SLOVENSKI STANDARD
SIST EN 300 141-4 V1.2.4:2005

01-julij-2005

Digitalno omrežje z integriranimi storitvami (ISDN) - Dopolnilna storitev: zadrţanje klica (HOLD) - Protokol digitalne naroļniške signalizacije št. 1 (DSS1) - 4. del: Abstraktni preskušalni niz (ATS) in dodatna informacija za preskušanje delne izvedbe protokola (PIXIT) - Proforma specifikacija za uporabnika

Integrated Services Digital Network (ISDN); Call Hold (HOLD) supplementary service; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 4: Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma specification for the user

Ta slovenski standard je istoveten z: **EN 300 141-4 Version 1.2.4**

ICS:

33.080	Digitalno omrežje z integriranimi storitvami (ISDN)	Integrated Services Digital Network (ISDN)

SIST EN 300 141-4 V1.2.4:2005 **en**

EN 300 141-4 V1.2.4 (1998-06)

European Standard (Telecommunications series)

Integrated Services Digital Network (ISDN); Call Hold (HOLD) supplementary service; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 4: Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma specification for the user

Reference
REN/SPS-05145-S-4 (1b100iqo.PDF)

Keywords
ISDN, DSS1, supplementary service, HOLD,
testing, ATS, PIXIT, user

ETSI

Postal address
F-06921 Sophia Antipolis Cedex - FRANCE

Office address
650 Route des Lucioles - Sophia Antipolis
Valbonne - 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
Sous-Préfecture de Grasse (06) N° 7803/88

Internet
secretariat@etsi.fr
http://www.etsi.fr
http://www.etsi.org

Contents

Intellectual Property Rights

IPRs essential or potentially essential to the present document may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in SR 000 314: *"Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards"*, which is available **free of charge** from the ETSI Secretariat. Latest updates are available on the ETSI Web server (http://www.etsi.fr/ipr or http://www.etsi.org/ipr).

Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Foreword

This European Standard (Telecommunications series) has been produced by ETSI Technical Committee Signalling Protocols and Switching (SPS).

The present document is part 4 of a multi-part standard covering the Digital Subscriber Signalling System No. one (DSS1) protocol specification for the Integrated Services Digital Network (ISDN) Call Hold (HOLD) supplementary service, as described 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:	19 June 1998
Date of latest announcement of this EN (doa):	30 September 1998
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 March 1999
Date of withdrawal of any conflicting National Standard (dow):	31 March 1999

1 Scope

This fourth part of EN 300 141 specifies the Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma for the User side of the T reference point or coincident S and T reference point (as defined in ITU-T Recommendation I.411 [11]) of implementations conforming to the stage three standard for the Call Hold (HOLD) supplementary service for the pan-European Integrated Services Digital Network (ISDN) by means of the Digital Subscriber Signalling System No. one (DSS1) protocol, EN 300 141-1 [2].

EN 300 141-3 [4] 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 Network side of the T reference point or coincident S and T reference point of implementations conforming to EN 300 141-1 [2].

2 Normative references

References may be made to:

a) specific versions of publications (identified by date of publication, edition number, version number, etc.), in which case, subsequent revisions to the referenced document do not apply; or

b) all versions up to and including the identified version (identified by "up to and including" before the version identity); or

c) all versions subsequent to and including the identified version (identified by "onwards" following the version identity); or

d) publications without mention of a specific version, in which case 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.

v[1] EN 300 403-1: "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Signalling network layer for circuit-mode basic call control; Part 1: Protocol specification [ITU-T Recommendation Q.931 (1993), modified]".

[2] EN 300 141-1 (V1.2): "Integrated Services Digital Network (ISDN); Call Hold (HOLD) supplementary service; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".

[3] EN 300 141-2 (V1.2): "Integrated Services Digital Network (ISDN); Call Hold (HOLD) supplementary service; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 2: Protocol Implementation Conformance Statement (PICS) proforma specification".

[4] EN 300 141-3 (V1.2): "Integrated Services Digital Network (ISDN); Call Hold (HOLD) supplementary service; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 3: Test Suite Structure and Test Purposes (TSS&TP) specification for the user".

[5] 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".

[6] ISO/IEC 9646-1: "Information Technology - OSI Conformance Testing Methodology and Framework; Part 1: General Concepts".

[7] ISO/IEC 9646-2: "Information Technology - OSI Conformance Testing Methodology and Framework; Part 2: Abstract Test Suite Specification".

