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Foreword

This European Telecommunication Standard (ETS) has been produced by Project Team 35 on behalf of the Business TeleCommunications (BTC) Technical Committee of the European Telecommunications Standards Institute (ETSI) and the TC32 Committee of the European Computer Manufacturers Association (ECMA).

ETSI has taken over the responsibility for CENELEC ENV 41005: "Method for the specification of basic and supplementary services of private telecommunication networks" and has agreed to replace this ENV with an equivalent ETS.

This ETS is a re-typed version of ENV 41005 with no changes of substance. The opportunity has been taken to carry out minor re-alignments, e.g. of references and definitions. This ETS supersedes ENV 41005.

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1 Scope

This European Telecommunication Standard (ETS) specifies the method for specification of basic and supplementary services provided by a Private Telecommunications Network (PTN) to users of terminal equipment attached to it. It applies to any other PTN-related standard, such as:

- stage 1 and stage 2 specifications of basic and supplementary services;

- specifications of basic and supplementary service signalling protocols, at any relevant PTN reference point, in the context of any scenarios for the interconnection of Private Telecommunications Network Exchanges (PTNXs) and in the context of interworking with other networks.

This ETS applies to Private Telecommunications Networks (PTNs).

Informative references are given in Annex A.

2 Normative references

This ETS incorporates by dated and undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this ETS only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

[1]   DE/BT-01023:   "Business   Telecommunications   (BT);   Private Telecommunications Network (PTN); functional requirements Part 1: Definition of terms".

3 Definitions and abbreviations

3.1 Definitions

Private Telecommunications Network (PTN): see DE/BT-01023 [1].

Private Telecommunications Network Exchange (PTNX): see DE/BT-01023 [1].

3.2 Abbreviations

CC	Call Control
CCA	Call Control Agent
FE	Functional Entity
ISDN	Integrated Services Digital Network
LE	Local Exchange
PTN	Private Telecommunications Network
PTNX	Private Telecommunications Network Exchange
S	S reference point
T	T reference point
TE	Terminal Equipment

4 Conformance

In general, a PTN-related specification is in conformance with this ETS if it adheres to the method specified in this ETS.

In particular:

- stage 2 specifications of a basic service, or of supplementary services, are in conformance with this ETS if they adhere to the method specified in this ETS and, in addition, satisfy the requirements of the corresponding stage 1 specifications;

- stage 3 specifications of a basic service or of supplementary services are in conformance with this ETS if they adhere to the method specified in this ETS and, in addition, satisfy the requirements of the corresponding stage 1 and stage 2 specifications.

5 General principles and requirements

5.1 Classification of services

The services offered to the user of a PTNX comprise basic and supplementary services.

Basic services are divided into basic bearer services and basic teleservices.

Supplementary services can apply to both basic bearer services and basic teleservices.

This classification of services is the same as for an Integrated Services Digital Network (ISDN), see CCITT Recommendation I.210.

The attributes for the characterisation of basic services are described in CCITT Recommendation I.140.

5.2 Basic call

The basic call is an instance of the use of a basic service. The basic call shall be established when use of a basic service is requested, it shall be maintained throughout the use of that service and it shall be released when the use of that service is no longer required.

Additions to the basic call shall provide the means for initiating, maintaining (if applicable) and terminating the use of supplementary services.

> NOTE: The following are examples of basic services, as specified in CCITT Recommendations I.220, I.230 and I.240:
>
> - circuit mode bearer services;
> - bearer services for the support of packetized information transfer;
> - bearer services for the support of management applications;
> - teleservices.

6 The three-stage specification method

Service specifications shall follow the three-stage method specified in this Clause, which is based on the method specified for public ISDNs by CCITT Recommendations I.130.

The three-stage method implies that the stage 2 specification satisfies the requirements of the stage 1 specification, and that the stage 3 specification satisfies the requirements of the stage 1 and of the stage 2 specifications.

6.1 Stage 1 of the method

This stage shall specify how basic or supplementary services present themselves to the PTN user.

Stage 1 specifications of basic services shall make use of a basic call stage 1 specification covering common aspects of all basic services and specific aspects that are service-dependent.

The basic call stage 1 specification shall define the establishment and release of a basic call, as they appear to the PTN user. It shall also define the nature of PTN user information transfer during the established phase of the basic call.

Stage 1 specifications of supplementary services shall define additions to the basic call, as they appear to the PTN user.

