ETSI

Integrated Services Digital Network (ISDN);
Multiple Subscriber Number (MSN) 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 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 Public Enquiry phase of the ETSI standards approval procedure.

This ETS is part 5 of a multi-part standard covering the Digital Subscriber Signalling System No. one (DSS1) protocol specification for the Integrated Services Digital Network (ISDN) Multiple Subscriber Number (MSN) 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 fifth part of ETS 300 052 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 [6]) of implementations conforming to the stage three standard for the Multiple Subscriber Number (MSN) supplementary service for the pan-European Integrated Services Digital Network (ISDN) by means of Digital Subscriber Signalling System No. one (DSS1) protocol.

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 User side of the T reference point or coincident S and T reference point of implementations conforming to ETS 300 052-1 [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 300 052-1 (1991): "Integrated Services Digital Network (ISDN); Multiple Subscriber Number (MSN) supplementary service; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".

NOTE: ETS 300 052-1 (1991) was initially published as ETS 300 052 (1991).

[2]	ETS 300 052-2 (1995): "Integrated Services Digital Network (ISDN); Multiple Subscriber Number (MSN) 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: 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 an 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 (TP): Refer to ISO/IEC 9646-1 [3].

3.2 Definitions related to ETS 300 052-1

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 [9].

international number: An ISDN number structured as specified in subclause 3.2 (in the paragraphs relating to international number) of CCITT Recommendation E.164 [9].

multiple subscriber number: An ISDN number as part of a set of ISDN numbers assigned to a user which shall be either the whole ISDN number or a part of the ISDN number including only the MSN significant digits (the least significant "n" digit(s) where "n" may be a number up to the full length of the ISDN number) and shall be a number large enough to allow all terminals on an access to be assigned an individual number.

national number; national significant number: An ISDN number structured as specified in subclause 3.2 (in the paragraphs relating to national significant number) of CCITT Recommendation E.164 [9].

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 (Network connected to Private ISDN).

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

subscriber number: An ISDN number structured as specified in subclause 3.2 (in the paragraphs relating to subscriber number) of CCITT Recommendation E.164 [9].

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

4 Abbreviations

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

ATM	Abstract Test Method
ATS	Abstract Test Suite
ISDN	Integrated Services Digital Network
IUT	Implementation Under Test
MSN	Multiple Subscriber Number
N00	Null Call state
PICS	Protocol Implementation Conformance Statement
PIXIT	Protocol Implementation eXtra Information for Testing
TON	Type Of Number
TP	Test Purpose
TSS	Test Suite Structure

5 Test Suite Structure (TSS)

MSN - Network

Called user interface (01)   Calling user interface (01)

NOTE: Numbers in brackets represent group numbers and are used in Test Purpose identifiers.
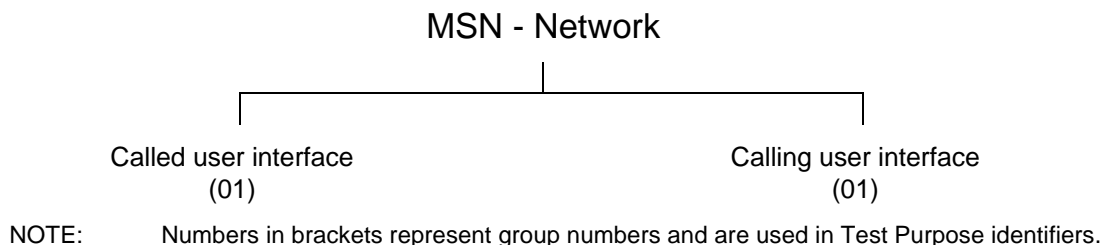
Figure 1: Test suite structure

6 Test Purposes (TP)

6.1 Introduction

For each test requirement a TP is defined.

6.1.1 TP naming convention

The 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 side (see table 1).

Table 1: TP identifier naming convention scheme

Identifier:	**<ss>_<iut><group>_<nnn>**		
<ss> =	supplementary service:	e.g. "MSN_"	
<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 300 052-1 [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 for MSN

TP Part	Text	Example
Header	**<Identifier>** *tab* **<paragraph number in base ETS>** *tab* **<PICS reference>** *tab* **<condition>** *CR.*	see table 1 **subclause 0.0.0** **XY 0.0** **mandatory, optional, conditional**
Stimulus	Ensure that the IUT in the <basic call state> <trigger> *see below for message structure* *or* <goal>	N00, 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 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 *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 contained no explicit requirements for testing, the TPs were generated as a result of an analysis of the base standard and PICS. The criteria applied included 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 300 102-1 [7]. 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.

6.2 Network TPs for MSN

All PICS items referred to in this subclause are as specified in ETS 300 052-2 [2] unless indicated otherwise by another numbered reference.

6.2.1 Called user interface

MSN_N01_001   **subclause 9.2.1**   **optional**
Ensure that the IUT in the Null call state N00, to indicate an incoming call and only the partial ISDN number is available,
    sends a SETUP message with a Called party number information element with type of number coded as "unknown", numbering plan identification field coded as "unknown" or as "ISDN/telephony numbering plan", and MSN digits and enters state N06.
    Selection: IUT supports insertion of partial ISDN number in Called party number information element. PICS: SC 3.2.

MSN_N01_002   **subclause 9.2.1**   **optional**
Ensure that the IUT in the Null call state N00, to indicate an incoming call and the full ISDN number is available,
    sends a SETUP message with a Called party number information element with type of number coded as "subscriber number", "national number" or "international number" and numbering plan identification field coded as "unknown" or as "ISDN/telephony numbering plan", and the full ISDN number including MSN digits and enters state N06.
    Selection: IUT supports insertion of full ISDN number in Called party number information element. PICS: SC 3.1.

6.2.2 Calling user interface

MSN_N02_001   **subclause 9.3.2**   **mandatory**
Ensure that the IUT in the Null call state N00, to indicate that a SETUP message with a Calling party number information element with fewer digits than is required to uniquely identify one ISDN number from the set of ISDN numbers at the access has been received,
    discards the Calling party number information element (resulting in the sending of a SETUP message to the called user either without the Calling party number information element or containing a Calling party number information element with different number digits than that received at the interface of the calling user) and 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 network equipment claiming conformance to ETS 300 052-1 [1].

History

Document history		
March 1996	Public Enquiry	PE 103: 1996-03-04 to 1996-06-28