# ETSI TS 102 250-1 V1.2.1 (2007-03)

Technical Specification

Speech Processing, Transmission and Quality Aspects (STQ); QoS aspects for popular services in GSM and 3G networks; Part 1: Identification of Quality of Service criteria

ETSI

ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00   Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

Important notice

Individual copies of the present document can be downloaded from:
http://www.etsi.org

The present document may be made available in more than one electronic version or in print. In any case of existing or
perceived difference in contents between such versions, the reference version is the Portable Document Format (PDF).
In case of dispute, the reference shall be the printing on ETSI printers of the PDF version kept on a specific network drive
within ETSI Secretariat.

Users of the present document should be aware that the document may be subject to revision or change of status.
Information on the current status of this and other ETSI documents is available at
http://portal.etsi.org/tb/status/status.asp

If you find errors in the present document, please send your comment to one of the following services:
http://portal.etsi.org/chaircor/ETSI_support.asp

Copyright Notification

Contents

Intellectual Property Rights

IPRs essential or potentially essential to the present document may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: *"Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards"*, which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (http://webapp.etsi.org/IPR/home.asp).

Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Foreword

This Technical Specification (TS) has been produced by ETSI Technical Committee Speech Processing, Transmission and Quality Aspects (STQ).

The present document is part 1 of a multi-part deliverable covering the QoS aspects for popular services in GSM and 3G networks, as identified below:

Part 1: **"Identification of Quality of Service criteria";**

Part 2: "Definition of Quality of Service parameters and their computation";

Part 3: "Typical procedures for Quality of Service measurement equipment";

Part 4: "Requirements for Quality of Service measurement equipment";

Part 5: "Definition of typical measurement profiles";

Part 6: "Post processing and statistical methods".

Part 1 identifies QoS criteria for popular services in GSM and 3G networks. They are considered to be suitable for the quantitative characterization of the dominant technical QoS aspects as experienced from the customer perspective.

Part 2 defines QoS parameters and their computation for popular services in GSM and 3G networks. The technical QoS criteria, listed in part 1, are the basis for the parameter set chosen. The parameter definition is split into two parts: the abstract definition and the generic description of the measurement method with the respective trigger points. Only measurement methods not dependent on any infrastructure provided are described in the present document. The harmonized definitions given in the present document are considered as the prerequisites for comparison of QoS measurements and measurement results.

Part 3 describes typical procedures used for QoS measurements over GSM, along with settings and parameters for such measurements.

Part 4 defines the minimum requirements of QoS measurement equipment for GSM and 3G networks in the way that the values and trigger-points needed to compute the QoS parameter as defined in part 2 can be measured following the procedures defined in part 3. Test-equipment fulfilling the specified minimum requirements, will allow to perform the proposed measurements in a reliable and reproducible way.

Part 5 specifies test profiles which are required to enable benchmarking of different GSM or 3G networks both within and outside national boundaries. It is necessary to have these profiles so that when a specific set of tests are carried out then customers are comparing "like for like" performance.

Part 6 describes procedures to be used for statistical calculations in the field of QoS measurement of GSM and 3G networks using probing systems.

Introduction

Measurements of the criteria defined in the present document can only be made using special test equipment and the results obtained may depend to some extent on the design of this test equipment. The QoS experienced by users will also be influenced to some extent by the design of their terminals and therefore may differ somewhat from the results of formal tests.

There are several factors that could affect the comparability of measurements of different networks:

- use of different measurement equipment;

- use of different design settings in the networks that deliberately trade one aspect of quality against another;

- the locations where measurements are made;

- the time when measurements are made (for example the performance of the radio access will be affected by weather conditions, seasons (extent of tree foliage), and recent weather history (wetness of the ground and foliage).

Consequently any measurements that are intended to compare the quality of different networks should use a common measurement system and the different networks should be sampled simultaneously from the same locations, and the number of different locations should be sufficiently large to provide some statistical averaging to take account of the different locations of the base stations.

