Malaysian Communications and Multimedia Commission
Suruhanjaya Komunikasi dan Multimedia Malaysia

Public Inquiry Report

Review of the Mandatory Standards for Quality of Service (Wired Broadband Access Service) – Determination No.2 of 2016

3 July 2021

This Public Inquiry Report was prepared in fulfilment of Sections 61 and 65 of the Communications and Multimedia Act 1998.

Content

1. Summary of the Public Inquiry

1.1. Introduction

1.1.1. The Mandatory Standards for Quality of Service ("MSQoS") for Wired Broadband Access Services covers the network performance of the delivery of data over the internet protocol for fixed broadband systems.

1.1.2. The Public Inquiry ("PI") for the revised MSQoS focuses on the network performance parameters in which the Malaysian Communications and Multimedia Commission ("MCMC") considers would significantly improve the end user experience and enhance network capacity monitoring towards better service delivery.

1.1.3. For information, the set of parameters in this MS are referring to minimum requirements at the user's location, provided by the service provider, depending on the type of network and subscribed package. This MS concentrates on the quality level provided from the network up to the residential gateway or home routers.

1.1.4. In steering the industry to deliver enhanced quality of service ("QoS") for consumers, the proposed revisions of the mandatory standards are based on international best practice where possible and seeks to strengthen and streamline the QoS framework for current and future technologies. The revised MSQoS is targeted to be effective once the existing MSQoS is revoked.

1.2. Public Inquiry Exercise

1.2.1. In the PI document on the proposed revision of the MSQoS for Wired Broadband Access Service issued on 8th April 2021, the MCMC outlined the proposed QoS parameters pertaining to:

   i.   Proposed revision on the interpretation part of the standards;
  ii.   Proposed revision on the QoS standards, indicators, measurement, notification and reports; and
 iii.   Proposed revision on the applicable guidelines.

1.2.2. The PI document invited feedback from public and relevant stakeholders on MCMC's proposed standards. The PI document specifically sought comments for all proposed revisions and the general views of the standards.

1.2.3.   By the end of the PI period at 12 noon on 4th June 2021, MCMC received ten (10) submissions from the following parties:

No.	Submitting Parties	Submission Date
1.	Celcom Axiata Berhad ("Celcom")	4th June 2021
2.	Digi Telecommunications Sdn Bhd ("Digi")	4th June 2021
3.	Maxis Broadband Sdn Bhd ("Maxis")	4th June 2021
4.	U Mobile Sdn Bhd ("U Mobile")	4th June 2021
5.	YTL Broadband Sdn Bhd ("YTL")	2nd June 2021
6.	Telekom Malaysia Berhad ("TM")	4th June 2021
7.	TT dotCom Sdn Bhd ("TIME")	4th June 2021
8.	REDtone Telecommunications Sdn Bhd ("Redtone")	4th June 2021
9.	Myisp Dot Com Sdn Bhd ("Myisp")	4th June 2021
10.	Ts. Mohd Rizal Mohd Ramly ("Public")	19th May 2021

Table 1: List of respondents to the PI

1.2.4.   MCMC considered all ten submissions and a summary of comments/suggestions are outlined in further sections of this report in which this PI Report is presented within the 30-day requirement from the closing date of submissions, as stipulated under Section 65 of the Communications and Multimedia Act 1998 ("CMA").

1.2.5.   MCMC proposes to issue a Commission Determination that will reflect the Commission's final views expressed in this PI Report in respect of the MSQoS for Wired Broadband Access Service.

1.3.   Structure of the Public Inquiry Report

1.3.1.   The remainder of this PI Report is structured broadly to follow the PI Paper to provide context for MCMC's questions for comments, as follows:

   i.   Section 2 provides the summary of input received on the proposed changes;
   ii.   Section 3 describes MCMC's final views of the framework and responses; and
   iii. Section 4 highlights the way forward.

