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Digitalno omrežje z integriranimi storitvami (ISDN) - Protokol digitalne naročniške signalizacije št. 1 (DSS1) - Signalizacijska omrežna plast za krmiljenje vodovnega osnovnega klica - 6. del: Zgradba preskušalnega niza in namen preskušanja (TSS&TP) - Specifikacija za omrežje

Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Signalling network layer for circuit-mode basic call control; Part 6: Test Suite Structure and Test Purposes (TSS&TP) specification for the network

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Foreword

This European Telecommunication Standard (ETS) has been produced by the Signalling Protocols and Switching (SPS) Technical Committee of the European Telecommunications Standards Institute (ETSI).

This ETS is part 6 of a multi-part standard covering the Digital Subscriber Signalling System No. one (DSS1) protocol specification for the Integrated Services Digital Network (ISDN) signalling network layer for circuit-mode basic call control, as described below:

Part 1: "Protocol specification [ITU-T Recommendation Q.931 (1993), modified]";

Part 2: "Specification and Description Language (SDL) diagrams";

Part 3: "Protocol Implementation Conformance Statement (PICS) proforma specification";

Part 4: "Test Suite Structure and Test Purposes (TSS&TP) specification for the user";

Part 5: "Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma specification for the user";

Part 6: "TSS&TP specification for the network";

Part 7: "ATS and partial PIXIT proforma specification for the network".

Transposition dates	
Date of adoption:	20 December 1996
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1 Scope

This sixth part of ETS 300 403 specifies the network Test Suite Structure and Test Purposes (TSS&TP) for the T reference point or coincident S and T reference point (as defined in ITU-T Recommendation I.411 [9]) of implementations conforming to the standards for the signalling network layer for circuit-mode basic call control of the Digital Subscriber Signalling System No. one (DSS1) protocol for the pan-European Integrated Services Digital Network (ISDN), ETS 300 403-1 [1] and ETS 300 403-2 [2].

A further part of this ETS specifies the Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma based on this ETS. 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 ETS 300 403-1 [1] and ETS 300 403-2 [2].

2 Normative references

This ETS incorporates by dated and undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this ETS only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

[1] ETS 300 403-1 (1995): "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] ETS 300 403-2 (1995): "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Signalling network layer for circuit-mode basic call control; Part 2: Specification and Description Language (SDL) diagrams".

[3] ETS 300 403-3 (1996): "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Signalling network layer for circuit-mode basic call control; Part 3: Protocol Implementation Conformance Statement (PICS) proforma specification".

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

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

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

[7] CCITT Recommendation E.164 (1991): "Numbering plan for the ISDN era".

[8] ITU-T Recommendation I.112 (1993): "Vocabulary and terms for ISDNs".

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

3 Definitions

For the purposes of this ETS, the following definitions apply, in addition to those given in ETS 300 403-1 [1]:

3.1 Definitions related to conformance testing

abstract test case: Refer to ISO/IEC 9646-1 [4].

Abstract Test Method (ATM): Refer to ISO/IEC 9646-1 [4].

Abstract Test Suite (ATS): Refer to ISO/IEC 9646-1 [4].

active test: A 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.

Implementation Under Test (IUT): Refer to ISO/IEC 9646-1 [4].

implicit send event: Refer to ISO/IEC 9646-3 [6].

lower tester: Refer to ISO/IEC 9646-1 [4].

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

point of control and observation: Refer to ISO/IEC 9646-1 [4].

Protocol Implementation Conformance Statement (PICS): Refer to ISO/IEC 9646-1 [4].

PICS proforma: Refer to ISO/IEC 9646-1 [4].

Protocol Implementation eXtra Information for Testing (PIXIT): Refer to ISO/IEC 9646-1 [4].

PIXIT proforma: Refer to ISO/IEC 9646-1 [4].

system under test: Refer to ISO/IEC 9646-1 [4].

Test Purpose (TP): Refer to ISO/IEC 9646-1 [4].

3.2 Definitions related to ETS 300 403-1

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

ISDN number: A number conforming to the numbering and structure specified in CCITT Recommendation E.164 [7].

network: The DSS1 protocol entity at the Network side of the user-network interface where a T reference point or coincident S and T reference point applies.

network (S/T): The DSS1 protocol entity at the Network side of the user-network interface where a coincident S and T reference point applies.

network (T): The DSS1 protocol entity at the Network side of the user-network interface where a T reference point applies (user is the private ISDN).