1 Scope

The present document identifies QoS criteria for popular services in GSM and 3G. They are considered to be suitable for the quantitative characterization of the dominant technical QoS aspects as experienced from the customer perspective.

The criteria are described by their name and a short description from the customer point of view.

Wherever possible existing ITU-T or ETSI definitions are referenced. If ITU-T or ETSI definitions do not exist or are considered as too generic, a more service and mobile network specific definition is made.

Standardization work on QoS aspects is ongoing and within the process of creating a comprehensive and harmonized QoS framework for ITU-T and ETSI. Although the definitions of QoS terms and criteria given in the present document represent the most recent results on this topic the reader of the present document is advised to also take into account up-to-date results of this ongoing work. The information contained in the present document will form among other input the basis for further work, is likely to be modified and amended. Therefore it is recommended to cross-check the given information with actual discussions within ITU-T and ETSI and with standards published after the date of publication of the present document.

2 References

Void.

3 Definitions and Abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in the ETSI Directives and the following apply:

> NOTE: Several terms and definitions presented in this clause are defined in ITU-T Recommendations E.800, E.802 and G.1000 (see bibliography).

A-party: initiating part of a connection (MO)

B-party: terminating part of a connection (MT)

customer: party that uses a telecommunication service(s) under a contractual agreement

> NOTE: The present document does not differentiate between "customer" and "user". Both terms are needed for explanatory reasons.

measure: unit by which a parameter may be expressed

network operator: organization that provides and operates a telecommunications network for the purpose of transporting bearers of telecommunication services

> NOTE: If the same organization also offers services it also becomes a service provider.

network performance: ability of a network portion to provide the functions related to communication between users

QoS criterion: single characteristic of a product or service that is observable and/or measurable

QoS parameter: definition of the scope of a QoS criterion with clear boundaries and explicit measurement method to enable a quantifiable or qualifiable value to be assigned

quality: total quality of characteristics of an entity that bear on its ability to satisfy stated and implied needs

NOTE: Where the characteristics should be observable or measurable. When the characteristics are defined they become parameters and parameters are expressed by measures.

Quality of Service:

1) Totality of characteristics of a telecommunication service that bear on its ability to satisfy stated and implied needs of the user of the service.

2) The collective effect of service performance, which determines the degree of satisfaction of a user of the service.

NOTE: These definitions may be seen to be considered complimentary, and either or both definitions may be used.

service provider: organization that offers telecommunication service to the customer

telecommunications: technical process of sending, transmitting and receiving any kind of message in form of signs, voice, images or sounds by means of telecommunications systems

telecommunication service: provision of telecommunications and provision of other additional services that are closely related to the provision of telecommunications like e.g. billing, directory services

telecommunication system: technical equipment or systems capable of sending, transmitting receiving, steering or controlling messages identifiable as electromagnetic signals

user: individual or organization using or requesting publicly available telecommunications services.

3.2   Abbreviations

For the purposes of the present document, the following abbreviations apply:

3G	3rd Generation
ESG	Electronic Service Guide
FTP	File Transfer Protocol
GSM	Global System for Mobile communications
IP	Internet Protocol
ISDN	Integrated Services Digital Network
MM	Multimedia Message
MMS	Multimedia Messaging Service
MMSC	Multimedia Messaging Service Centre
MO	Mobile Originated
MSISDN	Mobile Subscriber ISDN Number
MT	Mobile Terminated
NP	Network Performance
PDP	Packet Data Protocol
PLMN	Public Land Mobile Network
PoC	Push to talk over Cellular
PS	Packet Switched
QoS	Quality of Service
S&F	Store-and-Forward
SM	Short Message
SMS	Short Message Service
SMSC	Short Message Service Centre
TCP	Transmission Control Protocol
UE	User Equipment
WAP	Wireless Application Protocol

