a crucial milestone to implement and enforce Regulation 2015/2120 on the Open Internet.

We believe that customers deserve meaningful consumer information, trust in internet access services and the full confidence that service providers operate under legal certainty. While we appreciate the difficult task of developing guidelines to implement Regulation 2015/2120, we believe there are major weaknesses in the proposed methodology for achieving such crucial objectives.

We believe that it is be essential to ensure that the implementation of Regulation 2015/2120 results in greater clarity for consumers and that it does not create unfair or undue burden on our sectors, at a time in which we are focussed on increasing our investment in and quality of networks.

The GSMA and ETNO hope the following detailed comments can serve as a constructive contribution to BEREC's deliberations on the draft Net Neutrality Regulatory Assessment Methodology.

2. Introduction

The GSMA and ETNO welcomes BEREC regulatory assessment to support National Regulatory Agencies with the implementation of the net neutrality provisions of the Regulation 2015/2120, concerning monitoring systems. This provides the crucial opportunity to enable the development of tools that are robust, provide reliable information to consumers that build trust, while avoiding inappropriate burdens or misleading conclusions.

In particular, BEREC should recognise that quality of service measurement parameters and methodologies must be based on already existing consolidated technical and scientific foundations. The selection of parameters that are considered relevant and representative from the end user perspective to measure Internet access service (IAS) quality is already set in the relevant ETSI standards as defined by the STQ Technical Committee. These standards are to be included in the proposed analysis and complied with.

We very much welcome BEREC's finding that different measurement tools serve different objectives. E.g. monitoring customers' experience with regard to the IAS or applications is very different compared to the monitoring of contractual compliance of IAS providers. These differences have to be translated into the methodology or rather different methodologies.

However, we wish to underline that, with regard to the issues related to e.g. potential priorities, bottlenecks and effects of the specialised services, the EU Regulation does not require the NRAs to establish invasive measures, but essentially to detect any anomalies that could emerge on the market, especially those reported by the final customers. In these scenario, the NRAs may undertake ad hoc case by case assessments of the ISP behaviour, to ascertain the necessity to adopt specific measures.

Some of BEREC's objectives pursued through this exercise of developing guidelines for measurement tools risk to be partly misleading. An indication of the general IAS performance depends on a variety of factors, which go beyond any potential prioritisation, throttling or blocking of individual applications. Thus, the correlation between this performance and any potential breaches of obligations related to Art. 3 of the Open Internet Regulation (OIR) is rather weak.

We accordingly fully agree that in-browser or app-based monitoring tools cannot escape all interfering factors, particularly through end-users' environment. Measurement results can as a result be inaccurate. This finding is particularly important with regard to any legal consequences concerning contractual compliance.

Crowd-sourcing tools should be considered as "complementary" to monitoring tools which allow to assess ISPs contractual compliance. Crowd-sourcing tools can only provide an aggregated impression of individual measurements, based on subscribed contracts. They may vary greatly depending on the individual location and point in time, particularly for mobile. Accordingly, NRAs should take utmost attention to avoid misleading conclusions and communication based on crowd-sourced data.

BEREC should acknowledge that a range of NRAs have already implemented monitoring systems, also due to legal obligations based on Art. 4 of the Open Internet Regulation. Where these established systems already deliver sufficient results, NRAs should refrain from re-adjustments that burden industry and may confuse customers who have got used to the established tool.

3. Measuring Internet access service quality

ETNO and the GSMA fully support BEREC's statement that measurements have to be accurate, which is particularly relevant if the measurement is supposed to have legal implication based on Art. 4 OIR.

The added value of the declared aim of "comparability" is limited, considering that monitoring tools can only measure the customer experience rather than network performance.

Also with regard to BEREC's assumption that IAS quality is "developing sufficiently over time" it has to be considered that the subscribed IAS and not the deployed network is measured. Even if the measured general IAS performance may not grow or grows at reduced speed, this does not allow to draw conclusions on the deployed network performance.

If measurement results are used to increase transparency for customers (e.g. interactive maps), to improve end-users' informed choice, it is of utmost importance that these data are robust, up to date and representative.

We very much support BEREC's finding that up- and download speed are only some parameters crucial for customers' experience. Additional parameters which are in but also outside of the ISP's providers control strongly determine customers' experience.

We are very concerned about BEREC's recommendation that monitoring mechanisms should only "mitigate, to the extent possible" confounding factors which are internal to the user environment. Robustness of mechanisms is of utmost importance to build consumers' trust and to ensure legal certainly if delivered results are linked to contractual consequences.

The development of a general recommendation should go hand in hand with a proper standardisation process within ETSI and already established standards should be used. This is the essential basis to avoid or at least to minimise confusion and uncertainty effects, as well as unjustifiable burdens on the operators. In particular as to the IAS speed measurements, it is necessary to start from the ETSI standard to define the parameter, its statistical significance and the measurement methodologies to be applied. We do not believe that it would be advisable and viable that BEREC indicates ex-novo the more or less appropriate measures to be followed.

