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Information technology — Private integrated services network —

Part 3: Reference configuration for PINX extension lines

Technologies de l'information — Réseau privé avec intégration de services —

Partie 3: Configuration de référence pour lignes d'extension PINX

Reference number
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Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

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 part of ISO/IEC 11579 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 11579-3 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 6, *Telecommunications and information exchange between systems*.

ISO/IEC 11579 consists of the following parts, under the general title *Information technology — Private integrated services network*:

— *Part 1: Reference configuration for PISN Exchanges (PINX)*

— *Part 2: Reference configuration for HS-PISN Exchanges (HS-PINX)*

— *Part 3: Reference configuration for PINX extension lines*

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Introduction

In general, the PTS infrastructure consists of a series of transceivers, i.e. functional groupings which can perform reception, amplification, regeneration and sending of physical signals presented to them on the extension line. In the simplest case these transceiver functional groupings may be NULL, i.e. the extension line consists of a simple physical wiring.

This International Standard establishes the rules according to which a generic PTS functional grouping can be modelled to match the particular needs of an application, requiring active equipment in the extension line.

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Information technology — Private integrated services network —

Part 3:
Reference configuration for PINX extension lines

1 Scope

This part of ISO/IEC 11579 specifies a reference configuration (RC) for the extension line of a private integrated services network exchange (PINX) including high level functions in addition to the physical termination system specified in part 1 of ISO/IEC 11579.

Since such high level functions appear application dependent and can occur, in principle, in any multiplicity and combination, no firm allocation of functional groupings and thus no firm reference points can be indicated. Instead, the principles for combining functional groupings associated with the physical termination system and allocating reference points are specified in this part of ISO/IEC 11579.

Examples for some combinations of functional groupings and the allocation of reference points are given in annex A.

The principle is not intended to require any specific implementation of a PINX, but only to provide guidance for the specification of PINX capabilities.

The principle is sufficient to support ISDN-like applications. It can be extended to also support non-ISDN-like applications.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of ISO/IEC 11579. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of ISO/IEC 11579 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.

ITU-T (formerly: CCITT) Recommendation I.411 (1988), *ISDN-User-Network-Interfaces — Reference Configurations.*

ISO/IEC 11579-1:1994, *Information technology — Telecommunications and information exchange between systems — Private integrated services network — Part 1: Reference configuration for PISN Exchanges*.

3 Symbols and abbreviations

ATM Asynchronous Transfer Mode
CBR Constant Bit Rate
CES Circuit Emulation Service
CF Control Function
FRP Fixed Radio Part

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IWF InterWorking Function
MRP Mobile Radio Part
RC Reference Configuration
RP Reference Point
PET Private Exchange Termination
PLT Private Line Termination
PNT Private Network Termination
PINX Private Integrated Services Network eXchange
PISN Private Integrated Services Network
PTS Private Termination System
SW SWitching
TA Terminal Adapter
TE Terminal Equipment
TCF Transceicer Control Function
TCVR TransCeiVeR functional grouping
TE2 Terminal Equipment type 2

4 Definitions

For the purposes of this part of ISO/IEC 11579, the following definitions apply.

4.1
extension line
the circuit interconnecting the terminal equipment with the PINX, thereby bridging the distance between the terminal and the centralized SW function

NOTE Depending on implementation, the extension line can be part of the PTS or the PTS can be attached to the exension line at one of its ends.

4.2
terminal equipment
See [2]

4.3
transceiver
a functional grouping which can perform the reception, amplification, regeneration, multiplexing, demultiplexing and sending of physical signals presented to it on the extension line

5 PINX extension line reference configuration

The extension line reference configuration for a PINX provides for a private termination system (PTS), as specified in part 1 of ISO/IEC 11579, and may include High Level applications on top of the PTS infrastructure, as appropriate for the functions to be performed on the extension line, see Figure 1.

