ETSI TS 186 006-3 V3.1.1 (2012-01)

Technical Specification

**IMS Network Testing (INT);
Originating Identification Presentation (OIP) and
Originating Identification Restriction (OIR)
using IP Multimedia (IM) Core Network (CN) subsystem;
Conformance Testing;
Part 3: Abstract Test Suite (ATS) and partial Protocol
Implementation eXtra Information for Testing (PIXIT)
proforma specification**

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Foreword

This Technical Specification (TS) has been produced by ETSI Technical Committee IMS Network Testing (INT).

The present document is part 3 of a multi-part deliverable covering Originating Identification Presentation (OIP) and Originating Identification Restriction (OIR), as identified below:

Part 1:   "Protocol Implementation Conformance Statement (PICS)";

Part 2:   "Test Suite Structure and Test Purposes (TSS&TP)";

Part 3:   "Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma specification".

1 Scope

The present document specifies the Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma based on the Test Suite Structure and Test Purposes defined in TS 186 006-2 [2].

The test notation used in the ATS is TTCN-3 (see ES 201 873-1 [7]).

The following test specification and design considerations can be found in the body of the present document:

- the overall test suite structure;

- the testing architecture;

- the test methods and port definitions;

- the test configurations;

- the design principles, assumptions, and used interfaces to the TTCN3 tester (System Simulator);

- TTCN styles and conventions;

- the partial PIXIT proforma;

- the modules containing the TTCN-3 ATS.

Annex A provides the Partial Implementation Extra Information for Testing (PIXIT) Proforma of the ATS.

Annex B provides the Testing and Test Control Notation (TTCN-3) part of the ATS.

2 References

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the reference document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at http://docbox.etsi.org/Reference.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

2.1 Normative references

The following referenced documents are necessary for the application of the present document.

[1] ETSI TS 124 607: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Originating Identification Presentation (OIP) and Originating Identification Restriction (OIR) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification (3GPP TS 24.607 version 8.4.0 Release 8)".

[2] ETSI TS 186 006-2 (V3.1.1): "Technical Committee for IMS Network Testing (INT); Originating Identification Presentation (OIP) and Originating Identification Restriction (OIR) using IP Multimedia (IM) Core Network (CN) subsystem; Conformance Testing; Part 2: Test Suite Structure and Test Purposes (TSS&TP)".

[3] ETSI TS 102 790-3: "Technical Committee for IMS Network Testing (INT); Network Integration Testing; IMS specific use of Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Conformance Testing; Part 3: Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma specification".

[4]   IETF RFC 3261 (2002): "SIP: Session Initiation Protocol".

[5]   ISO/IEC 9646-1: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 1: General concepts".

[6]   ISO/IEC 9646-7: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 7: Implementation Conformance Statements".

[7]   ETSI ES 201 873-1 (V4.3.1): "Methods for Testing and Specification (MTS); The Testing and Test Control Notation version 3; Part 1: TTCN-3 Core Language".

[8]   ETSI TS 102 351 (V2.1.1): "Methods for Testing and Specification (MTS); Internet Protocol Testing (IPT); IPv6 Testing: Methodology and Framework".

[9]   ETSI TS 102 587-2: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Conformance testing for the Peer-to-Peer Digital Private Mobile Radio; Part 2: Test Suite Structure and Test Purposes (TSS&TP) specification".

[10]   IETF RFC 2617: "HTTP Authentication: Basic and Digest Access Authentication".

2.2   Informative references

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

Not applicable.

3   Definitions and abbreviations

3.1   Definitions

For the purposes of the present document, the terms and definitions given in ISO/IEC 9646-7 [6], TS 102 587-2 [9] and TS 102 790-3 [3] apply.

3.2   Abbreviations

For the purposes of the present document, the abbreviations given in ISO/IEC 9646-1 [5], ISO/IEC 9646-7 [6], TS 102 790-3 [3] and TS 124 607 [1] apply.

4   Abstract Test Method (ATM)

For the purposes of the present document, the ATM described in clause 4 of TS 102 790-3 [3] applies with following additions.

