

Broadband Internet – Quality of Service Framework

Response to Consultation

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Table of Contents

Table of Contents	i
1 Introduction	ii
1.1 General Feedback Received	1
2 Quality of Service Parameters	3
2.1 Proposal – 1 Quality of Service (QoS) Parameters	3
3 Measurement Methodology	4
3.1 Proposal – 2 Technical Measurements	4
3.2 Proposal – 3 Data Sampling Methodology.....	8
3.3 Proposal – 4 Data Reporting and Publishing.....	9
4 Network Performance Parameters	12
4.1 Proposal – 5 Information in respect of Network Performance Parameters.....	12
5 Service Contract Obligations	15
5.1 Proposal – 6 Introduction of Typical Speed Range	15
5.2 Proposal – 7 Obligations of Network Providers towards Internet Service Providers.....	18
Appendix 1 – Glossary.....	i
Appendix 2 – ISP Network Elements	ii

1 Introduction

In January 2012, the Malta Communications Authority (hereinafter referred to as 'MCA' or 'Authority') published a Consultation Document proposing a Quality of Service Framework for Broadband Internet¹. The proposed Framework had the following three objectives:

- the identification of a minimum number of parameters considered suitable to characterise a broadband Internet service;
- the establishment of the relevant methodology to measure these parameters; and
- the establishment of a set of obligations that will be incumbent on Internet Service Providers (ISPs) and which will establish with a level of confidence, that the service available to the subscriber is the service contracted.

The consultation period was open between 31st January 2012 and 28th March 2012. Four submissions were received from:

1. Alcatel Lucent
2. Go Plc
3. Melita Plc
4. Vodafone Plc.

The MCA wishes to thank these parties for their interest and response.

This paper provides an analysis of the responses received and the position taken with respect to the various matters raised by the respondents.

¹ <http://www.mca.org.mt/consultation/broadband-internet-%E2%80%93-quality-service-Framework>

1.1 General Feedback Received

There was general support of the guiding principles behind the proposed Quality of Service Framework and there was agreement on the choice of parameters proposed.

In general respondents felt that the MCA should provide more detail when specifying both the measurement methods for each parameter and the format suitable for publishing results. One respondent raised the following three points of criticism:

- a) The respondent argued that the proposed Framework is over ambitious and very complex to implement. It also expressed serious doubts about the feasibility of implementing the same Framework.
- b) The respondent also claimed that the proposed Framework leaves room for ISPs to abuse the same Framework by means of stretching the interpretation of the provisions to suit their agenda thus defeating the overarching objective of comparability and transparency.
- c) The respondent also highlighted that other EU member states have adopted simpler and less burdensome provisions which have been introduced through voluntary adoption by operators.

From its end, the Authority argues that:

- a) The complexity of the proposed Framework stems mainly from the level of complexity of providing an Internet connection and service. The Framework merely formalises what, in the opinion of the Authority, an ISP should be already doing to measure and monitor the performance of its network and services such that it ensures the level of service an ISP offers its subscribers.
- b) With reference to the observation that the proposal can leave open the possibility to interpret the provision and therefore manipulate the results, the Authority has, as part of its decision, fine tuned areas of the proposal to cater for such eventualities. The Authority reserves the right to adjust the same Framework, within the capacities granted to it at law, if it observes incorrect or abusive implementation of the same Framework by any of the ISPs.

In response to the feedback received during consultation, the final decision will include a number of changes to the proposed Framework mainly in areas related to the collection and publication of QoS information as well as changes in areas related to the Typical Speed Range (TSR) mechanism (Proposal 6 in the Consultation Document).

- c) Whilst acknowledging that the data that is to be provided by the ISPs as a result of the implementation of the Framework may be complex to understand by some subscribers, such data may be necessary for those subscribers who require a broadband connection for more than just reading email and browsing.

In addition the raising of the subscribers' awareness and their basic knowledge of the service being bought is beneficial to the market and can be addressed via information campaigns aimed at bridging the knowledge gap. Such an approach would ensure that the subscribers can better gauge the performance of their connection with the performance promised at the

point of sale as well as the average performance obtained by other connections of the same ISP.

- d) With reference to the regulatory approach adopted by the other European Union (EU) member states, the MCA notes that various member states have adopted different approaches with respect to broadband QoS.

The approach adopted by OFCOM² in the United Kingdom (UK) is the most notable. OFCOM has issued a Voluntary Code of Practice specifically on Broadband speeds in 2008³ which was then updated in 2010⁴. Among the requirements which the Code of Practice imparts on the UK based ISPs, two are relevant to the QoS Framework discussed in this paper.

