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Information technology —
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functions for the employment of a circuit
mode basic service and the
supplementary service user-to-user
signalling as a pair of on-demand
inter-PINX connections

*Technologies de l'information — Télécommunications et échange
d'information entre systèmes — Réseau privé avec intégration de
services — Fonctions d'application pour l'emploi d'un service de base
en mode circuit et de la signalisation utilisateur/utilisateur du service
supplémentaire en tant que paire de connexions entre PINX sur
demande*

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Foreword

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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.

Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

International Standard ISO/IEC 17309 was prepared by ECMA (as ECMA-244) and was adopted, under a special "fast-track procedure", by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, in parallel with its approval by national bodies of ISO and IEC.

Annex A forms a normative part of this International Standard.

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Introduction

This International Standard is one of a series of standards defining mapping functions in exchanges of Private Integrated Services Networks required for the utilization of intervening network scenarios. The series uses the ISDN concepts as developed by ITU-T (formerly CCITT) and is also within the framework of standards for open systems interconnection as defined by ISO/IEC.

This International Standard specifies mapping functions for the type of scenarios where two PINXs are interconnected via on-demand connections via the public ISDN using the supplementary service User-to-User Signalling for carrying signalling information.

This International Standard is based upon the practical experience of ECMA member companies and the results of their active and continuous participation in the work of ISO/IEC JTC 1, ITU-T, ETSI and other international and national standardization bodies. It represents a pragmatic and widely based consensus.

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Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Mapping functions for the employment of a circuit mode basic service and the supplementary service user-to-user signalling as a pair of on-demand inter-PINX connections

1 Scope

This International Standard specifies the mapping functions for a pair of on-demand inter-PINX connections using a circuit mode basic service and the supplementary service User-to-User Signalling (service 3) of a public ISDN at the same time.

In order to connect a Private Integrated Services Network Exchange (PINX) to another PINX, mapping functions are required to adapt the specific interfaces at the C reference point to the application at the Q reference point. As such, mapping functions provide for physical adaptation to the interface at the C reference point. Mapping functions also provide for the mapping of user channels and signalling information at the Q reference point to the appropriate channels or timeslots at the C reference point.

The C and Q reference points are defined in ISO/IEC 11579-1.

At the Q reference point the mappings provide a 64 kbit/s service for user channels and a packet mode service for the signalling channel. Bearer conditioning is outside the scope of this International Standard, except for providing the layer 2 for the signalling channel at the Q reference point.

Scenario management is outside the scope of this International Standard.

This International Standard is applicable to PINXs which can be interconnected to form a Private Integrated Services Network (PISN) and which support signalling protocols at the Q reference point.

2 Conformance

In order to conform to this International Standard, a PINX shall satisfy the requirements identified in the Implementation Conformance Statement (ICS) proforma in annex A.

3 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO/IEC 11574:2000, *Information technology — Telecommunications and information exchange between systems — Private Integrated Services Network — Circuit-mode 64 kbit/s bearer services — Service description, functional capabilities and information flows.*

ISO/IEC 11579-1:1994, *Information technology — Telecommunications and information exchange between systems — Private Integrated Services Network — Part 1: Reference configuration for PISN exchanges (PINX).*

ITU-T Rec. I.112:1993, *Vocabulary of terms for ISDNs.*

IUT-T Rec. I.210:1993, *Principles of telecommunication services supported by an ISDN and the means to describe them.*

ITU-T Rec. I.411:1993, *ISDN user-network interfaces — Reference configurations.*

ITU-T Rec. I.430:1995, *Basic user-network interface — Layer 1 specification.*

ITU-T Rec. I.431:1993, *Primary rate user-network interface — Layer 1 specification.*

ITU-T Rec. Q.920:1993, *Digital Subscriber Signalling System No. 1 (DSS1) — ISDN user-network interface data link layer — General aspects.*

ITU-T Rec. Q.920 Am. 1:2000, *Amendment 1 to ITU-T Recommendation Q.920*.

ITU-T Rec. Q.921:1997, *ISDN user-network interface — Data link layer specification*.

ITU-T Rec. Q.921 Am. 1:2000, *Amendment 1 to ITU-T Recommendation Q.921*.

ITU-T Rec. Q.931:1998, *ISDN user-network interface layer 3 specification for basic call control*.

ITU-T Rec. Q.957.1:1996, *Stage 3 description for additional information transfer supplementary services using DSS 1: User-to-User Signalling (UUS)*.

