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European Standard (Telecommunications series)

**Integrated Services Digital Network (ISDN);
Narrowband Multi-service Delivery System (NMDS);
Part 7: Abstract Test Suite (ATS) and partial Protocol
Implementation eXtra Information for Testing (PIXIT)
specification for the PSTN NMDS
interface Layer 3 (NTN side)**



Reference

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Keywords

access, ATS, basic, ISDN, layer 3, NMDS, PIXIT,
PSTN, user

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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 7 of a multi-part deliverable covering the Integrated Services Digital Network (ISDN); Narrowband Multi-service Delivery System (NMDS), as identified below:

- Part 1: "NMDS interface specification";
- Part 2: "Protocol Implementation Conformance Statement (PICS) proforma specification";
- Part 3: "Test Suite Structure and Test Purposes (TSS&TP) specification for the data link layer (NTN side)";
- Part 4: "Test Suite Structure and Test Purposes (TSS&TP) specification for the network layer (NTN side)";
- Part 5: "Test Suite Structure and Test Purposes (TSS&TP) specification for the network layer (LE side)";
- Part 6: "Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) specification for the NMDS Layer 2 PSTN-GW function (NTN side)";
- Part 7: "Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) specification for the PSTN NMDS interface Layer 3 (NTN side)";**
- Part 8: "Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) specification for the PSTN NMDS interface Layer 3 (LE side)".

National transposition dates	
Date of adoption of this EN:	8 February 2002
Date of latest announcement of this EN (doa):	31 May 2002
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1 Scope

The present document specifies the Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma for the Network Termination Node (NTN) part at the T* or V1* reference points shown in figure 2 of EN 301 141-1 [1]. The present document contains the ATS and partial PIXIT proforma for only the NTN side.

EN 301 141-2 [2] specifies the Protocol Implementation Conformance Statement (PICS) proforma related to this ATS.

EN 301 141-4 [4] specifies the Test Suite Structure and Test Purposes (TSS&TP) related to this ATS and partial PIXIT proforma specification.

An NMDS implementation may contain one ISDN-BA port and/or a limited number of PSTN ports up to a maximum of 10. Typically one or two PSTN ports would be supported.

The objective of the present document is to provide conformance tests giving a high probability of inter-operability of a Network Termination Node (NTN) and a Local Exchange (LE) by testing the layer 3 aspects of an NTN from different manufacturers over the NMDS interface. The present document covers only the procedures described in EN 301 141-1 [1].

ISO/IEC 9646-1 [12] is used as the basis for the methodology of conformance testing.

EN 301 141-1 [1] defines the NMDS layer 3 functions in detail:

- For the ISDN-BA.
- For the PSTN functions. In this case, then bulk of the material shall come from EN 300 324-1 [5].

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.

- [1] ETSI EN 301 141-1 (V2.1.1): "Integrated Services Digital Network (ISDN); Narrowband Multi-service Delivery System (NMDS); Part 1: NMDS interface specification".
- [2] ETSI EN 301 141-2 (V1.3.1): "Integrated Services Digital Network (ISDN); Narrowband Multi-service Delivery System (NMDS); Part 2: Protocol Implementation Conformance Statement (PICS) proforma specification".
- [3] ETSI EN 301 141-3 (V1.1.1): "Integrated Services Digital Network (ISDN); Narrowband Multi-service Delivery System (NMDS); Part 3: Test Suite Structure and Test Purposes (TSS&TP) specification for the data link layer (NTN side)".
- [4] ETSI EN 301 141-4 (V1.1.1): "Integrated Services Digital Network (ISDN); Narrowband Multi-service Delivery System (NMDS); Part 4: Test Suite Structure and Test Purposes (TSS&TP) specification for the network layer (NTN side)".
- [5] ETSI EN 300 324-1: "V interfaces at the digital Local Exchange (LE); V5.1 interface for the support of Access Network (AN); Part 1: V5.1 interface specification".
- [6] ETSI EN 300 324-2: "V interfaces at the digital Local Exchange (LE); V5.1 interface for the support of Access Network (AN); Part 2: Protocol Implementation Conformance Statement (PICS) proforma specification".

- [7] ETSI ETS 300 402-1: "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Data link layer; Part 1: General aspects [ITU-T Recommendation Q.920 (1993), modified]".
- [8] ISO/IEC 7498-1: "Information technology - Open Systems Interconnection - Basic Reference Model: The Basic Model".
- [9] ISO/IEC 7498-2: "Information processing systems - Open Systems Interconnection - Basic Reference Model - Part 2: Security Architecture".
- [10] ISO/IEC 7498-3: "Information technology - Open Systems Interconnection - Basic Reference Model: Naming and addressing".
- [11] ISO/IEC 7498-4: "Information processing systems - Open Systems Interconnection - Basic Reference Model - Part 4: Management framework".
- [12] ISO/IEC 9646-1: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 1: General concepts".
- [13] ISO/IEC 9646-2: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 2: Abstract test suite specification".
- [14] ISO/IEC 9646-3: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 3: The Tree and Tabular Combined Notation (TTCN)".
- [15] ISO/IEC 9646-4: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 4: Test realization".
- [16] ISO/IEC 9646-5: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 5: Requirements on test laboratories and clients for the conformance assessment process".

