



Technical Report

**Intelligent Transport Systems (ITS);  
Testing;  
Part 3: Conformance test specifications for Geographical  
addressing and forwarding for point-to-point and  
point-to-multipoint communications;  
GeoNetworking validation report**

STANDARDS PREVIEW  
https://standards.its.international.org/standards/948b3b8f-b4a4-426f-8851-522522222222/etsi-tr-103-061-3-v1.2.1-  
14

---

Reference

RTR/ITS-00341

---

Keywords

ITS, OTE, testing

**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  
Sous-Préfecture de Grasse (06) N° 7803/88

---

**Important notice**

The present document can be downloaded from:

<http://www.etsi.org>

The present document may be made available in electronic versions and/or in print. The content of any electronic and/or print versions of the present document shall not be modified without the prior written authorization of ETSI. In case of any existing or perceived difference in contents between such versions and/or in print, the only prevailing document is the print of the Portable Document Format (PDF) version kept on a specific network drive within ETSI Secretariat.

Users of the present document should be aware that the document may be subject to revision or change of status.

Information on the current status of this and other ETSI documents is available at

<http://portal.etsi.org/tb/status/status.asp>

If you find errors in the present document, please send your comment to one of the following services:

[http://portal.etsi.org/chaicor/ETSI\\_support.asp](http://portal.etsi.org/chaicor/ETSI_support.asp)

---

**Copyright Notification**

No part may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm except as authorized by written permission of ETSI.

The content of the PDF version shall not be modified without the written authorization of ETSI.

The copyright and the foregoing restriction extend to reproduction in all media.

© European Telecommunications Standards Institute 2014.

All rights reserved.

**DECT™**, **PLUGTESTS™**, **UMTS™** and the ETSI logo are Trade Marks of ETSI registered for the benefit of its Members.  
**3GPP™** and **LTE™** are Trade Marks of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners.  
**GSM®** and the GSM logo are Trade Marks registered and owned by the GSM Association.

# Contents

Intellectual Property Rights .....	4
Foreword.....	4
Introduction .....	4
1 Scope .....	5
2 References .....	5
2.1 Normative references .....	5
2.1 Informative references .....	5
3 Abbreviations .....	6
4 Validation report .....	6
4.1 Validation level .....	6
4.2 Source code evaluation.....	6
4.2.1 TTCN-3 version.....	6
4.2.2 TTCN-3 tools used for compilation.....	7
4.3 Validation Process.....	7
4.3.1 Test Platforms .....	7
4.3.2 SUTs .....	7
4.3.3 Validation Status.....	8
4.4 Feedback to standardization process .....	10
4.4.1 Base standard issues.....	10
4.4.2 Test specification issues.....	11
4.4.3 Typical SUT issues .....	11
<b>Annex A: Bibliography.....</b>	<b>12</b>
History .....	14

iTen STANDARD PREVIEW  
 (standards.itech.ai)  
 Full standard  
<https://standards.itech.ai/catalog/standard/csrf/948b31b8f-b4a4-426f-8851-1e563052ba12/etsi-tr-103-061-3-v1.2.1-2014-04>

---

## Intellectual Property Rights

IPRs essential or potentially essential to the present document may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: "*Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards*", which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (<http://ipr.etsi.org>).

Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

---

## Foreword

This Technical Report (TR) has been produced by ETSI Technical Committee Intelligent Transport Systems (ITS).

The present document is part 3 of a multi-part deliverable. Full details of the entire series can be found in part 1 [i.8].

---

## Introduction

In response to EC mandate M/453 [i.9], ETSI Technical Committee ITS has standardized base and test specifications for ITS protocols. In a next step a prototype TTCN-3 test system was built and validated. The present document and its related TR 103 099 [i.5] (Architecture of Conformance Validation Framework), describe the validation and design of the prototype TTCN-3 test system.

