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ITU-T E.755

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TELEPHONE NETWORK AND ISDN

QUALITY OF SERVICE, NETWORK MANAGEMENT AND TRAFFIC ENGINEERING

REFERENCE CONNECTIONS FOR UPT TRAFFIC PERFORMANCE AND GOS

ITU-T Recommendation E.755

(Previously "CCITT Recommendation")

FOREWORD

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

The approval of Recommendations by the Members of the ITU-T is covered by the procedure laid down in WTSC Resolution No. 1 (Helsinki, March 1-12, 1993).

ITU-T Recommendation E.755 was prepared by ITU-T Study Group 2 (1993-1996) and was approved under the WTSC Resolution No. 1 procedure on the19th of February 1996.

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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SUMMARY

This Recommendation provides high level reference connections for UPT call/connection setup. The primary purpose of reference connections is to provide a basis for developing traffic grade of service (GOS) Recommendations for networks supporting UPT.

Recommendation E.755

REFERENCE CONNECTIONS FOR UPT TRAFFIC PERFORMANCE AND GOS

(Geneva, 1996)

1 Scope

This Recommendation provides high level reference connections for UPT call/connection setup. The primary purpose of reference connections is to provide a basis for developing traffic Grade of Service (GOS) Recommendations for networks supporting UPT.

The traffic GOS takes into account the impact of both bearer network traffic and the associated traffic on the signalling network. The traffic GOS includes delay and blocking performance as reflected in the specification of GOS parameters described in Recommendation E.775.

The underlying UPT call flow model in the reference connections should be used as a basis for more implementation-specific configurations for detailed performance analysis and GOS target setting.

2 Related Recommendations

The following Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision: all users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published.

- ITU-T Recommendation E.168 (1993), *Application of E.164 numbering plan for UPT*.
- ITU-T Recommendation E.174 (1995), *Routing principles and guidance for universal personal telecommunication*.
- ITU-T Recommendation F.115 (1995), *Service objectives and principles for future public land mobile telecommunication systems*.
- ITU-T Recommendation F.850 (1993), *Principles of Universal Personal Telecommunication (UPT)*.
- ITU-T Recommendation F.851 (1995), *Universal Personal Telecommunication (UPT) – Service description (service set 1)*.
- ITU-T Recommendation I.114 (1993), *Vocabulary of terms for universal personal telecommunication*.
- ITU-T Recommendation I.373 (1993), *Network capabilities to support Universal Personal Telecommunication (UPT)*.
- CCITT Recommendation Q.1201 (1992), *Principles of intelligent network architecture*.

3 Definitions

For the purposes of this Recommendation, definitions provided in Recommendations I.114 and F.851 will be applicable.

4 Abbreviations

For the purposes of this Recommendation, the following abbreviations are used.

BSS	Base Station System
FPLMTS	Future Public Land Mobile Telecommunication Systems
GOS	Grade of Service
GW	Gateway (Mobile switching centre)
HLR	Home Location Register
IN	Intelligent Network
ISDN	Integrated Services Digital Network
LE	Local Exchange
MSC	Mobile Switching Centre
PLMN	Public Land Mobile Networks
PSTN	Public Switched Telephone Network
SCP	Service Control Point
SDP	Service Data Point
SRF	Specialized Resource Function
SS No. 7	Signalling System No. 7
SSP	Service Switching Point
UPT	Universal Personal Telecommunication

5 Introduction

UPT represents an emerging telecommunications service concept which will provide personal mobility and associated service portability features across both fixed and wireless access types using the advances in network intelligence and signalling. The Intelligent Network (IN) will support the necessary database requirements and provide personal mobility and call, connection and service management functions for UPT. The Signalling System No. 7 (SS No. 7) network, with suitable application protocols for UPT, will provide the messaging backbone for UPT service.

The scope of UPT includes provision of UPT service across multiple networks and different terminal types (fixed, mobile, portable). Thus, a UPT user can originate and receive calls, and access subscribed services in a network different from his home network from a terminal designated by the user.

