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Zasebno omrežje z integriranimi storitvami (PISN) - Medcentralni signalizacijski protokol - Vodovne osnovne storitve - Omrežna plast (NL) - 1. del: Zgradba preskušalnega niza in nameni preskušanja (TSS&TP)

Private Integrated Services Network (PISN); Inter-exchange signalling protocol; Circuit mode basic services; Network Layer (NL); Part 1: Test Suite Structure and Test Purposes (TSS&TP) specification

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Part 1: Test Suite Structure and Test Purposes (TSS&TP)**

ETSI

European Telecommunications Standards Institute

ETSI Secretariat

Postal address: F-06921 Sophia Antipolis CEDEX - FRANCE

Office address: 650 Route des Lucioles - Sophia Antipolis - Valbonne - FRANCE

X.400: c=fr, a=atlas, p=etsi, s=secretariat - **Internet:** secretariat@etsi.fr

Tel.: +33 4 92 94 42 00 - Fax: +33 4 93 65 47 16

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Foreword

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

This ETS comprises two parts with the generic title "Private Integrated Services Network (PISN); Inter-exchange signalling protocol; Network Layer (NL); Circuit mode basic services". The title of each part is listed below:

Part 1: "Test Suite Structure and Test Purposes (TSS&TPs)";

Part 2: "Abstract Test Suite (ATS) specification".

Transposition dates	
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Date of latest announcement of this ETS (doa):	31 May 1998
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1 Scope

This European Telecommunication Standard (ETS) contains the Test Suite Structure (TSS) and Test Purposes (TPs) specification for the Network Layer (NL), Circuit Mode Basic Services (CMBS) of the Inter-exchange signalling protocol for Private Integrated Services Networks (PISN).

The objective of this TSS and TPs specification is to provide conformance tests which give a high probability of inter-operability of the Network Layer. The TSS and TPs specification covers the procedures described in ETS 300 172 [1].

The ISO standard for the methodology of conformance testing (ISO/IEC 9646-1 [4], ISO/IEC 9646-2 [5] and ISO/IEC 9646-3 [6]) is used as basis for the test methodology.

This TSS and TPs specification standard is applicable for the support of Basic Call, at the Q-reference point between Private Integrated Services Network Exchanges (PINXs) connected together within a PISN. The Q reference point is defined in ETS 300 475-1 [7].

2 Normative references

This ETS incorporates by dated and undated reference, provisions from other publications. These normative references are cited in the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments or revisions to 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] ETS 300 172 (1995): "Private Integrated Services Network (PISN); Inter-exchange signalling protocol; Circuit-mode basic services" [ISO/IEC 11572 (1996), modified].
- [2] ETS 300 239 (1995): "Private Integrated Services Network (PISN); Inter-exchange signalling protocol, Generic functional protocol for the support of supplementary services" [ISO/IEC 11582 (1995), modified].
- [3] ETS 300 406 (1995): "Methods for Testing and Specification (MTS); Protocol and profile conformance testing specifications; Standardization methodology".
- [4] ISO/IEC 9646-1 (1994): "Information technology - Open Systems Interconnection; Conformance testing methodology and framework - Part 1: General concepts".
- [5] ISO/IEC 9646-2 (1994): "Information technology- Open Systems Interconnection; Conformance testing methodology and framework - Part 2: Abstract Test Suite Specification".
- [6] ISO/IEC 9646-3 (1992): "Information technology - Open Systems Interconnection; Conformance testing methodology and framework - Part 3: The Tree and Tabular Combined Notation (TTCN)".
- [7] ETS 300 475-1 (1995): "Private Telecommunication Network (PTN); Reference configuration; Part 1: Reference configuration for PTN eXchanges (PINX)" [ISO/IEC 11579-1 (1994), modified].
- [8] CCITT Recommendation I. 112 (1988): "Vocabulary of terms for ISDNs".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of this ETS the special terminology defined in CCITT Recommendation I.112 [8] applies in addition to the following definitions:

Abstract Test Suite (ATS): See ISO/IEC 9646-1 [4].

final TP: A TP which is intended to be mapped to a single test case (except if it is untestable).

NOTE: In this ETS all "final" TPs are individual TPs as there is no combination of TPs.

