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**Private Integrated Services Network (PISN);
Inter-exchange signalling protocol;
Diversion supplementary services
[ISO/IEC 13873 (1995) modified];
Part 1: Test Suite Structure and
Test Purposes (TSS&TP) specification**

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Foreword

This European Standard (Telecommunications series) has been produced by ETSI Technical Committee Services and Protocols for Advanced Networks (SPAN).

The present document covers the Private Integrated Service Network (PISN) Inter-exchange signalling protocol - Advice of charge supplementary service - Test Suite Structure and Test Purposes (TSS&TP) specification.

The present document is part 1 of a multi-part deliverable covering the Private Integrated Services Network (PISN); Inter-exchange signalling protocol; Diversion supplementary services [ISO/IEC 13873 (1995) modified], as identified below:

- Part 1:** "Test Suite Structure and Test Purposes (TSS&TP) specification";
- Part 2:** "Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma".

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1 Scope

The present document specifies the Test Suite Structure and Test Purposes (TSS&TP) for the Advice of charge supplementary services of the Interexchange signalling protocol for Private Integrated Services Networks (PISN).

The objective of this TSS and TPs specification is to provide conformance tests which give a greater probability of inter-operability. The TSS and TPs specification covers the procedures described in ETS 300 257 [1].

The ISO standard for the methodology of conformance testing (ISO/IEC 9646-1 [2], ISO/IEC 9646-2 [3] and ISO/IEC 9646-3 [7]) is used as basis for the test methodology.

The Test Suite Structure and Test Purposes specified in the present document are only intended for VPN scenarios at the "b" service entry point.

The VPN "b" service entry point is defined in EN 301 060-1 [4] and ETR 172 [5].

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

- <https://standards.iteh.ai/catalog/standards/sist/636ff482-acad-4ce9-9a04-57019950dc7a/en-301-453-1-v1.1.2-2005>
- [1] ETSI ETS 300 257 (1995): "Private Integrated Services Network (PISN); Inter-exchange signalling protocol; Diversion supplementary services [ISO/IEC 13873 (1995) modified]".
- [2] ISO/IEC 9646-1 (1994): "Information technology; Open Systems Interconnection; Conformance testing methodology and framework; Part 1: General concepts".
- [3] ISO/IEC 9646-2 (1994): "Information technology; Open Systems Interconnection; Conformance testing methodology and framework; Part 2: Abstract test suite specification".
- [4] ETSI EN 301 060-1 (V1.2.2): "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Basic call control; Enhancement at the "b" service entry point for Virtual Private Network (VPN) applications; Part 1: Protocol specification".
- [5] ETSI ETR 172: "Business TeleCommunications (BTC); Virtual Private Networking (VPN); Services and networking aspects; Standardization requirements and work items".
- [6] ETSI I-ETS 300 808: "Private Integrated Services Network (PISN); Cordless Terminal Mobility (CTM); Inter-exchange signalling protocol; Cordless terminal outgoing call additional network feature".
- [7] ISO/IEC 9646-3 (1998): "Information technology; Open Systems Interconnection; Conformance testing methodology and framework; Part 3: The Tree and Tabular Combined Notation (TTCN)".
- [8] ETSI ETS 300 406: "Methods for Testing and Specification (MTS); Protocol and profile conformance testing specifications; Standardization methodology".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply.

Abstract Test Suite (ATS): refer to ISO/IEC 9646-1 [2].

Implementation Under Test (IUT): refer to ISO/IEC 9646-1 [2].

Protocol Implementation Conformance Statement (PICS): refer to ISO/IEC 9646-1 [2].

PICS proforma: refer to ISO/IEC 9646-1 [2].

Test Purpose (TP): refer to ISO/IEC 9646-1 [2].

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

APDU	Application Protocol Data Unit
ATS	Abstract Test Suite
CDIV	Call DIVersion
CTM	Cordless Terminal Mobility
ISDN	Integrated Services Digital Network
IUT	Implementation Under Test
PDU	Protocol Data Unit
PICS	Protocol Implementation Conformance Statement
PINX	Private Integrated Services Network eXchange
PISN	Private Integrated Services Network
sc	call independent signalling connection
SS	Supplementary Service
SS-CDI	Call Deflection Immediate supplementary service
SS-DIV	Call Diversion supplementary services
SS-CFB	Call Forwarding Busy supplementary service
SS-CFNR	Call Forwarding No reply supplementary service
TP	Test Purpose
TSS	Test Suite Structure

4 Test Suite Structure (TSS)

Signalling procedures at the Q Reference Point Group

Signalling procedures at the Originating PINX Orig01

Signalling procedures at the Served User PINX

Activation	Served01
Deactivation	Served2
Interrogation	Served03
Invocation	Served04

Signalling procedures at the Rerouteing PINX Rerout01

Signalling procedures at the Diverted-to PINX

Invocation	Divert01
Verification of the diverted-to user	Divert02

Signalling procedures at the Activating PINX Act01

Signalling procedures at the Deactivating PINX Deact01

Signalling procedures at the Interrogating PINX Inter01

Signalling Procedures for Protocol Interactions between SS-DIV and other supplementary services and ANFs

Procedures between SS-CFU/ SS-CFB and SS-CCBS at the Originating PINX	Int01
Procedures between SS-CFU/ SS-CFB/ SS-CFNR and SS-CCNR at the Originating PINX	Int02
Procedures between SS-CFNR and SS-CT	Int03

5 Test Purpose (TP)

5.1 Introduction

For each requirement a TP is defined.

