INTERNATIONAL TELECOMMUNICATION UNION

CCITT

THE INTERNATIONAL
TELEGRAPH AND TELEPHONE
CONSULTATIVE COMMITTEE

E.721

(11/1988)

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

Traffic engineering – ISDN traffic engineering

NETWORK GRADE OF SERVICE PARAMETERS IN ISDN

Reedition of CCITT Recommendation E.721 published in the Blue Book, Fascicle II.3 (1988)

NOTES

1 CCITT Recommendation E.721 was published in Fascicle II.3 of the *Blue Book*. This file is an extract from the *Blue Book*. While the presentation and layout of the text might be slightly different from the *Blue Book* version, the contents of the file are identical to the *Blue Book* version and copyright conditions remain unchanged (see below).

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

© ITU 1988, 2007

All rights reserved. No part of this publication may be reproduced, by any means whatsoever, without the prior written permission of ITU.

Recommendation E.721

NETWORK GRADE OF SERVICE PARAMETERS IN ISDN

1 Introduction

This Recommendation proposes network Grade of Service (GOS) parameters for circuit-switched and packet-switched services in ISDN, based on the ISDN Grade of Service concept and guidelines for selecting GOS parameters provided in Recommendation E.720. These parameters are defined assuming that the network and the network components are fully operational.

2 Circuit-switched services

In the current ISDN specifications, call establishment and release for all circuit-switched services provided via B-channels (voice, data, image) will use the out-of-band call control procedures defined by Recommendation Q.931 and S.S. No. 7 (ISUP) signalling protocols. Thus, for the traffic GOS parameters that relate to call establishment and release phases, a single set of parameters can be used for all circuit-switched services provided by the ISDN.

The following four traffic GOS parameters are recommended for circuit-switched calls in ISDN:

1) pre-selection delay (overlap sending),

2) post-selection delay,

3) call release delay, and

4) probability of end-to-end blocking.

The definitions of these traffic GOS parameters are given below. The delay GOS parameters are based on the message flows in Recommendation Q.931 and S.S. No. 7 (ISUP) protocols as indicated, for example, in Figure A-1 /E.713.

2.1 *Pre-selection delay (overlap sending)*

pre-selection delay (overlap sending) is defined as the time interval from the instant the SABME message is passed by the calling terminal to the access signalling system until the SETUP ACK message is received by the calling terminal.

2.2 *Post-selection delay*

post-selection delay is defined as the time interval from the instant the INFO message containing the last selection digit (in the case of overlap sending or the SETUP message in the case of en-bloc sending) is passed by the calling terminal to the access signalling system until the first message indicating call disposition is received by the calling terminal.

Note – In the ISDN the called user can choose to delay the sending of the ALERTING signal to the calling user. This definition does not include such user-induced delays.

2.3 *Call release delay*

call release delay is defined as the time interval from the instant the DISCONNECT message is passed by the user terminal which terminated the call to the access signalling system, until the RELEASE message is received by the same terminal (indicating that the terminals can initiate/receive a new call).

2.4 *Probability of end-to-end blocking*

The **probability of end-to-end blocking** is the probability that a call attempt will be unsuccessful due to a lack of network resources.

Note – Resources in the access network are not part of this definition.

3 Packet-switched services

The ISDN user has a choice of two types of packet-switched data services. The B-channel provides 64 kbit/s packet access, while the D-channel can also be used to provide packet data access at 16 kbit/s (64 kbit/s in the case of primary access). For packet-switched services, the current call control procedures are based on X.25 (inband) protocols, except during the initial B- or D-channel set-up between the DTE (Data Terminating Equipment) and the PH (Packet Handler). Thus a certain number of messages will be exchanged between the TE (Terminal Equipment) and the LE (Local Exchange) over the D-channel during the initial establishment phase of a packet-switched call. The messages will have to compete with other signalling (SAPI 0) and data (SAPI 16) traffic on the D-channel.

Thus, the traffic GOS parameters for the current specification of ISDN packet-switched services will have to be based on the Q.931 as well as on the X.25 call control procedures.

The selection and definition of traffic GOS parameters for packet-switched services in ISDN are for further study.

