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SERIES E: TELEPHONE NETWORK AND ISDN

Quality of service, network management and traffic engineering – Traffic engineering – Mobile network traffic engineering

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Network grade of service parameters for UPT

ITU-T Recommendation E.776

(Previously CCITT Recommendation)

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ITU-T RECOMMENDATION E.776

NETWORK GRADE OF SERVICE PARAMETERS FOR UPT

Summary

Based on the reference connection for UPT in Recommendation E.755 and the grade of service concepts for UPT outlined in Recommendation E.775, this Recommendation proposes a set of traffic grade of service parameters for UPT.

Source

ITU-T Recommendation E.776 was prepared by ITU-T Study Group 2 (1993-1996) and was approved under the WTSC Resolution No. 1 procedure on the 8th of October 1996.

FOREWORD

ITU (International Telecommunication Union) is the United Nations Specialized Agency in the field of telecommunications. The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of the 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).

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.

CONTENTS

Recommendation E.776

NETWORK GRADE OF SERVICE PARAMETERS FOR UPT

(Geneva, 1996)

1 Scope

Based on the reference connection for UPT in Recommendation E.755 and the grade of service concepts for UPT outlined in Recommendation E.775, this Recommendation proposes a set of traffic grade of service parameters for UPT.

2 References

The following Recommendations contain material that is either relevant to or provides background for this Recommendation:

– ITU-T Recommendation E.600 (1993), *Terms and definitions of traffic engineering*.

– CCITT Recommendation E.721 (1991), *Network grade of service parameters and target values for circuit-switched services in the evolving ISDN.*

– CCITT Recommendation E.723 (1992), *Grade of service parameters for Signalling System No. 7 networks*.

– ITU-T Recommendation E.771 (1996), *Network grade of service parameters and target values for circuit-switched land mobile services.*

– ITU-T Recommendation E.755 (1996), *Reference connection for UPT traffic performance and GOS.*

– ITU-T Recommendation E.775 (1996), *UPT grade of service concept.*

– 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.373 (1993), *Network capabilities to support Universal Personal Telecommunication (UPT).*

– ITU-T Recommendation I.114 (1993), *Vocabulary of terms for universal personal telecommunication.*

– CCITT Recommendation Q.1201 (1992), *Principles of intelligent network architecture*.

3 Definitions

For the purposes of this Recommendation, definitions provided in Recommendations E.600, E.721, I.114 and F.851 will be applicable. Additional definitions related to access security performance are provided below:

3.1 The **authentication delay** is defined as the time interval from the instant the UPT user completes the authentication request (e.g. imputing the PIN/password) until the UPT user receives the decision (acceptance or rejection) from the network.

3.2 The **false rejection rate** is the probability that the network will return a decision of rejection to the authentication attempt of a legitimate UPT user.

3.3 The **impostor acceptance rate** is the probability that the network will return a decision of acceptance to the authentication attempt by an unauthorized user.

4 Abbreviations

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

GOS Grade of Service

IN Intelligent Network

ISDN Integrated Services Digital Network

PLMN Public Land Mobile Network

PSTN Public Switched Telephone Network

PIN Personal Identification Number

UPT Universal Personal Telecommunication

5 Introduction

A natural starting point from where a suitable set of traffic performance parameters for UPT should evolve is the existing performance standards for ISDN, SS No. 7, IN and Public Land Mobile Networks (PLMNs). The traffic performance parameters for these networks are specified in Recommendations E.721, E.723, E.724 and E.771, respectively. These can be modified and extended to include some of the specific service/network requirements for UPT discussed in Recommendation E.775.

6 Traffic grade of service parameters for UPT

The above approach together with a proposed initial set of traffic performance parameters for UPT is outlined in Figure 1.

