ETSI CTI Report 0.3 (2013-10)

eCall#2 Testfest;
Essen, DE;
9 - 13 September 2013

ETSI

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1 Executive Summary

The 2nd eCall Testfest was held from 9 to 13 September 2013 in Essen (Germany).

This event was co-organized by ETSI and ERTICO and hosted by CETECOM. Technical support was provided by QUALCOMM. This event was developed in coordination with The HeERO Standardisation Task Force.

It aimed to test the interoperability of Pan-European eCall equipments from all key vendors.

31 companies participated in this event testing 37 devices (27 IVS and 10 PSAP). Vendors came from China – EU – Japan – USA.

More than 2000 tests were executed during 350 pairing sessions. The results of the test show showed a significant level of interoperability (success rate higher than 90%).

In the final wrap session vendors stated that a certification framework is necessary for device manufacturer to ensure matching a set of minimum requirements; and that harmonisation with Glonass Union standards and certification is wanted.

2 Introduction

This Testfest aimed to verify the interoperability between different manufacturers of solutions for eCall IVS and PSAP devices, as well as operational eCall PSAPs from different countries.

The implementations were connected using the public VODAFONE GSM network, and local ISDN lines at CETECOM.

A Test Description document was provided by ERTICO – ITS Europe and ETSI CTI, containing 30 interoperability tests, including 8 mandatory test cases and 22 optional ones.

ETSI CTI provided the interoperability tool suite of wiki, scheduling and test reporting tool.

Each day test sessions for IOP assessment were conducted. A wrap-up meeting was held each day to discuss main interoperability points and other remarkable behaviours concerning special points within the used standards.

The goal of interoperability test is to check that devices resulting from protocol implementations are able to work together and provide the functionalities provided by the protocols. As necessary, one message may be checked during a test, when a successful functional verification may result from an incorrect behaviour for instance. Detailed protocol checks are part of the conformance testing process and are thus avoided during the interoperability tests.

The test sessions have been executed between 2 devices (IVS and PSAP eCall modem-server) from different vendors and between IVS devices and PSAP simulators.

In addition to the 8 mandatory interoperability tests, 22 other ‘optional’ tests have been specified, and these may be used to help diagnose basic call set-up problems and high level application protocol (HLAP) timing issues that may be encountered during the interoperability testing phase.

For some of the optional tests it was necessary to use a mobile phone instead of the IVS and in other tests to replace the PSAP eCall modem-server with a telephone.

3 Abbreviations

EUT	Equipment Under Test
NO	Test is recorded as NOT successfully passed.
NA	Test is not applicable.
OK	Test is recorded as successfully passed.
OT	Test is recorded as not being executed due to lack of time.
Test Session	A paring of vendors that test together during a given time slot.
TRT	Test Reporting Tool.
GPS	Global Positioning System
GPRS	General Packet Radio System
GSM	Global System of Mobile telecommunications
HLAP	High Level Application Protocol
IVS	In Vehicle System (eCall terminal and associated sub-systems in vehicle)
MSD	Minimum Set of Data
MSISDN	Mobile Subscriber Integrated Services Digital Network Number
PLMN	Public Land Mobile Network
PSAP	Public Service Answering Point
SIM	Subscriber Identity Module
VIN	Vehicle Identification Number

4 Acknowledgement

This is to acknowledge the effort of

- Ralf WEBER, QUALCOMM, for his contribution during the event preparation and his technical support during the Testfest.

5 Host

This event was hosted by CETECOM who realized the test site layout, provided the test facilities and test support.

6 Participants

In this section all the vendors, the organization as well as the support team are listed.

