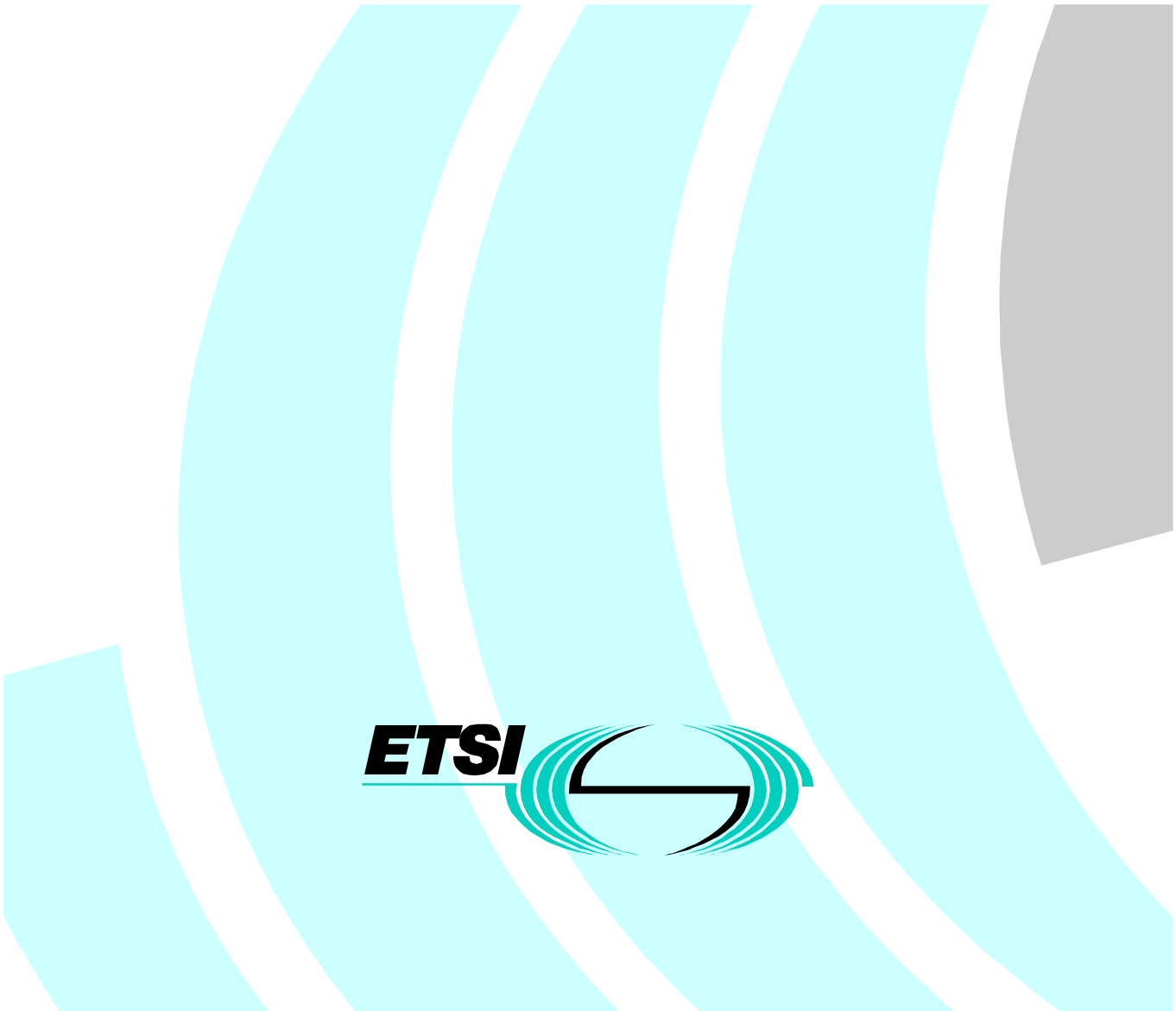
ETSI EN 301 483-2 V1.1.1 (2000-12)

European Standard (Telecommunications series)

**Private Integrated Services Network (PISN);
Inter-exchange signalling protocol;
Advice of Charge (AoC) supplementary services
[ISO/IEC 15049 (1997), modified];
Part 2: Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma**



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Contents

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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 2 for a multi-part deliverable covering the Inter-exchange signalling protocol; Advice of Charge (AoC) supplementary services [ISO/IEC 15049 (1997), modified], as described below:

Part 1: "Test Suite Structure and Test Purposes (TSS&TP) specification";

Part 2: "Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma".