The action described in the present document has supported the implementation of ITS standards by:

- Making available validated and standardized test specifications and thus enabling the application of reliable certification schemes.
- Executing conformance validation framework against real Implementations Under Test (IUTs) from industry and thus providing these companies with a conformance assessment of their implementations. During the lifetime of this action, the conformance validation framework was as well provided at ITS Cooperative Mobility Services Interoperability events.
- Releasing all software as open source and thus allowing industry to build and run their own conformance validation framework.

---

# 1 Scope

The present document is the validation report of the GeoNetworking conformance tests defined in TS 102 871-3 [i.2] derived from EN 302 636-4-1 (V1.2.0) [i.1]. It provides statistics of executed and validated GeoNetworking conformance tests. The information provided has been produced by validation against at least two prototype implementations from industry.

---

# 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.

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

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

## 2.1 Normative references

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

Not applicable.

## 2.1 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 EN 302 636-4-1 (V1.2.0): "Intelligent Transport Systems (ITS); Vehicular Communications; GeoNetworking; Part 4: Geographical addressing and forwarding for point-to-point and point-to-multipoint communications; Sub-part 1: Media-Independent Functionality".
- [i.2] ETSI TS 102 871-3 (V1.1.1): "Intelligent Transport Systems (ITS); Testing; Conformance test specifications for GeoNetworking ITS-G5; Part 3: Abstract Test Suite (ATS) and Protocol Implementation eXtra Information for Testing (PIXIT)".
- [i.3] ETSI TS 102 871-3 (V1.2.1): "Intelligent Transport Systems (ITS); Testing; Conformance test specifications for GeoNetworking ITS-G5; Part 3: Abstract Test Suite (ATS) and Protocol Implementation eXtra Information for Testing (PIXIT)".
- [i.4] ETSI TS 102 871-2 (V1.1.1): "Intelligent Transport Systems (ITS); Testing; Conformance test specifications for GeoNetworking ITS-G5; Part 2: Test Suite Structure and Test Purposes (TSS&TP)".
- [i.5] ETSI TR 103 099 (V1.2.1): "Intelligent Transport Systems (ITS); Architecture of conformance validation framework".
- [i.6] 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.7] ETSI ES 201 873-1 (V4.5.1): "Methods for Testing and Specification (MTS); The Testing and Test Control Notation version 3; Part 1: TTCN-3 Core Language".
- [i.8] ETSI TR 103 061-1: "Intelligent Transport Systems (ITS); Testing; Part 1: Conformance test specifications for Co-operative Awareness Messages (CAM); CAM validation report".

- [i.9] EC mandate M/453: "Standardisation mandate addressed to CEN, CENELEC and ETSI in the field of Information and Communication Technologies to support the interoperability of co-operative Systems for Intelligent Transport in the European Community".

## 3 Abbreviations

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

ASN.1	Abstract Syntax Notation One
ATS	Abstract Test Suite
CAM	Co-operative Awareness Message
CBF	Contention Based Forwarding
DENM	Decentralized Environmental Notification Messages basic service
DEPV	Destination Position Vector
EC	European Commission
GAC	Geographically-scoped AnyCast
GN	GeoNetworking
ITS	Intelligent Transportat Systems
IUT	Implementation Under Test
LS	Location Service
PICS	Protocol Implementation Conformance Statement
SCF	Store Carry & Forward
SHB	Single Hop Broadcast
SO	SOUrce
SOPV	SOUrce Position Vector
SQN	SeQUENCE Number
SUT	System Under Test
TC	Test Cases
TP	Test Purposes
TSB	Topology Scoped Broadcast
TTCN-3	Testing and Test Control Notation 3
UC	UniCast
UT	Upper Tester

## 4 Validation report

### 4.1 Validation level

Level 3 (Rigorous) abstract test suite validation has been performed, according to the validation handbook EG 201 015 [i.6]:

- 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 has 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 GeoNetworking abstract test suite is based on ES 201 873-1 (V4.5.1) [i.7].

## 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®	1.1.16	<ul style="list-style-type: none"> <li>Support for very large integers</li> <li>ASN.1-Language-Support-v1.1.4</li> </ul>	No error, no warning
Elvior™	TestCast T3™	6.7.2.1		No error, no warning
NOTE: This information is given for the convenience of users of the present document and does not constitute an endorsement by ETSI of these products.				

