

**Integrated Services Digital Network (ISDN);
Digital Subscriber Signalling System No. one (DSS1) protocol;
Generic functional protocol for the support of supplementary
services at the "b" service entry point
for Virtual Private Network (VPN) applications;
Part 4: Abstract Test Suite (ATS) and partial Protocol
Implementation eXtra Information for Testing (PIXIT)
proforma specification for the user**



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Foreword

This European Standard (Telecommunications series) has been produced by ETSI Technical Committee Services and Protocol for Advanced Networks (SPAN), and is now submitted for the Voting phase of the ETSI standards Two-step Approval Procedure.

The present document is part 4 of a multi-part standard covering the Digital Subscriber Signalling System No. one (DSS1) protocol specification for the Integrated Services Digital Network (ISDN) Generic functional protocol for the support of supplementary services for Virtual Private Network (VPN) applications, 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: "Test Suite Structure and Test Purposes (TSS&TP) specification for the network";
- Part 6: "Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma specification for the network".

Proposed national transposition dates	
Date of latest announcement of this EN (doa):	3 months after ETSI publication
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	6 months after doa
Date of withdrawal of any conflicting National Standard (dow):	6 months after doa

1 Scope

This fourth part of EN 301 061 is applicable to the Generic functional protocol for the support of supplementary services for Virtual Private Network (VPN) applications for the pan-European Integrated Services Digital Network (ISDN) by means of the Digital Subscriber Signalling System No. one (DSS1) protocol, EN 301 061-1 [1].

The present document specifies the Abstract Test Suite (ATS), and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma for the network side of the T reference point or coincident S and T reference point of implementation conforming to EN 301 061-1 [1] in compliance with the relevant requirements and in accordance with the relevant guidance given in ISO/IEC 9646.

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, the latest version applies.
- 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] EN 301 061-1: "Integrated Services Digital Network (ISDN); Subaddressing (SUB) supplementary service; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".
- [2] EN 301 061-2: "Integrated Services Digital Network (ISDN); Subaddressing (SUB) 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 - 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 9646-3: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 3: The Tree and Tabular Combined Notation (TTCN)".
- [6] EN 300 403-1: "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Signalling network layer for circuit-mode basic call control; Part 1: Protocol specification (ITU-T Recommendation Q.931 (1993), modified)".
- [7] ITU-T Recommendation I.112 (1993): "Vocabulary of terms for ISDNs".
- [8] CCITT Recommendation E.164 (1991): "Numbering plan for the ISDN era".
- [9] ITU-T Recommendation I.210 (1993): "Principles of telecommunication services supported by an ISDN and the means to describe them".
- [10] ETS 300 239: "Private Integrated Services Network (PISN); Inter-exchange signalling protocol; Generic functional protocol for the support of supplementary services [ISO/IEC 11582 (1995), modified]".
- [11] ISO/IEC 9646-4: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 4: Test realization".

- [12] 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
- [13] EN 301 061-3: "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Generic functional protocol for the support of supplementary services at the "b" service entry point for Virtual Private Network (VPN) applications; Part 3: Test Suite Structure and Test Purposes (TSS&TP) specification for the user".

3 Definitions and abbreviations

3.1 Definitions

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

3.1.1 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: test case where the IUT is required to send a particular message, but not in reaction to a received message. This would usually involve the use of PIXIT information to see how this message can be generated and quite often is specified in an ATS using an implicit send event.

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

implicit send event: refer to ISO/IEC 9646-3 [5].

lower tester: refer to ISO/IEC 9646-1 [3].

passive test: test case where the IUT is required to respond to a protocol event (e.g. received message) with another protocol event (e.g. send message) which normally does not require any special operator intervention as associated with the implicit send event.

point of control and observation: refer to ISO/IEC 9646-1 [3].

Protocol Implementation Conformance Statement (PICS): refer to ISO/IEC 9646-1 [3].

PICS proforma: refer to ISO/IEC 9646-1 [3].

Protocol Implementation eXtra Information for Testing (PIXIT): refer to ISO/IEC 9646-1 [3].

PIXIT proforma: refer to ISO/IEC 9646-1 [3].

system under test: refer to ISO/IEC 9646-1 [3].

Test Purpose (TP): refer to ISO/IEC 9646-1 [3].

3.1.2 Definitions related to EN 301 061-1

Dummy call reference: see EN 300 403-1 [6], subclause 4.3.

