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Zasebno telekomunikacijsko omrežje (PTN) – Specifikacija, funkcijski modeli in informacijski pretoki - Vidiki krmiljenja za vodovne osnovne storitve

Private Telecommunication Network (PTN); Specification, functional models and information flows; Control aspects of circuit mode basic services

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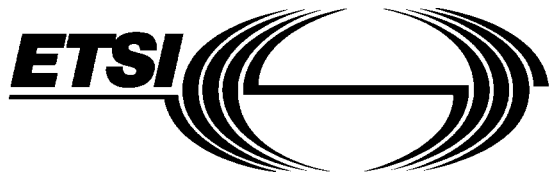
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Contents

Foreword	7
1 Scope	9
2 References	10
3 Definitions and acronyms	10
3.1 Definitions	10
3.1.1 Service	10
3.1.2 Call	10
3.1.3 Network call control entity	10
3.1.4 User	10
3.1.5 PTN user	10
3.2 Acronyms	10
4 PTN Service Provision	11
4.1 Bearer Services	11
4.2 Teleservices	11
4.3 Control and signalling	12
4.4 Interworking Considerations	12
4.5 Service Model	12
4.6 Service Attributes	13
5. Circuit mode 64 kbit/s (unrestricted 8 kHz structured bearer) service category	14
5.1 Description	14
5.2 Interworking Considerations	15
5.2.1 Interworking with a public ISDN	15
5.2.2 Interworking with networks supporting only a restricted digital information transfer capability	15
5.2.3 Interworking with analogue networks	15
5.3 Service attributes	16
5.3.1 Dominant information transfer attributes	16
5.3.2 Secondary information transfer attributes	16
5.3.3 Access attributes	16
6 Circuit mode 64 kbit/s 8 kHz structured bearer service category Usable for speech information transfer	16
6.1 Description	16
6.2 Interworking Considerations	17
6.2.1 Interworking with a public ISDN	17
6.2.2 Interworking with analogue networks	17
6.2.3 Encoding law conversion	17
6.3 Service attributes	17
6.3.1 Dominant information transfer attributes	17
6.3.2 Secondary information transfer attributes	18
6.3.3 Access attributes	18
7 Circuit mode 64 kbit/s 8 kHz structured bearer service category usable for 3,1 kHz audio information transfer	18
7.1 Description	18
7.2 Interworking Considerations	19
7.2.1 Interworking with a public ISDN	19
7.2.2 Interworking with analogue networks	19
7.2.3 Encoding law conversion	19
7.3 Service attributes	19
7.3.1 Dominant information transfer attributes	19
7.3.2 Secondary information transfer attributes	19

	7.3.3	Access attributes	20
8	Teleservices.....		20
	8.1	Telephony Teleservice	20
	8.2	Teletex Teleservice	21
	8.3	Telefax 4 Teleservice	21
	8.4	Videotex Teleservice	22
9	Demand service procedures for services within a PTN.....		22
	9.1	Provision of Services.....	22
	9.2	Normal Procedures	22
	9.2.1	Call establishment at the calling PTN user	22
	9.2.2	Call establishment at the called PTN user.....	24
	9.2.3	Terminating the service (call release).....	25
	9.3	Exceptional Procedures / Unsuccessful Outcome	25
	9.3.1	Failure situations due to calling PTN user.....	25
	9.3.2	Failure situations due to called PTN user state	25
	9.3.3	Failure situations due to network conditions.....	25
	9.3.4	Rejection of the call by the called PTN user	25
	9.3.5	Absence of response from called PTN user.....	26
10	Interworking		26
	10.1	General Interworking Considerations	26
	10.1.1	Incoming Calls	26
	10.1.2	Outgoing Calls	26
	10.1.3	PTN Transit Calls.....	26
	10.2	Demand service interworking with a public ISDN	27
	10.2.1	Receipt of service request from a public ISDN.....	27
	10.2.2	Sending a service request to a public ISDN	27
	10.2.3	Receipt of a service response from public ISDN	27
	10.2.4	Sending a service response to a public ISDN	28
11	Dynamic Description.....	SIST ETS 300.171.E1:2005	28
12	Functional model	https://standards.iteh.ai/catalog/standards/sist/8fb84681-6e13-4c1b-ba55-01559519ecd6/sist-ets-300-171-e1-2005	30
	12.1	Functional model description	30
	12.2	Description of the functional entities	31
	12.2.1	Call Control Agent functional entity	31
	12.2.1.1	Originating CCA functional entity	32
	12.2.1.2	Destination CCA functional entity.....	32
	12.2.2	Call Control functional entity	32
	12.2.2.1	Originating CC functional entity.....	33
	12.2.2.2	Destination CC functional entity	33
	12.2.2.3	Transit CC functional entity.....	33
	12.2.2.4	Incoming and Outgoing Gateway CC functional entities.....	34
13	Definition of information flows.....		34
	13.1	Conventions used within the description of information flows.....	34
	13.1.1	Convention for the description of mandatory or optional information	34
	13.1.2	Convention for the naming of information flows	35
	13.2	SETUP	35
	13.3	REPORT	39
	13.4	CHANNEL_ACKNOWLEDGE.....	40
	13.5	CHANNEL_CONNECT	40
	13.6	DISCONNECT	40
	13.7	RELEASE.....	40
	13.8	INFORMATION	40
	13.9	SETUP_REJECT	41
14	Information flow sequences.....		41
	14.1	Functional Entity Actions	41
	14.1.1	Originating CCA functional entity	41
	14.1.2	Originating CC functional entity	42