## 4.3 Validation Process

### 4.3.1 Test Platforms

The validation test platform has been built as described in conformance validation framework TR 103 099 [i.5] using the components as described in table 2.

**Table 2: Validation test platform components**

<b>TTCN-3 Tool</b>	TestingTech TTworkbench® v17 with ASN.1 support plugin
<b>Test Adapter</b>	The applicable software tag is: <a href="http://forge.etsi.org/websvn/listing.php?replname=ITS.ITS&amp;path=/tags/v1.2.1/">http://forge.etsi.org/websvn/listing.php?replname=ITS.ITS&amp;path=/tags/v1.2.1/</a> G5 Radio hardware: Cohda Wireless™ MK2 connected via Ethernet cable
<b>Codec</b>	The applicable software tag is: <a href="http://forge.etsi.org/websvn/listing.php?replname=ITS.ITS&amp;path=/tags/v1.2.1/">http://forge.etsi.org/websvn/listing.php?replname=ITS.ITS&amp;path=/tags/v1.2.1/</a>

### 4.3.2 SUTs

The SUTs listed in table 3 have been used to validate the GeoNetworking test suite.

**Table 3: SUTs used for validation**

Manufacturer	Product name	Version
Hitachi™ Europe SAS	GN	Development
NEC™ Europe LTD	GN	Development
QMIC™	GN	Development
MARBEN™	GN	Development
ESK™	GN	Development
DENSO™	GN	Development
COMMSIGNIA™	GN	Development
AUTOTALKS™	GN	Development
COHDA™	GN	Development
KAPSCH™	GN	Development
ITRI™	GN	Development
NOTE: This information is given for the convenience of users of the present document and does not constitute an endorsement by ETSI of these products.		

### 4.3.3 Validation Status

Table 4 shows the validation status of each test case of the GeoNetworking abstract test suite.