Integrated Services Digital Network (ISDN): see ITU-T Recommendation I.112 [7], definition 308.

ISDN number: number conforming to the numbering and structure specified in CCITT Recommendation E.164 [8].

service; telecommunication service: see ITU-T Recommendation I.112 [7], definition 201.

supplementary service: see ITU-T Recommendation I.210 [9], subclause 2.4.

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

3.2 Abbreviations

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

ASP	Abstract Service Primitive
ATM	Abstract Test Method
ATS	Abstract Test Suite
BA	Basic Access
CES	Connection Endpoint Suffix
CICS	Customer Information Control System (IBM)
CM	Co-ordination Message
DSE	Data Switching Exchange
ExTS	Executable Test Suite
GFTC	Generic Functional Transport Control
IE	(Signalling) Information Element
ISDN	Integrated Services Digital Network
IUT	Implementation Under Test
LT	Lower Tester
MOT	Means Of Testing
MTC	Main Test Component
NCICS	Network Call Independent Connection-oriented Signalling
NFE	Network Facility Extension
PCO	Point of Control and Observation
PCTR	Protocol Conformance Test Report
PDU	Protocol Data Unit
PICS	Protocol Implementation Conformance Statement
PINX	Private Integrated Network Exchange
PIXIT	Protocol Implementation eXtra Information for Testing
PRA	Primary Rate Access
PTC	Parallel Test Component
SUT	System Under Test
TP	Test Purpose
TSS	Test Suite Structure
TTCN	Tree and Tabular Combined Notation
VPN	Virtual Private Network

4 Abstract Test Method

4.1 Description of ATM used

Clause 4.1 describes the different Abstract Test Methods (ATM) used for testing the Generic Functional Protocol. Two methods are applied; the Remote test method, and the Multi-Party test method.

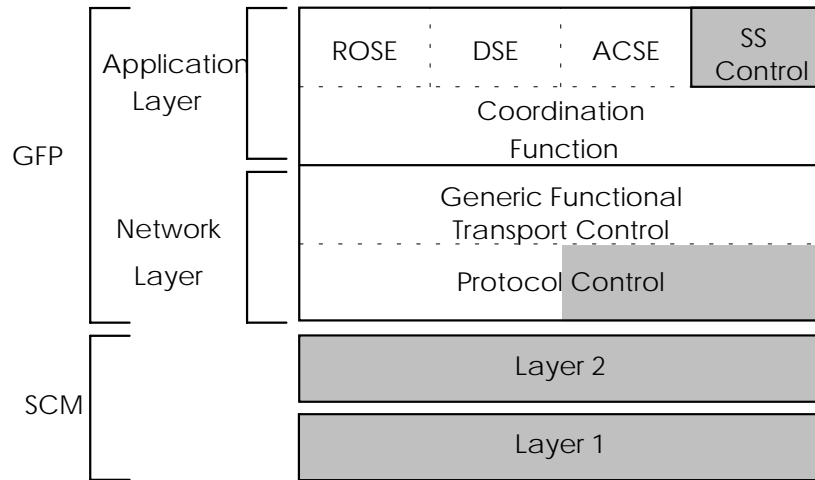
An ATS based on a multi-party test method is considered to be more useful in that it is closer to how a real test suite would be constructed. Such a test method specifies behaviour at multiple network interfaces. One very important limitation here is that tests are focused on one particular interface. Thus the test system is made up one Main Test Component (MTC) and one or more Parallel Test Components (PTC), see figure 1.

4.1.1 Functional subsets

The Generic Function Protocol is divided into a number of entities as shown in figure 1. This ATS is principally concerned with the testing of the Protocol Control and Generic Functional Transport Control entities, Coordination functions and ROSE entities.

NOTE: Valid behaviour of the application layer is supplementary service specific and its testing is specified in test specifications for individual supplementary services (if any). DSE requirements are excluded from the scope of the present document.

The testing of all these layers is performed using a PCO at the SCM/Network layer boundary.



NOTE: Grey shading indicates entities not part of the Generic Functional Protocol.

Figure 1: GFP functional subsets

4.1.2 PINX role and Test Component Configuration considerations

A PINX may act either in the role of an End PINX or in the role of a Transit PINX. A particular PINX may be capable of acting in one or both roles. Whereas the Generic Functional Transport Control (GFTC) requirements generally depend on which role is involved, the Protocol Control (PC) requirements do not.