14.1.3	Transit CC functional entity	43
14.1.4	Destination CC functional entity	44
14.1.5	Destination CCA functional entity	45
14.1.6	Incoming gateway CC functional entity	45
14.1.7	Outgoing gateway CC functional entity	47
14.2	Non-automatic Call Establishment.....	48
14.3	Automatic Answering	49
14.4	Unsuccessful calls with the provision of tones and announcements.....	50
14.5	Unsuccessful calls without the provision of tones and announcements.....	51
14.6	Incoming interworking with a non-ISDN.....	52
14.7	Outgoing interworking with a non-ISDN.....	53
14.8	Outgoing interworking with overlap sending	54
14.9	Basic call clearing	55
14.10	Incoming interworking with a public ISDN.....	56
14.11	Outgoing interworking with a public ISDN.....	57
15	SDL diagrams for functional entities	58
15.1	Originating CCA functional entity SDL diagrams	58
15.1.1	Originating CCA states used in SDL diagrams	58
15.1.2	Originating CCA SDL diagrams.....	59
15.2	Originating CC functional entity SDL diagrams.....	63
15.2.1	Originating CC states used in SDL diagrams.....	63
15.3	Transit CC functional entity SDL diagrams	70
15.3.1	Transit CC states used in SDL diagrams	70
15.4	Destination CC functional entity SDL diagrams	76
15.4.1	Destination CC states used in SDL diagrams	76
15.5	Destination CCA functional entity SDL diagrams.....	83
15.5.1	Destination CCA states used in SDL diagrams.....	83
15.5.2	Destination CCA SDL diagrams.....	84
16	Allocation of functional entities to physical entities.....	87
Annex A (informative):	Relationship to corresponding public ISDN Standards.....	88
Annex B (informative):	Other references.....	89
History.....		90

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Foreword

This European Telecommunication Standard (ETS) has been produced by the European Computer Manufacturers Association (ECMA) on behalf of its members and those of the European Telecommunications Standards Institute (ETSI).

This ETS is one of a series of Standards defining services and signalling protocols applicable to Private Telecommunication Networks (PTNs) incorporating one or more interconnected exchanges. The series uses the ISDN concepts as developed by CCITT and is also within the framework of standards for open systems interconnection as defined by ISO.

This particular ETS contains specifications of basic services.

Service specifications are produced in three stages, according to the method described in ENV 41005, which is based on the method used by CCITT Recommendation I.130 and Recommendation Q.65 and ETSI. This Standard contains the Stage 1 and Stage 2 specifications of the services. Stage 1 (clauses 5 to 11) describes the services as seen by users of PTNs. Clauses 9,10 and 11 describe the common aspects of the services and clauses 5,6,7 and 8 describe those aspects which are service dependent. Stage 2 (clauses 12 to 16) identifies the functional entities involved in the basic services and the information flows between them. Stage 3, the definition of the networking and access signalling protocols to support the basic services, will appear in separate ETSs.

This ETS was produced by ECMA using the ECMA guidelines for the production of ETSs and using the ECMA stylesheet. In order to avoid undue delays in the publication of this ETS it has been agreed that this ETS will not be converted to the ETSI stylesheet.

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1 Scope

This Standard specifies control aspects of standardized circuit mode services which may be supported by Private Telecommunication Networks (PTNs). This Standard contains the Stage 1 and Stage 2 specifications of these services.

