ETSI IMS Plugtest 3
October 16-23 2009, Lannion, France
Final Test Report

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1 Summary

This report presents the results of the third ETSI IMS interoperability event held in Lannion, France from October 16th to 23rd 2009 at the Ursulines center. This Plugtests concentrated on two major aspects of network-to-network testing:

The main focus was the assessment of the interoperability as well as conformance of IMS core networks (composed of P/I/S-CSCF, IBCF, AS (telephony and presence), DNS and HSS) which are implemented on the basis of ETSI TS 124 229 (V7.14.0) [3GPP TS 24.229 version 7.14.0 Release 7] at their network-to-network interfaces (NNI). The tests executed at the event were related to basic IMS call functionality, messaging, IMS roaming, topology hiding, MMTEL supplementary services, and the presence service and were taken from the ETSI IMS NNI interoperability test specification ETSI TS 186 011-2 Version 2.3.1.

The second focus was the interoperability of IMS core networks with legacy PSTN networks which are still widely deployed throughout the telecommunications market. The interoperability functionality and the mapping of IMS to ISUP parameters is described in ETSI TS 129 163 version 7.14 [3GPP TS29.163 version 7.14.0 Release 7]. Two approaches were used for the PSTN interoperability assessment. Either the IMS core including the media and signaling gateway functionality was connected to the PSTN network of the same or another vendor via the CSS#7 E1 interface or an IMS core without MGCF/SGF connected to the PSTN through the media/signaling gateway of a second IMS core network via the IMS Mg or Mj interface.

It is important to remember that the main goal of this IMS Plugtest has been to *assess the base specification* of IMS core networks, i.e., not the quality of IMS core network implementations. Therefore, all interoperability and conformances results are presented in this report purely from a test specification point of view, i.e., they are not related to the participating IMS core network vendors.

During the event it became clear that there is a common opinion on shortcomings in the descriptions of the topology hiding functionalities in the base specification ETSI TS 124 229. It seems that those descriptions over-complicate the use of topology by imposing encoding tasks on an IBCF acting as network exit point that do not only not add any extra value to the functionality but also broadcast the fact that topology hiding is used to any connected peer IMS network. The Plugtest team will forward those concerns to the ETSI Technical Committee INT where they will be discussed and where they may finally trigger a liaison statement to the responsible 3GPP working group.

Eight IMS core network vendors participated at this event. During the event 495 of 2805 potential IMS NNI tests were executed. Overall results show a very high level of interoperability (89%) of IMS core networks but a lower level of overall conformance to the 3GPP base standard (55%) in the tests executed. Also note that 13% of all potential

tests could not be executed due to issues outside of the IMS core networks, e.g. lack of the support for a feature by a participating IMS core network.

The main interoperability issues encountered were related to calls not going through the networks, unsuccessful registration and problems with user initiated hold and resume functionality. Most issues encountered in conformance assessment where related to the use of Record-Route, P-Charging-Vector and P-Asserted-Identity headers in various SIP requests and responses.

It should be noted that the overall interoperability and conformance results for IMS NNI tests also executed in last year's event show a significantly higher performance than last year's results. Technical areas that showed interoperability shortcomings during the last IMS Plugtest, e.g. topology hiding, showed a highly enhanced and more mature behavior. This proves that vendors returning to this event have made an effort to improve their implementations prior to this even and that the IMS technology is rapidly progressing toward full interoperability which is the key factor for seamless worldwide communication at qualities of service that satisfy the IMS end users.

For the PSTN-IMS interoperability there were two PSTN equipments and three different media/signaling gateways in use. Five of the present IMS core network vendor took the opportunity to prove the interoperability of their systems with the PSTN world. The very high level of interoperability (88%) promises a successful parallel co-existence of PSTN and IMS for the transition period from traditional to next generation networks. It should be noted an interoperability of 100% was observed for basic call tests. The final result of 88% was triggered by problems in interoperability when supplementary services were used.

For more detailed results the reader should check the remainder of this document.

2 Event Organization

In the event participating vendors had their IMS network either installed locally at the testing venue in Lannion or remotely connected via a VPN connection.

A local DNS server was provided by each vendor within their IMS core network installation for the resolution of Sip-URI identities. The resolution of ENUM queries was performed by a central DNS server which could be accessed through the test network set up and hosted by Orange Labs. The primary IMS user equipment used to drive core network interoperability tests was the Inexbee Mercuro client. However, also other commercial or proprietary IMS clients were used by IMS core network vendors. NTT-AT provided an IMS client simulator and test software which participated at the event in ad-hoc testing sessions. Application servers for telephony and presence were provided by most vendors, either locally or remotely.

Tests, i.e., the test sequence part of Test Descriptions specified in the test specification, were executed at match stations in the presence of two IMS core network vendor teams, an independent test session chair (appointed by ETSI), and observers. For each test executed, a member of the IMS network vendor team operated IMS user equipment connected to their IMS network based on instructions from the test session chair. During each test, IMS network traffic at Gm and Mw, ISC and Ic interfaces was captured and saved by the test session chair. For the IMS PSTN interoperability tests the behaviour on the CCS#7 E1 interface was also observed.

During the first 1.5 h each test session 52 tests were attempted to be executed from one IMS network vendor playing the role of IMS_A to the another IMS network vendor playing the role of IMS_B. In the next 1.5h the roles were reversed and all 52 tests were again attempted to be executed. Note that during the first 3 hours of the test session no conformance analysis was performed. Two test session reports were filled in using the ETSI Test Session Reporting (TSR) tool during each test session. Interoperability results were recorded based on mutual agreement of all involved parties.

After 3 hours into the test session all test execution was stopped and a selected number of tests (as many as possible) were reviewed for conformance for one hour during test session wrap-up. Conformance verdicts were assigned for each reviewed test. The remaining tests (which could not be analyzed due to time limitations) were analyzed for conformance and filled into test session reports by ETSI representatives supported by a TTCN-3 based test tool specifically implemented for this event. All test session reports with all interoperability results and conformance verdicts are available via the ETSI TSR tool (https://services.plugtests.net/reporting/index.php) to IMS core network vendors for a review after the end of the event.

Since the test specification only assessed SIP messaging it was agreed to not check bi-directional voice as part of interoperability test results. Also a number of tests from the test specification ETSI TS 186 011-2 were not taken into account since they either required functionality not part of the event test configuration, i.e. forced loss of connectivity of a UE, or were not supported by the user equipment used in the event, i.e. adding and dropping of media streams or fax functionalities.

IMS PSTN interoperability was tested in a slightly different manner. One IMS core network was connected to the PSTN either through its own media and signaling gateway or through the MGCF/SGF of a third party. The existing 21 tests, 10 calls from PSTN to IMS and 11 calls from IMS to PSTN, could you usually be performed within 1.5h. All tests could be run besides the tests for fax functionalities as no IMS client supporting fax feature was present at the event.

3 Overall Results

Table 1, Figure 1, and Figure 2 summarize interoperability as well as conformance results collected over all the IMS NNI test sessions performed during this event.

Table 2 and Figure 3 summarize interoperability results collected for the IMS PSTN test sessions performed during this event. No conformance evaluation has been performed for those tests.

For interoperability results there are four possible observations: “OK”, “not OK”, “Not Applicable” or “Out Of Time”. Whereas the first two results are self-explanatory, the “Not Applicable” result has been given in case the test could not be performed due to limitations of the event setup or by one of the IMS core networks participating in a test, e.g., missing support for registration of a roaming user. The “Out Of Time” result was given for all tests not executed due to lack of time in each three hour test session.

