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

ETSI

European Telecommunications Standards Institute

ETSI Secretariat

Postal address: F-06921 Sophia Antipolis CEDEX - FRANCE
Office address: 650 Route des Lucioles - Sophia Antipolis - Valbonne - FRANCE
X.400: c=fr, a=atlas, p=etsi, s=secretariat - **Internet:** secretariat@etsi.fr

Tel.: +33 4 92 94 42 00 - Fax: +33 4 93 65 47 16

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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) Freephone (FPH) 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 300 210 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 [7]) of implementations conforming to the stage three standard for the Freephone (FPH) supplementary service for the pan-European Integrated Services Digital Network (ISDN) by means of the Digital Subscriber Signalling System No. one (DSS1) protocol, ETS 300 210-1 [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 300 210-1 [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 300 210-1 (1996): "Integrated Services Digital Network (ISDN); Freephone (FPH) supplementary service; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".

[2] ETS 300 210-2 (1996): "Integrated Services Digital Network (ISDN); Freephone (FPH) 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] ETS 300 196-1 (1993): "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 (1993): "ISDN user-network interfaces - Reference configurations".

[8] ETS 300 102-1: "Integrated Services Digital Network (ISDN); User-network interface layer 3; Specifications for basic call control".

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

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

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

3.2 Definitions related to ETS 300 210-1

call held auxiliary state: See ETS 300 196-1 [6], subclause 7.1.2.

call reference: See ETS 300 102-1 [8], subclause 4.3.

component: See ETS 300 196-1 [6], subclause 11.2.2.1.

idle auxiliary state: See ETS 300 196-1 [6], subclause 7.1.2.

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

ISDN number: A number conforming to the numbering and structure specified in CCITT Recommendation E.164 [10].

invoke component: See ETS 300 196-1 [6], subclause 11.2.2.1.

return error component: See ETS 300 196-1 [6], subclause 11.2.2.1.

return result component: See ETS 300 196-1 [6], subclause 11.2.2.1.

served user: The served user is the user who invokes the FPH supplementary service.

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

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

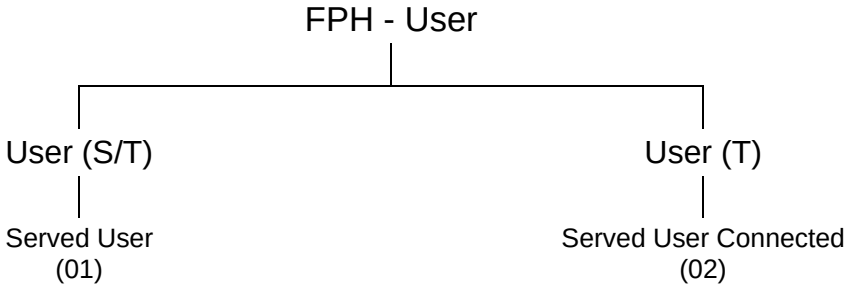
user (T): The DSS1 protocol entity at the User side of the user-network interface where a T reference point applies (User is a Private ISDN).

4 Abbreviations

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

(Held)	Call Held Auxiliary state
(Idle)	Idle Auxiliary state
ATM	Abstract Test Method
ATS	Abstract Test Suite
CR	Call Reference
FPH	Freephone
ISDN	Integrated Services Digital Network
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
U19	Release Request call state
U31	Bearer Independent Transport 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. "FPH"	
<iut>	=	type of IUT:	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 300 210-1 [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>** *tab* **<paragraph number in base ETS>** *tab* **<type of test>** *tab* **<condition>** *CR.*	see table 1 **subclause 0.0.0** **valid, invalid, inopportune** **mandatory, optional, conditional**
Stimulus	Ensure that the IUT in the <basic call state> / <supplementary service state> <trigger> *see below for message structure* *or* <goal>	 U10 etc. /FPH Idle, ... 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.	

6.1.4 Test strategy

As the base standard ETS 300 210-1 [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 300 210-2 [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.

6.2 User TPs for FPH

6.2.1 User (S/T)

Selection: IUT supports coincident S and T reference point procedures.

6.2.1.1 Served user

FPH_U01_001 subclause 9.2.2.1 valid mandatory
Ensure that the IUT in state U00 on receipt of a valid SETUP message containing a facility information element with a CallFPH invoke component including the CalledFreephoneNr parameter indicating the (valid) freephone service access code and freephone number,
accepts the component and responds with a SETUP ACKNOWLEDGE, CALL PROCEEDING, ALERTING or CONNECT message.