Depending on the role of the PINX, it may be necessary to use different procedures in the preambles to achieve the pre-condition in some TPs concerned with PC requirements. For these cases, which will require different test component configurations, there may be two separate Test Cases (TCs), one for each role, generated from each relevant TP.

The different configurations used are depending on the role of the PINX, in the sense that the slave part will use a different access point to the public network.

4.1.2.1 Single PCO testing

Single PCO testing is used for the tests when events at the outgoing side are not required to be tested and when no activity is expected at the outgoing side, i.e. only one interface is reacting.

CONFIG_MONO: this configuration is mainly used for NCICS connection.

4.1.2.2 Multi PCO testing

Multi PCO testing is used for the tests when events at the outgoing side are required either to be tested or to provoke a reaction of the IUT at the tested interface. the configuration defined i depending on the role of the PINX at the tested interface.

CONFIG_DUAL: The remote access for this configuration is directly dependant on the role of the PINX, transit or end.

4.2 Conventions for test components and PCOs

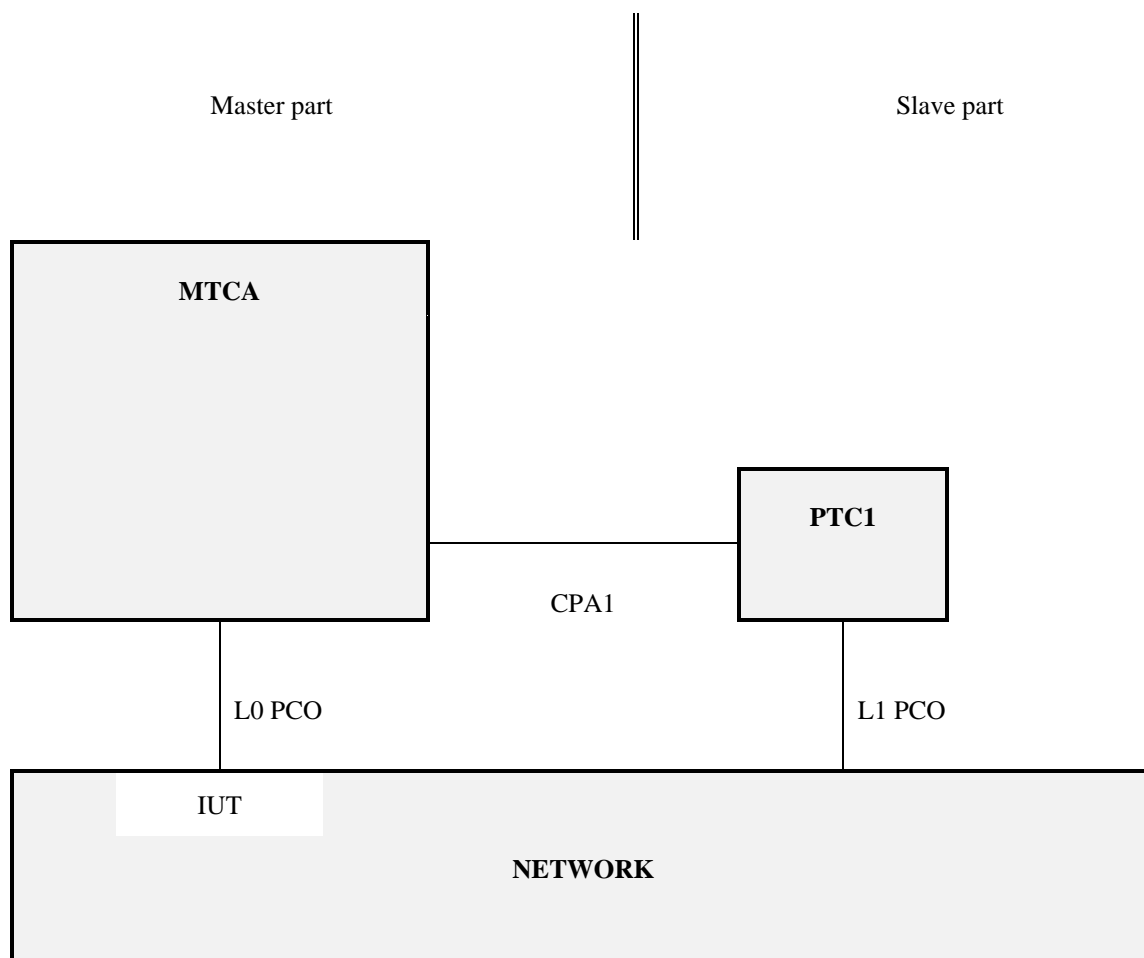


Figure 2: Multi-party test method

In a master/slave arrangement, the MTC is considered to be the master while the PTCs are the slaves. The "slave" testers are only an explicit description of how to deal with the "other" interfaces during the testing process, i.e. "how to make the IUT send the required message".

