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**Private Integrated Services Network (PISN);
Inter-exchange signalling protocol;
Cordless Terminal Incoming Call additional network feature
(ANF-CTMI) for the VPN b service entry point;
Part 1: Test Suite Structure and Test Purposes (TSS&TP)
specification**



Reference

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Foreword

This European Standard (Telecommunications series) has been produced by ETSI Technical Committee Signalling Protocol and Switching (SPS).

The present document covers the Private Integrated Service Network (PISN) Inter-exchange signalling protocol - Cordless Terminal Incoming Call Additional Network Feature (ANF-CTMI) - Test Suite Structure and Test Purposes (TSS&TP) specification.

The present document is part 1 of a multi-part deliverable covering Inter-exchange signalling protocol, as identified below:

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

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

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1 Scope

The present document specifies the Test Suite Structure and Test Purposes (TSS&TP) for the Cordless Terminal Incoming Call Additional Network Feature (ANF-CTMI) of the Interexchange signalling protocol for Private Integrated Services Networks (PISN).

The objective of the present document is to provide conformance tests, which give a greater probability of inter-operability. The TSS&TPs specification covers the procedures described in ETS 300 696 [5].

The ISO standard for the methodology of conformance testing (ISO/IEC 9646-1 [7], ISO/IEC 9646-2 [8] and ISO/IEC 9646-3 [9]) is used as basis for the test methodology.

The TSS&TPs specification standard is applicable for the support of the Cordless Terminal Incoming Call Additional Network Feature (ANF-CTMI) at the Q-reference point between Private Integrated Services Network Exchanges (PINXs) connected together within a PISN. The Test Suite Structure and Test Purposes specified in the present document are only intended for VPN scenarios at the "b" service entry point.

The Q-reference point is defined in ETS 300 475-1 [16].

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.

- [1] ETSI EN 300 171 (V1.2): "Private Integrated Services Network (PISN); Specification, functional models and information flows; Control aspects of circuit-mode basic services [ISO/IEC 11574 (1994) modified]".
- [2] ETSI EN 300 172 (V1.4): "Private Integrated Services Network (PISN); Inter-exchange signalling protocol; Circuit-mode basic services [ISO/IEC 11572 (1996) modified]".
- [3] ETSI ETS 300 239 (1993): "Private Telecommunication Network (PTN); Inter-exchange signalling protocol; Generic functional protocol for the support of supplementary services".
- [4] ETSI ETS 300 415 (1996): "Private Integrated Services Network (PISN); Terms and definitions".
- [5] ETSI ETS 300 696 (1996): "Private Integrated Services Network (PISN); Inter-exchange signalling protocol; Cordless Terminal Incoming Call additional network feature".
- [6] ETSI ETS 300 695 (1995): "Private Integrated Services Network (PISN); Cordless Terminal Mobility (CTM); Call handling additional network features; Functional capabilities and information flows".
- [7] ISO/IEC 9646-1 (1994): "Information technology; Open Systems Interconnection; Conformance testing methodology and framework; Part 1: General concepts".
- [8] ISO/IEC 9646-2 (1994): "Information technology; Open Systems Interconnection; Conformance testing methodology and framework; Part 2: Abstract test suite specification".
- [9] ISO/IEC 9646-3 (1992): "Information technology; Open Systems Interconnection; Conformance testing methodology and framework; Part 3: The Tree and Tabular Combined Notation (TTCN)".
- [10] ISO/IEC 11571 (1994): "Information Technology – Telecommunication and information exchange between systems – Numbering and Sub-addressing in Private Integrated Services Network".

- [11] ISO/IEC 11579-1 (1994): "Information Technology – Telecommunication and information exchange between systems – Private Integrated Services Network – Part 1: Reference configurations for PISN exchanges (PINX)".
- [12] ITU-T Recommendation I.112 (1993): "Vocabulary of terms for ISDNs".
- [13] ITU-T Recommendation I.210 (1993): "Principles of the telecommunication services supported by an ISDN and the means to describe them".
- [14] ETSI ETS 300 406 (1995): "Methods for Testing and Specification (MTS); Protocol and profile conformance testing specifications; Standardization methodology".
- [15] ETSI EN 301 060-1 (V1.2): "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Basic call control; Enhancement at the "b" service entry point for Virtual Private Network (VPN) applications; Part 1: Protocol specification".
- [16] ETSI ETS 300 475-1 (1995): "Private Telecommunication Network (PTN); Reference configuration; Part 1: Reference configuration for PTN eXchanges (PTNX) [ISO/IEC 11579-1 (1994), modified]".

3 Definitions and abbreviations

3.1 Definitions

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

abstract test case: Refer to ISO/IEC 9646-1 [7].

Abstract Test Suite (ATS): Refer to ISO/IEC 9646-1 [7].

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 [7].

implicit send event: Refer to ISO/IEC 9646-3 [9].

lower tester: Refer to ISO/IEC 9646-1 [7].

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 [7].

Protocol Implementation Conformance Statement (PICS): Refer to ISO/IEC 9646-1 [7].

