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European Standard (Telecommunications series)

**Broadband Integrated Services Digital Network (B-ISDN) and
Broadband Private Integrated Services Network (B-PISN);
Digital Subscriber Signalling System No. two (DSS2) and
Broadband Inter-Exchange Signalling (B-QSIG) and
Signalling System No. 7 (SS7); Prenegotiation;
Part 4: Abstract Test Suite (ATS) and partial Protocol
Implementation eXtra Information for Testing (PIXIT)
proforma specification**



Reference

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ATS, PIXIT**ETSI**

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Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

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 4 of a multi-part standard covering the Digital Subscriber Signalling System No. 2 (DSS2), Broadband Inter-Exchange Signalling (B-QSIG), and Signalling System No. 7 (SS7) TSS&TP for the Broadband Integrated Services Digital Network (B-ISDN) and Broadband Private Integrated Services Network (B-PISN) Prenegotiation, 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";
- Part 4: "Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma specification".**

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1 Scope

The present document provides the Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma for the Prenegotiation protocol as specified in EN 302 091-1 [1].

This fourth part of EN 302 091 [1] is applicable to the Prenegotiation protocol at the Q_B , S_B , T_B and co-incident S_B/T_B reference point of implementations conforming to the standards for the Digital Subscriber Signalling System No. two (DSS2), Broadband Inter-Exchange Signalling (B-QSIG), and Signalling System No. 7 (SS7) protocol specification for Broadband Integrated Services Digital Network (B-ISDN) and Broadband Private Integrated Services Network (B-PISN).

A further part of the present document specifies the Test Suite Structure and Test Purposes (TSS&TP) related to this ATS and partial PIXIT proforma.

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, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, subsequent revisions do apply.

- [1] ETSI EN 302 091-1: "Broadband Integrated Services Digital Network (B-ISDN) and Broadband Private Integrated Services Network (B-PISN); Digital Subscriber Signalling System No. two (DSS2), Broadband Inter-Exchange Signalling (B-QSIG), and Signalling System No. 7 (SS7); Prenegotiation; Part 1: Protocol specification".
- [2] ETSI EN 302 091-2: "Broadband Integrated Services Digital Network (B-ISDN) and Broadband Private Integrated Services Network (B-PISN); Digital Subscriber Signalling System No. two (DSS2), Broadband Inter-Exchange Signalling (B-QSIG), and Signalling System No.7 (SS7); Prenegotiation; 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 9646-4: "Information technology; Open Systems Interconnection; Conformance testing methodology and framework; Part 4: Test realization".
- [6] 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.
- [7] ETSI EN 302 092-1: "Broadband Integrated Services Digital Network (B-ISDN) and Broadband Private Integrated Services Network (B-PISN); Digital Subscriber Signalling System No. two (DSS2), Broadband Inter-Exchange Signalling (B-QSIG), and Signalling System No. 7 (SS7); Call control in a separated call and bearer control environment; Part 1: Protocol specification".
- [8] ISO/IEC 9646-3: "Information technology; Open Systems Interconnection; Conformance testing methodology and framework; Part 3: The Tree and Tabular Combined Notation (TTCN)".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply in addition to the definitions in EN 302 092-1 [7]:

Abstract test case: refer to ISO/IEC 9646-1 [3]

Abstract Test Method (ATM): refer to ISO/IEC 9646-1 [3]

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

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

Lower tester (LT): 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]

Point of Control and Observation (PCO): 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]

Upper Tester (UT): refer to ISO/IEC 9646-1 [3]

3.2 Abbreviations

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

ATM	Abstract Test Method
ATS	Abstract Test Suite
B-ISDN	Broadband Integrated Services Digital Network
B-PISN	Broadband Private Integrated Services Network
B-QSIG	Broadband Inter-Exchange Signalling System
CM	Co-ordination Message
CP	Co-ordination Point
DSS2	Digital Subscriber Signalling System No. two
ExTS	Executable Test Suite
IUT	Implementation Under Test
LT	Lower Tester
MOT	Means Of Testing
PCO	Point of Control and Observation
PICS	Protocol Implementation Conformance Statement
PIXIT	Protocol Implementation eXtra Information for Testing
PTC	Parallel Test Component
SUT	System Under Test
TCP	Test Co-ordination Procedures
TP	Test Purpose
TTCN	Tree and Tabular Combined Notation
UT	Upper Tester

4 Abstract Test Method

The remote test method is applied for the ATS. The Point of Control and Observation (PCO) resides at the service access point between Layer 2 and 3. This PCO is named "L0" (for Lower). The L0 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.

