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

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Contents

Intellectual Property Rights 5
Foreword 5
Modal verbs terminology 5
1 Scope 6
2 References 6
2.1 Normative references 6
2.2 Informative references 6
3 Definitions and abbreviations 7
3.1 Definitions 7
3.2 Abbreviations 7
4 Abstract Test Method (ATM) 8
4.1 Abstract protocol tester 8
4.2 Test Configuration 9
4.2.1 Test Configuration Overview 9
4.2.2 Configuration 1: CF01 9
4.2.3 Configuration 2: CF02 10
4.2.4 Configuration 3: CF03 11
4.2.5 Configuration 4: CF04 12
4.2.6 Configuration 5: CF05 13
4.2.7 Configuration 6: CF06 14
4.2.8 Configuration 7: CF07 15
4.3 Test architecture 15
4.4 Ports and ASPs (Abstract Services Primitives) 16
4.4.1 Introduction 16
4.4.2 Primitives of the geoNetworkingPort 17
4.4.3 Primitives of the utPort 17
4.4.4 Primitives of the taPort 17
4.5 Executing CA tests in secured mode 17
4.6 ETSI test adapter 18
5 Untestable Test Purposes 18
6 ATS conventions 18
6.1 Introduction 18
6.2 Testing conventions 18
6.2.1 Testing states 18
6.2.1.1 Initial state 18
6.2.1.2 Final state 18
6.3 Naming conventions 19
6.3.1 Introduction 19
6.3.2 General guidelines 19
6.3.3 ITS specific TTCN-3 naming conventions 20
6.3.4 Usage of Log statements 20
6.3.5 Test Case (TC) identifier 21
Annex A (normative): TTCN-3 library modules 22
A.1 Electronic annex, zip file with TTCN-3 code 22
Annex B (normative): Partial PIXIT pro forma for GeoNetworking 23
B.1 Partial cancellation of copyright 23
B.2 Introduction 23
B.3 Identification summary 23

B.4 ATS summary 23
B.5 Test laboratory....24
B.6 Client identification....24
B.7 SUT 24
B.8 Protocol layer information....25
B.8.1 Protocol identification 25
B.8.2 IUT information 25

Annex C (normative): PCTR pro forma for GeoNetworking 27

C.1 Partial cancellation of copyright....27
C.2 Introduction 27
C.3 Identification summary....27
C.3.1 Protocol conformance test report....27
C.3.2 IUT identification 27
C.3.3 Testing environment....28
C.3.4 Limits and reservation 28
C.3.5 Comments....28
C.4 IUT Conformance status 29
C.5 Static conformance summary 29
C.6 Dynamic conformance summary....29
C.7 Static conformance review report....29
C.8 Test campaign report 30
C.9 Observations....30
History 31

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Foreword

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

The present document is part 3 of a multi-part deliverable covering Conformance test specifications for Geonetworking ITS-G5, 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)".

The development of ITS test specifications follows the guidance provided in the ETSI EG 202 798 [i.9]. Therefore, the ATS documentation outlined in the present document is also based on the guidance provided in ETSI EG 202 798 [i.9].

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 ETSI Drafting Rules (Verbal forms for the expression of provisions).

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1 Scope

The present document contains the Abstract Test Suite (ATS) for GeoNetworking ITS-G5 as defined in ETSI EN 302 636-4-1 [1] in compliance with the relevant requirements and in accordance with the relevant guidance given in ISO/IEC 9646-7 [i.6].

The objective of the present document is to provide a basis for conformance tests for GeoNetworking ITS-G5 equipment giving a high probability of interoperability between different manufacturers' equipment.

The ISO standard for the methodology of conformance testing (ISO/IEC 9646-1 [i.3] and ISO/IEC 9646-2 [i.4]) as well as the ETSI rules for conformance testing (ETSI ETS 300 406 [i.7]) are used as a basis for the test methodology.

2 References

2.1 Normative references

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

[1] ETSI EN 302 636-4-1 (V1.2.1): "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".

[2] ETSI TS 102 871-1 (V1.4.1): "Intelligent Transport Systems (ITS); Testing; Conformance test specifications for GeoNetworking ITS-G5; Part 1: Test requirements and Protocol Implementation Conformance Statement (PICS) pro forma".

[3] ETSI TS 102 871-2 (V1.4.1): "Intelligent Transport Systems (ITS); Testing; Conformance test specifications for GeoNetworking ITS-G5; Part 2: Test Suite Structure and Test Purposes (TSS & TP)".

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.

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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 TS 103 096-3 (V1.3.1): "Intelligent Transport Systems (ITS); Testing; Conformance test specifications for ITS Security; Part 3: Abstract Test Suite (ATS) and Protocol Implementation eXtra Information for Testing (PIXIT)".

[i.2] ETSI TR 103 099 (V1.4.1): "Intelligent Transport Systems (ITS); Architecture of conformance validation framework".

[i.3] ISO/IEC 9646-1 (1994): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 1: General concepts".

[i.4] ISO/IEC 9646-2 (1994): "Information technology -- Open Systems Interconnection -- Conformance testing methodology and framework -- Part 2: Abstract Test Suite specification".

[i.5] ISO/IEC 9646-6 (1994): "Information technology -- Open Systems Interconnection -- Conformance testing methodology and framework -- Part 6: Protocol profile test specification".

[i.6] ISO/IEC 9646-7 (1995): "Information technology -- Open Systems Interconnection -- Conformance testing methodology and framework -- Part 7: Implementation Conformance Statements".

[i.7] ETSI ETS 300 406 (1995): "Methods for testing and Specification (MTS); Protocol and profile conformance testing specifications; Standardization methodology".

[i.8] 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.9] ETSI EG 202 798 (V1.1.1): "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 and definitions given in ETSI EN 302 636-4-1 [1], ISO/IEC 9646-1 [i.3] and in ISO/IEC 9646-7 [i.6] apply.

