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Intelligent Transport Systems (ITS);
Communications Access for Land Mobiles (CALM);
Test specifications for non-IP networking (ISO 29281);
Part 3: Abstract Test Suite (ATS) and partial PIXIT proforma

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Contents

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Foreword

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

The present document is part 3 of a multi-part deliverable covering Communications Access for Land Mobiles (CALM); Test specifications for non-IP networking (ISO 29281), as identified below:

Part 1: "Protocol Implementation Conformance Statement (PICS) proforma";

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

Part 3: "Abstract Test Suite (ATS) and partial PIXIT proforma".

1 Scope

The present document provides the Abstract Test Suite (ATS) and partial PIXIT proforma for the protocols specified in ISO 29281-1 [1] based on the related TSS&TP specification [3] and the PICS proforma [2], and in accordance with the relevant guidance given in ISO/IEC 9646-1 [4], ISO/IEC 9646-2 [5], ETS 300 406 [6] and EG 202 798 [i.1].

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.

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] ISO/DIS 29281-1: "Intelligent transport systems -- Communication access for land mobiles (CALM) -- Non-IP networking -- Part 1: Fast networking & transport layer protocol (FNTP)".

[2] ETSI TS 102 985-1: "Intelligent Transport Systems (ITS); Communications Access for Land Mobiles (CALM); Test specifications for non-IP networking (ISO 29281); Part 1: Protocol implementation conformance statement (PICS) proforma".

[3] ETSI TS 102 985-2: "Intelligent Transport Systems (ITS); Communications Access for Land Mobiles (CALM); Test specifications for non-IP networking (ISO 29281); Part 2: Test Suite Structure and Test Purposes (TSS&TP)".

[4] ISO/IEC 9646-1 (1995): "Information technology -- Open Systems Interconnection -- Conformance testing methodology and framework -- Part 1: General concepts".

[5] ISO/IEC 9646-2 (1995): "Information technology -- Open Systems Interconnection -- Conformance testing methodology and framework -- Part 2: Abstract Test Suite specification".

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

[7] ETSI ES 201 873-1: "Methods for Testing and Specification (MTS); The Testing and Test Control Notation version 3; Part 1: TTCN-3 Core Language".

[8] ETSI ES 201 873-7: "Methods for Testing and Specification (MTS); The Testing and Test Control Notation version 3; Part 7: Using ASN.1 with TTCN-3".

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".

[i.2] ISO 21217: "Intelligent transport systems -- Communications access for land mobiles (CALM) -- Architecture".

[i.3] ISO/DIS 24102-3: "Intelligent transport systems -- Communications access for land mobiles (CALM) -- ITS station management -- Part 3: Service access points".

[i.4] ISO/DIS 24102-4: "Intelligent transport systems -- Communications access for land mobiles (CALM) -- ITS station management -- Part 4: Station internal management communications".

[i.5] ISO/DIS 21218: "Intelligent transport systems -- Communications access for land mobiles (CALM) -- Access technology support".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in [1], [2], [3], [4], [5], [6], [7], [8], [i.1], [i.2], [i.3], [i.4] and [i.5] apply.

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in [1], [2], [3], [4], [5], [6], [7], [8], [i.1], [i.2], [i.3], [i.4] and [i.5] apply.

4 Abstract test method

This clause describes the "Abstract Test Method" (ATM) used to test the "Fast Networking & Transport Layer Protocol" (FNTP) [1].

4.1 Abstract protocol tester

In general, the conformance test system architecture as illustrated in the ITS testing framework [i.1], see figure 1, applies. For the present document, the IUT is the FNTP. The upper tester application allows accessing the NF-SAP of the IUT. Lower layer protocols indicated by the block "ITS lower layers" allow access to the IUT from the lower side.

NOTE 1: There is also the need and possibility to configure the IUT by the ITS test system. This feature is not illustrated in figure 1, but is presented in figure 5.

The test system simulates valid and invalid protocol behaviour, and analyses the reaction of the IUT.