PICS proforma: Refer to ISO/IEC 9646-1 [7].

Protocol Implementation eXtra Information for Testing (PIXIT): Refer to ISO/IEC 9646-1 [7].

PIXIT proforma: Refer to ISO/IEC 9646-1 [7].

system under test: Refer to ISO/IEC 9646-1 [7].

Test Purpose (TP): Refer to ISO/IEC 9646-1 [7].

Virtual Private Network (VPN): Refer to EN 301 060-1 [15].

Application Protocol Data Unit (APDU): See ETS 300 239 [3].

Basic Call: Instance of the use of a basic service.

- Basic Service:** See ITU-T Recommendation I.210 [13].
- Call independent signalling connection:** See ETS 300 239 [3], definition 4.7.
- Call related:** See ETS 300 239 [3], definition 4.9.
- Complete Number:** See ISO/IEC 11571 [10].
- Co-ordination Function:** See ETS 300 239 [3].
- CTM user:** See ETS 300 695 [6].
- CTMI-detect PINX:** PINX which detects that an incoming call is to a CTM user.
- End PINX:** See ETS 300 239 [3].
- Gateway PINX:** See EN 300 172 [2].
- Home Data Base (HDB):** See ETS 300 415 [4].
- Home PINX:** See ETS 300 695 [6].
- Incoming call:** See EN 300 172 [2], subclause 4.4.
- Incoming Gateway PINX:** See EN 300 172 [2], subclause 4.6.
- Integrated Services Digital Network (ISDN):** See ITU-T Recommendation I.112 [12], definition 308.
- Invoke component:** See ETS 300 239 [3], subclause 11.3.3.4.
- Originating PINX:** See EN 300 172 [2], subclause 4.5.
- Private Integrated Services Network (PISN):** See ISO/IEC 11579-1 [11].
- Private Integrated Services Network Exchange (PINx):** See ISO/IEC 11579-1 [11].
- PISN Number:** See ISO/IEC 11571 [10].
- Rerouting PINX:** PINX which executes the rerouting of the CTMI call to the current Visitor PINX.
- Signalling:** See ITU-T Recommendation I.112 [12].
- Supplementary service:** See ITU-T Recommendation I.210 [13], subclause 2.4.
- Supplementary Services Control Entity:** See ETS 300 239 [3].
- Terminating PINX:** See EN 300 172 [2], subclause 4.5.
- Transit PINX:** See EN 300 172 [2], subclause 4.5.
- User:** See EN 300 171 [1].
- Visitor area:** See ETS 300 415 [4].
- Visitor Data Base (VDB):** See ETS 300 415 [4].
- Visitor PINX:** See ETS 300 695 [6].

3.2 Abbreviations

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

ANF	Additional Network Feature
ANF-CTMI	Cordless Terminal Incoming Call Additional Network Feature
APDU	Application Protocol Data Unit
ATS	Abstract Test Suite
CTM	Cordless Terminal Mobility

HDB	Home Data Base
IE	Information Element
ISDN	Integrated Services Digital Network
IUT	Implementation Under Test
PICS	Protocol Implementation Conformance Statement
PINX	Private Integrated Services Network eXchange
PISN	Private Integrated Services Network
PIXIT	Protocol Implementation eXtra Information for Testing
PSS1	Private Integrated Signalling System Number 1
sc	call independent signalling connection
SS-CFU	Call Forwarding Unconditional supplementary service
SS-CI	Call Intrusion supplementary service
SS-CO	Call Offer supplementary service
T1	Timer T1
T2	Timer T2
TP	Test Purpose
TSS	Test Suite Structure
VDB	Visitor Data Base
VPN	Virtual Private Network

4 Test Suite Structure (TSS)

Signalling procedures at the VPN "b" service entry Point	Group
Actions at the Rerouteing PINX	Reroute01
Actions at the CTMI-detect PINX	
Normal procedures	Detect01
Exceptional procedures	Detect02
Rerouteing procedures	Detect03
Home procedures	Detect04
Actions at the Home PINX	Home01
Actions at the Visitor PINX	Visitor01
Procedures for interactions between ANF-CTMI and other supplementary services and ANFs	SS01

5 Test Purposes (TP)

5.1 Introduction

For each test requirement a TP is defined.

5.1.1 TP naming convention

TPs are numbered, starting at 001, within each group. Groups are organized according to the TSS. Additional references are added to identify the actual test suite and whether it applies to the network or the user (see table 1).

Table 1: TP identifier naming convention scheme

Identifier: <ss>_<group>_<nnn>			
<ss>	=	supplementary service:	"CTMI"
<group>	=	group	up to 8 digit field representing group reference according to TSS
<nnn>	=	sequential number	(001-999)

5.1.2 Source of TP definition

The TPs are based on ETS 300 696 [5].

5.1.3 TP structure

Each TP has been written in a manner, which is consistent with all other TPs. The intention of this is to make the TPs more readable and checkable. A particular structure has been used and this is illustrated in table 2. This table should be read in conjunction with any TP, i.e. use a TP as an example to fully understand the table.