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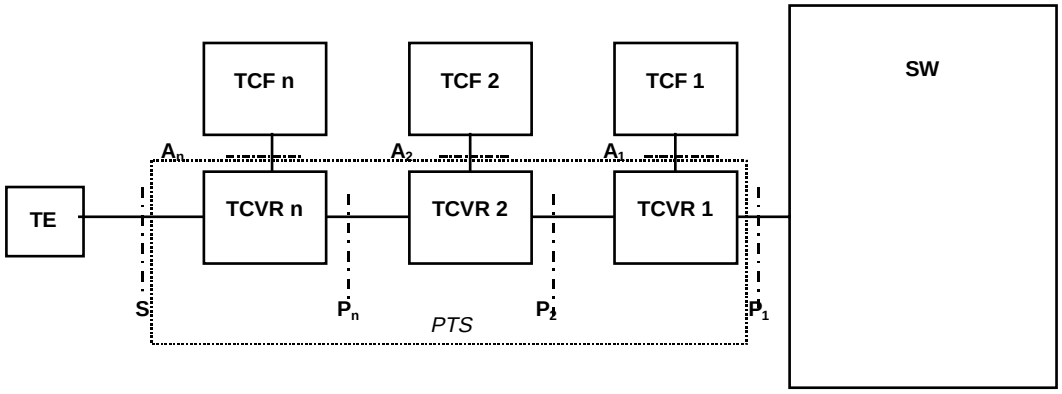


Figure 1 — Extension line reference configuration

5.1 Transceivers

In general, the PTS infrastructure consists of a series of transceivers (TCVR), i.e. functional groupings which can perform reception, amplification, regeneration and sending of physical signals presented to them on the extension line, in either direction of transmission. The number of transceivers can vary from 0 to any sensible number. The transceivers may act in a standalone manner or may act as a pair.

If multiple instances of transceivers need to be modelled, they shall be interconnected via multiple instances of P reference point, the individual instances being distinguished by appropriate indexes.

NOTE Examples of the various applications of the reference configuration are given in annex A.

5.2 Transceiver Control Function functional groupings

The individual transceivers can be under the control of transceiver control functions functional groupings (TCF). TCFs are outside the PTS functional grouping.

TCFs shall be connected to their corresponding transceivers via an instance of A reference point. If multiple instances of TCFs need to be modelled, each of them shall be connected to its TCVR via its own instance of A reference point, the individual instances being distinguished by appropriate indexes.

TCFs can communicate with other TCFs or with high level functions on the TE or on the SW. TCFs can take a specific name, depending on the particular application they support.

Non-TCF High Level entities are outside the scope of this part of ISO/IEC 11579 and are not shown in Figure 1, but are shown in annex A for better understanding of the overall context.

6 Reference points (RP)

A letter has been allocated to that reference point which is the subject of this part of ISO/IEC 11579.

6.1 A reference point

The A reference point defines the boundary between a transceiver functional grouping of the PTS and its TCF functional grouping.

Depending on the implementation, a physical interface can exist at the A reference point. If applicable, its physical, electrical and procedural characteristics shall be specified at the A reference point.

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6.2 P reference points

6.2.1 P_1 reference point

The P_1 reference point defines the boundary between the SW and the PTS, or between the SW and the first TCVR in the PTS, respectively. In the case that the PTS functions are NULL, the P_1 reference point will coincide with the S reference point.

6.2.2 Further P reference points

If applicable, further P reference points (P_2....P_n) define the boundaries between multiple transceiver functional groupings inside the PTS.

Depending on the implementation, a physical interface can exist at any instance of P reference point. If applicable, its physical, electrical and procedural characteristics shall be specified at that instance of P reference point.

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Annex A
(informative)

Examples for PTS Functional Groupings and their Combinations, and Allocation of Reference Points

Examples for PTS functional groupings are transceivers to support applications on extension lines such as:

— 2-wire/4-wire conversion (basic access only);

— wireless PISN mobility;

— campus cabling.

On a particular implementation of extension line, these applications can exist on their own or they can co-exist.