The scenario where both the calling and called users are UPT subscribers and both users are visiting in different networks, will occur with increasing frequency as the demand for UPT service increases within the travelling public and increasing number of UPT network/service providers emerge. Because of the increased database look-ups in this scenario and attendant potential for increased call setup delays, it represents a suitable candidate for a benchmark configuration for setting traffic GOS standards for networks supporting UPT service.

6 Reference connections

Reference connections are aimed at identifying representative cases without involving the specifics of actual realizations. (For example, databases should be considered – as far as practicable – at the functional level, without considering the specifics of actual partitioning and distribution.)

Though the initial implementations of UPT (Service Set 1) will be on fixed networks, both Recommendations F.851 and F.115 require support of UPT on mobile networks in the longer term. To reflect this phased evolution of UPT, this Recommendation provides two reference connections (Figure 1) suitable for UPT traffic engineering and traffic GOS studies. Both reference connections assume the case of UPT-to-UPT user connection, but in one reference connection the called UPT user is on a fixed terminal (medium term scenario) whereas in the other reference connection the called UPT user is on a wireless terminal (longer term scenario).

The reference connections of Figure 1 are intended to represent nearly worst-case configurations with respect to UPT performance (database access requirements and call setup).

The following assumptions are implicit:

i) both UPT users are outside their respective home networks;

ii) the service profile databases are available only in their respective home networks;

iii) the terminating user is already registered on a fixed - case a) - or wireless - case b) - terminal;

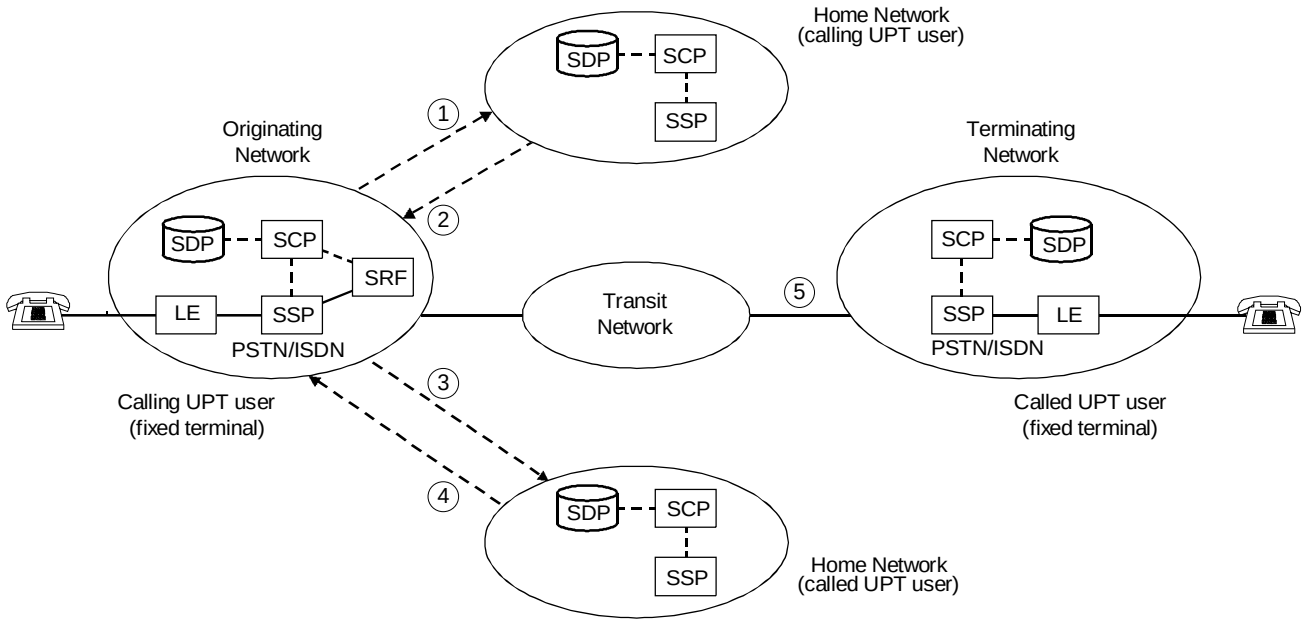
iv) full SS No. 7/IN capabilities are assumed;

v) each network maintains the service profile of the UPT user in a database. (The physical architecture of the database is not considered here.);

