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Technical Specification

Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Originating Identification Presentation (OIP) and Originating Identification Restriction (OIR); Part 3: Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma specification

Reference

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Keywords

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Contents

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Foreword

This Technical Specification (TS) has been produced by ETSI Technical Committee Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN).

The present document is part 3 of a multi-part deliverable covering the 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 [3].

The TSS&TP have been developed to test the Originating Identification Presentation (OIP) and Originating Identification Restriction (OIR) NGN Basic Service service.

The test notation used in the ATS is TTCN-3 (ES 201 873-1 [8]).

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 (IXIT) 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 a specific reference, subsequent revisions do not apply.
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  - if it is accepted that it will be possible to use all future changes of the referenced document for the purposes of the referring document;
  - for informative references.

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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 indispensable for the application of the present document. For dated references, only the edition cited applies. For non-specific references, the latest edition of the referenced document (including any amendments) applies.

[1] ETSI TS 183 007: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); PSTN/ISDN simulation services; Originating Identification Presentation (OIP) and Originating Identification Restriction (OIR); Protocol specification".

[2] ETSI TS 186 006-1: "Telecommunications and Internet Converged Services and Protocols for Advanced Networking (TISPAN); Originating Identification Presentation (OIP) and Originating Identification Restriction (OIR); Part 1: Protocol Implementation Conformance Statement (PICS)".

[3] ETSI TS 186 006-2: "Telecommunications and Internet Converged Services and Protocols for Advanced Networking (TISPAN); Originating Identification Presentation (OIP) and Originating Identification Restriction (OIR) Part 2: Test Suite Structure and Test Purposes (TSS&TP)".

[4] ETSI TS 186 002-4: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Interworking between Session Initiation Protocol (SIP) and Bearer Independent Call Control Protocol (BICC) or ISDN User Part (ISUP); Part 4: Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) for Profile A and B".

[5] ETSI EN 383 001: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Interworking between Session Initiation Protocol (SIP) and Bearer Independent Call Control (BICC) Protocol or ISDN User Part (ISUP) [ITU-T Recommendation Q.1912.5, modified]".

[6] ETSI TS 102 027-3 (V3.1.1): "Methods for Testing and Specification (MTS); Conformance Test Specification for SIP (IETF RFC 3261); Part 3: Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma".

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

[8] ETSI ES 201 873-1 (V3.1.1): "Methods for Testing and Specification (MTS); The Testing and Test Control Notation version 3; Part 1: TTCN-3 Core Language".

[9] ETSI ES 201 873-5 (V3.1.1): "Methods for Testing and Specification (MTS); The Testing and Test Control Notation version 3; Part 5: TTCN-3 Runtime Interface (TRI)".

[10] ETSI ES 201 873-6 (V3.1.1): "Methods for Testing and Specification (MTS); The Testing and Test Control Notation version 3; Part 6: TTCN-3 Control Interface (TCI)".

[11] ETSI ES 283 003: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); IP Multimedia Call Control Protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP) Stage 3 [3GPP TS 24.229 (Release 7), modified]".

[12] ETSI ES 283 027: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Endorsement of the SIP-ISUP Interworking between the IP Multimedia (IM) Core Network (CN) subsystem and Circuit Switched (CS) networks [3GPP TS 29.163 (Release 7), modified]".

[13] ISO/IEC 9646-1 (1992): "Information Technology - Open Systems Interconnection - Conformance Testing Methodology and Framework - Part 1: General concepts".

[14] ISO/IEC 9646-2 (1994): "Information Technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 2: Abstract Test Suite Specification".

[15] ISO/IEC 9646-3 (1992): "Information Technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 3: The Tree and Tabular Combined Notation".

[16] Void.

[17] ISO/IEC 9646-5 (1994): "Information Technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 5: Requirements on test laboratories and clients for the conformance assessment process".

[18] ISO/IEC 9646-7 (1994): "Information Technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 7: Implementation Conformance Statement".

[19] ITU-T Recommendation Q.1912.5 (2004): "Interworking between Session Initiation Protocol (SIP) and Bearer Independent Call Control protocol or ISDN User Part".

[20] ITU-T Recommendation Q.2150.1 (2001): "Signalling Transport Converter on MTP3 and MTP3b".

[21] ITU-T Recommendation E.164 (2005): "The international public telecommunication numbering plan".

[22] ITU-T Recommendation Q.761 (2000): "Specifications of Signalling System No.7 ISDN User Part (ISUP); functional description".