For conformance results there are three possible verdicts: “Pass”, “Fail”, “Inconclusive”. Here, the “Pass” verdict has been given in cases that the analysis of the test execution trace show that both the IMS core networks participating in a test fulfilled all of the verdict criteria specified in the test specification for that test. The “Fail” verdict has been given in cases that the analysis of the test execution trace show that one of the IMS core networks participating in a test violated one or more of the verdict criteria specified in the test specification for that test. The “Inconclusive” verdict was assigned in cases were some non-conformant condition had been observed which was either not part of the verdict criteria, e.g., the test never got to through its preamble, or could not be contributed to the participating IMS core networks, e.g., the user equipment was not able to add and drop media streams to an existing SIP dialogue. So in both latter cases the verdict criteria cannot be checked – therefore the test is assigned an “Inconclusive” verdict.

Table 1: Overall interoperability and conformance event results for IMS NNI testing

Specification under test	**ETSI TS 124 229 (V7.14.0), [3GPP TS 24.229 Release 7 (Version 7.14.0), modified]**
Test Specification used	**ETSI 186 011-2 2.3.1**
Number of participating IMS core network vendors	**8**
Number of test sessions	**56**
Number of tests executed	**495 of 2805**
Average number of tests executed per session	**8 of 52 (Minimum 0 tests, Maximum 35 tests)**
Overall percentage of IOP OK	**89.1%**
Overall percentage of IOP not OK	**10.9%**
Overall percentage of IOP Not Applicable (over total possible)	**12.9%**
Overall percentage of IOP Out Of Time (over total possible)	**69.4%**
Conformance testing	
Overall percentage of Pass Verdicts	**55.2%**
Overall percentage of Fail Verdicts	**37.2%**
Overall percentage of Inconclusive Verdicts	**7.6%**

Note that the percentages for “OK” and “not OK” or “Pass”, “Fail” and “Inconclusive“ are computed based on the total *executed* tests, whereas the percentage of “Not Applicable” and “Out Of Time” are based on the total of all *potential* tests. Where the number of “Out Of Time” seems to appear relatively high, it has to be noted, that the test scenarios in this third IMS Plugtest were of significantly larger number (+40% compared to 2008) and of higher complexity than during the earlier events in 2007 and 2008. The higher complexity made execution and interoperability analysis of the individual test scenarios more time consuming. Nevertheless the execution time per test session stayed constant at 1.5h. It should be also noted that conformance results are not complete for all test sessions, i.e., not all executed tests have been evaluated for their conformance.

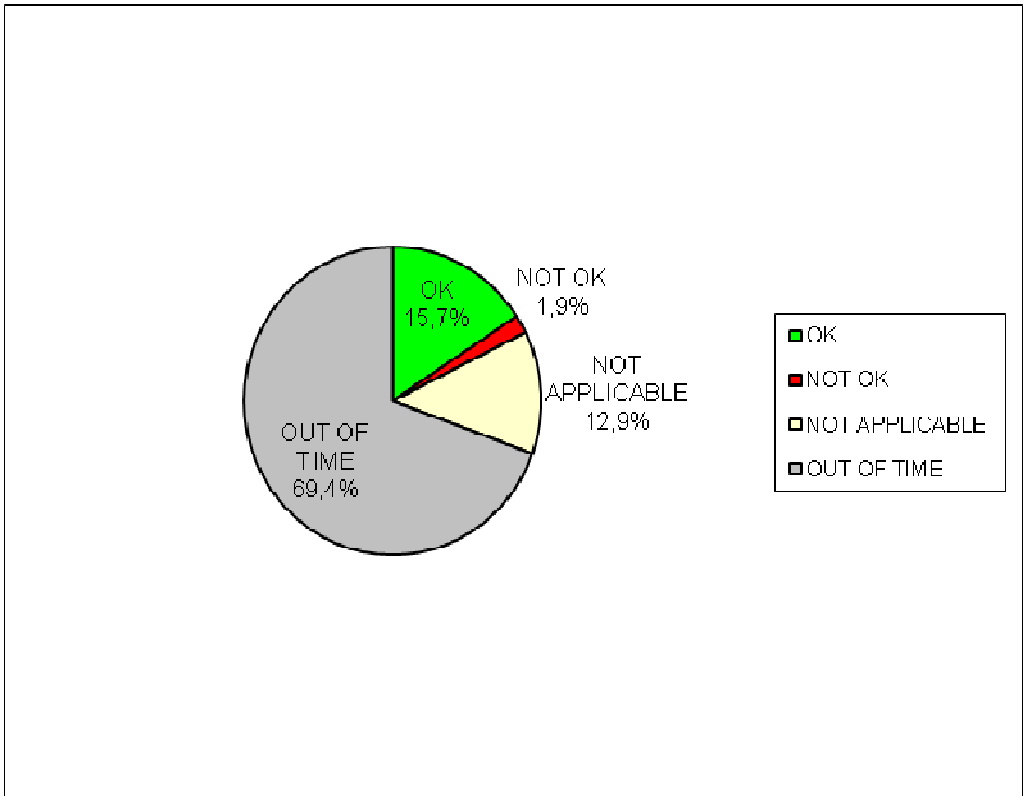

Figure 1: Pie chart of overall IMS NNI interoperability figures

Note that in Figure 2 “Pass”, “Fail”, and “Inconclusive” percentages are based on the number of all executed tests.

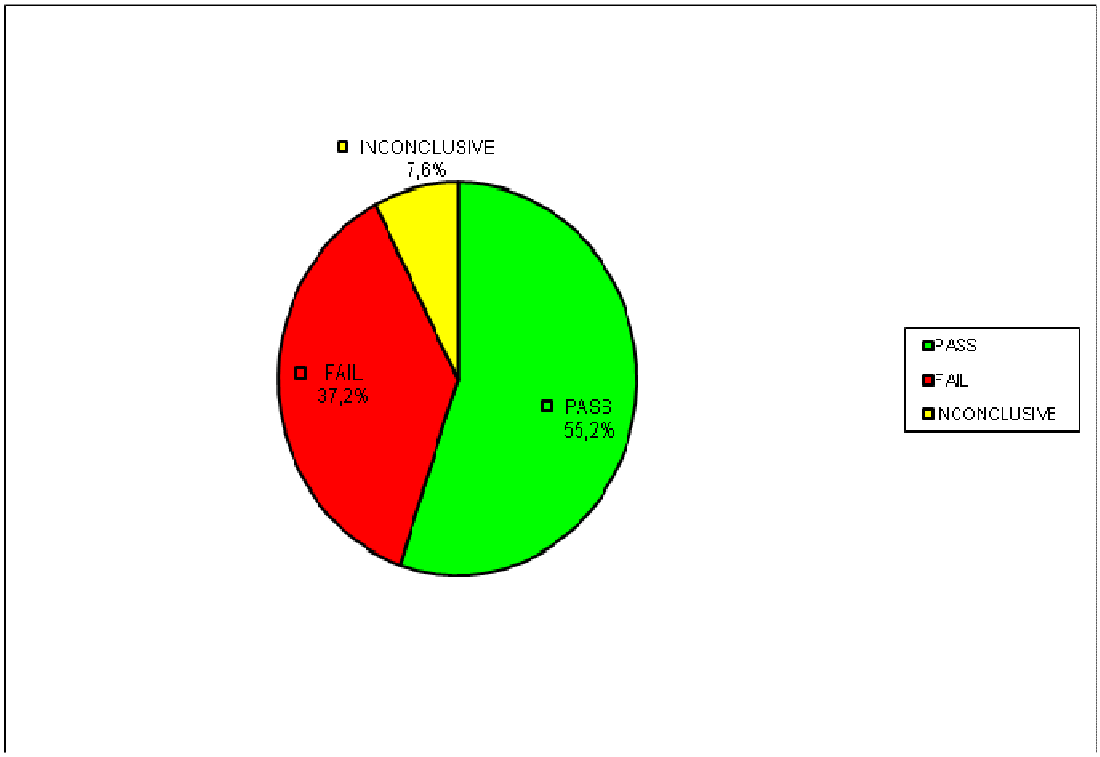

Figure 2: Pie chart of IMS NNI conformance figures

Table 2: Overall interoperability event results for IMS PSTN testing

Specification under test	**ETSI TS 129 163 (V7.14.0), [3GPP TS 29.163 Release 7 (Version 7.14.0), modified]**
Number of participating IMS/PSTN core network vendors	**5**
Number of test sessions	**7**
Number of tests executed	**81 of 145**
Average number of tests executed per session	**10 of 21 (Minimum 5 tests, Maximum 17 tests)**
Overall percentage of IOP OK	**87.7%**
Overall percentage of IOP not OK	**12.3%**
Overall percentage of IOP Not Applicable (over total possible)	**11.7%**
Overall percentage of IOP Out Of Time (over total possible)	**32.4%**