3 Definitions and abbreviations

3.1 Definitions

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

abstract test suite: See ISO/IEC 9646-1 [12].

data link layer: See ISO/IEC 7498 [8] to [11].

implementation under test: See ISO/IEC 9646-1 [12].

lower tester: See ISO/IEC 9646-1 [12].

point of control and observation: See ISO/IEC 9646-1 [12].

protocol conformance test report: See ISO/IEC 9646-1 [12].

Protocol Implementation Conformance Statement: See ISO/IEC 9646-1 [12].

proforma: See ISO/IEC 9646-1 [12].

Protocol Implementation eXtra Information for Testing: See ISO/IEC 9646-1 [12].

PIXIT proforma: See ISO/IEC 9646-1 [12].

system under test: See ISO/IEC 9646-1 [12].

upper tester: See ISO/IEC 9646-1 [12].

3.2 Abbreviations

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

AN	Access Network
ASP	Abstract Service Primitive
ATM	Abstract Test Method
ATS	Abstract Test Suite
ExTS	Executable Test Suite
ISDN	Integrated Services Digital Network
ISDN-BA	Integrated Services Digital Network-Basic Access
IUT	Implementation Under Test
LE	Local Exchange
LT	Lower Tester
MOT	Means Of Testing
NMDS	Narrowband Multi-service Delivery System
NTN	Network Termination Node
PCO	Point of Control and Observation
PCTR	Protocol Conformance Test Report
PDU	Protocol Data Unit
PICS	Protocol Implementation Conformance Statement
PIXIT	Protocol Implementation eXtra Information for Testing
PSTN	Public Switched Telephone Network
SUT	System Under Test
TP	Test Purpose
TSS	Test Suite Structure
TTCN	Tree and Tabular Combined Notation

4 Abstract Test Method (ATM)

The remote test method is applied for this ATS. The Point of Control and Observation (PCO) resides at the service access point between layers 1 and 2. This PCO is named "L" (for Lower). The L PCO is used to control and observe the behaviour of the Implementation Under Test (IUT) and test case verdicts are assigned depending on the behaviour observed at this PCO.

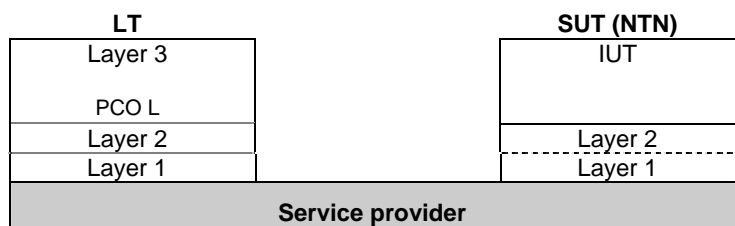


Figure 1: Remote test method

5 Untestable test purposes

There are no untestable test purposes associated with this ATS.

6 ATS conventions

This clause is structured similarly to the structure of a TTCN ATS. However, the names of the clauses are arranged in a way more suitable to the present document.

6.1 Declarations part

6.1.1 Type definitions

6.1.1.1 Simple type definitions

Where appropriate, simple types have a length, a value list, or a range restriction attached.

Simple types defined as being of some string type (e.g. BIT STRING, OCTET STRING) have a length restriction or a value list attached.

Simple types, defined as being of INTEGER type, have a value list or a range restriction attached.

6.1.1.2 Structured type definitions

6.1.1.2.1 TTCN structured type definitions

All structured type definitions are provided with a full name.

All elements in every structured type definition, defined as being of some string type (e.g. BIT STRING, OCTET STRING), have a length restriction attached.

6.1.1.2.2 ASN.1 structured type definitions

There are no ASN.1 structured type definitions in this ATS.

6.1.1.3 ASP type definitions

6.1.1.3.1 TTCN ASP type definitions

TTCN ASP type definitions only contain one PDU or no PDU at all.

All TTCN ASP type definitions are provided with a full identifier.

Table 1 shows an example of a parameterized ASP, DL_DATA_RQ, which is an ASP to be sent and contains a PDU.

Table 1: TTCN ASP type definition DL_DATA_RQ

ASP Type Definition		
ASP NAME : dl_data_req		
PCO Type : DSAP		
Comments : Ref: ETS 300 402-1 [7].		
Parameter Name	Parameter Type	Comments
user_data	PDU	(1)
Detailed Comments: ASP definition of primitive received from the DSAP PCO. 1) The user_data of this ASP is defined as metatype PDU, thus this ASP can be used to send any type of PDU.		