Implementation Under Test (IUT): See ISO/IEC 9646-1 [4].

incoming call: See ETS 300 172 [1].

incoming gateway PINX: See ETS 300 172 [1].

individual TP: A TP focusing on a single conformance requirement, produced before any combining of TPs. This term is not defined in ISO/IEC 9646-1 [4] but corresponds to the "individual test purpose" referred to in ISO/IEC 9646-2 [5], subclause 10.3.3.

Information Elements (IEs) with invalid contents: See ETS 300 172 [1].

originating PINX: See ETS 300 172 [1].

outgoing call: See ETS 300 172 [1].

outgoing gateway PINX: See ETS 300 172 [1].

preceding PINX: See ETS 300 172 [1].

Private Integrated Network Exchange (PINX): See ETS 300 172 [1].

Private Integrated Services Network (PISN): See ETS 300 172 [1].

Protocol Implementation Conformance Statement (PICS): See ISO/IEC 9646-1 [4].

Protocol Implementation Extra Information For Testing (PIXIT): See ISO/IEC 9646-1 [4].

reassembly: The process whereby an implementation on receipt of the parts of a single message which has been segmented for transmission, reassembles these parts to make up the original message.

segmentation: The process by which a message is divided into parts when the message size exceeds the maximum size of the SCM information field.

Signalling Carriage Mechanism (SCM): See ETS 300 172 [1].

subsequent PINX: See ETS 300 172 [1].

super Test Purpose (TP): A general TP from which one or more TPs may be derived. These derived TPs may be more detailed than the STP. This term is not defined in ISO/IEC 9646-1 [4] but corresponds to the "more specific test objectives" referred to in ISO/IEC 9646-2 [5] subclause 10.3.1.

terminating PINX: See ETS 300 172 [1].

transit PINX: See ETS 300 172 [1].

unexpected message: See ETS 300 172 [1].

unrecognized information element: See ETS 300 172 [1].

3.2 Abbreviations

For the purposes of this ETS, the following abbreviations apply:

ATS	Abstract Test Suite
BC	Bearer Capability
BI	Invalid Behaviour
BO	Inopportune Behaviour
BV	Valid Behaviour
CA	CApability test
CC	Call Clearing
CE	Call Establishing
CMBS	Circuit Mode Basic Services
CR	Call Reference
IE	Information Element
IG	Incoming Gateway
IUT	Implementation Under Test
IV	InValid behaviour tests
IO	InOpportune behaviour test
MS	Message Segmentation
NL	Network Layer
OG	Outgoing Gateway
PC	Protocol Control
PICS	Protocol Implementation Conformance Statement
PINX	Private Integrated Services Network eXchange
PISN	Private Integrated Services Network
PIXIT	Protocol Implementation eXtra Information for Testing
PSS1	Private Integrated Signalling System Number 1
PV	Parameter Variations
SCM	Signalling Carriage Mechanism
SE	State Event transitions
STP	Super Test Purpose
TE	TErminating
TI	TImlers
TP	Test Purpose
TR	TRansi
TSS	Test Suite Structure

4 Test Suite Structure (TSS)

Following the rules described in ETS 300 406 [3], subclause 7.4.1.1, the test suite is structured as a tree with the following levels:

1st level: the name representing the base specification (ETS 300 172 [1]);
PSS1_BC

2nd level: Call control for the major roles of the base specification (Originating, Terminating, Transit, Incoming Gateway, Outgoing Gateway) and Protocol Control which is common to all the behaviours;

- Protocol Control (PC);
- call control for Originating (OI);
- call control for TErminating (TE);
- call control for TRansit (TR);
- call control for Incoming Gateway (IG);
- call control for Outgoing Gateway (OG).

3rd level: the nature of the test;

- Basic Interconnection test (BI);
- CApability test (CA);
- Valid Behaviour tests (BV);
- InValid behaviour tests (IV);
- InOpportune behaviour tests (IO);

- Timers (TI).

4th level: the functional aspects tested;

- State Event transitions (SE);
- Parameter Variations (PV).

5th level: the phases of the base specification;

- Call Establishing (CE);
- Call Clearing (CC);
- Message Segmentation (MS) (this group may be empty for call control requirements);
- STATUS Procedures (ST) (this group may be empty for call control requirements);
- Layer Management (LM) (this group may be empty for call control requirements).

Figure 1 shows the PSS1 Layer 3 TSS overview. Not all the branches have been expanded to the "final" details.