2. Input from the Public Inquiry

2.1. Revision on the Interpretation Part of the Standards

QUESTION 1:	THE COMMISSION SEEKS VIEWS ON THE PROPOSED CHANGES TO THE INTERPRETATION PART OF THE MANDATORY STANDARD FOR QUALITY OF SERVICE (WIRED BROADBAND ACCESS SERVICE).

Submitting Party	Comments
Celcom	Celcom agrees with all the proposed interpretations stated in Part A.
Digi	Digi agrees with all the proposed interpretations stated in Part A and takes note on the Recommendation ITU-T I.113.
Maxis	Maxis takes note of MCMC's proposed interpretation.
U Mobile	U Mobile has no comments on the proposed interpretations.
YTL	YTL agrees with the proposed changes to interpretations stated in Part A.
TM	TM agrees with all of the proposed interpretations.
TIME	TIME has no objections.
Redtone	Redtone agrees with all of the proposed interpretations.
Myisp	Myisp has no objection on the proposed changes.
Public	Public proposes the broadband definition "wired broadband access service" means a wired connectivity of communication bandwidth service that is able to deliver acceptable experience as FCC's Broadband Internet Benchmark of 25/3Mbps.

Table 2: Response on interpretation part

2.2. Revision on the Quality of Service Standards

2.2.1. Network Latency

QUESTION 2:	THE COMMISSION SEEKS VIEWS ON THE PROPOSED CHANGES TO NETWORK LATENCY (PING TIME) STANDARD FOR THE MANDATORY STANDARD FOR QUALITY OF SERVICE (WIRED BROADBAND ACCESS SERVICE).

Proposed network latency standards in the PI:
Network latency shall not be more than 50ms for fibre 95% of the time or 85ms for DSL for 95% of the time, based on test sample.

Submitting Party	Comments

Celcom	• Celcom proposes to amend the QoS standard for network latency to: "Network latency shall not be more than 80ms for fibre for 95% of the time or 85ms for DSL for 95% of the time, based on test sample." • Celcom comments are as follows: (a) QoS performance is highly dependent on these wired broadband facilities/service providers; and (b) Transmission of a packet in Malaysia requires longer distance and additional hops which will increase the latency especially for packet from Sabah and Sarawak.
Digi	• Digi agrees with the proposed architecture of the measurement, and to maintain the DSL standard as previous MSQoS level and for fibre the measurement criteria for 80ms for 95% of the time. This is considering factors on the destination of servers that involves a number of samples required throughout the nation.
Maxis	• Maxis recommends the network latency to be measured with a minimum standard of not more than: (a) 80ms for fibre for 95% of the time; or (b) 85ms for DSL for 95% of the time. • Maxis proposes MCMC to move towards new digital tools, such as Automatic Configuration Server (ACS). Ofcom, ACMA and IMDA have also used automated digital tools or crowdsourcing for data collection.
U Mobile	• U Mobile proposes the network latency to be measured with a minimum standard of not more than: (a) 80ms for fibre for 95% of the time; or (b) 85ms for DSL for 95% of the time.
YTL	• YTL agrees with the proposal.
TM	• TM proposes for network latency as below: i. Fibre: 70ms at 95.0% of the time ii. DSL: 85ms at 95.0% of the time • TM is in view that high latency is due to the distance between Sabah and Sarawak to MyIX in Kuala Lumpur.
TIME	• TIME proposes to revise the standard for fibre network latency (ping time) to 80ms for 95% of the time.
Redtone	• Redtone proposes to revise the standard for fibre network latency (ping time) to 80ms for 95% of the time.
Myisp	• Myisp agrees on the proposal if it is measured from the end user to the test server of the company wherever it is located and not necessarily in KL or Klang Valley.
Public	• Public proposes network latency shall not be more than the following:

	Semenanjung Malaysia:
	    a) 30ms for fibre for 95% of the time; or
	    b) 85ms for DSL for 95% of the time
	Sabah & Sarawak:
	    a) 50ms for fibre for 95% of the time; or
	    b) 85ms for DSL for 95% of the time

<p align="center">Table 3: Response to network latency standards</p>

2.2.2. Broadband Speed (Throughput)

QUESTION 3:	THE COMMISSION SEEKS VIEWS ON THE PROPOSAL TO MAINTAIN THE EXISTING STANDARD FOR BROADBAND SPEED (THROUGHPUT) FOR THE MANDATORY STANDARD FOR QUALITY OF SERVICE (WIRED BROADBAND ACCESS SERVICE).