Table 1: List of IVS vendors

Company	Type	Nr of EUT
ACTIA	IVS	1
Civitronic	IVS	1
CTAG	IVS	1
FICOSA	IVS	1
Flairmicro	IVS	1
Ford	IVS	1
Fujitsu TEN	IVS	1
Gemalto	IVS	3
GMV	IVS	1
Huawei	IVS	1
Johnson Controls	IVS	1
LG Electronics	IVS	1
NXP	IVS	1
Peiker	IVS	3
RDSS	IVS	1
S1NN	IVS	1
Sherlog	IVS	1
Sierra Wireless	IVS	1
Telit	IVS	3
VALEO	IVS	1
VTT	(IVS	1

Table 2: List of PSAP vendors

Company	Type	Nr of EUT
Local PSAP		
VTT	PSAP (IVS)	1
Navcert	Simulator	2
OECON	PSAP	1
Picosoft	PSAP	2
Rohde & Schwarz	Tester	2
Remote PSAP		
NPRD	HR	entire week
AREU	I	Entire week
RWS	NL	Thu - Fri
Hitec	LUX	Tue - Wed
Telefonica	CZ	Entire week
G4S Telematix	GR	Entire week

Table 3: Organizer/Support Team

Organizer / support
CETECOM
ERTICO - ITS Europe
ETSI - CTI
QUALCOMM

7 Technical and Project Management

All the information presented in this chapter is an extract of the ETSI event wiki https://services.Testfest.net/wiki/ecall/index.php/Main_Page (Access for registered people only).

7.1 Test Description document

The Test Description document from Testfest#1 was updated and reused. It contains a set of pro-forma table corresponding to test scenarios to be executed by vendors, and it provides guidance to participants for executing and assessing the test sessions.

The Test Description document was distributed to participants some weeks before the event, proposing them to contribute or comment on the tests, or proposing additional tests. The tests were grouped in mandatory and optional tests, where mandatory tests where prioritized in the execution.

Table 4: Mandatory Tests

Nr	Test case ID	Summary
1	TD_MAN_PUSH_01	MSD transmission / reception /acknowledgement using the PUSH mode
2	TD_MAN_01	MSD transmission / reception /acknowledgement using the PULL Mode
3	TD_MAN_02	Voice communication after receipt of AL-ACK
4	TD_MAN_03	Retransmission of MSD on request from PSAP
5	TD_MAN_04	Voice communication after retransmission of MSD
6	TD_MAN_05	Clear down / PSAP initiated network clear down
7	TD_MAN_06	Clear down / PSAP initiated application layer AL-ACK Clear-down
8	TD_MAN_07	Call Back / PSAP initiated call back to IVS

NOTE: The mandatory tests are used to verify the interoperability between the IVS, PLMN and PSAP.

Table 5: Optional Tests

Nr	Test case ID	Summary
1	TD_OPT_01_IVS	Emergency call set-up with eCall identifier (flag) set to 'Automatically Initiated' in Service Category message – **for simulated or private mobile network only**
2	TD_OPT_02_IVS	Emergency call set-up with eCall identifier (flag) set to 'Manually Initiated' in Service Category message – **for simulated or private mobile network only**
3	TD_OPT_03_IVS	MSD call type indicator set to 'Automatically Initiated'
4	TD_OPT_04_IVS	MSD call type indicator set to 'Manually Initiated'
5	TD_OPT_05_IVS	MSD call type indicator set to 'Test Call'
6	TD_OPT_06_IVS	Duration of Initiation Signal does not exceed 2 seconds from when call is answered
7	TD_OPT_PUSH_07_PSAP	PSAP does not send 'SEND MSD' request if valid Initiation Signal is not received within 2 seconds from answering call
8	TD_OPT_08_IVS	Mute IVS audio during MSD transmission and un-mute after application layer acknowledgement
9	TD_OPT_09_PSAP	Mute PSAP audio during MSD request / MSD transfer and un-mute after application layer acknowledgement
10	TD_OPT_10a_IVS	Auto redial following busy during call set-up