[23] ITU-T Recommendation Q.762 (2000): "Specifications of Signalling System No.7 ISDN User Part (ISUP); general functions of messages and signals".

[24] ITU-T Recommendation Q.763 (2000): "Specifications of Signalling System No.7 ISDN User Part (ISUP); formats and codes".

[25] ITU-T Recommendation Q.764 (2000): "Specifications of Signalling System No.7 ISDN User Part (ISUP); signalling procedures".

[26] ITU-T Recommendation Q.732.4 (1999): "Stage 3 description for call offering supplementary services using Signalling System No. 7: Call Forwarding Unconditional (CFU)".

[27] ITU-T Recommendation Q.733.2 (1993): "Stage 3 description for call completion supplementary services using Signalling System No. 7: Call hold (HOLD)".

[28] ITU-T Recommendation Q.9: "Vocabulary of switching and signalling terms".

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

[30] IETF RFC 2327 (1998): "SDP: Session Description Protocol".

[31] IETF RFC 3325: "Private Extensions to the Session Initiation Protocol (SIP) for Asserted Identity within Trusted Networks".

[32] IETF RFC 3966: "The tel URI for Telephone Numbers".

[33] IETF RFC 2396: "Uniform Resource Identifiers (URI): Generic Syntax".

[34] IETF RFC 2617 (1999): "HTTP Authentication: Basic and Digest Access Authentication".

[35] IETF RFC 2806 (2000): "URLs for Telephone Calls".

[36] IETF RFC 3262 (2002): "Reliability of Provisional Responses in the Session Initiation Protocol (SIP)".

[37] IETF RFC 3264 (2002): "An Offer/Answer Model with the Session Description Protocol (SDP)".

[38] IETF RFC 3312 (2002): "Integration of Resource Management and Session Initiation Protocol (SIP)".

[39] IETF RFC 3323 (2002): "A Privacy Mechanism for the Session Initiation Protocol (SIP)".

[40] IETF RFC 3515: "The Session Initiation Protocol (SIP) Refer Method".

[41] ITU-T Recommendation Q.931:" ISDN user-network interface layer 3 specification for basic call control".

2.2 Informative references

The following referenced documents are not essential to the use of the present document but they assist the user with regard to a particular subject area**.** For non-specific references, the latest version of the referenced document (including any amendments) applies.

Not applicable.

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in SIP/ISUP interworking reference specification [5], ISDN User Part (ISUP) reference specifications ([22], [23], [24] and [25]), ISO/IEC 9646-1 [13], ISO/IEC 9646-7 [18] and ES 201 873-1 [8] (TTCN-3), and the following apply:

Abstract Test Case (ATC): complete and independent specification of the actions required to achieve a specific test purpose, defined at the level of abstraction of a particular Abstract Test Method, starting in a stable testing state and ending in a stable testing state

Abstract Test Method (ATM): description of how an IUT is to be tested, given at an appropriate level of abstraction to make the description independent of any particular realization of a Means of Testing, but with enough detail to enable abstract test cases to be specified for this method

Abstract Test Suite (ATS): test suite composed of abstract test cases

address identity: See Recommendation E.164 [21] and/or RFC 2806 [35].

call: See ITU-T Recommendation Q.9 [28], definition 2201.

call state: state as defined in clause 2.1 of the present document, for either the user side or network side as appropriate

NOTE: A call state may exist for each call reference value (and at the network side for each additional responding CEI in the incoming call states).

identity information: includes all the information (RFC 2806 [35]/RFC 2396 [33]/ITU-T Recommendation E.164 [21]) identifying a user, including trusted (network generated) and/or untrusted (user generated) addresses

Implementation Under Test (IUT): implementation of one or more OSI protocols in an adjacent user/provider relationship, being part of a real open system which is to be studied by testing

SIP number: number conforming to the numbering and structure specified in ITU-T Recommendation E.164 [21]

Means of Testing (MOT): combination of equipment and procedures that can perform the derivation, selection, parameterization and execution of test cases, in conformance with a reference standardized ATS, and can produce a conformance log

PICS proforma: document, in the form of a questionnaire, which when completed for an implementation or system becomes the PICS

PIXIT proforma: document, in the form of a questionnaire, which when completed for the IUT becomes the PIXIT

Point of Control and Observation (PCO): point within a testing environment where the occurrence of test events is to be controlled and observed, as defined in an Abstract Test Method

