



**SLOVENSKI STANDARD**  
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NUGYVbc`ca fYy`Y`n`]bhY[ f]fUbj]a ]`gkcf]hj Ua ]`fD-GBL`E`G][ bU]nUW`g\_]`dfcfc`c``a YX  
WYbhfUua ]`E`8cdc`b]`bUgkcf]hj`Xc`cb Ub`Y`\_]WU`nUj gkcdbc`hc`\_c`JDB`V`  
gkcf]hj Y`E`%`XY`.N[ fUXVUdfYg\_i yUby[ U`b]nU]b`bUa Yb`dfYg\_i yUb`U`fHGG/ HDL`E`  
GdYVWZ`\_UW`U

Private Integrated Services Network (PISN); Inter-exchange signalling protocol; Call completion supplementary service for the VPN b service entry point; Part 1: Test Suite Structure and Test Purposes (TSS&TP) specification

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# ETSI EN 301 452-1 V1.1.4 (2000-09)

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*European Standard (Telecommunications series)*

**Private Integrated Services Network (PISN);  
Inter-exchange signalling protocol;  
Call completion supplementary service  
for the VPN b service entry point;  
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 Signalling Protocol and Switching (SPS).

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

The present document is part 1 of a multi-part deliverable covering Call completion supplementary service, 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 Call Completion supplementary services of the Interexchange signalling protocol for Private Integrated Services Networks (PISN).

The objective of the present document is to provide conformance tests, which give a greater probability of inter-operability. The TSS&TPs specification covers the procedures described in ETS 300 366 [3].

The ISO standard for the methodology of conformance testing (ISO/IEC 9646-1 [5], ISO/IEC 9646-2 [6] 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 [10] and ETR 172 [11].

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## 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.

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https://standards.iteh.ai/catalog/standards/sist/bafe15c3-0df2-4a0e-a3a8-45571c142705
- [1] ETSI EN 300 172 (V1.4): "Private Integrated Services Network (PISN); Inter-exchange signalling protocol; Circuit-mode basic services [ISO/IEC 11572 (1996) modified]".
- [2] ETSI ETS 300 239 (1993): "Private Telecommunication Network (PTN); Inter-exchange signalling protocol; Generic functional protocol for the support of supplementary services".
- [3] ETSI ETS 300 366 (1995): "Private Integrated Services Network (PISN); Inter-exchange signalling protocol; Call completion supplementary services [ISO/IEC 13870 (1995) modified]".
- [4] ETSI ETS 300 406 (1995): "Methods for Testing and Specification (MTS); Protocol and profile conformance testing specifications; Standardization methodology".
- [5] ISO/IEC 9646-1 (1994): "Information technology; Open Systems Interconnection; Conformance testing methodology and framework; Part 1: General concepts".
- [6] ISO/IEC 9646-2 (1994): "Information technology; Open Systems Interconnection; Conformance testing methodology and framework; Part 2: Abstract test suite specification".
- [7] ISO/IEC 9646-3 (1992): "Information technology; Open Systems Interconnection; Conformance testing methodology and framework; Part 3: The Tree and Tabular Combined Notation (TTCN)".
- [8] ITU-T Recommendation I.112 (1993): "Vocabulary of terms for ISDNs".
- [9] ITU-T Recommendation I.210 (1993): "Principles of the telecommunication services supported by an ISDN and the means to describe them".
- [10] ETSI EN 301 060-1 (V1.2): "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".
- [11] ETSI ETR 172 (1995): "Business Telecommunications (BTC); Virtual Private Networking (VPN); Services and Networking aspects; Standardization requirements and work items".

- [12] ETSI EN 300 196-1 (V1.2): "Integrated Services Digital Network (ISDN); Generic functional protocol for the support of supplementary services; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".

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## 3 Definitions and abbreviations

### 3.1 Definitions

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

#### 3.1.1 Definitions related to conformance testing

**abstract test case:** Refer to ISO/IEC 9646-1 [5]

**Abstract Test Suite (ATS):** Refer to ISO/IEC 9646-1 [5]

**active test:** Test case where the IUT is required to send a particular message, but not in reaction to a received message. This would usually involve the use of PIXIT information to see how this message can be generated and quite often is specified in an ATS using an implicit send event

**component:** Refer to EN 300 196-1 [12]

**Implementation Under Test (IUT):** Refer to ISO/IEC 9646-1 [5]

**implicit send event:** Refer to ISO/IEC 9646-3 [7]

**lower tester:** Refer to ISO/IEC 9646-1 [5]

**passive test:** Test case where the IUT is required to respond to a protocol event (e.g. received message) with another protocol event (e.g. send message) which normally does not require any special operator intervention as associated with the implicit send event

