A Quality of Service Framework for Mobile Electronic Communication Services

Public Consultation

MCA/C/18-3278

July 2018

mca
MALTA COMMUNICATIONS AUTHORITY
ensuring connectivity

Contents

1   Introduction

Mobile services play a crucial role in the functioning of modern society. This necessitates a high degree of connectivity. As a result of this, products and services are naturally migrating to wireless devices and connectivity platforms.

In the pursuit of meeting the connectivity needs of consumers and business alike, the mobile industry maintains a continuous process of technology developments, network coverage and capacity enhancements and continuous quality improvement.

Quantification and measurement are important when comparing electronic communication service offerings objectively. Quantification enables the comparison of the wide array of mobile services available in the market. In the absence of simple and clear information of an existing mobile products and services, qualitative judgment are limited to own or peer perceived experiences.

Nonetheless, no single number can represent the complete picture of the quality of the electronic communications services being offered. Rather, specific variables or attributes are indicative of the overall performance attained by the end user. This necessitates a common approach, with mutual metrics and measurements, for the aforementioned variables or attributes. This ensures comparability and an understanding of quality parameters amongst end users, regulators and the service providers.

Through this consultation, the MCA is exploring the different approaches, metrics and measurement methodologies which are deemed necessary for a fair representation and interpretation of the quality parameters as advertised for mobile electronic communication services. This is expected to be an important development in the local mobile market to strengthen completion beyond pricing aspects and through the objective assessment of the quality of the mobile connectivity services offered.

2   Legal Basis

The below listed legal instruments empower the Authority to publish *A Quality of Service Framework for Mobile Electronic Communication Services*, as follows:-

- Regulation 39 of the Electronic Communications Networks and Services S.L. 399.28 of the Laws of Malta (hereafter referred to as the ECNSR), stipulates 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 being offered. In addition, the said Regulation also stipulates that the Authority may specify the quality of service 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.

- Article 5 of the Regulation (EU) 2015/2120 of the European Parliament and of the Council (hereafter referred to as the Net Neutrality Regulation), amongst other obligations, puts the responsibility of promoting the continued availability of non-discriminatory internet access at levels of quality that reflect advances in technology on the Authority. The monitoring and findings with regard to compliance with Net Neutrality Regulation obligations shall be published annually by the Authority.

3   Scope

The proposals as put forward in this consultation paper form the basis for the *Quality of Service Framework for Mobile Electronic Communication Services* (hereafter referred to as the Mobile QoS Framework). This framework establishes the different approaches, metrics and measurements methods that qualify and quantify Quality of Service (hereafter referred to as QoS) performance for both mobile broadband and telephony services. Moreover, the Mobile QoS Framework will, in addition to the facilitation of providing end users with comprehensible QoS parameters, also assist the Authority in fulfilling its regulatory functions.
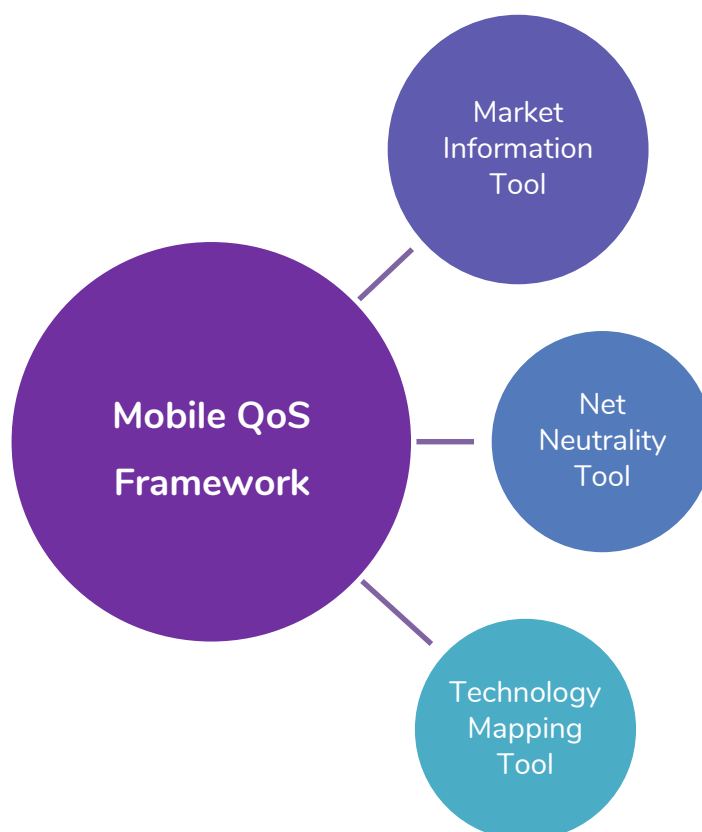
The breadth of regulatory functions which are encompassed by the Mobile QoS Framework.

