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**Integrated Services Digital Network (ISDN);
Conformance testing for the Euro-ISDN Programming
Communication Interface (PCI);
Part 1: Test Suite Structure and Test Purposes (TSS&TP)
specification for the PCI User Facility (PUF)**

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Foreword

Part 1 of this Interim European Telecommunication Standard (I-ETS) has been produced by the Terminal Equipment (TE) Technical Committee of the European Telecommunications Standards Institute (ETSI).

An ETSI standard may be given I-ETS status either because it is regarded as a provisional solution ahead of a more advanced standard, or because it is immature and requires a "trial period". The life of an I-ETS is limited to three years after which it can be converted into an ETS, have its life extended for a further two years, be replaced by a new version, or be withdrawn.

This is the first part of an I-ETS which comprises four parts:

"Integrated Services Digital Network (ISDN); Conformance testing for the Euro-ISDN Programming Communication Interface (PCI):

Part 1: "Test Suite Structure and Test Purposes (TSS&TP) for the PCI User Facility (PUF);

Part 2: "Abstract Test Suite (ATS) for the PCI User Facility (PUF);

Part 3: "Test Suite Structure and Test Purposes (TSS&TP) for the Network Access Facility (NAF);

Part 4: "Abstract Test Suite (ATS) for the Network Access Facility (NAF)".

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Introduction

I-ETS 300 697, Parts 1 to 4 comprises the Test Suite Structure and Test Purposes (TSS&TP) and the Abstract Test Suites (ATS) to ETS 300 325 [1]. The Euro-ISDN PCI is a PCI which provides access to the Euro-ISDN. The basic model of the ISDN PCI consists of two entities, a service user called the PCI User Facility (PUF) and a service provider called the Network Access Facility (NAF). For the purposes of conformance testing, the PUF and the NAF are treated separately. This is because the PUF manufacturer and the NAF manufacturer may be completely different and their testing needs should be treated separately. Each Part is tested to ensure that they each meet the conformance requirements of the I-ETS and to increase their probability of inter-operating. This is the reason why a separate TSS&TP and a separate Abstract Test Suite has been produced for both the PCI User Facility (PUF) and the Network Access Facility (NAF).

All parts have been produced according to ISO/IEC 9646 [2] and ETS 300 406 [6].

As stated above, this I-ETS is structured in four parts:

- **part 1 contains the TSS&TP for the PUF;**
- part 2 contains the ATS for the PUF;
- part 3 contains the TSS&TP for the NAF;
- part 4 contains the ATS for the NAF.

Part 1 (TSS&TP for the PUF) contains all Test Purposes (TPs) for the PUF (PCI messages). It describes what is covered by the TPs for the PUF and what areas of the I-ETS are not covered. The Test Suite Structure (TSS) is described and the convention followed in naming the TPs is described. A list of basic interconnection tests is given.

Part 2 (ATS for the PUF) contains the Abstract Test Suite (ATS) for the PUF (PCI messages). The test method used is described in detail and diagrams explaining the test method are presented. The reasons for choosing the test method are also given. The ATS is written in Tree and Tabular Combined Notation (TTCN) and the TTCN is contained in annex A. Annex B contains the Protocol Conformance Test Report (PCTR), annex C contains the Implementation eXtra Information for Testing (IXIT) and annex D contains an Implementation Conformance Statement (ICS).

Part 3 (TSS&TP for the NAF) contains all TPs for the NAF (PCI messages and Exchange Mechanism). It describes what is covered by the TPs for the NAF and what areas of the I-ETS are not covered. The TSS is described and the TPs are given. A list of basic interconnection tests is given.

Part 4 (ATS for the NAF) contains the ATS for the NAF (PCI messages and Exchange Mechanism). The test method used is described in detail and a diagram explaining the test method is given. The reasons for choosing that test method is also given. The ATS is written in concurrent TTCN and the TTCN is contained in annex A. Annex B contains the PCTR, annex C contains the IXIT and annex D contains an ICS.

NOTE: The ICS in annexes D of Part 2 and Part 4 are informative as ETS 300 325 [1] already contains an ICS. However, the ICS in ETS 300 325 [1] is not adequate for these ATSS and should, eventually, be replaced by annexes D of Part 2 and Part 4 of this I-ETS.

1 Scope

Part 1 of this I-ETS contains the Test Suite Structure and the Test Purposes (TSS&TP) of the conformance testing to ETS 300 325 [1] for a PUF. It indicates the choices of coverage which have been made, makes some remarks about the testability of a PUF, describes the TSS in a general way and contains all TPs, structured in accordance with the TSS.

2 Normative references

Part 1 of this I-ETS incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this I-ETS only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

- [1] ETS 300 325 (1994): "Integrated Services Digital Network (ISDN); Programming Communication Interface (PCI) for Euro-ISDN".
- [2] ISO/IEC 9646 (1994): "Information technology - Open Systems Interconnection - Conformance Testing Methodology and Framework".
- [3] ISO/IEC 8208 (1990): "Information technology; Data communications; X.25 Packet Layer Protocol for Data Terminal Equipment".
- [4] ETS 300 080 (1992): "Integrated Services Digital Network (ISDN); ISDN lower layer protocols for telematic terminals".
- [5] ETS 300 102-1: "Integrated Services Digital network (ISDN); User-network interface layer 3; Specifications for basic call control".
- [6] ETS 300 406 (1995): "Methods for Testing and Specification (MTS); Protocol and profile conformance testing specifications; Standardisation methodology".

3 Abbreviations

For the purposes of this I-ETS the following abbreviations apply:

AD	Administration Plane
AOC-D	Advice Of Charge During call
AOC-E	Advice Of Charge at the End of call
ATS	Abstract Test Suite
BV	Valid behaviour
CA	Capability tests
Ci	Control Plane state i
CLIR	Calling Line Identification Restriction
CO	Control Plane
DA	Data transfer
DDI	Direct Dialling In
DI	Disconnection
ED	Exchange Mechanism (DOS)
ED	Expedited Data
EU	Exchange Mechanism (Unix)
EW	Exchange Mechanism (Windows)
IC	Incoming Call establishment
ICS	Implementation Conformance Statement
ISDN	Integrated Services Digital Network
IUT	Implementation Under Test
IV	Invalid behaviour
IXIT	Implementation eXtra Information for Testing
NAF	Network Access Facility
NC	NAF co-ordination
NCO	Network Connection Object

NCOID	NCO Identifier
NMA	Network layer Message Access
NUi	User Plane state i in case of NAF co-ordination
OC	Outgoing Call establishment
OP	Optional
PC	PUF co-ordination
PCI	Programming Communication Interface
PCTR	Protocol Conformance Test Report
PP	Euro-ISDN PCI PUF
PUF	PCI User Facility
PUi	User Plane state i in case of PUF co-ordination
RE	Reset
TE	Terminal Equipment
TMA	Transparent Message Access
TP	Test Purpose
TSS	Test Suite Structure
TSS&TP	Test Suite Structure & Test Purposes
TTCN	Tree and Tabular Combined Notation
US	User Plane

4 Coverage

In this first version, only the most important parts of ETS 300 325 [1] are covered and other parts have been ignored. These parts are described below. Moreover, the final test campaign should be limited to a duration of one day. This implies that some choices were necessary which are outlined below.

4.1 What is covered?

All mandatory conformance requirements in ETS 300 325 [1] are covered, except the Exchange Mechanism. The purposes cover the following parts of the ETS:

- Administration Plane (class 1);
- Control Plane (class 1);
- User Plane (ISO/IEC 8208 [3], ETS 300 080 [4], ITU-T Recommendation T.70, NULL, ETS 300 325 [1]: Transparent Message Access (TMA)).

The TPs do not cover the following parts of ETS 300 325 [1]:

- Exchange Mechanism;
- Administration Plane (classes 2, 3);
- Control Plane (classes 2, 3, 4, 5, 6).