Table 2: Structure of a single TP for ANF-CTMI

TP part	Text	Example
Header	<Identifier> <i>tab</i> <paragraph number in base ETS> <i>tab</i>	see table 1 Subclause 0.0.0
Stimulus	Ensure that the IUT in the <basic call state> or <CTMI state> <trigger> <i>see below for message structure</i> or <goal>	State 3 or CTMI-Idle, etc. Receiving a XXXX message to request a...
Reaction	<action> <conditions> <i>if the action is sending</i> <i>see below for message structure</i> <next action>, etc. and remains in the same state or and enters state <state>	Sends, saves, does, etc. Using en bloc sending, ...
Message structure	<message type> message containing a a) <info element> information element with b) a <field name> encoded as or including <coding of the field> and <i>back to a or b</i> ,	SETUP, FACILITY, CONNECT, ... Bearer capability, Facility, ...
Selection	Selection criteria reference	Behaviour as CTMI-detect PINX for ANF-CTMI. PICS: A1
NOTE 1:	In order to use the same structure as for test group selection, the selection criteria is indicated at the bottom of the test purpose.	
NOTE 2:	Unless specified the messages are valid and contain at least the mandatory information elements and possibly optional information elements, the information elements are valid and contain at least the mandatory parameters and possibly optional parameters.	

5.1.4 Test strategy

As the base standard ETS 300 696 [5] contains no explicit requirements for testing, the TPs were generated as a result of an analysis of the base standard and the corresponding PICS proforma.

The TPs are only based on conformance requirements related to the externally observable behaviour of the IUT, and are limited to conceivable situations to which a real implementation is likely to be faced (ETS 300 406 [14]).

All the test purposes are mandatory unless they have a selection criteria. Optional test purposes (with selection criteria), are applicable according to the configuration options of the IUT. The configuration option shall be covered by a PICS item.

5.2 TPs for ANF-CTMI

All PICS items referred to in this subclause are as specified in ETS 300 696 [5] unless indicated otherwise by another numbered reference.

Unless specified:

- Only the requirements from the point of view of the VPN "b" service entry point are considered. This implies that the interactions with other networks are out of scope of the present document and causes that the corresponding Test Purposes are not included in the present document.
- The messages indicated are valid and contain at least the mandatory information elements and possibly optional information elements.
- The information elements indicated are valid and contain at least the mandatory parameters and possibly optional parameters.

The following wording convention was defined to make the test purposes more readable:

- When a message is to be sent or received on a call independent signalling connection, the message name shall be followed by a '(sc)', e.g. CONNECT (sc) means that the CONNECT message is conveyed on a call independent signalling connection.
- All the test purposes are valid for both user and network side of the VPN b interface. In order to simplify the text and to make the test purposes more readable, only the User side Call states (Ux) are indicated in the test purposes. For the network side of the VPNb interface, the mapping table below indicates which network call state (Ny) corresponds to the user call state used in the test purpose. Equivalent call state means there that the same message flow applies from the IUT point of view (e.g.: IUT sends a SETUP message gives the call state U01 or N06).

User side call state	equivalent network side call state
U00	N00
U01	N06
U10	N10

EXAMPLE:

Ensure that the IUT in the call state U01 ...

is equivalent to the following network side test purpose:

Ensure that the IUT in the call state N06 ...

5.2.1 ANF-CTMI signalling procedures

5.2.1.1 Actions at the Rerouteing PINX

Groupselection: IUT supports behaviour as Rerouteing PINX for ANF-CTMI. PICS: A7 AND NOT A1.

CTMI_Reroute01_001 subclause 6.5.1.1

Ensure that the IUT in the call state U03, on receipt of a FACILITY message from the CTMI detect PINX containing a ctmiDivert invoke APDU and it can proceed with ANF-CTMI,

sends a DISCONNECT message to the CTMI detect PINX containing a ctmiDivert return result APDU, sends a SETUP message to the Visitor PINX containing the data element Called party number, containing the number received in the visitPINX data element within the ctmiDivert invoke APDU; Called party subaddress, containing the subaddress received in the ctmUserSub data element within the ctmiDivert invoke APDU (optional); Calling party number, containing the number received in the callingNumber data element within the ctmiDivert invoke APDU; Calling party subaddress, containing the subaddress received in the callingUserSub data element within the ctmiDivert invoke APDU (optional); ctmiDivert invoke APDU; Bearer capability information element as received in embedded form within the ctmiDivert invoke APDU, and any of the following information elements which were also received in embedded form in this APDU: High layer compatibility, Low layer compatibility, Progress indicator and Party category information elements; Transit counter, with value zero (optional); a ctmiInform invoke APDU with the data element pismNumber with the same contents as the corresponding data element in the argument of the received ctmiDivert invoke APDU and enters state ExecIdle.

