



Suruhanjaya Komunikasi dan Multimedia Malaysia

Malaysian Communications and Multimedia Commission

PROPOSAL FOR REVIEW OF THE MANDATORY STANDARDS FOR QUALITY OF SERVICE (WIRELESS BROADBAND ACCESS SERVICE) (DETERMINATION NO. 1 OF 2016)

25 October 2019

This Public Inquiry Paper is prepared in fulfilment of Sections 58 and 61 of the Communications and Multimedia Act 1998.

TABLE OF CONTENTS

PREFACE	3
GLOSSARY	4
PREAMBLE	5
PUBLIC INQUIRY PROCESS	6
PART A: REVISION ON THE INTERPRETATION PART OF THE STANDARDS	7
PART B: PROPOSED REVISION ON THE QUALITY OF SERVICE STANDARDS	8
PART C: REVISION ON THE QUALITY OF SERVICE INDICATORS, MEASUREMENTS, STANDARDS, NOTIFICATION AND REPORTS	11
PART D: APPLICABLE GUIDELINES	13
PART E: VIEW SOUGHT	14
APPENDIX	15

PREFACE

The Commission is hereby holding a Public Inquiry on the proposal for the revision of Mandatory Standards for Quality of Service (Wireless Broadband Access Service) (Determination No. 1 of 2016) and invites members of the public and interested parties to participate in this inquiry by making written submissions on any matter they consider relevant to the inquiry. Written submissions, in both hard copy and electronic form, should be provided to the Commission in full by **12 noon, 9 December 2019 (45 days)** and addressed to:

Malaysian Communications and Multimedia Commission
MCMC Tower 1
Jalan Impact
Cyber 6
63000 Cyberjaya
Selangor Darul Ehsan

Attention : Quality of Service Department
Or E-mail : qos.dept@mcmc.gov.my
Or Fax : +60 3 86 88 10 00

In the interest of fostering informed and robust consultative process, the Commission may make available extracts of or entire submissions for others to read. Any commercially sensitive information should be provided under a separate cover and clearly marked "CONFIDENTIAL". Respondents are encouraged to support their comments with reasons and where appropriate provide or refer to evidence or other relevant information in support of their comments.

Incomplete and/or late submissions will not be considered.

The Commission thanks the public and all interested parties for their participation in this consultative process and for providing their submissions and feedback.

GLOSSARY

CMA1998	Communications and Multimedia Act 1998 (Act 588)
Commission	Malaysian Communications and Multimedia Commission
MS	Mandatory Standards
MSQoS	Mandatory Standards for Quality of Service
PI	Public Inquiry
QoS	Quality of Service

PREAMBLE

1. The present MSQoS for Wireless Broadband Service (Determination No.1 of 2016) came into force on 1 February 2016. At the time, the Commission recognizes the need to mandate certain QoS parameters in order to not only protect the consumers' interest but also to ensure that the wireless broadband service provided by the Service Providers is at the optimum level. This MSQoS covers the standards for Quality of Service for delivery of data over the internet protocol for wireless systems. The MSQoS standards are segregated into two parts; network performance and customer service.
2. The review of the MSQoS for Wireless Broadband Access Service will separate the customer service standards into a new Mandatory Standards specifically focusing on customer service aspects. This PI will only cover modifications made on network performance standards in light of customer expectations and perception towards service delivery.
3. In determining the relevant QoS parameters for the MSQoS, certain considerations must be taken including the current network scenario, network capabilities or readiness and user devices availability. Considerations are also made due to the increase of broadband usage, changes in customer expectations and perception towards service delivery. Therefore, pursuant to section 106 of the CMA1998, the Commission hereby undertakes the initiative to review the MSQoS for Wireless Broadband Service.
4. The review of the MSQoS is based on international best practices where possible and address current issues in relation to wireless broadband service in Malaysia. This MSQoS review also seeks to strengthen and streamline the QoS framework for current and future technologies. This MSQoS is targeted to be effective in 2020.

