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Digitalno omrežje z integriranimi storitvami (ISDN) - Dopolnilna storitev: meduporabniška signalizacija (UUS) - Protokol digitalne naročniške signalizacije št. 1 (DSS1) - 5. del: Zgradba preskušalnega niza in namen preskušanja (TSS&TP) - Specifikacija za omrežje

Integrated Services Digital Network (ISDN); User-to-User Signalling (UUS) supplementary service; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 5: Test Suite Structure and Test Purposes (TSS&TP) specification for the network

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Integrated Services Digital Network (ISDN); User-to-User Signalling (UUS) supplementary service; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 5: Test Suite Structure and Test Purposes (TSS&TP) 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 5 of a multi-part standard covering the Integrated Services Digital Network (ISDN); User-to-User Signalling (UUS) supplementary service; Digital Subscriber Signalling System No. one (DSS1) protocol, 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".

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1 Scope

The present document specifies the Test Suite Structure and Test Purposes (TSS&TP) for the Network side of the T reference point or coincident S and T reference point (as defined in ITU-T Recommendation I.411 [7]) of implementations conforming to the stage three standard for the User-to-User Signalling (UUS) supplementary service for the pan-European Integrated Services Digital Network (ISDN) by means of the Digital Subscriber Signalling System No. one (DSS1) protocol, EN 300 286-1 [1].

A further part of the present document specifies the Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma based on the present document. 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 300 286-1 [1].

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 and/or edition number or version number) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

Referenced documents which are not found to be publicly available in the expected location might be found at http://docbox.etsi.org/Reference.

[1] ETSI EN 300 286-1: "Integrated Services Digital Network (ISDN); User-to-User Signalling (UUS) supplementary service; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".

[2] ETSI EN 300 286-2: "Integrated Services Digital Network (ISDN); User-to-User Signalling (UUS) supplementary service; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 2: Protocol Implementation Conformance Statement (PICS) proforma specification".

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

[4] ISO/IEC 9646-2: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 2: Abstract Test Suite specification".

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

[6] 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".

[7] ITU-T Recommendation I.411: "ISDN user-network interfaces - Reference configurations".

[8] ETSI 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]".

[9] ITU-T Recommendation I.112: "Vocabulary of terms for ISDNs".

[10] ITU-T Recommendation E.164: "The international public telecommunication numbering plan".

[11] ITU-T Recommendation I.210: "Principles of the telecommunication services supported by an ISDN and the means to describe them".

[12] ETSI EN 300 403-3: "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".

3 Definitions and abbreviations

For the purposes of the present document, the following terms and definitions apply.

3.1 Definitions related to conformance testing

Abstract Test Case (ATC): Refer to ISO/IEC 9646-1 [3].

Abstract Test Suite (ATS): Refer to ISO/IEC 9646-1 [3].

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.

Implementation Under Test (IUT): Refer to ISO/IEC 9646-1 [3].

implicit send event: Refer to ISO/IEC 9646-3 [5].

Lower Tester (LT): Refer to ISO/IEC 9646-1 [3].

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 (PCO): Refer to ISO/IEC 9646-1 [3].

Protocol Implementation Conformance Statement (PICS): Refer to ISO/IEC 9646-1 [3].

PICS proforma: Refer to ISO/IEC 9646-1 [3].

Protocol Implementation eXtra Information for Testing (PIXIT): Refer to ISO/IEC 9646-1 [3].

PIXIT proforma: Refer to ISO/IEC 9646-1 [3].

System Under Test (SUT): Refer to ISO/IEC 9646-1 [3].

Test Purpose (TP): Refer to ISO/IEC 9646-1 [3].

3.2 Definitions related to EN 300 286-1

call reference: See EN 300 403-1 [8], clause 4.3.

called user: user at the destination side of the call

calling user: user at the origination side of the call

component: See EN 300 196-1 [6], clause 11.2.2.1.

Integrated Services Digital Network (ISDN): See ITU-T Recommendation I.112 [9], definition 308.

ISDN number: number conforming to the numbering and structure specified in ITU-T Recommendation E.164 [10]

invoke component: See EN 300 196-1 [6], clause 11.2.2.1.