CTMI_Reroute01_002 subclause 6.5.1.1

Ensure that the IUT in the call state U03, on receipt of a FACILITY message from the CTMI detect PINX containing a ctmiDivert invoke APDU with the element callingUserName and it can proceed with ANF-CTMI,

sends a DISCONNECT message to the CTMI detect PINX containing a ctmiDivert return result APDU, sends a SETUP message to the Visitor PINX containing the data element Called party number, containing the number received in the visitPINX data element within the ctmiDivert invoke APDU; Called party subaddress, containing the subaddress received in the ctmUserSub data element within the ctmiDivert invoke APDU (optional); Calling party number, containing the number received in the callingNumber data element within the ctmiDivert invoke APDU; Calling party subaddress, containing the subaddress received in the callingUserSub data element within the ctmiDivert invoke APDU (optional); ctmiDivert invoke APDU; Bearer capability information element as received in embedded form within the ctmiDivert invoke APDU, and any of the following information elements which were also received in embedded form in this APDU: High layer compatibility, Low layer compatibility, Progress indicator and Party category information elements; Transit counter, with value zero (optional); a callingName invoke APDU and a ctmiInform invoke APDU with the data element pisinNumber with the same contents as the corresponding data element in the argument of the received ctmiDivert invoke APDU and enters state ExecIdle.

CTMI_Reroute01_003 subclause 6.5.1.2

Ensure that the IUT in the call state U03, on receipt of a FACILITY message from the CTMI detect PINX containing a ctmiDivert invoke APDU but it can not proceed with ANF-CTMI,

sends a FACILITY message to the CTMI-detect PINX containing a ctmiDivert return error APDU with the error notAvailable and enters state ExecIdle.

5.2.1.2 Actions at the CTMI-detect PINX

Groupselection: IUT supports behaviour as CTMI-detect PINX for ANF-CTMI. PICS: A1.

5.2.1.2.1 Normal procedures

CTMI_Detect01_001 subclause 6.5.2.1

Ensure that the IUT in the call state U00 and in the CTMI-Idle state, on determining that ANF-CTMI is to be invoked following the received SETUP message from the Rerouting PINX,

sends a SETUP (sc) message to the Home PINX containing a ctmiEnquiry invoke APDU with the data elements pisinNumber as received in the incoming SETUP message in the Called party number information element; qSIGInfoElement containing an embedded Bearer capability information element, as received in the incoming SETUP message, and any of the following information elements which were received in the incoming SETUP message: High layer compatibility and Low layer compatibility, starts timer T1 and enters state CTMI-Detected.

CTMI_Detect01_002 subclause 6.5.2.1

Ensure that the IUT in the call state U03 (sc) and in the CTMI-Detected state, on receipt of a CONNECT (sc) message from the Home PINX containing a ctmiEnquiry return result APDU with choice currLocation,

sends a FACILITY message to the Rerouting PINX containing a ctmiDivert invoke APDU using the call reference of the incoming call and with the data elements visitPINX as received in the ctmiEnquiry return result APDU; callingNumber as received in the incoming SETUP message in the Calling party number information element; pisinNumber as received in the ctmiEnquiry return result APDU; qSIGInfoElement containing an embedded Bearer capability information element, as received in the incoming SETUP message, and any of the following information elements which were received in the incoming SETUP message: High layer compatibility, Low layer compatibility, Progress indicator and Party category; callingUserSub, if a Calling party subaddress information element was received in the incoming SETUP message; callingUserName, if a callingName invoke APDU was received in the incoming SETUP message; ctmUserSub, if a Called party subaddress information element was received in the incoming SETUP message, starts timer T2 and enters state CTMI-Divert.

CTMI_Detect01_003 subclause 6.5.2.1

Ensure that the IUT in the call state U03 (sc) and in the CTMI-Divert state, on receipt of a DISCONNECT from the Rerouteing PINX message containing a ctmiDivert return result APDU,

sends a RELEASE message to the Rerouteing PINX and enters the CTMI-Idle state.

5.2.1.2.2 Exceptional procedures**CTMI_Detect02_001** subclause 6.5.2.2

Ensure that the IUT in the call state U03 (sc) and in the CTMI-Detected state, on receipt of a CONNECT (sc) message from the Home PINX containing a ctmiEnquiry return error APDU indicating 'invalidServedUserNr',

sends a DISCONNECT message to the Rerouteing PINX with cause value #1 'Unallocated (unassigned) number' for release of the basic call and enters the CTMI-Idle state.

CTMI_Detect02_002 subclause 6.5.2.2

Ensure that the IUT in the call state U03 (sc) and in the CTMI-Detected state, on receipt of a CONNECT (sc) message from the Home PINX containing a ctmiEnquiry return error APDU indicating 'locationNotKnown',

sends a DISCONNECT message to the Rerouteing PINX with cause value #3 'No route to destination' for release of the basic call and enters the CTMI-Idle state.

CTMI_Detect02_003 subclause 6.5.2.2

Ensure that the IUT in the call state U03 (sc) and in the CTMI-Detected state, on receipt of a CONNECT (sc) message from the Home PINX containing a ctmiEnquiry return error APDU indicating 'notAvailable',

sends a DISCONNECT message to the Rerouteing PINX with cause value #20 'Subscriber absent' for release of the basic call and enters the CTMI-Idle state.