3.1. IAS speed measurements

While BEREC rightly describes accuracy as key element of monitoring systems, the draft at the same time proposes "best compromises" between accuracy, platform agnosticism, ease of implementation and transparency. Considering that these monitoring systems may have direct legal relevance and may be used to justify regulatory intervention, a "best compromise" sacrificing accuracy, is highly inappropriate and misleading.

The recommended tools such as included in web browsers or on-device apps have significant weaknesses with regard to interference from end-user environment. Such factors would need to be counterbalanced through smart solutions if the tool is meant to be accurate.

No Speed Measurement with any customer terminal can be considered as reliable. Not only the environment can disturb measurement but also performance of the terminal. Example: most of the current users'PC can't reach more than 300Mb/s with a speed test through gigabit Ethernet interface (because of Hardware, OS, browser, Firewall….)

Leaving the option of Server inside IXP is very hazardous because the load of the path during tests is unknown.

However, if this option is retained, it is at least necessary to make sure that:

- The server is equipped with a 10GEnetwork card

- No Packet drop between the IXP and the ISP during tests

- Remark about Speed Measurement methodology: TCP Protocol is not designed for Speed Measurement

- TCP protocol tries to avoid congestion though the aim of the tests is to measure the bandwidth up to the congestion

- TCP Performance is delay sensitive (even with more than 100 sessions like well-known tools Ookla Speed test and nperf)
- TCP performance depends on Congestion control efficiency.

BEREC should consistently refer to HTTPS, which is described as preference compared to HTTP.

ISPs' can only control their own networks. Accordingly, measurements should preferably be done within the ISPs' networks. BEREC's statement that test servers must per se not be located within the ISPs' network lacks any justification and rationale (see introduction). If the test/ measurement server is located outside of ISPs' networks, it is of utmost importance that conditions are alike, such as regarding connectivity. Location at the IXP may be an option, only if sufficient care is taken of crucial technical parameters. In any case it should be avoided to locate the test server in another country. Sufficient capacity may be ensured if the connection speed has around 10Gb/S or higher if at the same time the amount of parallel measurements is restricted to an amount that can be handled by a connection speed of around 10 Gb/S.

A reasonable limitation of measurements appears necessary, to avoid overload of networks and the measurement server.

BEREC should consider whether measurements should be based on unlimited zero-rating, considering that data packages can be considerable and this should not appear as major hurdle for consumers to measure speed. However, adequate compensation of ISPs has to be ensured.

The recommendation to refer to 1000 instead of 1024kB is a highly inappropriate recommendation. The same type of provision has been introduced in a Recital of the Regulation of wholesale roaming price about the conversion between Mbyte and Gbyte, generating extreme confusion for regulators. This confusion has been happily solved by a letter of the EC clarifying that the traditional use of base-2 conversion should prevail.

3.2. Delay and delay variation measurements

The GSMA/ETNO has no detailed comments to this section.

3.3. Packet loss measurements

ETNO and the GSMA fully agree that samples of measurements need to be sufficiently high, including different sizes of data packages in order to provide the full picture of networks' performance (e.g. large packages illustrate availability of higher network performance) and measurements should be done symmetrically over the whole day, including peak hours, at different days during the week. This is particularly important to ensure that measurements are representative, when it comes to contractual compliance.

In order to minimize power consumption a device (mobile, tablet or laptop) will release radio resources after some time of not sending or receiving data. Re-obtaining these resources will cause an additional latency that will be visible in elevated end-to-end RTTs observed for the data transaction with the network. In order to minimize these effects it is recommended to perform some short data transfer first before performing actual performance measurements.

4. Detecting traffic management practices that impact individual applications

- In principle we are opposed to associate aspects of higher level of the network, such as for example the blockage of TCP/UDP ports, to the features of the IP connectivity provided by the IAS. In fact, the management of TCP/UDP level and higher levels usually does not concern the IAS service, apart from totally legitimate functionalities such as the NAT usage.

- In general, the adoption of protection measures such as virus checkers and parental controls has increased year over year. Furthermore, after the recent worldwide Wannacry attack, the adoption of such measures increased as a natural measure fostered by Administrations to protect citizens from cyberattacks.

- Consequently, NRAs should take this situation of utmost relevance when assessing traffic management practices, especially in the crowdsourcing approach, as it can easily result in incorrect conclusions.

- Additionally, the GSMA/ETNO is concerned about BEREC's assessment on ad-blocking and parental controls which are network based without clarifying the cases when the customer has to opt-intransparency and consent by end-user have to be ensured.

