



INTERNATIONAL TELECOMMUNICATION UNION

CCITT

E.713

THE INTERNATIONAL
TELEGRAPH AND TELEPHONE
CONSULTATIVE COMMITTEE

(10/92)

**TELEPHONE NETWORK AND ISDN
QUALITY OF SERVICE,
NETWORK MANAGEMENT AND TRAFFIC
ENGINEERING**

CONTROL PLANE TRAFFIC MODELLING



Recommendation E.713

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.713 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 B.

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Recommendation E.713**CONTROL PLANE TRAFFIC MODELLING***(revised 1992)***1 Control plane traffic**

For the purposes of teletraffic engineering, the control plane traffic load is assumed to be generated by call attempts on the network. These call attempts are part of the call pattern described in Recommendation E.711.

This Recommendation considers traffic loads at the lower three layers of the CCITT 7-layer reference models (see Recommendations I.310 and I.320) described for ISDN in Recommendation Q.931 and in Signalling System No. 7.

The control plane traffic of an ISDN network includes all the control signals sent through the ISDN network. The types of control signals are:

- 1) signals for user call attempts
 - a) to set up the connection paths in the user plane (reservation of time slots for circuit switched connections or control for the virtual calls of packet-switched connections);
 - b) to release the connection paths in the user plane;
 - c) if required, to order additional communication facilities or change of service by the users during the time of user information transfer;
 - d) possibly to send charging information during the time of user information transfer.
- 2) User-to-user information messages¹⁾.

Because control plane traffic due to user-to-user messages is left for further study, this Recommendation will consider only signals for user call attempts.

The control plane traffic uses two types of channels in the network:

- a) the 16 kbit/s or 64 kbit/s D-channels in the user access, and
- b) the 64 kbit/s Signalling System No. 7 channels connecting two different signalling points.

2 Signalling traffic

The end-to-end ISDN signalling traffic depends on the call pattern arrival process defined in Recommendation E.711 and on the signalling protocol.

The basis for the estimation of the signalling traffic is the information given in the Recommendations of the I- and Q-Series dealing with the number and structure of the signals in the D- and Signalling System No. 7 channels for any type of attempt. The total signalling traffic is composed of these signals. The number of signals may be different for each different type of attempt.

¹⁾ The analysis of user-to-user messages in the control plane is left for further study.

3 Estimation of the signalling traffic for a single call attempt

In Figure 1/E.713 the network components supporting the control plane of the ISDN reference connection of Figure 1/E.701 are considered. In each section, a significant point is defined:

DA (D-channel, A user side):	S/T interface at an A user side
DB (D-channel, B user side):	S/T interface at a B user side
CA (S.S. No. 7 channels, A user side):	Outgoing side of the local exchange LE(A).
CB (S.S. No. 7 channels, B user side):	Incoming side of the local exchange LE(B).

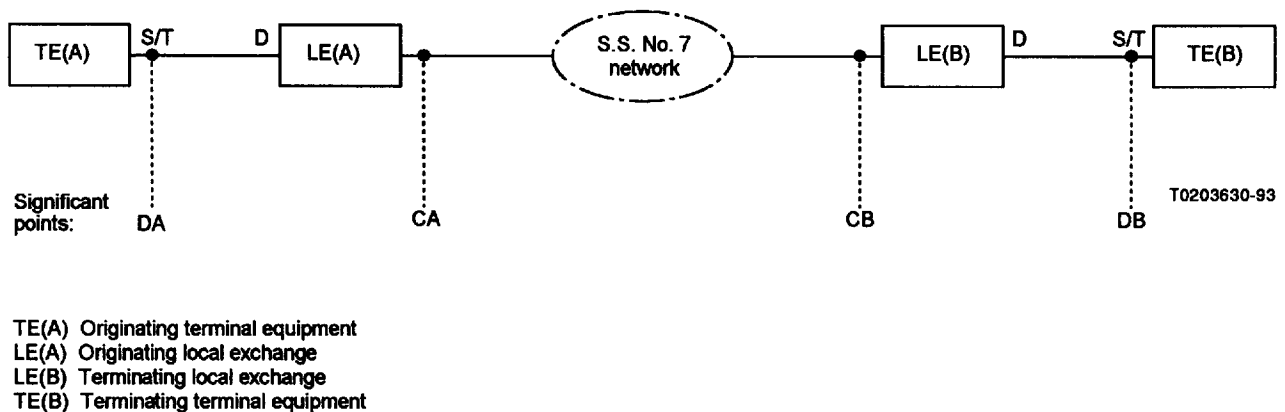


FIGURE 1/E.713
Significant points in the control plane

The signal flow which is necessary to perform the control functions of a particular call attempt may be represented by a signal flow diagram. It contains all the signals passing the significant points in the control plane for the considered attempt. Figure 2/E.713 shows the basic scheme of this signal flow diagram. The arrows represent the layer 2 signals in the three connection phases: call establishment, user information transfer and call release.

An example of a signal flow diagram for a successful circuit switched call attempt is given in Annex A.

The signal flow diagram is the basis for the estimation of the amount of signalling traffic caused by the considered attempt using the reference connection. The signalling traffic of a single attempt in a given section of the control plane associated with a significant point can be described by two sets of parameters:

- 1) the total number of signals passing the significant point in the three call-connection phases in the A-to-B direction and in the B-to-A direction, as in Figure 2/E.713;
- 2) the length of each signal type passing the significant point in the A-to-B and the B-to-A direction.