



TECHNICAL REPORT

**Core Network and Interoperability Testing (INT);  
IMS specific use of Session Initiation Protocol (SIP)  
and Session Description Protocol (SDP);  
Conformance Testing;  
(3GPP Release 10);  
Validation report**

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Reference

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## Foreword

This Technical Report (TR) has been produced by ETSI Technical Committee Core Network and Interoperability Testing (INT).

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## Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**may not**", "**need**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the [ETSI Drafting Rules](#) (Verbal forms for the expression of provisions).

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# 1 Scope

The present document is the validation report of the IMS specific use of Session Initiation Protocol (SIP) and Session Description Protocol (SDP) conformance tests and it provides statistics of executed and validated IMS SIP conformance tests. The information provided has been produced by validation against two implementations from industry.

Furthermore, identified base specifications and test specification issues are listed in the present document.

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# 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.

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## 2.1 Normative references

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

Not applicable.

## 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.

- [i.1] ETSI TS 102 790-2: "Core Network and Interoperability Testing (INT); IMS specific use of Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Conformance Testing; (3GPP Release 10); Part 2: Test Suite Structure (TSS) and Test Purposes (TP)".
- [i.2] ETSI TS 102 790-3: "Core Network and Interoperability Testing (INT); IMS specific use of Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Conformance Testing; (3GPP Release 10); Part 3: Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma specification".
- [i.3] ETSI EG 201 015 (V1.1.1): "Methods for Testing and Specification (MTS); Specification of protocols and services; Validation methodology for standards using SDL; Handbook".
- [i.4] ETSI ES 201 873-1 (V4.2.1): "Methods for Testing and Specification (MTS); The Testing and Test Control Notation version 3; Part 1: TTCN-3 Core Language".

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# 3 Abbreviations

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

ATS	Abstract Test Suite
IMS	IP Multimedia Subsystem
PICS	Protocol Implementation Conformance Statement
SDP	Session Description Protocol
SIP	Session Initiation Protocol
SUT	System under Test

TC	Test Case
TP	Test Purpose
TS	Test System
TSS	Test Suite Structure
TTCN-3	Testing and Test Control Notation version 3
XML	Extensible Markup Language
XSD	XML Schema Definition

## 4 Validation report

### 4.1 Validation level

Level 3 (rigorous) abstract test suite validation has been performed, according to the validation handbook [i.3]:

- the test suite has been compiled on more than one TTCN-3 tool;
- the complete suite of tests has been implemented and executed on more than one test platform;
- the complete suite of tests have been executed against SUTs from a range of different suppliers;
- the operation and output traces of all the tests have been validated.

### 4.2 Source code evaluation

#### 4.2.1 TTCN-3 version

The SIP IMS Release 10 abstract test suite is based on TTCN-3 edition 4.2.1 (TTCN3:2010) [i.4].

#### 4.2.2 TTCN-3 tools used for compilation

The test suite has been compiled using two different TTCN-3 tools, as detailed in table 1.

**Table 1: TTCN-3 tools used for compilation**

Supplier	Tool name	Version	Settings	Compilation result
TestingTech	TTworkbench	1.17	<ul style="list-style-type: none"> <li>• Support for very large integers</li> <li>• XSD-Language-Support-v1.1.9</li> </ul>	No error
Elvior	TestCast T3	6.8.0		No error

### 4.3 Validation Process

#### 4.3.1 Validation method

Void.

#### 4.3.2 Test Platforms

The validation test platform has been provided by Iskratel.

**Table 2: Validation test platform components**

<b>TTCN-3 Tool</b>	TestingTech TTworkbench v17 with XSD support plugin
<b>ATS</b>	The applicable ATS is: <a href="https://forge.etsi.org/svn/IMS_CON_BC/trunk/BC">https://forge.etsi.org/svn/IMS_CON_BC/trunk/BC</a>

### 4.3.3 SUTs

SUTs have been provided by Iskratel and Italtel for the purpose of the validation of the IMS SIP test suite.

### 4.3.4 Validation Status

Following features were not supported or partially supported by the vendors:

- Emergency call.
- Security association.
- Encryption algorithms: only MD5 Digest s supported.