This means, in particular, that the verdict will only be assigned from the protocol aspects observed on *the* interface under test (i.e. by the "master" tester), as it would be observed by a terminal connected to this interface. A failure in the correlation between the protocol at the different interfaces to which the different testers are connected, i.e. in the mechanism of the functional service itself, will not cause a FAIL verdict. For instance, if the IUT fails to send a message on the tested interface after another interface has received the proper stimulus, the verdict will be INCONCLUSIVE.

The MTC MTCA has two functions in this configuration. Firstly, it has the MTC function of controlling the one or more PTCs. Thus it is responsible for starting the PTCs and afterwards coordinates activities by exchanging Coordination Messages (CM) with the PTCs. Secondly it is responsible for the behaviour of the Lower Tester (LT) at PCO L0.

A combination of the remote and multi-party test methods is applied. As can be seen from figure 2, several PCOs are used. All PCOs reside at the service access points between layers 2 and 3.

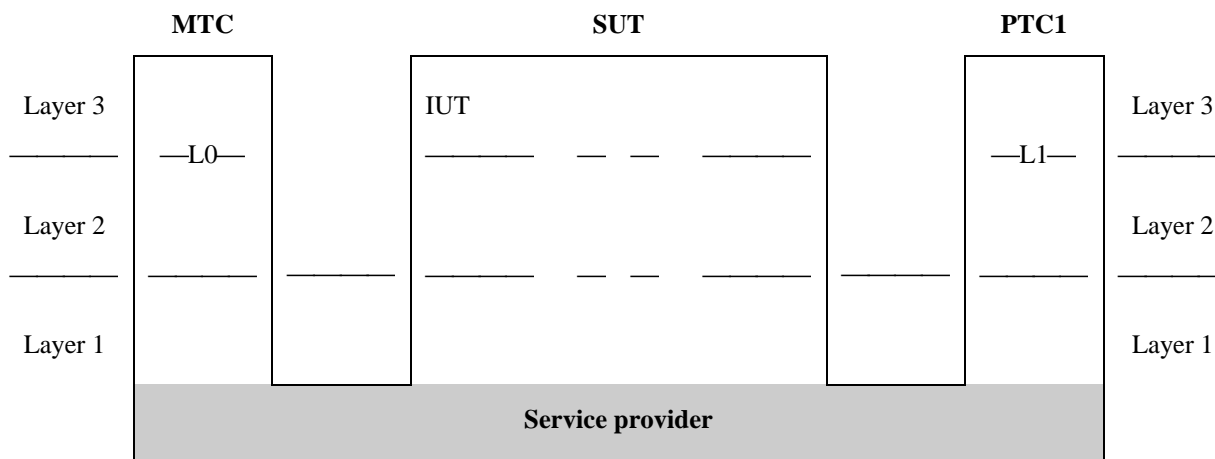


Figure 3: Combination of the remote and multi-party test methods

The MTC PCO is named "L0" ("L" for Lower). The L0 PCO is used to control and observe the behaviour of the IUT and test case verdicts are assigned depending on the behaviour observed at this PCO. The PTCs PTC1, use PCOs L1. These PCOs are used to control and, in a limited way, observe the behaviour of the network equipment at interfaces other than the one under test. No verdicts are assigned at these PCOs.

As stated in a previous paragraph, the non-receipt of network generated messages at L0, which are stimulated by events at the L1, will result in INCONCLUSIVE rather than FAIL verdicts being assigned.

The capability of the IUT to send INFORMATION and PROGRESS messages is tested in different call states. Implicit send events have to be used in this small set of test cases, as the sending of those messages cannot be triggered via a PTC. Separate PIXIT questions are asked for each call state, if and how it is possible for the test operator to cause the sending of the messages.

5 Untestable test purposes

There are no untestable test purposes in this ATS.

6 ATS conventions

Clause 6 is structured similarly to the structure of a TTCN ATS. However, the names of the subclauses 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.

