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Technical Specification

Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); SIP-ISUP Interworking between the IP Multimedia (IM) Core Network (CN) subsystem and Circuit Switched (CS) networks; Part 2: Test Suite Structure and Test Purposes (TSS&TP)

Reference

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ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
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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 2 of a multi-part deliverable covering the Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); SIP-ISUP Interworking between the IP Multimedia (IM) Core Network (CN) subsystem and Circuit Switched (CS) networks;

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 Test Suite Structure and Test Purposes (TSS&TP) for SIP-ISUP Interworking between the IP Multimedia (IM) Core Network (CN)subsystem and Circuit Switched (CS) networks ES 283 027 [1]. The references [1] and [16] are indentical.

A further part of the present document specifies the Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma based on the present document.

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 and/or edition number or version number) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

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

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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 ES 283 027 (V2.5.1): "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]".

[2] ETSI TS 129 163: "Digital cellular telecommunications system (Phase 2+) Universal Mobile Telecommunications System (UMTS) Interworking between the IP Multimedia (IM) Core Network (CN) subsystem and Circuit Switched (CS) networks (3GPP TS 29.163 version 7.9.0 Release 7)".

[3] ITU-T Recommendations Q.761 to Q.764 (2000): "Signalling System No.7 ISDN User Part (ISUP)".

[4] Void.

[5] ITU-T Recommendation Q.850 (1998): "Usage of cause and location in the Digital Subscriber Signalling System No. 1 and the Signalling System No. 7 ISDN User Part".

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

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

[8] ISO/IEC 9646-1 (1994): "Conformance testing methodology and framework - Part 1: General Concepts".

[9] ISO/IEC 9646-3 (1992): "Conformance testing methodology and framework - Part 3: The Tree and Tabular Combined Notation".

[10] ISO/IEC 9646-7 (1994): "Conformance testing methodology and framework - Part 7: Implementation Conformance Statement".

[11] ITU-T Recommendation E.164: "The international public telecommunication numbering plan".

[12] Void.

[13] ITU-T Recommendation Q.939: "Typical DSS 1 service indicator codings for ISDN telecommunications services".

[14] ETSI TS 183 008: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); PSTN/ISDN simulation services Terminating Identification Presentation (TIP) and Terminating Identification Restriction (TIR); Protocol specification".

[15] ETSI TS 129 163: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Interworking between the IP Multimedia (IM) Core Network (CN) subsystem and Circuit Switched (CS) networks (3GPP TS 29.163 version 8.5.0 Release 8)".

[16] ETSI TS 129 527 (V8.2.0): "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); 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] (3GPP TS 29.527 version 8.2.0 Release 8)".

[17] IETF RFC 3556: "Session Description Protocol (SDP) Bandwidth Modifiers for RTP Control Protocol (RTCP) Bandwidth".

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

[19] IETF RFC 4040: "RTP Payload Format for a 64 kbit/s Transparent Call".

[20] ITU-T Recommendation F.182: "Operational provisions for the international public facsimile service between subscribers with Group 3 facsimile terminals (Telefax 3)".

[21] ITU-T Recommendation F.184: "Operational provisions for the international public facsimile service between subscriber stations with group 4 facsimile terminals (telefax 4)".

[22] ITU-T Recommendation F.230: "Service requirements unique to the mixed mode (MM) used within the teletex service".

[23] ITU-T Recommendation F.220: "Service requirements unique to the processable mode number eleven (PM11) used within the teletex service".

[24] ITU-T Recommendation F.200: "Teletex service".

[25] ITU-T Recommendation F.300: "Videotex service".

[26] ITU-T Recommendation F.60: "Operational provisions for the international telex service".

[27] ITU-T Recommendation F.721: "Videotelephony teleservice for ISDN".

[28] ETSI ETS 300 356-1: "Integrated Services Digital Network (ISDN); Signalling System No.7 (SS7); ISDN User Part (ISUP) version 4 for the international interface; Part 1: Basic services [ITU-T Recommendations Q.761 to Q.764 (1999) modified]".

[29] ITU-T Recommendation X.213: "Information technology - Open Systems Interconnection - Network service definition".

[30] ISO/IEC 8348: "Information technology - Open Systems Interconnection - Network service definition".

[31] ITU-T Recommendation T.38: "Procedures for real-time Group 3 facsimile communication over IP networks".

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

[33] ITU-T Recommendation Q.737.1: "Stage 3 description for additional information transfer supplementary services using Signalling System No. 7 : User-to-user signalling (UUS)".

[34] ITU-T Recommendation Q.734.1: "Stage 3 description for multiparty supplementary services using Signalling System No. 7: Conference calling".