For these reasons:

- 1) groups of test cases such as 'emergency call' were not executed and validated;
- 2) some test cases in groups were not executed and validated (e.g. security association).

#### 4.3.4.1 Gm Interface

Table 3 shows the validation status of each test case on the Gm interface.

**Table 3: Test case validation status**

TC identifier	Verdict	Log analysis	Validated
TC_IMST2_GM_GEN_01	PASS	Yes	Yes
TC_IMST2_GM_REG_01	PASS	Yes	Yes
TC_IMST2_GM_REG_02	INCONC	Yes	Yes
TC_IMST2_GM_REG_03	INCONC	Yes	Yes
TC_IMST2_GM_REG_04	INCONC	Yes	Yes
TC_IMST2_GM_REG_05	INCONC	Yes	Yes
TC_IMST2_GM_REG_06	INCONC	Yes	Yes
TC_IMST2_GM_REG_07	INCONC	Yes	Yes
TC_IMST2_GM_REG_08	INCONC	Yes	Yes
TC_IMST2_GM_REG_09	FAIL	Yes	Yes
TC_IMST2_GM_REG_10			No
TC_IMST2_GM_REG_11	PASS	Yes	Yes
TC_IMST2_GM_INI_01	PASS	Yes	No
TC_IMST2_GM_INI_02	FAIL	Yes	Yes
TC_IMST2_GM_INI_03	PASS	Yes	Yes
TC_IMST2_GM_INI_03A	PASS	Yes	Yes
TC_IMST2_GM_INI_04	PASS	Yes	Yes
TC_IMST2_GM_INI_04A	PASS	Yes	Yes
TC_IMST2_GM_INI_05	PASS	Yes	Yes
TC_IMST2_GM_INI_06	FAIL	Yes	Yes
TC_IMST2_GM_INI_07	FAIL	Yes	Yes
TC_IMST2_GM_INI_08	PASS	Yes	Yes
TC_IMST2_GM_STA_01	PASS	Yes	Yes
TC_IMST2_GM_STA_02	PASS	Yes	Yes
TC_IMST2_GM_STA_03	PASS	Yes	Yes
TC_IMST2_GM_STA_04	PASS	Yes	Yes
TC_IMST2_GM_STA_05	FAIL	Yes	Yes
TC_IMST2_GM_SUB_01	FAIL	Yes	Yes
TC_IMST2_GM_SUB_02	FAIL	Yes	Yes
TC_IMST2_GM_SUB_03	FAIL	Yes	Yes
TC_IMST2_GM_SUB_04	PASS	Yes	Yes
TC_IMST2_GM_SUB_05	PASS	Yes	Yes
TC_IMST2_GM_SUB_06	PASS	Yes	Yes
TC_IMST2_GM_SUB_06a	PASS	Yes	Yes
TC_IMST2_GM_SUB_07	PASS	Yes	Yes
TC_IMST2_GM_SUB_07a	PASS	Yes	Yes
TC_IMST2_GM_SUB_08	FAIL	Yes	Yes

TC identifier	Verdict	Log analysis	Validated
TC_IMST2_GM_SUB_09	FAIL	Yes	Yes
TC_IMST2_GM_SUB_10	FAIL	Yes	Yes
TC_IMST2_GM_TAR_01	PASS	Yes	Yes
TC_IMST2_GM_TAR_02	FAIL	Yes	Yes
TC_IMST2_GM_TAR_03	FAIL	Yes	Yes
TC_IMST2_GM_TAR_04	FAIL	Yes	Yes
TC_IMST2_GM_TAR_05	FAIL	Yes	Yes
TC_IMST2_GM_TAR_06	FAIL	Yes	Yes
TC_IMST2_GM_TAR_07	FAIL	Yes	Yes
TC_IMST2_GM_TAR_08	FAIL	Yes	Yes
TC_IMST2_GM_TAR_09	FAIL	Yes	Yes
TC_IMST2_GM_TAR_10	FAIL	Yes	Yes
TC_IMST2_GM_TAR_11	FAIL	Yes	Yes
TC_IMST2_GM_TAR_12	FAIL	Yes	Yes
TC_IMST2_GM_EME_01			No
TC_IMST2_GM_EME_02			No
TC_IMST2_GM_EME_03			No
TC_IMST2_GM_EME_04			No
TC_IMST2_GM_EME_05			No
TC_IMST2_GM_EXC_01	FAIL	Yes	Yes
TC_IMST2_GM_EXC_01A	FAIL	Yes	Yes
TC_IMST2_GM_EXC_02	FAIL	Yes	Yes
TC_IMST2_GM_SDP_01	FAIL	Yes	Yes
TC_IMST2_GM_SDP_02	FAIL	Yes	Yes
TC_IMST2_GM_SDP_03	PASS	Yes	Yes
TC_IMST2_GM_NAT_01	FAIL	Yes	Yes