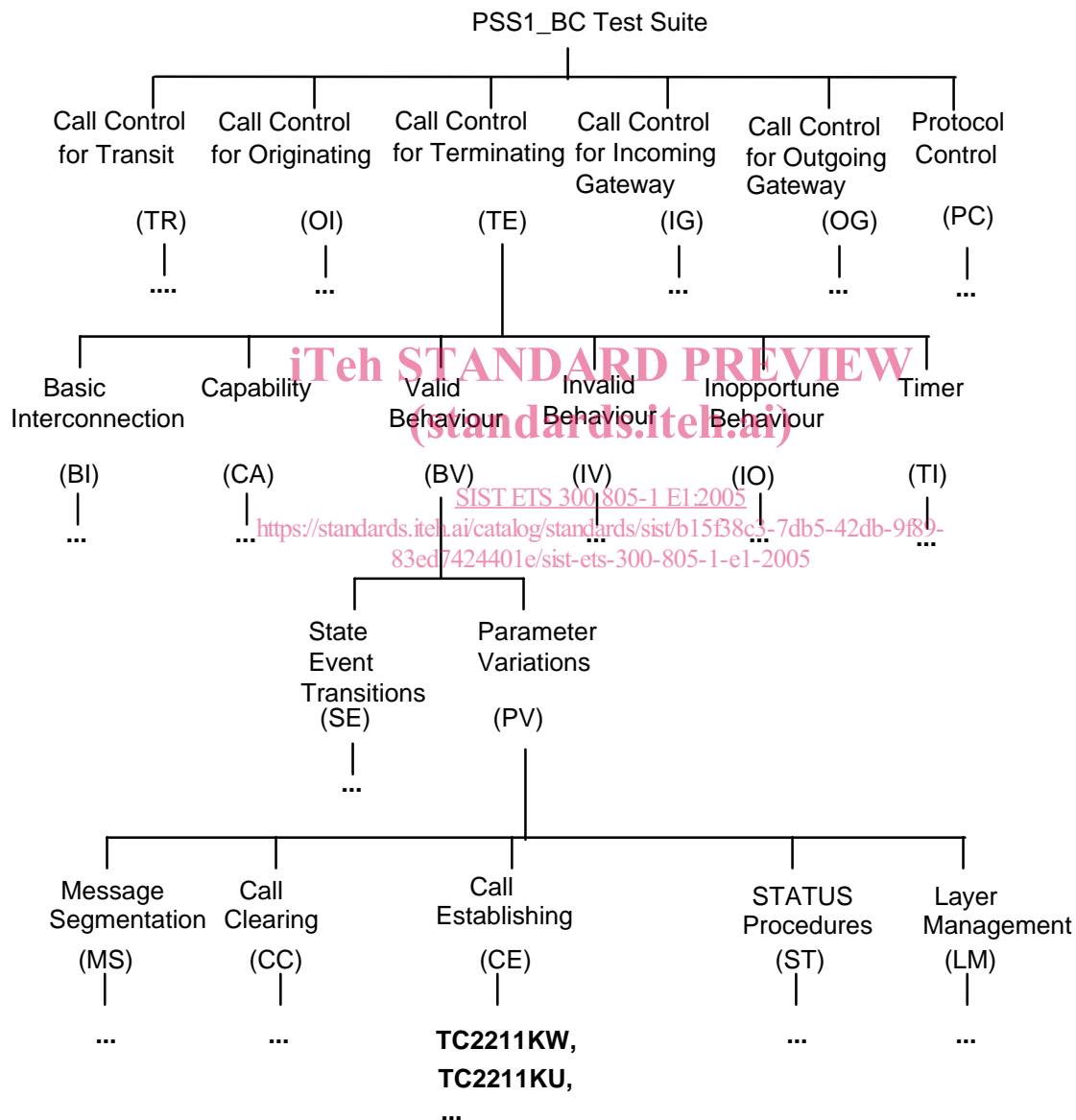


Figure 1: PSS1 Layer 3 TSS overview

Figure 2 shows the details of the PSS1 layer 3 TSS. Not all the branches have been expanded to the "final" details.