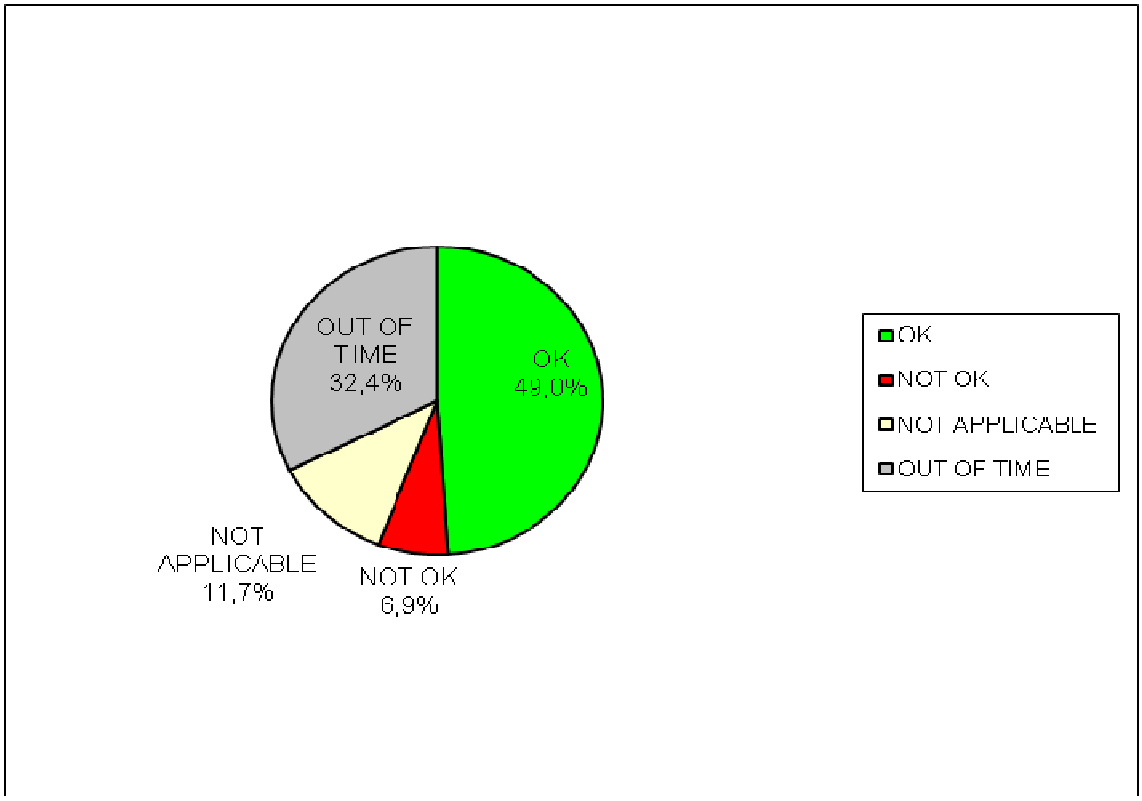

Figure 3: Pie chart of overall IMS PSTN interoperability figures

3 More Detailed Interoperability Results

This section presents the overall interoperability results based on the executed Test Description identifier from ETSI TS 186 011-2. The column "Runs" refers to the total number of executions during the entire event. Table 3 shows the IMS NNI interoperability results in percentages and in number of test execution runs. Note again that the percentages in Table 3 for "OK" and "not OK" are computed based on the total *executed* tests, whereas the percentage of NA (Not Applicable) and OT (Out Of Time) are based on the total of all *potential* tests. Note that "Out Of Time" results are likely to include or hide a significant number of "Not Applicable" results.

Tables 4 shows the same figures summarized for each test group to enable a faster understanding on to where the most issues still occur.

A first analysis shows that the tests involving roaming and topology hiding showed very high interoperability results. This is a significant progress from previous events when especially those test scenarios caused a number of not OK verdicts.

The number of test runs may be small but it is an encouraging sign that the result for media stream handling and presence server show already such a maturity of those functionalities in the IMS cores.