Table 4 shows the global results from the validation of the GM interface test cases.

**Table 4: Global results**

Number of TCs	PASS	FAIL	INCONC	N/A
63	22	28	7	6

Table 5 depicts the results grouped by test cases categories.

**Table 5: Results by test cases categories**

	GEN	REG	SUB	STA	INI	TAR	EXEC	SDP	NAT
pass	1	2	6	4	7	1	0	1	0
fail	0	1	6	1	3	11	3	2	1
inconc	0	7	0	0	0	0	0	0	0
none	0	1	0	0	0	0	0	0	0

#### 4.3.4.2 Mw Interface

Table 6 shows the validation status of each test case on the Mw interface.

**Table 6: Test case validation status**

TC identifier	Verdict	Log analysis	Validated
TC_IMST2_MW_GEN_01	PASS	Yes	Yes
TC_IMST2_MW_GEN_02	PASS	Yes	Yes
TC_IMST2_MW_GEN_03	PASS	Yes	Yes
TC_IMST2_MW_GEN_04			No
TC_IMST2_MW_GEN_05	PASS	Yes	Yes
TC_IMST2_MW_GEN_06	PASS	Yes	Yes
TC_IMST2_MW_GEN_07	PASS	Yes	Yes
TC_IMST2_MW_GEN_08	PASS	Yes	Yes
TC_IMST2_MW_GEN_09	PASS	Yes	Yes
TC_IMST2_MW_GEN_10	PASS	Yes	Yes