**point of control and observation:** Refer to ISO/IEC 9646-1 [5]

**Protocol Implementation Conformance Statement (PICS):** Refer to ISO/IEC 9646-1 [5]

**PICS proforma:** Refer to ISO/IEC 9646-1 [5]

**Protocol Implementation eXtra Information for Testing (PIXIT):** Refer to ISO/IEC 9646-1 [5]

**PIXIT proforma:** Refer to ISO/IEC 9646-1 [5]

**system under test:** Refer to ISO/IEC 9646-1 [5]

**Test Purpose (TP):** Refer to ISO/IEC 9646-1 [5]

#### 3.1.2 Definitions related to ETS 300 366

**call independent signalling connection:** See ETS 300 239 [2], definition 4.7

**call related:** See ETS 300 239 [2], definition 4.9

**incoming call:** See EN 300 172 [1], subclause 4.4

**incoming Gateway PINX:** See EN 300 172 [1], subclause 4.6

**Information Elements (IEs) with invalid contents:** See EN 300 172 [1], subclause 4.14

**Integrated Services Digital Network (ISDN):** See ITU-T Recommendation I.112 [8], definition 308



**invoke APDU:** See ETS 300 239 [2], subclause 11.3.3.4

**originating PINX:** See EN 300 172 [1], subclause 4.5

**outgoing call:** See EN 300 172 [1], subclause 4.4

**outgoing Gateway PINX:** See EN 300 172 [1], subclause 4.6

**reject APDU:** See ETS 300 239 [2], subclause 11.3.3.4

**return error APDU:** See ETS 300 239 [2], subclause 11.3.3.4

**return result APDU:** See ETS 300 239 [2], subclause 11.3.3.4

**ROSE APDU:** See ETS 300 239 [2], definition 4.33

**service; telecommunication service:** See ITU-T Recommendation I.112 [8], definition 201

**supplementary service:** See ITU-T Recommendation I.210 [9], subclause 2.4

**terminating PINX:** See EN 300 172 [1], subclause 4.5

**transit PINX:** See EN 300 172 [1], subclause 4.5

**Virtual Private Network (VPN):** Refer to EN 301 060-1 [10] and ETR 172 [11]

## 3.2 Abbreviations

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

APDU	Application Protocol Data Unit
ATS	Abstract Test Suite
BC	Basic Call
CCBS	Call Completion to Busy Subscriber
CCNR	Call Completion on No Reply
CR	Call Reference
IE	Information Element
ISDN	Integrated Services Digital Network
IUT	Implementation Under Test
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
sc	call independent signalling connection
SCM	Signalling Carriage Mechanism
T1	Timer T1
T2	Timer T2
T3	Timer T3
T4	Timer T4
TP	Test Purpose
TSS	Test Suite Structure
VPN	Virtual Private Network

## 4 Test Suite Structure (TSS)

<b>Signalling procedures at the VPN "b" service entry point</b>	<b>Group</b>
<b>Procedures at the Originating PINX</b>	
for SS-CCBS	Orig01
for SS-CCNR	Orig02
for User A not busy - path non-reservation method	Orig03
for User A not busy - path reservation method	Orig04
for User A busy - path non-reservation method	Orig05
for User A busy - either before or after the path reservation method	Orig06
for CCBS/CCNR cancellation	Orig07
for Timers expiry	Orig08
<b>Procedures at the Terminating PINX</b>	
for SS-CCBS	Term01
for SS-CCNR	Term02
for indication that User B is not busy	Term03
for CC Call without Path Reservation	Term04
for CC Call with Path Reservation	Term05
for CCBS/CCNR suspension and resumption	Term06
for CCBS/CCNR cancellation	Term07
<b>Procedures for Protocol Interactions between SS-CCBS and other supplementary services and ANFs</b>	
Procedures for the Originating PINX	Int01
<b>Procedures for Protocol Interactions between SS-CCNR and other supplementary services and ANFs</b>	
Procedures for the Originating PINX	Int02

## 5 Test Purposes (TP)

### 5.1 Introduction

For each test 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:	"CC"
<group>	=	group	up to 8 digit field representing group reference according to TSS
<nnn>	=	sequential number	(001-999)

### 5.1.2 Source of TP definition

The TPs are based on ETS 300 366 [3].

### 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 CC**

TP part	Text	Example
<b>Header</b>	<Identifier> <i>tab</i> <paragraph number in base ETS> <i>tab</i>	see table 1 <b>subclause 0.0.0</b>
<b>Stimulus</b>	Ensure that the IUT, in the <basic call state> or <CC state> <trigger> <i>see below for message structure</i> or <goal>	state 3 or CC-Idle, etc. receiving a XXXX message to request a ...
<b>Reaction</b>	<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, ...
<b>Message structure</b>	<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, ...
<b>Selection</b>	Selection criteria reference	PINX can act as Originating PINX. PICS: A1
NOTE 1: In order to use the same structure as for 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.		

### 5.1.4 Test strategy

As the base standard ETS 300 366 [3] 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 [4]).

## 5.2 TPs for CC signalling procedures

All PICS items referred to in this subclause are as specified in ETS 300 366 [3] 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 this specification.
- 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.
- In test cases where a bearer connection and a signalling connection is required at the same side of the interface, it is necessary to differentiate between the call states of the bearer connection and the call states of the signalling connection. Therefore the following naming convention is introduced: " Ensure that the IUT in the call states U03 and U10 (sc) ... ". This means that the IUT is in call state U03 for the bearer connection, and the IUT is in the call state U10 for the 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
U01	N06
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 ...