Proposed broadband speed standards in the PI:

Throughput must be not less than:
    a) 70% of the subscribed level of broadband speed, for 90% of the time for DSL; and
    b) 90% of the subscribed level for 90% of the time for fibre.

Submitting Party	Comments
Celcom	Celcom agrees to maintain existing standards.
Digi	Digi agrees to maintain existing standards.
Maxis	Maxis agrees to maintain existing standards.
U Mobile	U Mobile has no further comment.
YTL	YTL agrees to maintain existing standards.
TM	TM agrees to retain existing standards.
TIME	TIME has no objection.
Redtone	Redtone proposes to maintain existing standards.
Myisp	Myisp requests for the test to be measured from the end user to the test server of the company wherever it is located and not necessarily in KL or Klang Valley
Public	Public agrees to maintain existing standards.

<p align="center">Table 4: Response to broadband speed standards</p>

2.2.3. **Packet Loss**

> QUESTION 4:   THE COMMISSION SEEKS VIEWS ON THE PROPOSED CHANGES TO PACKET LOSS STANDARD FOR THE MANDATORY STANDARD FOR QUALITY OF SERVICE (WIRED BROADBAND ACCESS SERVICE).

Proposed packet loss standards in the PI:	
Packet loss shall not be more than **0.5%** for fiber and not more than **1.0%** for DSL computed based on the test sample.	
Submitting Party	**Comments**

Celcom	• Celcom proposes for packet loss standard to be removed.
	• Celcom's comments:
	    (a) Other countries do not impose standards on packet loss.
	    (b) Customer experience in wired broadband is mainly evaluated by the throughput (internet speed) and latency (response time).
	    (c) Not service level metrics or direct user engagement with the network.

Digi	• Digi proposed packet loss standard **to be removed.** • Digi's comment: Indicators that directly impact customer experience which is mainly the Broadband Speed and latency measurements and not the intermediary or infrastructure related elements i.e. packet loss and utilization.
Maxis	• Maxis proposes to exclude the packet loss measurement from this mandatory standard because subscribers will not be able to gauge the packet loss directly. • Maxis's comment: In the event where a packet loss happens, subscriber's experience will be affected due to the impact on their throughput and latency resulting in much longer time needed to download a particular page as packet retransmission is required. Thus, it is sufficient to measure the customer experience based on the throughput and latency.
U Mobile	• U Mobile proposes to focus on indicators that directly impact customer experience i.e. throughput and latency and not the intermediary or infrastructure related elements i.e. packet loss and utilization. • Service level KPIs have been measured via throughput and latency. If another KPI is set for packet loss and utilization, it could lead to a double penalty.
YTL	• YTL agrees with the proposal.

TM	• TM proposes to maintain the current standards. Although TM views that it could achieve the proposed standards, there may be geographical constraints as the test server is located in Klang Valley.
TIME	• Any major changes to the existing standard would require substantial cost upgrade to the network. TIME highlights that fibre technology has its limitations. For example, fibre has a tendency to drop in performance after multiple splicing and/or bending.
Redtone	• Redtone proposes to maintain the current standard fibre to 1.0%. Not applicable for DSL.
Myisp	• Myisp proposes to maintain the existing standard for Packet Loss for the MSQoS (Wired Broadband Access Service) for fibre.
Public	• The public agrees with the proposal.

Table 5: Response to packet loss standards

2.2.4. **Access Network Utilization**

QUESTION 5:	THE COMMISSION SEEKS VIEWS ON THE PROPOSED CHANGES TO ACCESS NETWORK UTILIZATION STANDARD FOR THE MANDATORY STANDARD FOR QUALITY OF SERVICE (WIRED BROADBAND ACCESS SERVICE).