Table 2 shows an example of a parameterized ASP, DL_DATA_IND, which is an ASP to be received and contains a PDU.

Table 2: TTCN ASP type definition DL_DATA_IND

ASP Type Definition		
ASP NAME : dl_data_ind		
PCO Type : DSAP		
Comments : Ref: ETS 300 402-1 [7].		
Parameter Name	Parameter Type	Comments
user_data	PDU	1)
Detailed Comments : ASP definition of primitive received from the DSAP PCO. 1) The user_data of this ASP is defined as metatype PDU, thus this ASP can be used to send any type of PDU.		

6.1.1.3.2 ASN.1 ASP type definitions

There are no ASN.1 ASP type definitions in this ATS.

6.1.1.4 PDU type definitions

6.1.1.4.1 TTCN PDU type definitions

The TTCN PDU type reflects the actual data being transferred or received. All PDUs are embedded in ASPs.

If a specific PDU type definition contains elements defined in terms of a pre-defined type, that element has a restriction attached to it.

6.1.1.4.2 ASN.1 PDU type definitions

There are no ASN.1 PDU type definitions in this ATS.

6.1.2 Test suite constants

Each test suite constant is defined in terms of a predefined type or a referenced type. The values given in the value column will remain unchanged throughout the test suite.

6.1.3 Test suite parameters

Each test suite parameter is defined in terms of a predefined type.

6.1.4 Variables

6.1.4.1 Test suite variables

Each test suite variable is defined in terms of a predefined type.

Where test suite variables are used in constraints, they are passed as formal parameters.

6.1.4.2 Test case variables

Each test case variable is defined in terms of a predefined type.

Where test case variables are used in constraints, they are passed as formal parameters.

6.1.5 Test suite operation definitions

The description part of a test suite operation definition uses natural language.

Table 3: Test suite operation definition using natural language

Test Suite Operation Definition	
Operation Name	TSO_INTEGER_TO_SN(integer_par: INTEGER)
Result Type	: 0_1
Comments	:
Description	
The Test Suite Operation TSO_INTEGER_TO_SN shall convert a INTEGER value to a sequence number. If the value of the sequence number (SN) is 127 value shall be reset to zero. The 8. (most significant) bit of the returned octetstring shall always be 1. Operation is used with PSTN and Protection Sequence Number IEs.	
Detailed comments:	

6.2 Constraints part

6.2.1 Structured type constraint declaration

For every structured type definition, there exists one or more structured type constraints.

6.2.2 ASN.1 type constraint declaration

There are no ASN.1 type constraint declarations in this ATS.

6.2.3 ASP type constraint declaration

6.2.3.1 ASN.1 ASP type constraint declaration

There are no ASN.1 ASP type constraint declarations in this ATS.

6.2.3.2 TTCN ASP type constraint declaration

The PDUs to be sent or received are passed to the TTCN ASP constraint declarations Fs and Fr as parameters of meta type PDU. Only if values inside a specific PDU have to be referenced, the use of the meta type PDU is not allowed according to ISO/IEC 9646-3 [14]. In such cases, different TTCN ASP constraint declarations are used which are defined to carry only a specific type of PDU (e.g. ESTABLISH).

Tables 4 and 5 show examples of such TTCN ASP constraint declarations.

Table 4: TTCN ASP constraint declaration

TTCN ASP Constraint Declaration		
Constraint Name	: Dl_data_ind_pstn(user_data: PDU)	
ASP Type	: dl_data_ind	
Derivation Path	:	
Comments	:	
Parameter Name	Parameter Value	Comments
user_data	user_data	m
Detailed Comments:	Base constraint of the ASP received from the DSAP PCO.	
Parameter:		
user_data:	The user_data of this ASP is defined as metatype PDU, thus this ASP can be used to receive any type of PDU.	

Table 5: TTCN ASP constraint declaration

TTCN ASP Constraint Declaration		
Constraint Name	: dl_data_req_pstn(user_data: PDU)	
ASP Type	: dl_data_req	
Derivation Path	:	
Comments	:	
Parameter Name	Parameter Value	Comments
user_data	user_data	m
Detailed Comments:	Base constraint of the ASP send to the DSAP PCO.	
Parameter:		
user_data:	The user_data of this ASP is defined as metatype PDU, thus this ASP can be used to send any type of PDU.	

All ASP constraints have a specific value for their parameters. No matching or wildcard symbols are used in ASPs.

6.2.4 PDU type constraint declaration

6.2.4.1 ASN.1 PDU type constraint declaration

There are no ASN.1 PDU type constraint declarations in this ATS.

6.2.4.2 TTCN PDU type constraint declaration

PDU constraints are used for assigning values or patterns to the data being sent or received.

6.2.5 Derived constraints

Derived constraints are used in this ATS for some PDUs.