4.2 Choices for coverage

Because of the nature of conformance testing, everything cannot be fully tested. In addition, because of the limitation on the time required for execution of the test suite, further choices have been made.

All messages and all mandatory parameters for the elements of the ETS 300 325 [1] listed above, are tested. Some of the optional functions are tested, i.e. in the Exchange Mechanism.

Not all optional parameters have been tested in all of the messages where they are optional, instead a representative sample has been tested where use of the parameter is most likely to occur, e.g. the Facility parameter which deals with charging information is tested in the CConnectReq message and not in the CAAlertReq message.

In addition, the optional Control Plane parameters are tested in the context of the use of supplementary services, if possible. Also more testing is performed in the PUF to NAF direction than in the direction from NAF to PUF because the behaviour of the PUF at the interface can be observed and assigned final verdicts. All parameters relevant for covered parts of ETS 300 325 [1], described in the previous subclause, are tested at least once.

4.3 Invalid behaviour coverage

Although the behaviour of the PUF on receiving messages which are invalid e.g. mandatory parameter missing, is not specified in ETS 300 325 [1], a limited number of tests are included in order to check the operation of the PUF. Because ETS 300 325 [1] does not specify how the PUF shall react to such messages, the verdicts from these tests may only be INCONCLUSIVE or PASS. This topic is further explained in a later clause.

5 Testability of the PUF

The lower interface of the PUF is defined in ETS 300 325 [1], i.e. it is the interface with a NAF, therefore behaviour at this interface can be both controlled and observed without any difficulty. Since PUFs are application specific, they may vary a lot in their actual implementation. The upper interface of the PUF is not specified in ETS 300 325 [1] and is a high level interface, e.g. a human interface. The nature of this interface makes testing of the PUF difficult because of the problems observing and controlling the behaviour of the PUF here.

Control

Where control of the upper interface is necessary in order to initiate some action, the means of control shall be stated in the IXIT in answer to a specific question. The control shall be by means of an implicit send statement in the test case. Control shall be necessary when the PUF is the initiator of some action, e.g. to initiate a user connection the IXIT asks: how does the IUT send a U3ConnectReq message in order to initiate an outgoing user connection?

Observation

Where observation of the upper interface is necessary in order to assign a verdict, the behaviour which should be observed is stated in the IXIT in answer to a specific question, e.g. how does the IUT react on receiving a CConnectCnf message in state 1? In such a case, behaviour at the lower interface cannot be used to assign the verdict because nothing observable occurs here (e.g. an internal change of NCO state is not observable). This verdict shall be assigned by the test suite operator. If the observation is not that specified in the IXIT, then the only possible verdict shall be an INCONCLUSIVE verdict, as a FAIL verdict cannot be assigned because the PUF has not failed to meet what is stated in ETS 300 325 [1].

Although it may not be normal practice to rely on observations at such an upper interface, this was the only way found to test many of the messages of the PUF, in particular when the PUF is receiving incoming messages. Sometimes where no specific observation at the upper interface can be made the IXIT answer could be "IUT does not react", this might mean that the IUT has not crashed for example. A simple mechanism shall be provided to de-select all test cases relying on observation at the upper interface where such de-selection is deemed necessary. These test cases might be optional conformance requirements. The corresponding TPs are marked by the key word "OP" (optional).

However, in most cases, even if the result of a received message is not immediately observable at the lower interface, it is implicitly tested in TPs which deal with other messages. For example, the result of an ACreateNCOConf message is implicitly tested in Control and User Plane groups: if the IUT is able to manage these planes, this means that it understood the Network Connection Object Identifier (NCOID) parameter of the previous ACreateNCOConf. In the same way, if the capability tests for the User Plane (in PUF co-ordination case), pass in case of an outgoing call, this means that the transition to the active state in the Control Plane succeeded. When a "OP" TP is in fact covered by a TP concerning another message, this shall be indicated. This may be used as another criterion to de-select it.

6 PUF basic interconnection tests

There is no basic interconnection test group in the TSS. However, a list of basic interconnection tests is provided here. These tests may be executed on the IUT prior to execution of the test suite in order to give the IUT implementor confidence that the IUT can perform certain basic tasks. The tests have been chosen to check that the IUT can perform simple tasks on each of the three planes, i.e. create a Network Connection Object (NCO), set up a D-channel and transfer data on the B-channel. Some operations from the Exchange Mechanism are specifically included and other operations from the Exchange Mechanism are exercised in the other test cases.

PCI Message	Test case identifier
ACreateNCOReq	TP411006
ACreateNCOReq	TP411008
CConnectRsp	TP511103
CConnectReq	TP511201
CConnectCnf	TP511204
CDisconnectReq	TP511301
CDisconnectRsp	TP511305
U3ConnectInd	TP611101
U3ConnectReq	TP611201
U3DisconnectReq	TP611302
U3DataReq	TP611401
U3DataInd	TP611402
U1DataReq	TP611410
U1DataInd	TP611411

7 Test Suite Structure (TSS)

7.1 Presentation

The test suite is structured as a tree in accordance with ISO/IEC 9646 [2]. There are two main reasons for structuring the test suite as a tree. Firstly, so that part of the tree can be selected for testing, e.g. the capability tests and secondly, to be able to see clearly the type of coverage of the base standard that is provided by the test suite.

The first level of the tree is the identifier of the ETS, Euro-ISDN PCI, PUF.

The second level represents the major divisions of the ETS, i.e. the Exchange Mechanism and the three planes.

The third level represents the nature of the tests to be performed, capability tests which show a basic capability of the ETS to operate, i.e. a message containing mandatory parameters only, valid behaviour tests where some additional features are tested, i.e. optional parameters, and invalid behaviour tests where the response of the Implementation Under Test (IUT) to invalid behaviour by the tester is checked.

The fourth level represents the class of the messages.

The fifth level represents the functionality of the ETS covered by the test and is relevant only to the Control and User Planes.

The TSS is now detailed. For each branch a two/four character identifier is given as a number which shall be used to generate unique identifiers for the TPs.

First level: it is the identifier of the ETS.

Euro-ISDN PCI PUF (PP)

Second level: it represents the major divisions of the ETS, the Exchange Mechanism and the three planes:

- Exchange Mechanism (Windows) (EW) (1) **Not covered**;
- Exchange Mechanism (DOS) (ED) (2) **Not covered**;
- Exchange Mechanism (Unix) (EU) (3) **Not covered**;
- Administration Plane (AD) (4);
- Control Plane (CO) (5);
- User Plane (US) (6).

Third level: the nature of the tests to be performed:

capability tests (CA) (1);

valid behaviour tests (BV) (2);
invalid behaviour tests (IV) (3).

Fourth level: the class of the messages. This level is not relevant for the Exchange Mechanism.

class 1 (C1) (1);
class 2 (C2) (2) **Not covered**;
class 3 (C3) (3) **Not covered**;
class 4 (C4) (4) **Not covered**;
class 5 (C5) (5) **Not covered**;
class 6 (C6) (6) **Not covered**.

Fifth level: a functionality of the standard covered by the class (depending on the class).

For Control Plane class 1:

incoming call establishment (IC) (1);
outgoing call establishment (OC) (2);
disconnection (DI) (3).

For the User Plane class 1: groups about incoming and outgoing calls establishment are duplicated, one for PUF co-ordination and one NAF co-ordination (for more details see clause 8). They have the same digit as identifier, but the type of co-ordination shall be indicated in brackets, at the end of TP identifiers:

incoming call establishment, PUF co-ordination (ICPC) (1 [P]);
incoming call establishment, NAF co-ordination (ICNC) (1 [N]);
outgoing call establishment, PUF co-ordination (OCPC) (2 [P]);
outgoing call establishment, NAF co-ordination (OCNC) (2 [N]);
disconnection (DI) (3);
data transfer (DA) (4);
expedited data (ED) (5);
reset (RE) (6).