Mobile QoS Framework contribution towards a Market Information Tool

The primary aim of the Mobile QoS Framework is to provide end users with comprehensible information about the quality of the products and services as offered by the mobile service providers. Such information, together with appropriate educational campaigns, is expected to permit the end users to determine the factual level of service offered of by either his current mobile service provider or that of other future prospective mobile service providers. In view of the inherent value that this information can provide, especially to end users considering switching mobile service providers, competition between the mobile service providers is expected to comprise, in addition to price and volumes, the level and quality of the services being offered.

One of the primary tasks of the Authority - the widespread telecommunications policy development and supervision, necessitates the collection of a compendium of data about the markets that it regulates. The information gathered through this framework will enhance further the quality and quantity of information which the Authority has access to, thus placing the Authority in a better position to facilitate and regulate the mobile networks and services.

Mobile QoS Framework contribution towards a Net Neutrality Tool

The Net Neutrality Regulation places on obligation on mobile broadband providers to list in their service contracts the estimated maximum upload and download speeds[1] that can realistically be attained by the end users on their respective network technology. In the absence of appropriate methods that quantify the network QoS performance, mobile service providers currently provide estimated maximum upload and download speeds according to their network capabilities. The mobile QoS data, shall provide the necessary information as required by the Authority in order to verify the maximum estimated speeds as claimed by the mobile service providers. In order to ensure that the near future estimates reflect better the level of quality as experienced by the end users, the Authority, through thorough analysis of the QoS data, will be in a position to establish a methodology by which mobile service providers can calculate the estimated maximum attainable speeds.

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[1] Article 4 [1]d of EU/2015/2120

The measurement methods and metrics defined in the Mobile QoS Framework shall also ensure that the quality of service offered to end-users is in line with the advancement of technologies deployed and that the provision of any specialised services[2] would not result in the degradation of service quality made available to the open internet service.

Mobile QoS Framework contribution towards a Technology Mapping Tool

Mobile networks service performance may have strong variances within the geographical footprint of the individual networks. Such a variance may be due to a number of factors; the geographical form and terrain structure, building clutter, the deployment and development of the network. Irrespective of the nature behind such variances, the geographic mapping of the service variances may prove useful for the end users to identify and to subsequently avail themselves of mobile connectivity on the basis of this mapping. Service coverage and performance maps may, depending on their intended audience (public consumption or use by the regulatory bodies) display diverse breadths in the level of details depicted.

The Authority notes that so far, the provision of mobile network coverage and performance maps has insofar been on a voluntary basis. This resulted in an un-harmonised approach in the representation of the information between the several mobile service providers. The Mobile QoS Framework will eventually coordinate the collation and the comparable representation of data amongst the various mobile service providers. The Mobile QoS Framework which will contribute towards the network technology mapping, will further assist the Authority in ensuring that holders of the right of use of licensed frequency bands meet the coverage obligations as specified in their respective spectrum licenses.