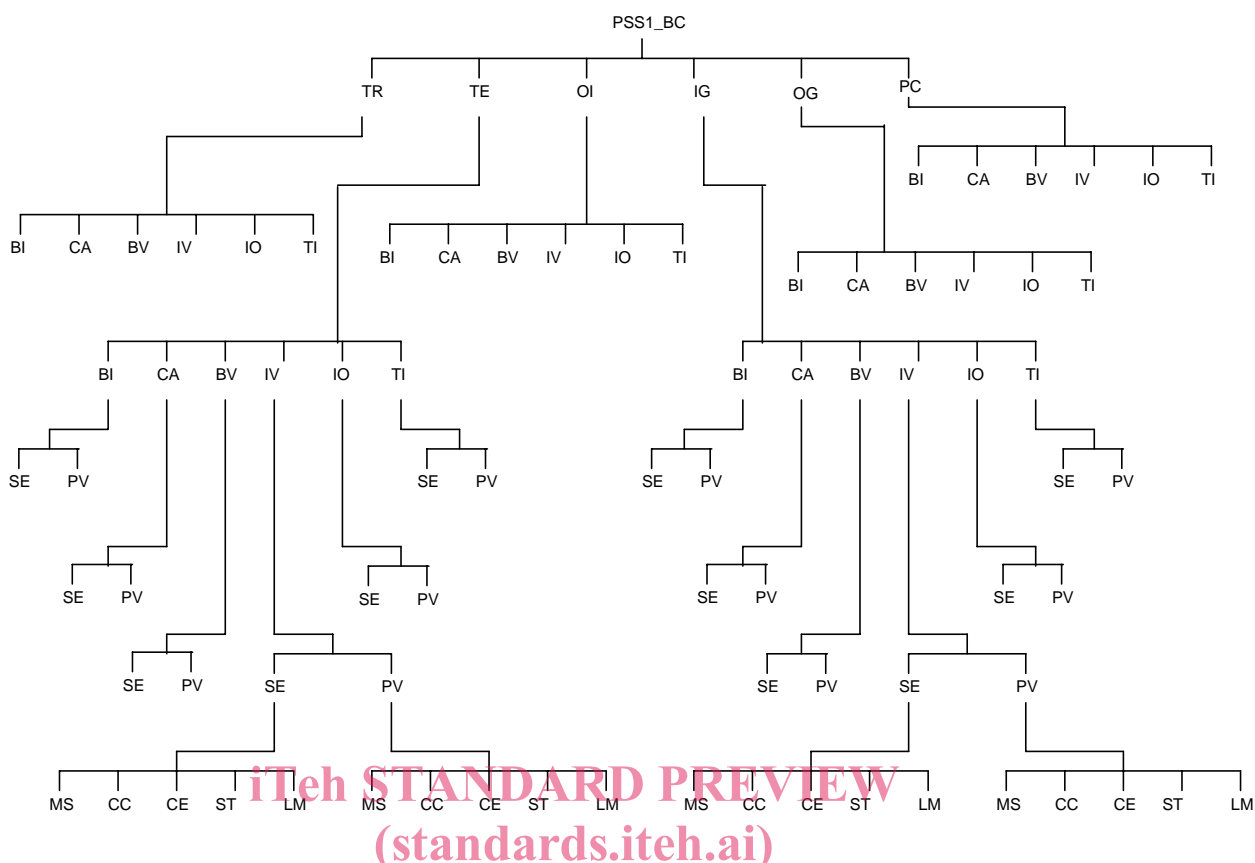


Figure 2: Detailed PSS1 layer 3 TSS

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5 Test Purposes (TPs)

5.1 Introduction to TPs

5.1.1 TPs production method

The TPs production method consists of reviewing the standard and specifying everything that should be tested, i.e. all the characteristics that could be determined from the standard, which an implementation is required to conform to.

This first phase led to the production of Super Test Purposes (STPs), which are general TPs, reflecting more the functional aspects and the structure of the standard rather than the TSS itself (see clause 4).

The second phase consisted of deriving from each STP several "final" TPs. These "final" TPs are the individual TPs as identified in the Abstract Test Suite (ATS) (each of which will give rise to a Test Case). The criteria for deriving these "final" TPs was to take into account the TSS, in order to ensure good coverage for testing. The objective was to derive "final" TPs and distribute them over the complete TSS, taking into account all the testing aspects (valid behaviour, inopportune behaviour, timer, parameter variations, state event transition, etc.), while retaining all the requirements of the standard. In this way, one or more "final" TPs may be derived from an STP.