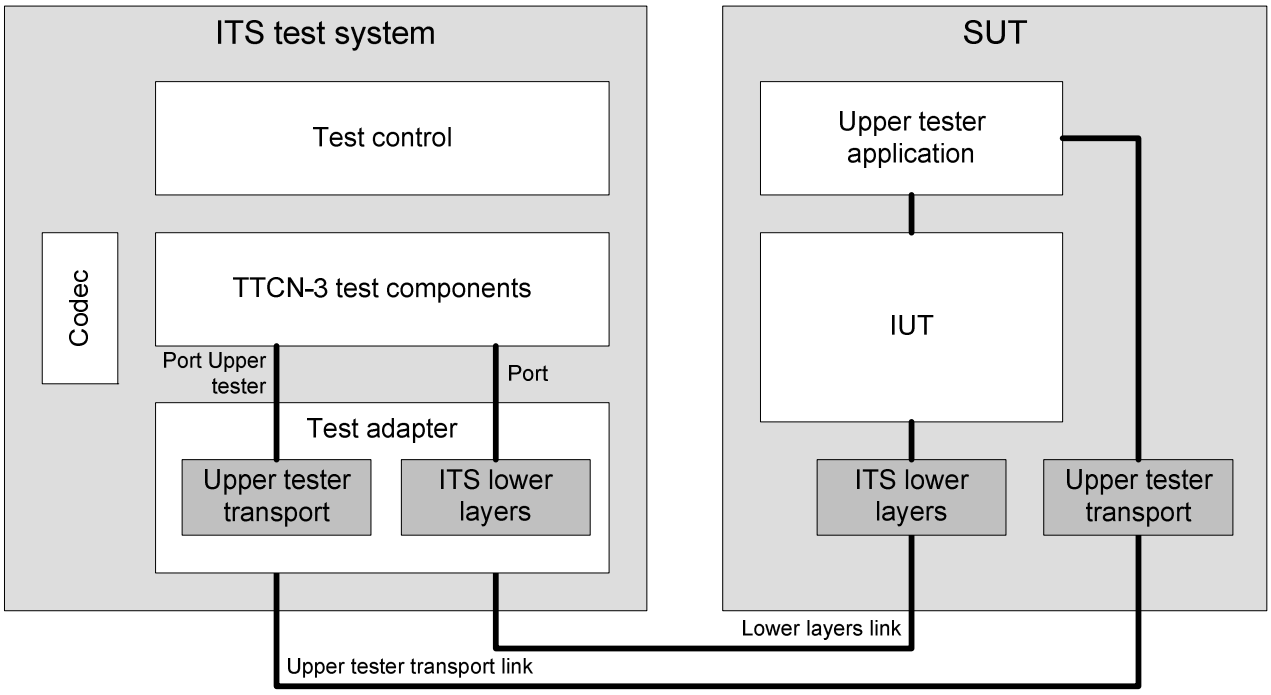

Figure 1: Abstract protocol tester - General approach

SUTs which support the "ITS station-internal management communications protocol" (IICP) [i.4] may benefit from the conformance test system architecture illustrated in figure 2, where the access to the IUT from top, i.e. in general via the upper tester application, is performed via the MN-SAP applying the MN-Command "UpTest_NF_Cmd" [i.3]. Similarly, access of the networking & transport layer protocol to the ITS facilities layer (Upper tester application) is possible via MN-SAP applying the MN-Request "UpTest_NF_Req" [i.3].