Furthermore, the European Commission has launched a broadband mapping initiative - **Mapping of Broadband Services in Europe SMART 2014/0016.** Through this initiative, all stakeholders that generate service quality related data are invited to contribute towards a single pan European information repository. This initiative aims at mapping the quality of service offered by the broadband network operators across all of Europe. The Mobile QoS

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[2] Definition as per the BEREC's Net Neutrality guidelines

Framework will provide the opportunity for the Authority to actively participate in such an initiative. The Authority notes that mapping is also a critical component of the European Commission's Vision towards the European Gigabit Society COM (2016) 587.

Q1 What are your views on the proposals related to the scope of applicability for the proposed Mobile QoS Framework?

4   The Proposed Mobile QoS Framework

4.1   Defining Mobile Quality of Service

ITU recommendation E.800 (09/2008) defines QoS as the "totality of characteristics of a telecommunications service that bear on its ability of satisfy stated and implied needs of the user of the service."

For the purpose of this framework, the term QoS shall refer to the effective performance of a system in support of end-user needs or of a system that contributes positively to another system's performance. The term QoS, shall only encompass the system (core and access network, together with other interconnected networks) up to the User-to-Network interface (mobile terminal or other similar device). Quality of Service is the collective result of the performance of the access network and the core network, together with other interconnected networks in delivering a given service performance at the User-to-Network interface which is key for QoS.
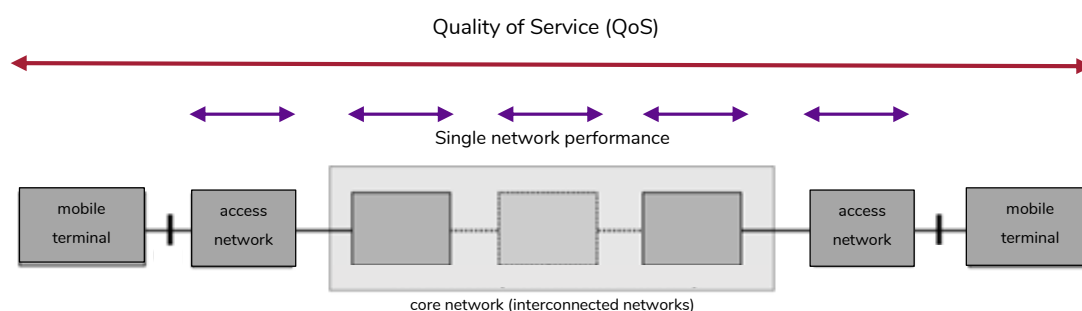
4.2   Relevance of the proposed Mobile QoS Framework

In the case were (i) broadband services which are regulated under the MCA's Broadband QoS Framework[3] (MCA/D/16-2691) are provided over a mobile access technology, and (ii) data

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[3]https://www.mca.org.mt/sites/default/files/decisions/Broadband%20QoS%20Framework%20-%20Extended%20Decision.pdf

services that are provided over 2G and WIFI networks, the obligations emanating from the proposed Mobile QoS Framework shall not apply for the aforementioned specific services.

4.3 The Key Stakeholders

The three key players identified in the implementation of the proposed Mobile QoS Framework are, the mobile network operators, the mobile services providers and the Authority.

The Mobile Network Operators and Mobile Service Providers

The proposed Mobile QoS Framework differentiates between mobile network operators and mobile service providers as in certain circumstances these might merit different obligations.

Mobile Networks Operators (MNO); provides any network element which has an influence on the QoS delivered to the end-user such as the core network or the radio-access network or both. MNOs are primarily in a position to monitor and control the quality of service they offer to their retail and wholesale subscribers.

Mobile Service Providers (MSP); provides mobile voice telephony services, mobile broadband services or both via the infrastructure provided by a mobile network operator.

In the case of vertically integrated mobile operations, the full set of obligations applicable to both MNOs and MSPs shall apply.