3.2 Abbreviations

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

AID	Application ID
ATM	Abstract Test Method
ATS	Abstract Test Suite
BAA	GeoBroadcast Advanced Algorithm
BAH	Basic Header
BCA	GeoBroadcast CBF Algorithm
BEA	Beacon
BI	Invalid test events for Behaviour tests
BO	Inopportune test events for Behaviour tests
BV	Valid test events for Behaviour tests
CAN	Controller Area Network
CAP	Buffer Capacities
CBF	Contention Based Forwarding
COH	Common Header
EN	European Norm
ES	ETSI Standard
FDV	Formatting and Data Validity
FPB	Forwarding Packet Buffer
FSR	Forwarder, Sender and the local GeoAdhoc router positions
GAC	Geographically-Scoped Anycast
GBC	Geographically-Scoped Broadcast
GEONW	GeoNetworking
GN	GeoNetworking
GNA	GeoNetworking Address
GUC	Geographically-Scoped Unicast
HST	Header Sub-Type

ISO	International Organization for Standardization
ITS	Intelligent Transportation Systems
ITS-G5	5 GHz wireless communication
IUT	Implementation Under Test
LDM	Local Dynamic Map
LOS	Location Service
LOT	Location Table
LPV	Local Position Vector
MAC	Media Access Control
MTC	Main Test Component
PCTR	Protocol Conformance Test Report
PICS	Protocol Implementation Conformance Statement
PIXIT	Partial Protocol Implementation Extra Information for Testing
PON	Protocol Operation
PTC	Parallel Test Component
SAP	Service Access Point
SCS	System Conformance Statement
SCTR	Static Conformance Test Report
SHB	Single Hop Broadcast
SQN	Sequence Number
SUT	System Under Test
TC	Test Case
TH	Threshold
TI	Timer Test
TIC	Transmission Interval Control
TP	Test Purposes
TS	Technical Specification
TSB	Topologically-Scoped Broadcast
TSS	Test Suite Structure
TTCN	Testing and Test Control Notation

4 Abstract Test Method (ATM)

4.1 Abstract protocol tester

The abstract protocol tester used by the GeoNetworking test suite is described in figure 1. The test system simulates valid and invalid protocol behaviour, and analyses the reaction of the IUT.

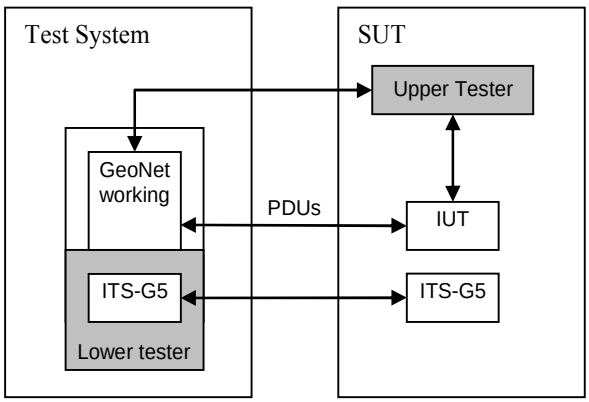

Figure 1: Abstract protocol tester - GeoNetworking

4.2 Test Configuration

4.2.1 Test Configuration Overview

This clause introduces the test configurations that have been used for the definition of test purposes. The test configurations cover the various scenarios of the GeoNetworking tests. The test configurations show:

-  green ItsNode: ItsNode is in the communication range of the IUT.
-  red ItsNode: ItsNode is not in the communication range of the IUT.
-  dashed rectangle: definition of a specific geographical area (see note).

NOTE: A geographical area is defined in the GeoBroadcast or GeoAnycast packet by HST field of Common Header and GeoAreaPos Latitude, GeoAreaPos Longitude, DistanceA, DistanceB and Angle fields of the Extended Header.

Seven test configurations are defined below.

4.2.2 Configuration 1: CF01

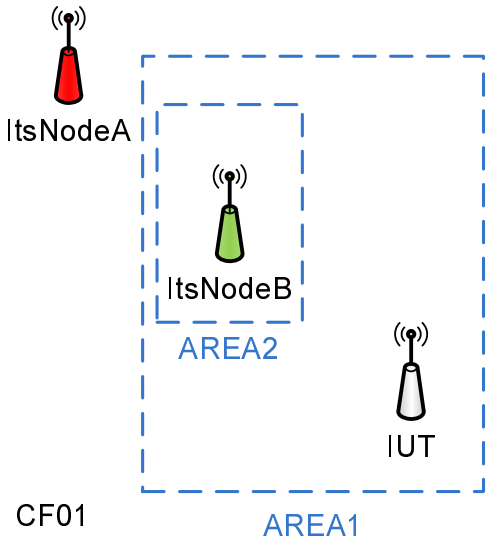

Figure 2

ItsNodeA	is not in IUT's communication range
ItsNodeB	is in IUT's communication range is in direction of ItsNodeA is in AREA1 is in AREA2
IUT	is in AREA1

