ETSI TS 102 859-1 V1.2.1 (2014-04)

Technical Specification

**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) proforma**

Reference

RTS/ITS-0030029

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 - 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/chaircor/ETSI_support.asp

Copyright Notification

ETSI

Contents

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 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) proforma";**

Part 2: "Test Suite Structure and Test Purposes (TSS & TP)";

Part 3: "Abstract Test Suite (ATS) and Protocol Implementation eXtra Information for Testing (PIXIT)".

1   Scope

The present document provides the Protocol Implementation Conformance Statement (PICS) proforma for Conformance test specifications for Geonetworking Basic Transport Protocol as defined in 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 [3].

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.

[1]   ETSI EN 302 636-6-1 (V1.2.0): "Intelligent Transport Systems (ITS); Vehicular Communications; GeoNetworking; Part 6: Internet Integration; Sub-part 1: Transmission of IPv6 Packets over GeoNetworking Protocols".

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

[3]   ISO/IEC 9646-7 (1995): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 7: Implementation Conformance Statements".

[4]   IEEE 802.3™-2008: "IEEE Standard for Information Technology - Telecommunications and information exchange between systems-Local and metropolitan area networks - Specific requirements - Part 3: Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications".

2.2   Informative references

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

Not applicable.

3   Definitions and abbreviations

3.1   Definitions

For the purposes of the present document, the terms and definitions given in EN 302 636-6-1 [1], ISO/IEC 9646-1 [2] and in ISO/IEC 9646-7 [3] apply.

3.2   Abbreviations

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

DGVL	Dynamic Geographical Virtual Link
ICS	Implementation Conformance Statement
IP	Internet Protocol
IPv6	Internet Protocol version 6
ITS	Intelligent Transportation Systems
IUT	Implementation 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 proforma to be filled in by a supplier shall be technically equivalent to the text of the PICS proforma given in annex A, and shall preserve the numbering, naming and ordering of the proforma items.

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

Annex A (normative):
IPV6overGEONETW PICS Proforma

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 proforma in this annex so that it can be used for its intended purposes and may further publish the completed IPV6overGEONETW PICS.

A.1 Guidance for completing the ICS proforma

A.1.1 Purposes and structure

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

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

- guidance for completing the ICS proforma;

- identification of the implementation;

- identification of the EN 302 636-6-1 [1];

- global statement of conformance;

- PICS proforma tables.

A.1.2 Abbreviations and conventions

The ICS proforma contained in this annex is comprised of information in tabular form in accordance with the guidelines presented in ISO/IEC 9646-7 [3].

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 [3], 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 EN 302 636-6-1 [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 [3], 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 [3], 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 proforma 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: <predicate>.

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.1.3   Instructions for completing the ICS proforma

The supplier of the implementation shall complete the ICS proforma 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.1.2.

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 proforma.

A.2   Identification of the implementation

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.

A.2.1   Date of the statement

....

A.2.2   Implementation Under Test (IUT) identification

IUT name:

....

....

IUT version:

....

A.2.3 System Under Test (SUT) identification

SUT name:

....

....

Hardware configuration:

....

....

....

Operating system:

....

A.2.4 Product supplier

Name:

....

Address:

....

....

....

Telephone number:

....

Facsimile number:

....

E-mail address:

....

Additional information:

....

....

....

A.2.5   Client (if different from product supplier)

Name:

....

Address:

....

....

....

Telephone number:

....

Facsimile number:

....

E-mail address:

....

Additional information:

....

....

A.2.6   ICS contact person

(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.3   Identification of the protocol

This ICS proforma applies to the following standard:

ETSI EN 302 636-6-1 [1]: "Intelligent Transport Systems (ITS); Vehicular Communications; GeoNetworking;
Part 6: Internet Integration; Sub-part 1: Transmission of IPv6 Packets over GeoNetworking Protocols".

A.4   Global statement of conformance

Are all mandatory capabilities implemented? (Yes/No)   ....

   NOTE: 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 proforma.

A.5   Tables

A.5.1   ITS Station type

Table A.1: ITS Station type

Item	Type	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.5.1.1   IPv6OverGeonetW sub layer

Table A.2: IPv6OverGeonetW sub layer

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

A.5.1.2   Router type

Table A.3: Central ITS station

Prerequisite: A.1/1				
Item	Type	Reference	Status	Support
1	Application server	6.1	m	
2	Access router	6.1	x	
3	GeoAdhoc router	6.1	x	
4	Mobile router	6.1	x	

Table A.4: Road side ITS station

Item	Type	Reference	Status	Support
Prerequisite: A.1/2				
1	Application server	6.1	x	
2	Access router	6.1	o	
3	GeoAdhoc router	6.1	m	
4	Mobile router	6.1	x	

Table A.5: Vehicle ITS station

Item	Type	Reference	Status	Support
Prerequisite: A.1/3				
1	Application server	6.1	x	
2	Access router	6.1	x	
3	GeoAdhoc router	6.1	m	
4	Moblie router	6.1	o	

A.5.2 Virtual links

Table A.6: Virtual links

Item	Type	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.5.3 Virtual network interfaces

Table A.7: virtual network interfaces

Item	Type	Reference	Status	Support
1	Ethernet V2.0/IEEE 802.3™ [4] LAN	5.3.2.1	m	

A.5.4 Primitives Associated

Table A.8: primitives associated

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

A.5.5 Packet Delivery

Table A.9: packet delivery

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

A.5.6 IPv6

Table A.10: IPv6 cast

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

A.5.6.1 IPv6 multicast

Table A.11: IPv6 multicast

Prerequisite: A.10/1				
Item	Type	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.5.7 IPv6 neighbour discovery support

Table A.12: IPv6 neighbour discovery

Item	Type	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.5.7.1 Address configuration

Table A.13: Address configuration

Prerequisite: A.12/2				
Item	Type	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.5.7.2 Address resolution

Table A.14: Address resolution

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

A.5.7.3 Constants

Table A.15: Constants

Item	Type	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.5.8 Protocol parameters

Table A.16: Protocol parameters

Item	Parameters	Ref.	Stat.	Sup.	Value allowed	Value supported
1	itsgn6aslVLTable	Annex A	m		itsgn6aslVLEntry (0..n)	
2	itsgn6aslTSversion	Annex A	m		EN 302 636-6-1 (V1.2.0)	

A.5.8.1 itsgn6aslVLEntry

Table A.17: itsgn6aslVLEntry

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 (1..4 294 967 295)	
7	itsgn6aslAreaDistB	Annex A	m		Unsigned32 (1..4 294 967 295)	
8	itsgn6aslAreaAngle	Annex A	m		INTEGER (0..255)	
9	itsgn6aslVIIndex	Annex A	m		Ipv6IfIndex	
10	itsgn6aslVIResolAddr	Annex A	m		Truth Value	

History

Document history		
V1.1.1	March 2011	Publication
V1.2.1	April 2014	Publication