PUBLIC INQUIRY PROCESS

5. Section 58(2) of the CMA1998 provides that the Commission may hold a public inquiry if it is satisfied that the matter is of significant interest to either the public or to current or prospective licensees under the CMA1998. The objective of such a public inquiry is to inform as well as to invite views of the public and the licensees under the CMA1998 on the matter at hand.
6. The Commission is of the view that it is appropriate in the circumstances to hold a public inquiry under section 58 (2)(b) of the CMA1998 in order to obtain industry and public comment, and to promote transparency in the exercise of its powers.
7. Under section 61 (1) (d) of the CMA1998, the Public Inquiry period shall be a minimum of forty-five (45) days, within which public submissions are invited. In the present Public Inquiry, licensees and the public are given 45 days to formulate and submit their views on the matter.
8. The Commission shall take into consideration all submissions received within the Public Inquiry period. The Commission is required under section 65 of the CMA1998 to publish a report setting out its findings as a result of any inquiry it conducted, and such report shall be published within thirty (30) days of the conclusion of the inquiry. The Commission shall summarize the submissions received and publish the same in the report.

PART A: REVISION ON THE INTERPRETATION PART OF THE STANDARDS

9. The following interpretations shall be revised in this Mandatory Standards for Quality of Service (Wireless Broadband Access Service):

Table 1: Proposed revision on interpretation part of the standards

Existing Interpretation	Revised Interpretation	Remarks
“ASN GW” means Access Service Network Gateway.	To be removed.	The term “ASN GW” will not be used in any part of this revised Mandatory Standards.
“MME” means Mobility Management Entity.	To be removed.	The term “MME” will not be used in any part of this revised Mandatory Standards.
“SGSN” means Serving GPRS Support Node.	To be removed.	The term “SGSN” will not be used in any part of this revised Mandatory Standards.
“wireless broadband access service” means a wireless connectivity of communication bandwidth service has a minimum downstream capacity of 650 kbps.	“wireless broadband access service” means a wireless connectivity of communication bandwidth service that is faster than primary rate interface of Integrated Services Digital Network (ISDN)	Recommendation ITU-T I.113 <ul style="list-style-type: none"> • Broadband defined as; qualifying a service or system requiring transmission channels capable of supporting rates greater than the primary rate. • The primary rate interface for ISDN is 2.0 Mbps.

10. The following interpretation shall be used in this revised MSQoS (Wireless Broadband Access Service):

“ASP” means Applications Service Provider;

“designated routes and areas” means those routes and areas as specified by the Commission in the guidelines;

“end user” means a person who receives, requires, acquires, uses or subscribes to the public cellular service and may include a customer;

“FDD” means frequency division duplex;

“guidelines” means a guidelines issued by the Commission pursuant to paragraph 8 of the Commission Determination on the Mandatory Standards for Quality of Service (Public Cellular Service);

“MyIX” means Malaysia Internet Exchange;

“NSP” means Network Service Provider;

“service provider” means an Applications Service Provider or a Network Service Provider which provide wireless broadband access service;

“TDD” means time division duplex;

“wireless broadband access service” means a wireless connectivity of communication bandwidth service that is faster than primary rate interface of Integrated Services Digital Network (ISDN).

PART B: PROPOSED REVISION ON THE QUALITY OF SERVICE STANDARDS

11. A summary of the proposed revision of the QoS standards are outline in the Table 2 below:

Table 2: Proposed Revision of the Quality of Service Standards

	Quality of Service Indicator	Present Quality of Service Standard	Proposed Revision of the Quality of Service Standard
i.	Network latency (ping time)	Network latency must be not more than 250 ms, 70 % of the time based on test sample.	Network latency must be not more than 80 ms , 90 % of the time based on test sample.
ii.	Broadband speed (Throughput)	Broadband speed must be: (a) not less than 650Kbps, 80.0 % of the time for TDD and 65 % of the time for FDD effective from 1 January 2016; and	Effective 1 Jan 2020, Broadband speed for both TDD and FDD technology must be: (a) not less than 30 Mbps , 80.0% of the time based on test sample while