6.2.6 Parameterized constraints

Parameterized constraints are used in this ATS.

6.2.7 Value assignment

6.2.7.1 Specific values

For specific value assignment both explicit values and references to explicit values are used.

6.2.7.2 Matching values

As matching/wildcard values the following mechanisms are used:

- Instead of Value:
 - AnyOrOmit "*"
 - AnyValue "?"
 - Omit "-"
- Inside value:
 - AnyOne "?"
 - AnyOrNone "*"
 - AnyOne "?"

6.3 Dynamic part

6.3.1 Test cases

Each test case contains the test purpose text from EN 301 141-3 [3]. To be able to read and understand the test case dynamic behaviour, it is recommended that the test steps are understood first.

6.3.2 Test steps

Much use has been made of test steps to avoid needless repetition of dynamic behaviour.

6.3.3 Defaults

Note the use of the RETURN statement which is defined in DAM1 of ISO/IEC 9646-3 [14]. This allows valid background behaviour to be handled in the default tree with a possibility to return to the original set of alternatives in the test case.

7 ATS to TP map

The identifiers used for the TPs are reused as test case names. Thus there is a straightforward one-to-one mapping.

8 PCTR conformance

A test laboratory, when requested by a client to produce a PCTR, is required, as specified in ISO/IEC 9646-5 [16], to produce a PCTR conformant with the PCTR template given in annex B of the present document.

Furthermore, a test laboratory, offering testing for the ATS specification contained in annex C, when requested by a client to produce a PCTR, is required to produce a PCTR conformant with the PCTR proforma contained in annex A of the present document.

A PCTR which conforms to this PCTR proforma specification shall preserve the content and ordering of the clauses contained in annex A. Clause A.6 of the PCTR may contain additional columns. If included, these shall be placed to the right of the existing columns. Text in italics may be retained by the test laboratory.

9 PIXIT conformance

A test realizer, producing an Executable Test Suite (ExTS) for the ATS specification contained in annex C, is required, as specified in ISO/IEC 9646-4 [15], to produce an augmented partial PIXIT proforma conformant with this partial PIXIT proforma specification.

An augmented partial PIXIT proforma which conforms to this partial PIXIT proforma specification shall, as a minimum, have contents which are technically equivalent to annex B. The augmented partial PIXIT proforma may contain additional questions that need to be answered in order to prepare the Means Of Testing (MOT) for a particular IUT.

10 ATS conformance

The test realizer, producing MOT and ExTS for this ATS specification, shall comply with the requirements of ISO/IEC 9646-4 [15]. In particular, these concern the realization of an ExTS based on each ATS. The test realizer shall provide a statement of conformance of the MOT to this ATS specification.

An ExTS which conforms to this ATS specification shall contain test groups and test cases which are technically equivalent to those contained in the ATS in annex C. All sequences of test events comprising an abstract test case shall be capable of being realized in the executable test case. Any further checking which the test system might be capable of performing is outside the scope of this ATS specification and shall not contribute to the verdict assignment for each test case.

Test laboratories running conformance test services using this ATS shall comply with ISO/IEC 9646-5 [16].

A test laboratory which claims to conform with ISO/IEC 9646-5 [16] shall use an MOT which conforms to this ATS.

Annex A (normative): Protocol Conformance Test Report (PCTR) proforma

Notwithstanding the provisions of the copyright clause related to the text of the present document, ETSI grants that users of the present document may freely reproduce the PCTR proforma in this annex so that it can be used for its intended purposes and may further publish the completed PCTR.

A.1 Identification summary

A.1.1 Protocol conformance test report

PCTR number:	
PCTR date:	
Corresponding SCTR number:	
Corresponding SCTR date:	
Test laboratory identification:	
Test laboratory manager:	
Signature:	

A.1.2 IUT identification

Name:	
Version:	
Protocol specification:	EN 301 141-1
PICS:	EN 301 141-2
Previous PCTRs (if any):	

A.1.3 Testing environment

PIXIT reference number:	
ATS specification:	EN 301 141-7
Abstract test method:	Remote test method (see ISO/IEC 9646-2)
Means of testing identification:	
Dates of testing:	
Conformance log reference(s):	
Retention date for log reference(s):	

A.1.4 Limits and reservations

Additional information relevant to the technical contents or further use of the test report, or to the rights and obligations of the test laboratory and the client, may be given here. Such information may include restriction on the publication of the report.

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.....

.....

A.1.5 Comments

Additional comments may be given by either the client or the test laboratory on any of the contents of the PCTR, for example, to note disagreement between the two parties.

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.....

A.2 IUT conformance status

This IUT has/has not been shown by conformance assessment to be non-conforming to the specified protocol specification.

Strike the appropriate words in this sentence. If the PICS for this IUT is consistent with the static conformance requirements (as specified in clause A.3 of the present document) and there are no "FAIL" verdicts to be recorded (in clause A.6) strike the word "has", otherwise strike the words "has not".