- In addition, we also have concerns about the result of regular and accepted actions like NAT practices or proxies solutions in fix and especially mobile environments where the scarcity of IPv4 addresses has forced ISPs to invest in technical solutions provided by the suppliers industry that can be taken erroneously as a non-compliance matter.

- The GSMA/ETNO wants to highlight that, despite BEREC 's acknowledgment that there are many different reasons to explain a certain result on performance, it is impossible to differentiate whether the problem of performance lies in the ISP network or in the apps or software used, or in the servers of certain service monitored, BEREC still considers such measurement in its report.

- Concerning the measurement of Apps, it has to be considered that the connection of the traffic from different service providers (no IAS, but service/ content provider) can differ depending on the IP interconnection agreement and respective access to ISP's backbone, which is subject to negotiations between different IP Interconnection partners; which include global players offering the most used app/ services. Therefore measurements located on the IXP may not be reasonable to represent the average user experience because some or at least the most important IP interconnection providers may also be connected on other national access points.

4.1. Connectivity measurements

The potential measures related to reachability of IP addresses are unsustainable in practice and completely ineffectual in the outcomes, since Internet can have temporary areas of non-reachability for its "best effort" nature and as a set of interconnected autonomous networks. Potential temporary non-reachability cannot be imputed to any specific entity present in the provision chain. Also in these cases we deem it appropriate a monitoring by the NRAs on the market and on potential complaints or anomalies reported by final customers with regard to reachability, to start, when the problem is demonstrated and lasting, further exploration of single cases.

The text on Network Address Translation should clarify the compatibility of use of NAT with the Regulation (Page 11 4th indent)

The fact that the same effect is measured on numerous measurements concerning numerous end-users does not necessarily prove that the problem is in the ISP's network: as the markets of devices, browsers, OS, firewalls etc. are very concentrated, a concern observed on numerous end-users can still be located outside the network if a large proportion of end-users have the same provider for their environment (5th indent, last sentence).

4.2. Detecting practices that impact QoS of individual applications

The GSMA/ETNO agrees with BEREC's consideration about how difficult or impossible it is to identify whether a problem is in the ISP in scenarios where traffic is affected by ISP, the terminal used by the end-user and the content server itself.

It must also be considered that the IAS does not provide links with the performance of specific higher level applications, also because application level techniques of optimisation (CDN, storage, etc.) may be used which are not related to Net Neutrality.

Also in this case, upon specific indications or complaints on real anomalies, the NRAs can explore potential issues possibly present on single applications.

5. End user dependent factors that may impact the measurement results

The GSMA and ETNO share BEREC's view that end-user dependent factors have a crucial importance with regard to accuracy. As BEREC rightly states, ISPs only control their networks but there are many things out of their control, such as premises, equipment etc. This was an utmost concern raised in previous BEREC consultations regarding the reliability that the measurement scenario presents. While ETNO and the GSMA agree with BEREC's various mentioned factors, additional elements need to be stressed in this context – for fixed and mobile IAS (see lists below).

5.1. End user initiated measurements

As amply demonstrated in the ETSI standardisation there is no certainty on the measurements carried out autonomously by the customers; only a designed and standardised measurement system can ensure reliability and comparability features. The speed test measurement should be considered only indicative to activate an in-depth examination at the NRAs discretion.

Indeed, measurements initiated by end-users are particularly relevant for assessing individual service experience. However, this goes beyond the IAS' performance as agreed in the contract. The exclusion of end-users environment is particularly challenging for mobile and fixed.

While end-user dependent factors have to be considered and excluded, when monitoring only the IAS performance, it is equally important to avoid any bottlenecks with regard to the measurement server (see crucial conditions for servers as described in chapter 3).

5.2. End user environment

The GSMA and ETNO welcome that BEREC's draft makes a clear distinction between mobile and fixed networks. Specific differences in these networks characteristics need to be reflected differently in the monitoring methodologies.

Nevertheless there are many factors which are relevant in a fixed environment as well as in a mobile environment:

- Terminal equipment (routers, different devices, etc. may appear as bottleneck)

- Parallel run software or, generally, internet traffic such as updates

- Turning off a device's energy saving options

Running on measurement tool application (e.g. browser/ java/ flash, dedicated app)

i. Fixed environment

Additional elements to consider in the scope of end-user environment:

- In-house cabling is not subject to the IAS contract, but can significantly influence the performance

- Ensure Ethernet usage and avoid WiFi

- In case of PC-based measurement, direct Ethernet connection to the Home Gateway with a 1GE network card and a Cat.6 cable at least

ii. Mobile environment

Additional factors beyond those identified by BEREC have to be considered for mobile IAS:

- End-user initiated measures highly depend on the location (e.g. in- or outside), amount of users in the cell (shared medium) as well as the used hardware. Consequently, end-user measurements can only be a snapshot of the performance at a specific point in time, greatly varying depending on the mentioned factors.

