INTERNATIONAL STANDARD

ISO/IEC 9574

Second edition
1992-12-15

Information technology — Provision of the OSI connection-mode network service by packet mode terminal equipment to an integrated services digital network (ISDN)

Technologies de l'information — Fourniture du service de réseau OSI en mode connexion par un terminal en mode paquet raccordé à un réseau numérique avec intégration de service (RNIS)

Reference number
ISO/IEC 9574:1992(E)

Contents

Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

International Standard ISO/IEC 9574 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, in collaboration with the CCITT. The identical text is published as CCITT Recommendation X.612

This second edition cancels and replaces the first edition (ISO 9574:1989), of which it constitutes a technical revision.

Annex A of this International Standard is for information only.

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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;

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.

5.1.1 Use of a packet mode service

The support of the packet mode terminal equipment by an ISDN when a packet mode service is used is described in Recommendation X.31. In this case, references to Recommendation Q.931 procedures indicate their use as described in Recommendation X.31. Two cases for ISDN support of packet mode terminal equipment are defined in Recommendation X.31: one, the case where the support is via the ISDN Virtual Circuit service [see Figure 1a)], and the other where the support is via access to PSDN services [see Figure 1b)], respectively referred to as "case B" and "case A".

In case A an ISDN transparent circuit connection, either semi-permanent (i.e., non-switched) or demand (i.e., switched), is used. The corresponding ISDN bearer service is a 64 kbit/s service as described in Recommendation I.231. The sub-network functions available to the user are those of the PSDN described in Recommendation X.25 (semi-permanent access) and Recommendation X.32 (demand access), as well as in other X-Series Recommendations (e.g., X.2, X.121).

In case B the ISDN virtual circuit bearer service is used, as described in Recommendation I.232. The sub-network functions available are those described in the I.2xx-Series Recommendations.

In case A only B channels may be used to access the PSDN, while in case B both B and D channels may be used to access the ISDN packet handling function.

5.1.2 Direct circuit-switched connection

Two packet mode terminal equipment may be connected directly using an ISDN B or H channel. The channel used is either semi-permanent (i.e. non-switched) or demand (i.e. switched), see Figure 1c).

5.2 CONS in this ISDN environment

Recommendation X.223 | ISO 8878 specifies the method for providing the OSI Connection-mode Network Service (CONS) through the use of the X.25 packet layer protocol. When operating in an ISDN environment, a few requirements additional to those contained in Recommendation X.223 | ISO 8878 are necessary.

The requirements for providing CONS by terminal equipment connected to an ISDN at the S or T reference points are specified in clause 6.

The requirements for providing CONS in X.25 DTEs presenting an X.21, X.21 *bis*, or V.25 *bis* interface at the R reference point and connected to an ISDN through a TA are specified in clause 7.