The stage 1 specifications for basic and supplementary services shall also define the impact of interworking with a public ISDN, as perceived by the PTN user, e.g. possible restrictions and modifications of the services.

6.2 Stage 2 of the method

This stage shall specify how a basic call or supplementary service is handled by the various functional entities that cooperate to provide the service. These specifications shall fulfil the requirements of the relevant stage 1 specifications.

6.2.1 Functional entities

A Functional Entity (FE) is a set of functions that are located in the same unit of equipment, e.g. a Terminal Equipment (TE) or a PTNX. Functions that may need to reside in different units of equipment shall be assigned to different FEs.

For basic calls, the FEs are defined in subclause 6.2.5. The FEs supporting a supplementary service shall be identified in the appropriate stage 2 specification.

6.2.2 Functional model

The functional model shows the FEs involved in the provision of a service and those pairs of FEs between which there is a direct interchange of information. Some types of FEs may occur more than once in the model. The model for the basic call is defined in subclause 6.2.5. The model to support supplementary services shall be shown in the appropriate stage 2 specification.

6.2.3 Information flows

A collection of items of information to be sent from one FE to another FE at a particular instant is called an information flow. Stage 2 shall show examples of information flows, with their contents specified in an abstract way.

6.2.4 Sequences of information flows

Examples of typical sequences of information flows necessary for the FEs to cooperate in the provision of a service shall be shown.
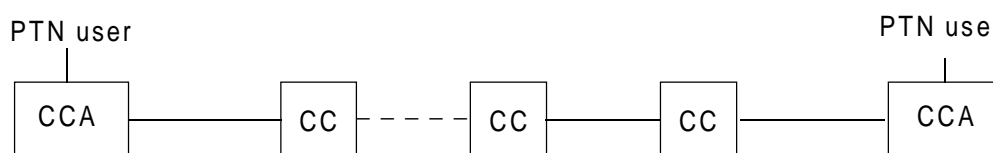
6.2.5 Functional entities involved in a basic call

Figure 1 shows the functional model for the basic call, which is based on CCITT Recommendation Q.71.

Two generic types of FEs are used, the Call Control Agent (CCA) FE and the Call Control (CC) FE.

The CCA acts on behalf of the PTN user and calls upon the CC(s) for the provision of the basic service requested by this user. Specific forms of CCA exist for the originating and the terminating PTN user.

CCAs are located within the TEs involved in the basic call, i.e. the TE of the PTN user who requests the service (the calling TE) and the TE of the destination PTN user (the called TE).

CC   : Call Control generic FE.
CCA   : Call Control Agent generic FE.

     NOTE: The number of CCs can vary from one upwards.

Figure 1: Generic Functional Entities involved in a PTN basic call

The CCs cooperate in the provision of the basic service requested by the CCAs.

Specific forms of CC exist at the exchanges through which the call is routed, including the exchange serving the calling TE (originating exchange), the exchange serving the called TE (terminating exchange) and any intermediate exchanges (transit exchanges).

This model is independent of the network or networks involved in the basic call, i.e. it also applies to interworking situations between a PTN and other networks such as public ISDNs.

For calls entirely within a PTN, the CCs are located at PTNXs and the CCAs are located at TEs attached to PTNXs. For calls that interwork with other networks, specific forms of CC exist at exchanges of the other networks, e.g. public ISDN local exchanges, and one of the CCAs is located in a TE attached to another network. Examples are given in Annex B.

In keeping with requirements for terminal interchangeability, the information flows between a CCA and a CC located in a PTNX shall be compatible with the information flows between a CCA and a CC located in a public ISDN local exchange.

6.2.6 Relationship between supplementary service and basic call FEs

The relationship between the FEs identified for the provision of supplementary services and the various CCs and CCAs of the basic call shall be specified in the appropriate stage 2 specification. For some supplementary services, there may be a number of different possibilities for the location of supplementary service FEs. In interworking situations some supplementary service FEs may be located within other networks.

The signalling protocols specified at stage 3 shall be able to support all of the possibilities identified at stage 2.

6.3 Stage 3 of the method

This stage shall specify the signalling protocols at each relevant reference point and/or interface for basic call and supplementary services, and other aspects of equipment behaviour that are necessary for cooperation in the provision of network services. These specifications shall fulfil the requirements of both the relevant stage 1 and the relevant stage 2 specifications.

Stage 3 conformance test specifications shall use the relevant stage 1 and stage 2 specifications to ensure that the equipment under test is capable of cooperating in the provision of network services based on those specified at stages 1 and 2.