TC identifier	Verdict	Log analysis	Validated
TC_IMST2_MW_GEN_11	FAIL	Yes	Yes
TC_IMST2_MW_GEN_12	FAIL	Yes	Yes
TC_IMST2_MW_GEN_13	PASS	Yes	Yes
TC_IMST2_MW_GEN_14	FAIL	Yes	Yes
TC_IMST2_MW_GEN_15	PASS	Yes	Yes
TC_IMST2_MW_GEN_16	PASS	Yes	Yes
TC_IMST2_MW_GEN_17	PASS	Yes	Yes
TC_IMST2_MW_REG_01			No
TC_IMST2_MW_REG_02			No
TC_IMST2_MW_REG_03			No
TC_IMST2_MW_REG_04			No
TC_IMST2_MW_REG_05			No
TC_IMST2_MW_REG_06			No
TC_IMST2_MW_REG_07			No
TC_IMST2_MW_REG_08			No
TC_IMST2_MW_REG_09			No
TC_IMST2_MW_REG_10			No
TC_IMST2_MW_REG_11			No
TC_IMST2_MW_REG_12			No
TC_IMST2_MW_REG_13			No
TC_IMST2_MW_REG_14			No
TC_IMST2_MW_REG_15			No
TC_IMST2_MW_REG_16			No
TC_IMST2_MW_REG_18			No
TC_IMST2_MW_REG_19			No
TC_IMST2_MW_REG_20	FAIL	Yes	Yes
TC_IMST2_MW_REG_21	FAIL	Yes	Yes
TC_IMST2_MW_REG_22	FAIL	Yes	Yes
TC_IMST2_MW_REG_23	FAIL	Yes	Yes
TC_IMST2_MW_REG_24	FAIL	Yes	Yes
TC_IMST2_MW_REG_25	FAIL	Yes	Yes
TC_IMST2_MW_REG_26	FAIL	Yes	Yes
TC_IMST2_MW_INI_01	FAIL	Yes	Yes
TC_IMST2_MW_INI_02	FAIL	Yes	Yes
TC_IMST2_MW_INI_03	FAIL	Yes	Yes
TC_IMST2_MW_INI_04	FAIL	Yes	Yes
TC_IMST2_MW_INI_05	FAIL	Yes	Yes
TC_IMST2_MW_INI_06	FAIL	Yes	Yes
TC_IMST2_MW_INI_07	FAIL	Yes	Yes
TC_IMST2_MW_INI_08	PASS	Yes	Yes
TC_IMST2_MW_INI_09	PASS	Yes	Yes
TC_IMST2_MW_INI_10	FAIL	Yes	Yes
TC_IMST2_MW_INI_11	FAIL	Yes	Yes
TC_IMST2_MW_INI_12	PASS	Yes	Yes
TC_IMST2_MW_INI_13	PASS	Yes	Yes
TC_IMST2_MW_INI_14	FAIL	Yes	Yes
TC_IMST2_MW_INI_15			No
TC_IMST2_MW_INI_16			No
TC_IMST2_MW_INI_18			No
TC_IMST2_MW_INI_19			No
TC_IMST2_MW_INI_20	PASS	Yes	Yes
TC_IMST2_MW_INI_21	PASS	Yes	Yes
TC_IMST2_MW_INI_22	PASS	Yes	Yes
TC_IMST2_MW_INI_23	PASS	Yes	Yes
TC_IMST2_MW_INI_24	FAIL	Yes	Yes
TC_IMST2_MW_INI_25			No
TC_IMST2_MW_STA_01	PASS	Yes	Yes
TC_IMST2_MW_STA_02	FAIL	Yes	Yes
TC_IMST2_MW_STA_03	FAIL	Yes	Yes
TC_IMST2_MW_STA_04	PASS	Yes	Yes
TC_IMST2_MW_STA_05	PASS	Yes	Yes
TC_IMST2_MW_STA_06	FAIL	Yes	Yes
TC_IMST2_MW_STA_07	FAIL	Yes	Yes
TC_IMST2_MW_SUB_01	FAIL	Yes	Yes

TC identifier	Verdict	Log analysis	Validated
TC_IMST2_MW_SUB_02	FAIL	Yes	Yes
TC_IMST2_MW_SUB_03	FAIL	Yes	Yes
TC_IMST2_MW_SUB_04	FAIL	Yes	Yes
TC_IMST2_MW_SUB_05	FAIL	Yes	Yes
TC_IMST2_MW_SUB_06	FAIL	Yes	Yes
TC_IMST2_MW_SUB_07			No
TC_IMST2_MW_SUB_07A	PASS	Yes	Yes
TC_IMST2_MW_SUB_08	FAIL	Yes	Yes
TC_IMST2_MW_SUB_09	FAIL	Yes	Yes
TC_IMST2_MW_SUB_10	FAIL	Yes	Yes
TC_IMST2_MW_TAR_01	FAIL	Yes	Yes
TC_IMST2_MW_TAR_02	FAIL	Yes	Yes
TC_IMST2_MW_TAR_03	FAIL	Yes	Yes
TC_IMST2_MW_TAR_04			No
TC_IMST2_MW_TAR_04A	PASS	Yes	Yes
TC_IMST2_MW_TAR_05			No
TC_IMST2_MW_TAR_05A	FAIL	Yes	Yes
TC_IMST2_MW_TAR_06	FAIL	Yes	Yes
TC_IMST2_MW_TAR_07			No
TC_IMST2_MW_TAR_07A	FAIL	Yes	Yes
TC_IMST2_MW_TAR_08	FAIL	Yes	Yes
TC_IMST2_MW_TAR_09			No
TC_IMST2_MW_TAR_09A	FAIL	Yes	Yes
TC_IMST2_MW_EME_01			No
TC_IMST2_MW_EME_02			No
TC_IMST2_MW_EME_03			No
TC_IMST2_MW_EME_04			No
TC_IMST2_MW_EME_05			No
TC_IMST2_MW_EME_06			No
TC_IMST2_MW_EME_07			No
TC_IMST2_MW_EME_08			No
TC_IMST2_MW_EME_09			No
TC_IMST2_MW_EME_10			No
TC_IMST2_MW_EME_11			No
TC_IMST2_MW_SDP_01	FAIL	Yes	Yes
TC_IMST2_MW_SDP_02			No
TC_IMST2_MW_SDP_03	FAIL	Yes	Yes
TC_IMST2_MW_SDP_04	FAIL	Yes	Yes
TC_IMST2_MW_SDP_05	FAIL	Yes	Yes