Pre-test condition: setting or state in the IUT which cannot be achieved by providing stimulus from the test environment

Protocol Implementation Conformance Statement (PICS): statement made by the supplier of a protocol claimed to conform to a given specification, stating which capabilities have been implemented

Protocol Implementation eXtra Information for Testing (PIXIT): statement made by a supplier or implementor of an IUT (protocol) which contains or references all of the information related to the IUT and its testing environment, which will enable the test laboratory to run an appropriate test suite against the IUT

supplementary service: a service that modifies or supplements a basic Telecommunication service

System Under Test (SUT): real open system in which the IUT resides

trusted identity: network generated user address information

untrusted identity: user generated user address information

voice session: existing voice connection between two terminal equipments

EXAMPLE: Via RTP.

3.2 Abbreviations

For the purposes of the present document, the following abbreviations given in table 2 of ITU-T Recommendation Q.762 [23] (ISUP messages) and the following apply:

NOTE: Abbreviations have been used both in the present document and in the TTCN-3 library modules (annex B).

ASP Abstract Service Primitive
NOTE: Exchanged between entities inside the TS or between the user of the ATS (operator) and the TS.

ATC Abstract Test Case
ATM Abstract Test Method
ATP Access Transport Parameter
ATS Abstract Test Suite
BC Bearer Capability
BCI Backward Call Indicators
CIC Circuit Identification Code
CPS Calling Party's Category
CN Core Network
CS Circuit Switched
DSS1 Digital Subscriber System No. 1
EDS Encoding/Decoding System
ETS Executable Test Suite
FCI Forward Call Indicators
OIP Originating Identification Presentation
OIR Originating Identification Restriction
HLC High Layer Compatibility
ICS Implementation Conformance Statement
IE Information Element
IETF Internet Engineering Task Force
IM IP Multimedia
IP Internet Protocol
ISDN Integrated Services Digital Network
ISUP ISDN User Part
IUT Implementation Under Test
IWU Interworking Unit
LLC Low Layer Compatibility
LT Lower Tester
MOT Means Of Testing
MTC Main Test Component
MTP Message Transfer Part
NCI Nature of Connection Indicators
NGN Next Generation Network
NNI Network-Network Interface
OBCI Optional Backward Call Indicators
OLE Originating Local Exchange

PA	Platform Adapter
PCO	Point of Control and Observation
PCTR	Protocol Conformance Test Report
PDU	Protocol Data Unit (message exchanged between TS and SUT at a signalling interface)
PICS	Protocol Implementation Conformance Statement
PIXIT	Protocol Implementation eXtra Information for Testing
PSTN	Public Switch Telephone Network
PTC	Parallel Test Component
SA	SUT Adapter
SDP	Session Description Protocol
SIP	Session Initiation Protocol
SN	Signalling Node
SS#7	Signalling System No. 7
STC	Signalling Transport Converter

NOTE According to ITU-T Recommendation Q.2150.1 [20].

SUT	System Under Test
TC	Test Case
TCI	TTCN-3 Control Interface
TCP	Test Coordination Procedures
TD	Test Description
TE	TTCN-3 Executable
TISPAN	ETSI Technical Committee Telecommunications and Internet converged Services and Protocols for Advanced Networking
TL	Test Logging
TMR	Transmission Medium Requirement
TMU	Transmission Medium Used
TP	Test Purpose
TRI	TTCN-3 Runtime Interface
TS	Test System
TSS	Test Suite Structure
TSS&TP	Test Suite Structure and Test Purposes
TTCN	Tree and Tabular Combined Notation
TTCN-3	Testing and Test Control Notation edition 3
UE	User Equipment

4 Abstract Test Method (ATM)

4.1 Network architecture

Two different network configurations have been assumed in the scope of the test purpose description defined in TS 186 006-2 [3], SIP-SIP and SIP-ISUP. The test purposes from the latter configuration are also covered in TS 186 002-4 [4]; they have been adopted and integrated to the present document and its related TTCN-3 test code specification.

Figures 1 and 2 show the network architecture for SIP-SIP and SIP-ISUP configuration.

Figure 1 shows the network architecture for SIP-SIP UE Interworking.