Definition of signalling protocols at Stage 3 is guided and constrained by the Stage 1 and Stage 2 specifications, and therefore this Standard is concerned mainly with the control aspects of services. The properties of the user information are described for the different basic services which have to be controlled. Detailed requirements of user information protocols and switching functions are outside the scope of this Standard.

NOTE 1:

The services specified are compatible with the equivalent services specified by CCITT and ETSI for public ISDNs. CCITT specifications of these services are to be found in Recommendations I.220, I.230, I.231 (Stage 1), Q.71 (Stage 2), I.240, and I.241.

This Standard applies to the following bearer services:

- Circuit Mode 64 kbit/s Unrestricted 8 kHz Structured Bearer Service Category;
- Circuit Mode 64 kbit/s 8 kHz Structured Bearer Service Category Usable for Speech Information Transfer;
- Circuit Mode 64 kbit/s 8 kHz Structured Bearer Service Category Usable for 3,1 kHz Audio Information Transfer.

The following Teleservices are supported by these bearer services:

- Telephony Teleservice; (standards.iteh.ai)
- Teletex Teleservice; [SIST ETS 300 171 E1:2005](https://standards.iteh.ai/catalog/standards/sist/8fb84681-6e13-4c1b-ba55-01559519ccd6/sist-ets-300-171-e1-2005)
- Telefax 4 Teleservice; <https://standards.iteh.ai/catalog/standards/sist/8fb84681-6e13-4c1b-ba55-01559519ccd6/sist-ets-300-171-e1-2005>
- Videotex Teleservice.

This Standard specifies the dynamic procedures for the support of these Teleservices within a PTN. The definition of these Teleservices is beyond the scope of this Standard.

Negotiation of service at call establishment time and change of service during a call are outside the scope of this Standard.

A Stage 3 Standard shall be in conformance with the Stage 1 and Stage 2 specifications contained in this Standard, if the signalling protocols and equipment behaviour specified in the Stage 3 Standard are capable of being used in a PTN which supports any or all of the basic services specified in this Standard. In particular, the Stage 3 Standards shall be adequate for the support of:

- common aspects of the control of basic services, as seen by the PTN user and the interworking with the ISDN, as specified in clauses 9 and 10;
- the control of the individual basic services specified in clauses 5, 6, 7 and 8;
- the functional entities, functional entity allocations and information flows identified in clauses 12, 13, 14 and 16.

2 References

- ETS 300 189 (1992) Private Telecommunication Network (PTN); Addressing.
- ENV 41005 (1992) Method for the specification of basic and supplementary services of private telecommunication networks.
- ENV 41007-1 (1991) Definition of terms in private telecommunication networks, Part 1: definition of general terms.
- ETS 300 089 (1991) Integrated Services Digital Network (ISDN); Calling Line Identification Presentation (CLIP) supplementary service, Service description.
- ETS 300 062 (1991) Integrated Services Digital Network (ISDN); Direct Dialling In (DDI) supplementary service, Service description.
- ETS 300 094 (1991) Integrated Services Digital Network (ISDN); Connected Line Identification Presentation (COLP) supplementary service, Service description.
- CCITT Recommendation I.112 Vocabulary of terms for ISDNs.

3 Definitions and acronyms

The special terminology defined in ENV 41007-1 and CCITT Recommendation I.112 applies. If there is conflict, the definitions in ENV 41007-1 shall take precedence. For the purpose of this Standard the following further definitions apply.

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3.1 Definitions

3.1.1 Service

Unless otherwise stated, the term "service" shall mean "basic telecommunication service".

3.1.2 Call

The instance of the use of a service.

3.1.3 Network call control entity

The collection of network functions concerned with the control of services, as opposed to functions concerned with the transfer of user information.

3.1.4 User

An entity which uses telecommunication services offered by a network, and which therefore directly or indirectly uses the services of the Network Layer.

3.1.5 PTN user

An entity which uses telecommunication services offered by a PTN, and which therefore directly or indirectly uses the services of the Network Layer.

3.2 Acronyms

CC	Clearing Cause
CC	Call Control generic functional entity
CCA	Call Control Agent generic functional entity
CH	Call History
CI	Channel Identifier
CN	Connected Number

CS	Connected Subaddress
CT	Connection Type
DC	Destination Category
DN	Destination Number
DS	Destination Subaddress
DT	Date/Time
FE	functional entity
ISDN	Integrated Services Digital Network
ISO	International Organisation for Standardization
NC	Number complete indication
OC	Originating Category
ON	Originating Number
OS	Originating Subaddress
OSI	Open Systems Interconnection
PSTN	Public Switched Telephone Network
PTN	Private Telecommunication Network
PTNX	Private Telecommunication Network Exchange
RT	Report Type
SDL	Specification and Description Language
TE	Terminal Equipment

4 PTN Service Provision

Basic services within a PTN consist of bearer services and teleservices. A bearer service is defined only up to a certain layer, in any case no higher than Layer 3. The definition of a teleservice also encompasses the higher layers up to Layer 7 (although some of the layers may be empty or not specified, as with Telephony, for example).