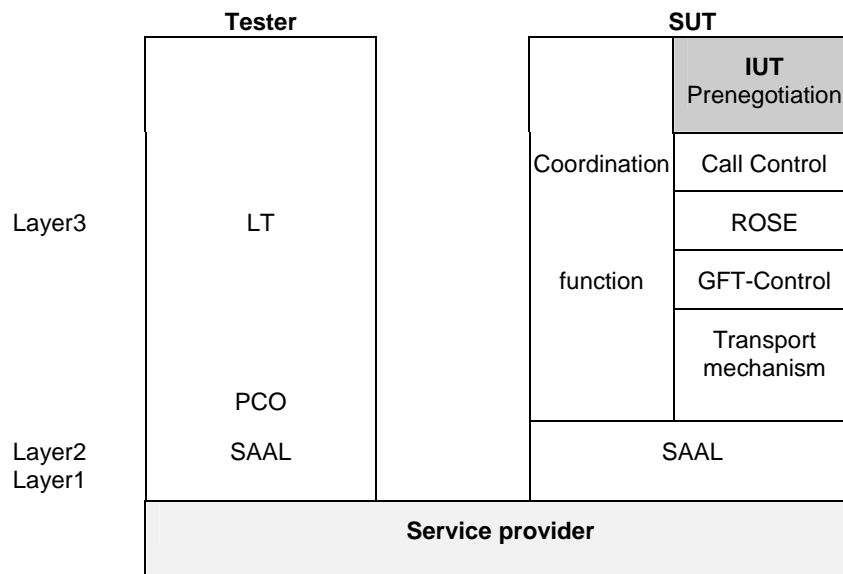


Figure 1: Remote test method

ISO/IEC 9646-2 [4] allows the informal expression of Test Co-ordination Procedures (TCP) between the System Under Test (SUT) upper layer(s) and the Lower Tester (LT). In the ATS contained in annex C, TCP is achieved by use of a second "informal" PCO, called "O" (for Operator). This PCO is used to specify control but not observation above the IUT and consequently, events at this PCO are never used to generate test case verdicts. The use of this O PCO is regarded as a preferred alternative to the use of the implicit send event, in that it allows the ATS to specify in a clear and meaningful way what actions are required to be performed on the IUT.

5 Untestable test purposes

There are no untestable test purposes associated with this ATS.

6 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.

7 PCTR conformance

A test laboratory, when requested by a client to produce a PCTR, is required, as specified in ISO/IEC 9646-5 [6], to produce a PCTR conformant with the PCTR template given in annex B of ISO/IEC 9646-5 [6].

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.

8 PIXIT conformance

A test realizer, producing an executable test suite for the Abstract Test Suite (ATS) specification contained in annex C, is required, as specified in ISO/IEC 9646-4 [5], 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 Implementation Under Test (IUT).

A test laboratory, offering testing for the ATS specification contained in annex C, is required, as specified in ISO/IEC 9646-5 [6], to further augment the augmented partial PIXIT proforma to produce a PIXIT proforma conformant with this partial PIXIT proforma specification.

A PIXIT proforma which conforms to this partial PIXIT proforma specification shall, as a minimum, have contents which are technically equivalent to annex B. The PIXIT proforma may contain additional questions that need to be answered in order to prepare the test laboratory for a particular IUT.

9 ATS Conformance

The test realizer, producing a Means Of Testing (MOT) and Executable Test Suite (ExTS) for this Abstract Test Suite (ATS) specification, shall comply with the requirements of ISO/IEC 9646-4 [5]. In particular, these concern the realization of an Executable Test Suite (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 [6].

A test laboratory which claims to conform to this ATS specification 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 302 091-1
PICS:	EN 302 091-2
Previous PCTRs (if any)	

A.1.3 Testing environment

PIXIT Reference number:	
ATS Specification:	EN 302 091-4
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 or 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 this report) and there are no "FAIL" verdicts to be recorded (in clause A.6) strike the words "has or", otherwise strike the words "or has not".

A.3 Static conformance summary

The PICS for this IUT is or 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 or 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 this report) strike the words "did or", otherwise strike the words "or did not".

Summary of the results of groups of tests:

.....

.....

.....

A.5 Static conformance review report

If clause A.3 indicates non-conformance, this clause itemises 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	Selected ? (Y/N)	Run ? (Y/N)	Verdict	Observations
L3PR_01_01				
L3PR_01_02				
L3PR_01_03				
L3PR_02_01				
L3PR_02_02				
L3PR_02_03				
L3PR_03_01a				
L3PR_03_01b				
L3PR_03_02a				
L3PR_03_02b				
L3PR_03_03a				
L3PR_03_03b				
L3PR_03_04a				
L3PR_03_04b				
L3PR_03_05a				
L3PR_03_05b				
L3PR_03_06a				
L3PR_03_06b				
L3PR_04_01a				
L3PR_04_01b				
L3PR_04_02a				
L3PR_04_02b				
L3PR_04_03a				
L3PR_04_03b				
L3PR_04_04a				
L3PR_04_04b				

ATS Reference	Selected ? (Y/N)	Run ? (Y/N)	Verdict	Observations
L3PR_04_05a				
L3PR_04_05b				
L3PR_04_06a				
L3PR_04_06b				
L3PR_04_07a				
L3PR_04_07b				
L3PR_04_08a				
L3PR_04_08b				
L3PR_04_09a				
L3PR_04_09b				

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 PIXIT proforma in this annex so that it can be used for its intended purposes and may further publish the completed PIXIT.