A.3 Static conformance summary

The PICS for this IUT is/is not consistent with the static conformance requirements in the specified protocol.

Strike the appropriate words in this sentence.

A.4 Dynamic conformance summary

The test campaign did/did not reveal errors in the IUT.

Strike the appropriate words in this sentence. If there are no "FAIL" verdicts to be recorded (in clause A.6 of the present document) strike the word "did", otherwise strike the words "did not".

Summary of the results of groups of tests:

.....

.....

.....

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.....

A.5 Static conformance review report

If clause A.3 indicates non-conformance, this clause itemizes the mismatches between the PICS and the static conformance requirements of the specified protocol specification.

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A.6 Test campaign report

ATS reference	PSTN Valid		Verdict	Observations
	Selected? (Y/N)	Run? (Y/N)		
TCP_S1_V_01				
TCP_S1_V_02				
TCP_S1_V_03				
TCP_S1_V_04				
TCP_S1_V_05				
TCP_S1_V_06				
TCP_S1_V_07				
TCP_S1_V_08				
TCP_S1_V_09				
TCP_S1_V_10				
TCP_S2_V_01				
TCP_S2_V_02				
TCP_S2_V_03				
TCP_S2_V_04				
TCP_S2_V_05				
TCP_S2_V_06				
TCP_S2_V_07				
TCP_S2_V_08				

ATS reference	PSTN Valid			Observations
	Selected? (Y/N)	Run? (Y/N)	Verdict	
TCP_S2_V_09				
TCP_S2_V_10				
TCP_S2_V_11				
TCP_S2_V_12				
TCP_S3_V_01				
TCP_S3_V_02				
TCP_S3_V_03				
TCP_S3_V_04				
TCP_S3_V_05				
TCP_S3_V_06				
TCP_S3_V_07				
TCP_S3_V_08				
TCP_S3_V_09				
TCP_S3_V_10				
TCP_S3_V_11				
TCP_S3_V_12				
TCP_S4_V_01				
TCP_S4_V_02				
TCP_S4_V_03				
TCP_S4_V_04				
TCP_S4_V_05				
TCP_S4_V_06				
TCP_S4_V_07				
TCP_S4_V_08				
TCP_S4_V_09				
TCP_S4_V_010				
TCP_S5_V_01				
TCP_S5_V_02				
TCP_S5_V_03				
TCP_S5_V_04				
TCP_S5_V_05				
TCP_S5_V_06				
TCP_S5_V_07				
TCP_S5_V_08				
TCP_S5_V_09				
TCP_S5_V_10				
TCP_S5_V_11				
TCP_S5_V_12				
TCP_S5_V_13				
TCP_S7_V_01				
TCP_S7_V_02				
TCP_S7_V_03				
TCP_S7_V_04				
TCP_S7_V_05				
TCP_S7_V_06				
TCP_S7_V_07				
TCP_S7_V_08				
TCP_S7_V_09				
TCP_S7_V_10				
TCP_S7_V_11				
TCP_S7_V_12				
TCP_S7_V_13				

Layer management - User - State 8.0				
ATS reference	Selected? (Y/N)	Run? (Y/N)	Verdict	Observations
L2U_L80_I_1				
L2U_L80_I_2				
L2U_L80_I_3				
L2U_L80_I_4				
L2U_L80_I_5				
L2U_L80_I_6				

Inopportune				
ATS reference	Selected? (Y/N)	Run? (Y/N)	Verdict	Observations
TCP_S1_I_01				
TCP_S1_I_02				
TCP_S1_I_03				
TCP_S1_I_04				
TCP_S2_I_01				
TCP_S2_I_02				
TCP_S3_I_01				
TCP_S3_I_02				
TCP_S3_I_03				
TCP_S4_I_01				
TCP_S4_I_02				
TCP_S4_I_03				
TCP_S4_I_04				
TCP_S5_I_01				
TCP_S5_I_02				

Syntactically_invalid				
ATS reference	Selected? (Y/N)	Run? (Y/N)	Verdict	Observations
TCP_S1_S_01				
TCP_S1_S_02				
TCP_S1_S_03				
TCP_S1_S_04				
TCP_S1_S_05				
TCP_S1_S_06				
TCP_S1_S_07				
TCP_S1_S_08				
TCP_S1_S_09				
TCP_S1_S_10				
TCP_S1_S_11				
TCP_S1_S_01				
TCP_S5_S_02				
TCP_S5_S_03				
TCP_S5_S_04				
TCP_S5_S_05				
TCP_S5_S_06				

Timers				
ATS reference	Selected? (Y/N)	Run? (Y/N)	Verdict	Observations
TCP_S2_T_01				
TCP_S2_T_02				
TCP_S3_T_01				
TCP_S4_T_01				
TCP_S4_T_02				
TCP_S5_T_02				
TCP_S5_T_03				
TCP_S5_T_04				
TCP_S7_T_01				
TCP_S7_T_02				

ISDN				
ATS reference	Selected? (Y/N)	Run? (Y/N)	Verdict	Observations
TCI_Sx_V_01				
TCI_Sx_S_01				

A.7 Observations

Additional information relevant to the technical content of the PCTR are given here.

