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**SERIES E: OVERALL NETWORK OPERATION,
TELEPHONE SERVICE, SERVICE OPERATION AND
HUMAN FACTORS**

Quality of telecommunication services: concepts, models,
objectives and dependability planning – Terms and
definitions related to the quality of telecommunication
services

Definitions of terms related to quality of service

Recommendation ITU-T E.800



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Recommendation ITU-T E.800

Definitions of terms related to quality of service

Summary

Recommendation ITU-T E.800 provides a set of commonly used terms in the study and management of quality of service (QoS). The technical and non-technical terms related to the QoS listed in this Recommendation are intended to represent the interests of all parties of telecommunications service market, i.e., user, service provider, manufacturer and regulator.

The definition of terms is in the context of QoS. Some terms may be defined differently in other documents in another context. Therefore, care should be taken in the use of such terms in their appropriate context. For a comprehensive set of QoS terms, one is referred to Recommendations related to specific services or performance characteristics.

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Source

Recommendation ITU-T E.800 was approved on 23 September 2008 by ITU-T Study Group 2 (2005-2008) under the WTSA Resolution 1 procedure.

FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications, information and communication technologies (ICTs). The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of ITU. ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

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Recommendation ITU-T E.800

Definitions of terms related to quality of service

1 Introduction

1.1 Overview

Terminology standardization is necessary for two main reasons:

- to avoid confusion to standards users by introducing conflicting terms and definitions;
- to assist alignment between the various groups involved in telecommunication standards development.

A consistent set of terms and definitions is required, therefore, to develop the important areas of quality of service (QoS) and network performance (NP). The technical and non-technical terms related to the QoS listed in this Recommendation are intended to represent the interests of all parties of telecommunications service market, i.e., user, service provider, manufacturer and regulator.

The definition of terms is in the context of QoS. Some terms may be defined differently in other documents in another context. Therefore, care should be taken in the use of such terms in their appropriate context.

The intention of this Recommendation is to set out a comprehensive set of terms and definitions relating to these concepts. These collective terms and definitions can be universally applied to all telecommunication services and the network arrangements used to provide these.

This Recommendation is intended to cover the commonly used terms in the study and management of QoS. For a comprehensive set of QoS terms, one is referred to Recommendation(s) related to specific services or performance characteristics.

1.2 General guide to concepts

The end-to-end QoS depends on the contributions made by the components as illustrated in Figure 1.

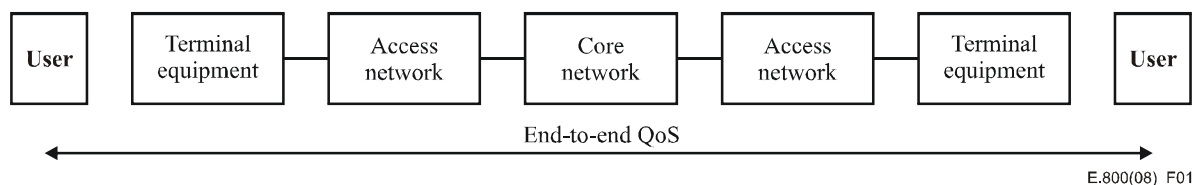


Figure 1 – Schematic contributions to end-to-end QoS

NOTE 1 – The configuration illustrated above is for the conventional service with users at each end of a connection. However, the principle of this configuration may be applied to services offered by a service provider at one end and user/s at the other end.

NOTE 2 – Terminal equipment: Contribution to the end-to-end QoS could depend on the variability of the performance of the terminal equipment.

NOTE 3 – Access network: The contributions of access network to the end-to-end QoS depend on the combination of access medium and technology used for a particular service (e.g., wireless, cable, ADSL etc.).

NOTE 4 – Core network: The core network may be a single provider or a concatenation of different provider's networks. QoS contribution to end-to-end performance from core network will be governed by the contributions from individual network components (whether single provider or multi providers); technology used (digital multiplexing, IP, etc.) transmission media (air, cable optical or metal) and other factors.

To specify the end-to-end QoS, it is necessary to state the specified operating conditions in which a service is supported over a connection (connectionless or connection oriented) that takes place. The QoS could also be altered for a given set of specified operating conditions by environmental conditions, such as traffic and routing.

Figure 2 illustrates the relationship between QoS and network performance (NP). QoS comprises both network performance and non-network related performance. Examples of NP are bit error rate, latency, etc., and for non-network performance provision time, repair time, range of tariffs and complaints resolution time, etc. The list of QoS criteria for a particular service would be dependent upon the service and their relevance could vary among the segments of the customer population.

