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**Integrated Services Digital Network (ISDN);
Call Waiting (CW) supplementary service;
Digital Subscriber Signalling System No. one (DSS1) protocol;
Part 3: Test Suite Structure and Test Purposes (TSS&TP)
specification for the user**

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Foreword

This final draft European Telecommunication Standard (ETS) has been produced by the Signalling Protocols and Switching (SPS) Technical Committee of the European Telecommunications Standards Institute (ETSI), and is now submitted for the Voting phase of the ETSI standards approval procedure.

This ETS is part 3 of a multi-part standard covering the Digital Subscriber Signalling System No. one (DSS1) protocol specification for the Integrated Services Digital Network (ISDN) Call Waiting (CW) 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: "TSS&TP specification for the network";

Part 6: "ATS and partial PIXIT proforma specification for the network".

Proposed transposition dates	
Date of latest announcement of this ETS (doa):	3 months after ETSI publication
Date of latest publication of new National Standard or endorsement of this ETS (dop/e):	6 months after doa
Date of withdrawal of any conflicting National Standard (dow):	6 months after doa

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1 Scope

This third part of ETS 300 058 specifies the Test Suite Structure and Test Purposes (TSS&TP) for the User side of the T reference point or coincident S and T reference point (as defined in ITU-T Recommendation I.411 [6]) of implementations conforming to the stage three standard for the Call Waiting (CW) supplementary service for the pan-European Integrated Services Digital Network (ISDN) by means of Digital Subscriber Signalling System No. one (DSS1) protocol, ETS 300 058-1 [1].

A further part of this ETS specifies the Abstract Test Suite (ATS) and partial PIXIT proforma based on this ETS. 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 ETS 300 058-1 [1].

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 300 058-1 (1991): "Integrated Services Digital Network (ISDN); Call Waiting (CW) supplementary service; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".
- [2] ETS 300 058-2 (1995): "Integrated Services Digital Network (ISDN); Call Waiting (CW) 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 - OSI Conformance Testing Methodology and Framework; Part 1: General Concepts".
- [4] ISO/IEC 9646-2: "Information Technology - OSI Conformance Testing Methodology and Framework; Part 2: Abstract Test Suite specification".
- [5] ISO/IEC 9646-3: "Information Technology - OSI Conformance Testing Methodology and Framework; Part 3: The Tree and Tabular Combined Notation".
- [6] ITU-T Recommendation I.411 (1993): "ISDN user-network interfaces - Reference configurations".
- [7] ETS 300 102-1: "Integrated Services Digital Network (ISDN); User-network interface layer 3; Specifications for basic call control".
- [8] ITU-T Recommendation I.112 (1993): "Vocabulary and terms for ISDNs".
- [9] CCITT Recommendation E.164 (1991): "Numbering plan for the ISDN era".
- [10] ITU-T Recommendation I.210 (1993): "Principles of the telecommunication services supported by an ISDN and the means to describe them".

3 Definitions

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

3.1 Definitions related to conformance testing

abstract test case: Refer to ISO/IEC 9646-1 [3].

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

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 [3].

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

lower tester: Refer to ISO/IEC 9646-1 [3].

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

test purpose: Refer to ISO/IEC 9646-1 [3].

3.2 Definitions related to ETS 300 058-1

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

ISDN number: A number conforming to the numbering plan and structure specified in CCITT Recommendation E.164 [9].

service; telecommunication service: See ITU-T Recommendation I.112 [8], definition 201.

subscriber B: Subscriber B is the subscriber who is provided by the network with the CW supplementary service on a particular interface.

supplementary service: See ITU-T Recommendation I.210 [10], subclause 2.4.

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

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

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

user B: User B is the one user who reacts to the call waiting at subscriber B.