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Annex B (normative): Partial PIXIT proforma

Notwithstanding the provisions of the copyright clause related to the text of the present document, ETSI grants that users of the present document may freely reproduce the partial PIXIT proforma in this annex so that it can be used for its intended purposes and may further publish the completed PIXIT.

B.1 Introduction

The PIXIT proforma are based on ISO/IEC 9646-5. Any additional information needed can be found in the present document.

B.2 PIXIT proforma

B.2.1 Identification summary

PIXIT Number:

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Test Laboratory Name:

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Date of Issue:

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Issued to:

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B.2.2 Abstract test suite summary

Protocol Specification: EN 301 141-1

Protocol to be tested: NMDS, NTN side network layer

ATS Specification: EN 301 141-7

Abstract Test Method: Remote test method

B.2.3 Test laboratory

Test Laboratory Identification:

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Test Laboratory Manager:

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Means of Testing:

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SAP Address:

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B.2.4 Client

Client Identification:

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Client Test manager:

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Test Facilities required:

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B.2.5 SUT

Name:

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Version:

.....

SCS Number:

.....

Machine configuration:

.....

Operating System Identification:

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IUT Identification:

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PICS Reference for IUT:

.....

Limitations of the SUT:

.....

Environmental Conditions:

.....

B.2.6 Protocol layer information

B.2.6.1 Protocol identification

Name: NMDS, network layer protocol for NTN side

Version:

PICS References: EN 301 141-2 and EN 300 324-2

B.2.6.2 IUT information

Table B.1: Addresses

Address name	Parameter type	Reference to EN 301 141-1	Value
TSPX_PSTN_L3ADDR	OCTETSTRING [2]	First I3 address of the PSTN user port provisioned : B-channel (see clause 8.2)	
TSPX_PSTN_L3ADDR_2ND	OCTETSTRING [2]	Second I3 address of the PSTN user port provisioned : B-channel (see clause 8.2)	
TSPX_PSTN_L3ADDR_RESERVED	OCTETSTRING [2]	L3 address of the PSTN user port which is considered as reserved by the IUT (see clause 8.2)	

Table B.2: Timer values

Timer name type	Reference to EN 301 141-1 or EN 300 324-1	Timer range	Timer value
TSPX_TIMER_T01_max	table 58 (see EN 300 324-1)	value: 1 200 [ms] T01 + T01 tolerance + test environment tolerance	
TSPX_TIMER_T02_max	table 58 (see EN 300 324-1)	value: 1 200 [ms] T02 + T02 tolerance + test environment tolerance	
TSPX_TIMER_T1_max	table 28 (see EN 300 324-1)	value: 3 000[ms] T1 + T1 tolerance + test environment tolerance	
TSPX_TIMER_T3_max	table 28 (see EN 300 324-1)	value: 2 400 [ms] T3 + T3 tolerance + test environment tolerance	
TSPX_TIMER_T4_max	table 28 (see EN 300 324-1)	value: 2 400 [ms] T4 + T4 tolerance + test environment tolerance	
TSPX_TIMER_AC_short	Watch dog timer if immediate ACTION is expected from the IUT	value: 1 000 [ms]	
TSPX_TIMER_NOAC_short	Guard timer used if NO ACTION shall appear	value: 1 000 [ms]	
TSPX_TIMER_T2_MAX	table 28 (see EN 300 324-1)	value: 5,5 [s] to 36 [s] T2 + T2 tolerance + test environment tolerance	
TSPX_TIMER_T2_MIN	table 28 (see EN 300 324-1)	value: 4,5 [s] to 27 [s] T2 - T2 tolerance - test environment tolerance	
TSPX_TIMER_Tm_MAX	table 10 (see EN 301 141-1)	value: 11 [s]	
TSPX_TIMER_AC_long	Watch dog timer if an ACTION from the IUT is expected after an undefined time period		
TSPX_TIMER_TEST_AN3	Watch dog timer to test the AN3 state	Value: 3 000 [ms] .. should be less than timer T1_min	

Table B.3: Procedural information

Procedural name	Reference to EN 300 324-1	Valid?
TSPX_PSTN_LINE_INFORMATION	PSTN state Line information (AN4) is supported by the IUT	
TSPX_PSTN_TERMINATING_CALL_PRIORITY	Terminating calls have priority (val: TRUE) (see clause 13.5.3.3). If the parameter is not set (val: FALSE), originating calls have priority	
NOTE: All parameters are of type BOOLEAN.		

