ETSITS 102 859-1 V1.3.1 (2022-02)



Intelligent Transport Systems (ITS); Testing;

Conformance test specifications for Transmission of IP packets over GeoNetworking;

Part 1: Test requirements and Protocol Implementation Conformance Statement (PICS) pro forma

Reference RTS/ITS-00372 Keywords IP, ITS, network, PICS, 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 - APE 7112B Association à but non lucratif enregistrée à la Sous-Préfecture de Grasse (06) N° w061004871

Important notice

The present document can be downloaded from: http://www.etsi.org/standards-search

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 prevailing version of an ETSI deliverable is the one made publicly available in PDF format at www.etsi.org/deliver.

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 https://portal.etsi.org/TB/ETSIDeliverableStatus.aspx

If you find errors in the present document, please send your comment to one of the following services: https://portal.etsi.org/People/CommiteeSupportStaff.aspx

Notice of disclaimer & limitation of liability

The information provided in the present deliverable is directed solely to professionals who have the appropriate degree of experience to understand and interpret its content in accordance with generally accepted engineering or other professional standard and applicable regulations.

No recommendation as to products and services or vendors is made or should be implied.

No representation or warranty is made that this deliverable is technically accurate or sufficient or conforms to any law and/or governmental rule and/or regulation and further, no representation or warranty is made of merchantability or fitness for any particular purpose or against infringement of intellectual property rights.

In no event shall ETSI be held liable for loss of profits or any other incidental or consequential damages.

Any software contained in this deliverable is provided "AS IS" with no warranties, express or implied, including but not limited to, the warranties of merchantability, fitness for a particular purpose and non-infringement of intellectual property rights and ETSI shall not be held liable in any event for any damages whatsoever (including, without limitation, damages for loss of profits, business interruption, loss of information, or any other pecuniary loss) arising out of or related to the use of or inability to use the software.

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.

© ETSI 2022. All rights reserved.

Contents

Intelle	ectual Property Rights	4
Forew	word	4
Moda	al verbs terminology	4
1	Scope	5
2	References	5
2.1	Normative references	
2.2	Informative references	
	Definition of terms, symbols and abbreviations	
3.1	Terms	
3.2	Symbols	
3.3	Abbreviations	6
4	Conformance requirement concerning PICS	6
Anne	ex A (normative): IPV6overGEONETW PICS Pro forma	7
A.1	The right to copy	7
A.2	Guidance for completing the ICS pro forma	7
A.2.1	Purposes and structure	
A.2.2	•	
A.2.3	Instructions for completing the ICS pro forma	
A.3	Identification of the implementation	9
A.3.1	Introduction	9
A.3.2	Date of the statement	9
A.3.3	Implementation Under Test (IUT) identification	9
A.3.4	System Under Test (SUT) identification	10
A.3.5		
A.3.6	1 11 /	
A.3.7	ICS contact person	11
A.4	Identification of the protocol	12
A.5	Global statement of conformance	12
A.6	Tables	12
A.6.1	Introduction	12
A.6.2	ITS Station type	12
A.6.2.		
A.6.2.2	•	
A.6.2.3	71	
A.6.3		
A.6.4		
A.6.5		
A.6.6	•	
A.6.7		
A.6.7.1		
A.6.7.2 A.6.8		
A.6.8.1	0 11	
A.6.8.2	ę ,	
A.6.8.3	\mathcal{E}	
A.6.8.4		
A.6.9		
	•	
Histor	ory	

Intellectual Property Rights

Essential patents

IPRs essential or potentially essential to normative deliverables may have been declared to ETSI. The declarations pertaining to these essential IPRs, if any, are 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 (https://ipr.etsi.org/).

Pursuant to the ETSI Directives including the ETSI IPR Policy, no investigation regarding the essentiality of IPRs, 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.

Trademarks

The present document may include trademarks and/or tradenames which are asserted and/or registered by their owners. ETSI claims no ownership of these except for any which are indicated as being the property of ETSI, and conveys no right to use or reproduce any trademark and/or tradename. Mention of those trademarks in the present document does not constitute an endorsement by ETSI of products, services or organizations associated with those trademarks.

