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TELEPHONE NETWORK AND ISDN

QUALITY OF SERVICE, NETWORK MANAGEMENT AND TRAFFIC ENGINEERING

LAND MOBILE AND FIXED NETWORK INTERCONNECTION TRAFFIC GRADE OF SERVICE CONCEPT

ITU-T Recommendation E.770

(Previously "CCITT Recommendation")

FOREWORD

The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of the International Telecommunication Union. The 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 Conference (WTSC), which meets every four years, established the topics for study by the ITU-T Study Groups which, in their turn, produce Recommendations on these topics.

ITU-T Recommendation E.770 was prepared by the ITU-T Study Group II (1988-1993) and was approved by the WTSC (Helsinki, March 1-12, 1993).

NOTES

1 As a consequence of a reform process within the International Telecommunication Union (ITU), the CCITT ceased to exist as of 28 February 1993. In its place, the ITU Telecommunication Standardization Sector (ITU-T) was created as of 1 March 1993. Similarly, in this reform process, the CCIR and the IFRB have been replaced by the Radiocommunication Sector.

In order not to delay publication of this Recommendation, no change has been made in the text to references containing the acronyms "CCITT, CCIR or IFRB" or their associated entities such as Plenary Assembly, Secretariat, etc. Future editions of this Recommendation will contain the proper terminology related to the new ITU structure.

2 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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LAND MOBILE AND FIXED NETWORK INTERCONNECTION TRAFFIC GRADE OF SERVICE CONCEPT

(Helsinki, 1993)

1 Introduction

This Recommendation outlines the general considerations for land mobile and fixed network interconnection trafficability performance concept and provides guidelines for selecting GOS (Grade of Service) parameters. In this Series of Recommendations, the term GOS always refers to traffic Grade of Service parameters as defined in Recommendation E.600.

GOS parameters effects on other traffic independent, user-perceived effects such as unavailability, service integrity and radio/service coverage contribute to the Quality of Service (QOS). The variation of the transmission quality of the channel may depend on how resources in the radio interface are engineered and managed (i.e. may be traffic related) and may affect QOS.

The relationship (or trade-off) between trafficability performance and transmission performance is for further study (E.800).

Land mobile and fixed network interconnection GOS parameters are given in subsequent Recommendations in the E.770-Series.

2 GOS concept

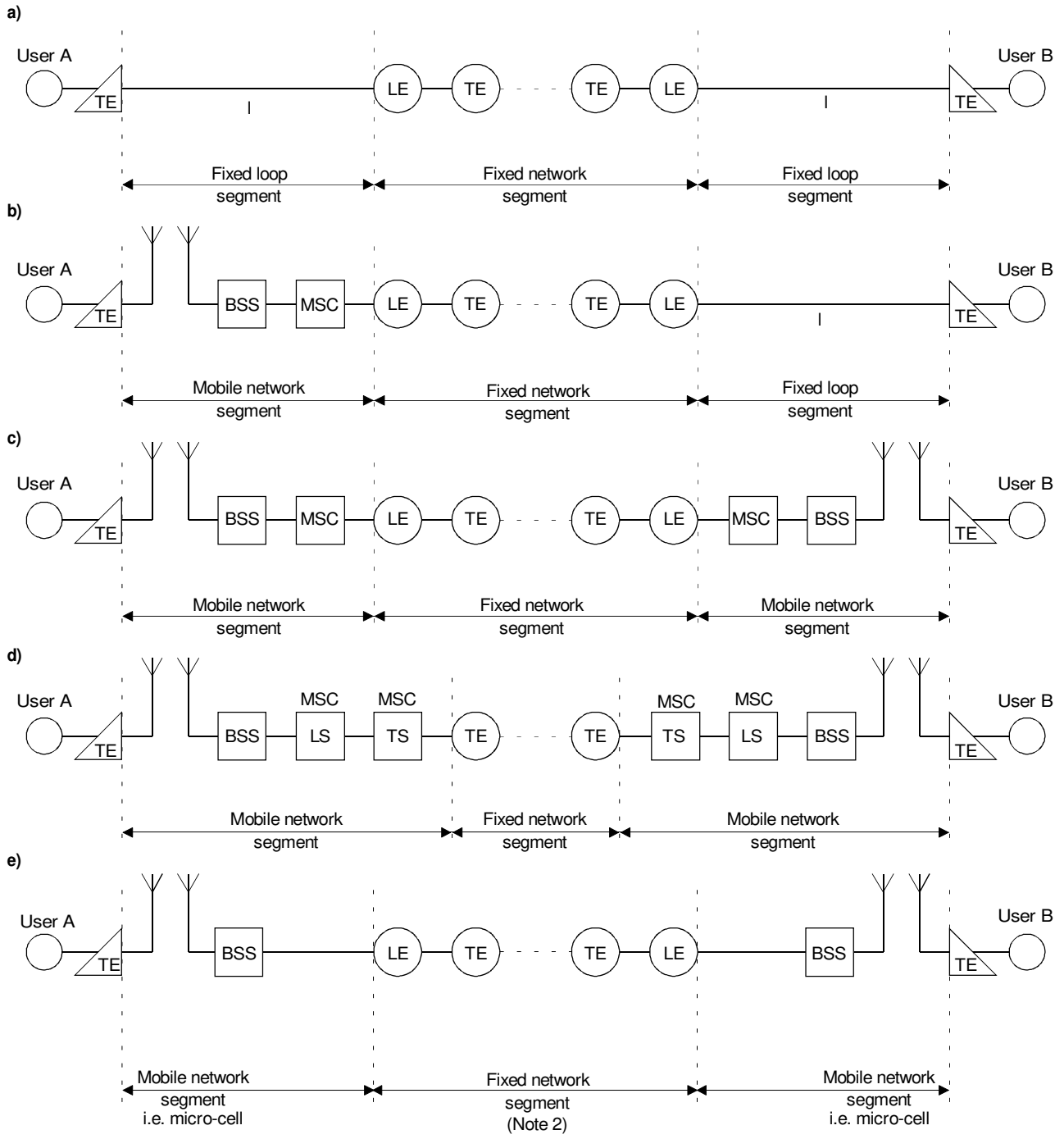
General concepts expressed in Recommendation E.720 are also applicable to land mobile and fixed network interconnection. However, peculiarities of the radio interface, such as variable transmission quality of the channel during the course of the same connection and the need of spectrum reuse to cope with traffic demand, as in the case of cellular systems, impact traffic GOS parameters in a unique way.