Table 3: IMS NNI Interoperability Results per Test Description

Group	Test Id	OK	Not OK	NA	OT	Runs
Registration	TD_IMS_REG_0001	41 (89.1%)	5 (10.9%)	0 (0.0%)	8 (14.8%)	46 (85.2%)
	TD_IMS_REG_0003	26 (100.0%)	0 (0.0%)	10 (18.5%)	18 (33.3%)	26 (48.1%)
	TD_IMS_REG_0005	18 (94.7%)	1 (5.3%)	9 (16.7%)	26 (48.1%)	19 (35.2%)
	TD_IMS_REG_0002	1 (20.0%)	4 (80.0%)	10 (18.5%)	39 (72.2%)	5 (9.3%)
	TD_IMS_REG_0006	4 (100.0%)	0 (0.0%)	19 (35.2%)	31 (57.4%)	4 (7.4%)
Basic Call	TD_IMS_CALL_0007	26 (72.2%)	10 (27.8%)	0 (0.0%)	18 (33.3%)	36 (66.7%)
	TD_IMS_CALL_0009	26 (100.0%)	0 (0.0%)	0 (0.0%)	28 (51.9%)	26 (48.1%)
	TD_IMS_CALL_0003	20 (95.2%)	1 (4.8%)	6 (11.1%)	27 (50.0%)	21 (38.9%)
	TD_IMS_CALL_0004	26 (96.3%)	1 (3.7%)	3 (5.6%)	24 (44.4%)	27 (50.0%)
	TD_IMS_CALL_0005	24 (92.3%)	2 (7.7%)	3 (5.6%)	25 (46.3%)	26 (48.1%)
	TD_IMS_CALL_0006	14 (93.3%)	1 (6.7%)	7 (13.0%)	32 (59.3%)	15 (27.8%)
	TD_IMS_CALL_0014	23 (92.0%)	2 (8.0%)	3 (5.9%)	23 (45.1%)	25 (49.0%)
	TD_IMS_CALL_0016	10 (90.9%)	1 (9.1%)	13 (24.1%)	30 (55.6%)	11 (20.4%)
Messaging	TD_IMS_MESS_0002	22 (91.7%)	2 (8.3%)	8 (14.8%)	22 (40.7%)	24 (44.4%)
	TD_IMS_MESS_0006	17 (100.0%)	0 (0.0%)	8 (14.8%)	29 (53.7%)	17 (31.5%)
	TD_IMS_MESS_0007	15 (100.0%)	0 (0.0%)	10 (18.5%)	29 (53.7%)	15 (27.8%)
	TD_IMS_MESS_0001	7 (100.0%)	0 (0.0%)	14 (25.9%)	33 (61.1%)	7 (13.0%)
Media Stream	TD_IMS_CALL_0019	1 (33.3%)	2 (66.7%)	9 (16.7%)	42 (77.8%)	3 (5.6%)
	TD_IMS_CALL_0020	1 (100.0%)	0 (0.0%)	10 (18.5%)	43 (79.6%)	1 (1.9%)
	TD_IMS_CALL_0021	1 (100.0%)	0 (0.0%)	10 (18.5%)	43 (79.6%)	1 (1.9%)
	TD_IMS_CALL_0022	1 (100.0%)	0 (0.0%)	9 (16.7%)	44 (81.5%)	1 (1.9%)
Application Server	TD_IMS_PRES_0002	1 (50.0%)	1 (50.0%)	7 (13.0%)	45 (83.3%)	2 (3.7%)
	TD_IMS_PRES_0003	1 (100.0%)	0 (0.0%)	8 (14.8%)	45 (83.3%)	1 (1.9%)
	TD_IMS_PRES_0005	0 (0.0%)	0 (0.0%)	7 (13.0%)	47 (87.0%)	0 (0.0%)
	TD_IMS_SS_0001	2 (33.3%)	4 (66.7%)	9 (16.7%)	39 (72.2%)	6 (11.1%)
	TD_IMS_SS_0003	7 (100.0%)	0 (0.0%)	8 (14.8%)	39 (72.2%)	7 (13.0%)
	TD_IMS_SS_0005	6 (85.7%)	1 (14.3%)	8 (14.8%)	39 (72.2%)	7 (13.0%)
	TD_IMS_SS_0007	3 (100.0%)	0 (0.0%)	9 (16.7%)	42 (77.8%)	3 (5.6%)
	TD_IMS_SS_0009	1 (50.0%)	1 (50.0%)	10 (18.5%)	42 (77.8%)	2 (3.7%)
Registration with hiding	TD_IMS_REG_0002H	2 (100.0%)	0 (0.0%)	3 (5.6%)	49 (90.7%)	2 (3.7%)
	TD_IMS_REG_0007	1 (100.0%)	0 (0.0%)	2 (3.7%)	51 (94.4%)	1 (1.9%)
	TD_IMS_REG_0003H	1 (100.0%)	0 (0.0%)	7 (13.0%)	46 (85.2%)	1 (1.9%)
Basic Call with hiding	TD_IMS_CALL_0024	5 (100.0%)	0 (0.0%)	4 (7.4%)	45 (83.3%)	5 (9.3%)
	TD_IMS_CALL_0025	4 (100.0%)	0 (0.0%)	3 (5.6%)	47 (87.0%)	4 (7.4%)
Tel URI and ENUM	TD_IMS_MESS_0003	3 (100.0%)	0 (0.0%)	10 (18.5%)	41 (75.9%)	3 (5.6%)
	TD_IMS_MESS_0004	1 (33.3%)	2 (66.7%)	9 (16.7%)	42 (77.8%)	3 (5.6%)
	TD_IMS_CALL_0001	8 (88.9%)	1 (11.1%)	6 (11.1%)	39 (72.2%)	9 (16.7%)
	TD_IMS_CALL_0002	3 (100.0%)	0 (0.0%)	7 (13.0%)	44 (81.5%)	3 (5.6%)
Message Roam	TD_IMS_MESS_0005	8 (80.0%)	2 (20.0%)	5 (9.3%)	39 (72.2%)	10 (18.5%)
Application Server Roam	TD_IMS_PRES_0001	1 (100.0%)	0 (0.0%)	5 (9.3%)	48 (88.9%)	1 (1.9%)
	TD_IMS_PRES_0004	2 (100.0%)	0 (0.0%)	6 (11.1%)	46 (85.2%)	2 (3.7%)
	TD_IMS_SS_0002	2 (66.7%)	1 (33.3%)	5 (9.3%)	46 (85.2%)	3 (5.6%)
	TD_IMS_SS_0004	2 (100.0%)	0 (0.0%)	5 (9.3%)	47 (87.0%)	2 (3.7%)
	TD_IMS_SS_0006	2 (100.0%)	0 (0.0%)	7 (13.0%)	45 (83.3%)	2 (3.7%)
	TD_IMS_SS_0008	1 (100.0%)	0 (0.0%)	7 (13.0%)	46 (85.2%)	1 (1.9%)
	TD_IMS_SS_0010	1 (100.0%)	0 (0.0%)	7 (13.0%)	46 (85.2%)	1 (1.9%)
User Hold and Resume	TD_IMS_CALL_0008	7 (70.0%)	3 (30.0%)	6 (11.1%)	38 (70.4%)	10 (18.5%)
	TD_IMS_CALL_0012	8 (88.9%)	1 (11.1%)	6 (11.1%)	39 (72.2%)	9 (16.7%)
	TD_IMS_CALL_0010	7 (100.0%)	0 (0.0%)	8 (14.8%)	39 (72.2%)	7 (13.0%)
	TD_IMS_CALL_0011	11 (91.7%)	1 (8.3%)	4 (7.4%)	38 (70.4%)	12 (22.2%)
	TD_IMS_CALL_0017	6 (85.7%)	1 (14.3%)	8 (14.8%)	39 (72.2%)	7 (13.0%)
	TD_IMS_CALL_0018	10 (76.9%)	3 (23.1%)	5 (9.3%)	36 (66.7%)	13 (24.1%)

Table 4: IMS NNI Interoperability Results per Test Group

Group	OK	Not OK	NA	OT	Runs
Registration	90 (90.0%)	10 (10.0%)	48 (17.8%)	122 (45.2%)	100 (37.0%)
Basic Call	169 (90.4%)	18 (9.6%)	35 (8.2%)	207 (48.3%)	187 (43.6%)
Messaging	61 (96.8%)	2 (3.2%)	40 (18.5%)	113 (52.3%)	63 (29.2%)
Media Stream	4 (66.7%)	2 (33.3%)	38 (17.6%)	172 (79.6%)	6 (2.8%)
Application Server	21 (75.0%)	7 (25.0%)	66 (15.3%)	338 (78.2%)	28 (6.5%)
Registration with hiding	4 (100.0%)	0 (0.0%)	12 (7.4%)	146 (90.1%)	4 (2.5%)
Basic Call with hiding	9 (100.0%)	0 (0.0%)	7 (6.5%)	92 (85.2%)	9 (8.3%)
Tel URI and ENUM	15 (83.3%)	3 (16.7%)	32 (14.8%)	166 (76.9%)	18 (8.3%)
Message Roam	8 (80.0%)	2 (20.0%)	5 (9.3%)	39 (72.2%)	10 (18.5%)
Application Server Roam	11 (91.7%)	1 (8.3%)	42 (11.1%)	324 (85.7%)	12 (3.2%)
User Hold and Resume	49 (84.5%)	9 (15.5%)	37 (11.4%)	229 (70.7%)	58 (17.9%)

Tables 5 shows the IMS PSTN interoperability results in percentages and in number of test execution runs.

A first analysis shows that basic call shows no interoperability issues at all which is a perfect result. The few interoperability issues in the supplementary services test groups where caused while testing the services TIP/TIR and Communication HOLD.