11	TD_OPT_10b_IVS	Auto redial following no-answer during call set-up
12	TD_OPT_11_IVS	Auto redial if call drops before MSD acknowledged and does not redial if MSD has been acknowledged (LL)
13	TD_OPT_12_PSAP	Un-mute PSAP audio when Initiation Signal not received (T4 expired)
14	TD_OPT_13_IVS	Un-mute IVS audio when SEND MSD not received (T5 expired)
15	TD_OPT_14_IVS	Un-mute IVS audio when AL-ACK not received (T6 expired)
16	TD_OPT_15_IVS	Un-mute IVS audio when LL-ACK not received (T7 expired)
17	TD_OPT_16_PSAP	Un-mute PSAP audio when MSD not received within (T8 expired)
18	TD_OPT_17_IVS	Format of encoded and decoded MSD in accordance with EN 15722
19	TD_OPT_18_IVS	IVS configured for eCall 'only' service (restricted)
20	TD_OPT_19_IVS	IVS maintains register of recent calls
21	TD_OPT_20_PSAP	PSAP handling of more than 1 eCall simultaneously
22	TD_OPT_21	Check handling of HLAP MSD request when PSAP is using NEC disabling tone.

7.2 Test Scheduling

ETSI CTI provided an initial test schedule. The requirement for the schedule was that each IVS could test against every PSAP. Based on the initial proposal the ERTICO team updated and managed the schedule modifications. There were 14 test sessions of 2 hours, and the test schedule provided pairing sessions for the whole week. Additional pairing sessions were arranged between vendors.

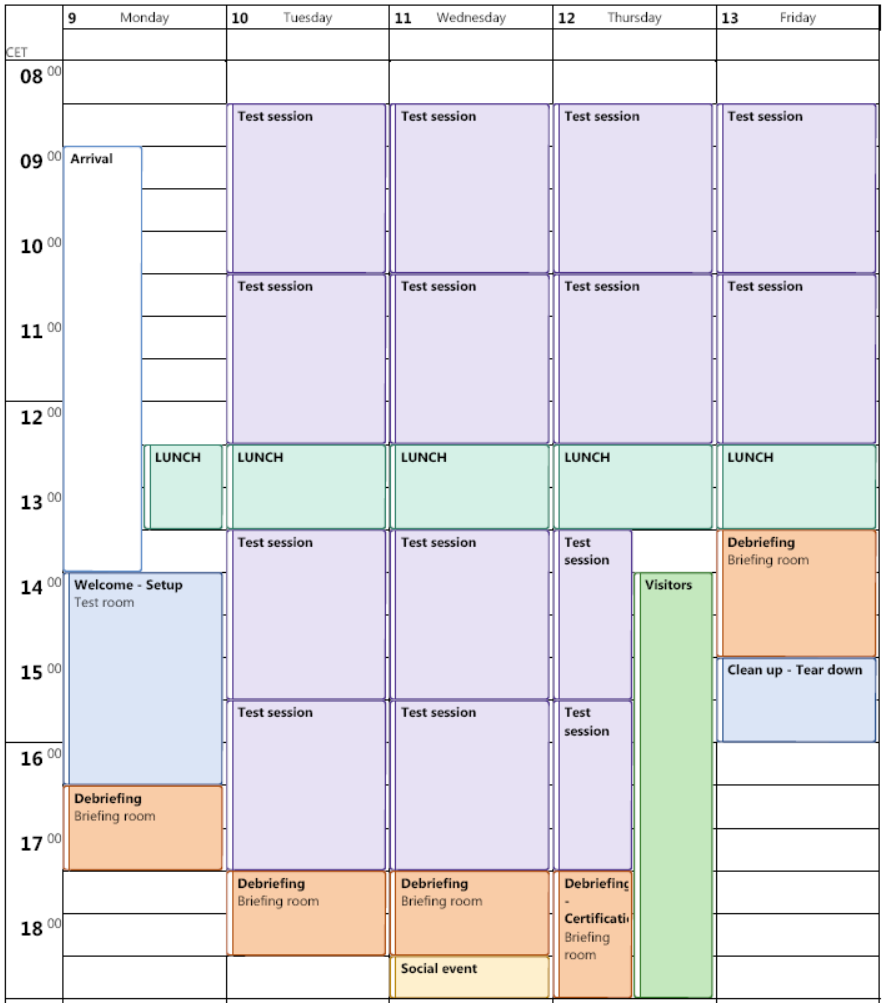

Figure 1: Agenda of the TestFest

7.3 Test Site Layout

The test site layout comprised a public GSM network. 4 x E1 / ISDN (PRI) and BRI interfaces connected to teh PSAPs.