7.2 Coverage

This subclause indicates the number of TPs per level.

First level:

Euro-ISDN PCI PUF: 99.

Second level:

- Administration Plane: 31;
- Control Plane: 32;
- User Plane: 36.

Third level:

capability tests: 51;
valid behaviour tests: 42;
invalid behaviour tests 6.

Fourth level: not relevant for coverage aspects.

Fifth level: a functionality of the standard covered by the class (depending on the class).

For Control Plane class 1:

incoming call establishment: 4;
outgoing call establishment: 17;
disconnection: 8.

For the User Plane class 1:

incoming call establishment: 3;
outgoing call establishment: 8;
disconnection: 4;
data transfer: 13;
expedited data: 2;
reset: 4.

NOTE: There are 22 (OP) TPs.

8 Guidelines used for TP generation

8.1 Writing approach

In writing the TPs, a uniform approach has been adopted, in order to facilitate their understanding. Common phrases are used throughout all TPs, depending on two cases:

- for the TPs where the IUT is the initiator, i.e. control on the upper interface (e.g. test operator action):
 - ensure that the IUT in < initial state>,
in order to <goal>,
<observable- action1>.
- for the TPs where the IUT is not the initiator, i.e. control on the lower interface (message from the NAF):
 - ensure that the IUT in < initial state>,
on receiving <message>,
<observable-action2>.

initial state ::= Ci | PU_i |< and additional information> (see below for more details)

goal ::= e.g. initiate an outgoing call ...

observable-action1 ::= <send action>

observable-action2 ::= <send action> | <react action>

send action ::= sends <message> (lower interface observation)

react action ::= reacts as stated in IXIT.pper interface observation)

message ::= <message name> message [containing <parameter name> parameter with <field name> encoded as <value>]

EXAMPLE: Ensure that the IUT in state C0, in order to initiate an outgoing call activating the Advice Of Charge at the End of the call (AOC-E) supplementary service, sends a CConnectReq message containing the Facility parameter with a FacilityTag field encoded as chargingend and no FacilityValue field.

Remarks about initial state:

- whenever it is written that the IUT is in state CX, this in fact means that the NCO connection is in state CX. Since there are state diagrams described for both the Control Plane and the User Plane and the same numbers are used in both diagrams, states of the Control Plane are prefixed with a 'C', e.g. Control Plane, and states of the User Plane are prefixed with a "U", e.g. U4. When it is necessary to distinguish PUF co-ordination and NAF co-ordination cases, they are prefixed by "PU" or "NU", e.g. PU1 is state 1 where PUF co-ordination is present and NU2 is state 2 where NAF co-ordination is present;

- only the state of the tested plane is mentioned. The state of other relevant planes are implicit. For example, if the initial state of a TP concerning an outgoing call on the Control Plane is Control Plane (Control Plane, idle), it is implicit that on the Administration Plane, a NCO with the relevant CDirection was created. For the PUF co-ordination User Plane tests, it is implicit that the Control Plane is in the active state.

8.2 TP identifiers

The following convention is used to give unique identifiers to the TPs:

TPabcdxy - where a, b, c and d correspond to the digits associated with each branch of the TSS:

a for the second level of the TSS tree;
b for the third level of the TSS tree;
c for the fourth level of the TSS tree;
d for the fifth level of the TSS tree;
xy for two digit identifier.

NOTE: When a level is not relevant, 0 is used.

EXAMPLE: TP511213. This TP is the 13th test belonging to the PP/CO/CA/C1/OC group. The code of this group expands out to:

PCI PUF/CO/CA/class 1/Outgoing Call.

9 User Plane tests

PUF co-ordination and NAF co-ordination cases are treated separately, except for capability tests about connection establishment. For these tests, the co-ordination notion is important. For the others TPs, the aim is to test messages or parameters for which the co-ordination type is not important. This is why, in that case, the TPs are not duplicated.

NOTE: When a TP is not duplicated, only one test case exists in the ATS. The preamble executed differs according to the co-ordination type, and is chosen according to a global variable.

10 Test Purposes

This clause contains the TPs, presented according to the TSS described previously.

10.1 PP/AD (Administration Plane)

Test group objective: To check the use of the Administration Plane messages by the IUT.

Subgroups:

- CA (capability);
- BV (valid behaviour);
- IV (invalid behaviour).

10.1.1 PP/AD/CA (capability tests)

Test group objective: To check the capability of the IUT to use Administration Plane messages, in order to manage NCOs.

Subgroup: Only class 1 is treated:

- C1 (class 1).

10.1.1.1 PP/AD/CA/C1 (class 1)

Test group objective: To check the capability of the IUT to use Administration Plane class 1 messages.

Test Purposes:

TP411001 (reference ETS 300 325 [1], subclause 6.2.1).

key words: ACreateNCOReq, C.

Ensure that the IUT, in order to request creation of an NCO of type C, sends an ACreateNCOReq message containing an NCOType parameter with an Identifier encoded as cset.

TP411002 (reference ETS 300 325 [1], subclause 6.2.1).

key words: ACreateNCOReq, C/U1.

Ensure that the IUT, in order to request creation of an NCO of type C/U1 (TMA), sends an ACreateNCOReq message containing an NCOType parameter with an Identifier encoded as s1u1set.

TP411003 (reference ETS 300 325 [1], subclause 6.2.1).

keywords: ACreateNCOReq, NCOType, C/U3.

Ensure that the IUT, in order to request creation of an NCO of type C/U3, sends an ACreateNCOReq message containing an NCOType parameter with an Identifier encoded as s1/u3set.

TP411004 (reference ETS 300 325 [1], subclause 6.2.1).

keywords: ACreateNCOReq, NCOType, U3.

Ensure that the IUT, in order to request creation of an NCO of type U3, sends an ACreateNCOReq message containing an NCOType parameter with an Identifier encoded as u3set.

TP411005 (reference ETS 300 325 [1], subclause 6.2.1).

keywords: ACreateNCOReq, NCOType, U3G.

Ensure that the IUT, in order to request creation of an NCO of type U3G, sends an ACreateNCOReq message containing an NCOType parameter with an Identifier encoded as u3group and a GroupID parameter of a previously created NCO.

TP411006 (reference ETS 300 325 [1], subclause 6.7.1).

keywords: AcreateNCOReq, CDirection, incoming.

Ensure that the IUT, in order to be able to receive an incoming call, sends an ACreateNCOReq message, containing a UDirection parameter with Direction field encoded as listen or both, and/or containing a CDirection parameter with Direction field encoded as listen or both.

TP411007 (reference ETS 300 325 [1], subclause 6.7.1).

keywords: AcreateNCOReq, UDirection, UDirection, incoming.

Ensure that the IUT, in order to be able to receive an incoming call, sends an ACreateNCOReq message, containing a CDirection parameter with Direction field encoded as listen or both.

TP411008 (reference ETS 300 325 [1], subclause 6.7.1).

keywords: AcreateNCOReq, CDirection, outgoing.

Ensure that the IUT, in order to be able to initiate outgoing call, sends an ACreateNCOReq message, containing a CDirection parameter with Direction field encoded as call or both.

TP411009 (reference ETS 300 325 [1], subclause 6.7.1).

keywords: AcreateNCOReq, UDirection, outgoing.

Ensure that the IUT, in order to be able to initiate outgoing user connection, sends an ACreateNCOReq message, containing a UDirection parameter with Direction field encoded as call or both.

TP411010 (reference ETS 300 325 [1], subclause 6.2.4).

keywords: ADestroyNCOReq.

Ensure that the IUT, in order to destroy an NCO, sends an ADestroyNCOReq message containing the correct NCROID parameter.

TP411011 (reference ETS 300 325 [1], subclause 6.2.5)(OP).

keywords: ADestroyNCOCnf.