4   QoS background

4.1   General considerations

The relationship between customer satisfaction, QoS and NP is shown in figure 1. The present document has its focus on the technical aspects related to customer satisfaction.
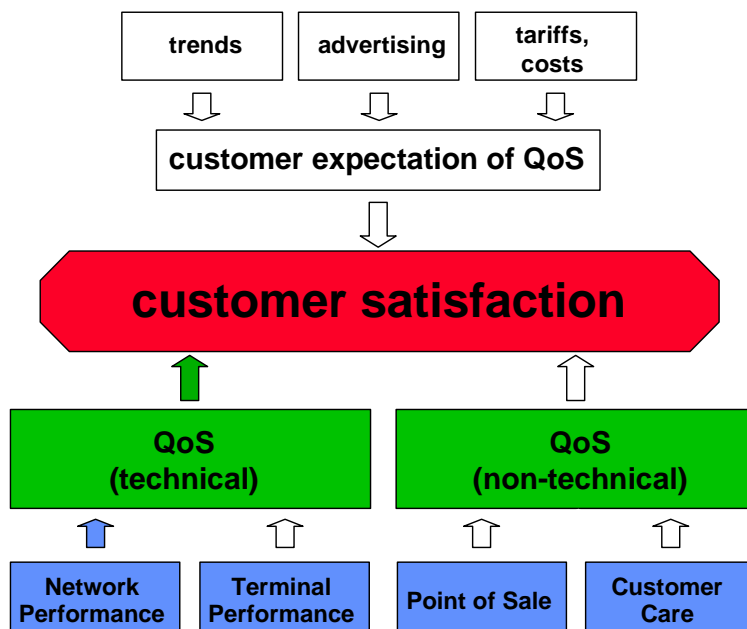
Figure 1: Relationship between customer satisfaction, QoS and NP

4.2   Phase model
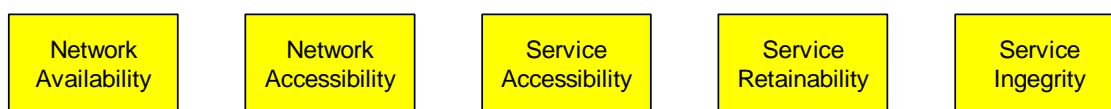
Figure 2: Phases of service use from the customer's point of view

Figure 2 shows the different phases (Quality of Service aspects) during service use from the customer's point of view. The meaning of these QoS aspects is:

1) **Network Availability:** Probability that the mobile services are offered to a user.

2) **Network Accessibility:** Probability that the user performs a successful registration on the PLMN.

3) **Service Accessibility:** If the customer wants to use a service, the network operator should provide him as fast as possible access to the service.

4) **Service Integrity:** This describes the Quality of Service during service use.

5) **Service Retainability:** Service retainability describes the termination of services (in accordance with or against the will of the user).

It is important to understand the interaction between these phases.

The network will only be available to the user if it estimates that the radio signal strength is above a certain threshold. The network will not be available at lower radio signal strengths even if the mobile is capable of operating at such strengths. The network availability, which is the basic estimate of radio coverage, is therefore influenced by the level of the threshold set by the network.

Presuming that the network is available, the user equipment will try to access the network in order to register itself. The network accessibility is shown to the user on the display of the user equipment by means of the network identity.

Service accessibility is the accessibility of a service when there is network access. Where there is network access, service access may not be possible because:

- There are no available radio channels to support the service.

- There are no available transmission links between the base station and the mobile switching centre.

- The service platform is not accessible.

Measurements of voice quality on a Public Land Mobile Network (PLMN) for example will be influenced by both the transmission capabilities of the network and the state of the radio access. A network with a higher threshold will support better speech quality but poorer network availability in an area of weak coverage.

4.3   Objective of the criteria list

The objective of the criteria list is to have an agreed set of QoS criteria. They should allow easier external and internal benchmarking.