**Table 4: Testcase validation status**

TC identifier	Verdict	Log analysis	Validated
TC_GEONW_FDV_BAH_BV_01	PASS	Yes	Yes
TC_GEONW_FDV_BAH_BV_02	PASS	Yes	Yes
TC_GEONW_FDV_COH_BV_01	PASS	Yes	Yes
TC_GEONW_FDV_COH_BV_02	PASS	Yes	Yes
TC_GEONW_FDV_COH_BV_03	PASS	Yes	Yes
TC_GEONW_FDV_COH_BV_04	PASS	Yes	Yes
TC_GEONW_FDV_BEA_BV_01	PASS	Yes	Yes
TC_GEONW_FDV_BEA_BV_02	PASS	Yes	Yes
TC_GEONW_FDV_BEA_BV_03	PASS	Yes	Yes
TC_GEONW_FDV_BEA_BV_04	PASS	Yes	Yes
TC_GEONW_FDV_GUC_BV_01	PASS	Yes	Yes
TC_GEONW_FDV_GBC_BV_01	PASS	Yes	Yes
TC_GEONW_FDV_GAC_BV_01	PASS	Yes	Yes
TC_GEONW_FDV_SHB_BV_01	PASS	Yes	Yes
TC_GEONW_FDV_TSB_BV_01	PASS	Yes	Yes
TC_GEONW_PON_LOT_BV_01	PASS	Yes	Yes
TC_GEONW_PON_LOT_BV_02	PASS	Yes	Yes
TC_GEONW_PON_LOT_BV_03_01	PASS	Yes	Yes
TC_GEONW_PON_LOT_BV_03_02	PASS	Yes	Yes
TC_GEONW_PON_LOT_BV_03_03	PASS	Yes	Yes
TC_GEONW_PON_LOT_BV_03_04	PASS	Yes	Yes
TC_GEONW_PON_LOT_BV_03_05	PASS	Yes	Yes
TC_GEONW_PON_LOT_BV_03_06	PASS	Yes	Yes
TC_GEONW_PON_LOT_BV_03_07	PASS	Yes	Yes
TC_GEONW_PON_LOT_BV_03_08	PASS	Yes	Yes
TC_GEONW_PON_LOT_BV_04	PASS	Yes	Yes
TC_GEONW_PON_LOT_BV_05_01	PASS	Yes	Yes
TC_GEONW_PON_LOT_BV_05_02	PASS	Yes	Yes
TC_GEONW_PON_LOT_BV_05_03	PASS	Yes	Yes
TC_GEONW_PON_LOT_BV_05_04	PASS	Yes	Yes
TC_GEONW_PON_LOT_BV_05_05	PASS	Yes	Yes
TC_GEONW_PON_LOT_BV_05_06	PASS	Yes	Yes
TC_GEONW_PON_LOT_BV_05_07	PASS	Yes	Yes
TC_GEONW_PON_LPV_BV_01	PASS	Yes	Yes
TC_GEONW_PON_SQN_BV_01	PASS	Yes	Yes
TC_GEONW_PON_SQN_BV_02	PASS	Yes	Yes
TC_GEONW_PON_LOS_BV_01	PASS	Yes	Yes
TC_GEONW_PON_LOS_BV_02	PASS	Yes	Yes
TC_GEONW_PON_LOS_BV_03	PASS	Yes	Yes
TC_GEONW_PON_LOS_BV_04	PASS	Yes	Yes
TC_GEONW_PON_LOS_BV_05	PASS	Yes	Yes
TC_GEONW_PON_LOS_BV_06	PASS	Yes	Yes
TC_GEONW_PON_LOS_BV_07	PASS	Yes	Yes
TC_GEONW_PON_LOS_BV_08	PASS	Yes	Yes
TC_GEONW_PON_LOS_BV_09	PASS	Yes	Yes
TC_GEONW_PON_LOS_BV_10	PASS	Yes	Yes
TC_GEONW_PON_LOS_BV_11	PASS	Yes	Yes
TC_GEONW_PON_LOS_BV_12	PASS	Yes	Yes
TC_GEONW_PON_LOS_BV_13	PASS	Yes	Yes
TC_GEONW_PON_LOS_BV_14	PASS	Yes	Yes
TC_GEONW_PON_FPB_BV_01	PASS	Yes	Yes
TC_GEONW_PON_FPB_BV_02	-	-	No
TC_GEONW_PON_FPB_BV_03	PASS	Yes	Yes
TC_GEONW_PON_FPB_BV_04	PASS	Yes	Yes
TC_GEONW_PON_FPB_BV_05	PASS	Yes	Yes
TC_GEONW_PON_FPB_BV_06	PASS	Yes	Yes
TC_GEONW_PON_FPB_BV_07	PASS	Yes	Yes
TC_GEONW_PON_FPB_BV_08	PASS	Yes	Yes



