Quality of Service Parameters to be Measured by Internet Access Service Providers and Publicly Available Interpersonal Communications Providers

Public Consultation

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1 Purpose

In accordance with the European Electronic Communications Code (hereafter the 'Code'), the Malta Communications Authority (hereafter the 'MCA' and/or 'the Authority') will be responsible to monitor and collect systematic information about the quality of the services offered by providers of internet access services and of publicly available interpersonal communications services. In anticipation of the transposition of these requirements into national legislation, the MCA is embarking on a consultative process to determine a minimum set of quality of service (hereafter 'QoS') parameters to be measured by providers. This consultative document proposes the methodologies that should be adopted by providers when measuring the performance of these QoS parameters and also proposes requirements regarding the content, form and manner in which the QoS performance results are to be published by providers.

From an end-user's perspective, the MCA believes that the provision of comparable and updated information about the performance of the quality of the services provided by undertakings empowers end-users and enables them to take more informed decisions when they are in the process of selecting a service. Besides benefitting end-users, this information would also allow the MCA to monitor more accurately trends in the sector and would enable service providers to benchmark the quality of their services with that of other service providers, leading to greater competition and investment.

By means of this consultative process, the MCA encourages interested parties to contribute by providing feedback to the proposals being set out by the MCA to establish a common framework on the measurement of QoS parameters within the industry.

2 Legal Basis

The legal instruments listed under 2.1 to 2.3 below empower the Authority to publish a proposed decision on *Quality of Service Parameters to be Measured by Internet Access Service Providers and Publicly Available Interpersonal Communications Providers*:

2.1 The Electronic Communications Networks and Services (General) Regulations ('ECNSR')[1]

Regulation 39 (1) of the ECNSR, specifies that the Authority may require undertakings that provide connection to a public communications network and, or publicly available electronic communications services, to publish comparable, adequate and up-to-date information for end-users on the quality of their services.

Regulation 39 (2) provides that the Authority may specify the QoS parameters to be measured, and the content, form, timing and manner of information to be published, including possible quality certification mechanisms, in order to ensure that end-users, have access to clear, comprehensive, comparable, reliable, up-to-date and user-friendly information.

2.2 European Electronic Communications Code ('EECC')[2]

Article 104 of the 'EECC', mandates that national regulatory authorities specify the QoS parameters to be measured by internet access service providers and publicly available interpersonal communications service providers, including the applicable measurement methods, and the content, form, and manner of the information to be published. This Article also states that where appropriate, the parameters, definitions and measurement methods set out in Annex X of the 'EECC' shall be used.

[1] The Electronic Communications Networks and Services (General) Regulations, Subsidiary Legislation 399.28 of the Laws of Malta.

[2] Directive (EU) 2018/1972 of the European Parliament and of the Council establishing the European Electronic Communications Code.

2.3 BEREC Guidelines detailing Quality of Service Parameters

In accordance with the 'EECC', in March 2020 BEREC published a set of guidelines, titled 'BEREC Guidelines detailing Quality of Service Parameters'. Besides assisting national regulatory authorities responsible in applying Article 104 of the 'EECC', these guidelines contribute towards achieving a consistent and harmonised application of this Article across Member States. These guidelines were published following a public consultation launched by BEREC in Quarter 4 of 2019 in which interested stakeholders and the general public were invited to submit their feedback.

2.4 Additional Legal Considerations

The proposed QoS parameters to be measured and the proposed methodologies to be used, take utmost account of Article 104 (including Annex X of the 'EECC') and of BEREC's guidelines referred to above. In accordance with the legal provisions it administers, the MCA reserves the right to introduce other QoS parameters to be measured in addition to those being proposed in this consultative paper. The introduction of additional measures or amendments to any decision issued by the MCA will be subject to a public consultation in which interested parties will be able to submit their views and feedback.

The proposals of the MCA are without prejudice to any other obligations arising from any applicable legal requirements including amongst others the European Union's Regulation on 'Open Internet Access'[3], and MCA's decisions entitled respectively 'Broadband QoS Framework'; and 'Universal Service Obligations on Electronic Communications Services'.