		(b) not less than 1 Mbps, 80.0% of the time for both TDD and FDD effective from 1 January 2018.	stationary; and (b) not less than 30 Mbps , 80.0% of the time based on test sample while moving.
iii.	Packet loss	Packet loss must be not more than 3.0 %, calculated based on the average of the test sample.	Packet loss must be not more than 1.0 % , calculated based on the average of the test sample.
iv.	Network availability	none	Network availability must be at least 98% in a year excluding scheduled downtime.
v.	Signal Strength	none	Average signal strength must be at least -98 dBm , 80% of the time based on test sample.
vi.	Advanced Notice of Scheduled downtime	Every session of scheduled downtime due to occur which affects customers must be notified to customers not less than 24 hours in advance.	*To be mandated under the new MSQoS for Customer Service.
vii.	Service Disruption	Any single Service Disruption incident that involves a SGSN, MME or ASN GW being out of service: (a) Between 5AM to 12 midnight, must be rectified within 60 minutes from the occurrence of the Service Disruption; and (b) Between 12 midnight to 5AM, must be rectified no later than 6AM. Service provider must notify the Commission within 60 minutes of	*To be mandated under the new MSQoS for Customer Service.

		<p>any single service disruption incident that involves a SGSN, MME or ASN GW being out of service.</p> <p>Service provider must submit a comprehensive report to the Commission within 7 business days of the occurrence of any single service disruption incident that involves a SGSN, MME or ASN GW being out of service for the specified duration and affecting customers.</p>	
viii.	Percentage of billing related complaints	Percentage of billing related complaints must be not more than 1.0% per quarterly reporting period.	*To be mandated under the new MSQoS for Customer Service.
ix.	Non-billing related complaints per 1,000 customers	Non-billing related complaints must be not more than 6.0 complaints per 1,000 customers per quarterly reporting period.	*To be mandated under the new MSQoS for Customer Service.
x.	Promptness in resolving customer complaints	<p>The standard on promptness in resolving customer complaints, separately measured for billing related complaints and non-billing related complaints, for every quarterly reporting period is:</p> <p>Not less than 60.0% must be resolved within 3 business days;</p> <p>Not less than 90.0% must be resolved within 5 business days;</p> <p>and</p> <p>Not less than 95.0% must be</p>	*To be mandated under the new MSQoS for Customer Service.

		resolved within 15 business days.	
xi.	Promptness in answering calls to Customer Hotline	At least 80.0% of calls to Customer Hotline that opted for human operator in a quarterly reporting period must be answered within 20 seconds; and At least 90.0% of calls to Customer Hotline that opted for human operator in a quarterly reporting period must be answered within 40 seconds.	*To be mandated under the new MSQoS for Customer Service.

PART C: REVISION ON THE QUALITY OF SERVICE INDICATORS, MEASUREMENTS, STANDARDS, NOTIFICATION AND REPORTS

12. Revised standards for Network Performance are outlined in Table 3 below:

Table 3: Network Performance

	Quality of Service Indicator	Description / Definition / Formula / Measurement / Reporting Requirement	Quality of Service Standard	Remarks / Rationale / Justification
i.	Network latency (ping time)	<p>This indicator measures the round-trip time taken by a standard packet size between 32 bytes to 128 bytes to travel across the network from the end user to MyIX and back to the end user.</p> <p>Formula:</p> $\frac{\text{Number of test samples} \leq 250 \text{ ms}}{\text{Total number of test samples}} \times 100$	Network latency must be not more than 80 ms , 90 % of the time based on test sample.	<ul style="list-style-type: none"> • Network latency will test the responsiveness of the network from the end user to the destination server hosted locally in MyIX, Kuala Lumpur. • Considering low latency which can be provided by 5G technology (ultra Reliable Low Latency Communications - uRLLC). • Based on other country's publication¹ on wireless

¹ <https://www.imda.gov.sg/imconnected>

				<p>broadband latency, the 3G services latency varies from 62 ms to 104 ms. Better latency performance is observed for 4G network with average of 50 ms.</p>
ii.	<p>Broadband speed (Throughput)</p>	<p>This indicator measures the speed of downloading data measured in units of megabits per second (Mbps) between the end user and MyIX.</p> <p>Formula:</p> $\frac{\text{Number of test samples} \geq \text{QoS Throughput Standard}}{\text{Total number of test samples}} \times 100$	<p>Effective 1 Jan 2020, Broadband speed for both TDD and FDD technology must be:</p> <p>(a) not less than 30 Mbps, 80.0% of the time based on test sample while stationary; and</p> <p>(b) not less than 30 Mbps, 80.0% of the time based on test sample while moving.</p>	<ul style="list-style-type: none"> • To facilitate government initiative (NFCP) to provide average download speed of 30 Mbps for 98% population coverage. • Considering download speed which can be provided by 5G technology (enhanced Mobile Broadband - eMBB). • Considering that spectrum allocation in Malaysia is one of the highest in Asia. • Ensure quality of service while driving on highways is on par while consumers are stationary.
iii.	<p>Packet loss</p>	<p>This indicator measures the percentage of data packets transmitted from the source that fails to arrive at their destinations. It is calculated based on the average of sample measurements between the end user and MyIX.</p>	<p>Packet loss must be not more than 1.0 %, calculated based on the average of the test sample.</p>	<ul style="list-style-type: none"> • The Commission has taken into account the various RF environment effect on the packet loss therefore 1.0 % is considered acceptable for wireless broadband operation.

