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Digitalno omrežje z integriranimi storitvami (ISDN) - Dopolnilne storitve: izsmeritev - Protokol digitalne naročniške signalizacije št. 1 (DSS1) - 6. del: Abstraktni preskusni niz (ATS) in delna dodatna informacija za preskušanje izvedbe protokola (PIXIT) - Proforma specifikacija za omrežje

Integrated Services Digital Network (ISDN); Diversion supplementary services; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 6: Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma specification for the network

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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 6 of a multi-part deliverable covering the Digital Subscriber Signalling System No. one (DSS1) protocol specification for the Integrated Services Digital Network (ISDN); Diversion supplementary services, as identified below:

Part 1: "Protocol specification";

Part 2: "Protocol Implementation Conformance Statement (PICS) proforma specification";

Part 3: "Test Suite Structure and Test Purposes (TSS&TP) specification for the user";

Part 4: "Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma specification for the user";

Part 5: "Test Suite Structure and Test Purposes (TSS&TP) specification for the network";

Part 6: "Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma specification for the network".

National transposition dates	
Date of adoption of this EN:	16 November 2001
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1 Scope

The present document specifies the Abstract Test Suites (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma for the Network side of the T reference point or coincident S and T reference point of implementations conforming to the stage three standard for the diversion supplementary services for the pan-European Integrated Services Digital Network (ISDN) by means of the Digital Subscriber Signalling System No. one (DSS1) protocol, EN 300 207-1 [1].

EN 300 207-5 [3] specifies the Test Suite Structure and Test Purposes (TSS&TP) related to this ATS and partial PIXIT proforma specification. Other parts specify the TSS&TP and the ATS and partial PIXIT proforma for the User side of the T reference point or coincident S and T reference point of implementations conforming to EN 300 207-1 [1].

The present document contains two ATSs for different parts of the protocol; one (CDIV) for Call Forwarding Busy, Call Forwarding Unconditional, Call Forwarding No Response and Call Deflection and the other (SCF) for Selective Call Forwarding Busy, Selective Call Forwarding Unconditional and Selective Call Forwarding No Response. Common parts of the protocol are covered by the CDIV ATS.

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.

[1] ETSI EN 300 207-1 (V2.0.1): "Integrated Services Digital Network (ISDN); Diversion supplementary services; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".

[2] ETSI EN 300 207-2 (V2.0.1): "Integrated Services Digital Network (ISDN); Diversion supplementary services; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 2: Protocol Implementation Conformance Statement (PICS) proforma specification".

[3] ETSI EN 300 207-5 (V3.1.1): "Integrated Services Digital Network (ISDN); Diversion supplementary services; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 5: Test Suite Structure and Test Purposes (TSS&TP) specification for the network".

[4] ETSI EN 300 196-1: "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".

NOTE: EN 300 207-1 [1] has an undated reference to EN 300 196-1 [4]. Some ASN.1 definitions from EN 300 196-1 [4] are referenced by EN 300 207-1 and are reproduced in the TTCN ATSs in the present document. The versions of these definitions used in the present document are based on those in EN 300 196-1 (V1.3.2). There is a technical change in the definition of PartyNumber in EN 300 196-1 (V1.3.2) which has no impact on the present document.

[5] Void.

[6] Void.

[7] Void.

[8] ISO/IEC 9646-1 (1994): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 1: General concepts".

[9] ISO/IEC 9646-2 (1994): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 2: Abstract test suite specification".

[10] ISO/IEC 9646-3 (1998): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 3: The Tree and Tabular Combined Notation (TTCN)".

[11] ISO/IEC 9646-4 (1994): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 4: Test realization".

[12] ISO/IEC 9646-5 (1994): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 5: Requirements on test laboratories and clients for the conformance assessment process".

[13] ISO/IEC 8825-1: "Information technology - ASN.1 encoding rules: Specification of Basic Encoding Rules (BER), Canonical Encoding Rules (CER) and Distinguished Encoding Rules (DER)". (See also ITU-T Recommendation X.690).

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in ISO/IEC 9646-1 [8] apply.