TC identifier	Verdict	Log analysis	Validated
TC_GEONW_PON_FP_BV_09	-	-	No
TC_GEONW_PON_FP_BV_10	PASS	Yes	Yes
TC_GEONW_PON_FP_BV_11_01	PASS	Yes	Yes
TC_GEONW_PON_FP_BV_11_02	PASS	Yes	Yes
TC_GEONW_PON_FP_BV_11_03	PASS	Yes	Yes
TC_GEONW_PON_FP_BV_11_04	PASS	Yes	Yes
TC_GEONW_PON_FP_BV_11_05	PASS	Yes	Yes
TC_GEONW_PON_FP_BV_12_01	PASS	Yes	Yes
TC_GEONW_PON_FP_BV_12_02	PASS	Yes	Yes
TC_GEONW_PON_FP_BV_12_03	PASS	Yes	Yes
TC_GEONW_PON_FP_BV_12_04	PASS	Yes	Yes
TC_GEONW_PON_GNA_BV_01	PASS	Yes	Yes
TC_GEONW_PON_GNA_BV_02	-	-	No
TC_GEONW_PON_BEA_BV_01	PASS	Yes	Yes
TC_GEONW_PON_BEA_BV_02	PASS	Yes	Yes
TC_GEONW_PON_GUC_BV_01	PASS	Yes	Yes
TC_GEONW_PON_GUC_BV_02	PASS	Yes	Yes
TC_GEONW_PON_GUC_BV_03	PASS	Yes	Yes
TC_GEONW_PON_GUC_BV_04	PASS	Yes	Yes
TC_GEONW_PON_GUC_BV_05	PASS	Yes	Yes
TC_GEONW_PON_GUC_BV_06	PASS	Yes	Yes
TC_GEONW_PON_GUC_BV_07	PASS	Yes	Yes
TC_GEONW_PON_GUC_BV_08	PASS	Yes	Yes
TC_GEONW_PON_GUC_BV_09	PASS	Yes	Yes
TC_GEONW_PON_GUC_BV_10	PASS	Yes	Yes
TC_GEONW_PON_GBC_BV_01	PASS	Yes	Yes
TC_GEONW_PON_GBC_BV_02	PASS	Yes	Yes
TC_GEONW_PON_GBC_BV_03	PASS	Yes	Yes
TC_GEONW_PON_GBC_BV_04	PASS	Yes	Yes
TC_GEONW_PON_GBC_BV_05	PASS	Yes	Yes
TC_GEONW_PON_GBC_BV_06	PASS	Yes	Yes
TC_GEONW_PON_GBC_BV_07	PASS	Yes	Yes
TC_GEONW_PON_GBC_BV_08	PASS	Yes	Yes
TC_GEONW_PON_GBC_BV_09	PASS	Yes	Yes
TC_GEONW_PON_GBC_BV_10	PASS	Yes	Yes
TC_GEONW_PON_GBC_BV_11	PASS	Yes	Yes
TC_GEONW_PON_GBC_BV_12	PASS	Yes	Yes
TC_GEONW_PON_GBC_BV_19	PASS	Yes	Yes
TC_GEONW_PON_GBC_BV_20	PASS	Yes	Yes
TC_GEONW_PON_GBC_BV_21	PASS	Yes	Yes
TC_GEONW_PON_TSB_BV_01	PASS	Yes	Yes
TC_GEONW_PON_TSB_BV_02	PASS	Yes	Yes
TC_GEONW_PON_TSB_BV_03	PASS	Yes	Yes
TC_GEONW_PON_TSB_BV_04	PASS	Yes	Yes
TC_GEONW_PON_TSB_BV_05	PASS	Yes	Yes
TC_GEONW_PON_TSB_BV_06	PASS	Yes	Yes
TC_GEONW_PON_TSB_BV_07	PASS	Yes	Yes
TC_GEONW_PON_SHB_BV_01	PASS	Yes	Yes
TC_GEONW_PON_SHB_BV_02	PASS	Yes	Yes
TC_GEONW_PON_GAC_BV_01	PASS	Yes	Yes
TC_GEONW_PON_GAC_BV_02	PASS	Yes	Yes
TC_GEONW_PON_GAC_BV_03	PASS	Yes	Yes
TC_GEONW_PON_GAC_BV_04	PASS	Yes	Yes
TC_GEONW_PON_GAC_BV_05	PASS	Yes	Yes
TC_GEONW_PON_GAC_BV_06	PASS	Yes	Yes
TC_GEONW_PON_GAC_BV_07	PASS	Yes	Yes
TC_GEONW_PON_GAC_BV_08	PASS	Yes	Yes
TC_GEONW_PON_GAC_BV_09	PASS	Yes	Yes
TC_GEONW_PON_GAC_BV_10	PASS	Yes	Yes
TC_GEONW_PON_GAC_BV_11	PASS	Yes	Yes
TC_GEONW_PON_GAC_BV_12	-	-	No
TC_GEONW_PON_BAA_BV_01	-	-	No
TC_GEONW_PON_BAA_BV_02	-	-	No
TC_GEONW_PON_BAA_BV_03	-	-	No