		Formula: $\frac{\text{Total Number of Packet Loss}}{\text{Total Number of Sent Packet}} \times 100$		
iv.	Network availability	This indicator measures percentage of service uptime over a specific time interval. Scheduled downtime for maintenance and upgrading of network is excluded from the computation. Computation formula will be specified in the applicable guideline.	Network availability must be at least 98% in a year excluding scheduled downtime.	<ul style="list-style-type: none"> • To ensure high service availability for consumer. • Minimum service disruption to consumer.
v.	Signal strength	This indicator measures the percentage of time that the average signal received is greater than -98 dBm. Formula: $\frac{\text{Total sample with signal strength} \geq -98 \text{ dBm}}{\text{Total sample}} \times 100\%$	Average signal strength must be at least -98 dBm , 80% of the time based on test sample.	<ul style="list-style-type: none"> • Minimum signal strength to ensure good throughput. • To ensure consumer are able to establish an active connection for data communications.

13. Six (6) QoS indicators within MSQoS for Wireless Broadband Access Service to be placed under the new MSQoS for Customer Service. The 6 items are:
- a. Advance notice of scheduled downtime;
 - b. Service disruption;
 - c. Percentage of billing related complaints;
 - d. Non-billing related complaints per 1000 customers;
 - e. Promptness in resolving customer complaints; and
 - f. Promptness in answering call to Customer Hotline.
14. The review of the MSQoS for Wireless Broadband Access Service will contain the revised and existing standards for network performance.

15. The demarcation of customer service standards into a new Mandatory Standards seeks to streamline customer service QoS indicators under one new unified document. Customer service standards focuses on service providers' responsibilities in regards to service disruptions, customer complaint related matters, notifications and reporting timelines between service providers and the Commission. Network performance standards will solely focus on network and technical matters in regards to network service delivery.
16. The demarcation also will enable the Commission to efficiently review future network performance standards in accordance to the evolution of technology in the telecommunication industry.

PART D: APPLICABLE GUIDELINES

17. The Commission has developed a set of guidelines that sets out the testing procedures, examples of computations, reporting templates, explanatory notes and list of designated routes and areas to the standards proposed in this document. The said guideline is annexed in **Appendix** – Guidelines to the Commission Determination on the Mandatory Standards for Quality of Service (Wireless Broadband Access Service).

PART E: VIEW SOUGHT

18. **The Commission seeks views on the proposed interpretations and the proposed Mandatory Standards highlighted in Parts A, B and C above, including comments on the proposed Guidelines stated in Part D, which will be used for the purpose of the Determination.**

19. **The Commission also welcomes comments on related matters that stakeholders or respondents believe are relevant to improve the Mandatory Standards for Quality of Service (Wireless Broadband Access Service).**

20. **The Commission also seeks views on other possible approaches that may be employed to improve quality of service for the wireless broadband services in Malaysia.**

APPENDIX



Suruhanjaya Komunikasi dan Multimedia Malaysia

Malaysian Communications and Multimedia Commission

**GUIDELINES TO THE COMMISSION DETERMINATION
ON THE MANDATORY STANDARDS FOR
QUALITY OF SERVICE (WIRELESS BROADBAND ACCESS SERVICE),
DETERMINATION 'X' OF 2019**

(SKMM(T)06-SEIR/140.003/Jil. 1 ('x'))