The services chosen are considered to be of a high relevance to the customer in a national and international market and are common for most of the network operators.

The selected criteria are considered:

- to have main influence on the customer's satisfaction with regard to the service;

- to identify technical QoS aspects, which can be influenced by the performance of the network or the terminal;

- to be measurable by technical means;

- to be relevant for network operator's national and international benchmarking.

There is the need to specify independent QoS criteria for each service. Whereas related preconditions may be necessary.

5   Service independent QoS criteria

5.1   Radio network unavailability

Probability that the mobile services are not offered to a user.

5.2   Network non-accessibility

Probability that the user cannot perform a successful registration on the PLMN.

5.3   Attach failure ratio

The attach failure ratio describes the probability that a user cannot attach to the PS network.

5.4   Attach Setup Time

This attach setup time describes the time period needed to attach to the PS network.

5.5 PDP context activation failure ratio

The PDP context activation failure ratio denotes the probability that the PDP context cannot be activated.

5.6 PDP context activation time

This criterion describes the time period needed for activating the PDP context.

5.7 PDP Context Cut-off Ratio

The PDP context cut-off ratio denotes the probability that a PDP context is deactivated without being initiated intentionally by the user.

5.8 Data call access failure ratio

The failure of the data call access from initiating the data call to alerting or a busy signal is covered by this criterion.

5.9 Data call access time

The time elapsing from initiating the data call to alerting or a busy signal is covered by this criterion.

6 Direct services QoS criteria

6.1 File Transfer (FTP)

6.1.1 Service Non-Accessibility

The Service Non-Accessibility ratio denotes the probability that a user cannot establish a PDP context and access the service successfully.

6.1.2 Setup Time

The Setup Time describes the time period needed to access the service successfully, from starting the dial-up connection to the point of time when the content is sent or received.

6.1.3 IP-Service Access Failure Ratio

The IP-Service Access Ratio denotes the probability that a user cannot establish a TCP/IP connection to the server of a service successfully.

6.1.4 IP-Service Setup Time

The IP-Service Setup Time is the time period needed to establish a TCP/IP connection to the server of a service, from sending the initial query to a server to the point of time when the content is sent or received.

6.1.5 Session Failure Ratio

The Session Failure Ratio is the proportion of uncompleted sessions and sessions that were started successfully.

6.1.6   Session Time

The Session Time is the time period needed to successfully complete a PS data session.

6.1.7   Mean Data Rate

After a data link has been successfully established, this criterion describes the average data transfer rate measured throughout the entire connect time to the service.

6.1.8   Data Transfer Cut-off Ratio

The Data Transfer Cut-off Ratio is the proportion of incomplete data transfers and data transfers that were started successfully.

6.2   Mobile Broadcast

6.2.1   Network Non-Availability

Probability that the Mobile Broadcast services are not offered to a user by the target network indicators on the UE in idle mode.

6.2.2   Service Discovery Failure Ratio

Probability that the Mobile Broadcast services are accessible by the user. The service discovery mechanism, responsible among others for proving the availability of services, plays a key role. The service discovery procedure can be divided in two phases: bootstrapping and ESG retrieval, which are dealt in following criteria and which may use different bearers.

6.2.3   Service Discovery Time

The criterion Initial Setup Time is the time period elapsed between a session start attempt of the Mobile Broadcast service and the available indication in the UE that grants access to the service. Hereby, the time the device requires to discover the available services for the first time is considered.

6.2.4   Bootstrapping Failure Ratio

Probability that the first access to the broadcast signal fails. The failure may occur during synchronization to or decoding of the broadcast signal.

6.2.5   Bootstrapping Time

The criterion Bootstrapping Time measures the time it takes to perform the bootstrapping procedure consisting of the phases synchronization to the broadcast signal and broadcast signal decoding.

6.2.6   ESG Retrieval Failure Ratio

Probability that the retrieval of ESG information fails. The acquisition and filtering of the ESG information, as part of the service discovery mechanism, plays a key role.