4 Target values for GOS parameters

The target values will be specified at the normal and high loads in the same sense as Recommendation E.500. The delay target values will be specified by the mean and percentile levels for both normal and high loads.

The actual target values are for further study.

ITU-T E-SERIES RECOMMENDATIONS

OVERALL NETWORK OPERATION, TELEPHONE SERVICE, SERVICE OPERATION AND HUMAN FACTORS

OPERATION, NUMBERING, ROUTING AND MOBILE SERVICES	
INTERNATIONAL OPERATION	
Definitions	E.100–E.103
General provisions concerning Administrations	E.104–E.119
General provisions concerning users	E.120–E.139
Operation of international telephone services	E.140–E.159
Numbering plan of the international telephone service	E.160–E.169
International routing plan	E.170–E.179
Tones in national signalling systems	E.180–E.189
Numbering plan of the international telephone service	E.190–E.199
Maritime mobile service and public land mobile service	E.200–E.229
OPERATIONAL PROVISIONS RELATING TO CHARGING AND ACCOUNTING IN THE INTERNATIONAL TELEPHONE SERVICE	
Charging in the international telephone service	E.230–E.249
Measuring and recording call durations for accounting purposes	E.260–E.269
UTILIZATION OF THE INTERNATIONAL TELEPHONE NETWORK FOR NON-TELEPHONY APPLICATIONS	
General	E.300–E.319
Phototelegraphy	E.320–E.329
ISDN PROVISIONS CONCERNING USERS	
International routing plan	E.350–E.399
QUALITY OF SERVICE, NETWORK MANAGEMENT AND TRAFFIC ENGINEERING	
NETWORK MANAGEMENT	
International service statistics	E.400–E.409
International network management	E.410–E.419
Checking the quality of the international telephone service	E.420–E.489
TRAFFIC ENGINEERING	
Measurement and recording of traffic	E.490–E.505
Forecasting of traffic	E.506–E.509
Determination of the number of circuits in manual operation	E.510–E.519
Determination of the number of circuits in automatic and semi-automatic operation	E.520–E.539
Grade of service	E.540–E.599
Definitions	E.600–E.649
ISDN traffic engineering	**E.700–E.749**
Mobile network traffic engineering	E.750–E.799
QUALITY OF TELECOMMUNICATION SERVICES: CONCEPTS, MODELS, OBJECTIVES AND DEPENDABILITY PLANNING	
Terms and definitions related to the quality of telecommunication services	E.800–E.809
Models for telecommunication services	E.810–E.844
Objectives for quality of service and related concepts of telecommunication services	E.845–E.859
Use of quality of service objectives for planning of telecommunication networks	E.860–E.879
Field data collection and evaluation on the performance of equipment, networks and services	E.880–E.899

For further details, please refer to ITU-T List of Recommendations.

ITU-T RECOMMENDATIONS SERIES

Series A	Organization of the work of the ITU-T
Series B	Means of expression: definitions, symbols, classification
Series C	General telecommunication statistics
Series D	General tariff principles
Series E	**Overall network operation, telephone service, service operation and human factors**
Series F	Non-telephone telecommunication services
Series G	Transmission systems and media, digital systems and networks
Series H	Audiovisual and multimedia systems
Series I	Integrated services digital network
Series J	Transmission of television, sound programme and other multimedia signals
Series K	Protection against interference
Series L	Construction, installation and protection of cables and other elements of outside plant
Series M	TMN and network maintenance: international transmission systems, telephone circuits, telegraphy, facsimile and leased circuits
Series N	Maintenance: international sound programme and television transmission circuits
Series O	Specifications of measuring equipment
Series P	Telephone transmission quality, telephone installations, local line networks
Series Q	Switching and signalling
Series R	Telegraph transmission
Series S	Telegraph services terminal equipment
Series T	Terminals for telematic services
Series U	Telegraph switching
Series V	Data communication over the telephone network
Series X	Data networks and open system communications
Series Y	Global information infrastructure and Internet protocol aspects
Series Z	Languages and general software aspects for telecommunication systems

Printed in Switzerland

Geneva, 2007