- An ISP in the UK which has endorsed the code of practice should present information at the point of sale and provide its subscribers with accurate information on access line speeds. The Code of Practice specifies that the ISP needs to provide realistic information about the service offered. Access speeds using a mechanism which is similar to the typical speed range described in the proposed Framework.
- Furthermore, such an ISP is also expected to provide its subscribers with information about the network including any applicable contention ratios.

Additional to the above, for each year since 2008, OFCOM has commissioned a broadband QoS measurement campaign targeting existing connections. Each measurement campaign was carried out using mostly active testing techniques using a sample which was representative of the UK population and the ISPs. The following are some of the parameters which were measured during the past campaigns:

- a) Upload and download speeds
- b) Latency
- c) Jitter
- d) Packet loss

The data is then published by OFCOM⁵ listing the results of obtained from all ISPs classified amongst others by the ISP.

The Authority highlights that contrary to what was claimed by one respondent, the proposed Framework draws out a number of parallels with the approach adopted by OFCOM in this sector.

The Authority notes that ISPs could have voluntarily entered into discussions with the Authority to adopt a similar code of practice. In the present circumstances, the Authority prefers the approach where the QoS Framework is implemented through a formal decision as permissible at law. This should lead to the achievement of the objectives laid down in the proposed Framework.

² Office of Communications - <http://www.ofcom.org.uk>

³ <http://stakeholders.ofcom.org.uk/telecoms/codes-of-practice/broadband-speeds-cop/voluntary-codes-of-practice/>

⁴ <http://stakeholders.ofcom.org.uk/telecoms/codes-of-practice/broadband-speeds-cop-2010/code-of-practice/>

⁵ <http://stakeholders.ofcom.org.uk/market-data-research/other/telecoms-research/broadband-speeds/bb-speeds-nov-11> Issued 2012

2 Quality of Service Parameters

2.1 Proposal – 1 Quality of Service (QoS) Parameters

In the Consultation Document the Authority proposed that:

- a) ISPs will be required to measure and maintain records of:
 - a) Speed (Download and Upload directions)
 - b) Availability of Internet Access (Network Availability)
 - c) Latency
 - d) Packet Loss
- b) ISPs will be required to publish the figures on a quarterly basis as a minimum.
- c) The Consultation Document also laid the method to be used by the ISPs to collect and present this information.

2.1.1 Responses Received

- a) One respondent agreed with the choice of parameters, while the remaining three chose not to comment in either sense.
- b) One respondent labelled the parameters as 'esoteric' when relating them to consumer relevance.

2.1.2 Authority's Reply

The Authority notes the mixed reaction that it has received in respect of the proposed QoS parameters. It also acknowledges that the data that is to be collected and provided as a result of the implementation of the QoS Framework, being technical in nature, may be complex for some subscribers to understand but may be necessary for others who require a broadband connection for more than just reading email and browsing. Therefore, in view of this, the Authority considers the proposed process of measurement and publication of QoS as important and of value to the subscriber.

3 Measurement Methodology

3.1 Proposal – 2 Technical Measurements

In the Consultation Document, the Authority recognised that although the active testing technique produces more accurate results in terms of broadband internet QoS measurement, its implementation with regard to the collection of QoS information would have been the costlier option. Therefore, without prejudice to future decisions that the Authority may need to consider, it was proposed that the ISP should employ a passive method technique to collect all the QoS data as indicated under section 5.2.1 of the Consultation Document.

It was also proposed that measurements were to be carried out in line with established technical standard as outlined in section 5.3 and 5.4 of the Consultation Document

It was further proposed that the location points of any measurement were to be retained for all measurement data.

3.1.1 Responses received

- a) Two respondents agreed with the proposal of using passive testing techniques for performing the measurements. Specifically, one respondent welcomed the proposal that data is not required to be measured off probes in subscriber premises. On the other hand, another respondent argued that passive measurement techniques are not suitable for the assessment of broadband QoS due to the nature of the test itself. This respondent however also recognised that the use of active testing mechanisms is expensive to carry out. Furthermore, the same respondent claimed that lack of replicable and comparable measurement protocol would undermine the usefulness of the measurement.
- b) The responses received raised a concern that the results obtained will suffer from inaccuracies arising from limitations inherent of the measurement techniques proposed. Of particular concern was the measurement of speed whereby in the case of passive testing the results obtained would reflect the instantaneous speed of flowing traffic, whereas, a subscriber may be more interested in the full potential of the connection.

3.1.2 Authority's response and Position

The Consultation Document recognises the benefits and difficulties of collecting QoS data using either the active or passive data collection techniques. It was also argued that while active techniques tend to be more accurate than passive data collection techniques, active measurement techniques tend to be more expensive to procure than passive measurement techniques. Therefore the Framework proposed the use of passive data collection techniques. Furthermore, ISPs do not normally measure their performance through active data collection manners and given the higher costs of active data collection it would be prudent to first evaluate the results obtained from passive data collection techniques.