4.2.3 Configuration 2: CF02

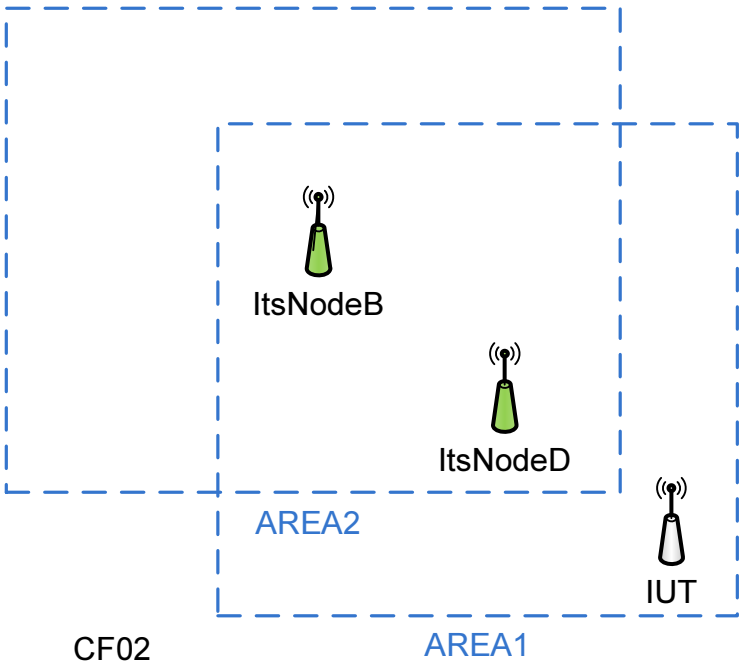

Figure 3

ItsNodeB	is in IUT's communication range is close to the centre of AREA2 is in AREA1 is in AREA2
ItsNodeD	is in IUT's communication range is in direction of ItsNodeB is in AREA1 is in AREA2
IUT	is in AREA1

4.2.4 Configuration 3: CF03

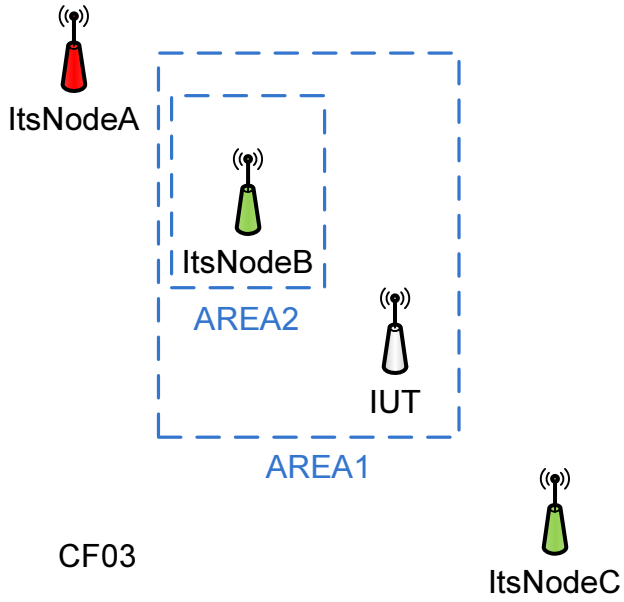

Figure 4

ItsNodeA	is not in IUT's communication range
ItsNodeB	is in IUT's communication range is in direction of ItsNodeA is in AREA1 is in AREA2
ItsNodeC	is in IUT's communication range is not in direction of ItsNodeA
IUT	is in AREA1

4.2.5 Configuration 4: CF04

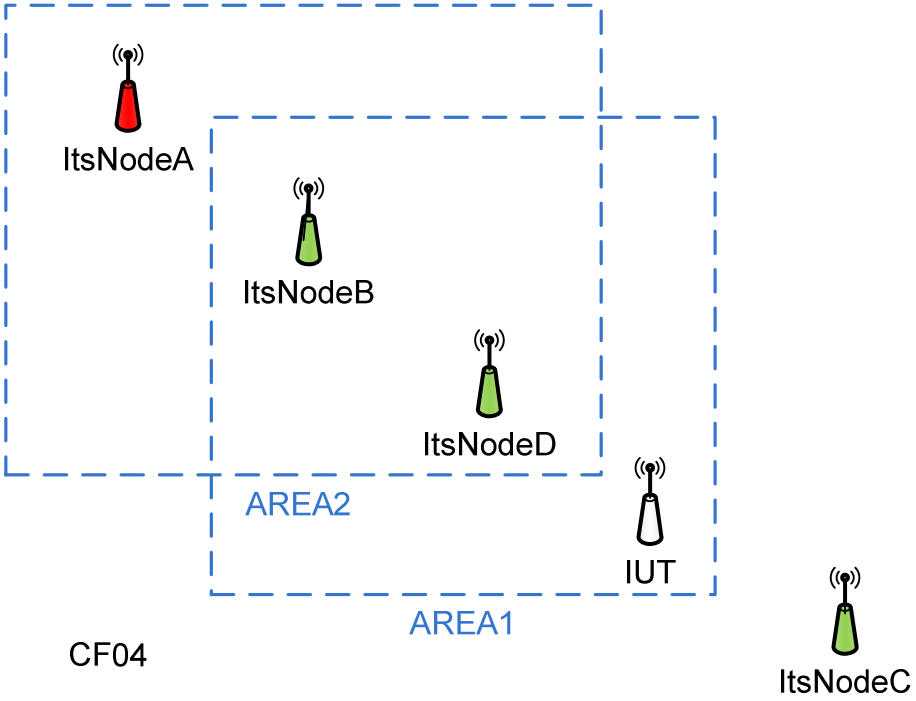

Figure 5

ItsNodeA	is not in IUT's communication range
ItsNodeB	is in IUT's communication range is in direction of ItsNodeA is closer to ItsNodeA than ItsNodeD is in AREA1 is in AREA2. is close to the centre of AREA2
ItsNodeC	is in IUT's communication range is not in direction of ItsNodeA
ItsNodeD	is in IUT's communication range is in direction of ItsNodeA is in AREA1 is in AREA2
IUT	is in AREA1