Ensure that the IUT, after having sent a ADestroyNCOReq message containing a NCROID, on receiving an ADestroyNCOCnf message containing the same NCROID, reacts as stated in IXIT.

TP411012 (reference ETS 300 325 [1], subclause 6.2.7).

keyword: AGetNCOInfoReq.

Ensure that the IUT, in order to get information about an NCO, sends an AGetNCOInfoReq message containing the correct NCoid

TP411013 (reference ETS 300 325 [1], subclause 6.2.8) (OP).

keyword: AGetNCOInfoCnf.

Ensure that the IUT, on receiving an AGetNCOInfoCnf message in response to a previously sent AGetNCOInfoReq message, reacts as stated in the IXIT.

10.1.2 PP/AD/BV (valid behaviour)

Test group objective: To check the use of Administration Plane messages by the IUT, in specific conditions, e.g. parameter variation.

Subgroups: Only class 1 is treated:

- C1 (class 1).

10.1.2.1 PP/AD/BV/C1 (class 1)

Test group objective: To check the use of Administration Plane class 1 messages by the IUT, in specific conditions, e.g. parameter variation.

Test Purposes:

TP421001 (reference ETS 300 325 [1], subclause 6.2.1, table 10).

keywords: ACreateNCOREq, RequestID.

Ensure that the IUT, in order to request creation of an NCO indicating a RequestID, sends an ACreateNCOREq message containing a RequestID parameter.

TP421002 (reference ETS 300 325 [1], subclause 6.2.1, table 10).

key words: ACreateNCOREq, CAttribute.

Ensure that the IUT, in order to request creation of an NCO indicating the CAttribute, sends an ACreateNCOREq message containing a CAttributeName parameter or (XOR) a CAttribute parameter.

TP421003 (reference ETS 300 325 [1], subclause 6.2.1, table 10).

key words: ACreateNCOREq, UAttribute.

Ensure that the IUT, in order to request creation of an NCO indicating the UAttribute, sends an ACreateNCOREq message containing a UAttributeName parameter or (XOR) a UAttribute parameter.

TP421004 (reference ETS 300 325 [1], subclause 6.2.1, table 10).

keywords: ACreateNCOREq, CAddress.

Ensure that the IUT, in order to request creation of an NCO indicating the C address, sends an ACreateNCOREq message containing a CAddress parameter.

TP421005 (reference ETS 300 325 [1], subclause 6.2.1, table 10).

keywords: ACreateNCOREq, UAddress.

Ensure that the IUT, in order to request creation of an NCO indicating the user address, sends an ACreateNCOREq message containing a UAddress parameter.

TP421006 (reference ETS 300 325 [1], subclause 6.2.1).

key words: ACreateNCOREq, Several.

Ensure that the IUT, in order to create 2 NCOs to be able to handle 2 connections, sends 2 ACreateNCOREq messages.

TP421007 (reference ETS 300 325 [1], subclause 5.7, 6.2.1).

key words: ACreateNCOREq, SelectorId.

Ensure that the IUT, in order to create 2 NCOs with the same SelectorId, sends a ACreateNCOREq message with a SelectorId parameter and sends a ACreateNCOREq message with the same SelectorId.

TP421008 (reference ETS 300 325 [1], subclause 6.2.1).

key words: ACreateNCOReq, NMA, ISO/IEC 8208 [3].

Ensure that the IUT, in order to create an NCO permitting an ISO/IEC 8208 [3] connection, sends an ACreateNCOReq message containing a UAttribute parameter with U3protocol encoded as ISO/IEC 8208 [3].

TP421009 (reference ETS 300 325 [1], subclause 6.2.1).

key words: ACreateNCOReq, NMA, ETS 300 080 [4].

Ensure that the IUT, in order to create an NCO permitting an ETS 300 080 [4] connection, sends an ACreateNCOReq message containing a UAttribute parameter with U3protocol encoded as ETS 300 080 [4] or an AttributeName parameter encoded as U_TELEMATIC_TERM.

TP421010 (reference ETS 300 325 [1], subclause 6.2.1).

key words: ACreateNCOReq, NMA, T.70.

Ensure that the IUT, in order to create an NCO permitting an ISO/IEC 8208 [3] connection, sends an ACreateNCOReq message containing a UAttribute parameter with U3protocol encoded as T.70.

TP421011 (reference ETS 300 325 [1], subclause 6.2.1).

key words: ACreateNCOReq, NMA, NULL.

Ensure that the IUT, in order to create an NCO permitting an connection with a NULL layer 3 protocol, sends an ACreateNCOReq message containing a UAttribute parameter with U3protocol encoded as NULL.

TP421012 (reference ETS 300 325 [1], subclause 6.2.1, table 10).

keywords: ACreateNCOReq, NCOType, C, prohibited parameters.

Ensure that the IUT, in order to request creation of an NCO of type C, sends an ACreateNCOReq message, containing no UAttributeName, no UAttribute parameters, no UAddress parameters, no GroupID.

TP421013 (reference ETS 300 325 [1], subclause 6.2.1, table 10).

key words: ACreateNCOReq, C/U1, prohibited parameters.

Ensure that the IUT, in order to request creation of an NCO of type C/U1 (TMA), sends an ACreateNCOReq message containing no UAddress parameters, no GroupID.

TP421014 (reference ETS 300 325 [1], subclause 6.2.1, table 10).

keywords: ACreateNCOReq, NCOType, C/U3, prohibited parameters.

Ensure that the IUT, in order to request creation of an NCO of type C/U3, sends an ACreateNCOReq message containing no GroupID parameter.

TP421015 (reference ETS 300 325 [1], subclause 6.2.1, table 10).

keywords: ACreateNCOReq, NCOType, U3, prohibited parameters.

Ensure that the IUT, in order to request creation of an NCO of type U3, sends an ACreateNCOReq message containing no GroupID parameter.

TP421016 (reference ETS 300 325 [1], subclause 6.2.1, table 10).

keywords: ACreateNCOReq, NCOType, U3G, prohibited parameters.

Ensure that the IUT, in order to request creation of an NCO of type U3G, sends an ACreateNCOReq message containing no CAttributeName, no CAttribute parameters, no CAddress parameters.

TP421017 (reference ETS 300 325 [1], subclause 6.23) (OP).

keyword: ACreateNCOCnf, CompletionStatus, NAFnotAvailable.

Ensure that the IUT, on receiving an ACreateNCOCnf message containing a CompletionStatus parameter with the Status field coded as NAFnotAvailable (255), in response to a previously ACreateNCOReq sent, reacts as stated in IXIT.

10.1.3 PP/AD/IV (invalid behaviour)

Test group objective: To check the reaction of the IUT on invalid behaviour of the NAF when using Administration Plane messages. The behaviour of the IUT is not specified in ETS 300 325 [1], thus this is an 'OP' group.

Subgroups: Only one class is treated:

C1 (class 1).

10.1.3.1 PP/AD/IV/C1

Test group objective: To check the reaction of the IUT on invalid behaviour of the NAF when using Administration Plane class 1 messages. The behaviour of the IUT is not specified in ETS 300 325 [1], thus this is an 'OP' group.

Test Purposes:

TP431001 (reference ETS 300 325 [1], subclause 6.2.5) (OP).

keywords: mandatory parameter missing.

Ensure that the IUT, on receiving an ADestroyNCOCnf message without the CompletionStatus parameter, in response to a previously sent ADestroyNCOREq message, reacts as stated in IXIT.

10.2 PP/CO (Control Plane)

Test group objective: To check the use of Control Plane messages by the IUT, in order to manage ETS 300 102-1 [5] calls. These messages are used only in the PUF co-ordination case.

Subgroups:

- CA (capability);
- BV (valid behaviour);
- IV (invalid behaviour).

Selected only in PUF co-ordination case.

10.2.1 PP/CO/CA (capability tests)

Test group objective: To check the capability of the IUT to use Control Plane messages.