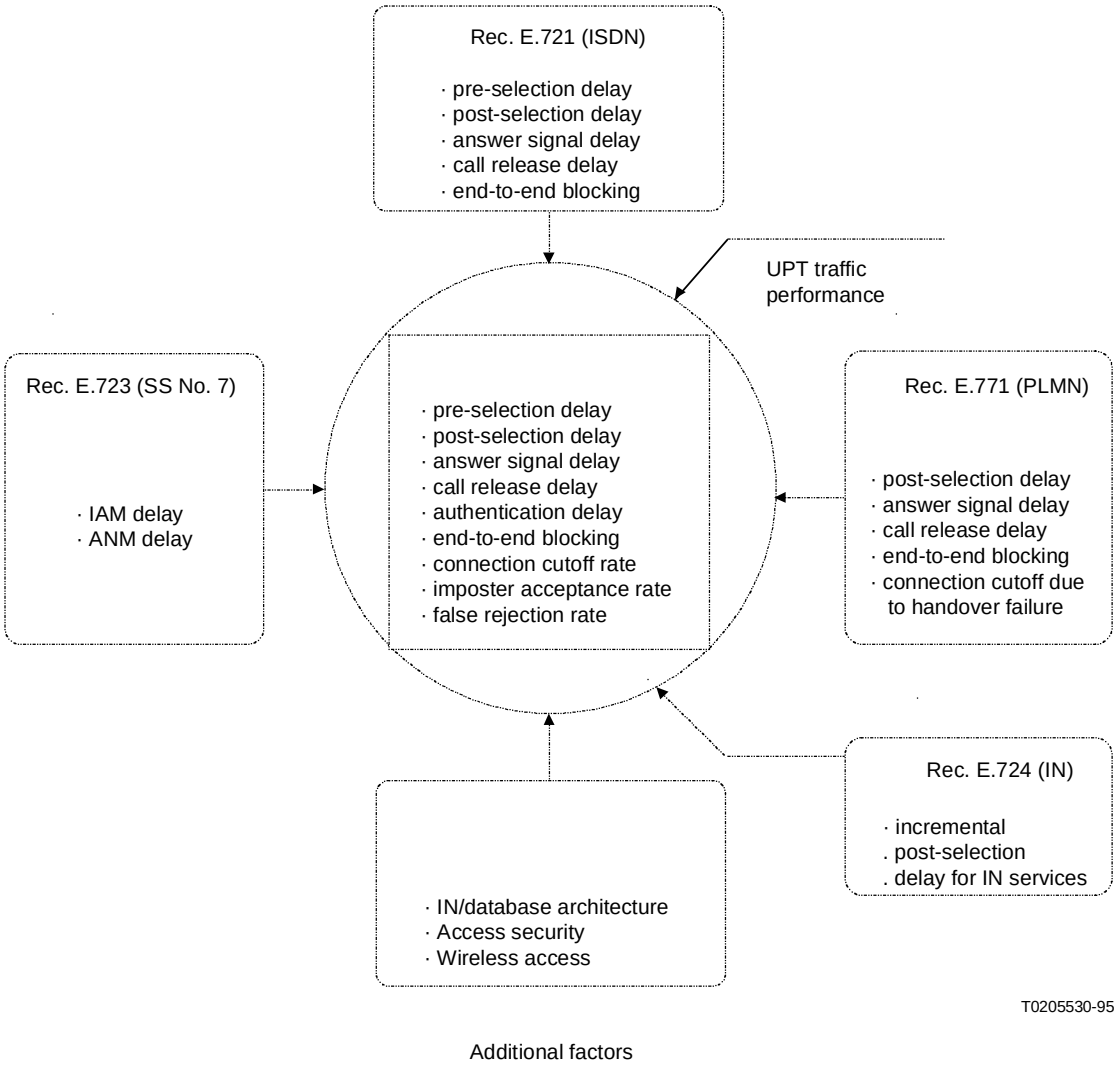

FIGURE 1/E.776

Approach for evolving UPT traffic performance parameters

Authentication delay, impostor acceptance rate and false rejection rate are parameters related to the security aspects which is an additional requirement for UPT. Security of access to UPT service is required in order to protect the user's resources or information from unauthorized persons (fraudulent use), or from unauthorized listening or recording of information (eavesdropping). The access security procedures thus minimize the probability of incorrect charging, malicious call redirection and ensure integrity of user's information and privacy.

Various methods and protocols to provide access security for personal mobility (UPT) and terminal mobility (FPLMTS) are being considered. Some of the potential options include:

a) use of PIN (Personal Identification Number) and UPT number over DTMF signalling;

b) use of a UPT device (smart card); and

c) use of speaker verification techniques.

Each option will have different characteristics with respect to the access security parameters.

In general, there will be a trade-off between false rejection (level of user annoyance) and impostor acceptance (breach of security), and also between the level of security (low impostor acceptance) and authentication delay.

If a UPT device (smart card) is used for authentication/verification, authentication delay will depend on the length of the authentication codes, the nature of the authentication process deployed (challenge-response), and the signalling and database access delays. In case of authentication based on "speaker verification" methods, this delay will depend on such factors as: length of the verification phrase, number of repeat attempts permitted, and whether voice prompts are permitted.

In most access/entry control systems, false rejection rates of 2-3%, and impostor acceptance rates of 0.1-0.5% are generally considered suitable. In telecommunication network applications, the user environment is less controlled and the populations are large and (geographically) distributed. The latter results in prohibitive costs of handling false rejections. Furthermore, frequent false rejections and inadequate provision of fallback mechanisms can alienate the users thereby reducing user satisfaction and acceptance of the service. Lower false rejection rates (1-2%) are therefore recommended in these applications. Imposter acceptance rates in the range of 1% may be tolerable (weak authentication) as they compare favourably with conventional means of identity verification over the telephone (e.g. PIN/password over a telephone keypad).

Further study is required to set definitive targets for the access security-related performance parameters for UPT.

7 Target values

For further study.

8 History

This is the first issue of Recommendation E.776

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