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

network (T): DSS1 protocol entity at the Network side of the user-network interface where a T reference point applies (Network connected to Private ISDN)

return error component: See EN 300 196-1 [6], clause 11.2.2.1.

return result component: See EN 300 196-1 [6], clause 11.2.2.1.

served user: user who invokes the UUS supplementary service. The served user is the calling user except for service 3 where the called user, as a network option can invoke the service 3 in the Active call state.

service; telecommunication service: See ITU-T Recommendation I.112 [9], definition 201.

supplementary service: See ITU-T Recommendation I.210 [11], clause 2.4.

3.3 Abbreviations

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

ATM	Abstract Test Method
ATS	Abstract Test Suite
CES	Connection Endpoint Suffix
CR	Call Reference
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
N19	Release Request call state
N25	Overlap Receiving call state
PICS	Protocol Implementation Conformance Statement
PIXIT	Protocol Implementation eXtra Information for Testing
TP	Test Purpose
TSS	Test Suite Structure
UUS	User-to-User Signalling

4 Test Suite Structure (TSS)

Served user **Group**

- Service 1
  - activation
    - implicit (01)
    - explicit (02)
  - invocation
    - during call establishment (03)
    - during call clearing
      - initiated by the calling user (04)
      - initiated by the called user (05)
- Service 2
  - activation (06)
  - invocation (07)
- Service 3
  - activation
    - during call establishment (08)
    - during active call state (09)
  - invocation (10)
  - flow control (11)

Remote user **Group**

- Service 1
  - activation
    - implicit (12)
    - explicit (13)
  - invocation
    - during call establishment (14)
    - during call clearing
      - initiated by the calling user (15)
      - initiated by the called user (16)
- Service 2
  - activation (17)
  - invocation (18)

- Service 3
  - activation
    - during call establishment (19)
    - during active call state (20)
  - invocation (21)
  - flow control (22)

NOTE: Numbers in brackets represent group numbers and are used in TP identifiers.

Figure 1: Test suite structure

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>_<iut><group>_<nnn>**				
<ss>	=	supplementary service:	e.g. "UUS"	
<iut>	=	type of IUT:	U	User
			N	Network
<group>	=	group	2 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 EN 300 286-1 [1].

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 UUS

TP part	Text	Example
Header	<Identifier> *tab* <paragraph number in base ETS> *tab* <type of test> *tab* <condition> *CR.*	see table 1 Clause X.X.X valid, invalid, inopportune mandatory, optional, conditional
Stimulus	Ensure that the IUT in the <basic call state> <trigger> *see below for message structure* *or* <goal>	 N10 etc. receiving a XXXX message 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, ...
Message structure	<message type> message containing a *a)* <info element> information element with *b)* a <field name> encoded as *or* including <coding of the field> and *back to a or b,*	SETUP, FACILITY, CONNECT, ... Bearer capability, Facility, ...
NOTE: 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.		

5.1.4 Test strategy

As the base standard EN 300 286-1 [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 EN 300 286-2 [2]. 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.

5.1.5 Test of 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.

5.2 Network TPs for UUS

All PICS items referred to in this clause are as specified in EN 300 286-2 [2] unless indicated otherwise by another numbered reference.

5.2.1 Served user

5.2.1.1 Service 1

Selection: Does the IUT support service 1? PICS: MC 2.1.

5.2.1.1.1 Activation

5.2.1.1.1.1 Implicitly requested

UUS_N01_001 **clause 9.1.1.1.1** **valid** **mandatory**
Ensure that the IUT, in the call state N00, receiving a valid SETUP message with a User-user information element without user information and the network can accept the request,
accepts the message (resulting in the inclusion of the same User-user information element in the SETUP message sent to the remote user) and enters the call state N01.

UUS_N01_002 **clause 9.1.1.1.2** **invalid** **mandatory**
Ensure that the IUT, in the call state N00, receiving a valid SETUP message with a User-user information element without user information and the network cannot accept the request,
discards the User-user information element (resulting in the sending of a SETUP message without User-user information element to the remote user) and enters the call state N01.