4.1 Configurations for testing UE

The Gm interface is located between SUT (UE) and the IMS.
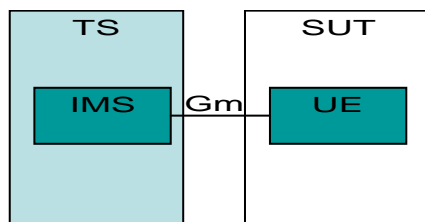
Figure 1: Test configuration CF_1GmUE

The ISC interface provides an access to the AP.
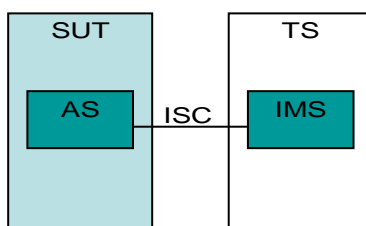
Figure 2: Test configuration CF_1ISC

5 The ATS development process

5.1 Requirements and Test Purposes

For each test purpose there is a table defined in clause 5 of TS 186 006-2 [2]. The requirements applicable to this TP are given by a reference to TS 124 607 [1]. There are no explicit formulations of requirements.

5.2 ATS structure

5.2.1 Test case grouping

The ATS structure defined in Table 1 is based on the structuring of Test Purposes in clause 4 of TS 186 006-2 [2]. The group names in column 2 of Table 1 are those assigned in the ATS; they are based on the names provided in clause 4 of TS 186 006-2 [2], but use the naming conventions defined for the ATS (see clause 5.2.2).

Table 1: OIP/OIR ATS structure

OIP/OIR			
	CallingUser		OIP_U01_xxx
	CalledUser		OIP_U02_xxx
	AS_OrigUser		OIP_N01_xxx
	AS_TermUser		OIP_N02_xxx

5.2.2 Test case identifiers

The test case names are built up according to the following scheme:

"<TC>"_"<Group index>"_"<TC number>"

where:

a)   double quotes (") are used to enclose literal strings;

b)   <Group path index> is the group index in Table 1 (which uniquely identifies the path of groups/subgroups);

c)   <TC number> is a running 3-digit decimal number, starting in each subgroup path with "001".

EXAMPLE:

TC_OIP_N01_001:

i)   the identifier has Group index "OIP_N01", i.e. it is in the subgroup having complete path: SupplementaryServices_OIP_OIR/AS_OrigUser;

ii)   the identifier is the first test case of this group/subgroup.

NOTE: This naming scheme provides a 1-1 correspondence of TP identifiers as defined in TS 186 006-2 [2] and test case names.
The TP identifier of TC_OIP_N01_001 is TP OIP_N01_001.

5.3   ATS specification framework

5.3.1   ATS Library

For this ATS the TTCN-3 library modules are basically organized as:

1)   AtsCommon modules.

2)   LibIms modules.

3)   LibSip modules (RFC 3261 [4]).

4)   LibCommon modules (taken from an improved version of TS 102 351 [8]).

NOTE: Due to the common LibSip and LibIms library approach with some other parallel running projects there is necessary to create tag version of all library modules.

Table 2 shows the organization of the ATS as library of modules.

Table 2: Library of modules

Module Class	Module Id	Description
OIP_OIR	OIP_OIR_TC_Functions	OIP_OIR test case functions
	OIP_OIR_TestCases	OIP_OIR test case definitions
	OIP_OIR_Templates	OIP_OIR template definitions
AtsCommon	SS_Ims_PICS	Module Parameter declarations associated with PICS
	SS_Ims_PIXITS	SIP common Module Parameter declarations associated with PIXIT
	SS_Ims_TestConfiguration	Functions which implement the configuration of the SUT adapter and mapping of test components for establishing and tearing down different test configurations
	SS_Ims_TestSystem	TSI components, test system internal ports
	SS_Ims_TestCases	Test case definitions
	SS_Ims_Functions	Test case functions
LibIms	LibIms_PIXITS	IMS specific common Module Parameter (e.g. addresses related to SUT components and TS) declarations associated with PIXIT
	LibIms_Interface	IMS component
	LibIms_SIPTypesAndValues	IMS specific user and interface specific profile data (see note)
	LibIms_Templates	Modified templates with IMS specific header fields
	LibIms_Steps	functions using IMS specific types

Module Class	Module Id	Description
LibSip	LibSip_PIXITS	SIP general common Module Parameter (e.g. SDP/SIP procedure options) declarations associated with PIXIT
	LibSip_Interface	SIP component
	LibSip_SIPTypesAndValues	SIP message types and constants, simple user profiles (see note)
	LibSip_SDPTypes	SDP types and constants
	LibSip_Templates	Basic and modified templates with SIP specific header fields
	LibSip_Steps	SIP specific behaviour function library
	LibSip_XMLTypes	XML types for SIP tests
	XSDAUX	Basic types used in XML
LibCommon	LibCommon_AbstractData	Generic data types for a stack and its operations
	LibCommon_BasicTypesAndValues	Basic type and value definitions (integer and Boolean)
	LibCommon_DataStrings	Bit and Octet string types
	LibCommon_Sync	Co-ordination/synchronization of test components
	LibCommon_TextStrings	Basic character and string types with fixed length
	LibCommon_Time	Time handling functions and module parameter
	LibCommon_VerdictControl	Basic functions for setting of test component verdicts
NOTE:	In order to build a comprehensive library all SIP message header (incl. IMS specific) have been defined in LibSip_SIPTypesAndValues only.	