The Authority is also aware of the availability of TR-069⁶ compliant CPEs on the market. A subset of the TR-069 protocol is the TR-143⁷ which additionally enables the ISP to conduct remote QoS testing using the CPE at the subscriber's premises as an active probe. While the Authority is aware that ISPs may have deployed a number of TR-143 compliant CPEs to their subscribers, it is also aware that there may be significant costs which may be incurred by the ISPs should QoS measurement be conducted using this technology. These costs are normally related to the preparation of test setups, licensing fees which may be required to make use of TR-143 protocols, and possibly additional hardware.

It should be also noted, that none of the respondents have so far pointed towards the use of such protocol as a viable alternative to passive testing, thus strengthening the Authority's position that such testing may not be currently feasible.

3.1.3 Responses Received (Section 5.1)

The discussion in section 5.1 of the Consultation Document treated the measurement methodology for each of the QoS parameters identified in Proposal 1. This discussion also leads to Proposal 2 and the respondents have also provided their feedback which is discussed below.

- a) One respondent pointed out that further guidance on the methodology to be followed by all ISPs when measuring parameters is necessary. This guidance should be such that it ensures that the parameters are measured in an equivalent and transparent manner by all ISPs.
- b) When referring to the detail of how Latency is to be measured, one respondent highlighted that the Consultation Document made reference to ETSI EG 202 057 04⁸ in which it is stated that Internet Control Message Protocol (ICMP) packets, which are to be used during the measurement of latency, are normally delivered with a low priority and therefore the result of latency may be skewed.
- c) Three respondents have raised a concern about the possibility that any results related to Availability of Internet Access (Network Availability) may be skewed as a result of the practice employed by a number of their subscribers in which they switch off their CPE units mainly for energy saving purposes.

On the same note, one respondent proposed that two metrics can be used to establish network availability. The first metric would measure the availability of internet access from the ISP's core network to the subscriber's CPE and the second metric would be the availability of internet access from the ISP's core to previously identified web pages.

- d) With reference to the treatment of periods of service or network downtime due to either planned or unplanned maintenance in the calculation of network availability, one respondent claimed that there are a number of instances whereby providing suitable notification is either

⁶ The TR-069 is a protocol which is normally used by an ISP to be able to remotely configure CPEs installed in subscriber's premises. http://www.broadband-forum.org/technical/download/TR-069_Amendment-4.pdf

⁷ TR-143 - <http://www.broadband-forum.org/technical/download/TR-143.pdf>

⁸ ETSI EG 202 057 04 - Speech Processing, Transmission and Quality Aspects (STQ); User related QoS parameter definitions and measurements; Part 4: Internet access. - http://www.etsi.org/deliver/etsi_eg/202000_202099/20205704/01.02.00_50/eg_20205704v010200m.pdf

very difficult to effect or is of little consequence due to the small extent of impact. Such examples include:

- a) Any upgrades, generally applied to the core network, which require network wide downtime and which are however carried out during the night; a period which is considered as off-peak.
- b) Some aspects of maintenance to the access network that may require third party access which renders coordination and notification a challenging task to the ISP. Nevertheless, the respondent claims that the impact is minimal as such maintenance affects only few subscribers and for a short period of time.

Therefore, in view of such circumstances the respondent suggested that any downtime due to planned maintenance, irrespective of it being notified or not, should be excluded entirely when calculating network availability.

- e) One respondent argued that any of the parameters proposed in the Framework may be potentially influenced negatively by the internal wiring within the subscriber's premises. Given that such wiring is beyond the control of the service provider, it would be difficult for the service provider to ensure performance of its service.

3.1.4 Authority's Response

- a) The Authority takes note of the concern raised about the lack of guidance which may result into different ISPs implementing the same parameters but in different ways. This may in turn give rise to confusion with the subscriber. As part of the final decision, the Authority will include the following points in the methodology to measure the QoS parameters:
 - In order to ensure that the QoS measurements carried out by different ISPs are not influenced by the possibility of measuring the same parameters but at different points of the Network, a reference point will be defined as that point within the core network, which is closest to the external gateways where the ISP connects to the Internet via its local and international gateways. This point is chosen on the basis that the incoming connections would be aggregated and therefore it would be simpler for an ISP to monitor the Simple Network Management Protocol (SNMP) statistics. This reference point shall be used by the ISP to measure Speed, Latency and Packet Loss.
- b) With reference to the observation regarding the use of ICMP messages to measure latency, the ETSI standard quoted in the Consultation Document refer to the use of the standard ICMP ping as the standard message to be used to measure the latency in the network. While it is understood that when different network elements assign a low priority to the ICMP messages to favour other traffic, the measurement of latency is worsened.