CTMI_Detect02_004 subclause 6.5.2.2

Ensure that the IUT in the call state U03 (sc) and in the CTMI-Detected state, on receipt of a CONNECT (sc) message from the Home PINX containing a ctmiEnquiry return error APDU indicating 'basicServiceNotProvided',

sends a DISCONNECT message to the Rerouteing PINX with cause value #88 'Incompatible destination' for release of the basic call and enters the CTMI-Idle state.

CTMI_Detect02_005 subclause 6.5.2.2

Ensure that the IUT in the call state U03 (sc) and in the CTMI-Detected state, on receipt of a CONNECT (sc) message from the Home PINX containing a ctmiEnquiry reject APDU,

sends a DISCONNECT message to the Rerouteing PINX with cause value #38 'Network out of order' for release of the basic call and enters the CTMI-Idle state.

CTMI_Detect02_006 subclause 6.5.2.2

Ensure that the IUT in the call state U03 (sc) and in the CTMI-Detected state, on expiry of T1,

sends a DISCONNECT message to the Rerouteing PINX with cause value #41 'Temporary failure' for release of the basic call and enters the CTMI-Idle state.

CTMI_Detect02_007 subclause 6.5.2.2

Ensure that the IUT in the call state U09 and in the CTMI-Detected state, on receipt of a DISCONNECT message from the Rerouteing PINX for call clearing,

sends a RELEASE message to the Rerouteing PINX and enters the CTMI-Idle state.

CTMI_Detect02_008 subclause 6.5.2.2

Ensure that the IUT in the call state U09 and in the CTMI-Divert state, on receipt of a FACILITY message from the Rerouteing PINX containing a ctmiDivert return error or reject APDU,

sends a DISCONNECT message to the Rerouteing PINX for release of the basic call and enters the CTMI-Idle state.

CTMI_Detect02_009 subclause 6.5.2.2

Ensure that the IUT in the call state U09 and in the CTMI-Divert state, on expiry of T2,

sends a DISCONNECT message to the Rerouteing PINX for release of the basic call and enters the CTMI-Idle state.

CTMI_Detect02_010 subclause 6.5.2.2

Ensure that the IUT in the call state U09 and in the CTMI-Divert state, on receipt of a DISCONNECT message from the Rerouteing PINX for call clearing,

sends a RELEASE message to the Rerouteing PINX and enters the CTMI-Idle state.

5.2.1.2.3 Rerouteing procedures

Groupselection: IUT provides Rerouteing PINX functionality. PICS: A7.

CTMI_Detect03_001 subclause 6.5.2.2

Ensure that the IUT in the call state U03 and in the CTMI-Divert state, on receipt of a FACILITY message from the Rerouteing PINX containing a ctmiDivert return error or reject APDU,

sends a SETUP message to the Visitor PINX containing a ctmiInform invoke APDU with the data element pisinNumber and enters the CTMI-Idle state.

CTMI_Detect03_002 subclause 6.5.2.2

Ensure that the IUT in the call state U03 and in the CTMI-Divert state, on expiry of T2,

sends a SETUP message to the Visitor PINX containing a ctmiInform invoke APDU with the data element pisinNumber and enters the CTMI-Idle state.

5.2.1.3 Actions at the Home PINX

Groupselection: IUT supports behaviour as Home PINX for ANF-CTMI. PICS: A2.

5.2.1.3.1 Normal procedures

CTMI_Home01_001 subclause 6.5.3.1

Ensure that the IUT in the call state U00 (sc) and in the HomeIdle state, on receipt of a SETUP (sc) message from the CTMI detect PINX containing a ctmiEnquiry invoke APDU and the CTM user is defined in the HDB, the basic service is provided to the CTM user and the current location of the CTM user is known for the basic service concerned,

sends a CONNECT (sc) message to the CTMI detect PINX containing a ctmiEnquiry return result APDU with choice currLocation; element visitPINX with the PISN number of the Visitor PINX; and element pisinNumber with the PISN number of the CTM user, and enters the HomeIdle state.

5.2.1.3.2 CTMI-detect procedures

Groupselection: IUT provides CTMI-detect PINX functionality. PICS: A1.

CTMI_Home02_001 subclause 6.5.3

Ensure that the IUT in the call state U00 and in the CTMI-Idle state, on determining that ANF-CTMI is to be invoked following the arrival of an incoming call from the Rerouteing PINX and the CTM user is defined in the HDB, the basic service is provided to the CTM user and the current location of the CTM user is known for the basic service concerned, sends a FACILITY message to the Rerouteing PINX containing a ctmiDivert invoke APDU using the call reference of the incoming call, starts timer T2 and enters the CTMI-Divert state.