[8] ISO/IEC 9646-3: "Information Technology - OSI Conformance Testing Methodology and Framework; Part 3: The Tree and Tabular Combined Notation".

[9] ISO/IEC 9646-4: "Information Technology - OSI Conformance Testing Methodology and Framework; Part 4: Test realization".

[10] ISO/IEC 9646-5: "Information Technology - OSI Conformance Testing Methodology and Framework; Part 5: Requirements on test laboratories and clients for the conformance assessment process".

[11] ITU-T Recommendation I.411 (1993): "ISDN user-network interfaces - Reference configurations".

[12] CCITT Recommendation X.209 (1988): "Specification of Basic Encoding Rules for Abstract Syntax Notation One (ASN.1)".

3 Definitions and abbreviations

3.1 Definitions

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

Abstract Test Suite (ATS): See ISO/IEC 9646-1 [6].

Implementation Under Test (IUT): See ISO/IEC 9646-1 [6].

Lower Tester (LT): See ISO/IEC 9646-1 [6].

Point of Control and Observation (PCO): See ISO/IEC 9646-1 [6].

Protocol Implementation Conformance Statement (PICS): See ISO/IEC 9646-1 [6].

PICS proforma: See ISO/IEC 9646-1 [6].

Protocol Implementation eXtra Information for Testing (PIXIT): See ISO/IEC 9646-1 [6].

PIXIT proforma: See ISO/IEC 9646-1 [6].

System Under Test (SUT): See ISO/IEC 9646-1 [6].

Upper Tester (UT): See ISO/IEC 9646-1 [6].

3.2 Abbreviations

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

ASP	Abstract Service Primitive
ATM	Abstract Test Method
ATS	Abstract Test Suite
BER	Basic Encoding Rules
ExTS	Executable Test Suite
HOLD	Call Hold
IE	Information Element
IUT	Implementation Under Test
LT	Lower Tester
MOT	Means Of Testing
PCO	Point of Control and Observation
PDU	Protocol Data Unit
PICS	Protocol Implementation Conformance Statement
PIXIT	Protocol Implementation eXtra Information for Testing
SUT	System Under Test
TCP	Test Co-ordination Procedures
TP	Test Purpose
TTCN	Tree and Tabular Combined Notation
UT	Upper Tester

4 Abstract Test Method (ATM)

The remote test method is applied for the HOLD user ATS. The Point of Control and Observation (PCO) resides at the service access point between layers 2 and 3. 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.

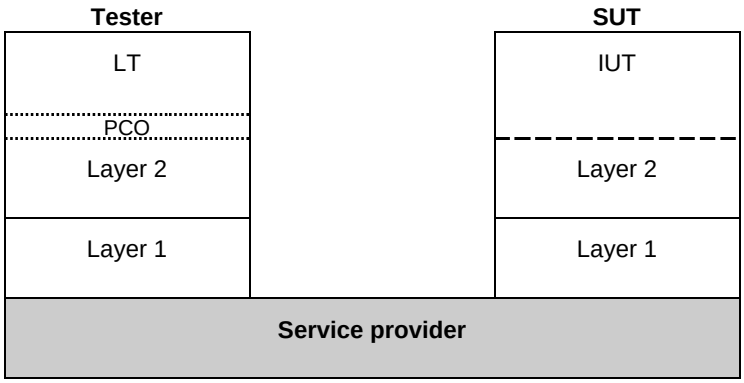

Figure 1: Remote test method

ISO/IEC 9646-2 [7] allows the informal expression of Test Co-ordination Procedures (TCP) between the System Under Test (SUT) upper layer(s) and the Lower Tester (LT). In the ATS contained in annex C, TCP is achieved by use of a second "informal" PCO, called "O" (for Operator). This PCO is used to specify control but not observation above the IUT and consequently, events at this PCO are never used to generate test case verdicts. The use of this O PCO is regarded as a preferred alternative to the use of the implicit send event, in that it allows the ATS to specify in a clear and meaningful way what actions are required to be performed on the IUT.

5 Untestable test purposes

There are no untestable test purposes associated with this ATS.

6 ATS conventions

This clause is structured similarly to the structure of a TTCN ATS. However, the names of the subclauses are arranged in a way more suitable to the present document.

6.1 Declarations part

6.1.1 Type definitions

6.1.1.1 Simple type definitions

Where appropriate, simple types have a length, a value list or a range restriction attached.

Simple types defined as being of some string type (e.g. BIT STRING, OCTET STRING), have a length restriction or a value list attached.

Simple types, defined as being of INTEGER type, have a value list or a range restriction attached.