3.2 Abbreviations

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

ATS	Abstract Test Suite
BER	Basic Encoding Rules
CD	Call Diversion
CDIV	Call DIVersion (this is used to refer collectively to the CD, CFB, CFNR and CFU services)
CFB	Call Forward Busy
CFNR	Call Forward No Reply
CFU	Call Forward Unconditional
ETS	Executable Test Suite
IUT	Implementation Under Test
LT	Lower Tester
MOT	Means Of Testing
MTC	Main Test Component
PCO	Point of Control and Observation
PICS	Protocol Implementation Conformance Statement
PIXIT	Protocol Implementation eXtra Information for Testing
PTC	Parallel Test Component
SCF	Selective Call Forwarding (this is used to refer collectively to the SCFB, SCFNR and SCFU services)
SUT	System Under Test
TP	Test Purpose
TTCN	Tree and Tabular Combined Notation

4 Abstract Test Method

4.1 CDIV network side ATS

The multi-party test method is applied for the CDIV network side ATS.

The requirement for testing the network IUT is to focus on the behaviour of the network IUT at the user-network interface where a T reference point or coincident S and T reference point applies. Thus the IUT is the network DSS1 protocol entity at a particular user-network interface and is not the whole network.

In practice the behaviour at a single user-network interface does not occur in isolation, but depends on the activity at other user-network interfaces. Therefore a multi-party test method is used.

The general configuration used is shown in figure 1. In this ATS the PTCs act as slaves to the MTC; all active behaviour at the PTCs is initiated by CMs sent by the MTC and all verdicts are assigned by the MTC. Not all components are used in every test case.

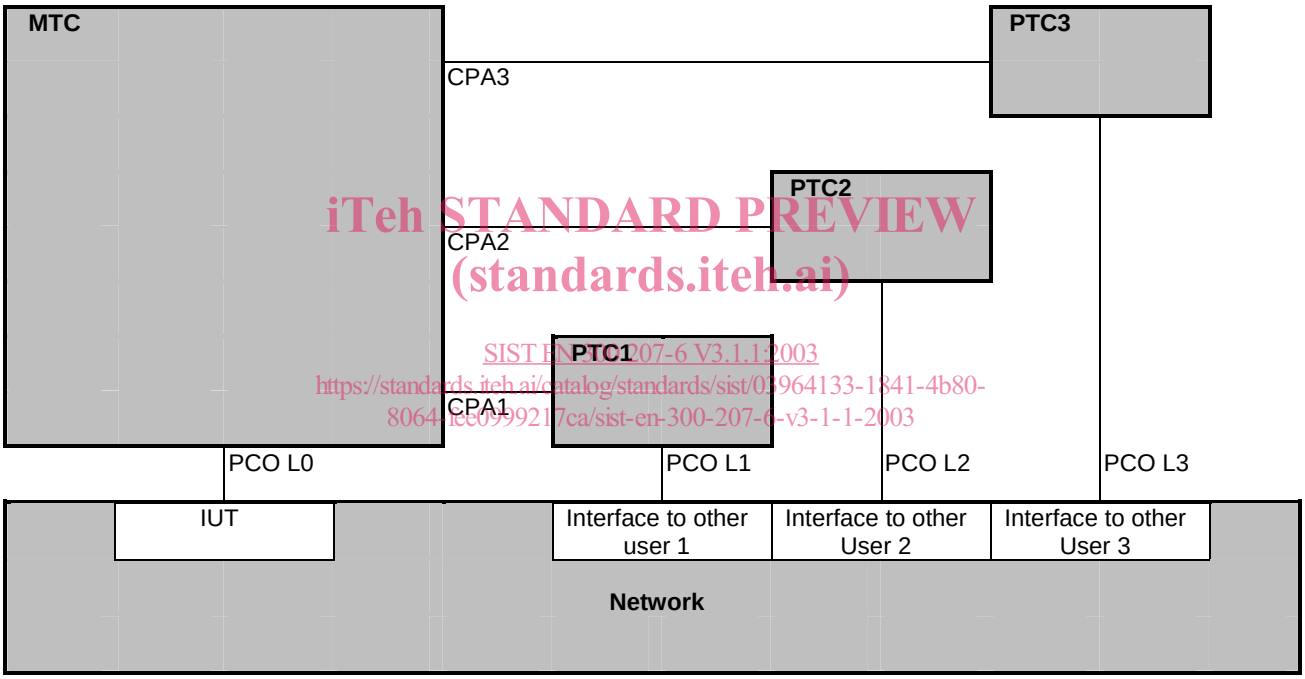

Figure 1: Multi-party test method

For each test case the interface to which the MTC connected is the IUT, which may be the interface of the calling user, served user or diverted-to user depending on the test group. PTCs are connected to any other interfaces where activity is necessary. The association between the network interfaces and PTCs that is typically used is described in table 1.