[3] Regulation (EU) 2015/2020 of the European Parliament and of the Council laying down measures concerning open internet access.

3 QoS Parameters to be Measured for Internet Access Services and Publicly Available Interpersonal Communications

The MCA considered different QoS parameters which could be measured and at this juncture is proposing a selective set of parameters as indicated in this consultation paper. MCA's proposed approach entails that service providers measure the performance of a set of identified QoS parameters, as published in Annex X of the EECC.

'Annex 1'[4] attached to this consultation, proposes the following:

- QoS parameters to be measured by internet access services and/or publicly available interpersonal communications service providers;
- definitions of each of the QoS parameters identified; and
- methodologies to be used to measure these QoS parameters.

For the scope of this consultation, the MCA shall be using the definitions and methodologies established in ETSI[5] and ITU[6] standards as adopted by BEREC in its guidelines.

The MCA proposes that the QoS parameters to be measured comprise the performance of the QoS provided to both consumers and businesses altogether. Furthermore, MCA proposes that when the measurement of a QoS parameter applies to more than one electronic communications service, providers are not required to report the performance of that QoS parameter separately for each electronic communications service, but should report one result comprising all electronic communications services together.

[4] QoS Parameters to be Measured by 'Internet Access Service Providers' and 'Publicly Available Interpersonal Communications Service Providers' (Definitions and Measurement Methods).

[5] European Telecommunications Standards Institute.

[6] International Telecommunication Union.

Proposed Decision 1

Internet access service providers and publicly available interpersonal communications service providers are to measure the QoS parameters listed in *'Annex 1: QoS Parameters to be Measured by Internet Access Service Providers and Publicly Available Interpersonal Communications Service Providers'*. The measurement of these parameters shall be completed in accordance with the methodologies set out in this same Annex.

Publication of Information

The main purpose of this proposal is to enable end-users to take well informed decisions when deciding which services are most suitable to their needs. To achieve this objective, the MCA is proposing a set of requirements that would ensure that the information about the performance of the QoS parameters published by service providers is:

- easily comparable from one provider to another and also between Member States;
- easily accessible and understandable by end-users; and
- frequently updated by service providers.

In order to facilitate comparability, the MCA proposes that the information about the performance of QoS parameters is published by providers in a standardised manner using a common structured format. As part of this consultation the MCA is presenting a proposed template to be used by all providers when publishing this information, as set out in '*Annex 2: Quality of Service Performance Report*'.

Further to the above, and in order to ensure that the publication of this information remains reliable, accurate and relevant to end-users, the MCA believes that it is of utmost importance that service providers regularly update this information with the latest information about the performance of the quality of their services. In this regard, the MCA proposes that providers publish periodic reports about the performance of the quality parameters of their services

twice yearly. The MCA considers that service providers should be given two months from the date of the publication of MCA's final decision to put into place the necessary methodologies and tools to start measuring the QoS parameters mandated in MCA's final decision.

Within the scope of this decision, the MCA understands that the industry's efforts to empower end-users can only be fulfilled if one can ensure that this information is easily accessible to end-users. The MCA recognises that service providers nowadays engage on several platforms with end-users to promote their services. Notably, the service providers' website remains one of the main sources from where end-users can obtain information about products and services offered by providers. In this respect, the MCA proposes that the information gathered by service providers is published on their respective websites, and is linked in a clear and visible manner on any of the service providers' webpage where any offer, plan or package is being made available by service providers.

Proposed Decision 2

Internet access service providers and publicly available interpersonal communications service providers shall publish information on the performance of the QoS parameters set out in the 'Proposed Decision 1' using the format contained in '*Annex 2: Quality of Service Performance Report*'.

The information shall be published bi-annually and shall cover the periods 'January – June' and 'July – December' of each year. Measurement results are to be published within one month commencing from the last day of the period being reported.