If an element in a structured type definition is defined as being of a referenced type, the (possible) restriction is defined in that referenced type.

For information elements the identifier, which is unique for each element, has its type defined as a simple type where the value list is restricted to the single value which is the identifier itself. This has the advantage that it allows a test system derived from this ATS to easily identify information elements embedded in messages. An ATS where information element identifiers are represented as unrestricted types can present difficulties for a derived test system in the case where it needs to find one information element embedded in a number of others and the constraints for the other elements have the any-or-omit value. In such a case the test system cannot easily find the beginning of each information element.

6.1.1.2.2 ASN.1 structured type definitions

ASN.1 types corresponding to Information Elements, have identifiers according to subclause 7.2.3. Other ASN.1 types taken from ETS 300 239 [10] have, whenever possible, the same identifier names as the ASN.1 type names used in those standards. In some cases it is necessary to replace a hyphen character ('-') with an underscore character ('_') to satisfy the TTCN syntax. Where an ASN.1 type is used to replace an ASN.1 macro, the identifier is the name of the macro with the first letter in upper case and the remainder of the name in lower case (the macro name is specified with all upper case characters).

In other cases the identifier consists of one or more words, with the first letter of each word in upper case, and the remaining letters in the word, in lower case.

EXAMPLE 1: **privateTypeOfNumber** is the ASN.1 PrivateTypeOfNumber type from ETS 300 239 [10].

EXAMPLE 2: **operation** is the ASN.1 type replacing the OPERATION macro.

The identifier of an ASN.1 named type (i.e. the name of a field within a type defined in ASN.1), the identifier of an ASN.1 named number or the identifier of a value of an ASN.1 enumerated type is composed of a string of concatenated words, all but the first word (which begins with a lower case letter), beginning with an uppercase letter, with the remainder of the word in lower case. Where these named types, named numbers or values of enumerated types are taken from ETS 300 239 [10] the same identifiers have been used as in those standards, subject to the same restrictions as for type identifiers.

EXAMPLE 3: **sourceEntity** is the identifier of the ASN.1 named type sourceEntity in the ASN.1 NetworkFacilityExtension type from ETS 300 239 [10].

EXAMPLE 4: **discardAnyUnrecognizedInvokePdu** is the identifier of one named number of the ASN.1 InterpretationAPDU enumerated type from ETS 300 239 [10].

NOTE: Due to the TTCN static semantics, it has been necessary to define new intermediate ASN.1 types (e.g. RoseErrors), consisting of some named numbers from INTEGER types or values of ENUMERATED types, in order to avoid multiple definitions of items with the same name.

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.

Some ASPs are not parameterized as shown in the example in table 1. Such ASPs are only used for requesting or receiving service from the lower layer.

Table 1: TTCN ASP type definition DL_REL_IN

TTCN ASP Type Definition		
ASP NAME: DL_REL_IN(DL_RELEASE_INDICATION)		
PCO Type: SAP		
Comments:		
Parameter Name	Parameter Type	Comments
Detailed Comments:		

Table 2 shows an example of a parameterized ASP. All ASPs containing PDUs contain only that PDU and no other parameters.

Table 2: TTCN ASP type definition DL_DATA_RQ

TTCN ASP Type Definition		
ASP NAME: DL_DATA_RQ(DL_DATA_REQUEST)		
PCO Type: SAP		
Comments:		
Parameter Name	Parameter Type	Comments
mun (MessageUnit)	PDU	
Detailed Comments:		

6.1.1.3.2 ASN.1 ASP type definitions

There are no ASN.1 ASP type definitions in the 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 the 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 or a referenced type. A referenced type is used when it is necessary to attach restrictions to these type definitions (it is not allowed to include restrictions directly in the test suite parameter table). The referenced type can have a length or value restriction attached to it in its declaration table.

6.1.4 Variables

6.1.4.1 Test suite variables

No Test Suite Variables are used or defined in this ATS.

6.1.4.2 Test case variables

Each test case variable is defined in terms of a predefined type or a referenced type. A referenced type is used when it is necessary to attach restrictions to these type definitions (it is not allowed to include restrictions directly in the test case variable table). The referenced type can have a length or value restriction attached to it in its declaration table.

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 either natural language or meta C.