The MNOs, in the implementation of the proposed Mobile QoS Framework shall:-

a. Measure the performance of the mobile network on a quarterly basis according to the metrics and measurement methods as identified in the Mobile QoS Framework,
b. Process through adequate techniques the network performance information collected in order to adequately represent the levels of quality available on the network through

consistent reports. Such reports shall meet the minimum data reporting requirements as established in the Mobile QoS Framework,

c. Make available to the Authority, and to the MSPs which rely on the respective mobile network infrastructure for the provision of mobile services (wholesale subscribers) the reports identified in point b above on a quarterly basis. The reports are to be made available by the end of the succeeding month for the quarter being reported, and

d. On request provide to the Authority access to a two year record of unfiltered data in the compilation of the reports identified in point b above. Such information is to be provided in an electronic format which is independent of any proprietary software used by the MNOs in order to collect, view and analyse the aforementioned data.

The MSPs, in the implementation of the proposed Mobile QoS Framework shall:-

a. Within two (2) weeks from obtaining the underlying MNO QoS report, provide to their end users comprehensible service quality information for the products and services on offer through their quarterly mobile QoS report publication.

The Authority

The Authority, in the implementation of the proposed Mobile QoS Framework shall:-

a. Establish the minimum parameters that will encompass in a comprehensible manner the services supported over the mobile networks – voice and data. The Authority, from time to time and subject to appropriate consultations, reserves the right to alter the QoS parameters as listed in the Mobile QoS Framework in order to address any technology or market developments, as well as due to any obligations imposed by harmonised EU Regulations and Directives,

b. Establish the methods to be adopted amongst MNOs and MSPs in order to gather the established QoS parameters in the most effective and efficient manner,

c. In order to ensure that the data presented by the MNOs and MSPs is understandable by the end users, the Authority reserves the right to prescribe the format in which the

mobile QoS reports are to be published. The Authority, will, only if it deems the reports published by the MNOs and MSPs unsuitable for their purpose, prescribe the aforementioned report formatting requirements,

d. Organise information campaigns in order to educate the end users in (i) interpreting the quality parameters reported by the MSPs (ii) evaluating the service quality delivered against the promised service quality and (iii) in better assessing the services and the service qualities offered by the MSPs against their mobile connectivity needs,

e. Analyse and ensure that the data reported by the MNOs and MSPs is correct and factual. The Authority will engage reputable third parties in the field of mobile QoS measurements biennially, or when it deems appropriate, in order to carry out an independent assessment and benchmark of the MNO/s and/or MSP/s, and

f. The Authority shall also reserve the right to make use of the data pertaining to the mobile QoS measurements for the fulfilment of the scope of the Mobile QoS Framework.

The Authority, in implementing the Mobile QoS Framework shall strive to strike a balance between the burden placed on the MNOs and MSPs in the data collection processes involved and the volume and the relevance of the data towards the end users. The Authority understands that the proposed QoS parameters and associated measurement methodology already form part of the day to day operations undertaken by the MNOs to ensure quality of service.

Q2 – Provide your views on the roles of the stakeholders identified in the proposed Mobile QoS Framework. Justify your reply, particularly in case of a disagreement.

4.4 Proposed Mobile QoS Parameters under Measurement

The list of mobile QoS parameters proposed in this framework are divided into two respective categories namely mobile QoS parameters for voice telephony and mobile QoS parameters for data services. Where feasibly possible, ETSI standards[4] or their adaptations of such standards to suit the local needs are adopted in order to avoid any measurement deviations.

Mobile QoS Parameters - Voice Telephony

The proposed QoS parameters were selected in order to comprehensibly gauge the level of quality for Mobile Voice Telephony:-

Unsuccessful Call ratio (%) – This parameter is the ratio of the number of unsuccessful all attempts to the total number of call attempts for a given time period. An unsuccessful call is established as a call attempt to a valid and properly dialed number where neither the busy tone, nor ringing tone, nor answer signal, is recognized on the access line of the calling user within 10 seconds from the instant when the address information required for the setting up a call is received by the network.

$$Unsuccessful\ Call\ Ratio = \frac{number\ of\ unsuccessful\ calls}{Total\ number\ of\ attempts}$$

*Call Set-up time (ms)-*This parameter, measured in milliseconds (ms) describes the time period between sending of complete address information and receipt of call setup notification.