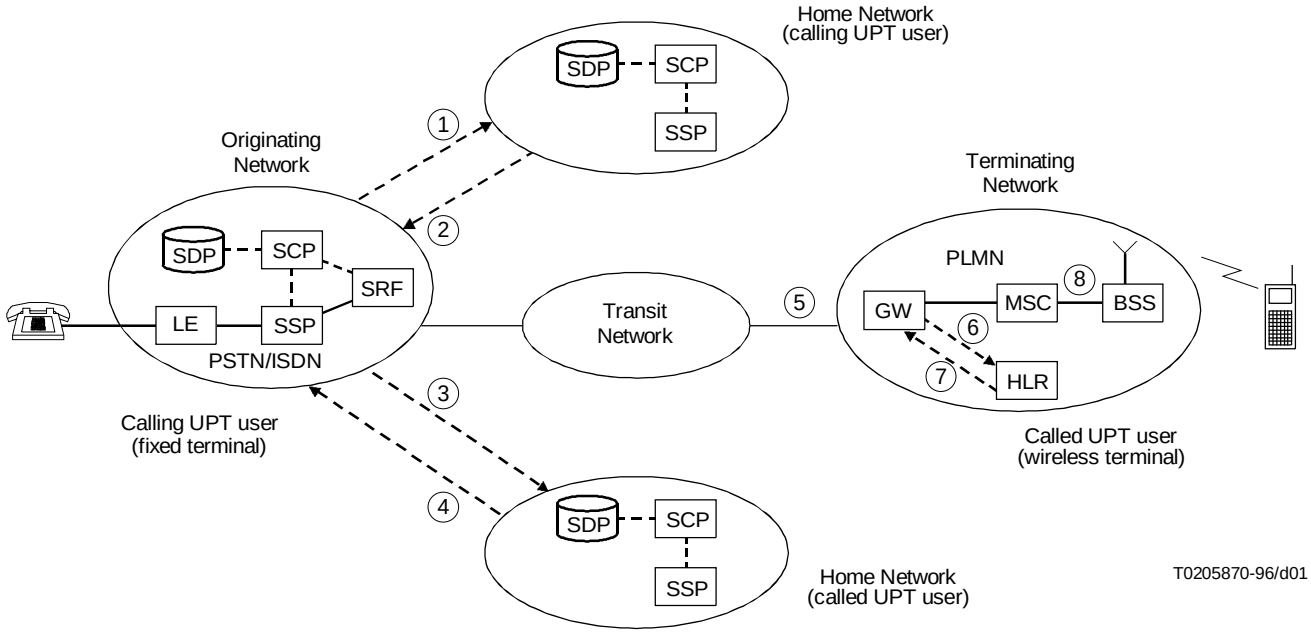
vi) the UPT number contains an indication of the location of the home network of the called user.

7 History

Recommendation first published in 1995.



Case a): Called UPT user registered via a fixed terminal



Case b): Called UPT user registered via a wireless terminal

Signalling connection

Bearer connection

NOTES

1 The specific interface (i.e. SCP-SCP, or SCP-SDP, or SDP-SDP) for internetwork signalling is for further study.

2 Bearer and signalling circuits in each network may consist of terrestrial and/or satellite connections.

3 Numbers 1 to 8 indicate the sequence of operations. In particular, 1 and 2 indicate registration/authentication of calling user; 3 and 4 indicate association of called UPT Number with Routing Number in case a), or with mobile station number in case b); 5 indicates bearer connection to the terminating network; 6 and 7 indicate mapping of mobile station number onto mobile station routing number; 8 indicates call completion to called (PLMN) user.

FIGURE 1/E.755

Reference connections for UTP traffic performance and GOS (UTP user to UTP user)