Proposed changes to access network utilization standards in the PI:	
Aggregated average access network utilization traffic for the duration of 3 months shall not be more than 70% of the bandwidth capacity and shall be rectified within 7 days.	
Submitting Party	**Comments and Justifications**
Celcom	• Celcom proposes the network utilization **be removed** from the MSQoS (Wired Broadband Access Service); and • Amend the requirement as an indicator for monitoring purposes only as shown below: "Aggregated average access network utilization traffic for the duration of 3 months shall be submitted to the Commission quarterly for monitoring purposes."
Digi	• Digi proposes for the standard not be included in the MS. Customer experience is already reflected in the main KPIs such as Broadband Speeds and Latency as these are most suitable measurements to gauge customer experience; and

	• Service Provider to manage the access network utilization on a self-regulation basis to provide a better service to our customers.
Maxis	• Maxis recommends to remove the access network utilization measurement; and • Focus should be on the quality of service rendered to the customers, and any measurements based on infrastructure utilization should be avoided.
U Mobile	• U Mobile proposes to focus on indicators that directly impact customer experience, i.e. throughput and latency. • Data could be gathered by MCMC for monitoring purposes only.
YTL	• YTL agrees with the proposal but not the rectification within 7 days. • Proposes to provide report to MCMC within 10 business days on rectification measures; and • YTL does not own end-to-end infrastructure and is dependent on other Service Providers.
TM	TM agrees with the proposed standard as it is based on the aggregated average access network utilization traffic for the duration of 3 months.

TIME	• TIME proposes to maintain the current standard instead of reporting it on monthly basis.
	• Should the network utilisation reach 70%, a Service Provider would typically need to carry out a number of assessments which may include:
	  a. Analysis – approximately 7 days.
	  b. Requirements identification (need to procure new fibres or available spares) – approximately 21 days.
	  c. Hardware availability – hardware procurement process may take up to 90 days or more should there be a need for new hardware.
	  d. Application to lay fibres on the location (local council/building managers/ relevant authorities) – May take up to 180 days or more.
	• TIME proposes to revert to MCMC with a high-level plan within 10 business days.

Redtone	• Redtone proposes 80% utilization instead of 70% as the finding shows that customers/subscribers will still be able to have access to videos at 90% utilization hence this would not compromise customer's access to service; and • the planning and process that comes in the upgrading requires analyzing, procurement process, approval processes internally and across various government organizations hence, 7 days would not be sufficient to rectify the economics, resources and operations that will take place.

Myisp	Myisp agrees with the proposal.
Public	• The public is in view that the uplink traffic (aggregated) will vary depending on time and proposes for it to be more specific. Duration of observation should change to 2 weeks due to behaviour of traffic is weekly seasonal and 2 weeks is enough to prove that the link is congested, ; • Measurement point shall not be limited to access to aggregation layer which must include aggregation layer to core network as well; and • Aggregated average access network utilization traffic for complete 2 weeks during peak hours (8:00 pm to 12:00 am) shall not be more than 70% of the bandwidth capacity and shall be rectified within 7 days.

Table 6: Response to network utilization standards

2.3. Revision of the Applicable Guidelines

2.3.1. **Applicable guidelines**

QUESTION 6:	THE COMMISSION SEEKS VIEWS ON THE PROPOSED CHANGES TO THE GUIDELINE OF THE COMMISSION DETERMINATION ON MANDATORY STANDARD FOR QUALITY OF SERVICE (WIRED BROADBAND ACCESS SERVICE).