It should be noted that traffic priority mechanism comes into action when some network element is congested for some reason or other. Therefore, it is reasonable to conclude that the

impact on measurement due to the low priority assigned to the ICMP message should have negligible impact on the overall figure of Latency unless the network suffers from long periods of network congestion.

- c) The Authority agrees with the views raised about the possibility of results of network availability being distorted when subscribers switch off their CPE for whatever reason. The alternative method suggested by one of the respondents eliminates the consideration of the CPE by splitting the measurement point part towards the access network and another part outbound towards third party websites. Although this measurement sacrifices the end-to-end element of the QoS parameter, it increases the accuracy and reliability of the results. Therefore Authority favours this approach and shall, in its final decision adopt this method to measure Network Availability.

With regards to the choice of International sites which are suitable for testing of the availability of the ISP's International connectivity, the Authority considers Internet Exchange Points⁹ as stable points on the Internet which are suitable to be used for such test. While the MCA suggests the use of large Internet exchanges such as the Milan Internet Exchange (MIX), London Internet Exchange (LINX), Amsterdam Internet Exchange(AMSIX) and Frankfurt Internet Exchange (DECIX), the MCA accepts that the ISPs may choose their own test points without affecting the comparability of results.

- d) The Authority notes the comments made by the respondent with reference to downtime. The Authority also notes that Article 8[b] of the Electronic Communications (Regulations) Act Chapter 399 of the Laws of Malta places a requirement on the provider to notify the Authority of such downtime. Since the Framework is not intended to regulate this area, without prejudice to any action the Authority might consider in this regard in the future, the Authority shall, as part of its final decision allow ISPs to, for the sole purpose of calculating the QoS parameters to exclude any downtime due to maintenance occurring between midnight (00:00) (included) and six in the morning (06:00) (excluded), irrespective of whether notification to subscribers and to the Authority has been exercised. This time frame is selected on the basis that a number of local ISPs that offer data download caps in their offers exclude the time period between midnight and six in the morning for data monitoring purposes, thus indicating the same period as off-peak.

The ISP shall be required to highlight the duration of downtime that its network has experience and which was excluded from the calculation of Availability of Internet Access.

- e) With respect to issues regarding the impact of wiring at the subscriber's premises on the ISP's QoS performance, the Authority acknowledges the validity of the point raised by the respondent. In the absence of an indication, from the responses received, of how frequent the

⁹ An Internet Exchange Point is defined as a physical network infrastructure the purpose of which is to facilitate the exchange of Internet traffic between ISPs

occurrence of such issue is, and from the fact that to-date no subscriber complaints were received by the Authority which following an analysis resulted in problems due to internal wiring, it is considered that the impact on the overall statistics of the service provider should be contained. Nevertheless, the Authority suggests that in those cases where the performance of broadband connections is particularly sensitive to the internal wiring, the ISP should, prior to provide the connection carry out the necessary tests to ensure the state of the subscriber's internal wiring.

In those instances where it is confirmed that the internal wiring is the cause of lack of performance of the broadband connection, the ISP may exclude such sources, provided that such exclusions are documented.

3.2 Proposal – 3 Data Sampling Methodology

In the Consultation Document, the Authority proposed that statistical samples which the ISPs should use when gathering the QoS information should be such that the resultant statistics would enjoy a margin of error of not greater than 5%. It was also proposed that the chosen sample base should be representative of:

- a) The individual broadband packages offered by the ISP
- b) The distribution of the subscribers across the whole territory of Malta and Gozo
- c) Time covering a 24 hour basis, 7 days a week with the exclusion of periods in which there no service due to preventive maintenance, provided that the subscriber is advised of such downtime with an adequate notice period.

3.2.1 Responses Received

Two responses were received on this proposal. Both agreed with the proposal.

3.2.2 Authority's Response

Given the agreement received from the respondents, the Authority does not have any further comments to add and therefore the final decision shall reflect the proposal as presented in the Consultation Document.

3.3 Proposal – 4 Data Reporting and Publishing

The Consultation Document proposed that ISPs should present the QoS information in the form of report using a format they deem appropriate, provided that this would reflect the principles discussed in section 5.4 of the Consultation Document and that the statistical information is collected and processed as in section 5.3 of the Consultation Document and consequently in accordance to Proposal 3.