$$Call\ Setup\ Time\ (s) =$$
$$(Time\ stamp\ when\ connection\ is\ established - Timestamp\ when\ user\ presses\ the\ send\ button\ on\ the\ UE)$$

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[4] ETSI TS 102 250-2 V2.2.1 (2001 – 04)

Where the call is considered to be established when the Alerting tone is heard by the call originator (A-party) and the ringing tone is received by the call terminating party (B-party). Both trigger points are applicable to calls carried out on a GSM (2G) and 3G Network

In the case of an automated answering machine, the timestamp when the connection is established may be approximated by the timestamp when the call is answered by the call terminating party provided that the answering machine is configured to answer the incoming call immediately.

Call Drop Ratio (%) – This parameter, is the percentage of successful calls attempts which are terminated by a cause other than the intention to terminate the call by either party of the call (A or B parties).

$$Dropped\ Call\ Ratio = \frac{Unintentionally\ terminateed\ telephony\ calls}{all\ successful\ telephony\ calls}$$

Where a call is deemed to be successful if the connection is intentionally released by either party. By corollary, an unsuccessful telephone call is on where the call is released unintentionally.

Voice Quality – This parameter evaluates the voice quality as perceived by the end user. ITU-T P.86x refers to a set of perceptual evaluation tools available for the assessment of voice Quality. PESQ measurements are the more popular and POLQA being a more recent evolution are the main tools. Both tools provide their scores using a compatible Mean Opinion Score system. It is proposed that providers should utilize any of the voice quality testing methods, however they should provide details of the tool and its critical configuration in their reporting.

Mobile QoS Parameters - Broadband Data

The proposed QoS parameters were selected in order to comprehensibly gauge the level of quality for Mobile Broadband Data:-

Upload and Download Data Rates: These parameters, measured in (kbps or Mbps) refer to the average data transfer rate in the upload or download direction provided that a data link has been successfully established, provided that a data session has been established successfully. Data rate is measured as the ratio between the amount of data transferred and the difference between the timestamp when data transfer was complete and timestamp when the data transfer was initiated. From an end user's perspective, the starting trigger is when the user starts downloading a web page, and the stopping trigger is when the web page is downloaded.

$$Average\ Data\ Rate = \frac{user\ data\ transferred\ (kbit)}{t_{Data\ transfer\ complete} - t_{Data\ transfer\ initiated}}$$

Note: - although ETSI standards recommend the use of either FTP or HTTP protocols for measuring data related parameters, only the HTTP protocol shall be employed for the upload and download data rates measurements as required through this framework. Such a constraint in the selection of the protocol employed is also in line with BEREC's selection of the HTTP protocol for the measurement of broadband QoS parameters as identified in its Net Neutrality Regulatory Assessment Methodology.

Ping Delay – Round Trip (ms) – This parameter measured in milliseconds denotes the time required for an ICMP echo packet, or similar, travels from source and destination and back.

$$Ping\ Round\ Trip\ time = t_{Packet\ received} - t_{Packet\ sent}$$

Where $t_{packet\ sent}$ refers to the time stamp when the packet was sent, and $t_{packet\ received}$

In measuring Ping delay, the average of at least 10 consecutive measurements should be considered to improve the accuracy of the measurement

Streaming Video Quality – This parameter is an index indicating the quality of streamed video over a broadband connection. The Authority proposes that MNOs, in measuring the streaming video quality parameter are to make use of the respective measurement tools provided by their current streaming video equipment vendors until such time when complementary measurement tools adopting the recent ITU recommendations on the assessment of audio visual streaming services over reliable transport mechanisms (ITU-T P.1203) are made available on the market. The MNOs are to clearly identify in their report the methodology and the measurement parameters adopted when assessing the streaming video quality.

Q3 – Do you agree with the proposed QoS parameters under measurement? Please provide substantiated reasons in your response?