Table 5: IMS PSTN Interoperability Results per Test Description

Group	Test Id	OK	Not OK	NA	OT	Run
Basic Call to IMS	PSTN–IMS_01	7 (100.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	7 (100.0%)
	PSTN–IMS_02	7 (100.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	7 (100.0%)
	PSTN–IMS_03	0 (0.0%)	0 (0.0%)	7 (100.0%)	0 (0.0%)	0 (0.0%)
	PSTN–IMS_04	5 (100.0%)	0 (0.0%)	1 (14.3%)	1 (14.3%)	5 (71.4%)
Supplementary Services to IMS	PSTN–IMS_06	5 (100.0%)	0 (0.0%)	1 (14.3%)	1 (14.3%)	5 (71.4%)
	PSTN–IMS_07	4 (80.0%)	1 (20.0%)	1 (14.3%)	1 (14.3%)	5 (71.4%)
	PSTN–IMS_08	5 (100.0%)	0 (0.0%)	0 (0.0%)	2 (28.6%)	5 (71.4%)
	PSTN–IMS_09	1 (33.3%)	2 (66.7%)	2 (28.6%)	2 (28.6%)	3 (42.9%)
	PSTN–IMS_10	4 (66.7%)	2 (33.3%)	0 (0.0%)	1 (14.3%)	6 (85.7%)
	PSTN–IMS_11	3 (60.0%)	2 (40.0%)	0 (0.0%)	2 (28.6%)	5 (71.4%)
Basic Call from IMS	IMS-PSTN_01	5 (100.0%)	0 (0.0%)	0 (0.0%)	2 (28.6%)	5 (71.4%)
	IMS-PSTN_02	5 (100.0%)	0 (0.0%)	0 (0.0%)	2 (28.6%)	5 (71.4%)
	IMS-PSTN_03	0 (0.0%)	0 (0.0%)	4 (57.1%)	3 (42.9%)	0 (0.0%)
	IMS-PSTN_04	3 (100.0%)	0 (0.0%)	1 (14.3%)	3 (42.9%)	3 (42.9%)
	IMS-PSTN_05	4 (100.0%)	0 (0.0%)	0 (0.0%)	3 (42.9%)	4 (57.1%)
Supplementary Services from IMS	IMS-PSTN_06	2 (100.0%)	0 (0.0%)	0 (0.0%)	4 (66.7%)	2 (33.3%)
	IMS-PSTN_07	2 (100.0%)	0 (0.0%)	0 (0.0%)	4 (66.7%)	2 (33.3%)
	IMS-PSTN_08	2 (66.7%)	1 (33.3%)	0 (0.0%)	4 (57.1%)	3 (42.9%)
	IMS-PSTN_09	2 (100.0%)	0 (0.0%)	0 (0.0%)	5 (71.4%)	2 (28.6%)
	IMS-PSTN_10	3 (75.0%)	1 (25.0%)	0 (0.0%)	3 (42.9%)	4 (57.1%)
	IMS-PSTN_11	2 (66.7%)	1 (33.3%)	0 (0.0%)	4 (57.1%)	3 (42.9%)

4 More Detailed Conformance Results

This section presents the overall conformance verdicts based on the executed Test Description identifier from ETSI TS 186 011-2. The column "Runs" refers to the total number of executions during the entire event. Table 6 shows conformance results in percentages and in number of test execution runs. Note again that the percentages in Table 5 for "PASS", "FAIL", and "INCONC(LUSIVE)" are computed based on the total *executed* tests. Tables 7 summarizes the conformance results per test group. It has to be noted that not 100% of the test runs with interoperability verdict OK have been conformance checked.

A first analysis shows that certain tests for registration and basic call (e.g. TD_IMS_REG_0001, TD_IMS_CALL_0007, TD_IMS_MESS_0002) have had a surprisingly high number of conformance issues mostly caused by problems in the P-Charging-Vector header. In general, Charging-Vector, P-Asserted-Identity and Record-Route header were the reason for most of the conformance issues. For further details see section 5 of the present report.

Table 6: IMS NNI Conformance Verdicts per Test Description

Group	Test Id	PASS	FAIL	INCONC	Runs
Registration	TD_IMS_REG_0001	2 (6.5%)	21 (67.7%)	8 (25.8%)	46 (85.2%)
	TD_IMS_REG_0003	19 (100.0%)	0 (0.0%)	0 (0.0%)	26 (48.1%)
	TD_IMS_REG_0005	3 (25.0%)	7 (58.3%)	2 (16.7%)	19 (35.2%)
	TD_IMS_REG_0002	2 (100.0%)	0 (0.0%)	0 (0.0%)	5 (9.3%)
	TD_IMS_REG_0006	0 (0.0%)	3 (75.0%)	1 (25.0%)	4 (7.4%)
Basic Call	TD_IMS_CALL_0007	3 (14.3%)	16 (76.2%)	2 (9.5%)	36 (66.7%)
	TD_IMS_CALL_0009	9 (52.9%)	7 (41.2%)	1 (5.9%)	26 (48.1%)
	TD_IMS_CALL_0003	19 (100.0%)	0 (0.0%)	0 (0.0%)	21 (38.9%)
	TD_IMS_CALL_0004	22 (100.0%)	0 (0.0%)	0 (0.0%)	27 (50.0%)
	TD_IMS_CALL_0005	16 (84.2%)	3 (15.8%)	0 (0.0%)	26 (48.1%)
	TD_IMS_CALL_0006	12 (80.0%)	3 (20.0%)	0 (0.0%)	15 (27.8%)
	TD_IMS_CALL_0014	16 (88.9%)	2 (11.1%)	0 (0.0%)	25 (49.0%)
	TD_IMS_CALL_0016	3 (30.0%)	6 (60.0%)	1 (10.0%)	11 (20.4%)
Messaging	TD_IMS_MESS_0002	3 (16.7%)	15 (83.3%)	0 (0.0%)	24 (44.4%)
	TD_IMS_MESS_0006	13 (100.0%)	0 (0.0%)	0 (0.0%)	17 (31.5%)
	TD_IMS_MESS_0007	10 (100.0%)	0 (0.0%)	0 (0.0%)	15 (27.8%)
	TD_IMS_MESS_0001	5 (83.3%)	0 (0.0%)	1 (16.7%)	7 (13.0%)
Media Stream	TD_IMS_CALL_0019	1 (33.3%)	1 (33.3%)	1 (33.3%)	3 (5.6%)
	TD_IMS_CALL_0020	1 (100.0%)	0 (0.0%)	0 (0.0%)	1 (1.9%)
	TD_IMS_CALL_0021	1 (100.0%)	0 (0.0%)	0 (0.0%)	1 (1.9%)
	TD_IMS_CALL_0022	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (1.9%)
Application Server	TD_IMS_PRES_0002	0 (0.0%)	0 (0.0%)	0 (0.0%)	2 (3.7%)
	TD_IMS_PRES_0003	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (1.9%)
	TD_IMS_PRES_0005	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
	TD_IMS_SS_0001	0 (0.0%)	1 (33.3%)	2 (66.7%)	6 (11.1%)
	TD_IMS_SS_0003	1 (25.0%)	3 (75.0%)	0 (0.0%)	7 (13.0%)
	TD_IMS_SS_0005	0 (0.0%)	3 (75.0%)	1 (25.0%)	7 (13.0%)
	TD_IMS_SS_0007	1 (100.0%)	0 (0.0%)	0 (0.0%)	3 (5.6%)
	TD_IMS_SS_0009	1 (50.0%)	1 (50.0%)	0 (0.0%)	2 (3.7%)
Registration with hiding	TD_IMS_REG_0002H	1 (100.0%)	0 (0.0%)	0 (0.0%)	2 (3.7%)
	TD_IMS_REG_0007	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (1.9%)
	TD_IMS_REG_0003H	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (1.9%)
Basic Call with hiding	TD_IMS_CALL_0024	0 (0.0%)	2 (100.0%)	0 (0.0%)	5 (9.3%)
	TD_IMS_CALL_0025	0 (0.0%)	1 (100.0%)	0 (0.0%)	4 (7.4%)
Tel URI and ENUM	TD_IMS_MESS_0003	0 (0.0%)	2 (66.7%)	1 (33.3%)	3 (5.6%)
	TD_IMS_MESS_0004	0 (0.0%)	0 (0.0%)	1 (100.0%)	3 (5.6%)
	TD_IMS_CALL_0001	0 (0.0%)	3 (100.0%)	0 (0.0%)	9 (16.7%)
	TD_IMS_CALL_0002	0 (0.0%)	0 (0.0%)	0 (0.0%)	3 (5.6%)
Message Roam	TD_IMS_MESS_0005	1 (25.0%)	3 (75.0%)	0 (0.0%)	10 (18.5%)
Application Server Roam	TD_IMS_PRES_0001	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (1.9%)
	TD_IMS_PRES_0004	0 (0.0%)	0 (0.0%)	0 (0.0%)	2 (3.7%)
	TD_IMS_SS_0002	0 (0.0%)	1 (100.0%)	0 (0.0%)	3 (5.6%)
	TD_IMS_SS_0004	0 (0.0%)	0 (0.0%)	0 (0.0%)	2 (3.7%)
	TD_IMS_SS_0006	0 (0.0%)	0 (0.0%)	0 (0.0%)	2 (3.7%)
	TD_IMS_SS_0008	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (1.9%)
	TD_IMS_SS_0010	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (1.9%)
User Hold and Resume	TD_IMS_CALL_0008	1 (25.0%)	2 (50.0%)	1 (25.0%)	10 (18.5%)
	TD_IMS_CALL_0012	0 (0.0%)	0 (0.0%)	0 (0.0%)	9 (16.7%)
	TD_IMS_CALL_0010	3 (75.0%)	1 (25.0%)	0 (0.0%)	7 (13.0%)
	TD_IMS_CALL_0011	1 (50.0%)	1 (50.0%)	0 (0.0%)	12 (22.2%)
	TD_IMS_CALL_0017	3 (50.0%)	3 (50.0%)	0 (0.0%)	7 (13.0%)
	TD_IMS_CALL_0018	2 (20.0%)	7 (70.0%)	1 (10.0%)	13 (24.1%)