6.2.7   ESG Retrieval Time

The ESG Retrieval Time is the time elapsed between the start of the ESG retrieval and the successful reception of the necessary ESG information required to acquire a service. The acquisition and filtering of the ESG information, as part of the service discovery mechanism, plays a key role.

6.2.8 Content Non-Accessibility

Probability that the requested Mobile Broadcast content (e.g. audio/video streaming data, files, metadata) is not started to be delivered to the user. This criterion applies also to zapping situations in which the user changes the offered streaming content frequently in short intervals.

6.2.9 Content Access Time

The criterion Content Access Time is the time period elapsed between the user's request to receive content and the reception of the first data packet.

6.2.10 Interactivity Response Failure Ratio

The Interactivity Response Failure Ratio measures the probability that a service request of a Mobile Broadcast service via an interactive channel does not result in an expected reaction (i.e. changes in content updated due to user's interaction, reception of any kind of notification to the user, etc.) on either the broadcast bearer or the mobile network bearer.

6.2.11 Interactivity Response Time

The criterion Interactivity Response Time is the time elapsed between a service request attempt of the Mobile Broadcast service via an interactive channel and the reception of a notification to the user.

6.3 Ping

6.3.1 Round Trip Time

The Round Trip Time is the time required for a packet to travel from a source to a destination and back. It is used to measure the delay on a network at a given time.

6.4 Push to talk over Cellular (PoC)

6.4.1 Registration Failure Ratio

The Registration Failure Ratio is the probability that the terminal can not register with the Push to talk over Cellular service when requested.

6.4.2 Registration Time

The Registration Time is the time period between the registration request of the PoC service and being registered to the PoC service.

6.4.3 Publish Failure Ratio

The Publish Failure Ratio is the probability that the terminal can not successfully publish his PoC service settings to the PoC server, after the terminal is registered to the PoC service.

6.4.4 Publish Time

The Publish Time is the period of time that it takes to publish the terminal's PoC service settings to the PoC server.

6.4.5 Registration Failure Ratio (long)

The Registration Failure Ratio is the probability that the terminal can not successfully be registered to the PoC service and publish his PoC service settings.

6.4.6 Registration Time (long)

The PoC Registration Time is the combined duration for a SIP registration and a SIP publish.

6.4.7 Session Initiation Failure Ratio (on-demand)

The Session Initiation Failure Ratio (on-demand) is the probability that a PoC Session can not be successfully initiated. A PoC Session is initiated when the user pushes the PoC button on the terminal (and thereby requests a talk burst) and is granted a talk burst.

6.4.8 Session Initiation Time (on-demand)

The Session Initiation Time (on-demand) is the time period between pushing the PoC button on the terminal in order to initiate a PoC session and being granted the talk burst, e.g. indicated by a "beep" tone on the terminal.

6.4.9 Pre-established Session Media Parameters Negotiation Failure Ratio

The pre-established Session Parameters Negotiation Failure Ratio is the probability that a negotiation procedure of media parameters for a posterior pre-established session can not be successfully accomplished.

6.4.10 Pre-established Session Media Parameters Negotiation Time

The Pre-established Session Parameters Negotiation Time describes the time period needed to accomplish a successful negotiation of media parameters.

6.4.11 Session Initiation Failure Ratio (pre-established)

The PoC Session Initiation Failure Ratio (pre-established) is the probability that a pre-established session can not be successfully initiated. After the negotiation of media parameters, a pre-established session is initiated when the user pushes the PoC button on the terminal (and thereby requests the talk burst) and is granted the talk burst.

6.4.12 Session Initiation Time (pre-established)

The Session Initiation Time (pre-established) is the time period between pushing the PoC button on the terminal in order to initiate a pre-established session and being granted the talk burst, e.g. indicated by a 'beep' tone on the terminal.