National transposition dates	
Date of adoption of this EN:	15 December 2000
Date of latest announcement of this EN (doa):	31 March 2001
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	30 September 2001
Date of withdrawal of any conflicting National Standard (dow):	30 September 2001

1 Scope

The present document specifies the Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma for the VPN "b" entry point of implementations conforming to the standard for the Advice of Charge supplementary service (SS-AoC) as described in EN 301 264 [1].

EN 301 483-1 [6] specifies the Test Suite Structure and Test Purposes (TSS&TP) related to this ATS and partial PIXIT proforma specification.

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.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

[1] ETSI EN 301 264 (V1.1.1): "Private Integrated Services Network (PISN); Inter-exchange signalling protocol; Advice of Charge (AoC) supplementary services [ISO/IEC 15050 (1997), modified]".

[2] ISO/IEC 9646 (all parts): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework".

[3] ETSI TR 101 101 (V1.1.1): "Methods for Testing and Specification (MTS); TTCN interim version including ASN.1 1994 support [ISO/IEC 9646-3] (Second Edition Mock-up for JTC1/SC21 Review)".

[4] ISO/IEC 8825-1: "Information technology - ASN.1 encoding rules: Specification of Basic Encoding Rules (BER), Canonical Encoding Rules (CER) and Distinguished Encoding Rules (DER) " (See also ITU-T Recommendation X.690 (1994)).

[5] ETSI EN 300 362: "Private Integrated Services Network (PISN); Inter-exchange signalling protocol; Call offer supplementary service [ISO/IEC 14843 (1996), modified]".

[6] ETSI EN 301 483-1: "Private Integrated Services Network (PISN); Inter-exchange signalling protocol; Advice of Charge (AoC) supplementary services [ISO/IEC 15049 (1997), modified]; Part 1: Test Suite Structure and Test Purposes (TSS&TP) specification".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in ISO/IEC 9646 [2] apply.

3.2 Abbreviations

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

AoC	Advice of Charge
ATM	Abstract Test Method
ATS	Abstract Test Suite
BER	Basic Encoding Rules
CI	Call Intrusion
CT	Call Transfer
ETS	Executable Test Suite
IUT	Implementation Under Test
MOT	Means Of Testing
MTC	Main Test Component
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
PTC	Parallel Test Component
SUT	System Under Test
TP	Test Purpose
TTCN	Tree and Tabular Combined Notation
VPN	Virtual Private Network

4 Abstract Test Method (ATM)

4.1 Description of ATM used

The multi-party test method is applied for testing the IUT. The Originating configuration used is shown in figure 1.

A Point of Control and Observation (PCO) resides at the service access point between layers 2 and 3 in the test system. The PCO used by the MTC is named "L0" (for Lower). This 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.

A second "informal" PCO, called "O" (for Operator) is used to specify control but not observation above the IUT; events at this PCO are never used to generate test case verdicts. Messages sent by the tester at this PCO explicitly indicate to the operator actions which are to be performed on the SUT. This is regarded as a preferred alternative to the use of the implicit send event.

The relationship between the IUT and the tester is as follows.