5.3.2   Use of TTCN-3

For the purposes of the present document, the description of the use of TTCN-3 described in clause 5.3.2 of TS 102 790-3 [3] applies.

Annex A (normative):
Partial PIXIT proforma

A.1 Introduction

This partial PIXIT proforma contained in the present document is provided for completion, when the related Abstract Test Suite is to be used against the Implementation Under Test (IUT).

The completed partial PIXIT will normally be used in conjunction with the completed PICS, as it adds precision to the information provided by the PICS.

A.2 PIXIT items

According to the type of ATS defined in the present document, the PIXIT are divided in PIXIT items for UE, AS and S-CSCF testing and general PIXIT items that apply for all types of IUT. Each PIXIT item corresponds to a Module Parameter of the ATS.

NOTE: The PIXIT definitions are part of a SIP TTCN-3 library that contains additional PIXIT definitions that are not used in this ATS and are therefore not presented in the following tables.

A.2.1 PIXIT for UE Testing

Table A.1: PIXIT items for UE testing

Id	Identifier	Type / Description
1	PX_IMS_TS_PCSCF_IPADDR	charstring, for TS/P-CSCF IP address to exchange SIP messages.
2	PX_IMS_TS_PCSCF_PORT	integer, for IUT/P-CSCF port number to exchange SIP messages.
3	PX_IMS_TS_UE1_IPADDR	charstring, for IP address used by the UE1 to exchange SIP messages.
4	PX_IMS_TS_UE1_PORT	integer, for port number used by the UE1 to exchange SIP messages.
5	PX_IMS_SUT_UE1_BEARER_IPADDR	charstring, for IP address used by the TS to exchange media streams for UE1.
6	PX_IMS_SUT_UE1_HOME_DOMAIN	charstring, for identity of the tester UE1 local domain.
7	PX_IMS_SUT_UE1_PUBLIC_USER	charstring, for identity of the tester UE1 local user.
8	PX_IMS_SUT_UE1_PRIVAT_USERNAME	charstring, for RFC 2617 [10], clause 3.2.2 username of UE1: The name of user in the specified realm.
9	PX_IMS_SUT_UE1_PRIVAT_PASSWD	charstring, for RFC 2617 [10], clause 3.2.2.2 passwd of UE1: A known shared secret, the password of user of the specified username.
10	PX_IMS_SUT_UE1_QOP	charstring, for RFC 2617 [10], clause 3.2.1 qop options of UE1: Quoted string of one or more tokens indicating the "quality of protection" values supported by the server; the value "auth" indicates authentication; the value "auth-int" indicates authentication with integrity protection.
11	PX_IMS_SUT_UE1_REGISTRAR	charstring, for home (SUT) REGISTRAR domain of UE1.
12	PX_UE_REGISTRATION	boolean, En-/disable UE registration.
13	PX_UE_REG_EVENT_SUBSCRIPTION	boolean, En-/disable UE reg event subscription.
14	PX_SIP_TWAIT	float, for TWait default value for waiting an operator action.

A.2.2 PIXIT for AS Testing

In addition to the PIXIT in table A.2, PICIT items A.1/6 and A.1/7 apply.