DECTTM, **PLUGTESTS**TM, **UMTS**TM and the ETSI logo are trademarks of ETSI registered for the benefit of its Members. **3GPP**TM and **LTE**TM are trademarks of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners. **oneM2M**TM logo is a trademark of ETSI registered for the benefit of its Members and of the oneM2M Partners. **GSM**[®] and the GSM logo are trademarks registered and owned by the GSM Association.

Foreword

This Technical Specification (TS) has been produced by ETSI Technical Committee Intelligent Transport Systems (ITS).

The present document is part 1 of a multi-part deliverable covering Conformance test specifications for Transmission of IP packets over GeoNetworking, as identified below:

- Part 1: "Test requirements and Protocol Implementation Conformance Statement (PICS) pro forma";
- Part 2: "Test Suite Structure and Test Purposes (TSS & TP)";
- Part 3: "Abstract Test Suite (ATS) and Protocol Implementation eXtra Information for Testing (PIXIT)".

Modal verbs terminology

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

"must" and "must not" are NOT allowed in ETSI deliverables except when used in direct citation.

1 Scope

The present document provides the Protocol Implementation Conformance Statement (PICS) pro forma for Conformance test specifications for Geonetworking Basic Transport Protocol as defined in ETSI EN 302 636-6-1 [1] in compliance with the relevant requirements and in accordance with the relevant guidance given in ISO/IEC 9646-7 [i.2].

2 References

2.1 Normative 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 referenced document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at https://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.

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

- [1] ETSI EN 302 636-6-1 (V1.2.1): "Intelligent Transport Systems (ITS); Vehicular Communications; GeoNetworking; Part 6: Internet Integration; Sub-part 1: Transmission of IPv6 Packets over GeoNetworking Protocols".
- [2] IEEE 802.3TM-2012: "IEEE Standard for Ethernet".

2.2 Informative 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 referenced document (including any amendments) applies.

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

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] ISO/IEC 9646-1 (1994): "Information technology Open Systems Interconnection Conformance testing methodology and framework Part 1: General concepts".
- [i.2] ISO/IEC 9646-7 (1995): "Information technology Open Systems Interconnection Conformance testing methodology and framework Part 7: Implementation Conformance Statements".

3 Definition of terms, symbols and abbreviations

3.1 Terms

For the purposes of the present document, the terms given in ETSI EN 302 636-6-1 [1], ISO/IEC 9646-1 [i.1] and in ISO/IEC 9646-7 [i.2] apply.

3.2 Symbols

Void.

3.3 Abbreviations

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

DGVL Dynamic Geographical Virtual Link ICS Implementation Conformance Statement

IP Internet Protocol

IPv6Internet Protocol version 6ITSIntelligent Transportation SystemsIUTImplementation Under Test

LAN Local Area Network
PDU Protocol Data Unit

PICS Protocol Implementation Conformance Statement

SGVL Static Geographical Virtual Link

SUT System Under Test
TVL Topological Virtual Link

4 Conformance requirement concerning PICS

If it claims to conform to the present document, the actual PICS pro forma to be filled in by a supplier shall be technically equivalent to the text of the PICS pro forma given in annex A, and shall preserve the numbering, naming and ordering of the pro forma items.

An ICS which conforms to the present document shall be a conforming PICS pro forma completed in accordance with the instructions for completion given in clause A.1.

Annex A (normative): IPV6overGEONETW PICS Pro forma

A.1 The right to copy

Notwithstanding the provisions of the copyright clause related to the text of the present document, ETSI grants that users of the present document may freely reproduce the IPV6overGEONETW PICS pro forma in this annex so that it can be used for its intended purposes and may further publish the completed IPV6overGEONETW PICS.

A.2 Guidance for completing the ICS pro forma

A.2.1 Purposes and structure

The purpose of this PICS pro forma is to provide a mechanism whereby a supplier of an implementation of the requirements defined in ETSI EN 302 636-6-1 may provide information about the implementation in a standardized manner.

