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SLOVENSKI STANDARD
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Private Integrated Services Network (PISN); Inter-exchange signalling protocol; Call transfer supplementary service for the VPN "b" service entry point; Part 2: Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma

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ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

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

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
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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 is part 2 for a multi-part deliverable covering the Inter-exchange signalling protocol for Call Transfer supplementary service for the VPN "b" service entry point, as described 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".

National transposition dates	
Date of adoption of this EN:	15 December 2000
Date of latest announcement of this EN (doa):	31 March 2001
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	30 September 2001
Date of withdrawal of any conflicting National Standard (dow):	30 September 2001

1   Scope

The present document specifies the Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma for the VPN "b" reference point of implementations conforming to the standard for the Call Transfer supplementary service (SS-CT) as described in ETS 300 261 [1].

EN 301 490-1 [5] specifies the Test Suite Structure and Test Purposes (TSS&TP) related to this ATS and partial PIXIT proforma specification.

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.

[1]	ETSI ETS 300 261 (1995): "Private Integrated Services Network (PISN); Inter-exchange signalling protocol; Call transfer supplementary service [ISO/IEC 13869 (1995) modified]".
[2]	ISO/IEC 9646-2 (1994): "Information technology; Open Systems Interconnection; Conformance testing methodology and framework; Part 2: Abstract test suite specification".
[3]	ETSI TR 101 101 (V1.1.1): "Methods for Testing and Specification (MTS); TTCN interim version including ASN.1 1994 support [ISO/IEC 9646-3] (Second Edition Mock-up for JTC1/SC21 Review)".
[4]	ISO/IEC 8825-1 (1994): "Information technology - Encoding Rules for Abstract Syntax Notation One (ASN.1) - Part 1: Specification of Basic Encoding Rules (BER), Canonical Encoding Rules (CER) and Distinguished Encoding Rules (DER)". (See also ITU-T Recommendation X.690).
[5]	ETSI EN 301 490-1: "Private Integrated Services Network (PISN); Inter-exchange signalling protocol; Call transfer supplementary service for the VPN "b" service entry point; Part 1: Test Suite Structure and Test Purposes (TSS&TP) specification".
[6]	ISO/IEC 9646 (all parts): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework".
[7]	ISO/IEC 9646-3: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 3: The Tree and Tabular Combined Notation (TTCN)".
[8]	ISO/IEC 9646-5: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 5: Requirements on test laboratories and clients for the conformance assessment".
[9]	ISO/IEC 9646-4: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 4: Test realization".

3   Definitions and abbreviations

3.1   Definitions

For the purposes of the present document, the terms and definitions given in ISO/IEC 9646 [6] apply.

3.2   Abbreviations

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

ATM	Abstract Test Method
ATS	Abstract Test Suite
BER	Basic Encoding Rules
ETS	Executable Test Suite
IUT	Implementation Under Test
MOT	Means Of Testing
MTC	Main Test Component
PCO	Point of Control and Observation
PCTR	Protocol Conformance Test Report
PDU	Protocol Data Unit
PICS	Protocol Implementation Conformance Statement
PIXIT	Protocol Implementation eXtra Information for Testing
PTC	Parallel Test Component
SS-CT	Call Transfer Supplementary Service
SUT	System Under Test
TP	Test Purpose
TTCN	Tree and Tabular Combined Notation
VPN	Virtual Private Network

4   Abstract Test Method (ATM)

4.1   Description of ATM used

The multi-party test method is applied for testing the IUT. The general configuration used is shown in figure 1.

A Point of Control and Observation (PCO) resides at the service access point between layers 2 and 3 in the test system. The PCO used by the MTC is named "L0" (for Lower) and the PCO used by the PTC is named "L1". These PCOs are used to control and observe the behaviour of the Implementation Under Test (IUT) and test case verdicts are assigned depending on the behaviour observed at these PCOs.