4.2.6 Configuration 5: CF05

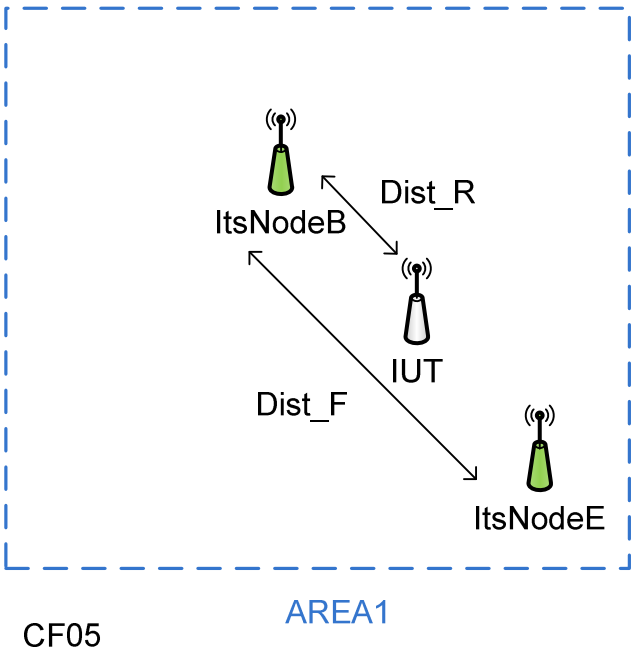

Figure 6

ItsNodeB	is in IUT's communication range is in AREA1 is close to the centre of AREA1
ItsNodeE	is in IUT's communication range is in AREA1
IUT	is in AREA1 is closer to ItsNodeB than ItsNodeE (Dist_R < Dist_F) Angle FSR formed by ItsNodeE, ItsNodeB and IUT is less than Angle_TH

4.2.7 Configuration 6: CF06

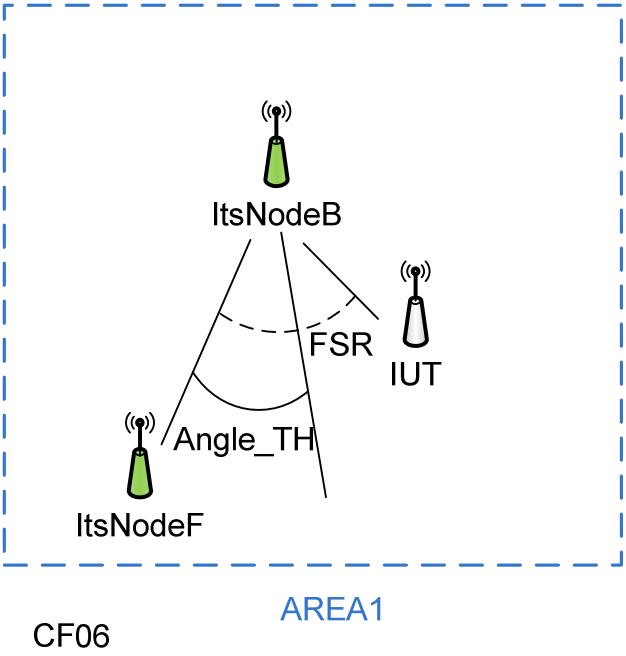

Figure 7

ItsNodeB	is in IUT's communication range is in AREA1 is close to the centre of AREA1
ItsNodeF	is in IUT's communication range is in AREA1
IUT	is in AREA1 is closer to ItsNodeB than ItsNodeE (Dist_R < Dist_F) Angle FSR formed by ItsNodeF, ItsNodeB and IUT is greater than Angle_TH

4.2.8 Configuration 7: CF07

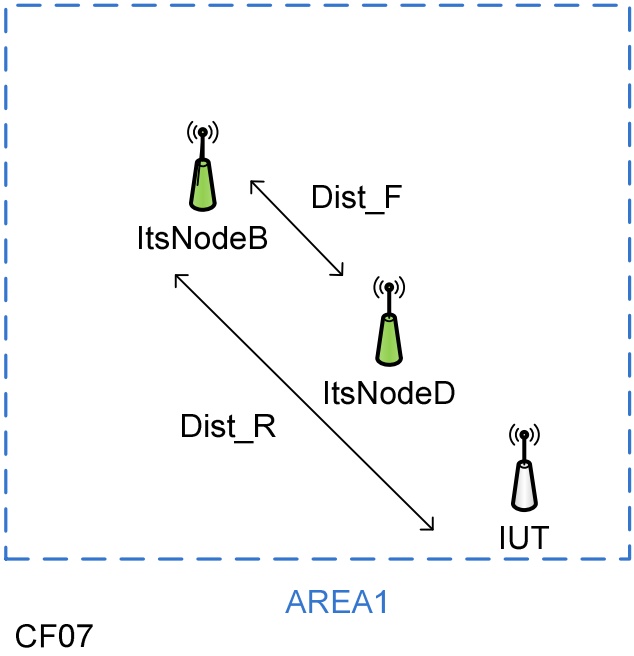

Figure 8

ItsNodeB	is in IUT's communication range is in AREA1 is close to the centre of AREA1
ItsNodeD	is in IUT's communication range is in AREA1 is closer to ItsNodeB than IUT (Dist_R > Dist_F) Angle FSR formed by ItsNodeD, ItsNodeB and IUT is less than Angle_TH
IUT	is in AREA1

4.3 Test architecture

The present document implements the general TTCN-3 test architecture described in ETSI EG 202 798 [i.9], clause 6.3.2 and clause 8.3.1.

Figure 9 shows the TTCN-3 test architecture used for the GeoNetworking ATS. In single-component testcases (configuration CF01), the MTC is of type ItsNt and communicates with SUT over geoNetworkingPort. In multi-component testcases (configuration CF02, CF03 and CF04), the MTC is of type ItsMtc and is used to synchronize the different PTCs. The PTCs are implemented using ItsNt components and communicate with SUT over geoNetworkingPort. GeoNetworkingPort is used to exchange GeoNetworking protocol messages between the GeoNetworking test components and the GeoNetworking IUT.

The Upper tester entity in the SUT enables triggering GeoNetworking functionalities by simulating primitives from application or LDM entities. It is required to trigger the GeoNetworking layer in the SUT to send GeoNetworking messages, which are resulting from upper layer primitives. Furthermore, receiving GeoNetworking messages may result for the GeoNetworking layer in sending primitives to the upper layer.