The concept of the extension line reference configuration enables easy concatenation of any number of transceivers in the PTS, as well as the accommodation of their control functions.

A.1 2-Wire/4-Wire Conversion

Figure A.1 shows an arrangement which provides a 2-wire extension line as a cost-efficient means to bridge larger distances, compared with the 4-wire cabling in accordance with the standards for a basic access S interface of terminal equipment to a PINX.

In its lower part, Figure A.1 shows an arrangement of functional groupings which is comparable to that in ITU-T Recommendation I.411 for the ISDN user-to-network access.

Except for the letter ”P” indicating that this is private equipment on an extension line rather than on a public ISDN access line, the same functional groupings appear on the access to the PINX, i.e.

— a private exchange termination (PET),

— a private line termination (PLT),

— a private network termination (PNT).

These functional groupings provide the functions similar to the corresponding functional groupings on a public user access to the ISDN, i.e.

— to handle extension line related operation and management (non-switching) functions of the PINX,

— to terminate the PINX to the extension line,

— to terminate the extension line with regard to the TE.

In this example the PLT is assumed to provide a 2-wire interface to the PNT, which converts this to a 4-wire S interface to the TE(s).

Extension line related operational and management functions will be executed between the PET and PNT, e.g. the activation of test loops.

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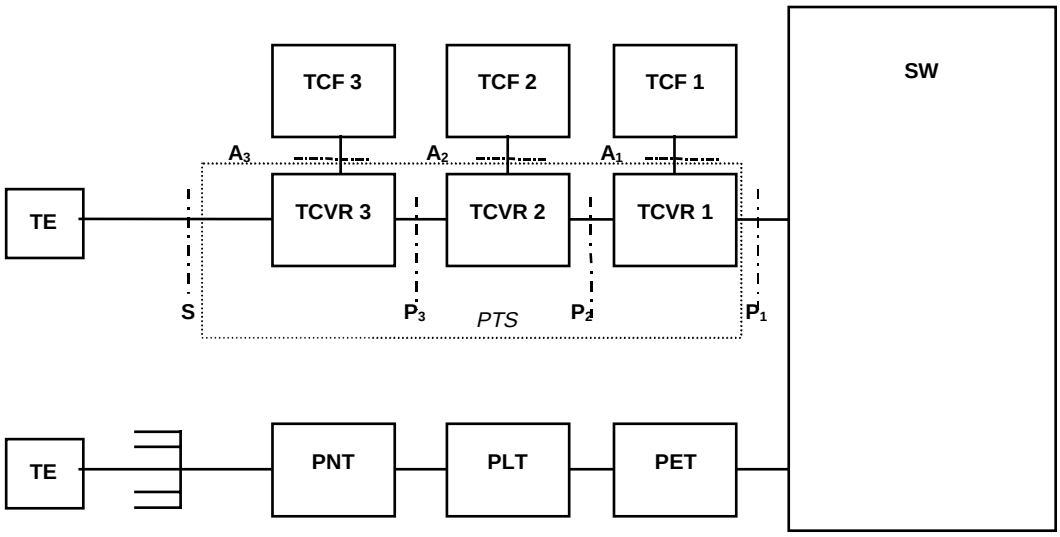


Figure A.1 — 2-wire-to-4-wire conversion on an extension line

A.2 PISN wireless mobility

Figure A.2 shows an example for a specific combination of PTS functional groupings which satisfies the requirements for describing an extension line including the equipment for wireless mobility.

Two cases are depicted:

In case 1 the equipment encompasses a fixed radio station at the wired end of the extension line and a wireless handset. This arrangement is known as ”wireless end-system”. Strictly, this arrangement does not fall under the scope of this part of ISO/IEC 11579, since all functional groupings needed are beyond the extension line, i.e. in the TE functional grouping. Still case 1 is shown here to illustrate the difference to case 2.