4 Abbreviations

For the purposes of this ETS, the following abbreviations apply:

ATM	Abstract Test Method
ATS	Abstract Test Suite
CES	Connection Endpoint Suffix
CR	Call Reference
DSS1	Digital Subscriber Signalling System No. one
I	Inopportune stimulus
ISDN	Integrated Services Digital Network
IUT	Implementation Under Test
N00	Null call state
N01	Call Initiated call state
N02	Overlap Sending call state
N03	Outgoing Call Proceeding call state
N04	Call Delivered call state
N06	Call Present call state
N07	Call Received call state
N08	Connect Request call state
N09	Incoming Call Proceeding call state
N10	Active call state
N11	Disconnect Request call state
N12	Disconnect Indication call state
N15	Suspend Request call state
N17	Resume Request call state
N19	Release Request call state
N22	Call Abort call state
N25	Overlap Receiving call state
PICS	Protocol Implementation Conformance Statement
PIXIT	Protocol Implementation eXtra Information for Testing
R00	Restart Null call state
R01	Restart Request call state
R02	Restart call state
S	Syntactically invalid stimulus
SEG	message Segmentation procedure
TP	Test Purpose
TSS	Test Suite Structure
V	Valid stimulus

5 Test Suite Structure (TSS)

- Null call state N00
    - Valid
        - Outgoing call
        - Incoming call - point-to-point configuration
        - Incoming call - point-to-multipoint configuration
        - Call rearrangement
    - Inopportune
    - Syntactically invalid
- Overlap Sending call state N02
    - Valid
    - Inopportune
    - Syntactically invalid
- Outgoing Call Proceeding call state N03
    - Valid
    - Inopportune
    - Syntactically invalid
- Call Delivered call state N04
    - Valid
    - Inopportune
    - Syntactically invalid
- Call Present call state N06
    - Valid
        - Point-to-point configuration
        - Point-to-multipoint configuration
    - Inopportune
    - Syntactically invalid
- Call Received call state N07
    - Valid
        - Point-to-point configuration
        - Point-to-multipoint configuration
    - Inopportune
    - Syntactically invalid
- Incoming Call Proceeding call state N09
    - Valid
        - Point-to-point configuration
        - Point-to-multipoint configuration
    - Inopportune
    - Syntactically invalid
- Active call state N10 (Incoming call)
    - Valid
    - Inopportune
    - Syntactically invalid
- Active call state N10 (Outgoing call)
    - Valid
    - Inopportune
    - Syntactically invalid
- Disconnect Indication call state N12 (Incoming call)
    - Valid
    - Inopportune
    - Syntactically invalid
- Disconnect Indication call state N12 (Outgoing call)
    - Valid
    - Inopportune
    - Syntactically invalid
- Release Request call state N19 (Incoming call)
    - Valid
    - Inopportune
    - Syntactically invalid

Figure 1 (sheet 1 of 2): Test suite structure

- Release Request call state N19 (Outgoing call)
  - Valid
  - Inopportune
  - Syntactically invalid
- Call Abort call state N22
- Overlap Receiving call state N25
  - Valid
    - Point-to-point configuration
    - Point-to-multipoint configuration
  - Inopportune
  - Syntactically invalid
- Restart Null call state R00 (Incoming call)
  - Valid
  - Inopportune
  - Syntactically invalid
- Restart Null call state R00 (Outgoing call)
  - Valid
  - Inopportune
  - Syntactically invalid
- Restart Request call state R01
  - Valid
  - Inopportune
  - Syntactically invalid
- Message segmentation procedure
  - Valid
  - Inopportune
  - Syntactically invalid

Figure 1 (sheet 2 of 2): Test suite structure

6 Test Purposes (TP)

6.1 Introduction

For each test requirement, a TP is defined.

6.1.1 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:	**<layer iut>_<state>_<group>_<nnn>**		
<layer iut>	=	layer + type of IUT:	e.g. "L3N" for layer 3, IUT = network
<state>	=	call state:	e.g. N10 for Active call state
<group>	=	group:	one character field representing the group reference according to TSS V: Valid stimulus I: Inopportune stimulus S: Syntactically invalid stimulus
<nnn>	=	sequential number:	(001-999)

6.1.2 Source of TP definition

The TPs are based on ETS 300 403-1 [1] and ETS 300 403-2 [2].

6.1.3 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 which is illustrated in table 2. This table should be read in conjunction with any TP, i.e. please use a TP as an example to facilitate the full comprehension of table 2.

Table 2: Structure of a single TP

TP part	Text	Example
Header	**<Identifier>** *tab* **<subclause number in base ETS 300 403-1>**	see table 1 **subclause 2.3.4**
Stimulus	Ensure that the IUT in the <basic call state> <trigger> *see below for message structure* *or* <goal>	 N00, N10, etc. on receipt of a XXXX message (see note 2) to request a ...
Reaction	<action> <conditions> *if the action is sending* *see below for message structure* <next action>, *etc.* *and* remains in the same state *or* and enters state <state>	sends, saves, does, etc. using en bloc sending, etc.
Message structure	<message type> message *a)* with a <info element> information element *b)* indicating in the <field name> <coding of the field> and *back to a) or b)*	SETUP, FACILITY, CONNECT, etc. (see note 2) Bearer capability, Facility, etc.
NOTE 1:	Text in italics will not appear in TPs and text between <> is filled in for each TP and may differ from one TP to the next.	
NOTE 2:	All messages shall be considered as "valid and compatible" unless otherwise specified in the test purpose.	