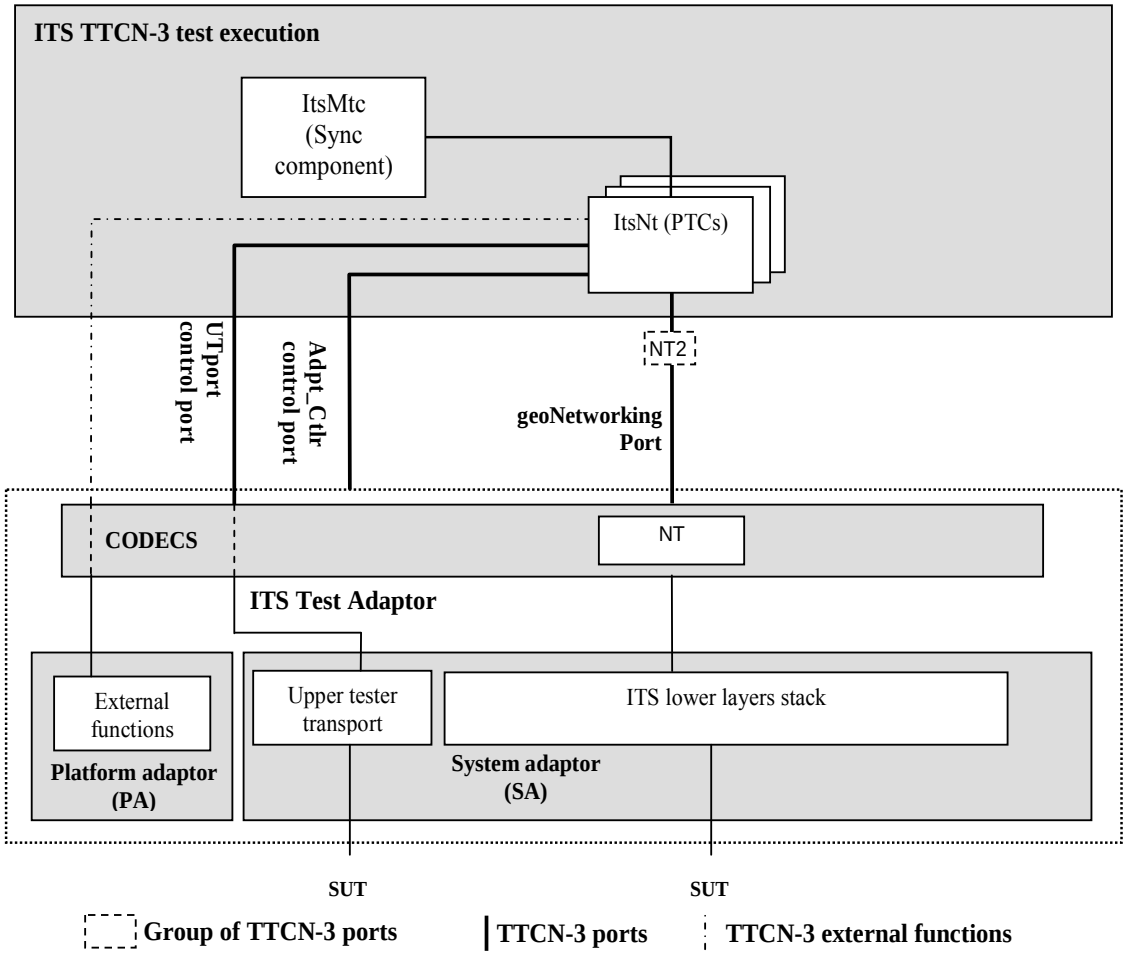

Figure 9: Test system architecture

In multi-component testcases, each PTC maps the geoNetworkingPort. In this case, the geoNetworkingPort is connected in a one-to-many manner, as described in ETSI ES 201 873-1 [i.8], clause 9.1 and figure 6h.

For each PTC mapping the geoNetworkingPort, the test adapter shall assign a different MAC layer address which is used for all send operations of this PTC. In addition, the test adapter shall follow the rules below when receiving GeoNetworking packets:

- If the lower layer headers indicate a broadcasted message, then enqueue the GeoNetworking packet on all PTCs.
- Otherwise, use the lower layer destination MAC address to determine on which PTC the GeoNetworking packet shall be enqueued.

4.4 Ports and ASPs (Abstract Services Primitives)

4.4.1 Introduction

Two ports are used by the GeoNetworking ATS:

- The geoNetworkingPort, of type GeoNetworkingPort.
- The utPort of type UpperTesterPort.

4.4.2 Primitives of the geoNetworkingPort

Two types of primitives are used in the geoNetworkingPort:

- The geoNetworkingInd primitive used to receive messages of type GeoNetworkingPacket.
- The geoNetworkingReq primitive used to send messages of type GeoNetworkingPacket.

4.4.3 Primitives of the utPort

This port uses two types of primitives:

- The UtInitialize primitive used to initialize IUT.
- The UtTrigger primitive used trigger upper layer events in IUT.

4.4.4 Primitives of the taPort

This port uses the following primitives to trigger special behaviour in Test adapter:

- AcStartBeaconing: Test adapter shall start sending beacon messages for a simulated ITS node.
- AcStopBeaconing: Test adapter shall stop sending beacon messages for a simulated ITS node.
- AcStartPassBeaconing: Test adapter shall transmit received beacon messages to TTCN-3 script.
- AcStopPassBeaconing: Test adapter shall not transmit received beacon messages to TTCN-3 script.
- AcStartBeaconingMultipleNeighbour: Test adapter shall start sending beacon messages for multiple simulated ITS nodes.
- AcStopBeaconingMultipleNeighbour: Test adapter shall stop sending beacon messages for multiple simulated ITS nodes.
- AcGetLongPosVector used to retrieve IUT's position (extracted from IUT's beacon messages).

4.5 Executing CA tests in secured mode

All the GEONW tests, can be executed with security enabled or with security disabled. The choice of running the GEONW tests in secured or non-secured mode has no impact on the result of the GEONW tests because the test verdicts assess GEONW protocol behaviour only.