B.1 Identification summary

PIXIT Number:

.....

Test Laboratory Name:

.....

Date of Issue:

.....

Issued to:

.....

B.2 Abstract test suite summary

Protocol Specification: EN 302 091-1

ATS Specification: EN 302 091-4

Abstract Test Method: Remote test method (see ISO/IEC 9646-2)

B.3 Test laboratory

Test Laboratory Identification:

.....

Accreditation status of the test service:

.....

Accreditation reference:

.....

Test Laboratory Manager:

.....

Test Laboratory contact:

.....

Means of Testing:

.....

Test Laboratory instructions for Completion:

.....

B.4 Client (of the Test Laboratory)

Client Identification:

.....

Client Test manager:

.....

Client contact:

.....

Test Facilities required:

.....

B.5 SUT

Name:

.....

Version:

.....

SCS Reference:

.....

Machine configuration:

.....

Operating System Identification:

.....

IUT Identification:

.....

PICS (all layers):

.....

Limitations of the SUT:

.....

Environmental Conditions:

.....

B.6 Protocol information

B.6.1 Protocol identification

Specification reference: EN 302 091-1

Protocol Version:

PICS Reference: EN 302 091-2

B.6.2 Configuration to be tested

Table B.1: Configuration to be tested

Item	Configuration The IUT can be configured..	Supported Y/N
1.1	That the requested resource is temporary unavailable.	

B.6.3 Parameter Values

Table B.2: Parameter values

Item	Parameter values Give a value for...	Value
Call description		
2.1	the bearer establishment address of the preceding side	
2.2	the bearer establishment address of the succeeding side	
2.3	a valid CallDescription acceptable by IUT	
2.4	a SEQUENCE of proposed item acceptable by the IUT without modification	
2.5	a SEQUENCE of proposed item acceptable by the IUT with modification only	
2.6	a SEQUENCE of proposed item not acceptable by the IUT	
2.7	a SEQUENCE of proposed item acceptable by the IUT but not able to establish such a connection	
Protocol discriminator		
2.8	protocol discriminator to be used in the message header of the transport messages	
2.9	protocol profile to be used in the Facility information element	

B.6.4 Test management timers

Table B.3: Timer values

Item	Timer Give a value for the timer that is used ...	Value (in seconds)
3.1	to wait for the IUT to respond to a stimulus sent by the tester (TAC).	
3.2	to wait for the test operator to perform an implicit send action or to wait for a PTC to react (TWAIT).	
3.3	to control the reception of prenegotiationAlert (T1MAX)	
3.4	to control the reception of prenegotiate return result (T2MAX)	
3.5	to control establishment of a call (TCEST)	
3.6	as Call Control timer T708 (default 30 seconds)	
<p>NOTE: The IUT provider may fill in a value range rather than a fixed value for the test management timers. During test execution the test laboratory will choose specific values for the timers dependant on the means of testing used. These specific values may even be beyond the range given by the IUT provider, if this is necessary for achieving satisfactory test results.</p>		

Annex C (normative): Abstract Test Suite (ATS)

This ATS has been produced using the Tree and Tabular Combined Notation (TTCN) according to ISO/IEC 9646-3 [8].

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.

C1 The TTCN Graphical form (TTCN.GR)

The TTCN.GR representation of this ATS is contained in an Adobe Portable Document Format™ file (TD042b.PDF) contained in archive en_30209104v010101p0.ZIP) which accompanies the present document.

C2 The TTCN Machine Processable form (TTCN.MP)

The TTCN.MP representation corresponding to this ATS is contained in an ASCII file (TD041b.MP contained in archive en_30209104v010101p0.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.

Bibliography

The following material, though not specifically referenced in the body of the present document (or not publicly available), gives supporting information.

ETSI EN 302 091-3: "Broadband Integrated Services Digital Network (B-ISDN) and Broadband Private Integrated Services Network (B-PISN); Digital Subscriber Signalling System No. two (DSS2), Broadband Inter-Exchange Signalling (B-QSIG), and Signalling System No.7 (SS7); Pre negotiation; Part 3: Test Suite Structure and Test Purposes (TSS&TP) specification".

History

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