Submitting Party	Comments
Celcom	• Celcom states that many renowned regulators in the world are promoting industry self-regulation, as it is able to minimise government intervention, reduce costs and promote compliance. • The Commission at its discretion may perform tests on any selected Service Provider deemed necessary to verify the network quality. Such tests will be used to complement the service provider's self-testing for quality enhancement (if required) and will not be considered for enforcement of MSQoS. • Tests at complaint areas should only be carried out if the respective service provider has rectified the problems within reasonable timeline. • A test probe/router will be used to generate traffic and simulate end-user experience while the respective service provider's test server or responder will be configured and shall be located within Klang Valley to act as the target server. • Celcom proposes for the tests to be conducted remotely such as using Auto Configuration Server ("ACS") which is

	conducted via Hypertext Transfer Protocol ("HTTP") that yields similar result as FTP; • The throughput test to be conducted via file transfer protocol ("FTP") or Hypertext Transfer Protocol ("HTTP") with download depending on the internet package subscribed by the user. The selection of download file size is subject to the Commission's discretion; and • At least 10 locations each month in 6 regions in Malaysia will be selected based on availability of service. A minimum of 100 samples per location is required, report to be submitted by the 30th of each quarter and to remove "access node name", "access network utilization %" and "CPE brand and model" from table 2."
Digi	• Digi proposes for the packet loss and network utilization removed from the guidelines.
Maxis	Maxis takes note on the proposal.
U Mobile	Offers no comments on the proposal
YTL	• YTL states the need to invest in new guidelines. Which could result in an increase in compliance cost and then passed down to subscribers.
TM	• TM recommends the removal of this measurement methodology to allow tests to be conducted at any time including weekend.
TIME	• TIME proposes the use of iPerf software as opposed to FTP due to the following: (i) iPerf software is an application based methodology which is capable to provide more detailed information on transfer speed and connectivity. (ii) iPerf software has the capability to diagnose issues when a transfer appears to be slow or completely frozen i.e. to segment the packets transferred and provide detailed result on each transfer window. (iii) iPerf software has the ability to assess the pathway between source and destination i.e. the completeness of packets transferred from the source to destination including any issue arising during the transfer.
Redtone	• Redtone proposes for the complaint location to be removed, as time is needed to assess the complaints, identify the issue and provide resolutions before any assessment is done to allow visibility of the situation for action. • Proposes for the reports to be submitted on a quarterly basis by 30th of the following month.
Myisp	Myisp agrees with the proposal.
Public	Public agrees with the proposal.

Table 7: Response to the applicable guidelines

2.3.2. **Enforcement on each location**

QUESTION 7:	THE COMMISSION SEEKS VIEWS ON THE PROPOSAL TO ENFORCE THE MANDATORY STANDARD FOR QUALITY OF SERVICE (WIRED BROADBAND ACCESS SERVICE) ON EACH OF THE LOCATIONS MEASURED AS STATED IN THE GUIDELINE OF THE COMMISSION DETERMINATION.

Submitting Party	Comments
Celcom	• Celcom states that there is no Regulator in the world that enforce the mandatory standard for QoS on each of the locations measured; and • A concern is that the high/inappropriate QoS standards imposed by MCMC will eventually increase the deployment cost for wired broadband. • Celcom proposes to enforce the MSQoS (Wired Broadband Access Service) yearly based on the average value of all the locations measured nationwide.
Digi	• Digi proposes consumer complaints on service coverage about a particular service provider are lodged to the Commission to be removed from the MS. • Proposes customer complaints should be handled and address based on the resolution required after assessment has been taken by the service provider.
Maxis	• Maxis disagrees to enforce the standard per premises measured and opines the approach is too stringent. Opinion is based on its own analysis whereby it is not the best practice in other countries. • Maxis proposes to enforce the standards nationwide on yearly basis as this will grant enough time for the service provider to improve the network performance.
U Mobile	• U Mobile proposes for the complaint locations to be excluded from MS to grant ample time for Service Providers to enhance the network.
YTL	• YTL proposes test probes to be located at access nodes and not the customer premise.
TM	• TM disagrees and prefers the current practice: (a)Average yearly audit results nationwide (b)Average Throughput, Latency and Packet Loss results. • TM states there is no other country has enforced per premise measurement.
TIME	• TIME is in view that to enforce on premise basis will not be reflective of a Service Provider's overall network performance. The result for a particular premise is

	dependent on several factors such as connectivity from the building's MDF room to a customer's premise equipment, in-building fibre (from riser to horizontal cabling) as well as the internal cabling for a particular premise.
Redtone	• Redtone states that the enforcement should be done nationwide on a yearly basis as this gives room for optimization and overall improvement of the service and not on per premises measure.
Myisp	• Myisp proposes not to change the current quarterly measurement and reporting.
Public	Public agrees with the proposal.