The choice of running the GEONW tests in secured or non-secured mode shall be controlled via the test suite parameter PICS_IS_IUT_SECURED, see table A.4/1 [2].

Before running the GEONW tests in secured mode, the following steps need to be executed

- security certificates need to be generated for the tester as well as for the IUT, see ETSI TS 103 096-3 [i.1] clause 5.3.2.5;
- security certificates need to be installed onto the IUT, see ETSI TS 103 096-3 [i.1] clause 5.3.2.6;
- in case of usage of the ETSI test adapter, the following test adapter parameters need to be configured (see table 1).

Table 1: Test Adapter parameters for secured mode

Test adapter parameter	Default value	Comment
TsSecuredRootPath	data/certificates	The path to the location where all certificates (tester and IUT certificates) are installed
TsSecuredConfigId	void	Name of the subfolder in TsSecuredRootPath in order to organize multiple IUTs
UtSecuredMode	FALSE	To use upper-tester interface in non-secured mode
TsItsAidOther	141	ITS-AID of GN-MGMT messages

4.6 ETSI test adapter

All information of the ETSI test adapter is described in ETSI TR 103 099 [i.2].

5 Untestable Test Purposes

Table 2 gives a list of TP, which are not implemented in the ATS due to the restriction of the chosen ATM.

Table 2: Untestable TP

Test purpose	Reason
None	

6 ATS conventions

6.1 Introduction

The ATS conventions are intended to give a better understanding of the ATS but they also describe the conventions made for the development of the ATS. These conventions shall be considered during any later maintenance or further development of the ATS.

The ATS conventions contain two clauses, the testing conventions and the naming conventions. The testing conventions describe the functional structure of the ATS. The naming conventions describe the structure of the naming of all ATS elements.

To define the ATS, the guidelines of the document ETSI ETS 300 406 [i.7] were considered.

6.2 Testing conventions

6.2.1 Testing states

6.2.1.1 Initial state

All test cases start with the function f_prInitialState. This function brings the IUT in an "initialized" state by invoking the upper tester primitive UtInitialize.

6.2.1.2 Final state

All test cases end with the function f_poDefault. This function brings the IUT back in an "idle" state. As no specific actions are required for the idle state in the base standard, the function f_ poDefault does not invoke any action.

As necessary, further actions may be included in the f_poDefault function.

6.3 Naming conventions

6.3.1 Introduction

This test suite follows the naming convention guidelines provided in ETSI EG 202 798 [i.9].

6.3.2 General guidelines

The naming convention is based on the following underlying principles:

- in most cases, identifiers should be prefixed with a short alphabetic string (specified in table 3) indicating the type of TTCN-3 element it represents;
- suffixes should not be used except in those specific cases identified in table 2;
- prefixes and suffixes should be separated from the body of the identifier with an underscore ("_");

EXAMPLE 1: `c_sixteen, t_wait`.

- only module names, data type names and module parameters should begin with an upper-case letter. All other names (i.e. the part of the identifier following the prefix) should begin with a lower-case letter;
- the start of second and subsequent words in an identifier should be indicated by capitalizing the first character. Underscores should not be used for this purpose.

EXAMPLE 2: `f_initialState`.

Table 3 specifies the naming guidelines for each element of the TTCN-3 language indicating the recommended prefix, suffixes (if any) and capitalization.

Table 3: ETSI TTCN-3 generic naming conventions

Language element	Naming convention	Prefix	Example identifier
Module	Use upper-case initial letter	none	IPv6Templates
Group within a module	Use lower-case initial letter	none	messageGroup
Data type	Use upper-case initial letter	none	SetupContents
Message template	Use lower-case initial letter	m_	m_setupInit
Message template with wildcard or matching expression	Use lower-case initial letters	mw_	mw_anyUserReply
Signature template	Use lower-case initial letter	s_	s_callSignature
Port instance	Use lower-case initial letter	none	signallingPort
Test component instance	Use lower-case initial letter	none	userTerminal
Constant	Use lower-case initial letter	c_	c_maxRetransmission
Constant (defined within component type)	Use lower-case initial letter	cc_	cc_minDuration
External constant	Use lower-case initial letter	cx_	cx_macId
Function	Use lower-case initial letter	f_	f_authentication()
External function	Use lower-case initial letter	fx_	fx_calculateLength()
Altstep (incl. Default)	Use lower-case initial letter	a_	a_receiveSetup()
Test case	Use ETSI numbering	TC_	TC_COR_0009_47_ND
Variable (local)	Use lower-case initial letter	v_	v_macId
Variable (defined within a component type)	Use lower-case initial letters	vc_	vc_systemName
Timer (local)	Use lower-case initial letter	t_	t_wait
Timer (defined within a component)	Use lower-case initial letters	tc_	tc_authMin
Module parameters for PICS	Use all upper case letters	PICS_	PICS_DOOROPEN
Module parameters for other parameters	Use all upper case letters	PX_	PX_TESTER_STATION_ID
Formal Parameters	Use lower-case initial letter	p_	p_macId
Enumerated Values	Use lower-case initial letter	e_	e_syncOk

6.3.3 ITS specific TTCN-3 naming conventions

Next to such general naming conventions, table 4 shows specific naming conventions that apply to the ITS TTCN-3 test suite.