6.4.13 Session Setup Failure Ratio (on-demand)

The Session Setup Failure Ratio (on-demand) is the probability that a terminal can not successful register to the PoC service and initialize an on-demand session.

6.4.14 Session Setup Failure Ratio (pre-established)

The Session Setup Failure Ratio (pre-established) is the probability that a terminal can not successful register to the PoC service and initialize a pre-established session.

6.4.15 Session Setup Time

The Session Setup Time is the time period for the registration to the PoC service plus the time period for the initiation of a PoC session.

6.4.16 Push to Speech Failure Ratio

The Push to Speech Failure Ratio is the probability that the A-party can not successfully set up a PoC session and start with speech leading to no other terminal receiving speech.

6.4.17   Push to Speech Time

The Push to Speech Time is the period of time that it takes to setup a PoC session and start with speech in addition to the delay until the B-party receives the speech.

6.4.18   Session Leaving Failure Ratio (on-demand)

The Session Leaving Failure Ratio (on-demand) is the probability that the user can not leave the PoC session he is participating.

6.4.19   Session Leaving Time (on-demand)

The Session Leaving Time (on-demand) is the time period between sending the on-demand session leaving request and being disconnected from the on-demand session.

6.4.20   Session Leaving Failure Ratio (pre-established)

The Session Leaving Failure Ratio (pre-established) is the probability that the user can not leave the PoC pre-established session he is participating.

6.4.21   Session Leaving Time (pre-established)

The Session Leaving Time (pre-established) is the time period between sending the PoC session leaving request and being disconnected from the pre-established session.

6.4.22   Deregistration Failure Ratio

The Deregistration Failure Ratio is the probability that the user can not be deregistered from the Push to talk over Cellular service when requested.

6.4.23   Deregistration Time

The Deregistration Time is the time period between the de-activation request of the PoC service and being deregistered from the PoC service.

6.4.24   Busy Floor Response Failure Ratio

The Busy Floor Response Failure Ratio is the probability that, once in a PoC session, the talk burst request from the terminal fails.

6.4.25   Busy Floor Response Time

The Busy Floor Response Time is the is the time period between requesting the talk burst and receiving the indication the floor is busy within an already established PoC session.

6.4.26   Talk Burst Request Failure Ratio

The Talk Burst Request Failure Ratio is the probability that, once in a PoC session, the terminal's request of the idle floor fails.

6.4.27   Talk Burst Request Time

The Talk Burst Request Time is the time period between requesting the talk burst and being granted the previously idle floor within an already established PoC session.

6.4.28   Talk Burst Cut-off Ratio

The Talk Burst Cut-off Ratio is the probability that the terminal on the originating side (A-party) has the floor and creates and sends data packets containing speech data (RTP media stream), but the stream does not arrive (or arrives only partly) at the terminating side (B-party).

6.4.29   Talk Burst Packet Drop Ratio

The PoC Talk Burst Packet Drop Ratio is the probability that the terminal on the originating side (A-party) has the floor and creates and sends data packets containing speech data (RTP media stream), but the stream arrives only partially at the terminating side (B-party).

6.4.30   Voice Transmission Delay (first)

The criterion Voice Transmission Delay (first) describes the period of time between a terminal sending speech data (RTP media stream) and the first terminal receiving the speech data for the first talk burst after a PoC session has been established successfully.

6.4.31   Voice Transmission Delay (others)

The criterion Voice Transmission Delay (others) describes the period of time between a terminal sending speech data (RTP media stream) and the first terminal receiving the speech data (within an already established PoC session).

6.4.32   Speech Quality

To be defined.

6.4.33   Group Management QoS Criteria

To be defined.

6.4.34   Group Document related QoS Criteria

To be defined.

6.4.35   Instant Message QoS Criteria

To be defined.

6.5   Streaming

6.5.1   Service Non-Accessibility

The criterion Service Non-Accessibility describes the probability that the first data packet of the stream cannot be received by the UE when requested by the user. The "packet reception" is completed by appearance of the "buffering" message on the player at user side.