Table A.2: PIXIT items for AS testing

Id	Identifier	Type / Description
1	PX_IMS_TS_UE4_IPADDR	charstring, for IP address used by the UE4 to exchange SIP messages.
2	PX_IMS_TS_UE4_PORT	integer, for port number used by the UE4 to exchange SIP messages.
3	PX_IMS_TS_SCSCF_IPADDR	charstring, for TS/S-CSCF IP address to exchange SIP messages.
4	PX_IMS_TS_SCSCF_PORT	integer, for TS/S-CSCF port number to exchange SIP messages.
5	PX_IMS_SUT_UE4_BEARER_IPADDR	charstring, for IP address used by the TS to exchange media streams for UE4.
6	PX_IMS_SUT_UE4_HOME_DOMAIN	charstring, for identity of the tester UE4 local domain.
7	PX_IMS_SUT_UE4_PUBLIC_USER	charstring, for identity of the tester UE4 local user.
8	PX_IMS_SUT_UE4_PRIVAT_USERNAME	charstring, for RFC 2617 [10], clause 3.2.2 username of UE4: The name of user in the specified realm.
9	PX_IMS_SUT_UE4_PRIVAT_PASSWD	charstring, for RFC 2617 [10], clause 3.2.2.2 passwd of UE4: A known shared secret, the password of user of the specified username.
10	PX_IMS_SUT_UE4_QOP	charstring, for RFC 2617 [10], clause 3.2.1 qop options of UE4: Quoted string of one or more tokens indicating the "quality of protection" values supported by the server; the value "auth" indicates authentication; the value "auth-int" indicates authentication with integrity protection.
11	PX_IMS_SUT_UE4_REGISTRAR	charstring for home (SUT) REGISTRAR domain of UE4.
NOTE:	UE1: Simulated calling (originating) UE. UE4: Simulated called (terminating) UE.	

A.2.3 PIXIT for S-CSCF Testing

In addition to the PIXIT in table A.3, PICIT items A.1/1 through to A.1/11 apply.

Table A.3: PIXIT items for S-CSCF testing

Id	Identifier	Type / Description
1	PX_IMS_TS_AS1_IPADDR	charstring, for TS/AS1 IP address to exchange SIP messages.
2	PX_IMS_TS_AS1_PORT	integer, for TS/AS1 port number to exchange SIP messages.
3	PX_IMS_TS_AS1_HOME_DOMAIN	charstring, for TS/AS1 domain.

A.2.4 General PIXIT

The following PIXIT items apply for all types of IUT.

Table A.4: General PIXIT items (SDP and Synchronization)

Id	Identifier	Type / Description
1	PX_SIP_SDP_dyn	charstring, for SDP dynamic port.
2	PX_SIP_SDP_b_modifier	charstring, for SDP bandwidth modifier.
3	PX_SIP_SDP_b_bandwidth	integer, for SDP bandwidth value.
4	PX_SIP_SDP_encoding	charstring, for SDP media attribute encoding supported by the IUT.
5	PX_TSYNC_TIME_LIMIT	float, Default time limit for a sync client to reach a synchronization point.
6	PX_TSHUT_DOWN_TIME_LIMIT	float, Default time limit for a sync client to finish its execution of the shutdown default.

Annex B (informative):
TTCN-3 library modules

B.1 Electronic annex, zip file with TTCN-3 code

The TTCN-3 library modules are contained in archive ts_18600603v030101p0.zip which accompanies the present document.

Annex C (informative):
Validation Report

C.1 Test Suite Validation Level

Level 3 validation (strong) was achieved.

C.2 TTCN-3 Edition

Release 4.3.1 of the TTCN-3 documents [7] were used.

C.3 TTCN-3 Tool(s)

The following TTCN-3 tools were used:

- Elvior TestCast®

- Ericsson® Titan

- Testing Technologies TTWorkbench®

C.3.1 TTCN-3 Tool Elvior TestCast®

C.3.1.1 Identification of the TTCN-3 Tool Elvior TestCast®

Elvior TestCast® T3 Version 6.4.3, no plugins necessary

C.3.1.2 Compilation status

Full compilation, without any errors.

C.3.2 TTCN-3 Tool Ericsson® Titan

C.3.2.1 Identification of the TTCN-3 Tool Ericsson® Titan

Ericsson® Titan as in file ttcn3-1.8.pl4-mingw, no plugins necessary

C.3.2.2 Compilation status

Partial compilation, as xml data structure were not supported by this version.

C.3.3   TTCN-3 Tool Testing Technologies TTWorkbench®

C.3.3.1   Identification of the TTCN-3 Tool Testing Technologies TTWorkbench®

Testing Technologies TTworkbench® Basic, Version: 13, Build id: 2011.10.17.13.21.07.953 with plugin TTplugin-XSD Version 1.1.4.

C.3.3.2   Compilation status

Full compilation, without any errors.

C.3.4   Test Platform(s)

The test cases were run on the execution environment of the Testing Technology TTworkbench® tool mentioned in clause C.3.3.

History

Document history		
V1.1.1	September 2008	Publication
V3.1.1	January 2012	Publication