The following information should be included in the report as a minimum:

- a) the margin of error of the published statistical figures;
- b) the methodology used during the collection of data including any limitations which apply to the same statistical information;
- c) a clear identification of the location points between which the measurements were taken;
- d) the QoS information of each broadband package per geographical region. A geographic region is represented either on the basis of locality as established by the Local Councils, or in regions as commonly used by the National Statistics Office, which is found in The Demographic Review of 2010.

3.3.1 Responses Received

- a) One respondent criticized the approach adopted in the proposed Framework with regards to the publication of data. The respondent argued that the harmonization of the published QoS data is of significant importance without which the objective of presenting comparable data would be lost.
- b) One respondent argued that the publication of measurement results which are sorted out by the broadband package and on a region by region basis makes sensitive market data available to its competitors. In addition the respondent stated that the same information is not personalized to the subscriber and therefore is not useful to him.
- c) One respondent expressed agreement with this proposal without adding further comments.

3.3.2 Authority's Response

- a) The Authority notes the concern raised by the respondents with respect to the need to have a harmonised format to present the QoS data. The Authority notes however that its proposals include the minimum information that should form part of publication. While the Authority will reserve the right to intervene in this area if it deems that harmonisation in terms of document formatting is required in order to support comparison, it will not include a preferred format as part of its final decision.

This approach does not limit in any way the ISPs from entering in voluntarily agreements on a format which they deem to be the most appropriate to use to present their data.

Following the feedback received, both in terms of specification of measurement and also in the manner of data presentation, the Authority shall be introducing the requirement to publish QoS information in a gradual manner as outlined below. This will allow for a buffer period during which collection and presentation of data is fine tuned before being made public. The following are the stages being envisaged:

- a. ISPS will be required to measure the QoS parameters listed and present the data solely to the Authority which shall treat the received data with confidentiality.
 - b. The Authority will then analyse the data received from each ISP individually to evaluate if there is the need for further clarity in the data presented thus ensuring that the data would be understandable and useful for the general public when published.
 - c. The Authority will also evaluate the reports received to ensure their comparability in terms of format.
 - d. During this stage of analysis, the Authority will also ensure that ISPs have implemented their QoS measurements in accordance to the Authority's decision.
 - e. The Authority will request ISPs to publish their QoS information after the Authority ensures that any necessary modifications are applied.
- b) With reference to the comment received submitted by one respondent about the commercial sensitivity of published QoS information when classified by geographic areas, the following is the Authority's position:

The main justification of this requirement is that if an ISP operates a network which is significantly susceptible to location when compared to others, then the subscribers should be aware of such dependency and should also be able to quantify how such dependency would affect the performance of the broadband service which they either have, or are considering to purchase before entering into contract with a service provider.

Therefore, the question is no longer whether to publish QoS information classified by geographic information or not, but what constitutes the geographic granularity which respects the commercial sensitivity requirements of the ISP, and the consumer interests.

On one hand, one can argue that if no geographic information is included with the QoS data, the default geographic information is the whole territory of Malta and Gozo since this is the area of operation of the ISPs. The aggregation of data on a national level is not suitable for the subscriber.

On the other hand, one can argue that publishing QoS data with very fine granularity, for example street level, the information may be very suitable for the subscriber, the information may be too cumbersome for the ISP to compile and furthermore an ISP may be potentially publishing a level of detail which may be commercially sensitive.

In order to strike the correct balance between the needs of the ISP and that of the subscribers, the data can be classified by geographic information based on Demographic Review of 2010 as published by the NSO. This is without prejudice to any further

measures that the Authority may undertake in this area. This choice is justified on the following grounds:

- a. The chosen borders are of large geographic area since the Maltese islands are subdivided in six regions.
- b. The chosen borders are established at a National level and therefore should not pose any difficulty for the ISPs to interpret their use.
- c. The chosen borders are independent of any network topology used by any ISP and therefore, correlation between the network topology and the geographic data would be difficult to conclude.

4 Network Performance Parameters

4.1 Proposal – 5 Information in respect of Network Performance Parameters

In the Consultation Document, the Authority proposed that in cases where

- a) Consumer complaints received at the Authority cited significant deterioration of broadband QoS; and/or
- b) A deterioration of broadband QoS is observed by the Authority through studies which it may conduct from time to time or otherwise,

the Authority may deem necessary to request information from the relevant ISP about its network performance. The network performance information requested will be limited to the connection oriented and core network related parameters as listed in section 6.1.1 and 6.1.2 of the Consultation Document.

4.1.1 Responses Received

The Authority received responses both in respect of the procedure the MCA should adopt in dealing with the ISPs when it needs to verify claims about degradation of service, and also in respect of the parameters the MCA would be looking at in order to establish the origin of degradation.