Table 1: Association of test components with interfaces

	Calling user	(First) served user	Second served user	Diverted-to user
Calling user tests - one diversion	MTC	PTC1		PTC2
Calling user tests - two diversions	MTC	PTC1	PTC2	PTC3
Served user tests - activation, deactivation and interrogation		MTC		
Served user tests - one diversion	PTC1	MTC		PTC2 (see note)
Served user tests - two diversions	PTC1	PTC2	MTC	PTC3
Called user tests - one diversion	PTC1	PTC2		MTC
Called user tests - two diversions	PTC3	PTC1	PTC2	MTC
NOTE: In some TCs PCO L2 is connected to the interface of the diverted-to user but no PTC is associated with that PCO.				

4.2 SCF network side ATS

The remote test method is applied for the SCF network side ATS as illustrated in figure 2.

The parts of the protocol specific to SCF (i.e. activation, deactivation and interrogation of the SCF services) do not involve any activity at interfaces of users other than the served user and therefore it is not appropriate to use a multi-party test method.

A Point of Control and Observation (PCO) resides at the service access point between layers 2 and 3 in the test system. This PCO is named "L" (for Lower). The L PCO is 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 this PCO.

Within test cases all communication with the IUT is via PCO L. However in some cases informal test co-ordination is performed by re-configuration of the IUT between test cases.

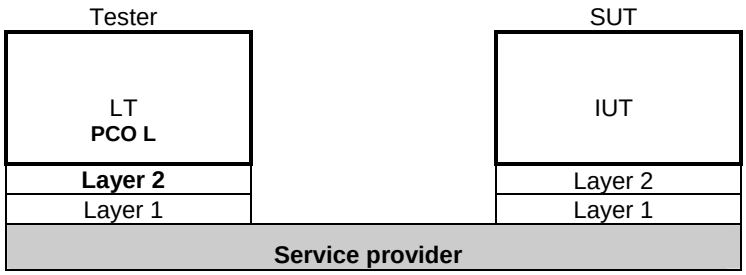

Figure 2: Remote test method

5 Untestable test purposes

There are no untestable test purposes associated with these ATSs.

6 ATS conventions

6.1 Version of TTCN used

The version of TTCN used is that defined in ISO/IEC 9646-3 [10].

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 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 this ATS and therefore a mechanism is needed to differentiate the encoding rules. However the mechanism specified in ISO/IEC 9646-3 [10] 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 [10] in which comment fields have been used as a means of encoding rules.

For ASN.1 used in this ATS, two variations of encoding rules are used. One is the commonly known Basic Encoding Rules (BER) as specified in ISO/IEC 8825-1 [13]. 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.

Note that within BER, there are a number of variations for the encoding of lengths of fields. According to EN 300 196-1 [4], an IUT should be able to interpret all length forms within BER for received PDUs. When sending PDUs containing BER encoding, EN 300 196-1 [4] gives guidelines but makes no restrictions on the length forms within BER which an IUT may apply.

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

Table 2: ASN.1 type constraint declaration showing use of encoding variation

ASN.1 Type Constraint Declaration	
Constraint Name	: Beg3PTYinv
ASN.1 Type	: Component
Derivation Path	:
Comments	: ASN1_Encoding: BER Receive component: Begin3PTY invoke component
Description	
begin3PTY_Components begin3PTY_InvokeComp { invokeID ? , operation_value localValue 4}	
Detailed comments:	

6.3 Conventions for variables and parameters

This is applicable to the CDIV ATS only (no calls are used in the SCF ATS).

MTCA

call reference	CREF1
B channel (basic)	bch_num1
channel number (primary)	CH_NUM1
PCO L0	IPN0, LIPN0

PTC1

call reference	P1_CREF
B channel (basic)	P1_bch_num
channel number (primary)	P1_CH_NUM
PCO L1	IPN1, LIPN1