The PICS pro forma is subdivided into clauses for the following categories of information:

- guidance for completing the ICS pro forma;
- identification of the implementation;
- identification of the ETSI EN 302 636-6-1;
- global statement of conformance;
- PICS pro forma tables.

A.2.2 Abbreviations and conventions

The ICS pro forma contained in this annex is comprised of information in tabular form in accordance with the guidelines presented in ISO/IEC 9646-7.

Item column

The item column contains a number which identifies the item in the table.

Item description column

The item description column describes in free text each respective item (e.g. parameters, timers, etc.). It implicitly means "is <item description> supported by the implementation?".

Status column

The following notations, defined in ISO/IEC 9646-7, are used for the status column:

m mandatory - the capability is required to be supported.

o optional - the capability may be supported or not.

n/a not applicable - in the given context, it is impossible to use the capability.

x prohibited (excluded) - there is a requirement not to use this capability in the given context.

o.i qualified optional - for mutually exclusive or selectable options from a set. "i" is an integer which

identifies an unique group of related optional items and the logic of their selection which is

defined immediately following the table.

ci conditional - the requirement on the capability ("m", "o", "x" or "n/a") depends on the support of

other optional or conditional items. "i" is an integer identifying an unique conditional status

expression which is defined immediately following the table.

i irrelevant (out-of-scope) - capability outside the scope of the reference specification. No answer is

requested from the supplier.

NOTE 1: This use of "i" status is not to be confused with the suffix "i" to the "o" and "c" statuses above.

Reference column

The reference column makes reference to ETSI EN 302 636-6-1, except where explicitly stated otherwise.

Support column

The support column shall be filled in by the supplier of the implementation. The following common notations, defined in ISO/IEC 9646-7, are used for the support column:

Y or y supported by the implementation.

N or n not supported by the implementation.

N/A, n/a or - no answer required (allowed only if the status is n/a, directly or after evaluation of a conditional

status).

NOTE 2: As stated in ISO/IEC 9646-7, support for a received PDU requires the ability to parse all valid parameters of that PDU. Supporting a PDU while having no ability to parse a valid parameter is non-conformant. Support for a parameter on a PDU means that the semantics of that parameter are supported.

Values allowed column

The values allowed column contains the type, the list, the range, or the length of values allowed. The following notations are used:

- range of values: <min value> .. <max value>

example: 5 .. 20

- list of values: <value1>, <value2>, ..., <valueN>

example: 2, 4, 6, 8, 9

example: '1101'B, '1011'B, '1111'B example: '0A'H, '34'H, '2F'H

- list of named values: <name1>(<val1>), <name2>(<val2>), ..., <nameN>(<valN>)

example: reject(1), accept(2)

- length: size (<min size> .. <max size>)

example: size (1 .. 8)

Values supported column

The values supported column shall be filled in by the supplier of the implementation. In this column, the values or the ranges of values supported by the implementation shall be indicated.

References to items

For each possible item answer (answer in the support column) within the ICS pro forma a unique reference exists, used, for example, in the conditional expressions. It is defined as the table identifier, followed by a solidus character "/", followed by the item number in the table. If there is more than one support column in a table, the columns are discriminated by letters (a, b, etc.), respectively.

EXAMPLE 1: A.5/4 is the reference to the answer of item 4 in table 5 of annex A.

EXAMPLE 2: A.6/3b is the reference to the second answer (i.e. in the second support column) of item 3 in

table 6 of annex A.

Prerequisite line

A prerequisite line takes the form: Prerequisite: cpredicate>.

A prerequisite line after a clause or table title indicates that the whole clause or the whole table is not required to be completed if the predicate is FALSE.

A.2.3 Instructions for completing the ICS pro forma

The supplier of the implementation shall complete the ICS pro forma in each of the spaces provided. In particular, an explicit answer shall be entered, in each of the support or supported column boxes provided, using the notation described in clause A.2.2.