CTMI_Home02_002 subclause 6.5.3

Ensure that the IUT in the call state U00 and in the CTMI-Idle state, on determining that ANF-CTMI is to be invoked following the arrival of an incoming call from the Rerouteing PINX and the CTM user is not found in the HDB, sends a DISCONNECT message to the Rerouteing PINX with cause value #1 'Unallocated (unassigned) number' for release of the basic call and enters the CTMI-Idle state.

CTMI_Home02_003 subclause 6.5.3

Ensure that the IUT in the call state U00 and in the CTMI-Idle state, on determining that ANF-CTMI is to be invoked following the arrival of an incoming call from the Rerouteing PINX and the CTM user has deregistered, sends a DISCONNECT message to the Rerouteing PINX with cause value #20 'Subscriber absent' for release of the basic call and enters the CTMI-Idle state.

CTMI_Home02_004 subclause 6.5.3

Ensure that the IUT in the call state U00 and in the CTMI-Idle state, on determining that ANF-CTMI is to be invoked following the arrival of an incoming call from the Rerouteing PINX and the current location of the CTM user is unknown, sends a DISCONNECT message to the Rerouteing PINX with cause value #3 'No route to destination' for release of the basic call and enters the CTMI-Idle state.

CTMI_Home02_005 subclause 6.5.3

Ensure that the IUT in the call state U00 and in the CTMI-Idle state, on determining that ANF-CTMI is to be invoked following the arrival of an incoming call from the Rerouteing PINX and the requested basic service is not provided, sends a DISCONNECT message to the Rerouteing PINX with cause value #88 'Incompatible destination' for release of the basic call and enters the CTMI-Idle state.

CTMI_Home02_006 subclause 6.5.2.2

Ensure that the IUT in the call state U00 and in the CTMI-Idle state, on determining that ANF-CTMI is to be invoked following the arrival of an incoming call from the Rerouteing PINX and on receiving a DISCONNECT message for call clearing, sends a RELEASE message to the Rerouteing PINX and enters the CTMI-Idle state.

CTMI_Home02_007 subclause 6.5.3

Ensure that the IUT in the call state U00 and in the CTMI-Idle state, on determining that ANF-CTMI is to be invoked following the arrival of an incoming call from the Rerouteing PINX and the CTM user is defined in the HDB and SS-CFU is active,

sends a FACILITY message to the Rerouteing PINX containing a callRerouteing invoke APDU, starts timer T2 and enters state CFS-Requested.

Selection: IUT supports Call Forwarding Unconditional. PICS: B10 AND E1.

5.2.1.3.3 Exceptional procedures

CTMI_Home03_001 subclause 6.5.3.2

Ensure that the IUT in the call state U00 (sc) and in the HomeIdle state, on receipt of a SETUP (sc) message from the CTMI detect PINX containing a ctmiEnquiry invoke APDU and the CTM user is not found in the HDB,

sends a CONNECT (sc) message to the CTMI detect PINX containing a ctmiEnquiry return error APDU with the error invalidServedUserNr and enters the HomeIdle state.

CTMI_Home03_002 subclause 6.5.3.2

Ensure that the IUT in the call state U00 (sc) and in the HomeIdle state, on receipt of a SETUP (sc) message from the CTMI detect PINX containing a ctmiEnquiry invoke APDU and the CTM user has deregistered,

sends a CONNECT (sc) message to the CTMI detect PINX containing a ctmiEnquiry return error APDU with the error notAvailable and enters the HomeIdle state.

CTMI_Home03_003 subclause 6.5.3.2

Ensure that the IUT in the call state U00 (sc) and in the HomeIdle state, on receipt of a SETUP (sc) message from the CTMI detect PINX containing a ctmiEnquiry invoke APDU and the current location of the CTM user is unknown,

sends a CONNECT (sc) message to the CTMI detect PINX containing a ctmiEnquiry return error APDU with the error locationNotKnown and enters the HomeIdle state.

CTMI_Home03_004 subclause 6.5.3.2

Ensure that the IUT in the call state U00 (sc) and in the HomeIdle state, on receipt of a SETUP (sc) message from the CTMI detect PINX containing a ctmiEnquiry invoke APDU and the requested basic service is not provided,

sends a CONNECT (sc) message to the CTMI detect PINX containing a ctmiEnquiry return error APDU with the error basicServiceNotProvided and enters the HomeIdle state.

5.2.1.3.4 Additional procedures

CTMI_Home04_001 subclause 6.5.3.3

Ensure that the IUT in the call state U00 (sc) and in the HomeIdle state, on receipt of a SETUP (sc) message from the CTMI detect PINX containing a ctmiEnquiry invoke APDU and the CTM user is defined in the HDB and SS-CFU is active,

sends a CONNECT (sc) message to the CTMI detect PINX containing a ctmiEnquiry return result APDU with choice cfuActivated and enters the HomeIdle state.

Selection: IUT supports additional procedures at a Home PINX for Call Forwarding Unconditional. PICS: B10.

5.2.1.4 Actions at the Visitor PINX

Groupselection: IUT supports behaviour as Visitor PINX for ANF-CTMI. PICS: A3.