Subgroups: only class 1 is treated:

- C1 (class 1).

10.2.1.1 PP/CO/CA/C1 (class 1)

Test group objective: To check the capability of the IUT to use Control Plane class 1 messages.

Subgroups:

- IC (incoming);
- OC (outgoing);
- DI (disconnection).

10.2.1.1.1 PP/CO/CA/C1/IC (incoming call establishment)

Test group objective: To check the capability of the IUT to use Control Plane class 1 messages, in the case of incoming call establishment. This group deals with CConnectInd, CAlertReq and CConnectRsp messages.

Test Purposes:

TP511101 (reference ETS 300 325 [1], subclauses 6.3.2 and 6.3.5, figure 9).

key words: CConnectInd, CAlertReq.

Ensure that the IUT in state Control Plane, on receiving a CConnectInd message containing CalledNumber, CalledSubaddress, BearerCap, LLC, HLC parameters encoded as stated in IXIT, in order to indicate its compatibility with the incoming call, sends a CAlertReq message, containing the correct NCROID.

TP511102 (reference ETS 300 325 [1], subclauses 6.3.5 and 6.3.6, figure 9).

Key words: CAlertReq, C3.

Ensure that the IUT in state C3, in order to accept the incoming call, sends a CConnectRsp message, containing the correct NCROID.

TP511103 (reference ETS 300 325 [1], subclauses 6.3.5, and 6.3.6, figure 9).

Key words: CConnectInd, CConnectRsp, C0.

Ensure that the IUT in state C0, on receiving a CConnectInd message containing CalledNumber, CalledSubaddress, BearerCap, LLC, HLC parameters encoded as stated in IXIT, in order to accept the incoming call, sends a CConnectRsp message, containing the correct NCROID.

10.2.1.1.2 PP/CO/CA/C1/OC (outgoing call establishment)

Test group objective: To check the capability of the IUT to use Control Plane class 1 messages, in the case of outgoing call establishment. This group deals with CConnectReq, CAlertInd, CProgressInd and CConnectCnf messages.

Test Purposes:

TP511201 (reference ETS 300 325 [1], subclause 6.3.4, figure 9).

key words: CConnectReq.

Ensure that the IUT in state C0, in order to initiate an outgoing call, sends a CConnectReq message containing the Correct NCROID.

TP511202 (reference ETS 300 325 [1], subclause 6.3.4, figure 9).

key words: CConnectReq, CalledNumber, CalledSubaddress, BearerCap.

Ensure that the IUT in state C0, and the CalledNumber, CalledSubaddress and BearerCap parameters were not specified during NCO creation, in order to initiate an outgoing call, sends a CConnectReq message containing the CalledNumber, the CalledSubaddress, BearerCap parameters.

TP511203 (reference ETS 300 325 [1], subclause 6.3.3, figure 9) (OP).

key words: CAlertInd.

Ensure that the IUT in state C1 on a telephony call, on receiving a CAlertInd message reacts as stated in IXIT.

TP511204 (reference ETS 300 325 [1], subclause 6.3.7, figure 9) (OP: covered by PP/US/CA/C1/OCPC).

key words: CConnectCnf.

Ensure that the IUT in state C1 on a telephony call, on receiving a CConnectCnf message reacts as stated in IXIT.

TP511205 (reference ETS 300 325 [1], subclause 6.3.12, figure 9) (OP).

key words: CProgressInd.

Ensure that the IUT in state C1 on a telephony call, on receiving a CProgressInd message containing a ProgressIndicator parameter with a standard field encoded as ccitt, a location field encoded as user and Value encoded as inbandinformation, reacts as stated in IXIT.

10.2.1.1.3 PP/CO/CA/C1/DI (disconnection)

Test group objective: To check the capability of the IUT to use Control Plane class 1 messages, in the case of disconnection. This group deals with CDisconnectReq, CDisconnectCnf, CDisconnectInd, and CDisconnectRsp messages.

Test Purposes:

TP511301 (reference ETS 300 325 [1], subclause 6.3.8, figure 12).
keywords: CDisconnectReq.

Ensure that the IUT in state C4, in order to initiate a disconnection, sends a CDisconnectReq message, containing the correct NCROID.

TP511302 (reference ETS 300 325 [1], subclauses 6.3.9 and 6.3.10, figure 12).
keywords: CDisconnectInd, CDisconnectRsp, C1 state.

Ensure that the IUT in state C1, on receiving a CDisconnectInd message containing a CauseToPUF parameter with a Cause field encoded as userbusy, sends a CDisconnectRsp message containing the correct NCROID.

TP511303 (reference ETS 300 325 [1], subclauses 6.3.9 and 6.3.10, figure 12).
keywords: CDisconnectInd, CDisconnectRsp, C4 state.

Ensure that the IUT in state C4, on receiving a CDisconnectInd message containing a CauseToPUF parameter with a Cause field encoded as Normal call clearing, sends a CDisconnectRsp message containing the correct NCROID.

10.2.2 PP/CO/BV (valid behaviour)

Test group objective: To check the use of Control Plane messages by the IUT, in specific conditions, e.g. parameter variation, several connections.

Subgroups: Only class 1 is treated:

- C1 (class 1).

10.2.2.1 PP/CO/BV/C1 (class 1)

Test group objectives: To check the use of Control Plane class 1 messages by the IUT, in specific conditions.

Subgroups:

- IC (incoming call establishment);
- OC (outgoing call establishment);
- DI (disconnection).

10.2.2.1.1 PP/CO/BV/C1/IC (incoming call establishment)

Test group objectives: To check the use of Control Plane class 1 messages by the IUT, in specific conditions, in the case of incoming call establishment.

Test Purposes:

TP521101 (reference ETS 300 325 [1], subclause 6.3.5, figure 9) (OP).
keywords: CConnectInd, Display.

Ensure that the IUT in state C0, on receiving a compatible CConnectInd message containing a Display parameter encoded as "HELLO", reacts as stated in IXIT.

10.2.2.1.2 PP/CO/BV/C1/OC (outgoing call establishment)

Test group objectives: To check the use of Control Plane class 1 messages by the IUT, in specific conditions, in the case of outgoing call establishment.

Test Purposes:

TP521201 (reference ETS 300 325 [1], subclause 6.3.4, figure 9).

keywords: CConnectReq, CalledNumber, block mode, DDI.

Ensure that the IUT in state C0, in order to initiate a block mode dialling DDI outgoing call with the CalledNumber provided in the Control Plane message, sends a CConnectReq message containing the CalledNumber parameter encoded as the remote address provided by the test operator.

TP521202 (reference ETS 300 325 [1], subclause 6.3.4, figure 9).

keywords: CConnectReq, CallingNumber.

Ensure that the IUT in state C0, in order to initiate an outgoing call indicating the local address, sends a CConnectReq message containing the CallingNumber parameter with the Number field encoded as programmed by the test operator.

TP521203 (reference ETS 300 325 [1], subclause 6.3.4, figure 9, subclause 6.3.34.4).

keywords: CConnectReq, CallingNumber, CLIR.

Ensure that the IUT in state C0, in order to initiate an outgoing call overriding the default value of CLIR supplementary service by "allowed", sends a CConnectReq message containing the CallingNumber parameter with a Presentation field encoded as allowed.

TP521204 (reference ETS 300 325 [1], subclause 6.3.4, figure 9, subclause 6.3.34.5).

keywords: CConnectReq, CalledSubaddress, SUB.

Ensure that the IUT in state C0, in order to initiate an outgoing call activating the SUB supplementary service in the Control Plane message, sends a CConnectReq message containing the CalledSubaddress parameter with a Number field encoded as the remote subaddress provided by the test operator.

TP521205 (reference ETS 300 325 [1], subclause 6.3.4, figure 9).

keywords: CConnectReq, Facility, AOC-E.