DD MM 2019

TABLE OF CONTENTS

GLOSSARY	3
PART A: OBJECTIVE AND SCOPE	4
PART B: NETWORK PERFORMANCE QUALITY OF SERVICE	4
○ Test Methodology	4
○ Location identification	4
○ Testing parameters	5
○ Testing Methodologies	5
○ Designated areas	6
PART C: REQUIREMENT FOR REPORT SUBMISSION	7
PART D: EFFECTIVE DATE AND COMMISSION CONTACT	8

GLOSSARY

BB	Broadband
FTP	File Transfer Protocol
GPS	Global Positioning System
HTTP	Hypertext Transfer Protocol
ICMP	Internet Control Message Protocol
ISP	Internet Service Provider
Mbps	Mega bit per second
MEF	Metro Ethernet Forum
MyIX	Malaysian Internet Exchange
QoS	Quality of Service
RF	Radio Frequency
TCP	Transport Control Protocol
UE	User Equipment
UDP	User Datagram Protocol
WGS	World Geodetic System
3G	Third Generation of mobile telecommunications technology
4G	Fourth Generation of mobile telecommunications technology

PART A: OBJECTIVE AND SCOPE

1. These guidelines are developed by the Malaysian Communications and Multimedia Commission (the "Commission") pursuant to Paragraph 'x' of the Commission Determination on the Mandatory Standards for Quality of Service (Wireless Broadband Access Service), Determination 'X' of 2019 ("Mandatory Standards").
2. These guidelines set out the testing procedures, examples of computations, reporting templates, explanatory notes and list of designated areas to the standards in the Mandatory Standards.
3. These guideline is applicable to terrestrial Wireless Broadband Access Service.

PART B: NETWORK PERFORMANCE QUALITY OF SERVICE

Test Methodology

4. Network latency or ping time measures the round-trip time taken by a standard packet size of between 32 to 128 bytes to travel across the network from the end user to MyIX and back to the end user.
5. Broadband speed or throughput measures the speed of downloading data measured in units of megabits per second (Mbps) from MyIX to the end user.
6. Packet loss measures the percentage of data packets transmitted from the source that fails to arrive at their destinations. It is calculated based on the average of sample measurements between the end user and MyIX.
7. These tests will be carried out by the Commission or the Commission's appointed consultant in accordance with these guidelines. However, the Commission may, at its sole discretion, request the Broadband Service Providers to conduct the tests and provide the report, if necessary.
8. The Commission at its discretion, may perform test on any selected service provider deemed necessary.

Location Identification

9. The tests are to be carried out by the way of stationary, walk or drive test at locations identified to at least have 3G broadband service coverage. Maximum driving speed for drive test will be 110 km/h.

10. The service coverage will be identified in the following manner:
 - a. Through the service coverage information as advertised in the wireless broadband Service Providers' websites; or
 - b. Confirmation from the wireless broadband Service Providers; or
 - c. Where complaints from consumers on individual services by a particular Service provider is lodged to the MCMC.