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The basic services defined in this document correspond to the circuit mode basic services defined by ETSI.

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4.1 Bearer Services

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PTN circuit mode bearer services provide a means of transferring information between users at Physical Layer level. Layers above Layer 3 are not defined. The provision of bearer services involves only low layer functions and so a bearer service can support a variety of high layer protocols.

A circuit mode bearer service provides a connection (at the Physical Layer) for the conveyance of user information. Each switching point intervenes only at the Physical Layer. This gives a constant bit rate and fixed delays, which are very close to the inherent delays of the transmission media.

4.2 Teleservices

The provision of a teleservice involves high layer functions, generally using the underlying low layer capabilities of bearer services. A PTN can support a teleservice by supporting a bearer service having the same capabilities as those required by the teleservice and by satisfying any special control requirements of the teleservice. The provision of high layer functions in support of a teleservice is not a necessary part of a PTN and is beyond the scope of this Standard.

When requesting a teleservice from a PTN, the user has to explicitly indicate the bearer capabilities required in the same way as when a bearer service is requested. In addition, an indication of the teleservice required is provided by the PTN user, primarily for passing the indication through the network to the called PTN user in order to allow compatibility checking. A PTN may optionally make use of this information for purposes such as barring certain teleservices to certain PTN users, or for the provision or activation of supplementary services on a per teleservice basis, e.g., call forwarding. Any use of this information by a PTN is outside the scope of, but is not precluded by, this Standard.

4.3 Control and signalling

In order for information transfer to take place, an information connection must exist between the PTN users concerned. A demand service involves the establishment and release of information connections according to the demands of users. From the point of view of users, calls have to be established and released, and this involves call control functions. Call control requires knowledge of the properties of the user information to be transferred in order to provide appropriate capabilities.

In general, more than one network element (e.g., PTNX, terminal) is involved in a call, and therefore call control is distributed. Therefore call control information needs to be conveyed between network elements. The conveyance of this information is a function of signalling (see ECMA TR/44).

PTN services use signalling, information which is carried over a dedicated logical connection, separate from the connection established for conveying user information. In the case of circuit mode bearer services, the signalling connection is by necessity carried on a separate physical channel from the information channel (out-of-band signalling).

NOTE 2:

The possible use of the signalling connection also to provide user-to-user information transfer is the function of the User-to-User Signalling supplementary service, which is outside the scope of this Standard.

4.4 Interworking Considerations

In general, interworking between a PTN bearer service and a bearer service provided by another network requires interworking functions, both for information transfer and for signalling.

When interworking with the same service in a public ISDN, the interworking function for information transfer is null. However, interworking has an impact on signalling.

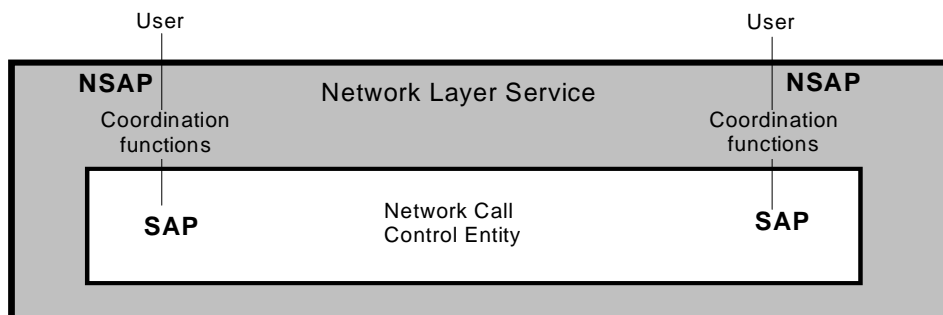
4.5 Service Model

This Standard uses the following model in order to specify services.

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The Network Layer provides the bearer capabilities necessary for the support of bearer services and teleservices. A PTN user accesses the Network Layer service through Network Service Access Points (NSAP) and requests the Network Layer to provide the bearer capabilities necessary for the support of the bearer services or teleservices. An NSAP is identifiable by an address, which in a PTN is generally in the form of a PTN number, or of the concatenation of a PTN number and a subaddress. For addressing requirements see ETS 300 189.

