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CCITT

THE INTERNATIONAL
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DATA COMMUNICATION NETWORKS

INFORMATION TECHNOLOGY – PROVISION OF THE OSI CONNECTION-MODE NETWORK SERVICE BY PACKET-MODE TERMINAL EQUIPMENT CONNECTED TO AN INTEGRATED SERVICES DIGITAL NETWORK (ISDN)

Recommendation X.612



Geneva, 1992

Foreword

ITU (International Telecommunication Union) is the United Nations Specialized Agency in the field of telecommunications. The CCITT (the International Telegraph and Telephone Consultative Committee) is a permanent organ of the ITU. Some 166 member countries, 68 telecom operating entities, 163 scientific and industrial organizations and 39 international organizations participate in CCITT which is the body which sets world telecommunications standards (Recommendations).

The approval of Recommendations by the members of CCITT is covered by the procedure laid down in CCITT Resolution No. 2 (Melbourne, 1988). In addition, the Plenary Assembly of CCITT, which meets every four years, approves Recommendations submitted to it and establishes the study programme for the following period.

In some areas of information technology which fall within CCITT's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC. The text of CCITT Recommendation X.612 was approved on 10th September 1992. The identical text is also published as ISO/IEC International Standard 9574.

CCITT NOTE

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

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INTERNATIONAL STANDARD

CCITT RECOMMENDATION

**INFORMATION TECHNOLOGY -
PROVISION OF THE OSI CONNECTION-MODE NETWORK
SERVICE BY PACKET-MODE TERMINAL EQUIPMENT
CONNECTED TO AN INTEGRATED SERVICES DIGITAL
NETWORK (ISDN)**

1 Scope

This Recommendation | International Standard specifies the method of providing the OSI Connection-mode Network Service (CONS) by packet mode terminal equipment connected to an Integrated Services Digital Network (ISDN) in accordance with the procedures described in Recommendation X.31. This is done by specifying the mapping of the CONS primitives and parameters to and from the elements of the protocols used by two types of packet mode terminal equipment:

- a) an X.25 DTE (TE2) connected to an R reference point and accessing an ISDN; and
- b) a packet mode ISDN terminal (TE1) operating ISO/IEC 8208 packet layer protocol (PLP) and connected to an ISDN at either the S or T reference point.

This Recommendation | International Standard is applicable:

- a) when operating according to Recommendation X.31, either a TE1 or a TE2 is connected to a packet handler in an ISDN or an access unit to a packet-switched data network via an ISDN;
- b) when using an ISDN circuit-switched channel, either TE1s and/or TE2/TAs are connected directly to each other (i.e. the terminals operate in DTE/DTE mode).

This Recommendation | International Standard does not address TE2s using TAs (at the R reference point) when using an ISDN circuit-switched channel with the terminals operating in DTE/DTE mode (see Recommendation X.613 | ISO/IEC 10588).

NOTES

- 1 The definitions of TE1, TE2 and TA equipment, and R, S, and T reference points are given in Recommendation I.411.
- 2 This Recommendation | International Standard applies to a TE1 or TE2/TA (i.e. an OSI End System) regardless of whether it is a physically separate system or embedded in other equipment such as a PBX.

This Recommendation | International Standard addresses the provision of the CONS using Virtual Calls as described in Recommendation X.25. It does not address the use of X.25 Permanent Virtual Circuits. The extension of this Recommendation | International Standard to include the use of X.25 PVCs is for further study.

NOTE – This Recommendation | International Standard uses numbers to identify layers, rather than their names. This is done to align the terminology of this document with the terminology of the related ISDN Recommendations, and does not imply any change in the functionality of the layers from that defined in the reference model of open systems interconnection.

2 Normative references

The following CCITT Recommendations and ISO/IEC International Standards contain provisions which, through reference in this text, constitute provisions of this Recommendation | International Standard. At the time of publication, the editions indicated were valid. All Recommendations and Standards are subject to revision. Parties to agreements based on this Recommendation | International Standard are encouraged to investigate the possibility of applying the most recent editions of the Recommendations and Standards listed below. Members of IEC and ISO maintain registers of currently valid International Standards. The CCITT Secretariat maintains a list of currently valid CCITT Recommendations.

2.1 Identical Recommendations | International Standards

- CCITT Recommendation X.213 (1992) | ISO/IEC 8348: 1992, *Information technology – Network service definition for Open Systems Interconnection*

2.2 Paired Recommendations | International Standards equivalent in technical content

- CCITT Recommendation X.200 (1988), *Reference model of open systems interconnection for CCITT applications.*

ISO 7498:1984, *Information processing systems – Open Systems Interconnection – Basic Reference Model.*
- CCITT Recommendation X.210 (1988), *Open systems interconnection layer service definition conventions.*

ISO/TR 8509:1987, *Information processing systems – Open Systems Interconnection – Service conventions.*
- CCITT Recommendation X.223 (1988), *Use of X.25 to provide the OSI connection-mode network service for CCITT applications.*

ISO 8878:1987, *Information processing systems – Data communications – Use of X.25 to provide the OSI connection-mode network service.*