Annex A (informative): Bibliography

The following references are used for informative purposes in this ETS.

CCITT Recommendation I.130 (1988): "Method for the characterization of telecommunication services supported by an ISDN and network capabilities of an ISDN".

CCITT Recommendation I.140 (1988): "Attribute technique for the characterization of telecommunication services supported by an ISDN and network capabilities of an ISDN".

CCITT Recommendation I.210 (1988): "Principles of telecommunication services supported by an ISDN and the means to describe them".

CCITT Recommendation I.220 (1988): "Common dynamic description of basic telecommunication services".

CCITT Recommendation I.230 (1988): "Definition of bearer service categories".

CCITT Recommendation I.240 (1988): "Definition of teleservices".

CCITT Recommendation Q.65 (1988): "Stage 2 of the method for the characterization of services supported by an ISDN".

CCITT Recommendation Q.71 (1988): "ISDN circuit mode switched bearer services".

Annex B (informative): Examples of interworking for basic calls and supplementary services between PTN and public ISDN

Figure B.1 shows an example of the application of the model to a mixed PTN to public ISDN interworking situation.
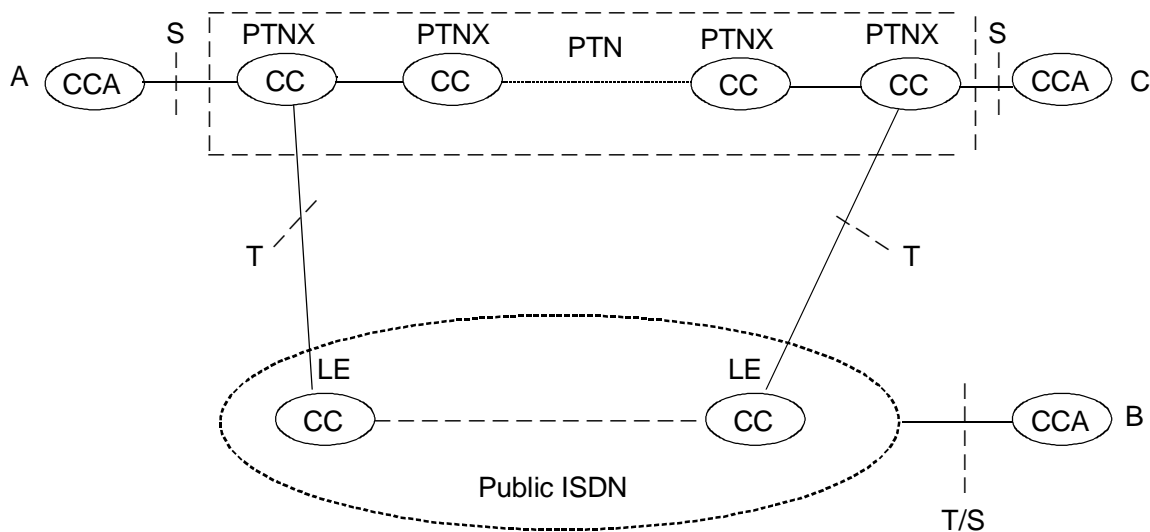
CC : Call Control generic FE.
CCA : Call Control Agent generic FE.
LE : Local Exchange.

Figure B.1: Example of a PTN to public ISDN interworking situation

A call between CCAs A and C can either be routed entirely through CCs of the PTN, or through a CC of the PTN, CCs of the public ISDN, and a further CC of the PTN.

A call between CCAs A and B can be routed through a CC of the PTN and CCs of the public ISDN, or through a series of CCs of the PTN and a CC of the public ISDN.

It can be seen that a CC in a public ISDN Local Exchange (LE) is in communication with a CCA when a TE is attached at coincident S and T reference points, whereas a CC is a public ISDN LE is in communication with another CC when a PTNX is attached at the T reference point. This implies different information flows across coincident S and T reference points compared with those across a single T reference point, and different behaviour of the CC in the public ISDN LE, depending on whether a TE or a PTNX is attached. It may also have impact on the signalling protocol at the public ISDN user-network interface, as specified at stage 3.

The above considerations may also apply to certain supplementary services, i.e. the FEs on either side of a stand-alone T reference point may differ from those on either side of coincident S and T reference points. This may, again, lead to differences in the behaviour of the public ISDN LE and differences in the signalling protocol, depending on whether a TE or a PTNX is attached.

History

Document history	
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