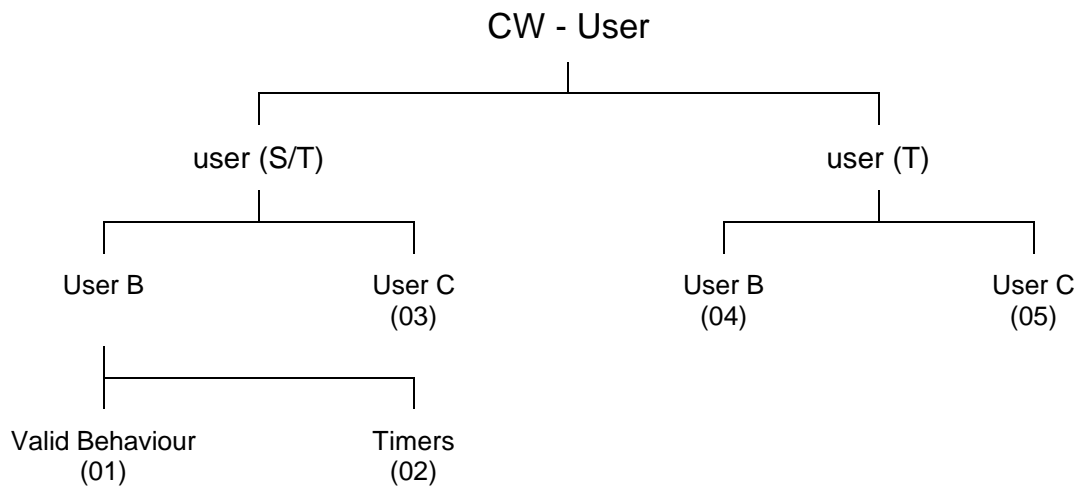
user C: User C is the user who has originated a call to subscriber B which causes the CW supplementary service to be invoked.

4 Abbreviations

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

ATM	Abstract Test Method
ATS	Abstract Test Suite
CW	Call Waiting
IUT	Implementation Under Test
PICS	Protocol Implementation Conformance Statement
PIXIT	Protocol Implementation eXtra Information for Testing
TP	Test Purpose
TSS	Test Suite Structure
U00	Null call state
U08	Connect Request call state
U11	Disconnect Request call state

5 Test Suite Structure (TSS)



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

Figure 1: 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:	<ss>_<iut><group>_<nnn>						
<ss>	=	supplementary service: e.g. "3PTY_"					
<iut>	=	type of IUT:	<table border="0"> <tr> <td>U</td> <td>User</td> </tr> <tr> <td>N</td> <td>Network</td> </tr> </table>	U	User	N	Network
U	User						
N	Network						
<group>	=	group	2 digit field representing group reference according to TSS				
<nnn>	=	sequential number	(001-999)				

6.1.2 Source of TP definition

The TPs are based on ETS 300 058-1 [1].

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 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

TP part	Text	Example
Header	<Identifier> <i>tab</i> <paragraph number in base ETS> <i>tab</i> <PICS reference> <i>tab</i> <condition> <i>CR.</i>	see table 1 subclause 0.0.0 XY 0.0 mandatory, optional, conditional
Stimulus	Ensure that the IUT in the <basic call state> <trigger> <i>see below for message structure</i> or <goal>	U00, U10, etc. receiving a XXXX message to request a
Reaction	<action> <conditions> <i>if the action is sending</i> <i>see below for message structure</i> <next action>, <i>etc.</i> and enters <supplementary service state> and/or and remains in the same state(s) or and enters state <state> with CR<number(s)>	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 <i>or</i> including <coding of the field> and <i>back to a or b,</i>	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.	

6.1.4 Test strategy

As the base standard ETS 300 058-1 [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 300 058-2 [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 test purpose is not considered.

6.2 User TPs for CW

All PICS items referred to in this subclause are as specified in ETS 300 058-2 [2] unless indicated otherwise by another numbered reference.

6.2.1 User (S/T)

Selection: IUT supports coincident S and T reference point procedures

6.2.1.1 Valid behaviour

CW_U01_001 subclause 9.5.1

Ensure that the busy IUT, if a B-channel is available, receiving a valid and compatible SETUP message, responds with an ALERTING message.

CW_U01_002 subclause 9.5.1

Ensure that the busy IUT that have information channel control, receiving a valid and compatible SETUP message containing a Channel identification information element with an information channel selection indicating "no B-channel available", responds with an ALERTING message.