ETS 300 415:1994, *Private Telecommunication Network (PTN); Terms and definitions*.

4 Definitions

4.1 External definitions

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

– Basic Service	(CCITT Rec. I.210)
– Call, Basic Call	(ISO/IEC 11582)
– Integrated Services Digital Network	(CCITT Rec. I.112)
– Private Integrated Services Network	(ISO/IEC 11579-1)
– Private Integrated Services Network Exchange	(ISO/IEC 11579-1)
– Public ISDN	(ETS 300 415)
– Signalling	(CCITT Rec. I.112)
– Supplementary Service	(ISO/IEC 11582)

4.2 Special definitions

4.2.1 Calling PINX : The PINX which is at the originating interface of the public ISDN (IVN).

4.2.2 Called PINX : The PINX which is at the destination interface of the public ISDN (IVN).

4.2.3 Channel : A means of bi-directional transmission of user or signalling information between two points.

4.2.3.1 D_Q-Channel : A channel used to convey call control information between the Q reference points of two peer PINXs.

4.2.3.2 U_Q-Channel : A channel used to convey user information between the Q reference points of two PINXs.

4.2.4 Inter-PINX Connection : A connection provided by an IVN between two C reference points used to transport inter-PINX information from the PISN control plane and/or the PISN user plane.

4.2.5 Inter-PINX Link : A link between the Q reference points of two PINXs, comprising the totality of signalling transfer and user information transfer means.

5 List of acronyms

DSS1	Digital Subscriber Signalling System No. one
ICS	Implementation Conformance Statement
IPC	Inter-PINX Connection
IPL	Inter-PINX Link
ISDN	Integrated Services Digital Network
IVN	Intervening Network
PISN	Private Integrated Services Network
PINX	Private Integrated Services Network Exchange
UUS3	User-to-User Signalling service 3

6   Introduction

The inter-PINX connection scenario using circuit mode basic services and the supplementary service User-to-User Signalling service 3 as defined for public ISDNs is an on-demand connection scenario.

This scenario creates an IPL from the connections established as a result of an ISDN call. The ISDN call is established by specifying the supplementary service UUS3. The signalling connection associated with the ISDN call in conjunction with the UUS3 information transfer capability is used to provide the inter-PINX signalling connection. The circuit mode ISDN connection is used to provide the inter-PINX user connection.

This scenario also includes procedures for sequence control and end-to-end flow control.

Connections of this scenario can be established and released at any time under the control of either PINX. In case of failure, the public ISDN may reject a call establishment request or release an already established call. In case of congestion, the sending PINX may inhibit temporarily the sending of USER INFORMATION signalling messages by means of an internal congestion mechanism.

Subject to implementation in the public ISDN, this scenario provides for the use of:

−   up to 2 pairs of signalling and user information connections per ISDN basic access; and,

−   up to 23 (1544 kbit/s primary rate) or 30 (2048 kbit/s primary rate) pairs of signalling and user information connections per ISDN primary rate access.

Multiple pairs of IPCs may exist at one or at more interfaces of a PINX. Each pair of IPCs can convey just one IPL. In the case of multiple pairs of IPCs (at one or more interfaces of a PINX), i.e. several calls with UUS3 are established at the same time from one PINX to one or more other PINXs, there is no mapping coordination necessary.

Provision of just one number for addressing a Called PINX is sufficient for establishment of any number of pairs of IPCs from a given Calling PINX.

7   Capabilities at the Q reference point

For each instance of the Q reference point:

−   one signalling channel (D_Q) for carrying the inter-PINX Layer 3 signalling protocol, and

−   one user channel (U_Q)

are provided.

Inter-PINX signalling information is not restricted to call control on this particular U_Q-channel.

For a U_Q-channel the following bearer capability shall be provided:

−   information transfer rate: 64 kbit/s;

−   other attributes shall be the same as at the C reference point.

NOTE - The provision of bearer conditioning can change these attributes. However, this is outside the scope of this International Standard.

For a D_Q-channel the following bearer capability shall be provided:

−   Transfer mode: packet mode;

−   Information transfer capability: unrestricted digital information;

−   Information transfer rate: implementation-dependent;

−   other attributes shall be the same as at the C reference point.

The functions to map D_Q and U_Q channels to an inter-PINX connection (IPC) at the C reference point are described in clause 8.

8   Mapping functions

The PINX mapping functions shall meet the requirements defined for physical adaptation (8.1), channel allocation (8.2.1) and bearer conditioning for the D_Q-channel (8.2.2).