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Speech and multimediaTransmission Quality (STQ) - QoS and network performance metrics and measurement methods - Part 1: General considerations

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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
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Foreword

This ETSI Guide (EG) has been produced by ETSI Technical Committee Speech and multimedia Transmission Quality (STQ).

The present document is part 1 of a multi-part deliverable covering the QoS and network performance metrics and measurement methods as identified below:

Part 1: "General considerations";

Part 2: "Transmission Quality Indicator combining Voice Quality Metrics";

Part 3: "Network performance metrics and measurement methods in IP networks";

Part 4: "Indicators for supervision of Multiplay services".

Introduction

The QoS definition of ITU-T Recommendation G.1000 [i.1] gives criteria for judging the quality of the communications functions that any service must support. However, even this definitional matrix can be viewed from different perspectives:

- customer's QoS requirements;
- service provider's offerings of QoS (or planned/targeted QoS);
- QoS achieved or delivered;
- customer survey ratings of QoS.

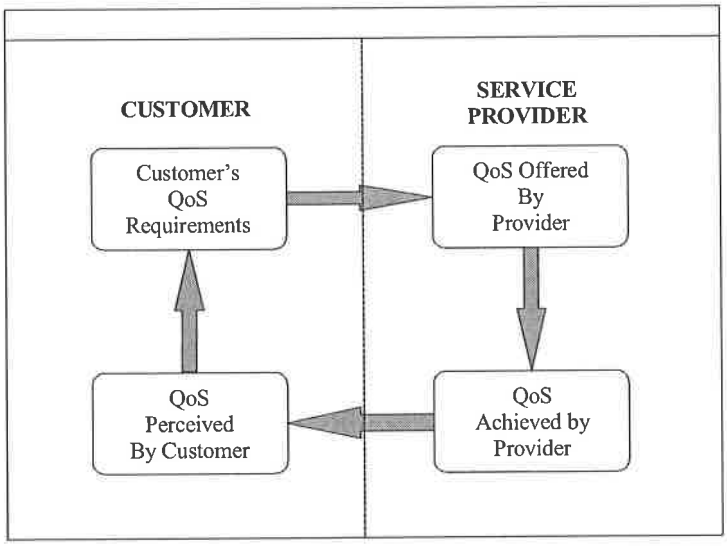

Figure 1: The four viewpoints of QoS

Under this angle of view the different parts of this multipart deliverable are positioned at different places in the matrix above:

Part 1 (the present document) provides the umbrella for the different parts of this multi-part document as these are service specific (e.g. voice) (i.e. relevant and perceivable by the end-user) on the one hand and transport network specific (e.g. IP) (i.e. relevant to the network itself and thus important to the network operator) on the other hand.

Part 2 [i.4] is identifying and defining indicators and methodologies for a use in a context of end-user quality characterisation and supervision of voice telephony services.

In this context the measurements and metric determinations are performed by analysing signals accessible on user-end services (end-user terminals and interfaces) and not on the network (network elements and interfaces within the network). In order to map the reality in terms of access to the services at the user-end side, measurements and analysis are performed on electrical signals that exclude the electro-acoustic part of the end equipment. However, the probe adaptation to electric interface of the end user equipment takes much into account the electro-acoustic characteristics of this terminal.

Part 3 [i.6] gives a survey on the existing network performance-related IETF standards and how these standards can be applied to end-to-end network performance measurements. The scope of this work is also to discuss the relationship of those standards to those of ITU-T and ETSI.

It discusses and compares definitions of metrics used to specify and assess performance in IP networks. The metrics addressed in this document are those defined by the IETF IPPM working group and ITU-T Study Group 12. Besides comparing the different definitions this document gives applicability guidelines on which metric is more appropriate for a particular application, configuration or scenario.

Part 4 [i.5] aims to identify and define indicators and methodologies for a use in a context of end-user quality characterisation and supervision of Multiplay services concerning IP access, voice messaging service, IPTV and as possible VoD.

In this context the measurements (intrusive and non intrusive) and metric determinations are performed by analysing signals accessible on user-end services and not on the network.

1 Scope

The present document provides the umbrella for the different parts of this multi-part document as these are service specific (e.g. Internet access, voice, IPTV and VoD) on the one hand and transport network specific (e.g. IP) on the other hand.

The service specific part(s) are considered to be suitable for the quantitatively characterization of the dominant technical QoS aspects that have a direct influence on the QoS as experienced by the end-user. Thus these technical parameters can be taken as a measure to estimate the end-user quality perception and to benchmark services subsequently.

The transport network specific(s) are considered to be suitable for the quantitatively characterization of the performance of the network as a whole and single network elements/functions. These parameters are used by the network operator to monitor the network performance, make a fault analysis and decide whether network upgrading/reconstruction, etc. needs to be undertaken.

The quality of modern terminals and network equipment is characterized by numerous quality parameters. A subset of them, those which are found to be the most important ones (KPI _ Key Performance Indicator) are measured during their lifetime and under real traffic conditions. These measurements guarantee the best possible assessment of quality problems that may occur during real use of the corresponding telecommunication device.

2 References

References are either specific (identified by date of publication and/or edition number or version number) or non-specific.

- For a specific reference, subsequent revisions do not apply.
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2.1 Normative references

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Not applicable.

2.2 Informative references

The following referenced documents are not essential to the use of the present document but they assist the user with regard to a particular subject area. For non-specific references, the latest version of the referenced document (including any amendments) applies.

[i.1] ITU-T Recommendation G.1000: "Communications Quality of Service: A framework and definitions".

[i.2] ITU-T Recommendation P.505: "One-view visualization of speech quality measurement results".

[i.3] ETSI ETR 003: "Network Aspects (NA); General aspects of Quality of Service (QoS) and Network Performance (NP)".

[i.4] ETSI EG 202 765-2: "Speech Processing, Transmission and Quality Aspects (STQ); QoS and network performance metrics and measurement methods Part 2 : Transmission Quality Indicator combining Voice Quality Metrics".

[i.5] ETSI EG 202 765-4: "Speech and multimedia Transmission Quality (STQ); QoS and network performance metrics and measurement methods; Part 4: Indicators for supervision of Multiplay services".

[i.6] ETSI EG 202 765-3: "Speech and multimediaTransmission Quality (STQ); QoS and network performance metrics and measurement methods; Part 3: Network performance metrics and measurement methods in IP networks".

3 Abbreviations

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

QoS Quality of Service
QoE Quality of Experience
VoIP Voice over Internet Protocol