Q4 –Are the parameters identified above feasible to be measured by the MNOs? Quantify the level of effort required by the MNOs to measure the respective QoS parameters.

4.5 Proposed Mobile QOS Parameters Measurement Methodology

In determining the proposed measurement methodology suitable for the mobile QoS parameters identified above, the Authority took into consideration the following approaches:-

The utilization of counters and statistical information implemented in the mobile network elements.

The information gathered through the use of counters and statistical information is primarily intended for the monitoring by the network operators of the performance of the various network elements, diagnose failures, and estimate quality of service. This approach would necessitate that,

a. All MNOs have to implement the appropriate counters in order to gather and calculate the QoS information identified in the Mobile QoS Framework,

b. The implementation of supplementary counters which may be necessary to fulfil the Mobile QoS Framework requirements and might result in a substantial operational and economic expense,

c. The calculation of a particular QoS parameter relying on vendor specific counters necessitates challenging alignment process between the different MNOs for the purposes of comparability,

d. A significant effort is required in order to set up these counters and extract the necessary QoS parameters, and

e. The measurement platform will require minimal human intervention once that it is up and running.

Data gathering through drive test measurement campaigns

The information gathered through the drive test measurement campaigns is primarily intended for the monitoring and optimisation of the services offered by the MNO across its relevant territory. In using this approach,

a. The measured QoS parameters are closely related to the QoS experienced by the end users,

b. Positive economies of scale may result when adopting a single collective data gathering exercise,

c. Drive test campaigns are an established process which form part of best practice adopted by the MNOs for the monitoring and optimization of their services, and

d. The QoS parameters are gathered over a substantial period of time necessary to conduct the drive tests across the whole geographical area of the Maltese islands.

In conclusion, after taking into consideration the different aspects of the two measurement methodologies listed above, the Authority proposes that the **Mobile QoS Framework**

establishes the drive test measurement campaigns as the preferred mobile QoS parameters data gathering methodology. The Authority notes that:

a. In contrast with network counters, the information gathered through the drive test measurement campaigns realistically simulates the service usage by the end user, fulfilling the purpose of the Mobile QoS Framework as outlined in section 3,

b. Information gathered through network counters may be severely limited towards essential parameters such as geospatial information, and

c. A drive test oriented methodology allows MNOs to explore options for adopting a common, single data gathering exercise should this be attractive.

Q5 – Do you agree with the proposed drive test measurement campaign as the mobile QoS parameter data gathering methodology? Justify your response, particularly in case of disagreement.

4.6   Proposed Measurement Methodology Parameters – Drive Testing

The mobile QoS parameters measurement methodology proposed in the Mobile QoS Framework specifies the following four key parameters:-

a. Drive Testing Schedule
b. Drive Test Route Coverage
c. Measurement Profile for Voice Service
d. Measurement Profile for Data Service

Drive Testing Schedule

The performance of mobile networks is a function of the network load; the lower the network load, the more favourable the QoS measurements will be. In order to realistically replicate the end user experience at the peak network loads (network critical periods), the Authority

proposes that the mobile QoS parameter data gathering shall be scheduled at a time period which is as closest to the busy hour as possible.

Drive Test Route Coverage

The road network in Malta[5] primarily consists of the following three categories of approximately:-

a. 214km or Arterial and Distributor roads,
b. 1684km of Urban and Local Access roads, and
c. 510km of Rural (paved) roads.

In order to achieve maximum geographic coverage of the Maltese islands, the Authority proposes that drive testing routes shall be designed as follows:-

a. A minimum of 90% coverage of the Arterial and Distributor roads. The results obtained from this portion of the network provide a general picture of the mobile service in Malta. Owing to their importance to the transport network, it is assumed that this road network also attracts the large majority of the vehicular traffic and hence also a substantial catchment areas for mobile networks,

b. A minimum of 25% of the Urban and Local Access roads residing within the core area of each town and village in Malta. These routes shall represent those areas where mobile end users are situated at their place of residence. In addition, the Authority through this consultation is trying to gauge the most efficient and effective manner in carrying out the QoS data gathering exercise in this respective category. The Authority is therefore proposing that these specific set of routes shall either (i) Option 1 - be maintained constant for a period of at least one year in order to facilitate comparative analysis between the quarterly reports or (ii) Option 2 - segmented into four clusters, and alternating the measurements amongst the route clusters. The cumulative effect of the four consecutive mobile QoS reports will eventually provide the complete picture of the mobile services being provided throughout the Maltese islands, and

