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Speech Processing, Transmission and Quality Aspects (STQ) - QoS parameter definitions and measurements - Part 1: Parameters for voice telephony service required under the ONP Voice Telephony Directive 98/10/EC

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Foreword

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

The present document is part 1 of a multi-part EG covering the QoS parameter definitions and measurements; as identified below:

Part 1: "Parameters for voice telephony service required under the ONP Voice Telephony Directive 98/10/EC";

Part 2: "Additional parameters for voice telephony for voluntary use".

This guide has taken into account as far as practicable the following principles which have been endorsed by the ONP Committee:

1) ONP QoS parameters should be easily understood by the public, and be useful and important to them.

2) All parameters are applicable at the network termination point.

3) Where measurements are possible they should be made on the customer's premises, using in-service lines.

NOTE: Literally principles 2 and 3 imply that all measurements are to be carried out at the NTP, which would require co-operation by users, and be excessively intrusive as would require many visits to the premises of users. Measurements at the subscriber side of the local exchange (e.g. at the MDF or other possible connection point/distribution frame in the access network) generally give an adequate representation of the quality that would be perceived at the NTP for the parameters defined in this part, and so this approach is used because it is more practicable and meets the underlying objectives of these principles.

4) To be as realistic as possible, real traffic rather than test calls should be used as a basis of the measurements, wherever possible.

5) Parameters should be capable of verification by independent organisations. This verification might be made by direct measurements or by audit of service provider's measurements.

6) The accuracy of QoS values should be set to a level consistent with measurement methods being as simple as possible with costs as low as possible.

7) The parameters are designed for both statistical and individual application. The statistical values should be derived by the application of a simple statistical function to the individual values. The statistical function should be specified in the standard. The standard should also contain guidelines on how statistically significant samples should be selected.

8) The statistical functions should be designed so QoS figures from different service providers can be compared easily by users and in particular consumers.

In addition, several measures have been re-designed (compared to version 1) to identify more transparently the service experienced by the user and to ensure that changes to that service are reflected more accurately in the measurements. An example is the change from measuring supply time and fault repair in working days/hours to measuring in calendar days/hours (elapsed time).

1 Scope

The present document contains harmonized definitions and measurement methods for a range of user perceivable Quality of Service (QoS) parameters for the voice telephony service. The set of parameters have been produced in response to the ONP Voice Telephony Directive 98/10/EC. Part 1 of the Guide addresses the parameters listed in annex 3 of the Directive. Additional parts may be developed for optional parameters and other services.

The purpose of these parameters is to define objective and comparable measures of the QoS delivered to users/customers for use by NRAs as set out in the Directive. The establishment of target values for QoS is beyond the scope of this Guide.

The Quality of Service parameters apply to the services governed by the Voice Telephony Directive (98/10/EC [1]), i.e. fixed public telephone services, irrespective of the network technology chosen by the service provider, e.g. PSTN, ISDN or other technology, and the destination of the call.

The parameters specified apply to fixed public telephony services irrespective of whether supplementary services are offered, subscribed to or invoked for a particular call.

Annex E provides a proforma for the provision of statistics to an NRA.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

[1] Directive 98/10/EC of the European Parliament and of the Council of 26 February 1998 on the application of open network provision (ONP) to voice telephony and on universal service for telecommunications in a competitive environment.

[2] Directive 97/51/EC of the European Parliament and of the Council of 6 October 1997 amending Council Directives 90/387/EEC and 92/44/EEC for the purpose of adaptation to a competitive environment in telecommunications.

[3] ITU-T Recommendation E.800: "Telephone network and ISDN quality of service, network management and traffic engineering: Terms and definitions related to quality of service and network performance including dependability".

[4] ITU-T Recommendation I.210: "Integrated Services Digital Network (ISDN) service capabilities: Principles of telecommunication services supported by an ISDN and the means to describe them".

[5] Directive 90/387/EC of the European Parliament and of the Council on harmonized conditions of access to public networks and service.

3 Definitions and abbreviations

3.1 Definitions

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

access line: connection from the Network Termination Point to the entry point to the local switch or remote concentrator, whichever is the nearer. In many cases this is the main distribution frame

access network operator: organisation that provides the access line. In many cases the access network operator will be the direct service provider, but if the line is unbundled, the direct service provider would be a separate organisation

customer: party that pays for the telecommunication service(s) provided. Customers can generally be categorized as business or residential; the definition of business and residential customers is left to individual service providers. Service providers who receive interconnect services from other service providers are not considered to be customers for the purpose of this Guide. The term "customer" is equivalent to "subscriber", which is used in Directive 98/10/EC [1]. "Customer" is the more modern term

direct service: service where the service provider that provides the telecommunication service(s) also provides the access network or rents an unswitched local loop (unbundled local loop) to use for the provision of the service to the customer

fixed public telephony service: service where the call originates on a fixed public telephone network irrespective of its destination. This service may include access to emergency services, the provision of operator assistance, directory services, provision of public payphones, provision of service under special terms and/or provision of special facilities for customers with disabilities or with special social needs, as set out in this Directive, but does not include value added services provided over the public telephone network. (Second part copied from Directive 98/10/EC [1])

indirect service: service where the service provider that provides the telecommunication service(s) does not provide the access network but is selected by the customer or user using a form of carrier selection

network operator: organisation that provides a network for the provision of a public telecommunication service. If the same organisation also offers services it also becomes a service provider

network termination point: physical point at which a user is provided with access to a public telecommunications network. The locations of network termination points shall be defined by the national regulatory authority and shall represent a boundary, for regulatory purposes, of the public telecommunications network; (Copied from Directive 97/51/EC [2] which amended the original ONP Directive 90/387/EC [5])

ported number: subscriber number (directory number) where the location of the NTP and/or the identity of the service provider has changed after the number was originally allocated

public pay-telephone: telephone available to the general public, for the use of which the means of payment are coins and/or credit/debit cards and/or pre-payment cards (copied from Directive 98/10/EC [1])