Table 4: ITS specific TTCN-3 naming conventions

Language element	Naming convention	Prefix	Example identifier
ITS Module	Use upper-case initial letter	Its"IUTname"_	ItsGeoNetworking_
Module containing types and values	Use upper-case initial letter	Its"IUTname"_TypesAndValues	ItsGeoNetworking_TypesAndValues
Module containing Templates	Use upper-case initial letter	Its"IUTname"_Templates	ItsGeoNetworking_Templates
Module containing test cases	Use upper-case initial letter	Its"IUTname"_TestCases	ItsGeoNetworking_TestCases
Module containing functions	Use upper-case initial letter	Its"IUTname"_Functions	ItsGeoNetworking_Functions
Module containing external functions	Use upper-case initial letter	Its"IUTname"_ExternalFunctions	ItsGeoNetworking_ExternalFunctions
Module containing components, ports and message definitions	Use upper-case initial letter	Its"IUTname"_Interface	ItsGeoNetworking_Interface
Module containing main component definitions	Use upper-case initial letter	Its"IUTname"_TestSystem	ItsGeoNetworking_TestSystem
Module containing the control part	Use upper-case initial letter	Its"IUTname"_TestControl	ItsGeoNetworking_TestControl

6.3.4 Usage of Log statements

All TTCN-3 log statements use the following format using the same order:

- Three asterisks.
- The TTCN-3 test case or function identifier in which the log statement is defined.
- One of the categories of log: INFO, WARNING, ERROR, PASS, FAIL, INCONC, TIMEOUT.
- Free text.
- Three asterisks.

EXAMPLE 1:

```
log("*** TC_GEONW_PON_LOT_BV_02: INFO: Preamble: Received and answered
Location Service Request ***");
```

Furthermore, the following rules are applied for the GeoNetworking ATS:

- Log statements are used in the body of the functions, so that invocation of functions are visible in the test logs.
- All TTCN-3 setverdict statement are combined (as defined in TTCN-3 as defined in ETSI ES 201 873-1 [i.8]) with a log statement following the same above rules (see example 2).

EXAMPLE 2:

```
setverdict(pass, "*** TC_GEONW_FDV_COH_BV_01: PASS: Common Header correctly
formatted ***");
```

6.3.5 Test Case (TC) identifier

Table 5 shows the test case naming convention, which follows the same naming convention as the test purposes.

Table 5: TC naming convention

Identifier:	**TC_<root>_<gr>_<sgr>_<x>_<nn>**		
	<root> = root	GEONW	
	<gr> = group	FDV	Formatting and Data Validity
		PON	Protocol Operation
		CAP	Buffer Capacities
	<sgr> =sub-group	BAH	Basic Header
		COH	Common Header
		BEA	Beacon
		GUC	GeoUnicast
		GBC	GeoBroadcast
		GAC	GeoAnycast
		SHB	Single-Hop Broadcast
		TSB	Topologically Scoped Broadcast
		LOT	Location Table
		LPV	Local Position Vector
		SQN	Sequence Number
		LOS	Location Service
		FPB	Forwarding Packet Buffer
		GNA	GeoNetworking Address
		TIC	Transmission Interval Control
		BCA	GeoBroadcast CBF Algorithm
		BAA	GeoBroadcast Advanced Algorithm
	<x> = type of testing	BV	Behaviour tests to valid test events
		BI	Behaviour tests to invalid test events
		BO	Behaviour tests to inopportune test events
		TI	Timer tests
	<nn> = sequential number		01 to 99

EXAMPLE: TP identifier: TP/GEONW/FDV/COH/BV/02
TC identifier: TC_GEONW_FDV_COH_BV_02

Annex A (normative): TTCN-3 library modules

A.1 Electronic annex, zip file with TTCN-3 code

This test suite has been produced using the Testing and Test Control Notation (TTCN) according to ETSI ES 201 873-1 [i.8].

ETSI EN 302 636-4-1 [1], ETSI TS 102 871-1 [2] and ETSI TS 102 871-2 [3] have been applied to develop this test suite.

This test suite has been compiled error-free using two different commercial TTCN-3 compilers.

The TTCN-3 library modules, which form parts of the present technical standard, are contained in the archive ts_10287103v010401p0.zip which accompanies the present document.

Annex B (normative): Partial PIXIT pro forma for GeoNetworking

B.1 Partial cancellation of copyright

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 Partial PIXIT pro forma in this annex so that it can be used for its intended purposes and may further publish the completed Partial PIXIT.

B.2 Introduction

The PIXIT Pro forma is based on ISO/IEC 9646-6 [i.5].

B.3 Identification summary

The Identification summary shall be as specified in table B.1.

Table B.1: Identifcation summary

PIXIT Number:	
Test Laboratory Name:	
Date of Issue:	
Issued to:	

B.4 ATS summary

The ATS summary shall be as specified in table B.2.

Table B.2: ATS summary

Protocol Specification:	ETSI EN 302 636-4-1 [1]
Protocol to be tested:	GEONETW (GeoNetworking ITS-G5)
ATS Specification:	ETSI TS 102 871-3
Abstract Test Method:	Clause 4

B.5 Test laboratory

The Test laboratory info shall be specified as in table B.3.

Table B.3: Test laboratory info

Test Laboratory Identification:	
Test Laboratory Manager:	
Means of Testing:	
SAP Address:	

B.6 Client identification

The Client identification shall be specified as in table B.4.

Table B.4: Client identification

Client Identification:	
Client Test manager:	
Test Facilities required:	

B.7 SUT

SUT shall be specified as in table B.5.

Table B.5

Name:	
Version:	
SCS Number:	
Machine configuration:	
Operating System Identification:	
IUT Identification:	
PICS Reference for IUT:	
Limitations of the SUT:	
Environmental Conditions:	

B.8 Protocol layer information

B.8.1 Protocol identification

Protocol identification shall be as specified in table B.6.

Table B.6: Protocol identification

Name:	ETSI EN 302 636-4-1 [1]
Version:	
PICS References:	ETSI TS 102 871-1 [2]

B.8.2 IUT information

GN PIXITs shall be as in table B.7.