2.3 Additional references

- CCITT Recommendation I.231 (1988), *Circuit-mode bearer service categories.*
- CCITT Recommendation I.232 (1988), *Packet-mode bearer service categories.*
- CCITT Recommendation I.430 (1988), *Basic User-Network Interface Layer 1 Specification.*
- CCITT Recommendation I.431 (1988), *Primary Rate User-Network Interface Layer 1 Specification.*
- CCITT Recommendation Q.921 (I.441) (1988), *ISDN User-Network Interface Data Link Layer Specification.*
- CCITT Recommendation Q.931 (I.451) (1988), *ISDN User-Network Interface Layer 3 Specification for Basic Call Control.*
- CCITT Recommendation V.25 bis (1988), *Automatic Answering Equipment and/or Parallel Automatic Calling Equipment on the General Switched Telephone Network Including Procedures for Disabling of Echo Control Devices for Both Manually and Automatically Established Calls.*
- CCITT Recommendation X.21 (1988), *Interface Between Data Terminal Equipment (DTE) and Data Circuit-terminating Equipment (DCE) for Synchronous Operation on Public Data Networks.*
- CCITT Recommendation X.21 bis (1988), *Use on Public Data Networks of Data Terminal Equipment (DTE) which is Designed for Interfacing to Synchronous V-series Modems.*

- CCITT Recommendation X.25 (1988), Interface between data terminal equipment (DTE) and data circuit-terminating equipment (DCE) for terminals operating in the packet mode and connected to public data networks by dedicated circuit.
- CCITT Recommendation X.30 (I.462) (1988), *Support of X.21, X.21 bis and X.20 bis based data terminal equipments (DTEs) by an integrated services digital network (ISDN).*
- CCITT Recommendation X.31 (I.462) (1988), *Support of Packet Mode Terminal Equipment by an ISDN.*
- CCITT Recommendation X.32 (1988), *Interface between data terminal equipment (DTE) and data circuit-terminating equipment (DCE) for terminals operating in the packet mode and accessing a packet switched public data network through a public switched telephone network or an ISDN or a circuit switched public data network.*
- ISO 7776:1986, *Information processing systems – Data communications – High-level data link control procedures – Description of the X.25 LAPB-compatible DTE data link procedures.*
- ISO/IEC 8208:1990, *Information technology – Data communications – X.25 Packet Layer Protocol for Data Terminal Equipment.*

3 Definitions

For the purposes of this Recommendation | International Standard, the following definitions apply.

3.1 Basic reference model definitions

This Recommendation | International Standard makes use of the following terms defined in CCITT Recommendation X.200 | ISO 7498:

- a) Network Connection;
- b) Network Layer;
- c) Network Service.

3.2 Service conventions definitions

This Recommendation | International Standard makes use of the following terms defined in CCITT Recommendation X.210 | ISO/TR 8509:

- a) Network Service provider;
- b) Network Service user.

3.3 Network service definitions

This Recommendation | International Standard makes use of the following terms defined in CCITT Recommendation X.213 | ISO/IEC 8348:

- a) N-CONNECT request;
- b) N-DISCONNECT indication.

3.4 X.25 definitions

This Recommendation | International Standard makes use of the following terms defined in CCITT Recommendation X.25 | ISO/IEC 8208:

- a) DATA packet;
- b) Data terminal equipment;
- c) INCOMING CALL packet;

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- d) Throughput class;
- e) User data field;

3.5 X.31 definitions

This Recommendation | International Standard makes use of the following terms defined in CCITT Recommendation X.31:

- a) Conditional notification class of service;
- b) ISDN Virtual Circuit Bearer Service;
- c) No notification class of service;
- d) Packet handling function;
- e) PSPDN Service;
- f) Unconditional class of service;
- g) Semi-permanent access (see Note);
- h) Demand access.

NOTE – Some ISDN Recommendations use the term 'permanent' to describe this feature.

3.6 I.112 definitions

This Recommendation | International Standard makes use of the following terms defined in CCITT Recommendation I.112:

- a) terminal equipment;
- b) reference point.

3.7 I.411 definitions

This Recommendation | International Standard makes use of the following terms defined in CCITT Recommendation I.411:

- a) R reference point;
- b) S reference point;
- c) T reference point;
- d) Terminal adaptor.

3.8 I.412 definitions

This Recommendation | International Standard makes use of the following terms defined in CCITT Recommendation I.412:

- a) B channel;
- b) D channel.

3.9 X.121 definitions

This Recommendation | International Standard makes use of the following terms defined in CCITT Recommendation X.121:

- a) prefix;
- b) escape.

4 Abbreviations

4.1 Reference model abbreviations

- OSI Open Systems Interconnection
- NS Network Service

4.2 Network service abbreviations

- CONS Connection-mode Network Service
- QOS Quality of service

4.3 X.25 abbreviations

- DCE Data circuit-terminating equipment
- DTE Data terminal equipment
- LAP link access procedure
- PLP Packet layer protocol
- PSDN Packet switched data network
- RPOA Recognized private operating agency

4.4 ISDN abbreviations

- AU Access unit
- ISDN Integrated services digital network
- PH Packet handling function
- SAPI Service access point identifier
- TA Terminal adaptor
- TE Terminal equipment
- HLC Higher layer compatibility

5 Overview

5.1 ISDN environment

The ISDN environment is characterised by two configurations. In the first, a packet mode terminal is connected to a packet mode service, as described in Recommendation X.31. In the second configuration, two packet mode terminals are connected directly by an ISDN circuit-switched B or H channel.