Ensure that the IUT in state C0, in order to initiate an outgoing call activating the AOC-E supplementary service, sends a CConnectReq message containing the Facility parameter with a FacilityTag field encoded as chargingend and no FacilityValue field.

TP521206 (reference ETS 300 325 [1], subclause 6.3.4, figure 9).

keywords: CConnectReq, Facility, AOC-D.

Ensure that the IUT in state C0, in order to initiate an outgoing call with activating the AOC-D supplementary service, sends a CConnectReq message containing the Facility parameter with a FacilityTag field encoded as chargingduring and no FacilityValue field.

TP521207 (reference ETS 300 325 [1], subclause 6.3.4, figure 9).

keywords: CConnectReq, LLC, HLC.

Ensure that the IUT in state C0, in order to initiate an outgoing call with LLC and HLC provided in CConnectReq message, sends a CConnectReq message containing the LLC and HLC parameters.

TP521208 (reference ETS 300 325 [1], subclause 6.3.4).

key words: CConnectReq, several.

Ensure that the IUT, in state C0 for 2 NCOIDs, in order to initiate 2 outgoing calls, sends a CConnectReq message containing an NCOID parameter encoded as one the NCOIDs, and sends a CConnectReq message containing an NCOID parameter encoded as the other NCOID.

TP511209 (reference ETS 300 325 [1], subclause 6.3.4, figure 9).

key words: CConnectReq, override NCO CalledNumber, CalledSubaddress, BearerCap.

Ensure that the IUT in state C0, and the CalledNumber, CalledSubaddress and BearerCap parameters were specified during NCO creation, in order to initiate an outgoing call overriding the CalledNumber, CalledSubaddress and BearerCap parameters specified during NCO creation, sends a CConnectReq message containing the CalledNumber, the CalledSubaddress, BearerCap parameters.

TP521210 (reference ETS 300 325 [1], subclause 6.3.4, figure 9).

keywords: CConnectReq, ChannelIdentification.

Ensure that the IUT in state C0, in order to initiate an outgoing call with ChannelIdentification provided in CConnectReq message, sends a CConnectReq message containing the ChannelIdentification parameter.

TP521211 (reference ETS 300 325 [1], subclause 6.3.4, figure 9).

keywords: CConnectReq, keypad.

Ensure that the IUT in state C0, in order to initiate an outgoing call with keypad facility provided in CConnectReq message, sends a CConnectReq message containing the Keypad parameter typed by the test operator.

TP521212 (reference ETS 300 325 [1], subclause 6.3.4, figure 9).

keywords: CConnectReq, UserToUserInfo.

Ensure that the IUT in state C0, in order to initiate an outgoing call with user to user information provided in CConnectReq message, sends a CConnectReq message containing the UserToUserInfo parameter.

10.2.2.1.3 PP/CO/BV/C1/DI (disconnection)

Test group objective: To check the use of Control Plane class 1 messages by the IUT, in specific conditions in the case of disconnection.

Test Purposes:

TP521301 (reference ETS 300 325 [1], subclauses 6.3.5 and 6.3.9, figure 12, subclause 6.8.6, table 31).

keywords: CDisconnectReq, CConnectInd, CauseToNAF.

Ensure that the IUT in state C0, on receiving a CConnectInd message containing an incompatible HLC parameter, in order to indicate that it refuses the incoming call because the destination incompatible, sends a CDisconnectReq message, containing the CauseToNAF parameter with Cause field encoded as incompatible destination.

TP521302 (reference ETS 300 325 [1], subclauses 6.3.5 and 6.3.9, figure 12, subclause 6.8.6, table 31).

keywords: CDisconnectInd, CDisconnectReq, CauseToNAF.

Ensure that the IUT in state C0, on receiving a CConnectInd message, in order to indicate that the incoming call is rejected, sends a CDisconnectReq message, containing the CauseToNAF parameter with Cause field encoded as CallRejected.

TP521303 (reference ETS 300 325 [1], subclause 6.3.8, figure 12, subclause 6.8.6, table 31).

keywords: CDisconnectReq.CauseToNAF.

Ensure that the IUT in state C4, in order to initiate a disconnection indicating that it is a normal one, sends a CDisconnectReq message, containing the CauseToNAF parameter with Cause field encoded as normal call clearing.

TP521304 (reference ETS 300 325 [1], subclause 6.3.11, figure 12) (OP).

keywords: CDisconnectCnf.Facility, AOC-E.

Ensure that the IUT in state C5, on receiving a CDisconnectCnf message containing the Facility parameter with FacilityTag field encoded as charginginfo and with FacilityValue field with TypeOfTotal subfield encoded as total, the TypeOfCharge subfield encoded as unitinfo, and the Value subfield encoded as 33.0, reacts as stated in IXIT.

TP521305 (reference ETS 300 325 [1], subclause 6.3.11, figure 12).

keywords: CDisconnectCnf, state C0.

Ensure that the IUT in state C5, on receiving a CDisconnectCnf message, enters state C0 (i.e. the same NCOID can be reused for a new incoming or outgoing call).

10.2.3 PP/CO/IV (Invalid behaviour tests)

Test group objective: To check the reaction of the IUT on invalid behaviour of the NAF when using Control Plane messages. The behaviour of the IUT is not specified in ETS 300 325 [1], thus this is an 'OP' group.

Subgroups: Only class 1 is treated:

- C1 (class 1).

10.2.3.1 PP/CO/IV/C1 (class 1)

Test Purposes:

TP531001 (no reference) (OP).

key words: Inopportune.

Ensure that the IUT in state C1, on receiving a CConnectInd message reacts as stated in IXIT.

TP531002 (no reference)(OP).

keywords: mandatory parameter content error.

Ensure that the IUT in state C1, on receiving a CConnectCnf message with NCOID parameter with Value field encoded as a non-existent NCOID, reacts as stated in IXIT.

TP531003 (no reference) (OP).

keywords: mandatory parameter missing.

Ensure that the IUT in state C4, on receiving a CDisconnectInd message without CauseToPUF parameter, reacts as stated in IXIT.

10.3 PP/US (User Plane)

Test group objective: To check the use of User Plane messages by the IUT, in order to manage user connections.

NOTE: The PUF co-ordination group implicitly tests the state C4 (active) of the Control Plane, because User Plane messages can only be managed if the Control Plane is in this state.

Subgroups:

- CA (capability);
- BV (valid behaviour);
- IV (invalid behaviour).

10.3.1 PP/US/CA (capability)

Test group objective: To check the capability of the IUT to use User Plane messages in order to manage user connections.

Subgroups: There is only one class in the User Plane:

- C1 (class 1).

10.3.1.1 PP/US/CA/C1 (class 1)

Test group objectives: To check the capability of the IUT to use User Plane class 1 messages, in order to manage ISO/IEC 8208 [3] connections.

Subgroups:

- incoming call establishment, PUF co-ordination (ICPC);
- incoming call establishment, NAF co-ordination (ICNC);
- outgoing call establishment, PUF co-ordination (OCPC);
- outgoing call establishment, NAF co-ordination (OCNC);
- disconnection (DI);
- data transfer (DA);
- expedited data (ED);
- reset (RE).

10.3.1.1.1 PP/US/CA/C1/ICPC (incoming connection PUF co-ordination)

Test group objective: To check the capability of the IUT to use User Plane class 1 messages, in order to answer an incoming user connection, in the case of PUF co-ordination. This group deals with U3ConnectInd and U3ConnectRsp messages.

Test Purposes:

TP611101[P] (reference ETS 300 325 [1], subclause 6.4.4, figure 13).

keywords: U3ConnectInd, U3ConnectRsp.

Ensure that the IUT in state PU1, on receiving a U3ConnectInd message containing a PacketSize parameter and a WindowSize parameter encoded, in order to accept the connection, sends a U3ConnectRsp message.