Table B.4 requests the national specific optional PSTN data, which shall be coded according to the PSTN standard to which the PSTN application of the IUT shall conform.

Table B.4: Optional information

PIXIT name	Related message	Reference to EN 300 324-1	Specific requirements	Value
TSPX_PSTN_COND_INFO_EST	ESTABLISH	13.3.1, table 5	Conditional information of the ESTABLISH message received by LT1, length [1..5]. The ESTABLISH message should not contain information which requests from the PSTN FSM a response which is sent in a signal	
TSPX_PSTN_COND_INFO_EST_SEND	ESTABLISH	13.3.1, table 5	Conditional information of the ESTABLISH message sent by LT1, length [1..5]. The ESTABLISH message should not contain information which requests from the PSTN FSM a response which is sent in a signal	
TSPX_PSTN_COND_INFO_EST_4_REP_COND_IE	ESTABLISH	13.3.1, table 5 13.5.2.5 (error conditions) (see also note)	The conditional part shall contain four repeated conditional IEs which are valid for the IUT to be tested	
TSPX_PSTN_COND_INFO_EST_IEI_4_TIMES_REP	ESTABLISH	table 17	IEI of 4 times repeated IE in optional info: TSPX_PSTN_COND_INFO_EST_4_REP_COND_IE	
TSPX_PSTN_COND_INFO_EST_ONE_VALID_ONE_INCORR_COND_IE	ESTABLISH	13.4.5, table 17 13.5.2.9 (error conditions) (see also note)	The conditional part shall contain one valid and one incorrect conditional IE	
TSPX_PSTN_COND_INFO_EST_IEI_INCORR_COND_IE	ESTABLISH	table 17	IEI of incorrect IE in conditional info: TSPX_PSTN_COND_INFO_EST_ONE_VALID_ONE_INCORR_COND_IE	
TSPX_PSTN_OPT_INFO_EST_ONE_VALID_ONE_UNSPEC_OPT_IE	ESTABLISH	13.4.5, table 17 13.5.2.7 (error conditions) (see also note)	The optional part shall contain one valid and one unspecified optional IE	
TSPX_PSTN_OPT_INFO_EST_IEI_UNSPEC_OPT_IE	ESTABLISH	table 17	IEI of unspecified IE in optional info: TSPX_PSTN_OPT_INFO_EST_ONE_VALID_ONE_UNSPEC_OPT_IE	
TSPX_PSTN_COND_INFO_EST_TWO_DIFF_COND_IE	ESTABLISH	13.3.1, table 5 13.5.2.11 (error conditions) (see also note)	The conditional part shall contain two different conditional IEs	
TSPX_PSTN_OPT_INFO_EST_ACK	ESTABLISH_ACK	13.3.2, table 6	Optional information of ESTABLISH_ACK message length [1..5]	

PIXIT name	Related message	Reference to EN 300 324-1	Specific requirements	Value
TSPX_PSTN_EST_LINE_INFO	ESTABLISH		Optional information of the ESTABLISH message to be send by the LT1, length [1] that corresponds to the FE-line_information message sent to the NWK entity	
TSPX_PSTN_COND_INFO_PROTOCOL_PARAMETER	PROTOCOL_PARAMETER	13.3.9, table 13	Conditional information of a PROTOCOL_PARAMETER message length [3..13]	
TSPX_PSTN_OPT_INFO_DISC_S	DISCONNECT		Optional information of the DISCONNECT message which is sent from the LE to AN	
TSPX_PSTN_OPT_INFO_DISC_4_REP	DISCONNECT	13.3.7, table 11	Optional information of a DISCONNECT message. The optional part shall contain 4 repeated optional IE which are valid for the IUT	
TSPX_PSTN_OPT_INFO_IEI_DISC_4_REP	DISCONNECT	13.3.7, table 11	IEI of the IE 4 times repeated in the parameter TSPX_PSTN_OPT_INFO_DISC_4_REP	
TSPX_PSTN_OPT_INFO_DISC_ONE_VALID_ONE_INCORR_OPT_IE	DISCONNECT	13.3.7, table 11	Optional information of a DISCONNECT message. The optional part shall contain one valid and one incorrect Optional IE	
TSPX_PSTN_OPT_INFO_DISC_IEI_INCORR_OPT_IE	DISCONNECT	13.3.7, table 11	IEI of the incorrect optional IE in the parameter TSPX_PSTN_OPT_INFO_DISC_ONE_VALID_ONE_INCORR_OPT_IE	
TSPX_PSTN_COND_INFO_SIGNAL_DIGIT1	SIGNAL	13.3.3, table 7	Conditional information of a SIGNAL message which is sent from the AN to the LE and which represents the line signal of digit 1 length [3]	
TSPX_PSTN_COND_INFO_SIGNAL_LE	SIGNAL	13.3.3, table 7	Conditional information of a SIGNAL message which is send from the LE to the AN length [1..8]	
NOTE: The PSTN messages which contain invalid optional information shall be coded according to the national PSTN specifications but the optional information shall be modified according to EN 300 324-1, clause 13.5.2. All parameters are of type OCTETSTRING.				