The users of telecommunications services supported through mobile/fixed network interconnection can experience the effects of GOS parameters depending on their perception of events such as those listed under points 1) to 3) in Recommendation E.720 plus those which are mobile-specific. The latter are associated, for example, with failure of handover attempts or excessive delay to satisfy handover attempts. Whereas in the cases listed in Recommendation E.720, the ability to distinguish GOS depends on having distinct indications of called user and network conditions, in the latter cases users can appreciate GOS directly through deterioration of the transmission quality of the channel and the possible cut-off of an established connection.

3 Principles to allocate GOS targets

The principles to allocate GOS targets for connections including a mobile network segment are generally the same as those described in Recommendation E.720. Accordingly, GOS target values are initially set end-to-end (user GOS) and subsequently allocated to network segments.

In a connection, mobile network segments may replace, from a logical point of view, fixed network counterparts. Typically, the wireless access and the wireline infrastructure between a land mobile terminal and a local (or transit) exchange may replace the subscriber loop in the fixed network (see Figure 1). Other situations may depend on the architecture of mobile systems, the layout chosen for mobile/fixed network interconnection, the supported services and concepts (e.g. UPT, Universal Personal Telecommunications) and the number and role of mobile networks, mobile network operators, and mobile service providers.



NOTES

1 Case b), c) and d) consider that mobile network switches are not integrated within the fixed network.

2 MSC functions are included in the LEs.

FIGURE 1/E.770

Possible connection realizations: a) fully supported by the fixed network; b), c), d) and e) supported by replacing fixed network segments with mobile network segments

It may not be possible, in general, for mobile network segments of existing systems to cost-effectively maintain some (or all) of the performance targets set for GOS parameters associated with corresponding fixed network segments. This is consistent with the current perception of mobile users that a service provided via a mobile network, or network segment, can hardly compare on an equal basis with the same service fully provided through the fixed network.

A differentiation of the GOS performance targets for specific network segments and in specific situations with respect to their fixed network logical counterparts is introduced in principle. The differentiation must, however, guarantee that specific bounds to the end-to-end GOS parameters values are met. It is expected that future technology and system design will relax or even not require differentiation of GOS targets for mobile network segments.

In connections comprising both mobile and fixed network segments, the allocation of GOS targets for the fixed network segments shall be the same as for end-to-end fixed network connections. In other words, interconnection of mobile and fixed networks should not impose any requirement for additional performance nor any restriction in the normal operation of the fixed network, in accordance with Recommendation E.220.

This enables independent design and implementation of functional network elements, both fixed and mobile.

Different GOS budgets for the mobile network may result from different fixed network segment replacements.

4 Principles to select GOS land mobile and fixed network interconnection parameters

For further study.

5 History

Recommendation first published in 1993.