Table B.7: GeoNetworking pixits

Identifier	Description	
PX_TS_NODE_A_LOCAL_GN_ADDR PX_TS_NODE_B_LOCAL_GN_ADDR PX_TS_NODE_C_LOCAL_GN_ADDR PX_TS_NODE_D_LOCAL_GN_ADDR PX_TS_NODE_E_LOCAL_GN_ADDR PX_TS_NODE_F_LOCAL_GN_ADDR	**Comment**	GeoNetworking address of the GeoAdhoc router node
	Type	GN_Address
	Def. value	typeOfAddress := e_manual, stationType := e_passengerCar, stationCountryCode := c_uInt10Zero, mid := c_6ZeroBytes
PX_MIN_NR_NEIGHBOUR	**Comment**	Nr of neighbour limit to enter the "medium" congestion status value
	Type	Integer
	Def. value	50
PX_MAX_NR_NEIGHBOUR	**Comment**	Nr of neighbour limit to enter the "maximum" congestion status value
	Type	Integer
	Def. value	50
PX_T_DELTA	**Comment**	Delta for timers to reflect processing time
	Type	float
	Def. value	0,1
PX_GN_BEACON_SERVICE_TIMER_MEDIUM	**Comment**	Duration of Beacon service retransmit timer [ms] for NetBeaconInterval = medium (cong. ctrl)
	Type	integer
	Def. value	5 000
PX_GN_BEACON_SERVICE_TIMER_MAXIMUM	**Comment**	Duration of Beacon service retransmit timer [ms] for NetBeaconInterval = maximum (cong. ctrl)
	Type	integer
	Def. value	8 000
PX_GN_LOCATION_SERVICE_TIMER_MEDIUM	**Comment**	Duration of Location service retransmit timer [ms] for NetRepInterval = medium (cong. ctrl)
	Type	integer
	Def. value	2 000

Identifier	Description	
PX_GN_LOCATION_SERVICE_TIMER_MAXIMUM	**Comment**	Duration of Location service retransmit timer [ms] for NetRepInterval = maximum (cong. ctrl)
	Type	integer
	Def. value	3 000
PX_GN_APPLICATION_RETRANSMIT_TIMER	**Comment**	Duration of Application retransmit timer [ms]
	Type	integer
	Def. value	1 000
PX_GN_APPLICATION_RETRANSMIT_TIMER_MEDIUM	**Comment**	Duration of Application retransmit timer [ms] - medium
	Type	integer
	Def. value	2 000
PX_GN_APPLICATION_RETRANSMIT_TIMER_MAXIMUM	**Comment**	Duration of Application retransmit timer [ms] - maximum
	Type	integer
	Def. value	3 000
PX_POS_DELTA	**Comment**	The allowed delta for position checking.
	Type	integer
	Def. value	1
PX_GN_APPLICATION_MAX_RETRANS	**Comment**	Maximum number of application retransmissions
	Type	Integer
	Def. value	10
PX_GN_UPPER_LAYER	**Comment**	The IUT's upper layer
	Type	NextHeader
	Def. value	e_any
PX_MESSAGE_COUNT	**Comment**	Number of messages to be sent
	Type	integer
	Def. value	5
PX_NEIGHBOUR_DISCOVERY_DELAY	**Comment**	Time necessary for IUT to detect neighbours
	Type	float
	Def. value	1,0

Annex C (normative): PCTR pro forma for GeoNetworking

C.1 Partial cancellation of copyright

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 PCTR pro forma in this annex so that it can be used for its intended purposes and may further publish the completed PCTR.

C.2 Introduction

The PCTR pro forma is based on ISO/IEC 9646-6 [i.5].

C.3 Identification summary

C.3.1 Protocol conformance test report

A protocol conformance test report shall be as in table C.1.

Table C.1: Protocol conformance test report

PCTR Number:	
PCTR Date:	
Corresponding SCTR Number:	
Corresponding SCTR Date:	
Test Laboratory Identification:	
Test Laboratory Manager:	
Signature:	

C.3.2 IUT identification

An IUT shall be identified as specified in table C.2.

Table C.2: IUT identification

Name:	
Version:	
Protocol specification:	
PICS:	
Previous PCTR if any:	

C.3.3 Testing environment

The testing environment shall be as specified in table C.3.

Table C.3: Testing environment

PIXIT Number:	
ATS Specification:	
Abstract Test Method:	
Means of Testing identification:	
Date of testing:	
Conformance Log reference(s):	
Retention Date for Log reference(s):	

C.3.4 Limits and reservation

Additional information relevant to the technical contents or further use of the test report, or the rights and obligations of the test laboratory and the client, may be given here. Such information may include restriction on the publication of the report.

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C.3.5 Comments

Additional comments may be given by either the client or the test laboratory on any of the contents of the PCTR, for example, to note disagreement between the two parties.

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C.4 IUT Conformance status

This IUT has or has not been shown by conformance assessment to be non-conforming to the specified protocol specification.

Strike the appropriate words in this sentence. If the PICS for this IUT is consistent with the static conformance requirements (as specified in clause C.3 in the present document) and there are no "FAIL" verdicts to be recorded (in clause C.6 in the present document) strike the words "has or", otherwise strike the words "or has not".

C.5 Static conformance summary

The PICS for this IUT is or is not consistent with the static conformance requirements in the specified protocol.

Strike the appropriate words in this sentence.

C.6 Dynamic conformance summary

The test campaign did or did not reveal errors in the IUT.

Strike the appropriate words in this sentence. If there are no "FAIL" verdicts to be recorded (in clause C.6 of the present document) strike the words "did or" otherwise strike the words "or did not".

Summary of the results of groups of test:

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C.7 Static conformance review report

If clause C.3 indicates non-conformance, this clause itemizes the mismatches between the PICS and the static conformance requirements of the specified protocol specification.

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C.8 Test campaign report

For the complete list of all test cases refer to the test control module of the file described in annex A of the present document.

C.9 Observations

Additional information relevant to the technical content of the PCTR is given here.

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History

Document history		
V1.1.1	June 2011	Publication
V1.2.1	April 2014	Publication
V1.3.1	June 2015	Publication
V1.4.1	May 2017	Publication