Internet access service providers and publicly available interpersonal communications service providers shall publish information on the performance of the QoS parameters on their website on a dedicated webpage, hereafter referred to as 'target page'. All webpages on a provider's website publicising the details of a service offer/s or plan/s, shall provide distinctive and clearly visible access to the target page by means of a hyperlink. The anchor text, i.e. the visible clickable text in the hyperlink, shall be titled 'Quality of Service results' and must be in:

- a distinct and noticeable colour, different from the other text,
- underlined, and
- the same size or larger than the prevailing font size used to highlight the main characteristics of the service offer/plan.

4 Entry into force of the Decision

The MCA shall take into consideration all feedback it receives before issuing its final decision. A final decision is expected to be published by the MCA by not later than the end of the first quarter of 2021. The MCA proposes that the first QoS parameters to be measured by providers should cover the period 01 July to 31 December 2021. In accordance with MCA's proposed decision, the first set of measured results would need to be published by not later than 31 January 2022.

5 Submission of Responses

In accordance with its obligations under article 4A of the Malta Communications Authority Act [Cap. 418 of the Laws of Malta], the Authority welcomes written comments and representations from interested parties and stakeholders during the national consultation period which shall run from the 14/12/2020 to the 08/02/2021.

The Authority appreciates that respondents may provide confidential information in their feedback to this consultation document. This information is to be included in a separate annex and should be clearly marked as confidential. Respondents are also requested to state the reasons why the information should be treated as confidential.

For the sake of openness and transparency, the MCA will publish a list of respondents to this consultation. The Authority will take the necessary steps to protect the confidentiality of such material as soon as it is received at the MCA offices in accordance with the MCA's confidentiality guidelines and procedures[7]. Respondents are however encouraged to avoid confidential markings wherever possible.

All responses should be addressed to the **Chief Executive Officer** and submitted to the Authority electronically on consultations@mca.org.mt.

The consultation period will run until close of business of 08/02/2021.

Extensions to the consultation deadline will only be permitted in exceptional circumstances and where the Authority deems fit. The MCA reserves the right to grant or refuse any such request at its discretion. Requests for extensions are to be made in writing within the first ten (10) working days of the consultation period.

[7] http://www.mca.org.mt/sites/default/files/articles/confidentialityguidelinesFINAL_0.pdf

Annex 1 - QoS Parameters to be Measured by 'Internet Access Service Providers' and 'Publicly Available Interpersonal Communications Service Providers'

(Definitions and Measurement Methods)

1. Applicable to Fixed Internet Access and Fixed Telephony Services

1.1 - Supply Time for Initial Connection

Definition	Measurement Method
ETSI ES 202 057-1 (Clause 5.1) The duration from the instant of a valid service order being received by a direct service provider to the instant a working service is made available for use. This should exclude cancelled orders.	ETSI ES 202 057-1 (Clause 5.1.3) It is measured by: a) the times by which the fastest 50%, 95% and 99% of orders are completed; b) the percentage of orders completed by the date agreed with the customer and, where the percentage of orders completed by the date agreed with the customer is below 80%, the average number of days, for the late orders, by which the agreed date is exceeded.

1.2 - Fault rate per access line

Definition	Measurement Method
ETSI ES 202 057-1 (clause 5.4)	ETSI ES 202 057-1 (clause (5.4.3)
The number of reported faults per fixed access line.	Statistics for all fixed access lines.

1.3 - Fault repair time

Definition	Measurement Method
ETSI ES 202 057-1 (clause 5.5)	ETSI ES 202 057-1 (clause 5.5.3)
The duration from the instant a fault report has been made to the instant when the service element or service has been restored to normal working order.	It is measured by: a) the time by which the fastest 80% and 95% of valid faults on access lines are repaired (expressed in clock hours); b) the percentage of faults cleared any time stated as an objective by the service provider; c) the provision of information on the hours during which faults may be reported.