Table B.5: Implicit send events

PIXIT name	Description	Selection
TSPX_IMPLICIT_EVENT_PSTN	This PIXIT is used to select/deselect PSTN test cases which use implicit send events and thus need manual operations (no automatic execution)	
NOTE: All parameters are of type BOOLEAN.		

Table B.6: Implicit send event procedures

Implicit event	Description	Procedural information
<IUT ! pstn_est> Pstn_est	How can the sending of an PSTN ESTABLISH message by the IUT be invoked? (sending of a FE-subscriber_seizure message to the NWK entity)	
<IUT ! pstn_signal> Pstn_signal(S_R, TSPX_PSTN_OPT_INFO_SIGNAL_ DIGIT1)	How can the sending of an PSTN SIGNAL message (digit 1) by the IUT be invoked? (sending of a FE-line_signal message (digit 1) message to the NWK entity)	
<IUT ! te_off_hook_pstn>	How can the IUT internal event "sending of a FE-subscriber_seizure message" be invoked?	
<IUT ! te_on_hook_pstn>	How can the IUT internal event "sending of a FE-subscriber_release message" be invoked?	
NOTE: <i>Procedural information</i> part shall provide the necessary information required to provoke the <i>Implicit event</i> described in <i>Description</i> part of this table.		

Table B.7: PICS information

PIXIT name	PICS item	Valid?
TSPC_ISDNBA	EN 301 141-2, A.4.1	
TSPC_PSTN	EN 301 141-2, A.4.2	
SPECIFIC_PSTN	EN 301 141-2, A.7.1	
SPECIFIC_ISDN	EN 301 141-2, A.7.2	
TSPC_PSTN_PROTO COL_PARAMETER	EN 300 324-2, U1.9	
NOTE: All parameters are of type BOOLEAN.		

Annex C (normative): Abstract Test Suite (ATS) PSTN NMDS interface Layer 3 (NTN side)

This ATS has been produced using the Tree and Tabular Combined Notation (TTCN) according to ISO/IEC 9646-3 [14].

The ATS was developed on a separate TTCN software tool and therefore the TTCN tables are not completely referenced in the table of contents. The ATS itself contains a test suite overview part which provides additional information and references.

C.1 The TTCN Graphical form (TTCN.GR)

The TTCN.GR representation of this ATS is contained in an Adobe Portable Document Format™ file (NMDS_NTN_L3.PDF contained in archive en_30114107v010101p0.ZIP) which accompanies the present document.

C.2 The TTCN Machine Processable form (TTCN.MP)

The TTCN.MP representation corresponding to this ATS is contained in an ASCII file (nmms_l3_ntn.MP contained in archive en_30114107v010101p0.ZIP) which accompanies the present document.

NOTE: Where an ETSI Abstract Test Suite (in TTCN) is published in both .GR and .MP format, these two forms shall be considered equivalent. In the event that there appears to be syntactical or semantic differences between the two then the problem shall be resolved and the erroneous format (whichever it is) shall be corrected.

C.3 General structure of an ATS

This clause gives a simple listing of the order of types of tables which appear in a typical ATS. This is intended as an aid in helping readers find particular sections quickly.

Test Suite Overview

Test Suite Structure

Test Case Index

Test Step Index

Default Index

Declarations Part

Simple Type Definitions

Structured Type Definitions

Test Suite Operation Definitions

Test Suite Parameter Declarations

Test Case Selection Expression Definitions

Test Suite Constant Declarations

Test Case Variable Declarations

PCO Declarations

Timer Declarations

TTCN ASP Type Definition

TTCN PDU Type Definition

Alias Definitions

Constraints Part

Structured Type Constraint Declarations

TTCN ASP Constraint Declarations

TTCN PDU Constraint Declarations

Dynamic Part

Test Case Dynamic Behaviour

Test Step Dynamic Behaviour

Default Dynamic Behaviour

Annex D (informative): Bibliography

- ETSI ETS 300 125 (1991): "Integrated Services Digital Network (ISDN); User-network interface data link layer specification; Application of ITU-T Recommendations Q.920/I.440 and Q.921/I.441".
- ETSI ETS 300 402-2 (1995): "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Data link layer; Part 2: General protocol specification [ITU-T Recommendation Q.921 (1993), modified]".
- ETSI ETS 300 402-6 (1997): "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Data link layer; Part 6: Test Suite Structure and Test Purposes (TSS&TP) specification for the general protocol".

History

Document history		
V1.1.1	July 2001	Public Enquiry PE 20011116: 2001-07-18 to 2001-11-16
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