Table 7: IMS NNI Conformance Verdicts per Test Group

Group	PASS	FAIL	INCONC	Runs
Registration	26 (38.2%)	31 (45.6%)	11 (16.2%)	100 (37.0%)
Basic Call	100 (70.9%)	37 (26.2%)	4 (2.8%)	187 (43.6%)
Messaging	31 (66.0%)	15 (31.9%)	1 (2.1%)	63 (29.2%)
Media Stream	3 (60.0%)	1 (20.0%)	1 (20.0%)	6 (2.8%)
Application Server	3 (21.4%)	8 (57.1%)	3 (21.4%)	28 (6.5%)
Registration with hiding	1 (100.0%)	0 (0.0%)	0 (0.0%)	4 (2.5%)
Basic Call with hiding	0 (0.0%)	3 (100.0%)	0 (0.0%)	9 (8.3%)
Tel URI and ENUM	0 (0.0%)	5 (71.4%)	2 (28.6%)	18 (8.3%)
Message Roam	1 (25.0%)	3 (75.0%)	0 (0.0%)	10 (18.5%)
Application Server Roam	0 (0.0%)	1 (100.0%)	0 (0.0%)	12 (3.2%)
User Hold and Resume	10 (38.5%)	14 (53.8%)	2 (7.7%)	58 (17.9%)

5 Collected Comments

In order to understand the results shown in previous sections better, this section presents the comments specified in cases of interoperability "not OK" and conformance "Fail" or "Inconclusive" verdicts. These comments have been extracted from relevant Test Session Reports.

5.1 Comments on Interoperability

Table 8: Comments from interoperability assessment

Test Id	Test Case Summary	Comment
TD_IMS_REG_0001	First time registration in a visited IMS network	User not registered
		Missing lr parameter in Path Header sent by IMS A
		Quotation Marks missing in P-Charging-Vector in 200-OK from IMS B to 2nd REGISTER
		Registration failed on IMS A network
		UE_B can not register into roaming network
TD_IMS_REG_0005	IMS network can initiate user de-registration	P-CSCF not identified
TD_IMS_REG_0002	IMS network chooses a second entry point without topology hiding.	2nd manually triggered REG OK.
		Step 2- unsuccessful registration
		No successful registration
		UE B does not show registration. IMS A does seems to time out and does nto forward 401 to UE; topo hiding enabled for IMS A
TD_IMS_CALL_0007	IMS network handles call while UE_B is roaming without topology hiding	Step 2- User A is not informed about receiving call
		Call does not go through
		Step 2 - User A is not informed of incoming call
		User A in IMS A is not informed about the call
		Call cannot be established
		IMS A could not handle call
		Route header missing in INVITE from IMS_B to IMS_A
		Step 2- User A is not informed of incoming call

Table 8 continued: Comments from interoperability assessment

Test Id	Test Case Summary	Comment
TD_IMS_CALL_0003	IMS network does not establish call to barred user	P-CSCF in IMS_A modifies request_URI (it adds port)
TD_IMS_CALL_0004	IMS network rejects call to non existing user	P-CSCF in IMS_A modifies request_URI (it adds port)
TD_IMS_CALL_0005	IMS network does not establish a call for unavailable user	Step 2- User A is not informed that User B is not reachable
		P-CSCF in IMS_A modifies request_URI (it adds port)
TD_IMS_CALL_0006	IMS network can handle call to non-registered user and unreachable AS	Has to be re-tested, trace recorded
TD_IMS_CALL_0014	IMS network handles calling user canceling call before its establishment	UE B is not informed of call
		Issue on Port entry in Request URI in INVITE from IMS A to IMS B
TD_IMS_CALL_0016	IMS network ends call in case calling UE is forcefully de-registered in IMS network	SCSF returns 500 error to network-initiated BYE
TD_IMS_MESS_0002	IMS network handles messaging with SIP identity without topology hiding	Issue on Port entry in Request URI in MESSAGE from IMS A to IMS B
		P-CSCF in IMS_A modifies request_URI (it adds port)
TD_IMS_CALL_0019	Addition of media streams (reINVITE)	ACK is discarded by IMS A (client issue?)
		UE_B does not see the new media stream. Signalling seems OK Check conformance
TD_IMS_PRES_0002	Watcher subscription to presence event notification in home network	UE_A is UE_B_2
TD_IMS_SS_0001	IMS network supports ISC based on HOLD	AS returns error on putting Call on Hold
		Step 8 - User A does not receive AS Tone after HOLD Signalling flow is OK. Check for conformance
		Step 7- After UE B puts the call on HOLD, AS B sends BYE
		Resuming call does not succeed
TD_IMS_SS_0005	IMS network supports ISC based on OIR/ACR	Failed
TD_IMS_SS_0009	IMS network supports ISC based on OIP/OIR	Pending investigation on Privacy Header

Table 8 continued: Comments from interoperability assessment

Test Id	Test Case Summary	Comment
TD_IMS_MESS_0004	IMS network handles messaging with DNS/ENUM lookup	Step 2 - User B does not receive the message
		Step 2 User B does not receive the message
TD_IMS_CALL_0001	Default SIP URI with DNS/ENUM lookup procedure	DNS server configuration issue
TD_IMS_MESS_0005	IMS network handles messaging while roaming	IMS B rejecting with 500
		route uri is modified by ims b, parameters are in lower caps
TD_IMS_SS_0002	IMS network supports ISC based on HOLD	UE_B belongs to IMS A Call not established
TD_IMS_CALL_0008	IMS network handles user initiated call hold when home caller puts roaming user on hold and resumes call using INVITE	UE_A is UE_B_2
		UE A is not informed that call is on hold
		route uri is modified by ims b, parameters are in lower caps
TD_IMS_CALL_0012	IMS network handles user initiated call hold when home caller puts roaming user on hold and resumes call using UPDATE	UPDATE for resume has missing route header
TD_IMS_CALL_0011	IMS network handles user initiated call hold when roaming caller puts a home user on hold and resumes call using UPDATE	resume UPDATE rejected by IMS B
TD_IMS_CALL_0017	IMS network handles user initiated call hold when home caller puts another home user on hold and resumes call using re-INVITE	HOLD did not work; problems with Re-INVITE
TD_IMS_CALL_0018	IMS network handles user initiated call hold when home caller puts another home user on hold and resumes call using UPDATE	Ckient issue, UPDATE for call resume is incorrect
		Step 11 - call is not resumed
		HOLD did not work