CTMI_Visitor01_001 subclause 6.5.4.1

Ensure that the IUT in the call state U00 and in state VisitIdle, on receipt of a SETUP message containing a ctmiInform invoke APDU and there is an entry in the VDB for the CTM user and the basic service indicated by basic call information elements and the CTM user is accessible,

establishes a call to the PISN access indicated by the VDB entry and enters state VisitIdle.

CTMI_Visitor01_002 subclause 6.5.4.2

Ensure that the IUT in the call state U00 and in state VisitIdle, on receipt of a SETUP message containing a ctmiInform invoke APDU and the CTM user is not found in VDB,

sends a DISCONNECT message with cause value #41 'Temporary failure' for release of the basic call and enters state VisitIdle.

CTMI_Visitor01_003 subclause 6.5.4.2

Ensure that the IUT in the call state U00 and in state VisitIdle, on receipt of a SETUP message containing a ctmiInform invoke APDU and the CTM user is not accessible,

sends a DISCONNECT message with cause value #18 'No user responding' for release of the basic call and enters state VisitIdle.

5.2.2 Protocol Interaction between ANF-CTMI and other Supplementary Services and ANFs

5.2.2.1 Interaction with Call Forwarding Unconditional

CTMI_SS01_001 subclause 6.8.3.1

Ensure that the IUT in the call state U03 (sc) and in state CTMI-Detected, on receipt of a CONNECT (sc) message from the Home PINX containing a ctmiEnquiry return result APDU with choice cfuActivated,

sends a FACILITY message to the Rerouteing PINX containing a callRerouteing invoke APDU, starts timer T2 and enters state CFS-Requested.

Selection: IUT supports Call Forwarding Unconditional supplementary service (SS-CFU) and behaviour as CTMI-Detect PINX for ANF-CTMI and does not provide Home PINX functionality. PICS: A1 AND E1 AND NOT A2.

5.2.2.2 Interaction with Call Offer

CTMI_SS02_001 subclause 6.8.10.1

Ensure that the IUT in the call state U03, having sent a SETUP message to the CTMI detect PINX containing a callOfferRequest invoke ADPU, on receipt of a FACILITY message from the CTMI detect PINX containing a ctmiDivert invoke APDU,

sends a DISCONNECT message to the CTMI-Detect PINX containing a ctmiDivert return result APDU, sends a SETUP message to the Visitor PINX containing a callOfferRequest invoke APDU and a ctmiInform invoke APDU with the data element pismNumber with the same contents as the corresponding data element in the argument of the received ctmiDivert invoke APDU and enters state ExecIdle.

Selection: IUT supports Call Offer supplementary service (SS-CO) and behaviour as Rerouteing PINX for ANF-CTMI and does not provide CTMI-Detect PINX functionality. PICS: A7 AND F1 AND NOT A1.

CTMI_SS02_002 subclause 6.8.10.1

Ensure that the IUT in the call state U03, having sent a SETUP message to the CTMI detect PINX containing a pathRetain invoke ADPU with callOffer bit set to ONE, on receipt of a FACILITY message from the CTMI detect PINX containing a ctmiDivert invoke APDU,

sends a DISCONNECT message to the CTMI-Detect PINX containing a ctmiDivert return result APDU, sends a SETUP message to the Visitor PINX containing a pathRetain invoke APDU with callOffer bit set to ONE and a ctmiInform invoke APDU with the data element pismNumber with the same contents as the corresponding data element in the argument of the received ctmiDivert invoke APDU and enters state ExecIdle.

Selection: IUT supports Call Offer supplementary service (SS-CO) and behaviour as Rerouteing PINX for ANF-CTMI and does not provide CTMI-Detect PINX functionality. PICS: A7 AND F1 AND NOT A1.

5.2.2.3 Interaction with Do Not Disturb Override

CTMI_SS03_001 subclause 6.8.12.1

Ensure that the IUT in the call state U03, having sent a SETUP message to the CTMI detect PINX containing a doNotDisturbOverrideQ invoke ADPU, on receipt of a FACILITY message from the CTMI detect PINX containing a ctmiDivert invoke APDU,

sends a DISCONNECT message to the CTMI detect PINX containing a ctmiDivert return result APDU, sends a SETUP message to the Visitor PINX containing a doNotDisturbOverrideQ invoke APDU and a ctmiInform invoke APDU with the data element pismNumber with the same contents as the corresponding data element in the argument of the received ctmiDivert invoke APDU and enters state ExecIdle.

Selection: IUT supports Do Not Disturb Override supplementary service (SS-CO) and behaviour as Rerouteing PINX for ANF-CTMI and does not provide CTMI-Detect PINX functionality. PICS: A7 AND G1 AND NOT A1.