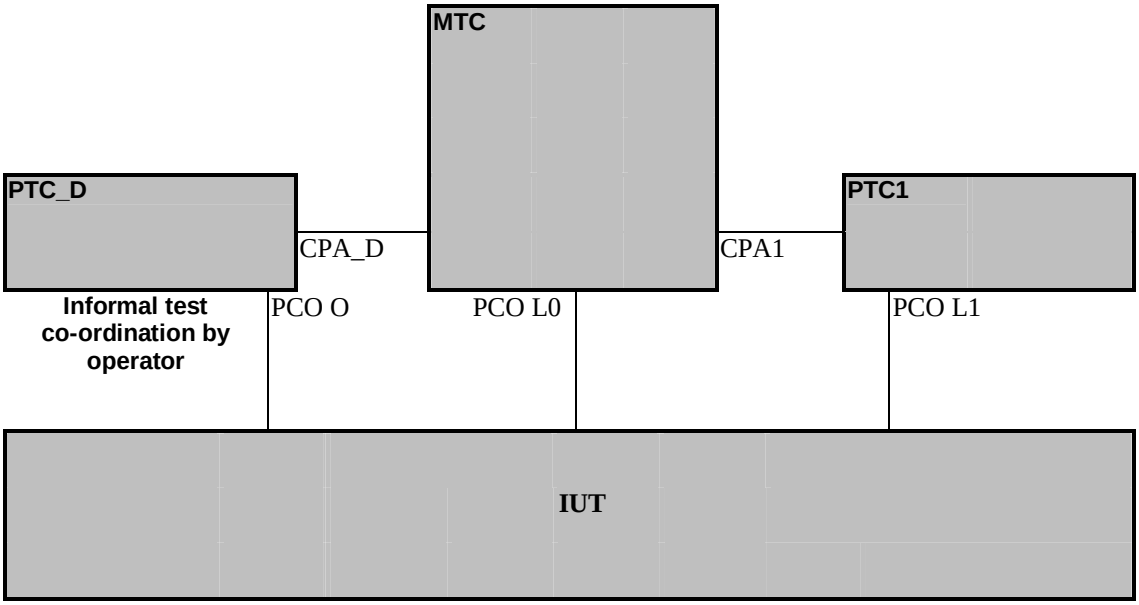

Figure 1: Multi-party test method

Not all components are used in every test case and the relationship between the IUT and the tester depends on the test group.

5 Untestable test purposes

There are no untestable test cases associated with this ATS and ATM.

6 ATS conventions

6.1 Version of TTCN used

The version of TTCN used is that defined in TR 101 101 [3].

6.2 Use of ASN.1

6.2.1 Situations where ASN.1 is used

ASN.1 has been used for three major reasons. First, types defined in ASN.1 can model problems that "pure" TTCN cannot. For instance, data structures modelling ordered or unordered sequences of data are preferably defined in ASN.1. Second, ASN.1 provides a better restriction mechanism for type definitions by using sub-type definitions. Third, it is necessary to use ASN.1 to reproduce the type definitions for remote operation components as specified in the base standards in ASN.1.

The possibility to use TTCN and ASN.1 in combination is used, i.e. referring to an ASN.1 type from a TTCN type.

6.2.2 Specification of encoding rules

There is a variation in the encoding rules applied to ASN.1 types and constraints specified in this ATS and therefore a mechanism is needed to differentiate the encoding rules. However the mechanism specified in ISO/IEC 9646-3/AM2 [2] and in TR 101 101 [3] does not facilitate definition of the encoding rules as needed for this ATS. A solution is therefore used which is broadly in the spirit of ISO/IEC 9646-3/AM2 [2] in which comment fields have been used as a means of encoding rules.

For ASN.1 used in this ATS, two variations of encoding rules are used. One is the commonly known Basic Encoding Rules (BER) as specified in ISO/IEC 8825-1 [4]. In the second case the encoding is according to ISDN, i.e. the ASN.1 data types are a representation of structures contained within the ISDN specification (basic call, Generic functional protocol or individual supplementary service). For example, if octets of an information element are specified in ASN.1 as a SEQUENCE then this should be encoded in an Executable Test Suite (ETS) as any other ISDN information element specified using tabular TTCN. This ISDN encoding variation is the default encoding rule for this ATS. This means that all ASN.1 constraint tables are encoded using ISDN (non-BER) encoding unless stated otherwise. BER encoding should never be applied to an ASN.1 constraint where BER encoding has not been specified. This encoding rule is sometimes named "Direct Encoding".

For BER encoding, an indication is given in the comments field of the table header. For this ATS such indications appear in the ASN.1 type constraint declaration tables only. In the table header comment field, the notation "ASN1_Encoding: BER" is used.

In this particular ATS all ASN.1 type constraints which are of type "Component" are to be encoded using BER.

Table 1 shows an example of a ASN.1 type Constrained Declaration used in this ATS.