In case 2 the equipment encompasses a fixed radio station at the wired end of the extension line and a complex mobile part which provides full S_0-bus capability to multiple, ordinary, wired terminals. This arrangement is known as ”wireless intermediate system”, the best known application of which is the ”radio local loop”.

In case 1 the radio interface appears at an instance of R reference point, whereas in case 2 the radio interface appears at an instance of P interface.

NOTE The R reference point is defined in ITU-T Recommendation I.411.

Both transceivers require high level functions to perform the typical wireless mobility functions, e.g. paging for a desired wireless extension before the actual setup of an incoming call, etc. Also the typical PISN access functions are to be performed in the fixed radio part functional groupings, e.g. TEI mapping between the MAC_ID at the radio interface and the TEI value obtained from the PINX.

For better understanding also a high level entity (”Home & Visitors’ Data Base”) connected to the SW is shown, i.e. the data base and other functions which communicate with the MRP CF and the FRP CF.

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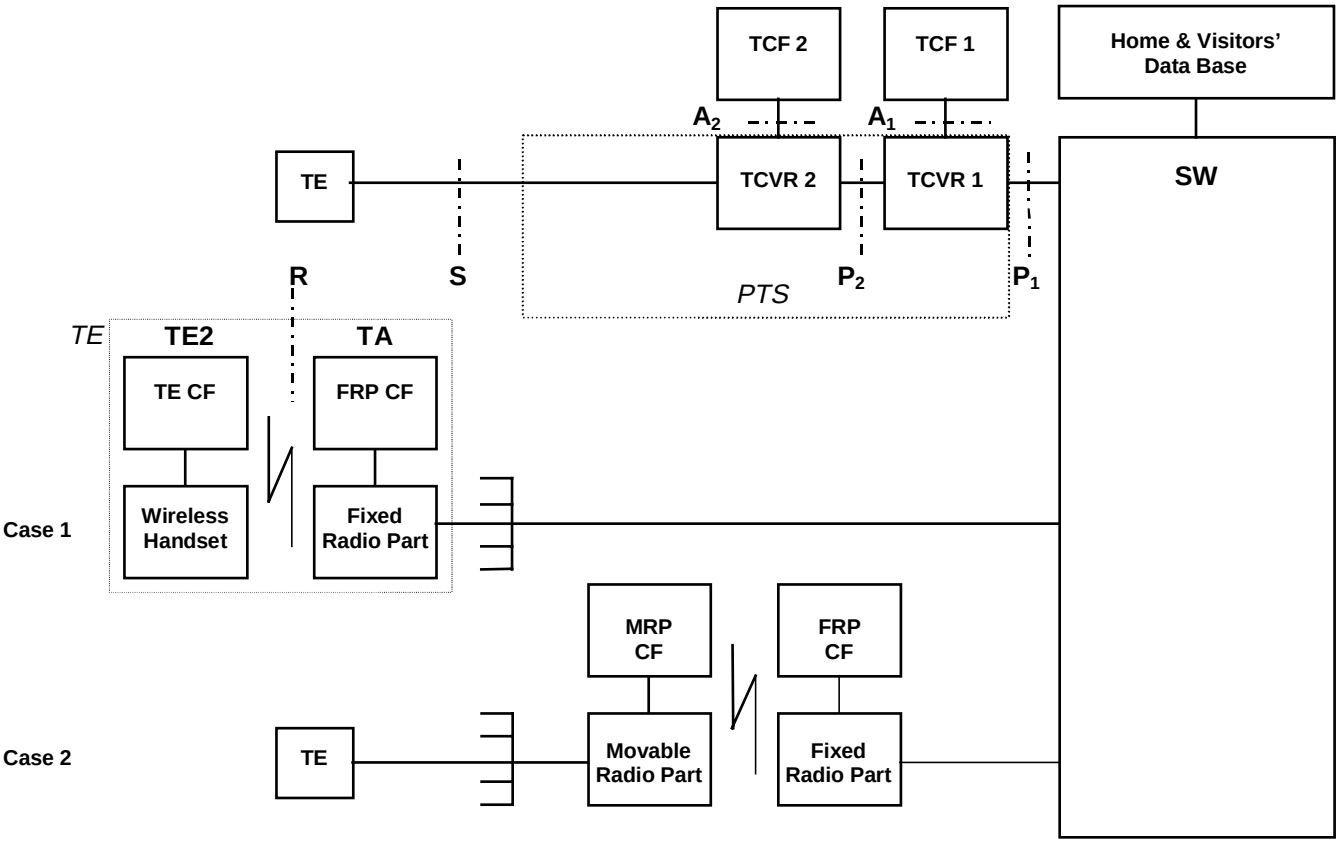