If necessary, the supplier may provide additional comments in space at the bottom of the tables or separately.

More detailed instructions are given at the beginning of the different clauses of the ICS pro forma.

A.3 Identification of the implementation

A.3.1 Introduction

Identification of the Implementation Under Test (IUT) and the system in which it resides (the System Under Test (SUT)) should be filled in so as to provide as much detail as possible regarding version numbers and configuration options.

The product supplier information and client information should both be filled in if they are different.

A person who can answer queries regarding information supplied in the ICS should be named as the contact person.

	Date of the statement
A.3.3	Implementation Under Test (IUT) identification

IUT version	:
A.3.4 SUT name:	System Under Test (SUT) identification
Hardware co	onfiguration:
Operating sy	ystem:
A.3.5 Name:	Product supplier
Address:	
Telephone n	number:
Facsimile nu E-mail addre	
Additional i	nformation:

Client (if different from product supplier) A.3.6 Name: Address: Telephone number: Facsimile number: E-mail address: Additional information: ICS contact person A.3.7 (A person to contact if there are any queries concerning the content of the ICS) Name: Telephone number: Facsimile number: E-mail address: Additional information:

A.4 Identification of the protocol

This ICS pro forma applies to the following standard: ETSI EN 302 636-6-1.

A.5 Global statement of conformance

Are all mandatory capabilities implemented? (Yes/No)

Answering "No" to this question indicates non-conformance to the GEONET standard specification. Non-supported mandatory capabilities are to be identified in the ICS, with an explanation of why the implementation is non-conforming, on pages attached to the ICS pro forma.

A.6 Tables

NOTE:

A.6.1 Introduction

Unless stated otherwise, the column references of all tables below indicates the clause numbers of ETSI EN 302 636-6-1.

A.6.2 ITS Station type

A.6.2.1 General

Table A.1: ITS Station type

Item	Туре	Reference	Status	Support
1	Central ITS station	6.1	o.101	
2	Road side ITS station	6.1	o.101	
3	Vehicle ITS station	6.1	o.101	
o.101:	It is mandatory to support one of these types.			

A.6.2.2 IPv6OverGeonetW sub layer

Table A.2: IPv6OverGeonetW sub layer

Item	Туре	Reference	Status	Support
1	Is the IPv6OverGeonetW sub layer implemented and	6.1	c.201	
	supported			
c.201:	IF A.1/3 THEN o ELSE m.			

A.6.2.3 Router type

Table A.3: Central ITS station

Prerequisite: A.1/1					
Item	Туре	Referen	ice Status	Support	
1	Application server	6.1	m		
2	Access router	6.1	Х		
3	GeoAdhoc router	6.1	Х		
4	Mobile router	6.1	х		

Table A.4: Road side ITS station

Prerequis	Prerequisite: A.1/2					
Item	Туре	Reference	Status	Support		
1	Application server	6.1	х			
2	Access router	6.1	0			
3	GeoAdhoc router	6.1	m			
4	Mobile router	6.1	х			

Table A.5: Vehicle ITS station

Prerequis	Prerequisite: A.1/3					
Item	Туре	Reference	Status	Support		
1	Application server	6.1	х			
2	Access router	6.1	Х			
3	GeoAdhoc router	6.1	m			
4	Moblie router	6.1	0			

A.6.3 Virtual links

Table A.6: Virtual links

Item	Туре	Reference	Status	Support	
1	Static Geographical Virtual Link (SGVL)	5.2.1.1	Note 1		
2	Dynamic Geographical Virtual Link (DGVL)	5.2.1.2	Note 2		
3	Topological Virtual Link (TVL)	5.2.2	Note 3		
NOTE 1:	It is mandatory to support at least one Static Geographical Virtual Link (SGVL).				
NOTE 2:	It is mandatory to support exactly one Dynamic Geographical Virtual Link (DGVL).				
NOTE 3:	It is mandatory to support exactly one Topological Virtual Link (TVL).				