CW_U01_003 subclause 9.5.2

Ensure that the free IUT in Null call state U00 but whose resources are in use, receiving a valid and compatible SETUP message containing a Channel identification information element with an information channel selection indicating "no B-channel available", if it can not proceed with the offered call, responds with a RELEASE COMPLETE message containing a Cause information element with cause value #34 "no circuit/channel available".

CW_U01_004 subclause 9.5.2

Ensure that the busy IUT receiving a valid and compatible SETUP message, but that is unable to proceed with the call, responds with a RELEASE COMPLETE message containing a Cause information element with cause value #17 "user busy".

CW_U01_005 subclause 9.6.1 MC 2 optional

Ensure that the IUT after setting free resources to accept a waiting call by releasing an existing call, sends a CONNECT message to the waiting call and enters the Connect Request call state U08.

CW_U01_006 subclause 9.6.1 MC 3 optional

Ensure that the IUT after setting free resources to accept a waiting call by using the call hold supplementary service to hold an existing call in the active state, sends a CONNECT message to the waiting call and enters the Connect Request call state U08.

CW_U01_007 subclause 9.6.1 MC 2 or MC 3 optional

Ensure that the IUT after setting free resources, to accept the waiting call, sends a CONNECT message containing a Channel identification information element encoded as "channel is indicated, no alternative acceptable" to the waiting call and enter the Connect Request call state U08.

CW_U01_008 **subclause 9.6.2** **MC 4** **optional**

Ensure that the IUT after sending the ALERTING message, if intends to reject the incoming waiting call, sends a DISCONNECT message to the waiting call and enters the Disconnect Request call state U11.

CW_U01_009 **subclause 9.6.1**

Ensure that the IUT in Connect Request call state U08, receiving a CONNECT ACKNOWLEDGE message containing a Channel identification information element indicating the B-channel to be used, sends no messages and enters the Active call state U10.

6.2.1.2 **Timers****CW_U02_001** **subclause 9.5.1.2** **TM 1** **optional**

Ensure the correct implementation of the timer T-CW.

CW_U02_002 **subclause 9.5.2** **TM 1** **optional**

Ensure that the IUT, on the expiry of timer T-CW, sends a DISCONNECT message with cause value #19.

6.2.1.3 **User C****CW_U03_001** **subclauses 9.5.1.1**

Ensure that the IUT in Call Initiated call state U01 or Outgoing Call Proceeding call state U03, receiving an ALERTING message containing a Notification indicator information element with notification description #96 "call is a waiting call", continues normal call handling.

6.2.2 **User (T)**

Selection: IUT supports T reference point procedures

6.2.2.1 **User B****CW_U04_001** **subclause 10.1** **MC 5** **mandatory**

Ensure that the IUT during incoming call establishment, when a waiting call is present at its S interface, sends an ALERTING message containing a Notification indicator information element with notification description #96 "call is a waiting call".

6.2.2.2 **User C****CW_U05_002** **subclauses 10.2**

Ensure that the IUT in Call Initiated call state U01 or Outgoing Call Proceeding call state U03, receiving an ALERTING message containing a Notification indicator information element with notification description #96 "call is a waiting call", continues normal call handling.

7 **Compliance**

An ATS which complies with this TSS&TP specification shall:

- a) consist of a set of test cases corresponding to the set or to a subset of the TPs specified in clause 6;
- b) use a TSS which is an appropriate subset of the whole of the TSS specified in clause 5;
- c) use the same naming conventions for the test groups and test cases;
- d) maintain the relationship specified in clause 6 between the test groups and TPs and the entries in the PICS proforma to be used for test case deselection;
- e) comply with ISO/IEC 9646-2 [4].

In the case of a) or b) above, a subset shall be used only where a particular Abstract Test Method (ATM) makes some TPs untestable. All testable TPs from clause 6 shall be included in a compliant ATS.

8 Requirements for a comprehensive testing service

As a minimum the Remote test method, as specified in ISO/IEC 9646-2 [4], shall be used by any organization claiming to provide a comprehensive testing service for user equipment claiming conformance to ETS 300 058-1 [1].

History

Document history			
October 1995	Public Enquiry	PE 94:	1995-10-23 to 1996-02-16
May 1996	Vote	V 103:	1996-05-20 to 1996-08-23