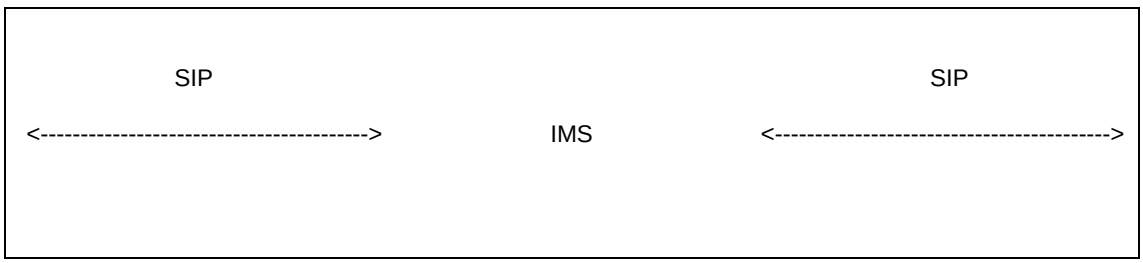

Figure 1: Interworking between two SIP UEs

Figure 2 shows the network architecture for SIP-ISUP Interworking.

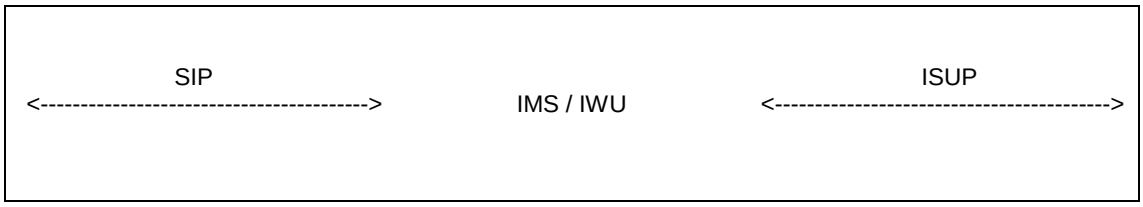

Figure 2: Interworking between SIP and ISUP

4.2 Protocol architecture

Figures 1 and 2 show that there are two configurations of the SUT (representing the SUT in the testing environment described in the present document): a SIP UE interface and either a second SIP UE or an ISUP- or BICC interface.

Since the ISUP and BICC protocols are very similar (the latter one being derived from ISUP), they are treated here as one protocol.

NOTE: No signalling is used within the SIP-ISUP-Interworking ATS to control the ATM bearer in case of BICC (ASPs are used).

Figure 3 shows the protocol architecture regarding the two interfaces.

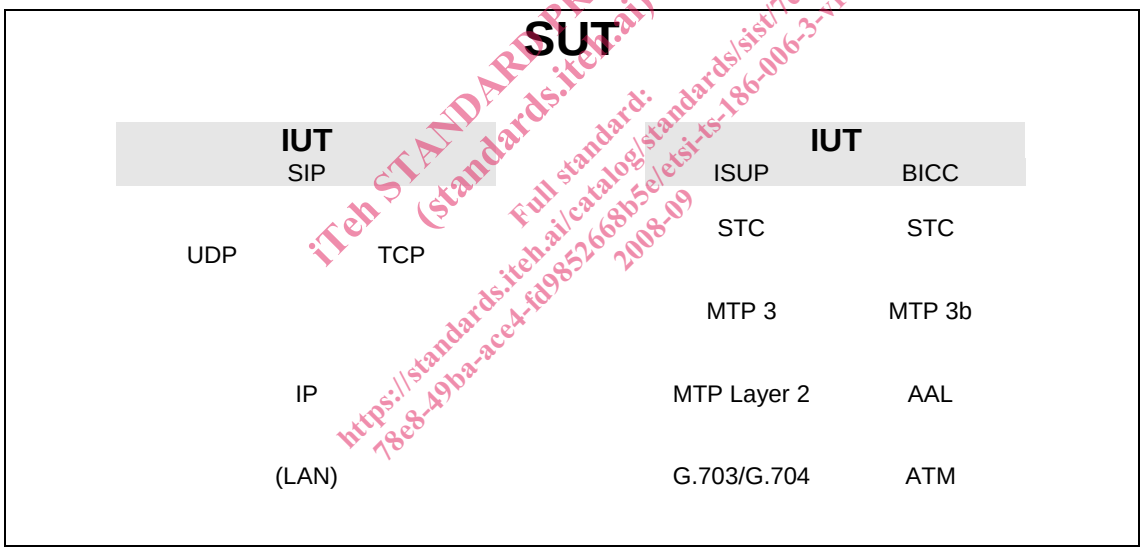

Figure 3: Protocol architecture of the SIP and ISUP interfaces