INTERNATIONAL TELECOMMUNICATION UNION

CCITT

THE INTERNATIONAL
TELEGRAPH AND TELEPHONE
CONSULTATIVE COMMITTEE

E.730

(10/92)

TELEPHONE NETWORK AND ISDN

QUALITY OF SERVICE, NETWORK MANAGEMENT AND TRAFFIC ENGINEERING

ISDN DIMENSIONING METHODS OVERVIEW

Recommendation E.730

FOREWORD

The CCITT (the International Telegraph and Telephone Consultative Committee) is a permanent organ of the International Telecommunication Union (ITU). CCITT 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 Plenary Assembly of CCITT which meets every four years, establishes the topics for study and approves Recommendations prepared by its Study Groups. The approval of Recommendations by the members of CCITT between Plenary Assemblies is covered by the procedure laid down in CCITT Resolution No. 2 (Melbourne, 1988).

Recommendation E.730 was prepared by Study Group II and was approved under the Resolution No. 2 procedure on the 30th October 1992.

CCITT NOTE

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

© ITU 1993

All rights reserved. No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the ITU.

Recommendation E.730

ISDN DIMENSIONING METHODS OVERVIEW

(1992)

1 Introduction

The E.730-Series Recommendations are intended to provide methods to relate the offered traffic and Grade of Service objectives in order to allocate sufficient resource for planning and design purposes in the ISDN. This Recommendation outlines the dimensioning methods required in ISDN, which are described in the E.730-Series as follows:

E.731 – Methods for dimensioning resources operating in circuit switched mode.

E.732 – Methods for dimensioning resources operating in packet switched mode.

E.733 – Methods for dimensioning resources in Signalling System No. 7 networks.

Additional Recommendations in this series will be developed in the future to reflect ISDN developments, in particular broadband ISDN.

Note – Recommendation E.732 is for further study.

2 Context

ISDN, concepts, services and networks are described in the I-Series Recommendations. The E.700- to E.749-Series is devoted to ISDN traffic engineering. Previous sections of this series deal with offered traffic modelling (E.710-Series Recommendations) and with Grade of Service objectives (E.720-Series Recommendations). Present section (E.730-Series Recommendations) provides dimensioning rules to assume that sufficient network resources are allocated to handle the offered traffic achieving the Grade of Service objectives.

The user plane/control plane perspectives described in Recommendation I.320 have been used to provide Recommendations dedicated to resources mainly dealing with user plane loads (Recommendations E.731 and E.732) or to resources mainly dealing with control plane loads (Recommendation E.733). Nevertheless, it should be kept in mind that source resources, as D-channels, deal with both types of loads and both of them have to be simultaneously considered in the dimensioning. At present the E.730-Series Recommendations concentrates on resources handling lower layer (1 to 3) traffic flows. Resources handling higher layer traffic flows are for further study.

The ISDN reference connections used in the E.730-Series Recommendations are those given in Recommendation E.701.

3 Resources operating in circuit switched mode

In circuit switched mode, new issues appear in ISDN with respect to the traditional telephone networks, such as multislot connections, attribute negotiation, service reservation and multipoint connections. These issues require the use of specific dimensioning techniques which complement the traditional dimensioning methods provided in the E.520-Series Recommendations and require particular application of some E.520 methods such as service protection.

Dimensioning techniques for circuit switched ISDN specific issues are provided in Recommendation E.731.

4 Resources operating in packet switched mode

Recommendation E.732 will be developed in the future to deal with the dimensioning procedures to be applied to the resources operating in X.25/X.75 packet mode, as well as to those resources, as D-channels, which support both Q.931 and X.25 protocols.

In addition to the traffic variables and network performance parameters considered in circuit switched mode, variables and parameters related to the information transfer will also have to be considered in the dimensioning of resources operating in packet switched mode.

5 Resources in Signalling System No. 7 networks

The dimensioning of Signalling System No. 7 networks require different criteria from those used in circuit switched or X.25/X.75 packet switched networks. In fact a high level performance of signalling network at all times is essential to ensure the survival of the whole ISDN. Thus, the traffic loading efficiency of the signalling devices should not be the primary consideration in the dimensioning, but the performance of the network under failure and excessive call demand conditions. Based on these criteria, Recommendation E.733 provides dimensioning methods for resources in the Signalling System No.7 network.

6 Further developments

The Recommendations of the E.730-Series presently concentrate on those services and facilities which predominate in the first implementation phases of ISDN.

However, the ISDN concepts include the inherent possibility of developing completely new service and functions in response to changing user needs. This will result in new traffic situations that will need new dimensioning methods to be covered in the E.730-Series Recommendations.

In particular, broadband ISDN using Asynchronous Transfer Mode (ATM) technology will require new dimensioning methods to be covered in this series.