Table 3: Test suite operation definition ASSIGN_CHI

Test Suite Operation Definition	
Operation Name:	ASSIGN_CHI(basic, primary : CHI; basic_flag : BOOLEAN)
Result Type	: CHI
Comments	: This operation is used to assign a correct Channel identification information element to PDUs dependent on the type of access that is tested.
Description	
CHI ASSIGN_CHI(basic,primary,basic_flag)	
<p>If the value of the basic_flag is set to TRUE, the result of the operation ASSIGN_CHI will be the value represented by the parameter basic which is of type CHI. Else the operation results in the value represented by the parameter primary.</p>	
<p>Examples:</p> <pre>ASSIGN_CHI(CHI1b_R1, CHI1p_R1, TRUE) = CHI1b_R1 ASSIGN_CHI(CHI1b_R1, CHI1p_R1, FALSE) = CHI1p_R1</pre>	
Detailed comments:	

The test suite operation definition shown in table 3 is used in the constraints part when assigning an element of type CHI a value. The CHI type can be defined in two ways depending on whether the ATS is testing basic or primary rate access. To avoid duplicate types and thereby duplicate test cases this operation is used to assign a value to an element of CHI type. It takes three parameters:

```
primary:      a constraint of type CHI valid for Primary-rate access;
basic:        a constraint of type CHI valid for Basic access;
basic_flag:   a Boolean value: TRUE if basic access is applicable, FALSE otherwise.
```

This operation returns the correct constraint according to the Boolean flag basic_flag. That constraint will then be assigned to the specific element of type CHI.

6.2 Constraints part

6.2.1 Structured type constraint declaration

For every structured type definition there exists one or more structured type constraint.

6.2.2 ASN.1 type constraint declaration

For every ASN.1 type definition there exists one or more ASN.1 type constraint.

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 the 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 Ms and Mr 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 [5]. In such cases different TTCN ASP constraint declarations are used, that are defined to carry only a specific type of PDU (e.g. SETUP). Table 4 shows an example of such a TTCN ASP constraint declaration.

Table 4: TTCN ASP constraint declaration Sr

TTCN ASP Constraint Declaration		
Constraint Name : Sr(PARAM: SETUP_PDU)		
ASP Type : DL_DAT_IN_SETUP		
Derivation Path:		
Comments : ASP to indicate the receipt of SETUP messages.		
Parameter Name	Parameter Value	Comments
mun	PARAM	
Detailed Comments:		

All ASP constraints have a specific value for its parameter. No matching 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 the 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.

6.2.4.3 Special coding

The information element transit counter, present in the SETUP PDU, shall be defined in codeset 4, for this purpose the ATS is coding this IE with a locking shift (codeset 4) at the end of the PDU SETUP.

6.2.5 Derived constraints

Derived constraints are used in this ATS only for SETUP.

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 values the following mechanisms are used:

Instead of Value:

AnyOrOmit "*"

AnyValue "?"

Omit "-"

Inside value:

AnyOne "?"

AnyOrNone "*"

6.3 Dynamic part

6.3.1 Test cases

Each test case contains the test purpose text from EN 301 061-3 [13]. 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 [5]. 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 [12], to produce a PCTR conformant with the PCTR template given in annex B of ISO/IEC 9646-5 [12].

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 for the Abstract Test Suite (ATS) specification contained in annex C, is required, as specified in ISO/IEC 9646-4 [11], 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 [12], 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 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 [11]. 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 [12].

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:	ETS 301 061-1
PICS:	
Previous PCTRs (if any)	

A.1.3 Testing environment

PIXIT Reference number:	
ATS Specification:	ETS 301 061-6
Abstract Test Method:	Multy-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 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:

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A.5 Static conformance review report

If clause A.3 indicates non-conformance, this subclause 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
CommonEapproach/bearer related				
GFP_N01_001				
GFP_N01_002				
GFP_N01_003				
GFP_N01_004				
GFP_N02_001				
GFP_N02_002				
GFP_N02_003				
GFP_N02_004				
GFP_N02_005				
GFP_N02_006				
GFP_N02_007				
GFP_N02_008				
GFP_N03_001				
GFP_N03_002				
GFP_N03_003				
GFP_N03_004				
GFP_N03_005				
GFP_N03_006				
GFP_N03_007				
GFP_N03_008				
GFP_N03_009				
GFP_N03_010				
GFP_N03_011				
GFP_N03_012				
GFP_N03_013				
GFP_N03_014				
GFP_N03_015				

