ETSI TS 102 870-2 V1.1.1 (2011-03)
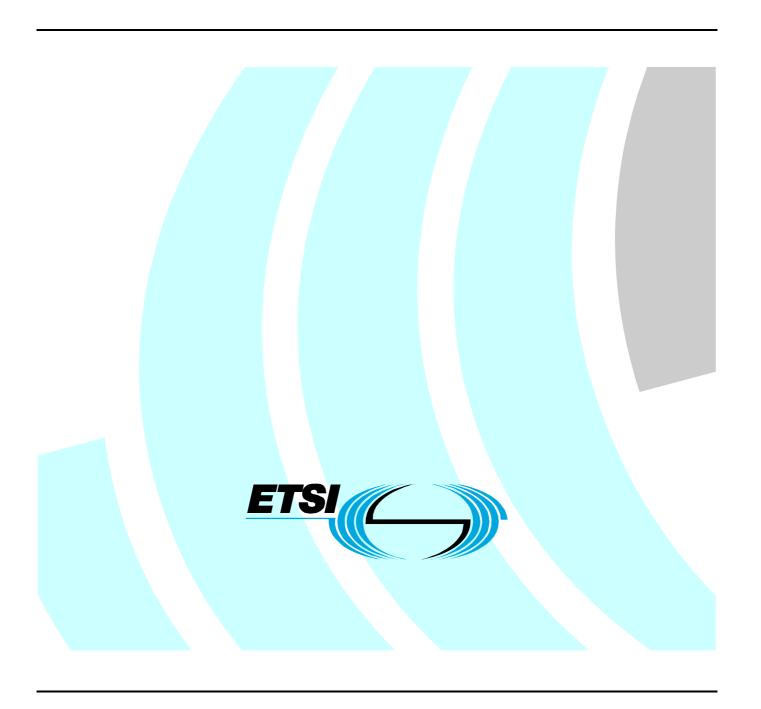
Technical Specification

**Intelligent Transport Systems (ITS);
Testing;
Conformance test specifications for GeoNetworking
Basic Transport Protocol (BTP);
Part 2: Test Suite Structure and Test Purposes (TSS&TP)**

ETSI

Reference

DTS/ITS-0030012

Keywords

ITS, TSS&TP, testing, transport

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

Individual copies of the present document can be downloaded from:
http://www.etsi.org

The present document may be made available in more than one electronic version or in print. In any case of existing or
perceived difference in contents between such versions, the reference version is the Portable Document Format (PDF).
In case of dispute, the reference shall be the printing on ETSI printers of the 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

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://webapp.etsi.org/IPR/home.asp).

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 System (ITS).

The present document is part 2 of a multi-part deliverable covering Conformance test specification for Geonetworking Basic Transport Protocol (BTP) 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 Test Suite Structure and Test Purposes (TSS&TP) for Geonetworking Basic Transport Protocol (BTP) as defined in TS 102 636-5-1 [1] in compliance with the relevant requirements and in accordance with the relevant guidance given in ISO/IEC 9646-7 [5].

The ISO standard for the methodology of conformance testing (ISO/IEC 9646-1 [2] and ISO/IEC 9646-2 [3]) as well as the ETSI rules for conformance testing (ETS 300 406 [6]) are used as a basis for the test methodology.

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 referenced 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.

2.1   Normative references

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

[1]   ETSI TS 102 636-5-1 (V1.1.1): "Intelligent Transport Systems (ITS); Vehicular Communications; GeoNetworking; Part 5: Transport Protocols; Sub-part 1: Basic Transport Protocol".

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

[3]   ISO/IEC 9646-2 (1994): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 2: Abstract Test Suite specification".

[4]   ISO/IEC 9646-6 (1994): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 6: Protocol profile test specification".

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

[6]   ETSI ETS 300 406 (1995): "Methods for testing and Specification (MTS); Protocol and profile conformance testing specifications; Standardization methodology".

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.

[i.1]   ETSI EG 202 798: "Intelligent Transport Systems (ITS); Testing; Framework for conformance and interoperability testing".

