

# ETSI TS 102 250-5 V2.5.1 (2019-11)



## Speech and multimedia Transmission Quality (STQ); QoS aspects for popular services in mobile networks; Part 5: Definition of typical measurement profiles

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# Foreword

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

The present document is part 5 of a multi-part deliverable. Full details of the entire series can be found in part 1 [5].

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# Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the [ETSI Drafting Rules](#) (Verbal forms for the expression of provisions).

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# Introduction

All the defined quality of service parameters and their computations are based on field measurements. That indicates that the measurements were made from user's point of view (full end-to-end perspective, taking into account the needs of testing).

It is assumed that the end user can handle his mobile and the services he wants to use (operability is not evaluated at this time). For the purpose of measurement it is assumed:

- that the service is available and not barred for any reason;
- routing is defined correctly without errors; and
- the target subscriber equipment is ready to answer the call.

Further preconditions may apply when reasonable.

The present document describes a set of typical measurement profiles which are precisely defined to allow for comparability between different measurements, possibly performed by different parties.

It is necessary to have these profiles so that when a specific set of measurements are carried out then users are comparing "like for like" performance.

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# 1 Scope

The present document specifies test profiles which are required to enable benchmarking of different mobile networks both within and outside national boundaries. It is necessary to have these profiles so that when a specific set of tests is carried out then users are comparing "like for like" performance.

All timeouts (as part of the profiles) given in the present document are examples from proven experience. It should be noted that most timeouts given in the present document do, with respect to failure ratios as defined in ETSI TS 102 250-2 [1], have a direct impact on measurement results. A timeout value might for example directly relate to the stop trigger point in the sense of the timeout reached event being the point in time where a certain state has not been reached.

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## 2 References

### 2.1 Normative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the reference document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at <http://docbox.etsi.org/Reference>.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

The following referenced documents are necessary for the application of the present document.

- [1] ETSI TS 102 250-2: "Speech and multimedia Transmission Quality (STQ); QoS aspects for popular services in mobile networks; Part 2: Definition of Quality of Service parameters and their computation".
- [2] ETSI TS 124 008 (V9.6.0): "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Mobile radio interface Layer 3 specification; Core network protocols; Stage 3 (3GPP TS 24.008 version 9.6.0 Release 9)".
- [3] IETF RFC 3481: "TCP over Second (2.5G) and Third (3G) Generation Wireless Networks".
- [4] ETSI EN 300 392-2: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 2: Air Interface (AI)".
- [5] ETSI TS 102 250-1: "Speech and multimedia Transmission Quality (STQ); QoS aspects for popular services in mobile networks; Part 1: Assessment of Quality of Service".

### 2.2 Informative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the reference document (including any amendments) applies.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

- [i.1] ETSI TR 102 505: "Speech and multimedia Transmission Quality (STQ); Development of a Reference Web page".

## 3 Definition of terms, symbols and abbreviations

### 3.1 Terms

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

**1 kByte:** 1 024 Byte

**1 MByte:** 1 024 kByte

**session:** continuous usage of a given service, e.g. a speech call or a data session

### 3.2 Symbols

Void.

### 3.3 Abbreviations

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

AMR	Adaptive Multi-Rate
BCP	Best Current Practice
DL	Down Link
DNS	Domain Name Server
FQDN	Fully Qualified Domain Name
FTP	File Transfer Protocol
GPRS	General Packet Radio Service
GR	GPRS Register
GSM	Global System for Mobile communications
HLR	Home Location Register
HTML	Hypertext Markup Language
HTTP	Hyper Text Transfer Protocol
IE	Information Element
IMAP	Internet Messaging Access Protocol
IP	Internet Protocol
MD5	Message-Digest algorithm 5
MMS	Multimedia Messaging Service
MO	Mobile Originated
MOC	Mobile Originated Call
MT	Mobile Termination
PDP	Pack Data Protocol
PEP	Performance Enhancement Proxy
PLMN	Public Land Mobile Network
POP3	Post Office Protocol version 3
PSD	Packet Switched Data
QoE	Quality of Experience
QoS	Quality of Service
SDS	Short Data Service
SGSN	Serving GPRS Support Node
SMS	Short Message Service
SMTP	Simple Mail Transfer Protocol
TCP	Transmission Control Protocol
TCP/IP	Transmission Control Protocol/Internet Protocol
TETRA	TErrestrial Trunked RAdio
UDP	User Datagram Protocol
UE	User Equipment
UL	Up Link
UMTS	Universal Mobile Telecommunication System

VT	Video Telephony
WAP	Wireless Application Protocol
XML	Extensible Markup Language

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## 4 Measurement profiles

### 4.1 Overview - Classification of measurement environments

Measurement profiles are required to enable benchmarking of different networks both within and outside national boundaries. It is necessary to have these profiles so that when a specific set of tests is carried out then users are comparing "like for like" performance.

It is recognized that many factors will affect comparability:

- number of sessions;
- sessions duration;
- time between sessions;
- demanded QoS settings for data services;
- protocol settings (like TCP/IP settings for data services or AMR-settings for speech services);
- usage profile during the session;
- fixed network test equipment like test servers for data sessions;
- user profile stored in the HLR or the GR;
- geographic location;
- type of location (indoor, hotspot, city, suburban, rural, train, etc.);
- speed when mobile;
- type of vehicle;
- type of antenna;
- handset type;
- handset hardware and firmware version;
- service being tested and limitations of service;
- network configuration;
- mobile users' population density.