ATS Reference	Selected ? (Y/N)	Run ? (Y/N)	Verdict	Observations
CommonIApproach/bearer independant				
GFP_N04_001				
GFP_N04_002				
GFP_N04_003				
GFP_N04_004				
GFP_N05_001				
GFP_N05_002				
GFP_N05_003				
GFP_N05_004				
GFP_N06_001				
GFP_N06_002				
GFP_N06_003				
GFP_N07_001_E				
GFP_N07_001_T				
GFP_N08_001				
GFP_N08_002				
GFP_N08_003				
GFP_N08_004				
GFP_N08_005				
GFP_N08_006				
GFP_N08_007				
GFP_N09_001				
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GFP_N11_010				
GFP_N11_011				
GFP_N11_012				
GFP_N11_013				
GFP_N11_014				
GFP_N11_015				
GFP_N12_001				
GFP_N12_002				
GFP_N12_003				
GFP_N12_004				
GFP_N12_005				
GFP_N12_006				
GFP_N12_007				
GFP_N12_008				

ATS Reference	Selected ? (Y/N)	Run ? (Y/N)	Verdict	Observations
Generic notifications				
GFP_N13_001				
GFP_N13_002				
GFP_N13_003				
GFP_N13_004				
GFP_N13_005				
GFP_N13_006				
GFP_N14_001				
GFP_N14_002				
GFP_N14_003				
GFP_N14_004				
GFP_N14_005				
GFP_N14_006				

ATS Reference	Selected ? (Y/N)	Run ? (Y/N)	Verdict	Observations
Coordination function				
GFP_N15_001				
GFP_N15_002				
GFP_N15_003				
GFP_N15_004				
GFP_N15_005				
GFP_N15_006				
GFP_N15_007				

ATS Reference	Selected ? (Y/N)	Run ? (Y/N)	Verdict	Observations
ROSE				
GFP_N16_001				
GFP_N16_002				
GFP_N16_003				
GFP_N16_004				
GFP_N16_005				

ATS Reference	Selected ? (Y/N)	Run ? (Y/N)	Verdict	Observations
Flow control				
GFP_N17_001				
GFP_N17_002				
GFP_N17_003				
GFP_N17_004				
GFP_N17_005				

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:

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Test Laboratory Name:

.....

Date of Issue:

.....

Issued to:

.....

B.2 Abstract test suite summary

Protocol specification: EN 301 061-1

ATS specification: EN 301 061-4

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:

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B.5 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 301 061-1

Protocol Version:

PICS Reference:

.....

NOTE: The PICS Reference should reference a completed PICS which is conformant with the PICS proforma contained in EN 301 061-2 [2].

B.6.2 Configuration to be tested

Table B.1: Configuration to be tested

Item	Configuration Is the access to be tested...	Supported Y/N
1.1	sending a RESTART message after the establishment of the multiple frame operation?	
1.2	releasing the multiple frame established operation (i.e. sending of a DISC frame) after entering the state N00?	
1.3	support the flow control mechanism.	
1.4	act as a END PINX.	
1.5	act as a TRANSIT PINX.	
1.6	can be configured so that the CICS is not authorized or not available.	

B.6.3 Test management timers

Table B.2: Timer values

Item	Timer Give a value for the timer that is used to...	Value (in seconds)
3.1	wait for the test operator to perform an implicit send action or to wait for a PTC to react (TWAIT).	
3.2	wait for the IUT to respond to a stimulus sent by the tester (TAC).	
3.3	control that the IUT does not respond to a stimulus sent by the tester (TNOAC).	
3.4	wait for RESTART messages after establishment of the multiple frame operation (T_RESTART; only if 1.1 is supported).	
3.5	value for the timer used for the flow control.	
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.		

B.6.4 Parameter Values

Table B.3: Parameter values

Item	Parameter values Give a...	Allowed Values	Value
5.1	value for an unrecognized message type.	N/A	
5.2	value for the supported length of the call reference value.	BA: 1 PRA: 2	
5.3	value for a length of the call reference value that is higher than the supported length.	BA: > 1 PRA: > 2	
5.4	a coding of a Bearer capability information element, which the IUT is compatible with, for the purpose of accepting outgoing calls.	N/A	
5.5	a coding of a High layer compatibility information element, which the IUT is compatible with, for the purpose of accepting outgoing calls.	N/A	
5.6	a coding of a Low layer compatibility information element, which the IUT is compatible with, for the purpose of accepting outgoing calls.	N/A	
5.7	a coding of a Called party number information element including the number digits of the access related to the PTC1.	N/A	
5.8	a coding of a Called party number information element including the number digits of the access related to the MTC.	N/A	
5.9	a value for the preferred channel number (used in Channel identification information element) to be used for outgoing calls.	BA: 1..2 PRA: 1..30	
5.10	a value for the preferred channel number (used in Channel identification information element) to be used for a second outgoing call on the same CES (if PIXIT item 2.2 is supported).	BA: 1..2 PRA: 1..30	