3   Definitions and abbreviations

3.1   Definitions

For the purposes of the present document, the terms given in TS 102 636-5-1 [1], ISO/IEC 9646-6 [4], ISO/IEC 9646-7 [5] apply.

3.2 Abbreviations

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

BI	Invalid Behaviour
BTP	Basic Transport Protocol
BV	Valid Behaviour
ITS	Intelligent Transportation Systems
IUT	Implementation Under Test
TP	Test Purposes
TSS	Test Suite Structure

4 Test Suite Structure (TSS)

4.1 Structure for BTP tests

Table 1 shows the BTP Test Suite Structure (TSS) including its subgroups defined for conformance testing.

Table 1

Root	Group	category
BTP	Packet Generation BTP-A	Valid behaviour
	Packet Generation BTP-B	Valid behaviour
	Packet Processing	Valid behaviour

4.2 Test groups

The test suite has a total of three levels. The first level is the root. The second level separates the root into various functional areas. The third level is the standard ISO conformance test categories.

4.2.1 Root

The root identify the Geonetworking Basic Transport Protocol (BTP) given in TS 102 636-5-1 [1].

4.2.2 Groups

This level contains three functional areas identified as: Packet Generation BTP-A, Packet Generation BTP-B and Packet processing.

4.2.3 Categories

This level contains the standard ISO conformance test categories limited to the valid behaviour and the invalid behaviour.

5 Test Purposes (TP)

5.1 Introduction

5.1.1 TP definition conventions

The TPs are defined by the rules shown in table 2.

Table 2: TP definition rules

TP Header	
TP ID	The TP ID is a unique identifier. It shall be specified according to the TP naming conventions defined in clause 5.1.2.
Test objective	Short description of test purpose objective according to the requirements from the base standard.
Reference	The reference indicates the sub-clauses of the reference standard specifications in which the conformance requirement is expressed.
PICS Selection	Reference to the PICS statement involved for selection of the TP. Contains a Boolean expression.
TP Behaviour	
Initial conditions	The initial conditions defines in which initial state the IUT has to be to apply the actual TP. In the corresponding Test Case, when the execution of the initial condition does not succeed, it leads to the assignment of an Inconclusive verdict.
Expected behaviour(TP body)	Definition of the events, which are parts of the TP objective, and the IUT are expected to perform in order to conform to the base specification. In the corresponding Test Case, Pass or Fail verdicts can be assigned there.
Final conditions	Definition of the events that the IUT is expected to perform or shall not perform, according to the base standard and following the correct execution of the actions in the expected behaviour above. In the corresponding Test Case, the execution of the final conditions is evaluated for the assignment of the final verdict.

5.1.2   TP Identifier naming conventions

The identifier of the TP is built according to table 3.

Table 3: TP naming convention

Identifier:	TP/<root>/<gr>/<x>/<nn>		
	<root> = root	BTP	Basic Transport Protocol
	<gr> = group	PGA	Packet Generation BTP-A
		PGB	Packet Generation BTP-B
		PP	Packet Processing
	<x> = type of testing	BV	Valid Behavior tests
		BI	Invalid Syntax or Behavior Tests
	<nn> = sequential number		01 to 99

5.1.3   Rules for the behaviour description

The description of the TP is built according to EG 202 798 [i.1].

5.1.4   Sources of TP definitions

All TPs are specified according to TS 102 636-5-1 [1].