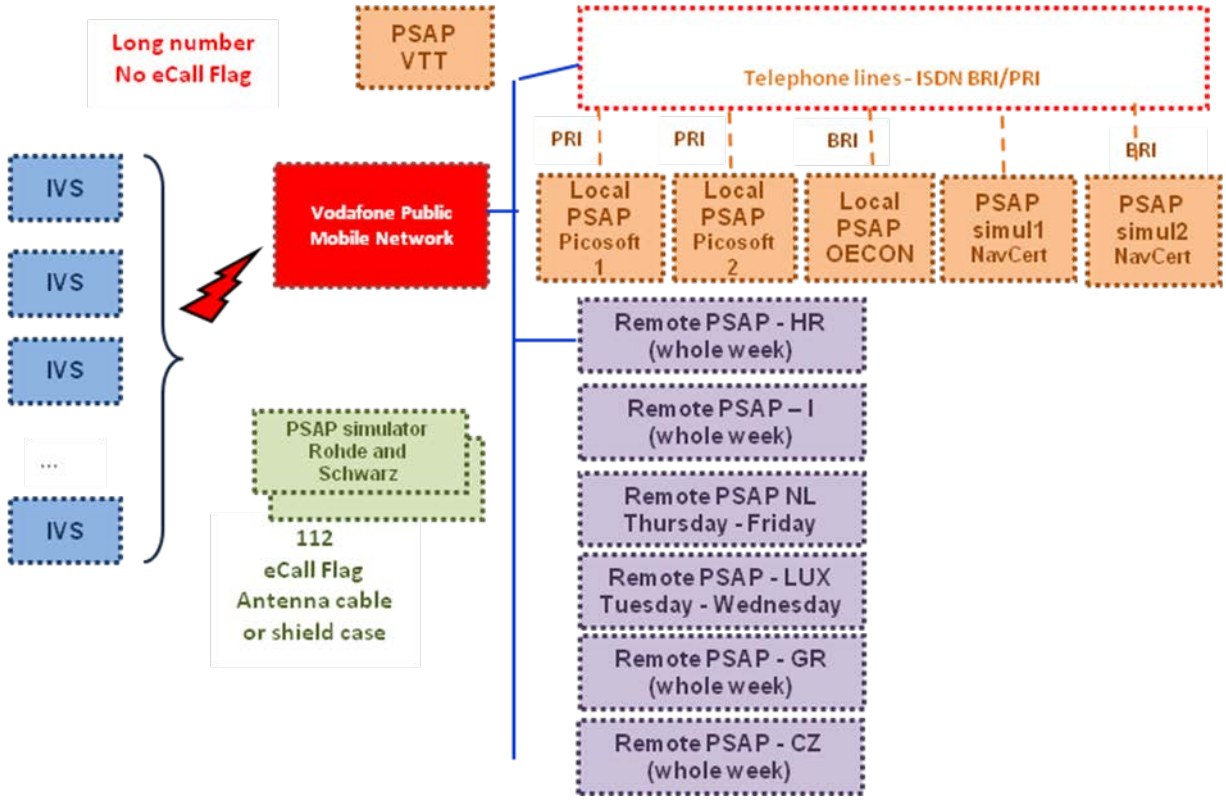

Figure 2: Test site layout

7.4 Interoperability Test Procedure

Each test was executed in the same manner as listed below:

1) Connect devices from different vendors

2) Check connectivity between devices

3) Perform tests according to Test description document

4) Check if devices can send/receive frames from each other

5) Check if data is handled correctly in the network and facility layers

6) Result determination and reporting

7) Result OK: run next test

8) Result NOK: check monitor tools to identify source of error

9) Report results in ETSI Test Reporting Tool

7.5 Results reporting

The results of each interoperability test session have been recorded in a dedicated web application software: the ETSI Test Report Tool (TRT). After each test execution the interoperability result is agreed among all participants and then recorded. After each test session the report is submitted to ETSI.

Vendors could edit their products as well as create, edit, and withdraw test session reports only of sessions that they have participated in.

8 Achieved Results

Below an extract from the ETSI test reporting tool is shown. There were 7 mandatory tests defined in the Test Description document and 21 optional ones.