Table B.4: VPN parameter values

Item	Parameter values Give a...	Allowed Values	Value
6.1	length of Business group identification (including octet 3).	N/A	
6.2	Business group identifier (bitstring[3]).	N/A	
6.3	a value for the business group identification.	[0..12]	
6.4	a value for the invoke id used in the dummy components.	N/A	
6.5	a local operation value that is not recognized by the ROSE entity.	N/A	
6.6	value of the burst parameter for the flow control.	N/A	
6.7	length of the called party number IE related to a NCICS connection for a END PINX.	N/A	
6.8	value for octet 3 (type of number, numbering plan identification) of the called party number IE related to a NCICS connection for a END PINX.	N/A	
6.9	number digit (IA5) for the called party number IE related to a NCICS connection for a END PINX.	N/A	
6.10	length of the called party number IE related to a NCICS connection for a TRANSIT PINX toward the remote user access (from the served user access).	N/A	
6.11	value for octet 3 (type of number, numbering plan identification) of the called party number IE related to a NCICS connection for a TRANSIT PINX toward the remote user access (from the served user access).	N/A	
6.12	number digit (IA5) for the called party number IE related to a NCICS connection for a TRANSIT PINX toward the remote user access (from the served user access).	N/A	
6.13	length of the called party number IE related to a NCICS connection for a TRANSIT PINX toward the served user access (from the remote user access).	N/A	
6.14	value for octet 3 (type of number, numbering plan identification) of the called party number IE related to a NCICS connection for a TRANSIT PINX toward the served user access (from the remote user access).	N/A	
6.15	number digit (IA5) for the called party number IE related to a NCICS connection for a TRANSIT PINX toward the served user access (from the remote user access).	N/A	
6.16	length of an incomplete called party number IE.	N/A	
6.17	value for octet 3 of an incomplete (type of number, numbering plan identification) of an incomplete called party number IE .	N/A	
6.18	number digit (IA5) of an incomplete called party number IE.	N/A	

Table B.5: ASN.1 addresses

Item	Parameter values Give a...	Allowed Values	Value
7.1	value for a NFE address of type PartyNumber matching the IUT address.	N/A	
7.2	value for a NFE address of type PartyNumber not matching the IUT address.	N/A	

Annex C (normative): The TTCN Graphical and Machine Processable forms

This ATS has been produced using the Tree and Tabular Combined Notation (TTCN) according to ISO/IEC 9646-3 [5].

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 (Sp511042.PDF contained in archive 9tp00ie0.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 (Sp511042.MP contained in archive 9tp00ie0.ZIP) which accompanies the present document.

NOTE: According to ISO/IEC 9646-3 [5], in case of a conflict in interpretation of the operational semantics of TTCN.GR and TTCN.MP, the operational semantics of the TTCN.GR representation takes precedence.

Annex D (informative): General structure of ATS

This informative annex gives a simple listing of the order of types of tables which appear in a typical supplementary service 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

ASN.1 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

Coordination Point Declarations

Timer Declarations

Test Component Declarations

Test Components Configuration Declarations

TTCN ASP Type Definition

TTCN PDU Type Definition

TTCN CM Type Definition

Alias Definitions

Constraints Part

Structured Type Constraint Declarations

ASN.1 Type Constraint Declarations

TTCN ASP Constraint Declarations

TTCN PDU Constraint Declarations

TTCN CM Constraint Declarations

Dynamic Part

Test Case Dynamic Behaviour

Test Step Dynamic Behaviour

Default Dynamic Behaviour

Annex E (informative): TTCN MP and GR version history

This annex describes all the modifications which occurred for each version of the TTCN files (MP and GR) against the previous one.

Version 1: First Release

Item No.	Description

History

Document history				
V1.1.2	December 1998	Public Enquiry	PE 9914:	1998-12-04 to 1999-04-02
V1.1.3	July 1999	Vote	V 9941:	1999-07-27 to 1999-09-24