Table 1: ASN.1 type constraint declaration showing use of encoding variation

ASN.1 Type Constraint Declaration
Constraint Name: CORequestInv_S1 (INV_ID: InvokeIDType) **ASN.1 Type** : Component **Derivation Path**: **Comments** : Sent Component: CORequest Invoke component. ASN1_Encoding: BER
Description
callOfferRequest_Comp callOfferRequest_InvokeComp { invokeID INV_ID, -- the invoke identifier operation_value localValue 34, -- value for operation argument OMIT}
Detailed comments:

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 [2], to produce a PCTR conformant with the PCTR template given in annex B of ISO/IEC 9646-5 [2].

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.

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 for the ATS specification contained in annex C, is required, as specified in ISO/IEC 9646-4 [2], 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.

A test laboratory, offering testing for the ATS specification contained in annex C, is required, as specified in ISO/IEC 9646-5 [2], 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.

10 ATS conformance

The test realizer, producing MOT and ETS for this ATS specification, shall comply with the requirements of ISO/IEC 9646-4 [2]. In particular, these concern the realization of an ETS based on each ATS. The test realizer shall provide a statement of conformance of the MOT to this ATS specification.

An EN 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 [2].

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

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 300 362
PICS:	
Previous PCTRs (if any):	

A.1.3 Testing environment

PIXIT reference number:	
ATS specification:	EN 301 483-2
Abstract test method:	Multi-party 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 words "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	Selected? (Y/N)	Run? (Y/N)	Verdict	Observations
Group Orig01				
AOC_Orig01_001				
AOC_Orig01_002				
AOC_Orig01_003				
AOC_Orig01_004				
AOC_Orig01_005				
AOC_Orig01_006				
AOC_Orig01_007				
AOC_Orig01_008				
AOC_Orig01_009				
AOC_Orig01_010				
AOC_Orig01_011				
AOC_Orig01_012				
AOC_Orig01_013				
AOC_Orig01_014				
Group Orig02				
AOC_Orig02_001				
AOC_Orig02_002				
AOC_Orig02_003				

ATS reference	Selected? (Y/N)	Run? (Y/N)	Verdict	Observations
AOC_Orig02_004				
AOC_Orig02_005				
AOC_Orig02_006				
AOC_Orig02_007				
AOC_Orig02_008				
AOC_Orig02_009				
AOC_Orig02_010				
AOC_Orig02_011				
AOC_Orig02_012				
AOC_Orig02_013				
Group Ogw01				
AOC_Ogw01_001				
AOC_Ogw01_002				
AOC_Ogw01_003				
AOC_Ogw01_004				
AOC_Ogw01_005				
AOC_Ogw01_006				
AOC_Ogw01_007				
AOC_Ogw01_008				
AOC_Ogw01_009				
AOC_Ogw01_010				
AOC_Ogw01_011				
Group Ogw02				
AOC_Ogw02_001				
AOC_Ogw02_002				
AOC_Ogw02_003				
Group Ogw03				
AOC_Ogw03_001				
AOC_Ogw03_002				
AOC_Ogw03_003				
AOC_Ogw03_004				
AOC_Ogw03_005				
Group Ogw04				
AOC_Ogw04_001				
AOC_Ogw04_002				
AOC_Ogw04_003				
Group Term01				
AOC_Term01_001				
AOC_Term01_002				
Group Int01				
AOC_Int01_001				
AOC_Int01_002				
AOC_Int01_003				
AOC_Int01_004				
AOC_Int01_005				
AOC_Int01_006				
AOC_Int01_007				
AOC_Int01_008				
Group Int02				
AOC_Int02_001				
AOC_Int02_002				

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

B.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 Abstract test suite summary

Protocol specification:	EN 301 264
ATS specification:	EN 301 483-2
Abstract test method:	Multi-party test method (see ISO/IEC 9646-2)

B.3 Test laboratory

Test laboratory identification:

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Accreditation status of the test service:

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Accreditation reference:

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Test laboratory manager:

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Test laboratory contact:

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Means of testing:

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Test laboratory instructions for completion:

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B.4 Client (of the test laboratory)

Client identification:

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Client test manager:

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Client contact:

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Test facilities required:

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B.5 System Under Test (SUT)

Name:

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Version:

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SCS reference:

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Machine configuration:

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Operating system identification:

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IUT identification:

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PICS (all layers):

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Limitations of the SUT:

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Environmental conditions:

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B.6 Protocol information

B.6.1 Protocol identification

Specification reference: EN 301 264

Protocol version: 1.2.1

PICS reference:

NOTE: The PICS reference should reference a completed PICS which is conform with the PICS proforma contained in EN 301 264.