Table 7 shows the global results from the validation of GM interface test cases.

**Table 7: Global results**

Number of TCs	PASS	FAIL	INCONC	N/A
113	25	46	0	4

Table 8 depicts the results grouped by test cases categories.

**Table 8: Results by test cases categories**

	GEN	REG	SUB	STA	INI	TAR	EME
pass	12	0	1	3	8	1	0
fail	3	7	9	4	11	8	0
inconc	0	0	0	0	0	0	0
none	1	17	1	0	5	4	11

### 4.3.4.3 ISC Interface

Table 9 shows the validation status of each test case on the ISC interface.

**Table 9: Test case validation status**

TC identifier	Verdict	Log analysis	Validated
TC_IMST2_ISC_GEN_01	PASS	Yes	Yes
TC_IMST2_ISC_GEN_02	FAIL	Yes	Yes
TC_IMST2_ISC_GEN_03	PASS	Yes	Yes
TC_IMST2_ISC_REG_01	FAIL	Yes	Yes
TC_IMST2_ISC_REG_02	FAIL	Yes	Yes
TC_IMST2_ISC_REG_03	FAIL	Yes	Yes
TC_IMST2_ISC_INI_01	FAIL	Yes	Yes
TC_IMST2_ISC_INI_02	FAIL	Yes	Yes
TC_IMST2_ISC_INI_03	PASS	Yes	Yes
TC_IMST2_ISC_INI_04	PASS	Yes	Yes
TC_IMST2_ISC_INI_05	FAIL	Yes	Yes
TC_IMST2_ISC_STA_01	FAIL	Yes	Yes
TC_IMST2_ISC_STA_02			No
TC_IMST2_ISC_STA_03			No
TC_IMST2_ISC_STA_04			No
TC_IMST2_ISC_STA_05			No
TC_IMST2_ISC_STA_06			No
TC_IMST2_ISC_STA_07	PASS	Yes	Yes
TC_IMST2_ISC_STA_08	FAIL	Yes	Yes
TC_IMST2_ISC_STA_09	PASS	Yes	Yes
TC_IMST2_ISC_STA_10	PASS	Yes	Yes
TC_IMST2_ISC_STA_11	PASS	Yes	Yes
TC_IMST2_ISC_SUB_01	PASS	Yes	Yes
TC_IMST2_ISC_TAR_01	FAIL	Yes	Yes
TC_IMST2_ISC_TAR_02	FAIL	Yes	Yes
TC_IMST2_ISC_TAR_03	FAIL	Yes	Yes
TC_IMST2_ISC_TAR_04	FAIL	Yes	Yes
TC_IMST2_ISC_TAR_05	FAIL	Yes	Yes

Table 10 shows the global results from the validation of the ISC interface test cases.

**Table 10: Global results**

Number of TCs	PASS	FAIL	INCONC	N/A
28	9	12	0	5

Table 11 depicts the results grouped by test cases categories.

**Table 11: Results by test cases categories**

	GEN	REG	SUB	STA	INI	TAR	EME
pass	2	0	1	4	2	0	0
fail	1	3	0	2	3	3	0
inconc	0	0	0	0	0	0	0
none	0	0	0	5	0	0	0

#### 4.3.4.4 Ic Interface

Table 12 shows the validation status of each test case on the Ic interface.