2. Applicable to Internet Access Services, Fixed Telephony Services and Mobile Telephony Services

2.1 - Response time for operator services (Customer Care Telephony Support Services)

Definition	Measurement Method
ETSI ES 202 057-1 (clause 5.6.1)	ETSI EG 202 057-1 (clause 5.6.3)
Time elapsed between the end of dialling to the instant the human operator answers the calling user to provide the service requested.	It is measured by: a) mean time to answers; b) percentage of calls answered within 20 seconds.

2.2 - Bill correctness complaints

Definition	Measurement Method
Based on ETSI ES 202 057-1 (clause 5.11)	ETSI ES 202 057-1 (clause 5.11.3)
The proportion of bills resulting in a customer complaint about the correctness of a given bill, and which is found not to be invalid, per subscription.	It is measured by a percentage.

2.3 - Customer complaints[1] resolution time

Definition	Measurement Method
ETSI ES 202 057-1 (clause 5.10.1)	ETSI ES 202 057-1 (clause 5.10.3)
The duration from the instant a customer complaint is notified to the published point of contact of a service provider and is not found to be invalid to the instant the cause for the complaint has been resolved.	It is measured by: a) the time by which the fastest 80% and 95% of complaints have been resolved (expressed in clock hours); b)the percentage of complaints resolved any time stated as an objective by the service provider.

[1] A complaint is defined in ETSI 202 843V1.2.1 (page 25) as "a *statement by a user or customer expressing dissatisfaction due to a gap between the expected and the delivered benefits from the use of a service*". NOTE: A complaint may be made in various forms, writing, electronic means, or in person. From ITU-T Recommendation E.800 [i.13].

3. Applicable to Fixed Telephony Services and Mobile Telephony Services

3.1 - Dropped call ratio

Definition	Measurement Method
ETSI EG 202 057-3 (clause 6.4.2)	ETSI EG 202 057-3 (clause 6.4.2.2)
The proportion of incoming and outgoing calls which, once they have been correctly established and therefore have an assigned traffic channel, are dropped or interrupted prior to their normal completion by the user, the cause of the early termination being within the operator's network.	When using the measurements based on network element counters, the following statistics should be provided: the percentage of dropped calls, calculated from all the calls in the period. When using test calls, the following statistics should be provided: the percentage of dropped calls, together with the number of observations used and the absolute accuracy limits for 95% confidence calculated from this number.
3GPP TS 32.454 clause 5.2.1	3GPP TS 32.454 clause 5.2.1
Call drop for IMS session Applicable for IMS (VoLTE KPI) The number of dropped sessions divided by the number of successful session establishments.	It is measured by a percentage.

3.2 - Unsuccessful call ratio

Definition	Measurement Method
ETSI EG 202 057-2 (clause 5.1) Unsuccessful call ratio is defined as the ratio of unsuccessful calls to the total number of call attempts in a specified time period.	ETSI EG 202 057-2 (clause 5.1.3) It is measured by: a) the percentage of unsuccessful calls for national calls; b) the percentage of unsuccessful calls for international calls; c) the number of observations used for national and international calls together with absolute accuracy.

3.3 - Call setup failure probability

Definition	Measurement Method
ETSI TS 102 024-9 (clause 4.1.1) The ratio of total call setup attempts that result in call setup failure to the total call setup attempts in a population of interest.	ETSI TS 102 024-9 (clause 4.1.1) It is measured by: a) the time by which the fastest 80% and 95% of complaints have been resolved (expressed in clock hours); b) the percentage of complaints resolved any time stated as an objective by the service provider.

4. Applicable to Internet Access Services of a Fixed and Mobile nature

4.1 - Packet Loss Ratio

Definition	Measurement Method
Ref. ITU-T Y.2617 The total number of packets failing to deliver through the network divided by the total number of transmitted packets within a specific time window.	Ref. ITU-T Y.2617 Ref. BoR (17) 178 Sec 3.3 If a packet is not received back within a certain timeout (e.g. 3 seconds), it is considered as lost for the purpose of packet loss measurements. Recommended to send a large number of IP packets (e.g. at least 1000). Delay and packet loss measurements are typically performed over a longer period of time in order to allow for the time varying nature of network performance in packet-switched networks