5.2 Comments on Conformance

Table 9: Comments from conformance assessment, verdict FAIL

Test Id	Test Case Summary	Comment
TD_IMS_REG_0001	First time registration in a visited IMS network	Check 2 - Security-Client header is missing Check 4 - rand parameter is missing in www-authenticate header
		Check 3 - SUBSCRIBE NOT sent by IMS A Check 6 - UE SUBSCRIBE never arrives to IMS B
		Security support is expected
		check 1 - integrity-protected parameter is missing in authorization header check 4 - rand parameter is missing in www-authenticate header
		1,2: orig-ioi missing, check in spec!
		test case run without IPSec, Check 1: REGISTER does not contain Require_header, does not contain P-Charging Header
		Authorization_header is not provided by IMS_A
		5: P-Charging-Vector missing
		Check 1: REGISTER does not contain Security-Client_header
		CHeck 1 & 2 - No security client header from UE; Check 3 & 6 - No subscribe; Check 4 - missing 401 on NNI in trace Check 5 - no integrety protected param
		Check 1: REGISTER does not coontain Security-Client Header
		Check 1&2 - no sec client header; Check 3 -no SUBSCRIBE from PCSCF; Check 4 & 5 no integrity protected param;
		1,2: orig-ioi missing3,6: SUBSCRIBE comes from UE and not from P-CSCF5: P-Charging-Vector header missing
		3,6: SUBSCRIBE from P-CSCF not supported 5: P-Charging-Vector header missing
		Check 1 & 2: No sec client header; Check 3 - no SUBSCRIBE from P-CSCF (F); Check 4 7 5 - no integrity protected param;

Table 9 continued: Comments from conformance assessment, verdict FAIL

Test Id	Test Case Summary	Comment
TD_IMS_REG_0001 continued	First time registration in a visited IMS network	HTTP digest instead of AKA - Check 1,2 : Orig-ioi not present - Check 3 : From_header and P-asserted-Identity_Header does not contain P_CSCF_SIP_URI, Expires not greater than 200_response, - Check 5 NA since no IPSec used
		Use Digest REGISTER message from IMS_A does not contain P-Visited-Network-ID_header
		Use Digest In TP_IMS_5044_01, SUBSCRIBE message sent by IMS_A does not contain P-Charging-Vector_header
TD_IMS_REG_0005	IMS network can initiate user de-registration	Into TP_IMS_5093_01, userFo field indicating UE_B is missing
		Check 1: 2nd NOTIFY (P-CSCF_SIP_URI) not sent by IMS B
		Route_header of the NOTIFY message does not match the opriginal route_header in SUBSCRIBE message
		In TP_IMS_5093_01, Request_URI shall contain P-CSCF_SIP_URI of IMS_A
		Check 1: 2nd NOTIFY (indicating P-CSCF_SIP_URI of IMS A) not sent
		In step 27, the NOTIFY message sent by IMS_B shall contain the P-CSCF_SIP_URI of IMS_A, not the UE_B_SIP_URI
		Check 1: IMS_B does not send 2nd NOTIFY (indicating P-CSCF_SIP_URI of IMS_A)
TD_IMS_REG_0006	IMS network can initiate user re-authentication	Route_header of the NOTIFY message does not match the opriginal route_header in SUBSCRIBE message
		Check 2: 2nd NOTIFY (indicating P-CSCF_SIP_URI of IMS_A) not sent by IMS_B
		Check 1: IMS_B does not send 2nd NOTIFY (indicating P-CSCF_SIP_URI of IMS_A)

Table 9 continued: Comments from conformance assessment, verdict FAIL

Test Id	Test Case Summary	Comment
TD_IMS_CALL_0007	IMS network handles call while UE_B is roaming without topology hiding	Inconclusive: Criteria Step2: access-network-charging-info_parameter only if received by UE Step4: Not applicable for roaming.
		Check 1 - IMS A does not forward initial INVITE to IMS B
		Script: AtsImsIot_Functions, Line: 1195, Reason: Template matching failed (.msgHeader.pChargingVector.chargeParams[0].id: access-network-charging-info != icid-value)
		check 1 - host in P-Asserted-Identity is wrong check 7 - Record-Route header is missing
		In step1, P-Assert-Identity_header does not contain the expected value
		P-Asserted-Identity does not match TP_IMS_5046_01
		Check 1: INVITE does not contain P-Charging Vector, incorrect Via_header, missing Record_route_header
		check 5 - P-Asserted-Identity is missing. check 6 - P-Asserted-Identity is missing.
		Check 1: P-asserted-Identity header does not contain an address of UE_A
		4,5: Wrong P-CSCF in Record-Route header due to UE configuration
		1,2,7: P-Charging-Vector header missing 5,6: P-Asserted-Identity header missing
		Japonese characters are not allowed into via-branch (check BNF)
		Check 6: P-Asserted-Identity not present
		According TP_IMS_5046_01, the P-Asserted-Identity_header shall contains UE_A address
		Check 2: P-Charging-Vector header sent by IMS_A does not contain access-network-charging-info parameter

Table 9 continued: Comments from conformance assessment, verdict FAIL

Test Id	Test Case Summary	Comment
TD_IMS_CALL_0009	IMS network handles routing information received from the UE before forwarding them	The record-route contains P-CSCF_SIP_URI of IMS_A, contrary to the eTP_IMS_5052_01
		check 1 - Record Route header is missing.
		No record route
		IMS_A receives a BYE message with a route indicating P-CSCF SIP_URI of IMS_A
		Japonese characters are not allowed into via-branch (check BNF)
		Record-Route_header between previous ACK and BYE (on the same interface) does not match
		Check1: P-CSCF_SIP_URI of IMS_A indicated in Route header
TD_IMS_CALL_0005	IMS network does not establish a call for unavailable user	Check 1 - IMS B does not send a 4xx response
		IMS_B does not send the Status-Line 4xx
		IMS_B sent a 404 message with Server part not compliant with RFC 3261 (::)
TD_IMS_CALL_0006	IMS network can handle call to non-registered user and unreachable AS	408 not received
		In step6, the Content-Type field must not be present if the content length is null
		The functionality is ok, the code is not correct (401)
TD_IMS_CALL_0016	IMS network ends call in case calling UE is forcefully de-registered in IMS network	According to the TP, IMS_A should send BYE to EU_B, not to EU_AScript: AtsImsIot_Functions, Line: 1203, Reason: Template matching failed (.requestLine.requestUri.hostPort.host: scscf.nsn.etsi != 10.10.20.2)
		IMS B sends "500 error"
		In step1, Reason_header is missing
		Check 1 - Incorrect Request URI - no Route and Reason headers
		In Step1, Route_header shall be present