6.1.4 Test strategy

As the base standard ETS 300 403-1 [1] contains no explicit requirements for testing, the TPs were generated as a result of an analysis of the base standard and the PICS specification ETS 300 403-3 [3]. The criteria applied include the following:

- only the requirements from the point of view of the T or coincident S and T reference point are considered;

- whether or not a test case can be built from the TP is not considered.

6.1.5 Test of call states

Many TPs include a reference to the IUT's final call state after the realization of the TP. In these cases the TP includes the requirement to ensure that the IUT has entered this particular final call state. Ensuring that the IUT is in a particular call state shall be realized by following the procedures described in subclause 5.8.10 of ETS 300 403-1 [1]. According to these procedures, the IUT on receipt of a STATUS ENQUIRY message, shall respond with a STATUS message indicating, in the third octet of the Call state information element, the current call state of the IUT. This exchange of messages is not mentioned explicitly in each TP but is considered to be implicit in the reference to the final call state. This way of phrasing the TPs has been used to avoid over-complicating the text and structure of the TPs and to improve the readability.

6.1.6 Test of point-to-multipoint configurations

In subclauses 6.2.1, 6.2.5, 6.2.6, 6.2.7 and 6.2.15 (call states Null N00, Call Present N06, Call Received N07, Incoming Call Proceeding N09 and Overlap Receiving N25) a distinction is made between point-to-point and point-to-multipoint configurations. In the case of a point-to-multipoint configuration several terminals may be attached to one basic access interface. Each terminal will use a different Connection Endpoint Suffix (CES). To reflect this in the TPs the CES for which a message is received or sent (e.g. "... on receipt of an ALERTING message for CES1 ...") is named explicitly where this clarification is needed.

6.1.7 Test of inopportune and syntactically invalid behaviour

In the test groups for inopportune and syntactically invalid behaviour the procedures as described in subclause 5.8 of ETS 300 403-1 [1] are tested. This is done in each call state with one message for each of the described error cases. Messages have been chosen that are, if they are received without the inopportune or erroneous coding, expected messages in the call states under test.

Test purposes for inopportune behaviour that is described outside the subclause 5.8 of ETS 300 403-1 [1] are found in the valid test groups. This was done, as these procedures are seen more as a part of the basic call procedures than as a part of the error handling procedures.

6.2 TPs for the basic call control, layer 3, network

All PICS items referred to in this subclause are as specified in ETS 300 403-3 [3] unless indicated otherwise by another numbered reference.

6.2.1 Null call state N00

6.2.1.1 Valid

6.2.1.1.1 Outgoing call

L3N_N00_V_001 subclause 5.1.1
Ensure that the IUT in the Null call state N00, on receipt of a SETUP message during an all channels busy condition,

sends a RELEASE COMPLETE message with a Cause information element indicating the cause value 34 "no circuit/channel available" and remains in the Null call state N00.

L3N_N00_V_002 subclauses 5.1.2 a), 5.1.3
Ensure that the IUT in the Null call state N00, on receipt of a SETUP message without Called party number and Sending complete information element and with the Channel identification information element indicating a B-channel that is available and indicating in the preferred/exclusive bit "exclusive: only the indicated channel is acceptable",

sends SETUP ACKNOWLEDGE message with the Channel identification information element indicating the requested B-channel and indicating in the preferred/exclusive bit "exclusive: only the indicated channel is acceptable" and enters the Overlap Sending call state N02.

L3N_N00_V_003 subclauses 5.1.2 a), 5.1.5.1
Ensure that the IUT in the Null call state N00, on receipt of a SETUP message with a Called party number information element providing the complete called party information, with a Sending complete information element and with the Channel identification information element indicating a B-channel that is available and indicating in the preferred/exclusive bit "exclusive: only the indicated channel is acceptable",

sends CALL PROCEEDING message with the Channel identification information element indicating the requested B-channel and indicating in the preferred/exclusive bit "exclusive: only the indicated channel is acceptable" and enters the Outgoing Call Proceeding call state N03.

L3N_N00_V_004 subclause 5.1.2 a)
Ensure that the IUT in the Null call state N00, on receipt of a SETUP message with the Channel identification information element indicating a B-channel that is not available and indicating in the preferred/exclusive bit "exclusive: only the indicated channel is acceptable",

sends a RELEASE COMPLETE message with a Cause information element indicating the cause value 34 "no circuit/channel available" or 44 "requested circuit/channel not available" and remains in the Null call state.