UUS_N01_003 **clause 9.1.1.1.2** **invalid** **mandatory**
Ensure that the IUT, in the call state N00, receiving a valid SETUP message with a User-user information element of less than 3 octets in length,
discards the User-user information element (resulting in the sending of a SETUP message without User-user information element to the remote user) and enters the call state N01.

5.2.1.1.1.2 Explicitly requested

Selection: Does the IUT support the explicit request of service 1? PICS: MC 2.1.2.

UUS_N02_001 **clause 9.1.1.2.1** **valid** **mandatory**
Ensure that the IUT, in the call state N00 receiving a valid SETUP message with a Facility information element including a UserUserService invoke component indicating service 1 preferred,
accepts the message (resulting in the inclusion of the same Facility information element in the SETUP message sent to the remote user) and enters the call state N01.

UUS_N02_002 **clause 9.1.1.2.1** **valid** **mandatory**
Ensure that the IUT, in the call state N00 receiving a valid SETUP message with a Facility information element including a UserUserService invoke component indicating service 1 required,
accepts the message (resulting in the inclusion of the same Facility information element in the SETUP message sent to the remote user) and enters the call state N01.

UUS_N02_003 **clause 9.1.1.2.2** **inopportune** **mandatory**
Ensure that the IUT, in the call state N00 receiving a SETUP message with a Facility information element including a UserUserService invoke component indicating service 1 and an incompatible bearer capability,
sends a RELEASE COMPLETE message without UserUserService return error component and enters the call state N00.

UUS_N02_004 **clause 9.1.1.2.2** **inopportune** **mandatory**
Ensure that the IUT, in the call state N00 receiving a valid SETUP message with a Facility information element including a UserUserService invoke component indicating service 1 preferred and the resources are not available,
continues with normal call handling and includes a UserUserService return error component with the value "rejectedByNetwork" in a valid SETUP ACKNOWLEDGE, CALL PROCEEDING, PROGRESS, ALERTING or CONNECT message.

UUS_N02_005 clause 9.1.1.2.2 inopportune mandatory
Ensure that the IUT, in the call state N00 receiving a valid SETUP message with a Facility information element including a UserUserService invoke component indicating service 1 preferred and the service 1 is not subscribed to,
continues with normal call handling and includes a UserUserService return error component with the value "rejectedByNetwork" in a valid SETUP ACKNOWLEDGE, CALL PROCEEDING, PROGRESS, ALERTING or CONNECT message.

UUS_N02_006 clause 9.1.1.2.2 inopportune mandatory
Ensure that the IUT, in the call state N00 receiving a valid SETUP message with a Facility information element including a UserUserService invoke component indicating service 1 required and the resources are not available,
sends a DISCONNECT or RELEASE COMPLETE message, with cause value #47 "resources unavailable", including a UserUserService return error component with the value "rejectedByNetwork" and enters the call state N12 or N00.

5.2.1.1.2 Invocation

5.2.1.1.2.1 During call establishment

UUS_N03_001 clause 9.1.2.1.1 valid mandatory
Ensure that the IUT, in the call state N00, receiving a valid SETUP message including a User-user information element with user information,
accepts the message (resulting in the sending of a SETUP message to the remote user with the same User-user information element) sends a SETUP ACKNOWLEDGE or a CALL PROCEEDING message and enters the call state N02 or N03.

NOTE: This TP corresponds to the invocation of service 1 simultaneously with the activation by the same User-user information element.

UUS_N03_002 clause 9.1.2.1.1 valid mandatory
Ensure that the IUT, in the call state N00, receiving a valid SETUP message including a UserUserService invoke component indicating service 1 and a User-user information element with user information,
accepts the message (resulting in the sending of a SETUP message to the remote user with the same UserUserService invoke component and User-user information element) sends a SETUP ACKNOWLEDGE or a CALL PROCEEDING message and enters the call state N02 or N03.

UUS_N03_003 clause 9.1.2.1.2 invalid mandatory
Ensure that the IUT, in the call state N00, receiving a valid SETUP message including a User-user information element with user information with an overall length exceeding 131 octets,
discards the User-user information element (resulting in the sending of a SETUP message without User-user information element to the remote user) sends a SETUP ACKNOWLEDGE or a CALL PROCEEDING message and optionally sends a STATUS message with cause value #43 "access information discarded".