For the points mentioned above where there is no recommendation or requirement in the present document, the settings experienced by a regular user of the service under test in the network under test shall be used as a guideline.

As far as possible all particular values, e.g. timeout values, are named preserving the name of the respective Quality of Service parameters as defined in ETSI TS 102 250-2 [1].

For interpretation and comparability of test results it is important to know in which measurement environment the tests were performed. The environment classifications described below shall be used. Since the type of the measurement locations may be interpreted differently, the particular understanding of the location type determining a category shall be described in the results report.



**Table 1: Stationary Tests**

Category	Location Type	Additional information
S10:	airports/railway stations/shopping centres and malls business districts and exhibition areas	outdoor measurement
S11:	airports/railway stations/shopping centres and malls business districts and exhibition areas	indoor measurements

**Table 2: Drive Tests/Walk Tests**

Category	Location Type	Additional information
D1:	Train Measurements	
D2:	Urban Areas (medium cities)	
D3:	Highways	
D4:	Rural Areas (country roads)	
D5:	Large cities	
W1:	Walk Tests (indoor measurements)	
W2:	Walk Tests (outdoor measurements)	
NOTE:	Drive tests may be performed by in car using external antenna with an appropriate attenuation.	

## 4.2 Service profiles

### 4.2.1 Telephony

#### 4.2.1.1 Overview - Speech Telephony

Clause 4.2 describes recommended service profiles used for testing.

The service profiles defined for telephony might be applicable for different scenarios, e.g. mobile-to-mobile or mobile-to-fixed, and the respective results should not be compared directly, if so.

To achieve comparable statistics when performing a benchmark, there should be no fixed pause between calls. Instead, a fixed call window is defined in which one single call has to be performed. If the call fails or drops, the next call attempt shall only be made when the next call window arrives.

A minimum pause interval between two call attempts should be applied to prevent unintentionally taking into account network related problems between connection release and the next establishment (e.g. signalling in the PSD or mobility management) for respective QoS parameter calculation. If, on the other hand, scenarios like calling back immediately after a dropped call are to be tested, and where such problems do have an impact on the user experience, the pause interval should be set to a representative value.

For speech telephony the following call durations shall be used:

- CD1: 10 seconds for call setup testing;
- CD2: 120 seconds for typical tests, default call duration for PLMN;
- CD3: 300 seconds for stability tests;
- CD4: 60 seconds for typical tests, default call duration for TETRA individual calls.

**Call Window:** Call duration + 30 seconds, (for the setup and release phases) + 30 seconds (for the minimum pause interval), for the default call duration CD2 this results in 180 seconds call window.

Timeout values:

- Telephony {Service Non-Accessibility | Setup Time} Timeout: 20 seconds.

### 4.2.1.2 Video Telephony

Video Telephony should be tested in mobile-to-mobile scenarios. The following call durations shall be used:

- CD1: 10 seconds for call setup testing;
- CD2: 120 seconds for typical tests, default call duration;
- CD3: 300 seconds for stability tests.

**Call Window:** Call duration + 30 seconds (for the setup and release phases) + 30 seconds (for minimum pause interval), for the default call duration CD2 this results in 180 seconds call window.

Timeout values:

- VT Service {Non-Accessibility | Access Time} Timeout: 20 seconds;
- VT Audio/Video Setup {Failure Ratio | Time} Timeout: 30 seconds.

### 4.2.1.3 Group Call

Group Calls should be tested in mobile-to-mobile(s) scenarios. The following call durations shall be used:

- CD1: 20 seconds for typical tests, default call duration;
- CD2: 60 seconds for stability tests.

**Call Window:** Call duration + 20 seconds (for the setup and release phases) + 20 seconds (for minimum pause interval), for the default call duration CD1 this results in 60 seconds call window.

Timeout values:

- Group Call Service Non-Accessibility Timeout: 5 seconds.

## 4.2.2 Messaging Services

### 4.2.2.1 {SMS | SDS}

For all messaging services it is important that the recipient of a message is not interrupted by the next message while retrieving the previous one. For this reason it is important that the interval between sending two messages is larger than the 95 % percentile of the end-to-end duration, unless measures are taken to avoid this kind of interference.

It should be noted, that mobility of either the sender of a message or the receiver of a message or both of a message can have an impact on the results. Therefore it is recommended that measurements are not only performed stationary, but also with mobility of one or both participants. In all cases the used scenario has to be stated.

{SMS | SDS} should be tested in mobile-to-mobile scenarios and without concatenation. Thus the user data should be chosen in a way that it will fit into a single message.

The interval between two consecutive {SMS | SDS} shall be 60 seconds.

The transmission window of measurements shall be 175 seconds.

Timeout-values:

- {SMS | SDS} Service Non-Accessibility Timeout: 20 seconds;
- {SMS | SDS} Completion Failure Ratio Timeout: 30 seconds;
- {SMS | SDS} Receive Confirmation Failure Ratio Timeout: 60 seconds;