[35] ITU-T Recommendation Q.734.2: "Stage 3 description for multiparty supplementary services using Signalling System No. 7: Three-party service".

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, in ISDN layer 3 reference specification, in ISO/IEC 9646-1 [8], in ISO/IEC 9646-3 [9], in ISO/IEC 9646-7 [10] 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 SUT 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

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

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 SUT 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 SUT 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 SUT (protocol) which contains or references all of the information related to the SUT and its testing environment, which will enable the test laboratory to run an appropriate test suite against the SUT

SIP number: number conforming to the numbering and structure specified in ITU-T Recommendation E.164 [11]

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

user: access protocol entity at the User side of the user-network interface where a T reference point or coincident S and T reference point applies

3.2 Abbreviations

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

ATC	Abstract Test Case
ATM	Abstract Test Method
ATP	Access Transport Parameter
ATS	Abstract Test Suite
BCI	Backward Call Indicators
CPS	Calling Party's Category
DSS1	Digital Subscriber System No. 1
FCI	Forward Call Indicators
HLC	High Layer Compatibility
ISDN	Integrated Services Digital Network
ISUP	ISDN User Part
IUT	Implementation Under Test
MOT	Means Of Testing
NCI	Nature of Connection Indicators
OBCI	Optional Backward Call Indicators
OFCI	Optional Forward Call Indicator
PICS	Protocol Implementation Conformance Statement
PIXIT	Protocol Implementation eXtra Information for Testing
SUT	System Under Test
TMR	Transmission Medium Requirement
TP	Test Purpose
TSS	Test Suite Structure
TTCN	Tree and Tabular Combined Notation

NOTE: The ISUP message acronyms can be found in table 2/ ITU-T Recommendation Q.762 [3].

4 Implementation under test and test methods

4.1 Identification of the system and implementation under test

FFS

5 Test Suite Structure (TSS)

The Test Suite Structure is in close alignment with ES 283 027 [1].

5.1 Interworking from SIP to ISUP (outgoing call)

SIP -ISUP Basic call		
	Sending of the Initial address message (IAM)	101xxx
	Sending of the Subsequent address message (SAM)	102xxx
	Sending of COT	103xxx
	Receipt of the Address complete message (ACM)	104xxx
	Receipt of the Call progress message (CPG)	105xxx
	Receipt of the answer message (ANM)	106xxx
	Receipt of the Connect message (CON)	107xxx
	Receipt of the Release message (REL)	108xxx
	Autonomous release at I-MGCF	109xxx
	Receipt of the BYE, CANCEL message / sending of a REL message	110xxx
	Receipt of Reset circuit message (RSC), Circuit group reset message (GRS) or Circuit group blocking message (CGB) with the indication hardware failure oriented	111xxx
	Receipt of the SUSPEND Message (SUS)	111xxx
	Receipt of the RESUME Message (RES)	112xxx

Figure 1: Basic call -
Test suite structure for interworking between SIP to ISUP (outgoing call)

5.2 Interworking from ISUP to SIP (incoming call)

ISUP-SIP Basic call		
	Sending of the INVITE message	301xxx
	Receipt of the Subsequent address message (SAM)	302xxx
	Sending of the Address complete message (ACM)	303xxx
	Sending of the Call progress message (CPG)	304xxx
	Sending of the answer message (ANM)	305xxx
	Sending of the Connect message (CON)	306xxx
	Receipt of the Release message (REL)	307xxx
	Sending of the Release Message (REL)	308xxx
	Autonomous release	309xxx
	Receipt of Reset circuit message (RSC)	310xxx
	Receipt of Circuit group reset message (GRS)	311xxx
	Receipt of Circuit group blocking message (CGB) with the indication hardware failure oriented	312xxx

Figure 2: Basic call -
Test suite structure for interworking between ISUP to SIP (incoming call)

5.3 Supplementary Services - Interworking from SIP to ISUP (outgoing call)

SIP-ISUP Supplementary Services		
	Calling Line Identification (CLI)	501xxx
	Call Hold (HOLD)	502xxx
	Terminal Portability (TP)	503xxx
	Conference Calling (CONF)	504xxx
	Three-Party (3PTY)	505xxx
	Connected Line Identification (COL)	506xxx
	Malicious call identification (MCID)	507xxx
	Subaddressing (SUB)	508xxx
	Call Diversion (CDIV)	509xxx
	Call Waiting (CW)	510xxx
	User to User Signalling (UUS)	511xxx
	Explicit Call transfer (ECT)	512xxx
	Completion of Call to Busy Subscriber (CCBS)	513xxx
	Completion of Calls on No reply (CCNR)	514xxx
	Anonymous Call Rejection (ACR)	515xxx
	Closed user group (CUG)	516xxx