5.2.1.1.2.2 During call clearing

5.2.1.1.2.2.1 Clearing initiated by the calling user

UUS_N04_002 clause 9.1.2.2.1.a valid mandatory
Ensure that the IUT, in the call state N03 and in the service 1 active state, receiving a DISCONNECT message with a User-user information element,
accepts the message (resulting in the inclusion of a User-user information element in the DISCONNECT message sent to the remote user), sends a RELEASE message and enters the call state N19.

UUS_N04_003 clause 9.1.2.2.1.a valid mandatory
Ensure that the IUT, in the call state N04 and in the service 1 active state, receiving a DISCONNECT message with a User-user information element,
accepts the message (resulting in the inclusion of a User-user information element in the DISCONNECT message sent to the remote user), sends a RELEASE message and enters the call state N19.

UUS_N04_004 clause 9.1.2.2.1.a valid mandatory
Ensure that the IUT, in the call state N10 (outgoing call) and in the service 1 active state, receiving a DISCONNECT message with a User-user information element,

accepts the message (resulting in the inclusion of a User-user information element in the DISCONNECT message sent to the remote user), sends a RELEASE message and enters the call state N19.

UUS_N04_006 clause 9.1.2.2.2 invalid mandatory
Ensure that the IUT, in the call state N03, with the service 1 not activated, receiving a DISCONNECT message with a User-user information element,

discards the User-user information element (resulting in the sending of a DISCONNECT or RELEASE message to the remote user without User-user information element), sends a RELEASE message optionally including a Cause information element with the cause value #43 "access information discarded" and enters the call state N19.

UUS_N04_007 clause 9.1.2.2.2 invalid mandatory
Ensure that the IUT, in the call state N04, with the service 1 not activated, receiving a DISCONNECT message with a User-user information element,

discards the User-user information element (resulting in the sending of a DISCONNECT or RELEASE message to the remote user without User-user information element), sends a RELEASE message optionally including a Cause information element with the cause value #43 "access information discarded" and enters the call state N19.

UUS_N04_008 clause 9.1.2.2.2 invalid mandatory
Ensure that the IUT, in the call state N10 (outgoing call), with the service 1 not activated, receiving a DISCONNECT message with a User-user information element,

discards the User-user information element (resulting in the sending of a DISCONNECT or RELEASE message to the remote user without User-user information element), sends a RELEASE message optionally including a Cause information element with the cause value #43 "access information discarded" and enters the call state N19.

UUS_N04_010 clause 9.1.2.2.2 invalid mandatory
Ensure that the IUT, in the call state N03 and in the service 1 active state, receiving a DISCONNECT message with a User-user information element with the overall length exceeding 131 octets,

discards the User-user information element (resulting in the sending of a DISCONNECT or RELEASE message to the remote user without User-user information element), sends a RELEASE message optionally including a Cause information element with the cause value #43 "access information discarded" and enters the call state N19.

UUS_N04_011 clause 9.1.2.2.2 invalid mandatory
Ensure that the IUT, in the call state N04 and in the service 1 active state, receiving a DISCONNECT message with a User-user information element with the overall length exceeding 131 octets,

discards the User-user information element (resulting in the sending of a DISCONNECT or RELEASE message to the remote user without User-user information element), sends a RELEASE message optionally including a Cause information element with the cause value #43 "access information discarded" and enters the call state N19.

UUS_N04_012 clause 9.1.2.2.2 invalid mandatory
Ensure that the IUT, in the call state N10 and in the service 1 active state, receiving a DISCONNECT message with a User-user information element with the overall length exceeding 131 octets,

discards the User-user information element (resulting in the sending of a DISCONNECT or RELEASE message to the remote user without User-user information element), sends a RELEASE message optionally including a Cause information element with the cause value #43 "access information discarded" and enters the call state N19.

5.2.1.1.2.2.2 Clearing initiated by the called user

No test requirement for this group.