CTMI_SS03_002 subclause 6.8.12.1

Ensure that the IUT in the call state U03, having sent a SETUP message to the CTMI detect PINX containing a pathRetain invoke ADPU with bit dndo-low, dndo-medium or dndo-high set to ONE, on receipt of a FACILITY message from the CTMI detect PINX containing a ctmiDivert invoke APDU,

sends a DISCONNECT message to the CTMI detect PINX containing a ctmiDivert return result APDU, sends a SETUP message to the Visitor PINX containing a pathRetain invoke APDU with bit dndo-low, dndo-medium or dndo-high set to ONE and a ctmiInform invoke APDU with the data element pismNumber with the same contents as the corresponding data element in the argument of the received ctmiDivert invoke APDU and enters state ExecIdle.

Selection: IUT supports Do Not Disturb Override supplementary service (SS-CO) and behaviour as Rerouteing PINX for ANF-CTMI and does not provide CTMI-Detect PINX functionality. PICS: A7 AND G1 AND NOT A1.

5.2.2.4 Interaction with Call Intrusion

CTMI_SS04_001 subclause 6.8.13.1

Ensure that the IUT in the call state U03, having sent a SETUP message to the CTMI detect PINX containing a callIntrusionRequest invoke ADPU, on receipt of a FACILITY message from the CTMI detect PINX containing a ctmiDivert invoke APDU,

sends a DISCONNECT message to the CTMI detect PINX containing a ctmiDivert return result APDU, sends a SETUP message to the Visitor PINX containing a callIntrusionRequest invoke APDU and a ctmiInform invoke APDU with the data element pismNumber with the same contents as the corresponding data element in the argument of the received ctmiDivert invoke APDU and enters state ExecIdle.

Selection: IUT supports Call Intrusion supplementary service (SS-CI) and behaviour as Rerouteing PINX for ANF-CTMI and does not provide CTMI-Detect PINX functionality. PICS: A7 AND H1 AND NOT A1.

CTMI_SS04_002 subclause 6.8.13.1

Ensure that the IUT the call state U03, having sent a SETUP message to the CTMI detect PINX containing a pathRetain invoke APDU with bit ci-low, ci-medium or ci-high set to ONE, on receipt of a FACILITY message from the CTMI detect PINX containing a ctmiDivert invoke APDU,

sends a DISCONNECT message to the CTMI detect PINX containing a ctmiDivert return result APDU, sends a SETUP message to the Visitor PINX containing a pathRetain invoke APDU with bit ci-low, ci-medium or ci-high set to ONE and a ctmiInform invoke APDU with the data element pisinNumber with the same contents as the corresponding data element in the argument of the received ctmiDivert invoke APDU and enters state ExecIdle.

Selection: IUT supports Call Intrusion supplementary service (SS-CI) and behaviour as Rerouteing PINX for ANF-CTMI and does not provide CTMI-Detect PINX functionality. PICS: A7 AND H1 AND NOT A1.

6 Compliance

An ATS, which complies with the present document, shall:

- a) consist of a set of test cases corresponding to the set or to a subset of the TPs specified in clause 5;
- b) use a TSS, which is an appropriate subset of the whole of the TSS specified in clause 4;
- c) use the same naming conventions for the test groups and test cases;
- d) maintain the relationship specified in clause 5 between the test groups and TPs and the entries in the PICS proforma to be used for test case deselection;
- e) comply with ISO/IEC 9646-2 [8].

In the case of a) or b), a subset shall be used only where a particular Abstract Test Method (ATM) makes some TPs untestable. All testable TPs from clause 5 shall be included in a compliant ATS.

7 Requirements for a comprehensive testing service

As a minimum the Remote test method, as specified in ISO/IEC 9646-2 [8], shall be used by any organization claiming to provide a comprehensive testing service for equipment claiming conformance to ETS 300 696 [5].

Bibliography

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

- ETSI ETS 300 238 (1995): "Private Integrated Services Network (PISN); Inter-exchange signalling protocol; Name identification supplementary services [ISO/IEC 13868 (1995) modified]".
- ETSI ETS 300 257 (1995): "Private Integrated Services Network (PISN); Inter-exchange signalling protocol; Diversion supplementary services [ISO/IEC 13873 (1995) modified]". 2nd edition.
- ETSI EN 300 362 (V1.2): "Private Integrated Services Network (PISN); Inter-exchange signalling protocol; Call offer supplementary service [ISO/IEC 14843 (1996), modified]".
- ETSI EN 300 364 (V1.2): "Private Integrated Services Network (PISN); Inter-exchange signalling protocol; Do not disturb and do not disturb override supplementary services [ISO/IEC 14844 (1996), modified]".
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- ISO/IEC 11582 (1995): "Information Technology – Telecommunication and information exchange between systems – Private Integrated Services Network – Generic functional protocol for the support of supplementary services – Inter-exchange signalling procedures and protocol".
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- CCITT Recommendation Z.100 (1988): "Specification and description language".
- ITU-T Recommendation Q.850 (1993): "Usage of cause and location in the digital subscriber signalling system No.1 and the signalling system No.7 ISDN user part".
- ITU-T Recommendation Q.950 (1993): "Digital subscriber signalling system No.1 (DSS1) – Supplementary services protocols, structure and general principles".
- ETSI EN 301 061-1 (V1.2): "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 1: Protocol specification".

History

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