The following are the main points raised in respect of claims about degradation of service:

- a) One respondent requested the assurance of the Authority that it shall use a transparent procedure in dealing with complaints. As part of the procedure, the respondent suggested that the complaints received by the MCA should be vetted before any action is taken. This should be done in order to eliminate complaints which arise due to factors which are outside the control of the ISP. The respondent also iterated that the Authority should provide the respective ISP with information relevant to the complaint prior to any investigation. This way, the concerned ISP would be in a better position to assist the Authority in its verifications.
- b) One respondent raised a query on how the Framework would treat instances where the broadband Internet service may be negatively affected due to traffic management policies, as employed by the ISP, in some cases where the broadband Internet connection provided to the subscriber's premises is shared by a number of services including broadband Internet.

The following are comments received by the Authority with respect to the assessment of the network performance of the ISP using core oriented and connection oriented parameters.

- a) One respondent requested clarification with respect to the proposed measurement of the international connection lines. The respondent argued that the benefit of an ISP with more than

one international connection lies in its ability to offer better service in terms of resilience, rather than providing an increase in the available bandwidth. The respondent suggested that the 'aggregation' proposed in the Consultation Document should instead reflect resilience.

- b) One respondent also referred to the use of the first Point of Presence (PoP) of the ISP as the demarcation point of the International connections of an ISP. The respondent pointed out that limiting the performance measurements of the ISP to the first PoP leads to inaccurate representation of the control that an ISP has over the service it offers. The respondent recommended that the MCA should factor in additional hops which are beyond the first PoP by advising ISPs to measure the performance of its international connectivity up to an internationally known point which would be acceptable to all ISPs. The respondent suggested the use of Frankfurt Internet Exchange (DECIX) or the Amsterdam Internet Exchange (AMSIX) as the reference points. Additionally, the respondent expressed its disagreement with the proposed approach of testing the ISP's network in isolation from the performance of third party networks. The respondent argued that the performance of an ISP ultimately depends on how well connected it is to other networks. Therefore, the respondent argues that the Framework should include a measure which captures the efficiency of the ISP's peering efficiency.

4.1.2 Authority Reply

With reference to the response received concerning claims about degradation of service, the following is the Authority's response:

- a) The Authority considers its current procedure for handling consumer complaints as adequate to address the concern raised in the response to consultation. A request for data relative to an ISP Network Performance Parameters¹⁰ will only be triggered in the following circumstances:
- a. The Authority receives a substantial number of consumer complaints related to a specific ISP citing lack of performance or a degraded broadband experience on their broadband connection.
 - b. The Authority, either through analysis of data published by the ISP, or through any appropriate QoS monitoring exercise carried out by the Authority, observes a significant degradation of service measured on an ISP's network, or a service level not matching marketed offers.
- b) With reference to a query raised by a respondent about the classification of degradation of service when multiple services (such as IPTV) are delivered over the same broadband connection, the Authority argues that degradation of service is always relative to the service which the ISP proposes to the subscriber. All broadband services are provided with a performance limitation. With the adoption of the proposal of providing a TSR to the subscriber as proposed in Proposal 6 of the

¹⁰"Network Performance Parameters" - A collection of performance parameters applicable to the core network and to the access, and local and international connections of an ISP.

Consultation Document and discussed further in the section 5.1 of this document, a standard metric of what constitutes of degradation, or lack of, service is established. The Authority argues that any connection which does not perform in line with the boundaries of the TSR (Section 5.1), irrespective to what causes such lack of performance, should be considered as degraded.

- c) With reference to comments about the assessment of the network performance of the ISP using core oriented and connection oriented parameters, the following are the MCA's comments:
- a. The proposal to allow an ISP to aggregate the bandwidth originating from multiple lines was intended to recognise that an ISP may provide international connectivity over multiple connections and therefore the total bandwidth available to its subscribers is the summation of all the deployed connections. This principle shall not be changed. Therefore, as a means of clarification, the aggregation of connections (applicable also to Local Connections) shall exclude those connections which are in a state which do not normally carry traffic and furthermore, require an intervention to be able to do so.
 - b. The first PoP has been selected as the point for carrying out the measurement of network performance as the ISP is in direct control of this connection and therefore any performance parameters should not include other areas which may be attributed to third party elements. This clear demarcation point is required in order to provide for the demarcation of responsibility in respect of network performance.

As a general note with regards to the measurement of Network Performance Parameters, it is appropriate to note that there shall be no requirement whatsoever from the ISP to publish any results related to Network Performance parameters. These parameters are to be used by the Authority if necessary under the circumstances underlined earlier, in this document.