**Table 12: Test case validation status**

TC identifier	Verdict	Log analysis	Validated
TC_IMST2_IC_GEN_01	PASS	Yes	Yes
TC_IMST2_IC_REG_01	FAIL	Yes	Yes
TC_IMST2_IC_REG_02	FAIL	Yes	Yes
TC_IMST2_IC_REG_03	FAIL	Yes	Yes
TC_IMST2_IC_REG_04	FAIL	Yes	Yes
TC_IMST2_IC_REG_05	FAIL	Yes	Yes
TC_IMST2_IC_REG_06	FAIL	Yes	Yes
TC_IMST2_IC_REG_07	PASS	Yes	Yes
TC_IMST2_IC_INI_01			No
TC_IMST2_IC_INI_02			No
TC_IMST2_IC_INI_03			No
TC_IMST2_IC_INI_04			No
TC_IMST2_IC_INI_05	FAIL	Yes	Yes
TC_IMST2_IC_INI_06	FAIL	Yes	Yes
TC_IMST2_IC_INI_07	FAIL	Yes	Yes
TC_IMST2_IC_INI_08	FAIL	Yes	Yes
TC_IMST2_IC_INI_09			No
TC_IMST2_IC_STA_01			No
TC_IMST2_IC_STA_02			No
TC_IMST2_IC_STA_03	PASS	Yes	Yes
TC_IMST2_IC_STA_04	PASS	Yes	Yes
TC_IMST2_ISC_SUB_01			No
TC_IMST2_ISC_SUB_02	PASS	Yes	Yes
TC_IMST2_ISC_SUB_03	PASS	Yes	Yes
TC_IMST2_ISC_SUB_04	PASS	Yes	Yes
TC_IMST2_ISC_SUB_05			No
TC_IMST2_ISC_TAR_01			No
TC_IMST2_ISC_TAR_02	PASS	Yes	Yes

Table 13 shows the global results from the validation of the Ic interface test cases.

**Table 13: Global results**

Number of TCs	PASS	FAIL	INCONC	N/A
28	8	10	0	1

Table 14 depicts the results grouped by test cases categories.

**Table 14: Results by test cases categories**

	GEN	REG	SUB	STA	INI	TAR
pass	1	1	3	2	0	1
fail	0	6	0	0	4	0
inconc	0	0	0	0	0	0
none	0	0	2	2	5	1

## 4.4 Feedback to standardization process

During this validation exercise, a number of issues were raised.

For each issue concerning PICS, TP or ATS, a bug report has been fixed immediately.

Issues found in SUT implementations have been signalled directly to the concerned manufacturer, joining detailed explanations and test logs.

#### 4.4.1 Base standard issues

The following problems have been found and fixed:

- Wrong TP descriptions in TS 102 790-2 [i.1].

#### 4.4.2 Test specification issues

The following problems have been found and fixed in TS 102 790-3 [i.2]:

- Adjustments in test cases synchronisation points.
- Adjustments in TTCN-3 altsteps required.
- TTCN-3 template corrections.

#### 4.4.3 Typical SUT issues

The following SUT problems have been often encountered during IMS SIP test suite validation:

- Codec issues on PAssertedID.

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## Annex A: Bibliography

- ETSI TS 124 229 (V10.14.0): "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; IP multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3 (3GPP TS 24.229 version 10.14.0 Release 10)".
- ISO/IEC 9646-1: "Information technology -- Open Systems Interconnection -- Conformance testing methodology and framework -- Part 1: General concepts".
- ISO/IEC 9646-7: "Information technology -- Open Systems Interconnection -- Conformance testing methodology and framework -- Part 7: Implementation Conformance Statements".
- ETSI ETS 300 406: "Methods for testing and Specification (MTS); Protocol and profile conformance testing specifications; Standardization methodology".
- ETSI TS 102 790-1: "Core Network and Interoperability Testing (INT); IMS specific use of Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Conformance Testing; (3GPP Release 10); Part 1: Protocol Implementation Conformance Statement (PICS)".
- IETF RFC 4028: "Session Timers in the Session Initiation Protocol (SIP)".

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## History

<b>Document history</b>		
V1.1.1	July 2014	Publication