10.3.1.1.2 PP/US/CA/C1/ICNC (incoming connection NAF co-ordination)

Test group objective: To check the capability of the IUT to use User Plane class 1 messages, in order to answer an incoming user connection, in the case of NAF co-ordination. This group deals with U3ConnectInd and U3ConnectRsp messages.

Test Purposes:

TP611101[N] (reference ETS 300 325 [1], subclause 6.4.4, figure 13).

keywords: U3ConnectInd, U3ConnectRsp.

Ensure that the IUT in state NU1, on receiving a U3ConnectInd message containing a PacketSize parameter and a WindowSize parameter encoded, in order to accept the connection, sends a U3ConnectRsp message.

10.3.1.1.3 PP/US/CA/C1/OCPC (outgoing connection, PUF co-ordination)

Test group objective: To check the capability of the IUT to use User Plane class 1 messages, in order to initiate an user connection, in the case of PUF co-ordination. This group deals with U3ConnectReq and U3ConnectCnf messages.

Test Purposes:

TP611201[P] (reference ETS 300 325 [1], subclause 6.4.3, figure 13).

keywords: U3ConnectReq.

Ensure that the IUT in state PU1, in order to initiate the establishment of a user connection,, sends a U3ConnectReq message containing the correct NCOID.

TP611202[P] (reference ETS 300 325 [1], subclause 6.4.6, figure 13).

keywords: U3ConnectCnf.

Ensure that the IUT in state PU2, on receiving a U3ConnectCnf message containing a PacketSize parameter and a WindowSize parameter encoded, enters state U4 (i.e. data transfer may proceed).

10.3.1.1.4 PP/US/CA/C1/OCNC (outgoing connection NAF co-ordination)

Test group objective: To check the capability of the IUT to use User Plane class 1 messages, in order to initiate an user connection, in the case of NAF co-ordination. This group deals with U3ConnectReq and U3ConnectCnf messages.

Test Purposes:

TP611201[N] (reference ETS 300 325 [1], subclause 6.4.3, figure 13).

keywords: U3ConnectReq.

Ensure that the IUT in state NU1, in order to initiate the establishment of a user connection,, sends a U3ConnectReq message containing the correct NCOID.

TP611202[N] (reference ETS 300 325 [1], subclause 6.4.6, figure 13).

keywords: U3ConnectCnf.

Ensure that the IUT in state NU2, on receiving a U3ConnectCnf message containing a PacketSize parameter and a WindowSize parameter encoded, enters state U4 (i.e. data transfer may proceed).

10.3.1.1.5 PP/US/CA/C1/ DI(disconnection)

Test group objective: To check the capability of the IUT to use User Plane class 1 messages, in order to disconnect an user connection. This group deals with U3DisconnectReq and U3DisconnectInd messages.

Test Purposes:

TP611301 (reference ETS 300 325 [1], subclause 6.4.7, figure 13).

keyword: U3DisconnectReq.

Ensure that the IUT in state U4, in order to remove a user connection,, sends a U3DisconnectReq message containing the correct NCOID.

TP611302 (reference ETS 300 325 [1], subclause 6.4.8, figure 13) (OP).

keyword: U3DisconnectInd, U2 state.

Ensure that the IUT in state U2, on receiving a U3DisconnectInd message, reacts as stated in IXIT.

TP611303 (reference ETS 300 325 [1], subclause 6.4.8, figure 13) (OP).

keyword: U3DisconnectInd, U4 state.

Ensure that the IUT in state U4, on receiving a U3DisconnectInd message, reacts as stated in IXIT.

10.3.1.1.6 PP/US/CA/C1/DA (data)

Test group objective: To check the capability of the IUT to use User Plane class 1 messages, in order to transfer data on an user connection. This group deals with U3DataReq, U3DataInd, U3DataAcknowledgeReq, U3DataAcknowledgeInd, U3ReadyToReceiveReq, U3ReadyToReceiveInd, U1DataReq, U1DataInd and U1ErrorInd messages.

Test Purposes:

TP611401 (reference ETS 300 325 [1], subclause 6.4.9, figure 13).

keywords: U3DataReq.

Ensure that the IUT in state U4, in order to send a data packet, sends a U3DataReq message containing the correct NCOID and data packet in data buffer.

TP611402 (reference ETS 300 325 [1], subclause 6.4.10) (OP).

keywords: U3DataInd.

Ensure that IUT in state U4, on receiving a U3DataInd message, reacts as stated in IXIT.

TP611403 (reference ETS 300 325 [1], subclauses 6.4.10 and 6.4.17).

keywords: U3DataInd, U3DataAcknowledgeReq.

Ensure that the IUT in state U4, on a connection with receipt confirmation in use, on receiving a U3DataInd message containing a Bit_DQM parameter with DQM field with bit 1 (D bit) encoded as Confirmation required and with bit 3 (M bit) encoded as reset, sends a U3DataAcknowledgeReq message containing a the correct NCOID parameter.

TP611404 (reference ETS 300 325 [1], subclauses 6.4.10 and 6.4.18) (OP).

keywords: U3DataAcknowledgeInd.

Ensure that the IUT in state U4 for an outgoing connection with receipt confirmation in use, after having sent a U3DataReq message containing a Bit_DQM parameter with DQM field with bit 1 (D bit) encoded as Confirmation required and with bit 3 (M bit) encoded as reset, on receiving U3DataAcknowledgeInd message, reacts as stated in IXIT.

TP611405 (reference ETS 300 325 [1], subclause 6.4.19).

keywords: U3ReadyToReceiveReq, ReadyFlag, TRUE.

Ensure that the IUT in state U4 for an incoming connection, in order to indicate to the NAF it can accept incoming data, sends a U3ReadyToReceiveReq message containing the correct NCOID parameter and a ReadyFlag parameter with Usage field encoded as TRUE.

TP611406 (reference ETS 300 325 [1], subclause 6.4.19).

keywords: U3ReadyToReceiveReq, ReadyFlag, FALSE.

Ensure that the IUT in state U4, in order to indicate to the NAF it cannot accept incoming data, sends a U3ReadyToReceiveReq message containing the correct NCOID parameter and a ReadyFlag parameter with Usage field encoded as FALSE.

TP611407 (reference ETS 300 325 [1], subclause 6.4.20).

keywords: U3ReadyToReceiveInd.

Ensure that the IUT in state U4, on receiving U3ReadyToReceiveInd message containing a ReadyFlag parameter with Usage field encoded as FALSE, sends no more U3DataReq messages.

TP611408 (reference ETS 300 325 [1], subclause 6.4.20).

keywords: U3ReadyToReceiveInd.

Ensure that the IUT in state U4, on receiving U3ReadyToReceiveInd message containing a ReadyFlag parameter with Usage field encoded as TRUE, sends a U3DataReq message if it has something to transfer.

TP611409 (reference ETS 300 325 [1], subclause 6.4.24) (OP).

keywords: U3ErrorInd.

Ensure the IUT in state U4, on receiving U3ErrorInd message containing CompletionStatus parameter with Status field encoded as overflow, reacts as stated in IXIT.

TP611410 (reference ETS 300 325 [1], subclause 6.4.22).

keywords: U1DataReq.

Ensure the IUT after having established a TMA connection on the Control Plane, in order to send transparent data on the B-channel, sends a U1DataReq message containing correct NCOID and data in data buffer.

TP611411 (reference ETS 300 325 [1], subclause 6.4.23) (OP).

keywords: U1DataInd.

Ensure the IUT after a TMA connection is established on the Control Plane, on receiving U1DataInd message, reacts as stated in IXIT.

TP611412 (reference ETS 300 325 [1], subclause 6.4.24) (OP).

keywords: U1ErrorInd.

Ensure the IUT after a TMA connection is established on the Control Plane, on receiving U1ErrorInd message containing CompletionStatus parameter with Status field encoded as overflow, reacts as stated in IXIT.