From potentially 3988 tests, 2237 were performed, which gives an execution rate of more than 50%. This means that all mandatory as well as a significant amount of optional tests were performed.

From the 2237 tests performed, 2095 had a PASS rate (OK), which represents a success rate of 93.7%. This is an excellent result especially as so many different vendors attended this Test fest.

Result Summaries

Results for all configurations

Number of tests per test session: 30
Number of Sessions: 348
Of the 348 reported sessions 339 were agreed (97.4%)

All results in the following includes non-agreed sessions

Overall Results

Interoperability		Not Executed		Totals	
OK	NO	NA	OT	Run	Results
2095 (93.7%)	142 (6.3%)	990 (24.8%)	761 (19.1%)	2237 (56.1%)	3988

Total: 2237

Results Statistics per Test Session

	Interoperability		Not Executed		Totals
	OK	NO	NA	OT	Runs
Minimum	0	0	0	0	0
Maximum	19	7	18	18	20
Mean	6.5	0.4	3.1	2.3	7.0
Deviation	3.03	0.98	4.16	4.72	3.04

Results per Group

	Interoperability		Not Executed		Totals	
Group	OK	NO	NA	OT	Run	Results
Mandatory	1232 (93.9%)	80 (6.1%)	257 (15.5%)	87 (5.3%)	1312 (79.2%)	1656
Optional_CFG_01	830 (93.5%)	58 (6.5%)	733 (32.0%)	673 (29.3%)	888 (38.7%)	2294
Optional_CFG_02	33 (89.2%)	4 (10.8%)	0 (0.0%)	1 (2.6%)	37 (97.4%)	38

9 Feedback to standardization

9.1 Base Specification Issues

Since the previous eCall Plugtests event, run in May 2012 at Nuneaton in UK, changes were proposed to CEN for providing a new release of EN16062 – eCall High Level Application requirements (HLPA).

In particular the handling of the PULL mode was added to allow PSAP to send a SEND-MSD message to the IVS, without waiting for the receipt of an invitation message.

The way to handle these new requirements was discussed during the debriefing sessions. However no further need to change the proposal for revising EN16062 was made.

The way to interpret the procedures relating to LL ACK and AL ACK were also discussed. There are situations where the LL ACK is not well detected by the IVS. However it was understood during the debriefing sessions that the standard shall be interpreted so that the forthcoming AL ACK shall then be accepted by the IVS. Therefore, if the sending of LL ACK is mandatory for the PSAP, the receipt is not mandatory for the IVS, which shall then proceed as usual when receiving the AL ACK.

Issues with the interpretation of timers were discussed. In the published EN16062, the definition of the timers and the different action associated with the expiration of those timers, are unclear. For instance the difference between T10 and T11, as well as the relationship with T9. The behavior of the timers was clarified while presenting a proposal to refine the current timer table in EN16062. For instance in this proposal T11 has been deleted, being somehow redundant with T10. Furthermore the timer table is far more clear, while specifying the conditions for starting, stopping the timers, and the action at their expiry.

9.2 Interoperability Issues

Participants experienced some interoperability issues with specific devices. Some implementation issues were sometimes solved by participants during the test sessions.

Generally the eCall technology based on in-band modem transmission showed its capability to setup the HLAP transmission link and transmit the MSD. Issues with the interpretation of standard lead sometimes to interoperability problems, which could be fixed with a software update.

Also some minor discrepancy relating to the content of the MSD were observed, but which could also be fixed with software updates.

10 Some pictures from the Testfest

Pairing session

Debriefing

IVS embedded in a vehicle

Test coordination

Research: IVS and PSAP on a Mobile Phone

Test room

Group picture in test room

Annex A Interoperability Test specification

The interoperability test specification, which forms parts of the present technical report, is contained in the file eCall_2_Testfest_Test_Descriptions_V2.4.3.pdf which accompanies the present document.

eCall Testfest#2
-TestDescriptions v2.

History

Document history		
V0.1	September 2013	Draft version
V0.2	Sep. 2013	FF revisions
V0.3	Sep. 2013	Final version