5.3. Hardware and software information retrieval methods

The GSMA/ETNO agrees on BEREC comments regarding the required compliance with Privacy – not only referring to the General Data Protection Regulation but also to the ePrivacy Directive. In case the collected information would be published, this would limit the possibility to publicly indicate individual measurements and would concern only aggregated data.

5.4. Measurements data filtering

Storage and processing of measurement data should be limited to measurement results that are accurate. ISPs should have the possibility to assess these data, in close cooperation with authorities.

6. Measurement results assessment

ETNO and the GSMA supports clearly differentiate between speed measurement results and contractual speed values for end-users, which is not necessarily linked.

6.1. Data validation

- Crowd sourced measurement campaigns have specific weaknesses linked to interference from end-users' environment, limiting accuracy of measurements.

- Besides this, the amount of provided samples has to be sufficiently high (to ensure representative figures) and up to date (filter old measurements, which do not reflect up to date network deployment any more).

- The text should acknowledge that crowd-sourcing in this domain may be very prone to selection bias, as the typical voluntary participant to a crowd-sourcing campaign is likely not to be an average representative end-user. Also the risk of crowd-sourcing manipulation needs to be considered and countermeasures adopted.

- In this line, we would like to stress that making public performances that cannot unequivocally be assigned to ISPs could provide misleading messages to the public about specific ISPs performance should be carefully considered by NRAs as negative consequences might be permanent.

6.2. Speed assessment for end users

Please see ETNO and the GSMA joint response in the scope of BEREC's consultation regarding Guidelines for the OIR, elaborating on the legal and technical interpretation of Art. 4 OIR[1]. Additional to BEREC's comments, ETNO and the GSMA would like to highlight the following aspects:

- Max. speed mobile IAS: Most reliable information on maximum speed of mobile networks is provided through Drive Tests. Maximum speed usually cannot be achieved under conditions such as in-house measurements, which significantly impair mobile network performance. BEREC's draft recommendation does not consider inter alia this technical circumstance. The draft lacks an explanation why max. speed of fixed IAS should not be valued against individual samples which is more reasonable than comparing agreed max. speed only with one individual measurement (Art. 4 OIR demands for several measurements and comparisons).

- Advertised speed: Support for BEREC's proposal to evaluate advertised speed of mobile on market level and not individually, taking into account that advertisement is not individual but addresses usually the whole market. The same applies to fixed IAS.

- Normally available speed: Very problematic KPI considering that ISPs can only indicate speed ranges and no single speed parameter can be constantly ensured to the customer.

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[1] ETNO and the GSMA joint response in the scope of BEREC's consultation regarding Guidelines for the OIR: https://etno.eu/datas/positions-papers/2016/Joint_PPs/ETNO-GSMA_BEREC_Guidelines_21032016.pdf

6.3. Market level aggregation

Interactive maps that are based on crowd-sourcing can only provide an overview of measurements and not of deployed networks. In any case, customers' privacy to be ensured and, if publication is considered, this should only encompass clusters of location and measurements, reflecting a reasonably high amount of measurements.

On the approach to assess the impact of specialized service on IAS quality: The first approach using aggregated IAS QoS measurement measures appears fairly reasonable and in line with the spirit of the Regulation (which mentions the "availability and general quality of IAS"). On the contrary the second so-called "more direct approach taking into account network topography" appears much more questionable: To which extend local specific effects are relevant on assessing the "general quality of IAS" mentioned in the Regulation is doubtful. In addition the test is not made against the right counterfactual. Contrary to the hypothesis underlying the proposed procedure, the counterfactual of an end-user using IP-TV, if the IP-TV service is provided, is not an end-user using nothing if the IP-TV service is not provided, but an end user using some form of OTT video service, which would impact the IAS quality of other users

6.4. Individual applications using IAS

The GSMA/ETNO has no detailed comments to this section.

7. Certified monitoring mechanism

- If certification criteria are used to assess contractual compliance according to Art. 4 OIR, criteria should be established on the crucial principles reliability, accuracy, comparability, transparency. A very cautious and thorough approach is required.
- Any limitation of the quality of measurement results, particularly regarding accuracy, should be made transparent.
- If results are not correct, they should not be used to assess contractual compliance.
- Certification should be done through an independent third party.
- Also NRAs should be required to get a certification of their monitoring systems, if these systems are used to e.g. contractual compliance. Art. 4 of the TSM does not provide any justification that NRAs are not required to certify their monitoring system in case it is used to assess ISPs' contractual compliance by a third party
- Certification should avoid any costly or negative implications for ISPs' already established good practices.

7.1. Guidance on criteria regarding certified monitoring mechanism

Certification has to be based on accuracy. And only accurate monitoring, approved by certification, should be considered for assessing contractual compliance. In this context, no compromise may be considered, particularly not with regard to assessing contractual or legal compliance.