INTERNATIONAL TELECOMMUNICATION UNION

CCITT

THE INTERNATIONAL
TELEGRAPH AND TELEPHONE
CONSULTATIVE COMMITTEE

E.710

(10/92)

TELEPHONE NETWORK AND ISDN

QUALITY OF SERVICE, NETWORK MANAGEMENT AND TRAFFIC ENGINEERING

ISDN TRAFFIC MODELLING OVERVIEW

Recommendation E.710

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.710 was revised by Study Group II and was approved under the Resolution No. 2 procedure on the 30th of October 1992.

CCITT NOTES

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

2) A list of abbreviations used in this Recommendation can be found in Annex A.

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Recommendation E.710

ISDN TRAFFIC MODELLING OVERWIEV

(revised 1992)

1 Introduction

This Recommendation outlines the general consideration in modelling traffic flows in ISDNs. More detailed descriptions for specific services and significant points[1)] in the network are given in Recommendations of the E.710 Series as follows:

E.711 – User Demand Modelling.

E.712 – User Plane Traffic Modelling.

E.713 – Control Plane Traffic Modelling.

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

2 Context

ISDN concepts, services and networks are described in the Series I-Recommendations. The E.710-Series Recommendations have been developed consistent with the approach. However, the grouping of material in the E.710-Series concentrates on the important aspects from a traffic point of view of ISDN operations in the immediate future.

A way to represent ISDN capabilities is the layered architecture described in Recommendations I.310 and I.320. The E.710-Series has been developed consistent with this approach. At present the E.710-Series concentrates on lower layer (1-3) traffic flows. Higher layer traffic flows are for further study.

The user plane/control plane perspectives described in Recommendation I.320 have been used to provide two separate traffic models in Recommendations E.712 and E.713. Nevertheless, it should be kept in mind that many traffic engineering procedures described in subsequent E.700-Series Recommendations require incorporating traffic loads from both planes using the same resources.

The ISDN reference connections used in the E.710-Series are those given in Recommendation E.701.

3 User demand

ISDN users have various needs for information transfer. The user and his terminal equipment transform these needs into call demands for available ISDN services.

These call demands are modelled in Recommendation E.711 to allow the characterization of the traffic offered to the layers 1-3 of the ISDN. Corresponding traffic variables including the number of attempts per call demand are derived. Based on the call demand modelling, users are characterized by the generating process of their originating and terminating call demands.

4 User plane

In the user plane the attributes of some ISDN services give rise to additional traffic parameters beyond those used in telephony. Based on the call demand models and user characterization of Recommendation E.711, Recommendation E.712 derives traffic models for the user plane, considering both circuit switched traffic and packet switched traffic.

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1) s**ignificant points** are points in the network where traffic flows and grades of service should be evaluated.

5 Control plane

Each attempt from a terminal will result in signalling messages in the control plane. The number of messages and their length are highly dependent on:

- protocols (S.S. No. 7 and Q.931 digital access);
- call disposition (including user facilities);
- originating and terminating subscriber equipment configurations (e.g. overlap sending).

Control plane traffic models are given in Recommendation E.713.

6 Further developments

The preceding sections of this Recommendation and the Recommendations of the E.710-Series concentrate on those services and facilities which will predominate in the first ISDNs to be implemented.

However, the ISDN concepts include the inherent possibility of developing completely new services and functions in response to changing user needs. This will result in new traffic situations that will need to be covered in the E.710-Series. Some of the situations which can be anticipated are:

- the impact of supplementary services, such as call waiting, on control plane traffic;
- new statistical multiplexing and dynamic allocation techniques;
- connectionless communications;
- the impact of user-to-user signalling;
- the impact of the use of broadcast mode.

New Recommendations will be developed in this series to cover traffic modelling in broadband ISDN using Asynchronous Transfer Mode (ATM).

ANNEX A

(to Recommendation E.710)

Alphabetical list of abbreviations used in this Recommendation

ATM Asynchronous transfer mode

ISDN Integrated service digital network