6.1.1.2 Structured type definitions

6.1.1.2.1 TTCN structured type definitions

All structured type definitions are provided with a full name.

All elements in every structured type definition, defined as being of some string type (e.g. BIT STRING, OCTET STRING), have a length restriction attached.

If an element in a structured type definition is defined as being of a referenced type, the (possible) restriction is defined in that referenced type.

For information elements the identifier, which is unique for each element, has its type defined as a simple type where the value list is restricted to the single value which is the identifier itself. This has the advantage that it allows a test system derived from this ATS to easily identify information elements embedded in messages. An ATS where information element identifiers are represented as unrestricted types can present difficulties for a derived test system in the case where it needs to find one information element embedded in a number of others and the constraints for the other elements have the any-or-omit value. In such a case the test system cannot easily find the beginning of each information element.

6.1.1.2.2 ASN.1 structured type definitions

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.

The fact that ASN.1 provides a better restriction mechanism for type definitions is used for the purpose of achieving type-compatibility.

In table 1, the ASN.1 type BIT7OR15 is defined as being of type BIT STRING with a size constraint attached to it. The size is determined by the value of CR_LENGTH, a test suite parameter. It can have the value of either 7 or 15. The type BIT7OR15 is used in the structured type CR, field cr_r allowing this type to represent a Basic Access or a Primary Rate Access call reference. By using this type definition the field cr_r is always type compatible with values of type BIT STRING (SIZE(7)) and BIT STRING (SIZE(15)). Another approach to solve this problem would be to define the type BIT7OR15 as BIT STRING (SIZE(7 | 15)). This type has a small disadvantage compared with the previous one. It is impossible, in run-time, to determine the actual length of any instance of this type.

Table 1: ASN.1 type definition BIT7OR15

ASN.1 Type Definition
Type Name : BIT7OR15 **Comments** :
Type Definition
BIT STRING(SIZE(CR_LENGTH))

Table 2 shows a typical use of ASN.1. The CHI element will have two different type definitions depending on whether it represents basic or primary rate access. In TTCN, this needs to be defined as two different types. In ASN.1 this can be done in one, the type being a choice of either BASIC_CHI or PRIMARY_CHI. These two types are then (locally) defined in the same table.

Table 2: ASN.1 type definition CHI

ASN.1 Type Definition
Type Name : CHI **Comments** : Info Element Channel Identification EN 300 403-1 clause 4.5.13
Type Definition

```
CHOICE {
 basic    BASIC_CHI,
 primary  PRIMARY_CHI
}

-- Local type definitions --

BASIC_CHI ::= SEQUENCE {
 chi_i       CHI_I,                    -- Identifier
 chi_l       BIT STRING(SIZE(8)),      -- Length
 chi_e3_cs   BIT STRING(SIZE(8))       -- Channel selection
}

PRIMARY_CHI ::= SEQUENCE {
 chi_i       CHI_I,                    -- Identifier
 chi_l       BIT STRING(SIZE(8)),      -- Length
 chi_e3_p1   BIT STRING(SIZE(4)),      -- First nibble of Channel selection
 chi_e3_pe   BIT STRING(SIZE(1)),      -- Preferred/Exclusive Bit
 chi_e3_p3   BIT STRING(SIZE(3)),      -- Last three bits of Channel selection
 chi_e4      BIT STRING(SIZE(8)),      -- Channel type
 chi_e5_chl  BIT STRING(SIZE(1)),
 chi_e5_ch2  BIT STRING(SIZE(7))       -- Channel number
}
```

Table 3 shows an example of how ASN.1 can be used to model unordered sequences.

Table 3: ASN.1 type definition FIES

ASN.1 Type Definition
Type Name : FIES **Comments** :
Type Definition
SET OF FIE

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

6.1.1.3 ASP type definitions

6.1.1.3.1 TTCN ASP type definitions

TTCN ASP type definitions only contain one PDU or no PDU at all. The relationship between an ASP type and a PDU type is one-to-one. That is, there exists one ASP type definition for each PDU type definition (if that ASP type contains a PDU).

All TTCN ASP type definitions are provided with a full identifier.

Some ASPs are not parameterized as shown in the example in table 4. Such ASPs are only used for requesting or receiving service from the lower layer.

Table 4: TTCN ASP type definition DL_REL_IN

TTCN ASP Type Definition		
ASP NAME : DL_REL_IN(DL_RELEASE_INDICATION) **PCO Type** : SAP **Comments** :		
Parameter Name	**Parameter Type**	**Comments**
Detailed Comments :		