NOTE 1: This definition excludes courtesy telephones whose outgoing call capabilities are strictly limited and where no charges are normally made.

quality of service: collective effect of service performance which determines the degree of satisfaction of a user of the service. (Taken from ITU-T Recommendation E.800 [3])

service provider: organisation that offers a telecommunication service to the customer and/or user. A service provider need not be a network operator

NOTE 2: A service provider that is subject to the requirements of the ONP Voice Telephony Directive will in most cases also be a network operator.

supplementary service: additional service that modifies or supplements a basic telecommunication service. Consequently, it cannot be offered to a customer as a stand-alone service; it has to be offered in association with a basic telecommunication service. The same supplementary service may be common to a number of basic telecommunication services. See ITU-T Recommendation I.210 [4]

user: individuals, including consumers, or organizations using or requesting publicly available telecommunications services. (Copied from Directive 98/10/EC [1])

voice telephony service: service available to the public for the commercial provision of direct transport of real-time speech via the public switched network or networks such that any user can use equipment connected to a network termination point at a fixed location to communicate with another user of equipment connected to another termination point. (Copied from Directive 98/10/EC [1])

3.2 Abbreviations

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

CLI	Calling Line Identity
CPE	Customer Premises Equipment (controlled and normally provided by the customer)
ISDN	Integrated Services Digital Network
MDF	Main Distribution Frame
NRA	National Regulatory Authority
NTP	Network Termination Point
ONP	Open Network Provision
PSTN	Public Switched Telephone Network
QoS	Quality of Service

4 General considerations

4.1 Services covered

The parameters specified apply to fixed public telephony services irrespective of whether supplementary services are offered, subscribed to or invoked for a particular call. The parameters do not apply to the quality of supplementary services themselves.

The parameters are end-user / customer and end-to-end orientated and are not intended to address the quality of interconnect services explicitly. Any dependence on interconnect services is included implicitly in the measures of QoS provided to the end user.

In many cases the provider of the voice telephony service to the customer may depend on other providers for part of the service. An example is an international call where several service providers are normally involved. In such cases the provider of the service to the customer is responsible for all elements for which it receives payment from the customer. In order to provide satisfactory QoS, this service provider will need to ensure that adequate QoS is provided by the other interconnected service providers. QoS figures for the responsible service provider will reflect both its own capability and that of the interconnected service providers.

The parameters apply to all fixed voice telephony services irrespective of the network technology chosen by the service provider, e.g. PSTN, ISDN or other technology, and the destination of the call. Service providers should include in their measurements calls to numbers served by mobile networks and calls to international destinations, however for some parameters separate measures are required for national and international destinations.

4.2 Reporting for different classes of customers

For each parameter, service providers should provide statistics aggregated over all classes of customer. In addition to the provision of aggregated information, service providers who distinguish between different classes, e.g. residential and business, may provide separate statistics, but they are not required to do so.

4.3 Non standard levels of QoS

Statistics provided should apply only to the standard level of QoS for each parameter. Cases where customers choose to pay more for enhanced or less for lower QoS should be excluded.

4.4 Reporting for directly- and indirectly-serviced customers

The principle used is that the service provider who charges the customer should be responsible for the quality of the service and for providing QoS statistics relevant to the service provided. Thus, in the case of carrier selection, the indirect service provider has the responsibility for QoS and provision of QoS statistics when it is selected to carry a call.

For each parameter in clause 5 a statement is made on whether it is applicable to indirect services.

Some service providers provide both direct and indirect services. Where there are likely to be significantly different levels of performance for these two service types, separate reporting is required for each service type, otherwise only a single combined statistic needs to be reported.

The treatment of direct and indirect services is summarized in the last column of table 1.

NOTE: Where only a combined statistic for both types of service is specified, separate statistics for each service type may be provided in addition if the service provider wishes to do so.

4.5 Data processing issues

Where the measures are based on all actual occurrences rather than samples, service providers may prefer to process data on a weekly or monthly basis, discard the detailed data and use a statistical method such as that specified in annexes A and B for combining the weekly or monthly results. Whether or not this approach may be used should be agreed with the NRA concerned.

For several parameters the statistic required is "the time by which the fastest X % is ...". This statistic is explained in annex B.

Service providers should agree with the NRA how instances of data loss, corruption or incompleteness should be handled.

In some cases disasters, freak weather, etc. may distort measured QoS figures. Such occurrences may not necessarily damage a network, but could degrade QoS by inducing exceptional traffic levels etc. In these cases, service providers should provide the measured QoS and may additionally provide a second figure which excludes the effects of the exceptional circumstances. A note clearly explaining the difference should also be provided. Service providers covering large geographical areas are likely to be more prone to these effects than service providers serving smaller areas. The effect on the reported QoS of a service provider covering a small area is likely to be more severe, however, should such an event occur.

4.6 Data collection period

QoS data should be collected and calculated on a quarterly basis starting 1 January, 1 April etc.

NOTE: Reporting and publication arrangements are not specified in the Directive and would normally be decided by the NRA.

4.7 Sampling and test calls

Where sampling and test calls are used the approach should ensure that the results adequately reflect the QoS perceived by customers for the period under review.