A.6.4 Virtual network interfaces

Table A.7: virtual network interfaces

Item	Туре	Reference	Status	Support
1	Ethernet V2.0/IEEE 802.3™ LAN	5.3.2.1	m	

A.6.5 Primitives Associated

Table A.8: primitives associated

Item	Туре	Reference	Status	Support
1	GN6-UNITDATA.request	7	m	
2	GN6-UNITDATA.indication	7	m	

A.6.6 Packet Delivery

Table A.9: packet delivery

Item	Туре	Reference	Status	Support
1	Outbound traffic	8.2.1	m	
2	Inbound traffic	8.2.2	m	

A.6.7 IPv6

A.6.7.1 IPv6 cast

Table A.10: IPv6 cast

Item	Туре	Reference	Status	Support
1	IPv6 multicast	9.2	m	
2	IPv6 anycast	9.3	m	
3	Geographic IPv6 anycast	9.4	m	

A.6.7.2 IPv6 multicast

Table A.11: IPv6 multicast

Prerequisite: A.10/1					
Item	Туре	Reference	Status	Support	
1	IPv6 link-local multicast	9.2.1	m		
2	IPv6 wider-scope multicast	9.2.2	m		
3	Geocasting of IPv6 multicast traffic	9.2.3	m		

A.6.8 IPv6 neighbour discovery support

A.6.8.1 IPv6 neighbour discovery

Table A.12: IPv6 neighbour discovery

Item	Туре	Reference	Status	Support
1	On-link determination	10.1	m	
2	Address configuration	10.2	m	
3	Address resolution	10.3	m	
4	Neighbour unreachability detection	10.4	m	

A.6.8.2 Address configuration

Table A.13: Address configuration

Prerequisite: A.12/2						
Item	Туре	Reference	Status	Support		
1	Stateless address auto configuration	10.2.1	m			
2	Stateful address configuration	10.2.2	m			
3	Manual address configuration	10.2.3	m			

A.6.8.3 Address resolution

Table A.14: Address resolution

Prerequisite: A.12/3					
Item	Туре	Reference	Status	Support	
1	Non-ND-based address resolution	10.3.1	m		
2	ND-based address resolution	10.3.2	m		

A.6.8.4 Constants

Table A.15: Constants

Item	Туре	Reference	Status	Support
1	RTR_SOLICITATION_INTERVAL	10.5	m	
2	MAX_RTR_SOLICITATIONS	10.5	m	
3	MAX_MULTICAST_SOLICIT	10.5	m	
4	MAX_UNICAST_SOLICIT	10.5	m	
5	REACHABLE_TIME	10.5	m	

A.6.9 Protocol parameters

Table A.16: Protocol parameters

Item	Parameters	Ref.	Stat.	Sup.	Value allowed	Value supported
1	itsgn6aslVLTable	Annex A	m		itsgn6aslVLEntry (0n)	
2	itsgn6aslTSversion	Annex A	m		ETSI EN 302 636-6-1 (1.2.x)	

Table A.17: itsgn6asIVLEntry

Item	Parameters	Ref.	Stat.	Sup.	Value allowed	Value supported
1	itsgn6aslVLType	Annex A	m		INTEGER	
2	itsgn6aslAreaPos1Latitude	Annex A	m		Integer32	
3	itsgn6aslAreaPos1Longitude	Annex A	m		Integer32	
4	itsgn6aslAreaPos2Latitude	Annex A	m		Integer32	
5	itsgn6aslAreaPos2Longitude	Annex A	m		Integer32	
6	itsgn6aslAreaDistA	Annex A	m		Unsigned32 (14 294 967 295)	
7	itsgn6aslAreaDistB	Annex A	m		Unsigned32 (14 294 967 295)	
8	itsgn6aslAreaAngle	Annex A	m		INTEGER (0255)	
9	itsgn6aslVIIndex	Annex A	m		lpv6lfIndex	
10	itsgn6aslVIResolAddr	Annex A	m		Truth Value	

History

	Document history					
V1.1.1	March 2011	Publication				
V1.2.1	April 2014	Publication				
V1.3.1	February 2022	Publication				