Table 8: Response to the enforcement part

2.3.3. **General Comments**

QUESTION 8:	THE COMMISSION SEEKS VIEWS ON ANY OF THE GENERAL CHANGES PROPOSED TO THE GUIDELINE OF THE COMMISSION DETERMINATION ON MANDATORY STANDARD FOR QUALITY OF SERVICE (WIRED BROADBAND ACCESS SERVICE).

Submitting Party	Comments
Celcom	• Celcom proposes to exempt the wired broadband service providers from being responsible for failure that is beyond its control such as failure due to third party/other service providers or force majeure.
Digi	• Digi proposes to adopt a flexible testing method and configuration whereby no person is required to enter the customer premises to conduct the testing. • Testing to be conducted remotely, such as running test using Auto Configuration Server ("ACS"). The router at the customer premises will be used as a test probe via ACS to generate traffic and simulate end-user experience, which will yield similar results. • To only impose the MS on a service provider that deploys network infrastructure. • Digi proposes for 10 locations tested per month in 6 regions totaling 30 locations per quarter. • Digi proposes the monthly measurement report for Wired BAS by the end of the following month (30th). • Any enforcement will be performed on a yearly basis based on nationwide results.
Maxis	• Maxis proposes to use new digital tools, such as Automatic Configuration Server (ACS) to reflect user experience as

	accurately as possible. ACS uses TR-143, which is a Broadband Forum standard. This approach will enable MCMC to gather a wealth of information collaboratively produced to identify any market failures and to make information transparent. • Proposes the audit or customer complaint verification is for monitoring purpose only, and recommend to conduct the assessment at 30 locations in a quarter. For the measurement report to be submitted on quarterly basis by the 30th. • In terms of service prioritization, there is need to engage with the industry in developing the validation procedure and consider involvement of 3rd party experts. • Access to 3rd party's (Access Provider) Access Network Utilization data due to the agreements limitation.
U Mobile	• Proposes a test method that does not require entry into customer premises such as at the Access Control Server (ACS).
YTL	• YTL needs to invest in infrastructure to comply with the new standard and would have to pass this down to customers; and • Needs time to source out and setup the testing facilities because YTLB is still new.

TM	• TM disagrees to conduct test on complaint locations and proposes for it to be removed. Service providers should be given sufficient time to resolve the complaints.
	• TM proposes to disable WiFi connection to avoid interference during testing procedure, which must be done to ensure a clean environment.
	• TM agrees throughput test to be conducted via file transfer protocol (FTP) but with the following comments:
	  a. Additional header will contribute to high latency.
	  b. Prefer iPerf – developer removed some headers to get more accurate results.
	  c. Use suitable file size for respective packages e.g. for 500Mb package to use 500Mb or 1G file size.
	• TM proposes testing to be conducted on quarterly basis for 15 locations by region and report on quarterly basis, by the 30th.

TIME	• The preparation for monthly reporting is cumbersome and time consuming i.e. testing, gathering and compiling relevant data and information from various departments. This will pose a challenge, as it would require triple effort on each quarter for the preparation of the monthly report as per the new standard. TIME believes that resources should be optimally allocated i.e. ensuring efficient delivery and performance into other critical areas such as service restoration and fault monitoring.

	• TIME recommends the reporting for the throughput, latency and packet loss be maintained as a quarterly submission. • The enforcement on premise basis will not be reflective of a Service Provider's overall network performance. The result for a particular premise is dependent on several factors such as connectivity from the building's MDF room to a customer's premise equipment, in-building fibre (from riser to horizontal cabling) as well as the internal cabling for a particular premise.
Redtone	Offers no comments.
Myisp	Offers no comments.
Public	Public proposes for no change.