Although an STP may generate a number of "final" TPs, not all of them may be retained, as they may deal with a requirement which has already been covered by a previous "final" TP. This ensures a more efficient testing with good coverage, avoiding repeatedly testing the same aspect of the standard, probably leading to the same verdict each time.

Some STPs are not decomposed into "final" derived TPs, either because the requirement of this STP has already been covered by a previous "final" TP, or because it is determined to be untestable. In this case the STP is referenced as an "untestable" TP.

5.1.2 STP identifier

The STP identifier is described using a 5 digit alphanumeric code, this code is used in the following manner:

- characters 5-4 : "SP";
- digit 3-2-1 : STP number.

PATTERN: SP<xyz> with <xyz> = 000 -> 999.

5.1.3 "final" derived TP identifier

The TP identifier is described using an 8 digit alphanumeric code, this code is used in the following manner:

- characters 8-7 : "TC";
- digit 6 : 2nd level of TSS;
- digit 5 : 3rd level of TSS;
- digit 4 : 4th level of TSS;
- digit 3 : 5th level of TSS;
- characters 2-1 : letters identifying the "final" TP.

PATTERN: TC<u><v><w><x><y> with

- <u> =

0: protocol control
 1: call control originating
 2: call control terminating
 3: call control transit
 4: call control outgoing gateway
 5: call control incoming gateway

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- <v> =

0: basic interconnection test <https://standards.iteh.ai/catalog/standards/sist/b15f38c3-7db5-42db-9f89-83ed7424401e/sist-ets-300-805-1-e1-2005>
 1: capability test
 2: valid behaviour tests
 3: invalid behaviour test
 4: inopportune behaviour tests
 5: timer test

- <w> =

0: state events transitions
 1: parameter variations

- <x> =

0: call establishing
 1: call clearing
 2: message segmentation
 3: status procedures
 4: layer management

- <y> = AA-> ZZ

EXAMPLE 1: TC2211KW is the number of the TP KW, for a terminating PINX, to test the valid behaviour of the IUT, with parameter variations, during CC.

EXAMPLE 2: TC2211KU is the number of the TP KU, for a terminating PINX, to test the valid behaviour of the IUT, with parameter variations, during CC.

5.1.4 Standard options

In reviewing the standard to produce TPs, two situations have been identified regarding optional requirements.

The first case is where either the Implementation Under Test (IUT) performs an action which can be tested, or does nothing that can be tested. In this situation there is a TP for the case where the IUT does something testable and a Protocol Implementation eXtra Information for Testing (PIXIT) question should be used to select the associated test case.

The second case is where the IUT always performs a first action which has to be tested and optionally performs a second action which has also to be tested if it occurs. In this situation no PIXIT question is asked for this selection.

5.1.5 Message segmentation

Where a TP refers to a message sent by the IUT, this message may be segmented (unless otherwise stated) without affecting the TP.

5.2 TP writing rules

Writing rules have been defined in order to have consistency between all the TPs. However, in some cases, it is not possible to use them without losing the real objective of the test. Consequently, a small number of TPs may deviate from these rules in a minor way.

5.2.1 Terminating, originating, incoming/outgoing gateway PINX

Table 1 gives the TPs writing rules for non-transit PINX requirements.

Table 1: TP writing rules for non-transit PINX requirements

Structure	Values
Ensure that the IUT in call state	
<state>	0, 1, 2, 3, etc.
[<trigger if passive> or <goal if active>]	on receiving a XXX message, on expiry of Txxx, etc. in order to initiate CC, etc.
<action>	sends, saves, does, etc.
<conditions>	using en-bloc sending, using overlap sending, etc.
if the action is sending	
a <message type>	SETUP, CONNECT, etc.
message containing a	
a) <information element>	Channel Identification, Call Reference, etc.
IE with a	
b) <field name>	channel number, Call Reference Flag, etc.
encoded as	
<coding of the field>	16, 0, etc.
and back to a) or b)	
[and remains in the same state or and enters state]	
<state>	0, 1, 2, etc.
NOTE:	In this table normal text in the left hand column is included in the TP, text between < and > is replaced by a value (examples given in the right column). Text in bold is not included in the TP, [and] are used to delimit options and a) and b) are labels.