6.5.2   Service Access Time

The criterion Service Access Time describes the duration of a service access from requesting the stream at the portal until the reception of the first stream data packet at the UE.

6.5.3   Reproduction Cut-off Ratio

The criterion Reproduction Cut-off Ratio describes the probability that a successfully started stream reproduction is ended by a cause other than the intentional termination by the user.

6.5.4   Audio Quality

The criterion Audio Quality estimates the audio quality as perceived by the user.

6.5.5   Video Quality

The criterion Video Quality estimates the quality of the video stream as perceived by the user.

6.5.6   Audio/Video De-Synchronization

The criterion Audio/Video De-Synchronization describes the percentage of times that time difference of the audio and video signal at the user side exceeds a predefined threshold.

6.5.7   Reproduction Start Failure Ratio

The criterion Reproduction Start Failure Ratio describes the probability of unsuccessful stream reproduction.

6.5.8   Reproduction Start Delay

The criterion Reproduction Delay describes the duration between the reception at UE of the first stream data packet and the start of the reproduction of the stream on the UE.

6.6   Telephony

6.6.1   Service Non-Accessibility

Probability that the user cannot access the Mobile Telephony Service when requested if it is offered by display of the network indicator on the user equipment.

6.6.2   Setup Time

Time between sending of complete address information and receipt of call set-up notification.

6.6.3   Speech Quality on Call Basis

Criterion representing the quantification of the end-to-end speech transmission quality of the Mobile Telephony service. This criterion computes the speech quality on the basis of completed calls.

6.6.4   Speech Quality on Sample Basis

Criterion representing the quantification of the end-to-end speech transmission quality of the Mobile Telephony service. This criterion computes the speech quality on a sample basis.

6.6.5   Cut-off Call Ratio

Probability that a successful call attempt is ended by a cause other than the intentional termination by A- or B-party.

6.7   Video Telephony

6.7.1   Service Non-Accessibility

Probability that the user cannot access the service when requested while it is offered by network indication on the user equipment.

6.7.2   Service Access Time

Time between pushing send button after input of MSISDN and receipt of alerting at the A-party.

6.7.3   Audio/Video Setup Failure Ratio

Probability of audio/video setup failure after service access. The audio/video setup is successful if audio and video output is performed at both sides.

6.7.4   Audio/Video Setup Time

The elapsed time from the B-party call acceptance indicated at A-party until audio and video output starts at both sides.

6.7.5   Cut-off Call Ratio

Probability that a successful service access is ended by a cause other than the intentional termination of the user (A- or B-party).

6.7.6   Speech Quality on Call Basis

Indicator representing the quantification of the end-to-end speech transmission quality of the Video Telephony service. This criterion computes the speech quality on the basis of completed calls.

6.7.7   Speech Quality on Sample Basis

Indicator representing the quantification of the end-to-end speech transmission quality as perceived by the user. This criterion computes the speech quality on a sample basis.

6.7.8   Video Quality

End-to-end quality of the video signal as perceived by the end user during a VT call. This criterion computes the video quality on a sample basis.

6.7.9   End-To-End Mean One-Way Transmission Time

Delay time from input of the signal at the A-party (mic/cam) to output of the signal at the B-party (loudspeaker/display).

6.7.10   Audio/Video Synchronization

Percentage of times that the time differences of the audio and video signal at the user side exceeds a predefined threshold.

6.8   Web Browsing (HTTP)

6.8.1   Service Non-Accessibility

The Service Non-Accessibility ratio denotes the probability that a user cannot establish a PDP context and access the service successfully.

6.8.2   Setup Time

The Setup Time describes the time period needed to access the service successfully, from starting the dial-up connection to the point of time when the content is sent or received.

7.1.5 Session Failure Ratio

The Session Failure Ratio is the proportion of uncompleted sessions and sessions that were started successfully.