B.6.2 IUT information

B.6.2.1 Parameter values

Table B.1: Parameter values

Item	Question	Supported? (Y/N)	Allowed values	Value
1.1	a value for the length of the Business Group Identification		Bitstring	
1.2	a value for the Business Group Identifier		Bitstring	
1.3	a value for the Business Group Identification		Octetstring	
1.4	True if the IUT is configured so that the accounting function is unable to accept the AOC request.		Y/N	
1.5	True if the IUT is configured so that the accounting function decides to charge User A for the call before and after transfer.		Y/N	
1.6	True if the IUT is configured so that the accounting function decides to charge User A for the call after transfer.		Y/N	

B.6.2.2 Timer values

Table B.2: Timer values

Item	Timer duration	Supported? (Y/N)	Allowed values	Value
2.1	Wait for the test operator to perform an implicit send action or to wait for a PTC to react (TWAIT). Duration in s.		Integer	
2.2	Wait for the IUT to respond to a stimulus sent by the tester (TAC). Duration in s.		Integer	
2.3	Control that the IUT does not respond to a stimulus sent by the tester (TNOAC). Duration in s.		Integer	
2.4	Timer that is used to wait for a RESTART PDU(T_RESTART). Duration in s		Integer	
2.5	T1 timer value in seconds: not less than 15 seconds.		Integer	
2.6	Period (in seconds) used by the IUT to send the aocInterim invoke component.		Integer	
NOTE: The IUT provider 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.				

B.6.2.3 Information parameter values

Table B.3: Information parameter values

Item	Question	Supported? (Y/N)	Value
3.1	Length of the Called party number information element (PTC) to be sent to the IUT.		
3.2	Octet 3 (Type of number, Numbering plan identification) of the Called party number information elements to be sent to the IUT.		
3.3	Number digits (IA5) for the Called party number information element to be sent to the IUT.		
3.4	Length of the Called party number information element with incomplete number information (insufficient to route the call to destination) to be sent to the IUT.		
3.5	Number digits (IA5) for the Called party number information element with incomplete number information (insufficient to route the call to destination) to be sent to the IUT.		
3.6	Length of the Calling party number information element to be sent to the IUT (MTC).		
3.7	Type Of Number for the Calling party number information element to be sent to the IUT.		
3.8	Screening Indicator for the Calling party number information element to be sent to the IUT.		
3.9	Number digits (IA5) for the Calling party number information element (MTC) to be sent to the IUT.		
3.10	AdviceModeCombination parameter accepted by the IUT accounting function (Outgoing Gateway). AdviceModeCombination ASN.1 type.		
3.11	Party number (ASN.1 type), of the charged user to be included in an AocComplete invoke component.		
3.12	Party number (ASN.1 type), of the charged user to be included in an AocDivChargeReq invoke component.		

B.7 Basic call PIXIT items

B.7.1 Parameter values - information element coding

Table B.4: Coding of information elements

Item	Information element: provide, if possible,...	Supported? (Y/N)	Value
4.1	A value for the length of the Call Reference (bitstring).		
4.2	A value to select if the IUT sends RESTART PDUs after re-establishment of the multiple frame operation.		
4.3	A value to select if the IUT initiates release of the multiple frame established operation after entering U00/N00.		
4.4	A value for the length of the Bearer Capability information element.		
4.5	A coding of the content of the Bearer Capability information element.		
4.6	A value for the preferred channel number.		
4.7	A value for the preferred channel number for the second call.		
4.8	A value for the length of the High Layer Compatibility information element.		
4.9	A coding of the content of the High Layer Compatibility information element.		
4.10	A value for the length of the Low Layer Compatibility information element.		
4.11	A coding of the content of the Low Layer Compatibility information element.		

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 [2].

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 (sp519232.PDF contained in archive en_30148302v010101p0.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 (sp519232.MP contained in archive en_30148302v010101p0.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.

History

Document history				
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