Table 9 continued: Comments from conformance assessment, verdict FAIL

Test Id	Test Case Summary	Comment
TD_IMS_MESS_0002	IMS network handles messaging with SIP identity without topology hiding	In TP_IMS_5097_05, received route value does not match the expected one
		check 2 - Tel URI is missing
		check 1 - P-Charging-Vector header is missing. check 2 - Tel URI is missing in P-Asserted-Identity header
		Check 2: P-Asserted-Identity does not contain Tel URICheck 4: no term-ioi in p-charging vector
		Check 3 and 4- IMS B does not add p charging vector.
		Wrong P-Asserted-Identity:
		Wrong PCAP traces
		check 1 - orig-ioi parameter is missing in P-Charging-Vector header. check 2 - Tel URI is missing in P-Asserted-Identity header. check 4 - orig-ioi parameter is missing in P-Charging-Vector header.
		Check 1: MESSAGE sent by IMS A does not contain P-Charging-Vector header
		Check 3: No P-Charging-Vector header
		Check 1 - No P-charging header, Check 2 - No P-asserted identity, Check 4 - Orig-Ioi missing due to missing P-charging vector
		In TP_IMS_5097_07, there is a P-Assert-Identity_header mismatch
		Check 1: Message does not indicate orig-ioi parameter in P-Charging-Info header
		Check 3: 2xx response sent by IMS_B does not contain P-Charging-Vector
TD_IMS_CALL_0019	Addition of media streams (reINVITE)	Check 1: Record-Route header not present
TD_IMS_SS_0001	IMS network supports ISC based on HOLD	Step 1 - INVITE from UE B does not contain p charging vector Step 1 - INVITE from IMS B to AS B does not contain p charging vector

Table 9 continued: Comments from conformance assessment, verdict FAIL

Test Id	Test Case Summary	Comment
TD_IMS_SS_0003	IMS network supports ISC based on OIP	Check 1: initial INVITE does not contain P-Asserted-Identity header indicating the Tel_URI of UE_A
		Check 3 - Orig-Ioi not found, Incorrect Check 3 - Term-Ioi not sent by AS
		Check 1: INVITE send by IMS_A does not contain P-Asserted-Identity header indicating Tel-URI of UE_A
TD_IMS_SS_0005	IMS network supports ISC based on OIR/ACR	Check 2: "433 response" does not include access-network-charging-info parameter in P-Charging-Vector
		Check 2: "403 response" sent by IMS B does not include access-network-charging-info in P-Charging-Vector header
		Check 2: no response from IMS_B
TD_IMS_SS_0009	IMS network supports ISC based on OIP/OIR	Check 2- No P charging vector header
TD_IMS_CALL_0024	IMS network handles basic call with topology hiding correctly	encrypted_consecutive_header are missing
		In TP_IMS_5137_01, Route_header is missing
TD_IMS_CALL_0025	IMS network handles calling user canceling call correctly before its establishment with topology hiding	encrypted_consecutive_header are missing
TD_IMS_MESS_0003	IMS network handles messaging with TEL URI identities	Step3 - IMS-A receives 200 message without P-Charging-Vector_header
		Check 2: no P-Charging-Vector
TD_IMS_CALL_0001	Default SIP URI with DNS/ENUM lookup procedure	Check 6: P-Charging-Vector does not contain orig-ioi and term-ioi parameters
		1,6,8: P-Charging-Vector missing orig-ioi_parameter 2: P-Asserted-Identity_header missing Tel_URI 6,8: P-Charging-Vector missing term-ioi_parameter 7,9: P-Asserted-Identity missing
TD_IMS_MESS_0005	IMS network handles messaging while roaming	In TP_IMS_5118_01: Missing parameters into P-Charging-Vector_header
		check 2 - P-Charging-Vector header is missing.
TD_IMS_SS_0002	IMS network supports ISC based on HOLD	Step 1 - INVITE from UE B does not contain p charging vector Step 1 - INVITE from IMS B to AS B does not contain p charging vector

Table 9 continued: Comments from conformance assessment, verdict FAIL

Test Id	Test Case Summary	Comment
TD_IMS_CALL_0008	IMS network handles user initiated call hold when home caller puts roaming user on hold and resumes call using INVITE	200 OK message sent from IMS_A to IMS_B does not contains the expected P-Charging-Vector attributes ("access-network-charging-info" was expected)
		Check 3: Topmost Route header contains S-CSCF_SIP_URI
TD_IMS_CALL_0010	IMS network handles user initiated call hold when roaming caller puts a home user on hold and resumes call using INVITE	Check 1: no record route, via only UE;
TD_IMS_CALL_0011	IMS network handles user initiated call hold when roaming caller puts a home user on hold and resumes call using UPDATE	Check 1: access-network-charging-info parameter not contained in P-Charging-Vector header
TD_IMS_CALL_0017	IMS network handles user initiated call hold when home caller puts another home user on hold and resumes call using re-INVITE	In step1, P-Access-Network-Info_header shall not be preseant
		Check 1: no Record-Route header in INVITE from IMS_A
		Check 2: No P-Charging-Vector header
TD_IMS_CALL_0018	IMS network handles user initiated call hold when home caller puts another home user on hold and resumes call using UPDATE	Step1: UPDATE message received by IMS_B does not contain P-Charging-Vector_header
		check 1 - Record Route and P-Charging-Vector header is missing
		Check 1: IMS_A does not forward UPDATE to IMS_B
		Check 1: No P-Charging-Vector header
		In step1, the Record-Route_header in UPDATE message does not contain the expected value
		Check 2: No P-Charging-Vector header
		Check 1: UPDATE sent by IMS_A does not contain Record-Route header

Table 10: Comments from conformance assessment, verdict INCONCLUSIVE

TD_IMS_REG_0001	First time registration in a visited IMS network	Step1: No Security-Client Header because of DIGEST Step1: No Authorization Header from IMS A to IMS B Step2: No integrity protection with DIGEST Step4: No Authorization Header with DIGEST Step5: No Authorization Header with DIGEST
		Digest
		No security client header
		Check 1: UE_B does not send Security-Client header
		UE_B does not send Security-Client header
TD_IMS_REG_0005	IMS network can initiate user de-registration	SUSCRIBE message sent by IMS A to IMS B is invalid: P-Asserted-Identity contains a list of IDs separated by SEMICOLON instead of COMMA
		Missing NOTIFY message 27
TD_IMS_CALL_0007	IMS network handles call while UE_B is roaming without topology hiding	PRACK message sent by IMS A to IMS B is invalid: P-Asserted-Identity contains a list of IDs separated by SEMICOLON instead of COMMA
		IMS A could not handle call
TD_IMS_CALL_0009	IMS network handles routing information received from the UE before forwarding them	SIP message sent by IMS A to IMS B is invalid: P-Asserted-Identity contains a list of IDs separated by SEMICOLON instead of COMMA
TD_IMS_CALL_0016	IMS network ends call in case calling UE is forcefully de-registered in IMS network	Message sequences 13 to 27 does not match the PCAP traces
TD_IMS_MESS_0001	IMS network shall support SIP messages greater than 1500 bytes	Message is not greater than 1500 bytes.
TD_IMS_SS_0001	IMS network supports ISC based on HOLD	Check1: INVITE sent by UE_B does not contain P-Charging-Vector header
		Check 1: reINVITE message not sent by UE_B.
TD_IMS_SS_0005	IMS network supports ISC based on OIR/ACR	Step2: access-network-info_parameter not set for NNI
TD_IMS_MESS_0003	IMS network handles messaging with TEL URI identities	Only one Identity in P-Asserted-Identity in IMS A
TD_IMS_MESS_0004	IMS network handles messaging with DNS/ENUM lookup	Check 2: UE_B does not send 2xx response (cf interop result)
TD_IMS_CALL_0008	IMS network handles user initiated call hold when home	Conformance verdict set to: inconc***f_gen_receive: Timer

	caller puts roaming user on hold and resumes call using INVITE	tc_wait expired when waiting for incoming message in TP_IMS_5120_01 at interface Mw
TD_IMS_CALL_0018	IMS network handles user initiated call hold when home caller puts another home user on hold and resumes call using UPDATE	No SIP UPDATE message into MS1 Sun Morning 2TD_IMS_CALL_0018.pcap file

Version History

V1.0.0	October 2009	First version