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[5] NSO Transport Statistics 2016 (ISSN: 1681-780X)

c. <u>A minimum of 10% of the Rural (paved) roads in Malta</u>. These routes represent low population density areas which may attract a lower network investment incentive and hence resulting in lower service qualities. Such routes shall also provide an indication of the network operators' commitment towards investment in non-urban territories around the Maltese Islands.

In addition, drive test routes shall be designed in such a way to be contiguous to provide a fair representation of the quality of service

Q6 – What are your views on the drive testing schedule and route coverage requirements as proposed in the framework?

Q7 – Which time of the day is considered as the network busy hour for data and voice services on your mobile network. (Such replies will be treated as strictly confidential information by the Authority)

Q8 – In your opinion, which route coverage options would suit best when carrying out drive test campaigns in the Urban and Local Access roads route category?

Measurement Profile for Voice Services

In measuring mobile voice quality service levels, the following call duration parameters shall be used:

a. Call duration of 120s in the case where the respective call setup time is less or equal to 10s. An interval of 120s to 150s shall be adopted between the start of consecutive calls.

Measurement Profile for Data Services

In measuring mobile data quality service levels, the following data session parameters shall be used:

a. Download and upload of a 2 Gbyte random data test file. This test setup is intended to monitor quality levels during end user terminal changeover to different network technologies as may be experienced during data sessions of a relative long duration.

b. Download and upload of a 250 Mbyte random data test file. This test setup is intended to measure the network technology parameters whilst avoiding any network technology changeovers.

Q9 – *What are your views on the test profiles presented?*

4.7   Proposed Minimum Data Reporting Requirements

When compiling the mandatory quarterly QoS reports, MNOs and MSPs shall, as a minimum include the following details:-

a. The owner of the underlying radio access and core network. This information is particularly necessary for those MSPs who's mobile service delivery relies primarily on third party MNOs,

b. Details of the equipment used to gather the QoS data parameters together with any limitations inherent in the equipment and/or setup which may influence the QoS results obtained,

c. A histogram displaying the number of test carried out during the hours of the day. For the reporting period in question, identify the top – eight (8) testing hours particularly highlighting the relationship with the network busy hours.

d. Detailed maps depicting (i) the arterial and distributor roads, (ii) the urban and local access roads and (iii) the non-urban roads covered in the reported dataset

e. For the reported data sets, present information about the total distance covered during the cumulative drive tests, subdivided by the route categories at a resolution of NUTS Level 3[6].

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[6] Nomenclature of Territorial Units for Statistics (NUTS) Level 3, as developed by Eurostat, divides the territory of the Maltese Islands into two distinct geographic areas – Mata and Gozo (including Comino).

f. Present at a NUTS level 3 resolution, the total number of QoS data points gathered throughout the drive tests carried out during the reporting period,

g. Present the QoS parameters gathered during the reporting period in both a Map and in Numerical Format.

    In choosing an appropriate map resolution, the standard NUTS Level 1 to Level 3, and LAU Levels 1 and 2 were considered. However, the aforementioned resolutions would result in either a resolution which is too low for the purpose of this exercise, or otherwise involve complex map boundaries to process. Hence the proposed Map resolution to be adopted shall consist of a 1 km square grid system. All the data points gathered within each square of the proposed grid shall then be averaged out and represented collectively as a single QoS parameter respectively. In the case of Numerical Format, the QoS parameters, are to be average out on a NUTS 3 grid space, and presented in a histogram table. The data intervals for a particular QoS measurement shall be grouped into ten (10) or more equal bins, tabulating the frequencies in each bin along with the number of data points (scores) that contributed to the frequency in each bin. Since histograms will facilitate the long term analysis of the QoS data, MNOs are requested not to alter the bins for at least a period of one (1) year.