7.1.6 Session Time

The Session Time is the time period needed to successfully complete a PS data session.

7.1.7 Mean Data Rate

After a data link has been successfully established, this criterion describes the average data transfer rate measured throughout the entire connect time to the service. The data transfer shall be successfully terminated.

7.1.8 Data Transfer Cut-off Ratio

The Data Transfer Cut-off Ratio is the proportion of incomplete data transfers and data transfers that were started successfully.

7.2 Multimedia Messaging Service (MMS)

7.2.1 Send Failure Ratio

The criterion Send Failure Ratio describes the probability that a MM can not be sent by the A-party, although he has requested to do so by pushing the "send button".

7.2.2 Retrieval Failure Ratio

The criterion Retrieval Failure Ratio describes the probability that the MM can not be downloaded by the B-party, which received a MMS notification before.

7.2.3 Send Time

The time elapsing from pushing the send button after the editing of a MM to the completion of the data transfer is described by this criterion.

7.2.4 Retrieval Time

The reception of a MM works as follows: A push SM is sent to the B-party. In automatic mode, the push SM initiates a WAP connection to download the MM from the MMSC. The initiation of the WAP connection is called the WAP GET REQUEST (WGR). The time elapsing between the WGR and the completion of the download of the MM will be described by the criterion Retrieval Time.

7.2.5 Notification Failure Ratio

The criterion Notification Failure Ratio describes the probability that the Multimedia Messaging Service is not able to deliver the notification of a MM to the B-party.

7.2.6 Notification Time

The Notification Delay is the time elapsing from the complete submission of the MM to the MMSC to the reception of the Notification at the B-party.

7.2.7   End-to-End Failure Ratio

The criterion End-to-End Failure Ratio describes the probability that the Multimedia Messaging Service is not able to deliver a MM after the "send button" has been pushed or the A-party has not received an acknowledgement of the successful transmission from the MMSC.

7.2.8   End-to-End Delivery Time

The End-to-End Delivery Time is the time elapsing from the pushing of the "send button" to the reception of the MM by the B-party.

7.3   Short Message Service (SMS)

7.3.1   Service Non-Accessibility

Probability that the user cannot access the Short Message Service when requested while it is offered by display of the network indicator on the UE.

7.3.2   Access Delay

Time between sending a SM to a SMSC and receiving the notification from the SMSC.

7.3.3   End-to-End Delivery Time

Time between sending a SM to a SMSC and receiving the very same SM on another UE.

7.3.4   Completion Failure Ratio

Ratio of not received and sent test SMs from one UE to another UE, excluding duplicate received and corrupted test SMs.

Annex A (informative):
Bibliography

ITU-T Recommendation E.800: "Terms and definitions related to Quality of Service and network performance including dependability".

ITU-T Recommendation G.1000: "Communications Quality of Service: A framework and definitions".

ETSI TS 102 250-2: "Speech Processing, Transmission and Quality Aspects (STQ); QoS aspects for popular services in GSM and 3G networks; Part 2: Definition of Quality of Service parameters and their computation".

ETSI TS 102 250-3: "Speech processing, Transmission and Quality Aspects (STQ); QoS aspects for popular services in GSM and 3G networks; Part 3: Typical procedures for Quality of Service measurement equipment".

OMA-TS-PoC-ControlPlane-V1-0-1: "Push to talk Over Cellular Control Plane Specification".

OMA-TS-PoC-UserPlane-V1-0-1: "Push to talk Over Cellular User Plane".

OMA-AD-PoC-V1-0-1: "Push to talk over Cellular (PoC) - Architecture".

GSM Association PRD IR.43: "Typical procedures for QoS measurement equipment".

ITU-T Recommendation E.802: "Framework and methodologies for the determination and application of QoS parameters".

History

Document history		
V1.1.1	October 2003	Publication
V1.2.1	March 2007	Publication