FPH_U01_002 subclause 9.2.2.1 valid mandatory
Ensure that the IUT in state U00 on receipt of a valid SETUP message containing a facility information element with a CallFPH invoke component NOT including the CalledFreephoneNr parameter,
accepts the component and responds with a SETUP ACKNOWLEDGE, CALL PROCEEDING, ALERTING or CONNECT message.

6.2.2 User (T)

6.2.2.1 Served user connected

FPH_U02_001 subclause 10.2.1 valid mandatory
Ensure that the IUT in state U00 on receipt of a REGISTER message containing a facility information element with a valid Monitor-T-FPH invoke component including a queueIdentity parameter,
enters state U31 and sends a FACILITY message containing a facility information element with a Monitor-T-FPH return result component.

FPH_U02_002 subclause 10.2.1 valid mandatory
Ensure that the IUT in state U00 on receipt of a REGISTER message containing a facility information element with a valid Monitor-T-FPH invoke component NOT including a queueIdentity parameter,
enters state U31 and sends a FACILITY message containing a facility information element with a Monitor-T-FPH return result component.

FPH_U02_003 subclause 10.2.1 valid mandatory
Ensure that the IUT in state U31, in order to cancel a previously successful requested monitoring,
sends a RELEASE message and enters the Release Request state U19.

FPH_U02_004 subclause 10.2.1 valid mandatory
Ensure that the IUT in state U31, on receipt of a RELEASE message cancelling a previously successfully requested monitoring,
terminates the previously requested monitoring, sends a RELEASE COMPLETE message and enters state U00.

FPH_U02_005 subclause 10.2.1 valid mandatory
Ensure that the IUT in state U31, to indicate that the destination user has become free,
sends a FACILITY message containing a Free-T-FPH invoke component with a fPHReference parameter and remains in state U31.

FPH_U02_006 subclause 10.2.1 valid mandatory
Ensure that the IUT in state U00 having previously indicated that the destination user has become free, on receipt of a valid SETUP message containing a Call-T-FPH invoke component excluding a CalledFreephoneNr parameter,

accepts the component and responds with a SETUP ACKNOWLEDGE, CALL PROCEEDING, ALERTING or CONNECT message.

FPH_U02_007 subclause 10.2.1 valid mandatory
Ensure that the IUT in state U00 having previously indicated that the destination user has become free, on receipt of a valid SETUP message containing a Call-T-FPH invoke component with the previously received CalledFreephoneNr parameter,

accepts the component and responds with a CALL PROCEEDING, ALERTING or CONNECT message.

FPH_U02_008 subclause 10.2.2 inopportune mandatory
Ensure that the IUT in state U00, on receipt of a REGISTER message containing a Monitor-T-FPH invoke component and the monitor operation is not allowed because the request does not relate to a basic service for which the private network can currently support the identified FPH supplementary service,

enters state U31 and sends a FACILITY message containing a Monitor-T-FPH return error component indicating "notAvailable".

FPH_U02_009 subclause 10.2.2 inopportune mandatory
Ensure that the IUT in state U00, on receipt of a REGISTER message containing a Monitor-T-FPH invoke component and the monitor operation is not allowed because the request does not relate to a basic service for which the private network supports the identified FPH supplementary service,

enters state U31 and sends a FACILITY message containing a Monitor-T-FPH return error component indicating "notImplemented".

FPH_U02_010 subclause 10.2.2 valid mandatory
Ensure that the IUT in state U31, on receipt of a FACILITY message containing a reject component in response to the sending of a FACILITY message containing a Monitor-T-FPH return result component,

sends a RELEASE message and enters the Release Request state U19.

FPH_U02_011 subclause 10.2.2 valid mandatory
Ensure that the IUT in state U31, on receipt of a FACILITY message containing a reject component in response to the sending of a FACILITY message containing a Free-T-FPH invoke component,

sends a RELEASE message and enters the Release Request state U19.

FPH_U02_012 subclause 10.2.2 valid mandatory
Ensure that the IUT in state U31, on receipt of a FACILITY message containing a reject component in response to the sending of a FACILITY message containing a Monitor-T-FPH return error component indicating "notAvailable",

sends a RELEASE message and enters the Release Request state U19.

FPH_U02_013 subclause 10.2.2 valid mandatory
Ensure that the IUT in state U31, on receipt of a FACILITY message containing a reject component in response to the sending of a FACILITY message containing a Monitor-T-FPH return error component indicating "notImplemented",

sends a RELEASE message and enters the Release Request state U19.

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 300 210-1 [1].

History

Document history			
July 1996	Public Enquiry	PE 109:	1996-07-08 to 1996-11-01
March 1997	Vote	V 9720:	1997-03-18 to 1997-05-16