Figure 3: Supplementary Services -
Test suite structure for interworking between SIP to ISUP (outgoing call)

5.4 Supplementary Services - Interworking from ISUP to SIP (incoming call)

ISUP-SIP		
	Calling Line Identification (CLI)	601xxx
	Call Hold (HOLD)	602xxx
	Terminal Portability (TP)	603xxx
	Conference Calling (CONF)	604xxx
	Three-Party (3PTY)	605xxx
	Connected Line Identification (COL)	606xxx
	Subaddressing (SUB)	607xxx
	Closed User Group (CUG)	608xxx
	Call Diversion (CDIV)	609xxx
	User to User Signalling (UUS)	610xxx
	Explicit Call transfer (ECT)	611xxx
	Anonymous Call Rejection (ACR)	612xxx
	Call waiting (CW)	613xxx
	Malicious call identification (MCID)	614xxx

Figure 4: Supplementary Services -
Test suite structure for interworking between ISUP to SIP (outgoing call)

6 Test purposes (TP)

6.1 Introduction

For each test requirement a Test Purpose (TP) is defined.

6.1.1 Test purpose (TP) naming convention

For each test requirement a Test Purpose (TP) is defined.

All test purposes belong to the main group ISUP_SIP_Interworking. Groups are organized according to the test suite structure (TSS). Each test purpose is presented in a separate table. The first row of the table contains the following items:

TP	Identifier of the test purpose;
SIP reference	the reference to the requirement in the DSS1 layer 3 Recommendation, which led to the TP;
ISUP reference	the reference to the requirement in the interworking specification and the requirement in the SIP-UP Recommendation, which led to the TP.

6.1.2 Source of test purpose definition

The test purposes have been developed based on ES 283 027 [1] as an endorsement of TS 129 163 [15].

6.1.3 Test purpose structure

The test purpose structure is according to the test suite structure (TSS).

6.2 Test purposes for the basic call

6.2.1 Interworking from SIP to ISUP (Outgoing Call)

6.2.1.1 Sending of the Initial Address Message (IAM)

TP101001	**SIP reference: RFC 3261 [6]**	**ISUP reference: ES 283 027 [1], clause 7.2.3.1.1**
TSS reference:	SIP-ISUP/Basic call/ Sending of the Initial Address message (IAM)/	
SIP selection criteria:		
ISUP selection criteria:		
Test purpose:	*Normal call setup without precondition reequirement* Ensure that if the SIP precondition extension is not included in the Supported or Require header, the I-MGCF shall send an IAM immediately after the reception of the INVITE, The I-MGCF shall set the continuity indicators to "Continuity check not required".	
SIP Parameter values:		
ISUP Parameter values:		
Comments:	**SIP** SUT **ISUP** INVITE → → IAM 180 Ringing ← ← ACM Ringing tone 200 OK INVITE ← ← ANM ACK → Conversation BYE → → REL 200 OK BYE ← ← RLC	

TP101002	**SIP reference: RFC 3261 [6]**	**ISUP reference: ES 283 027 [1], clause 7.2.3.1.1**
TSS reference:	SIP-ISUP/Basic call/ Sending of the Initial Address message (IAM)/	
SIP selection criteria:	PICS 4/4 AND PICS 4/5	
ISUP selection criteria:		
Test purpose:	*Call setup with precontion tag in the Supported header and preconditions are fullfield successful* Ensure if a Continuity Check procedure is supported in the ISUP network and SIP precondition extension are included in the SIP Supported header and the preconditions are indicated as fullfield in the SDP, the I-MGCF shall send the IAM immediately after the reception of the INVITE. The preconditions met is sent in the 200 OK INVITE.	
SIP Parameter values:	INVITE: Supported: 100rel, precondition SDP a=curr:qos local sendrecv a=curr:qos remote none a=des:qos mandatory local sendrecv a=des:qos none remote sendrecv 200 OK INVITE SDP a=curr:qos local sendrecv a=curr:qos remote sendrecv a=des:qos mandatory local sendrecv a=des:qos mandatory remote sendrecv	
ISUP Parameter values:	IAM: Continuity indicator: Continuity check not required	
Comments:	**SIP** SUT **ISUP** INVITE → → IAM 180 Ringing ← ← ACM Ringing tone 200 OK INVITE ← ← ANM ACK → Conversation BYE → → REL 200 OK BYE ← ← RLC	