Q10 – What are your views on the minimum data reporting requirements as proposed in the Mobile QoS Framework? Justify your views based on the estimated efforts required in order to be able to meet the proposed minimum requirements.

Q11- What are your views on the Map and Numerical Format data representation set up as proposed in the Mobile QoS Framework?

5   Proposed Mobile QoS Framework Implementation Plan

Alternative Mobile QoS Framework Implementation Plan

The Authority shall allow for combined drive tests and data analysis between two or more of the MNOs which agree to collaborate in carrying out such an exercise. The combined data gathered for the aforementioned MNOs shall however be individually reported by the respective MNOs as required through the framework.

QoS Reported Data Verification by the Authority

One of the primary roles of the Authority in the implementation of the Mobile QoS Framework, is for the Authority to engage reputable third parties in the field of mobile QoS measurements either biennial, or when the Authority deems appropriate, in order to carry out an independent assessment and benchmark of the MNO/s and/or MSP/s.

The costs incurred in carrying out the independent benchmarks, subject to appropriate procurement procedures applicable at the time, shall be financed through the General Authorisation Fees.

Framework Implementation Timeframes

The Mobile QoS Framework shall come into force within three (3) months from the publication of the final Decision. The QoS data gathering as established in the Mobile QoS Framework shall then commence from the next complete calendar quarter.

Q12 - What are you views on the proposed time frames for the implementation of the framework by the MNOs and MSPs?

6   Consultation Questions and Invitation to Comments

The Authority would be pleased to receive comments and proposals on any other aspects that may be deemed relevant for the purposes of this consultation.

For the sake of clarity and ease of understanding, the Authority encourages stakeholders to structure their comments in the same order as adopted throughout this document.

Consultation Questions

Q1 What are your views on the proposals related to the scope of applicability for the proposed Mobile QoS Framework?

Q2 – Provide your views on the roles of the stakeholders identified in the proposed Mobile QoS Framework. Justify your reply, particularly in case of a disagreement.

Q3 – Do you agree with the proposed QoS parameters under measurement? Please provide substantiated reasons in your response?

Q4 –Are the parameters identified above feasible to be measured by the MNOs? Quantify the level of effort required by the MNOs to measure the respective QoS parameters.

Q5 – Do you agree with the proposed drive test measurement campaign as the mobile QoS parameter data gathering methodology? Justify your response, particularly in case of disagreement.

Q6 – What are your views on the drive testing schedule and route coverage requirements as proposed in the framework?

Q7 – Which time of the day is considered as the network busy hour for data and voice services on your mobile network. (Such replies will be treated as strictly confidential information by the Authority)

Q8 – In your opinion, which route coverage options would suit best when carrying out drive test campaigns in the Urban and Local Access roads route category?

Q9 – What are your views on the test profiles presented?

Q10 – What are your views on the minimum data reporting requirements as proposed in the Mobile QoS Framework? Justify your views based on the estimated efforts required in order to be able to meet the proposed minimum requirements.

Q11- What are your views on the Map and Numerical Format data representation set up as proposed in the Mobile QoS Framework?

Q12 - What are you views on the proposed time frames for the implementation of the framework by the MNOs and MSPs?

Invitation to Comments

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 **27th July** 2018 till the **7th September** 2018.

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 transparency, the Authority may publish a list of all respondents to this Consultation on its website, within three days following the deadline for responses. The Authority will take the necessary steps to protect the confidentiality of all such material as soon as it is received, 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 submitted electronically to the Authority, in writing and addressed to:

Ing. Antoine Sciberras
Chief, Spectrum Management and Technology
Malta Communications Authority
Valletta Waterfront, Pinto Wharf,
Floriana, FRN1913
Malta.
Email: **mobileqos@mca.org.mt**

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.

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

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