5.1.1 TP naming convention

TPs are numbered, starting at 001, within each group. Groups are organized according to the TSS. Additional references are added to identify the actual test suite and whether it applies to the network or the user (see table 1).

Table 1: TP identifier naming convention scheme

Identifier: <ss>_<group>_<nnn>			
<ss>	=	supplementary service:	"CDIV"
<group>	=	group	up to 8 digit field representing group reference according to TSS
<service>	=	service	CFU, CFB, CFNR
<nnn>	=	sequential number	(001-999)

5.1.2 Source of TP definition

The TPs are based on ETS 300 257 [1].

5.1.3 TP structure

Each TP has been written in a manner which is consistent with all other TPs. The intention of this is to make the TPs more readable and checkable. A particular structure has been used and this is illustrated in table 2. This table should be read in conjunction with any TP, i.e. use a TP as an example to fully understand the table.

Table 2: Structure of a single TP for SS-DIV

TP part	Text	Example
Header	<Identifier> <i>tab</i> <paragraph number in base ETS> <i>tab</i>	see table 1 subclause 0.0.0
Stimulus	Ensure that the IUT in the <basic call state> or <ANF-CTMO state> <trigger> <i>see below for message structure</i> or <goal>	N10 etc. Receiving a XXXX message to request a...
Reaction	<action> <conditions> <i>if the action is sending</i> <i>see below for message structure</i> <next action>, etc. and remains in the same state or and enters state <state>	sends, saves, does, etc. using en bloc sending,...
Message structure	<message type> message containing a a) <info element> information element with b) a <field name> encoded as or including <coding of the field> and <i>back to a or b.</i>	SETUP, FACILITY, CONNECT,... Bearer capability, Facility,...
Selection	Selection criteria reference	Support of SS-CFU. PICS: A1
NOTE 1: In order to use the same structure as for the test group selection, the selection criteria is indicated at the bottom of the test purpose.		
NOTE 2: Unless specified the messages are valid and contain at least the mandatory information elements and possibly optional information elements, the information elements are valid and contain at least the mandatory parameters and possibly optional parameters.		

<service> = SS-CFU, SS-CFB, SS-CFNR

NOTE 1: As a large amount of the protocol for CFB, CFNR and CFU is independent of which of the three services is supported, the TPs have mostly been written in a general way. This ensures consistent TPs and should help in the development of consistent test cases and in their maintenance. Each TP containing "<service>" is in fact three TPs - one for each of the three services.

<service_UB> = SS-CFU, SS-CFB

NOTE 2: As a large amount of the protocol for CFB and CFU is independent of which of the three services is supported, the TPs have mostly been written in a general way. This ensures consistent TPs and should help in the development of consistent test cases and in their maintenance. Each TP containing "<service>" is in fact two TPs - one for CFU and one for CFB.

5.1.4 Test strategy

As the base standard ETS 300 257 [1] contains no explicit requirements for testing, the TPs were generated as a result of an analysis of the base standard and the corresponding PICS proforma.

The TPs are only based on conformance requirements related to the externally observable behaviour of the IUT, and are limited to conceivable situations to which a real implementation is likely to be faced (ETS 300 406 [8]). All the test purposes are mandatory unless they have a selection criteria. Optional test purposes (with selection criteria) are applicable according to the configuration options of the IUT. The configuration option shall be covered by a PICS item.

5.2 TPs for SS-CDIV

All PICS items referred to in this subclause are as specified in ETS 300 257 [1] unless indicated otherwise by another numbered reference.

Unless specified:

- only the requirements from the point of view of the VPN "b" service entry point are considered. This implies that the interactions with other networks are out of scope of the present document and causes that the corresponding Test Purposes are not included in the present document;
- the messages indicated are valid and contain at least the mandatory information elements and possibly optional information elements;
- the information elements indicated are valid and contain at least the mandatory parameters and possibly optional parameters.

The following wording convention was defined to make the test purposes more readable:

- when a message is to be sent or received on a call independent signalling connection, the message name shall be followed by a '(sc)', e.g. CONNECT (sc) means that the CONNECT message is conveyed on a call independent signalling connection;
- all the test purposes are valid for both user and network side of the VPN b interface. In order to simplify the text and to make the test purposes more readable, only the User side Call states (Ux) are indicated in the test purposes. For the network side of the VPNb interface, the mapping table below indicates which network call state (Ny) corresponds to the user call state used in the test purpose. Equivalent call state means there that the same message flow applies from the IUT point of view (e.g.: IUT sends a SETUP message gives the call state U01 or N06).

User side call state	equivalent network side call state
U00	N00
U03	N09
U04	N07
U06	N01
U07	N04
U09	N03
U10	N10

Example:

Ensure that the IUT in the call state U01 ...

is equivalent to the following network side test purpose:

Ensure that the IUT in the call state N06 ...

5.2.1 Signalling procedures at the Originating PINX

Selection: IUT supports procedures at the Originating PINX (PICS A6).

NOTE: Rerouting is executed by the Served User PINX.

5.2.1.1 SS-CFU or SS-CFB

Selection: IUT supports SS-CFU/ SS-CFB (PICS A1 and PICS A2)

CDIV_Orig01_<service_UB>_001 subclause 6.5.1

Ensure that the IUT in the call state U03 and the CDO-Idle state, on receipt of a FACILITY message containing a divertingLegInformation1 invoke APDU with a diversionReason set to <service_UB>, accepts the provided information and remains in the call state U03 and enters the CDO-Divert state.