5 Service Contract Obligations

5.1 Proposal – 6 Introduction of Typical Speed Range

In its Consultation Document, the Authority proposed that

- a) ISPs should qualify the broadband access speed through the use of a TSR which, in the case of existing connection would be computed in line with a procedure listed in 6.3.1 of the Consultation Document and in line with procedure listed in 6.3.2 of the Consultation Document in the case of new broadband packages.
- b) The established TSR should be indicated to the subscriber:
 - a. in any advertising material with importance similar to the headline speed;
 - b. at the point of sale;
 - c. in the subscriber's contract.

The Authority clarified that the provision of the TSR is not to apply to existing contracts.

- c) An ISP should not sell to its subscriber connections which cannot perform within the limits of the TSR.

Provided that in the case whereby a subscriber insists in purchasing a particular package in spite of the fact that the ISP cannot guarantee the performance of the connection within the established TSR, the subscriber contract should reflect this particular scenario.

The Authority proposed that ISPs were to calculate the TSR figures on a quarterly basis and to maintain the statistical data related to the latest TSR figures for audit purposes.

5.1.1 Responses Received

The following is a summary of the main responses received:

- a) One respondent agreed with this proposal.
- b) One respondent agreed with this proposal, however suggested that instead of estimating the TSR on the performance of a sample of the ISPs connections, information should be gathered from the whole network on a 24x7 basis at the access network interface for all Malta and Gozo, such that the information published is based on the whole traffic across the network rather than a statistical sample.
- c) Another respondent proposed the use of a mechanism which it currently has in place. This mechanism can be summed up in the following steps:
 - o Upon request for a new connection the service provider would check the performance of the connection which already exists in the premises of interest. In the absence of a

connection at the requested premises, tests are performed on nearby connections and results are extrapolated.

- o The subscriber is informed of any discrepancies between the requested speed and the capabilities of the available connection. Under such circumstances, the ISP would suggest to its subscriber any other broadband product which is the best match to the capabilities of the connection.

At this point, the respondent highlights that a number of subscribers may choose a package which has a speed which cannot be achieved by the connection. This may be done because these subscribers appreciate other aspects of the package such as the download limit size, over the speed factor.

The respondent argued that the information provided to the subscriber, via the proposed mechanism, is directly related to the connection which the same subscriber will be using, and therefore, it is expected to be of more relevance to the subscriber than any TSR figure, which is based on a the performance of a group of connections.

5.1.2 Authority's Response

- a) The MCA notes that the TSR mechanism as proposed in the Consultation Document was received positively by two respondents.
- b) With reference to the point raised by one respondent about the sample base for establishing the TSR figure, the Authority considers the proposal put forward by the respondent to be significantly more stringent than that proposed by the Authority. The Authority recognises that some setups and configurations do not permit, in a feasible and timely manner, the collection of information required to compile the TSR, across the whole network. The Authority is therefore of the opinion that the minimum requirement should be maintained on the basis of a valid statistical sample.
- c) The Authority considers that the TSR mechanism as proposed in the Framework is more suitable than the alternative mechanism as described by the respondent as follows:
 - i. The mechanism proposed by the respondent is valid in those cases when the access network does not include or rely on resource contention. Consideration for contention should include the whole path from the core network to the end user thus including both the last mile connection and backhaul resources. This is contrasted with the proposed TSR mechanism which is also resilient in contention related scenarios and it is therefore applicable to different types of access network deployed locally.
 - ii. The TSR as proposed in the Consultation Document formalises the concept that a broadband connection is sold at a nominal speed which is also known as the headline speed. While it is expected that the connection is able to reach such speeds, it is also true that it may not be always possible to achieve the headline speed due to the best effort nature of the service. However, the subscriber should know the performance boundaries he should expect of his connection. Furthermore, the method used to establish the performance boundaries would be similar for all ISPs thus enabling the subscriber to compare better the broadband offers on the market.

- iii. To date, broadband connections are sold on the basis of the maximum speed they can reach. The “up to” term included in contracts sold by the ISPs provides a wide spectrum of performance ranging between zero and the headline speed. On the other hand, the TSR provides the subscriber with the expected upper and lower access speed limits thus obliging the ISP to be more prudent and realistic in its offers.

- d) In order to address a concern raised by one respondent about the possibility of abuse of the proposed Framework, the Authority will require that advertising of packages enjoying quantified numerical speeds (e.g. 5Mbps or any similar wording) be limited to those connections which, when considering all physical limitation and any contention ratios on the Access Network, can achieve the indicated speed. For the avoidance of doubt, connections which under no circumstance can reach the advertised headline speed should not be sold to the consumer under such headline speed.