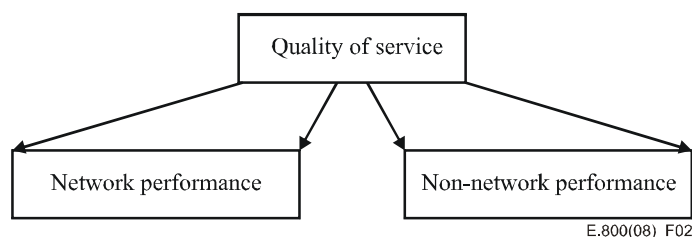


Figure 2 – Quality of service comprises network and non-network criteria

At a more detailed level, QoS can be divided into four viewpoints as illustrated in Figure 3. This concept is described further in [ITU-T G.1000].

A generic definition of QoS is derived from a definition of quality and is given in clause 2. Of particular interest is QoS experienced by the user (expressed by QoSE or QoSP – QoS perceived). QoSE is influenced by the delivered QoS and the psychological factors influencing the perception of the user. Understanding of the QoSE is of primary importance to help optimize revenue and resources of the service provider.

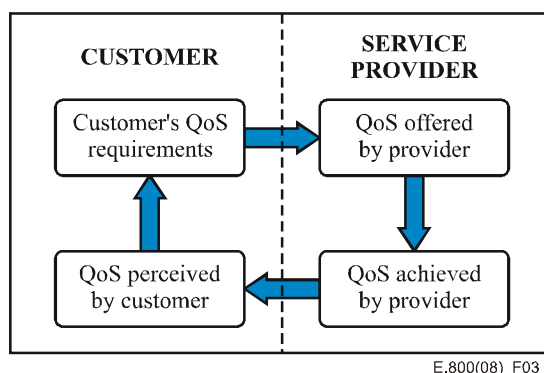


Figure 3 – Four viewpoints of quality of service

Various issues related to QoS are brought together in [ITU-T E.802]. It also shows the inter-relationship between various QoS aspects.

2 General terms

2.1 Quality

The totality of characteristics of an entity that bear on its ability to satisfy stated and implied needs.

NOTE – The *characteristics* should be observable and/or measurable. When the characteristics are defined, they become parameters and are expressed by metrics (see clauses 2.7 to 2.13).

2.2 Quality of service (QoS)

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

2.3 QoS requirements of user/customer (QoSR)

A statement of QoS requirements by a customer/user or segment/s of customer/user population with unique performance requirements or needs.

NOTE – The customer/user needs may be expressed in descriptive terms (criteria) listed in the order of priority, with preferred performance value for each criterion. The service provider then translates these into parameters and metrics pertinent to the service (see [ITU-T E.802]).

2.4 QoS offered/planned by service provider (QoSO)

A statement of the level of quality planned and therefore offered to the customer by the service provider.

NOTE – Level of QoS the service provider plans to achieve (and therefore offers) to the customer/user is expressed by target values (or range) for measures of parameters pertinent to a specified service.

2.5 QoS delivered/achieved by service provider (QoSD)

A statement of the level of QoS achieved or delivered to the customer.

NOTE – Achieved or delivered QoS is expressed by metrics for the pertinent parameters for a service.

2.6 QoS experienced/perceived by customer/user (QoSE)

A statement expressing the level of quality that customers/users believe they have experienced.

NOTE 1 – The level of QoS experienced and/or perceived by the customer/user may be expressed by an opinion rating.

NOTE 2 – QoSE has two main components: quantitative and qualitative. The quantitative component can be influenced by the complete end-to-end system effects (network infrastructure).

NOTE 3 – The qualitative component can be influenced by user expectations, ambient conditions, psychological factors, application context, etc.

NOTE 4 – QoSE may also be *considered* as QoSD received and interpreted by a user with the pertinent qualitative factors influencing his/her perception of the service.

2.7 Characteristic

A property which helps to differentiate between the individuals of a given population.

NOTE – The differentiation may be either quantitative (by variables) or qualitative (by attributes).

2.8 Criterion

Collections of characteristics or a single characteristic, as appropriate, to describe benefit to user of a product or a service.

2.9 Parameter

A quantifiable characteristic of a service with specified scope and boundaries.

Example: The parameter for estimating the 'misdialling probability' would be expressed as: 'The number of misdialed calls per 100 call attempts'.

NOTE – Parameters may be objective or subjective.

2.10 Objective (Quantitative) parameters

Parameters that are measurable (with instruments or observations) and a performance value assigned quantitatively may be classified as objective parameters.

NOTE – Examples: error rate of a channel, repair time.