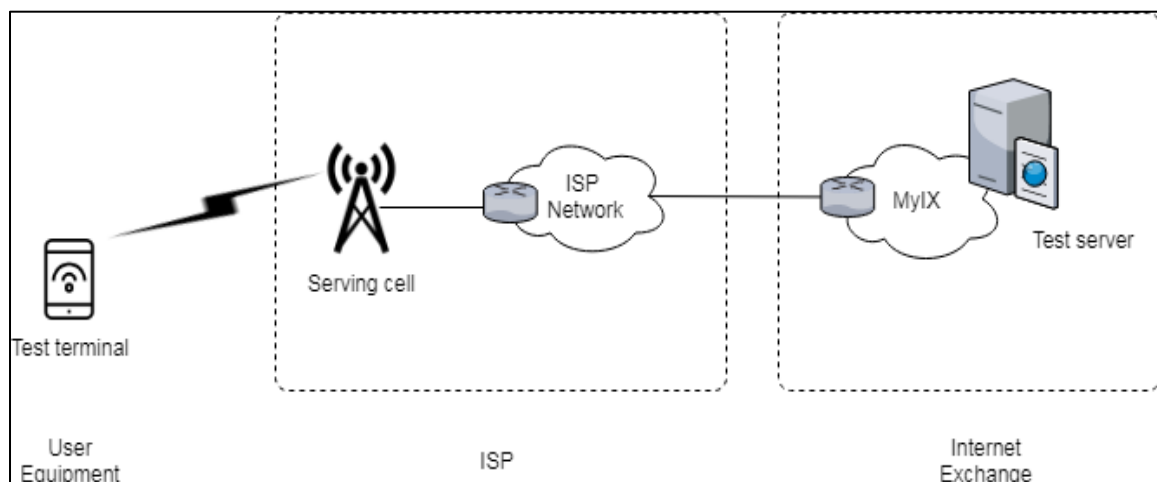
Testing Equipment

11. UE supporting frequency band in Malaysia are to be install with QoS monitoring software for cellular based systems measurement and testing.
12. The software/measurement tools used for the tests shall be in compliance with the relevant recommendations from European Telecommunications Standards Institute (ETSI)'s standards or equivalent.

Testing Methodologies

13. The test set up configuration is as shown below:

Diagram 1: Test set up configuration



14. A test server or a responder will be configured at MyIX to act as the target server for measuring download throughput and network latency.

15. The tests are to be conducted up to transport layer (ICMP, TCP, UDP, etc.). Test on application layer (web browsing http, ftp, video streaming, etc.) utilizing the relevant transport protocol to simulate customer's experience may be conducted by the Commission, if necessary.
16. Packet size of 32/64/128 bytes will be used for network latency or ping time measurement. The selection of test packet size is subject to the Commission's discretion.
17. Geographical positioning will be based on the Global Positioning System (GPS) and the WGS-84 digital map or its equivalent.
18. A validation procedure shall be applied to avoid any service/application prioritization in order to ensure the test is conducted in a fair manner representing real user experience. These prioritizations include but not limited to the following:
 - a. SIM based prioritization.
 - b. Service based prioritization such as, application name, port number, IP address, type of service and etc.
19. Any service provider found to perform alteration to the network configuration or manipulation during test measurement such as service prioritization, which did not represent real user experience will be penalized with the following, but not limited to:
 - a. All results found to be manipulated during the said test will be zeroed.
 - b. The zeroed results will be included into the overall calculation for compliance.

Designated areas

20. The designated areas for wireless broadband access service testing covers all 6 regions as follow:
 - a. Central Region
 - b. Northern Region
 - c. Southern Region
 - d. Eastern Region
 - e. Sabah
 - f. Sarawak
21. The selection of test location is subject to the Commission's discretion.

PART C: REQUIREMENT FOR REPORT SUBMISSION

22. All reports (including notices and notifications) that are required to be sent to the Commission should be sent to Quality of Service Department's address and/or email as follows:

Quality of Service Department
Malaysian Communications and Multimedia Commission
MCMC Tower 1, Jalan Impact, Cyber 6,
63000 Cyberjaya
Selangor Darul Ehsan
Email : qos.dept@mcmc.gov.my

23. These reports shall be in the form and format as described below. Each report shall be accompanied by a declaration signed by an officer of the Service Provider duly authorised by the board of directors, stating that each report is true and accurate.

24. The Service Provider shall submit the report based on the following timelines:

Table 1: Reporting timeline

No	Item	Reporting Period	Report Submission Date
1	Report (1 st Quarter)	1 January – 31 March	By 30 April of the same year
2	Report (2 nd Quarter)	1 April – 30 June	By 30 July of the same year
3	Report (3 rd Quarter)	1 July – 30 September	By 30 October of the same year
4	Report (4 th Quarter)	1 October – 31 December	By 30 January of the following year

25. The Service Provider shall submit network availability report based on the format below for each access network (3G, 4G and any future network):

Table 2: Format for network availability in quarterly reports

Report Item	1 st month	2 nd month	3 rd month	Total	QoS Standard	Compliance
A. Total uptime (minutes)						
B. Total downtime (minutes)						
C. % of network availability $C = \left(\frac{A}{A+B} \right) \times 100\%$					98 %	YES/NO

PART D: EFFECTIVE DATE AND COMMISSION CONTACT

26. These guidelines shall come into effect on **DD MM 2020**, and shall continue to be effective unless modified, varied or revoked by the Commission.
27. For any queries and further information on these Guidelines please contact:
- Quality of Service Department
Network Security Monitoring Division
Phone : 03-8688 8000
Email : qos.dept@mcmc.gov.my