Table 9: Response on the general views of the standards

3. Summary of The Commission's Final Views

The following section summarizes the Commission's final views based on feedbacks received from the PI and taking into consideration the interest of the public:

Question No.	Commission's final view
1	• Definition of "wired broadband access service" means a wired connectivity of communication bandwidth service that is faster than primary rate interface of Integrated Service Digital Network (ISDN) of 2.0Mbps.
2	Standards: • **Network latency** (ping, RTT) shall be ≤50ms, 95% of time for fibre and maintained at ≤85ms, 95% of time for DSL. Justifications: • Network latency will be performed from test points within Malaysia to the respective Service providers' server located in Klang Valley. • Latency could be achieved by fibre network. • Reflects the network performance parameters aspired by Jendela initiative. • The parameter takes into consideration, the long distance connection between test points to Klang Valley especially for Sabah and Sarawak. • The standard for network experience needs to be consistent for consumers in both Peninsular Malaysia and Sabah and Sarawak.
3	Standards: • **Throughput** must be not less than: a) 70% of the subscribed level of broadband speeds, for 90% of the time for DSL; and b) 90% of the subscribed level for 90% of the time for fibre. Justifications: • MCMC is of the view that the existing standards are already consider stringent and would be adequate for subscribers.

	• Service providers need to factor in the dependency on Access Providers' network capacity to ensure good users experience. • Retaining the existing standards will encourage migration from DSL to fibre. • Service providers are currently focusing on expanding their fibre network, in-line with the Jendela initiative. • Service providers have also increased the speed and lowered the prices for broadband services in recent year.
4	Standards: • **Packet loss** shall not be more than 0.5% for fibre or not more than 1.0% for DSL, computed based on average of the test sample. Justifications: • Service providers need to ensure distance from user to the nearest exchange is not too far to ensure low packet loss. • Service providers have to ensure that the fibre is upgraded especially in the buildings. • Retaining the existing standard for DSL to encourage migration from DSL to fibre.
5	Standards: • **Monthly Average of traffic** utilization for access layer and aggregated layer (including but not limited to: DSLAM, MSAN, OLT, Metro-E, aggregation to core, etc.) for 3 months shall not be more than 70% of the bandwidth capacity and shall be rectified within 7 days. Justifications: • Service providers need to ensure network is designed to cater for any increase in number of users and traffic. • Service providers have to ensure that the aggregated layer of the network is upgraded accordingly, to support any surges in traffic.
6,7 and 8	Standards: • **The method of measurement** can be done in 2 ways, physical test probe connected to user's router or using Auto Configuration Server (ACS) and simulating physical test probe. Both method shall use FTP protocol. • Reporting to be done on quarterly basis, by the 30th of the following month of each quarter. • Minimum of 30 locations to be tested each quarter covering all regions, evenly distributed. • MSQoS shall be enforced on per location basis.

	Justifications: • Quarterly reporting provides sufficient time for service providers to work on rectification processes. • ACS would be able to reflect on user experience since the test is performed using consumer's router. It uses TR-143 standard, which is a Broadband Forum standard adopted globally. • ACS will allow test to be conducted remotely without having to enter customer's premise. Which is a concern, especially in the pandemic era. • ACS to use FTP protocol to be able to provide standard comparison to physical probe test used by the Commission. • Enforcement at every location to ensure that Service Provider are providing sufficient bandwidth capacity to each of their consumers.

Table 10: The Commission's final views on the standards

4. The Way Forward

- MCMC is of the view that the proposed revision of the MSQoS for Wired Broadband Access Service will ensure enhancements to existing levels of quality of service by the service providers and further improve consumers' experience.

- In selecting a particular benchmark for the quality of service, the MCMC endeavors to make certain that the benchmark is meaningful to the customer and will enable them to assess and make informed decisions on the levels of quality they are experiencing. The benchmark will be equally useful for MCMC to gauge the performance of the service providers in fulfilling its role to monitor the industry.

- MCMC intends to consider all the general views and proposed approaches, from respondents to improve the state of the wired broadband services in Malaysia.

- The revised MSQoS for Wired Broadband Access Service will take effect starting 1st August 2021 and the existing MSQoS will be revoked.