10.3.1.1.7 PP/US/CA/C1/ED (expedited data)

Test group objective: To check the capability of the IUT to use User Plane class 1 messages, in order to manage expedited data on a user connection. This group deals with U3ExpeditedDataReq and U3ExpeditedDataInd messages.

Test Purposes:

TP611501 (reference ETS 300 325 [1], subclause 6.4.11, figure 13).

keyword: U3ExpeditedDataReq.

Ensure that the IUT in state U4 and the use of expedited data is allowed for this connection, in order to send expedited data, sends a U3ExpeditedDataReq message containing the correct NCOID and a UerData parameter.

TP611502 (reference ETS 300 325 [1], subclause 6.4.12, figure 13) (OP).

keyword: U3ExpeditedDataInd.

Ensure that the IUT in state U4, and the use of expedited data is allowed for this connection, on receiving a U3ExpeditedDataInd message, reacts as stated in IXIT.

10.3.1.1.8 PP/US/CA/C1/RE (Reset)

Test group objective: To check the capability of the IUT to use User Plane class 1 messages, in order to manage the reset of an user connection. This group deals with U3ResetReq, U3ResetRsp, U3ResetInd, U3ResetCnf messages.

Test Purposes:

TP611601 (reference ETS 300 325 [1], subclause 6.4.13, figure 13).

keywords: U3ResetReq.

Ensure that the IUT in state U4, in order to reset a user connection, sends a U3ResetReq message containing the correct NCOID.

TP611602 (reference ETS 300 325 [1], subclause 6.4.16, figure 13).

keywords: U3ResetCnf, state U4.

Ensure that the IUT in state U5, on receiving a U3ResetCnf message, enters in state U4 (i.e. data transfer may proceed).

TP611603 (reference ETS 300 325 [1], subclauses 6.4.14 and 6.4.15, figure 13).

keywords: U3ResetInd, U3ResetRsp.

Ensure that the IUT in state U4, on receiving a U3ResetInd message, in order to indicate that it has dealt with the reset and is ready to proceed, sends an U3ResetRsp containing the correct NCOID.

TP611604 (reference ETS 300 325 [1], subclauses 6.4.14 and 6.4.15, figure 13).

keywords: U3ResetInd, U3ResetRsp, state U4.

Ensure that the IUT in state U4, on receiving a U3ResetInd message, after having sent and U3ResetRsp message, enters in state U4 (i.e. data transfer may proceed).

10.3.2 PP/US/BV (valid behaviour)

Test group objective: To check the use of User Plane messages by the IUT, in specific valid conditions.

Subgroups: There is only one class in the User Plane.

10.3.2.1 PP/US/BV/C1 (class 1)

Test group objective: To check the use of User Plane class 1 messages by the IUT, in specific valid conditions.

Subgroups:

- IC (incoming call establishment);
- OC (outgoing call establishment);
- DI (disconnection);
- DA (data transfer).

10.3.2.1.1 PP/US/BV/C1/IC (incoming call)

Test group objective: To check the use of User Plane class 1 messages by the IUT, in order to manage an incoming user connection in specific valid conditions. This group deals with U3ConnectInd and U3ConnectRsp messages.

Test Purpose:

TP621101 (reference ETS 300 325 [1], subclause 6.4.5, figure 13).

keywords: U3ConnectInd, U3ConnectRsp, PacketSize.

Ensure that the IUT in state U1, on receiving a U3ConnectInd containing PacketSize parameter encoded, sends a U3ConnectRsp message containing a new value for the PacketSize parameter.

10.3.2.1.2 PP/US/BV/C1/OC (outgoing call)

Test group objective: To check the use of User Plane class 1 messages by the IUT, in order to initiate an user connection, in specific valid conditions. This group deals with U3ConnectReq and U3ConnectCnf messages.

Test Purposes:

TP621201 (reference ETS 300 325 [1], subclause 6.4.3, figure 13).
keywords: U3ConnectReq, ReceiptConfirm.

Ensure that the IUT in state U1, in order to initiate the establishment of a user connection and request confirmation of data receipt for this user connection, sends a U3ConnectReq message containing the ReceiptConfirm parameter with Value field encoded as TRUE.

TP621202 (reference ETS 300 325 [1], subclause 6.4.3, figure 13).
keywords: U3ConnectReq, ExpeditedData.

Ensure that the IUT in state U1, in order to initiate the establishment of a user connection requesting the use of expedited data for the user connection, sends a U3ConnectReq message containing the ExpeditedData parameter with the Usage field encoded as TRUE.

TP621203 (reference ETS 300 325 [1], subclause 6.4.3, figure 13).
keywords: U3ConnectReq, FastSelect.

Ensure that the IUT in state U1, in order to initiate the establishment of a user connection to invoke the use of the Fast Select facility in the ISO/IEC 8208 [3] Call Request, sends a U3ConnectReq message containing the FastSelect parameter with the FastSelect field encoded as norestriction.

TP621204 (reference ETS 300 325 [1], subclause 6.4.3, figure 13).
keywords: U3ConnectReq, several on same B-channel.

Ensure that the IUT in state U1, for 2 NCoid grouped, in order to initiate 2 user connections sends a U3ConnectReq message for each NCoid.

10.3.2.1.3 PP/US/BV/C1/DI (disconnection)

Test group objective: To check the use of User Plane class 1 messages by the IUT, in order to manage disconnection of an user connection, in specific valid conditions. This group deals with U3DisconnectInd and U3DisconnectRsp messages.

Test Purpose:

TP621301 (reference ETS 300 325 [1], subclause 6.4.8, figure 13) (OP).
keywords: U3DisconnectInd, X213Cause.

Ensure that the IUT in state U2, on receiving a U3DisconnectInd message containing the X213Cause parameter with a Value field encoded as NoReasonPerm (228) reacts as stated in IXIT.

10.3.2.1.4 PP/US/BV/C1/DA (data)

Test group objective: To check the use of User Plane class 1 messages by the IUT, in order to manage data transfer on an user connection, in specific valid conditions. This group deals with the U3DataReq message.

Test Purpose:

TP62140 (reference ETS 300 325 [1], subclause 6.4.9, figure 13).
keywords: U3DataReq, Bit_DQM, confirmation, no more data.

Ensure that the IUT in state U4 on a connection with confirmation in used, in order to send a data packet requesting confirmation of receipt of data and indicating that there is no more data, sends a U3DataReq message containing a Bit_DQM parameter with DQM field with bit 1 (D bit) encoded as Confirmation required and bit 3 (M bit) encoded as no more data.

10.3.3 PP/US/IV (invalid behaviour)

Test group objective: To check the reaction of the IUT on invalid behaviour of the NAF when using User Plane messages. The behaviour of the IUT is not specified in the ETS, thus this is an 'OP' group.

Subgroups: There is only one class in the User Plane:

- C1 (class 1).

10.3.3.1 PP/US/IV/C1

Test group objective: To check the reaction of the IUT to invalid behaviour of the NAF when using class 1 User Plane messages.

Test Purposes:

TP631001 (reference ETS 300 325 [1], none) (OP).

keyword: inopportune.

Ensure that the IUT in state U4, on receiving a U3ResetRsp message, i.e. an inopportune message, reacts as stated in IXIT.

TP631002 (reference ETS 300 325 [1], none) (OP).

keyword: mandatory parameter missing.

Ensure that the IUT in state U2, on receiving a U3ConnectCnf message containing no PacketSize parameter, reacts as stated in IXIT.

10.4 Miscellaneous

10.4.1 Untestable Test Purposes

Error messages which occur when there is an error from the PUF.

Test Purpose:

Ensure that the IUT in every state, in receiving a CStatusInd message, remains in the same state.

Annex A (informative): Bibliography

For the purposes of this part of the I-ETS, the following recommendation has been used for information:

- 1) ITU-T Recommendation T.70 (1993): "Network-independent basic transport service for the telematic services".

History

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