Figure A.2 — Application of the extension line reference configuration to PISN wireless mobility

A.3 Campus cabling

Figure A.3 shows an example for a specific combination of PTS functional groupings which satisfies the requirements for campus cabling (i.e. cabling on a larger customer premises) where the extension line plant is run on an ATM backbone network laid out on the campus for various transmission tasks.

In this case transceivers convert from different presentations of the physical signals within the ATM section to outside the ATM section. A basic rate narrow-band TE is connected to a PINX via an interworking function providing an ATM circuit emulation service (CES-IWF2). The CES-IWF2 performs the mapping to an ATM CBR channel. At the termination of the ATM connection, an ATM CES IWF1 re-maps the information into circuit mode and sends it to the PINX.

The two ATM CES IWFs therefore virtually extend the CBR link between the TE and the PINX across an intermediate ATM network. Control plane and user information sent by either the TE or the PINX are transported transparently through the ATM network. The circuit emulation function preserves bit integrity.

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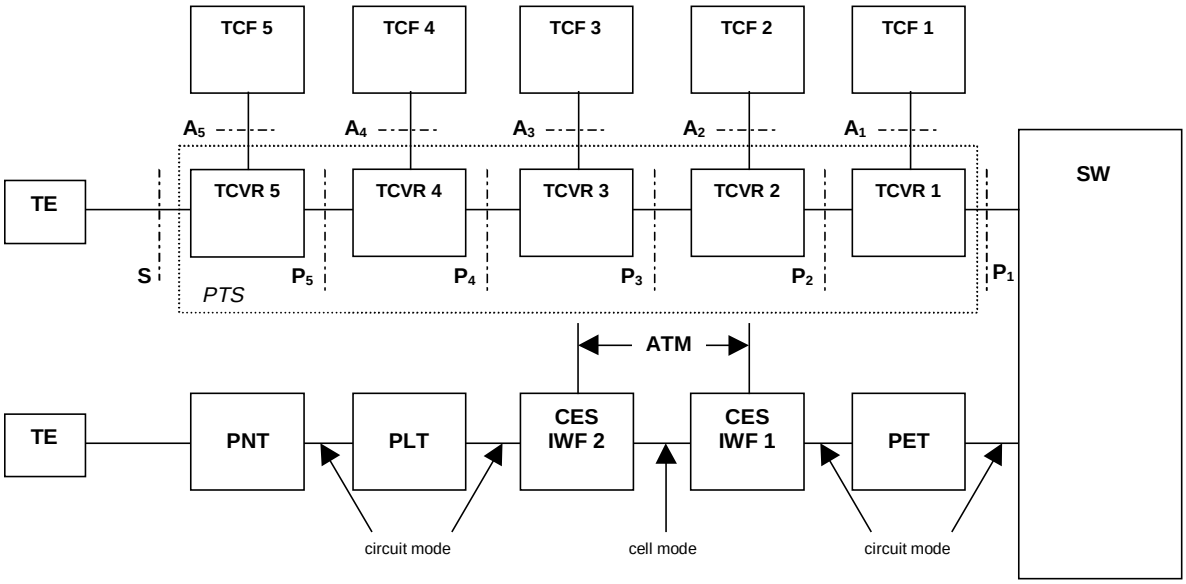


Figure A.3 — Application of the extension line reference configuration to campus cabling

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