5.2 Proposal – 7 Obligations of Network Providers towards Internet Service Providers

In its Consultation Document the Authority proposed that contracts regulating the agreements between the upstream and the downstream providers should need to include as a minimum, the necessary performance commitments in terms of the Network Performance Parameters, that will allow the downstream provider to offer to its subscribers the required level of service as put forward in the same consultation.

5.2.1 Responses Received

- a) One respondent noted that it does not have any other ISP's on its core or access network
- b) One respondent requested a clarification if the proposal is applicable with respect to agreements entered into by ISPs with network operators for the provision of broadband services locally, or whether this would be also applicable to the ISP's Internet Protocol (IP) transit peers acting as the ISP internationally.

5.2.2 Authority's Response

In reply to the request for clarification the Authority iterates that this proposal is intended to cover agreements entered into by ISPs with network operators to offer local broadband services.

Appendix 1 – Glossary

CPE	Customer Premises Equipment
ECNSR	Electronic Communications Networks and Services (General) Regulations SL399.28 of the Laws of Malta
ECRA	Electronic Communications (Regulations) Act – Chapter 399 of the Laws of Malta
EU	European Union
ICMP	Internet Control Message Protocol
IP	Internet Protocol
ISP	Internet Service Provider
MCA	Malta Communications Authority
PoP	Point of Presence
QoS	Quality of Service
SNMP	Simple Network Management Protocol
TSR	Typical Speed Range

Appendix 2 – ISP Network Elements

Core Network refers to those network elements which connect together the Access network, and the Local and International Connections.

Access Network refers to all the network elements comprising of the connections labeled 'A' and the component labeled 'Access network' in Figure 1. The delineation encompasses the connection of each individual subscriber up to the point where these are aggregated to the point of connection to the core network.

Local and International Connections (Gateways) refer to the external connections which an ISP uses to route traffic to and from its core network to the Internet. The Local Connection refers to the connection used by the ISP to route local traffic, while the International Connections refers to the connection which an ISP uses to route international traffic. These connections are labelled 'D' and 'C' respectively in Figure 1.

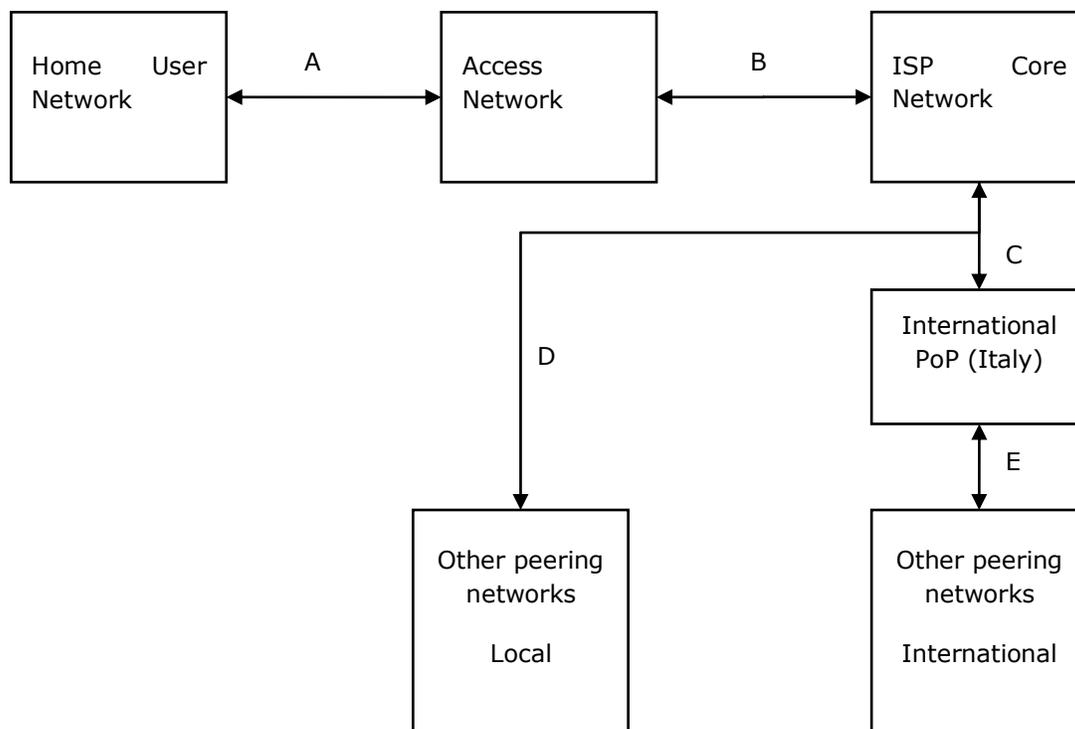


Figure 1 High level schematic diagram of a generic ISP setup