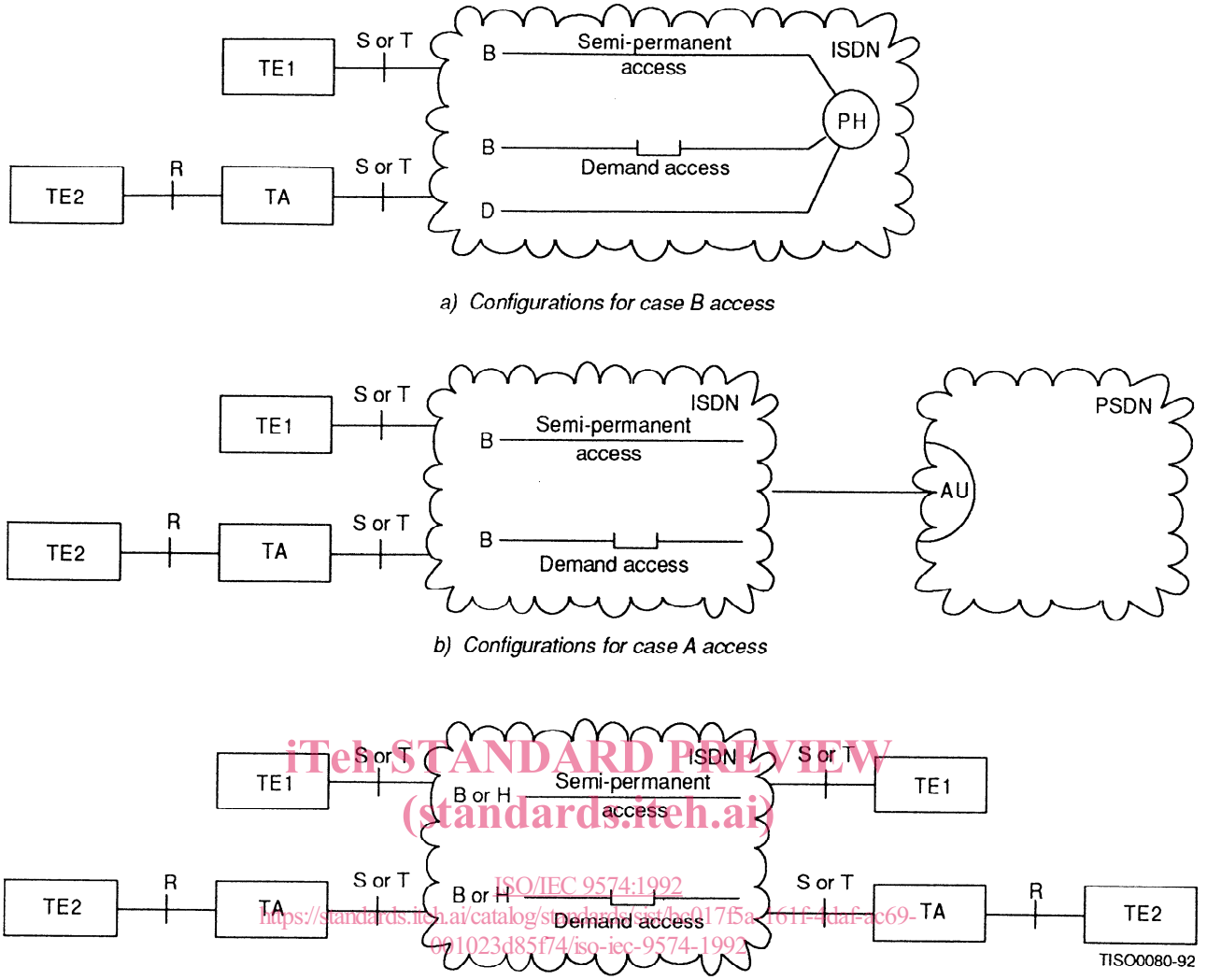
This Recommendation | International Standard uses the X.25 PLP to convey all elements, of all three phases, of the OSI Connection-mode Network Service.

6 Provision of the CONS in systems attached at the S/T reference point

6.1 Procedures for TE1s or TE2/TAs to provide CONS

This clause of this Recommendation | International Standard covers the five cases that exist taking into account the various types of underlying connections that can be available to the packet mode TE1 or TE2/TA (see Table 1). The protocol layers applicable to these cases are given in Figures 2 and 3 and as referenced in Table 1.

The mapping of the elements of the CONS to the protocol and procedures of ISO/IEC 8208 shall be as required by Recommendation X.223 | ISO 8878. The remaining clauses in this section specify the provisions required in addition to these mappings, by systems attached to an interface at the S/T reference point.



a) *Configurations for case B access*

b) *Configurations for case A access*

c) *Configurations for direct connection by ISDN circuit-switched B or H channel*

TE Terminal equipment
TA Terminal adaptor
PH Packet handling function
AU Access unit

Figure 1 – Cases covered by clause 6

Table 1 – Cases covered by clause 6

Underlying connection perceived by the terminal equipment	Access to	Figure	Subclause
D channel	Packet Mode service	2	6.2
B channel : Semi-permanent	Packet Mode service	3	6.3.1
B channel : Demand	Packet Mode service	3	6.3.2
B or H channel : Semi-permanent	Remote terminal	3	6.4.1
B or H channel : Demand	Remote terminal	3	6.4.2