4.2 - Latency

Definition	Measurement Method [2]
Ref. IETF RFC 2681[1] The time between the first bit of a packet of a source entering a network, being received by the destination, which immediately sent a bit back to the source, and then the last bit of the packet arriving at the source across the network (round trip delay). The total number of packets failing to deliver through the network divided by the total number of transmitted packets within a specific time window.	Ref. BoR (17) 178 Sec 3.2 It is recommended that delay is measured using: • UDP with ICMP or TCP as fall back option, • at least 10 measurements, and • calculated as an average of recorded round-trip time values (typically expressed in milliseconds). The measurement server should return any UDP packet payload immediately, allowing the client to calculate delay. The Unix echo service could be used for this function. The measurement setup should be insensitive to (user) clock changes during the measurement.

[2] Whilst in Annex X, the EECC refers to the standard ITU-T Y.2617 with regard to latency (delay) and delay variation, BEREC proposes to use round-trip IP packet delay (RFC 2681) and the IP packet delay variation (RFC 3393) in accordance with BEREC report “Net Neutrality Regulatory Assessment Methodology” (BoR(17)178, section 3.2, p. 9). In fact, one-way delay is not useful in practice from an end-user perspective, thus round-trip delay is of primary interest. For a matter of consistency between latency and delay variation (that are related to each other) and to be coherent with BoR (14) 117, the present Guidelines refer to IETF standards for both parameters.

Annex 2 - Quality of Service Performance Report

{Name of Provider}

Covering Period: *{day/month/year}* till *{day/month/year}*

Date of Publication: *{day/month/year}*

1. Fixed Internet Access and Fixed Telephony Services Parameters

Supply Time for Initial Connection

Parameter	Result
The time by which the fastest 50% of orders are completed	_____ days
The time by which the fastest 95% of orders are completed	_____ days
The time by which the fastest 99% of orders are completed	_____ days
The percentage of orders completed by the date agreed with the customer	_____ %
Where the percentage of orders completed by the date agreed with the customer is below 80%, the average number of days, for the late orders, by which the agreed date is exceeded	_____ days

Fault Rate and Fault Repair Timeframes

Parameter	Result
Fault rate per access line	_____ reports
The time by which the fastest 80% of valid faults on access lines are repaired	_____ days
The time by which the fastest 95% of valid faults on access lines are repaired	_____ days
The percentage of faults cleared any time stated as an objective by the service provider	_____ %

2. Fixed Internet Access, Fixed Telephony and Mobile Telephony Services Parameters

Bill Correctness Complaints

Parameter	Result
The proportion of bills resulting in a valid customer complaint about the correctness of a given bill per subscription	_____ %

Customer Complaints Resolution Time

Parameter	Result
The time by which the fastest 80% of complaints have been resolved	_____ days
The time by which the fastest 95% of complaints have been resolved	_____ days
The percentage of complaints resolved any time stated as an objective by the service provider.	_____%

Response time for operator services (Customer Care Services – Help Desk)

Parameter	Result
Mean time to answer calls	_____ seconds
Percentage of calls answered within 20 seconds.	_____ %

3. Fixed Telephony Services and Mobile Telephony Services

Dropped call ratio

Parameter	Result
Dropped call ratio - fixed telephony	_____ %
Dropped call ratio - mobile telephony	_____ %

Unsuccessful call ratio

Parameter	Result
Unsuccessful call ratio - fixed telephony	_____ %
Unsuccessful call ratio - mobile telephony	_____ %

Call setup failure probability

Parameter	Result
Call setup failure probability - fixed telephony	_____ %
Call setup failure probability - mobile telephony	_____ %

4. Applicable to Internet Access Services of a Fixed and Mobile nature

Packet loss ratio

Parameter	Result
Packet loss ratio - fixed	_____ %
Packet loss ratio - mobile	_____ %

Latency

Parameter	Result
Latency - fixed	_____ ms
Latency - mobile	_____ ms

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Public Consultation

MALTA COMMUNICATIONS AUTHORITY