A third "informal" PCO, called "O" (for Operator) is used to specify control but not observation above the IUT; events at this PCO are never used to generate test case verdicts. Messages sent by the tester at this PCO explicitly indicate to the operator actions, which are to be performed on the SUT. This is regarded as a preferred alternative to the use of the implicit send event.
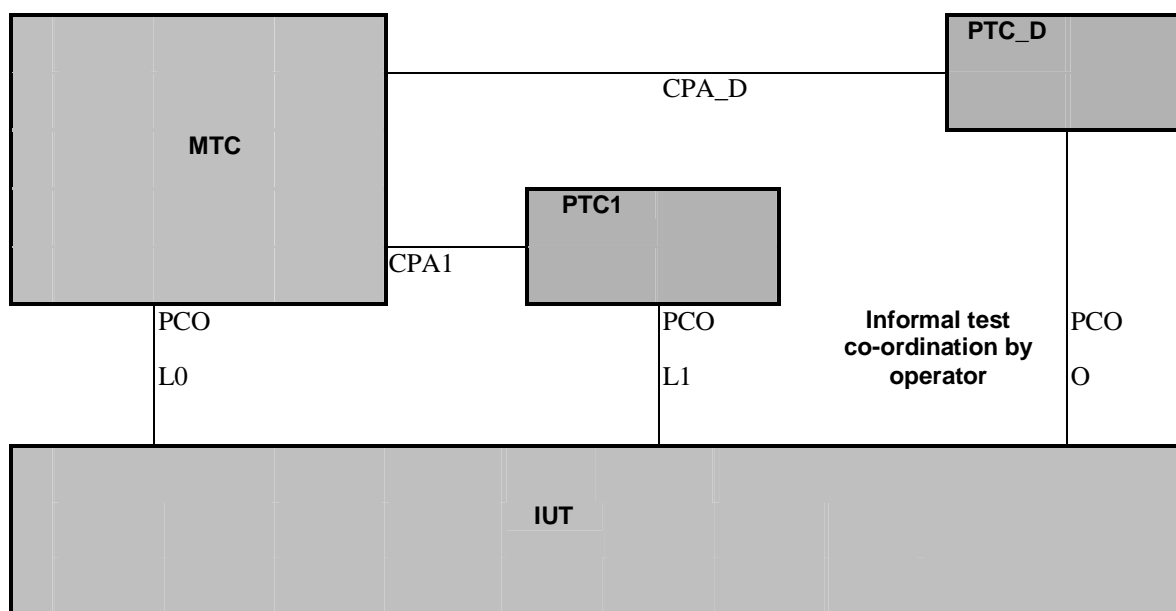
Figure 1: Multi-party test method

Not all components are used in every test case and the relationship between the IUT and the tester depends on the test group:

- when the IUT is in the Authentication configuration, the IUT is only connected to the MTC. The verdict depends only on the behaviour observed at the PCO between the IUT and the MTC. The PTC1 and PTC_D are not used.

- when the IUT is in the Home and Visitor configuration, the PTC1 and the MTC are both used. The verdict is assigned by the MTC or the PTC1 depending on the test purpose. The PTC_D and PCO O are used to specify control above the IUT.

5   Untestable test purposes

There are no untestable test cases associated with this ATS and ATM.

6   ATS conventions

6.1   Version of TTCN used

The version of TTCN used is that defined in TR 101 101 [3].

6.2   Use of ASN.1

6.2.1   Situations where ASN.1 is used

ASN.1 has been used for three major reasons. First, types defined in ASN.1 can model problems that "pure" TTCN cannot. For instance, data structures modelling ordered or unordered sequences of data are preferably defined in ASN.1. Second, ASN.1 provides a better restriction mechanism for type definitions by using sub-type definitions. Third, it is necessary to use ASN.1 to reproduce the type definitions for remote operation components as specified in the base standards in ASN.1.

The possibility to use TTCN and ASN.1 in combination is used, i.e. referring to an ASN.1 type from a TTCN type.

6.2.2 Specification of encoding rules

There is a variation in the encoding rules applied to ASN.1 types and constraints specified in the present document and therefore a mechanism is needed to differentiate the encoding rules. However the mechanism specified in ISO/IEC 9646-3 [7] and in TR 101 101 [3] does not facilitate definition of the encoding rules as needed for this ATS. A solution is therefore used which is broadly in the spirit of ISO/IEC 9646-3 [7] in which comment fields have been used as a means of encoding rules.

For ASN.1 used in the present document, two variations of encoding rules are used. One is the commonly known Basic Encoding Rules (BER) as specified in ISO/IEC 8825-1 [4]. In the second case the encoding is according to ISDN, i.e. the ASN.1 data types are a representation of structures contained within the ISDN specification (basic call, Generic functional protocol or individual supplementary service). For example, if octets of an information element are specified in ASN.1 as a SEQUENCE then this should be encoded in an Executable Test Suite (ETS) as any other ISDN information element specified using tabular TTCN. This ISDN encoding variation is the default encoding rule for this ATS. This means that all ASN.1 constraint tables are encoded using ISDN (non-BER) encoding unless stated otherwise. BER encoding should never be applied to an ASN.1 constraint where BER encoding has not been specified. This encoding rule is sometimes named "Direct Encoding".

For BER encoding, an indication is given in the comments field of the table header. For this ATS such indications appear in the ASN.1 type constraint declaration tables only. In the first line of the table header comment field, the notation "ASN1_Encoding: *BER*" is used.

In this particular ATS all ASN.1 type constraints which are of type "Component" are to be encoded using BER.

Table 1: ASN.1 type constraint declaration showing use of encoding variation

```
                        ASN.1 Type Constraint Declaration
Constraint Name     : CallTransferComplete_inv_S1 (INV_ID: InvokeIDType

ASN.1 Type          : Component

Derivation Path     :

Encoding Variation  :

Comments            : ASN1_Encoding: BER
                                   Description
callTransferComplete_Comp

callTransferComplete_InvokeComp {

invokeID INV_ID,

operation_value localValue 12,

argument {

endDesignation primaryEnd,

callStatus  answered }}

Detailed comments :
```

7 ATS to TP map

The identifiers used for the TPs are reused as test case names. Thus there is a straightforward one-to-one mapping.