5.2   Test purposes for BTP

5.2.1   Packet Generation

5.2.1.1   BTP-A

TP Id	TP/BTP/PGA/BV/01
Test objective	Checks that BTP-A packet is well-formatted
Reference	TS 102 636-5-1 [1], clauses 6, 7.1, 7.2.1 and 8.2
PICS Selection	
Initial conditions	

with {
    the IUT being in the "initial state"
}	

Expected behaviour	

ensure that {
    when {
        the IUT is requested to send a BTP packet via a BTP-data request
            containing BTP Type
                indicationg value 'BTP-A'
            containing Source Port
                indicating value 'SOURCE_PORT'
            containing Destination Port
                indicating value 'DESTINATION_PORT'
    }
    then {
        the IUT sends a valid BTP-A packet
            containing source port
                indicating 'SOURCE_PORT',
            containing destination port
                indicating 'DESTINATION_PORT',
            containing the Upper Layer payload
    }
}	

5.2.1.2   BTP-B

TP Id	TP/BTP/PGB/BV/01
Test objective	Checks that BTP-B packet is well-formatted if Destination Port info is provided
Reference	TS 102 636-5-1 [1], clauses 6, 7.1, 7.3.2 and 8.2
PICS Selection	
Initial conditions	

with {
   the IUT being in the "initial state"
}

| **Expected behaviour** | |

ensure that {
   when {
      the IUT is requested to send a BTP packet via a BTP-data request
         containing BTP Type
            indicationg value 'BTP-B'
         containing Destination Port
            indicating value 'DESTINATION_PORT'
         containing Destination Port Info
            indicating value 'DESTINATION_PORT_INFO'
   }
   then {
      the IUT sends a valid BTP-B packet
         containing Destination port
            indicating 'DESTINATION_PORT',
         contaning destination port info
            indicating 'DESTINATION_PORT_INFO',
         contaning the Upper Layer payload
   }
}

TP Id	TP/BTP/PGB/BV/02
Test objective	Checks that BTP-B packet is well-formatted if no Destination Port Info is provided
Reference	TS 102 636-5-1 [1], clauses 6, 7.1, 7.3.2 and 8.2
PICS Selection	
Initial conditions	

with {
   the IUT being in the "initial state"
}

| **Expected behaviour** | |

ensure that {
   when {
      the IUT is requested to send a BTP packet via a BTP-data request via a BTP-data request
         containing BTP Type
            indicationg value 'BTP-B'
         containing Destination Port
            indicating value 'DESTINATION_PORT'
         not containing Destination Port Info parameter
   }
   then {
      the IUT sends a valid BTP-B packet
         containing destination port
            indicating 'DESTINATION_PORT',
         contaning destination port info
            indicating '0',
         contaning the Upper Layer payload
   }
}

5.2.3 Packet processing

5.2.3.1 Valid

TP Id	TP/BTP/PP/BV/01
Test objective	Checks that BTP passes a valid BTP-A packet to the upper protocol entity
Reference	TS 102 636-5-1 [1], clauses 6, 7.1, 7.2.1 and 8.3
PICS Selection	
Initial conditions	
with { the IUT being in the "initial state"}	
Expected behaviour	

ensure that {
   when {
      the IUT receives a valid BTP-A packet
         containing source port
           indicating 'SOURCE_PORT',
         contaning destination port
           indicating 'DESTINATION_PORT',
         contaning payload
   }
   then {
      the IUT passes the payload to the upper layer
   }
}	

TP Id	TP/BTP/PP/BV/02
Test objective	Checks that BTP passes a valid BTP-B packet to the upper protocol entity
Reference	TS 102 636-5-1 [1], clauses 6, 7.1, 7.3.1 and 8.3
PICS Selection	
Initial conditions	
with { the IUT being in the "initial state"}	
Expected behaviour	

ensure that {
   when {
      the IUT receives a valid BTP-B packet
         contaning destination port
           indicating 'DESTINATION_PORT',
         contaning destination port info
           indicating 'DESTINATION_PORT_INFO'
         contaning payload
   }
   then {
      the IUT passes the payload to the upper protocol
   }
}	

Annex A (informative):
Bibliography

ETSI TS 102 870-1: "Intelligent Transport Systems (ITS); Testing; Conformance test specifications for Geonetworking Basic Transport Protocol (BTP); Part 1: Test requirements and Protocol Implementation Conformance Statement (PICS) proforma".

"GeoNet STREP N 216269 - D2.2 Final GeoNet Specification".

History

Document history		
V1.1.1	March 2011	Publication