The Network Layer incorporates functions for the control of calls and functions for the transfer of user information. This Standard views control functions as services being provided by a Network Call Control entity, which are accessible through service access points. Co-ordination functions use the services of the Network Call Control entity when coordinating call control with the transfer of user information, thereby providing a complete Network Layer service to PTN users. Unless explicitly stated the terms "network" and "Network Call Control entity" are used interchangeably hereafter. See figure 1.



SAP = Service Access Point
NSAP = Network Service Access Point

Figure 1 - Service Model

The mapping mechanism between NSAPs and Network Call Control service access points is beyond the scope of this Standard. An address which identifies an NSAP also identifies a Network Call Control service access point by implication.

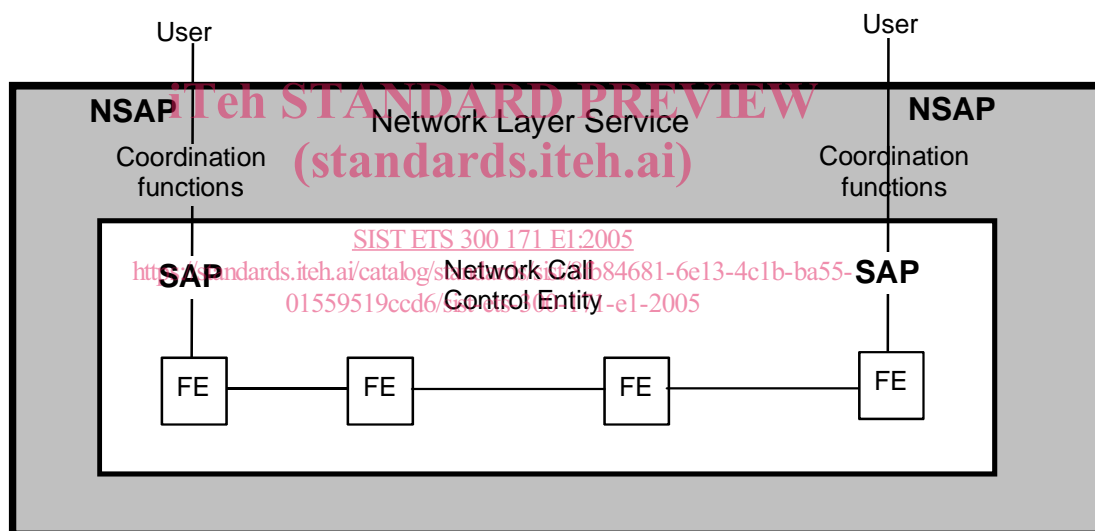
The primitives used across Network Call Control service access points are as follows.

- SETUP_request/indication/response/confirmation; used for call establishment.
- RELEASE_request/indication/response/confirmation; used for call rejection and release.
- REPORT_request/indication; used for reporting that the called PTN user is being alerted, interworking situations, and the presence of in-band tones or announcements.
- INFORMATION_request; used for providing additional destination addressing information not provided with the SETUP_request.

The above primitives are mappable on to the primitives at an NSAP, e.g., N-CONNECT_request/indication/response/confirmation. NSAP primitives relating to the transfer of user information do not have equivalents at the Network Call Control service access point.

At Stage 1, the control aspects of services are specified in terms of the primitives listed above at the Network Call Control service access points. The entire Network Call Control is treated as a single entity.

At Stage 2, the internal behaviour of Network Call Control is specified by breaking it down into a number of Functional Entities (FE) and specifying the information flows between them. The result is a model of the form shown in figure 2. The particular model used for the basic call is specified in clauses 12, 13, 14, 15 and 16. Other models based on this generic model are used for supplementary services. These are specified in other Standards.



SAP = Service Access Point

NSAP = Network Service Access Point

Figure 2 - Generic Model for Stage 2.

4.6 Service Attributes

For each specific service category described in clauses 5 to 8, the attributes, as described in CCITT Recommendations I.140 and I.210, are given. Bearer services are described by low layer attributes. Teleservices are described by both low layer attributes and high layer attributes. High layer attributes are outside the scope of this Standard.

The low layer attributes described in CCITT Recommendation I.210 consist of information transfer attributes, access attributes and general attributes. The information transfer attributes define the network capabilities for transferring information between PTN users of the service. The access attributes define the way in which PTN functions are accessed at the S reference point. Access attributes may differ for different PTN users in a call. General attributes are not used in this Standard.