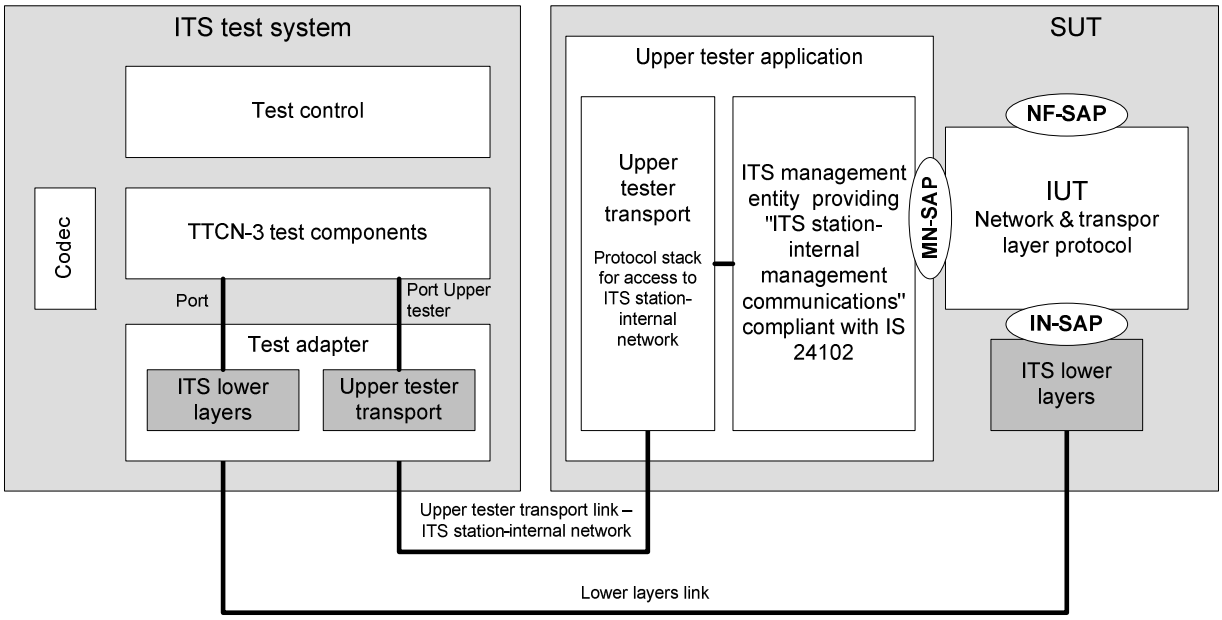

Figure 2: Abstract protocol tester - IICP approach

NOTE 2: In CALM-compliant implementations, in addition to the upper tester access, configuration of the IUT by the ITS test system is also done via the ITS station-internal network. This feature is illustrated in figure 5.

4.2 Test configurations

4.2.1 Roles of an ITS-SCU

This test suite uses two test configurations in order to cover the different test scenarios. Distinction between the two configurations is given by the two possible implementation scenarios for an ITS station, i.e. a single-unit implementation, or an implementation with several "ITS station communication units" (ITS-SCU) which are interconnected via an ITS station-internal network [1] and [i.2]. These ITS-SCUs can take over the roles of an ITS-S host, or an ITS-S router, or the combined role of ITS-S host and ITS-S router. These two identified testing configurations are referred to as CF01, for the single unit implementation, and CF02 for the multi-unit implementation, and are described in the following clauses.

4.2.2 Test configuration CF01: No ITS station-internal network

In test configuration CF01, the roles of ITS-S host and ITS-S router are implemented in a single ITS-SCU. Consequently the whole supported functionality of FNTP is given in a single ITS-SCU, and no station-internal forwarding between ITS-S host and ITS-S router is needed.

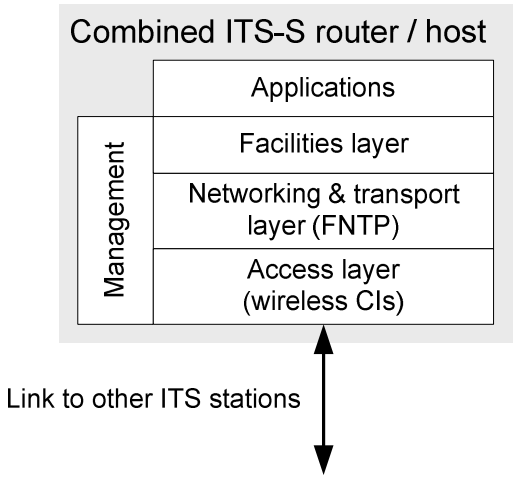

Figure 3: Test configuration CF01 architecture

In this test configuration, the FNTP is connected only to communication interfaces (CI) which establish a link to another instance of an ITS station. Such CIs provide "virtual communication interfaces" (VCIs) for MAC broadcast communications, multicast communications and unicast communications. Details on VCIs, and how the ITS-S access layer is connected to the ITS-S networking & transport layer via the IN-SAP are specified in [i.5]. The following address elements contained in the element LinkID specified in [i.5] are used:

- LocalCIID, identifying uniquely a CI, specified in the following PIXIT variable:

  PX_WL_LOCAL_CIID.

- RemoteCIID, identifying VCI for broadcast communications in destination_address.RemoteCIID of the IN-UNITDATA.request service primitive, specified in the following PIXIT variable:

  PX_WL_REMOTE_CIID_BC

- RemoteCIID, identifying VCI for multicast communications in destination_address.RemoteCIID of the IN-UNITDATA.request service primitive, specified in the following PIXIT variable:

  PX_WL_REMOTE_CIID_MC

- RemoteCIID, identifying a VCI for unicast communications in destination_address.RemoteCIID of the IN-UNITDATA.request service primitive / source_address.RemoteCIID of the IN-UNITDATA.indication service primitive, specified in the following PIXIT variable:

  PX_WL_REMOTE_CIID_UC.

Note that for every know peer ITS station, a distinct VCI identified by destination_address.RemoteCIID of the IN-UNITDATA.request service primitive / source_address.RemoteCIID of the IN-UNITDATA.indication service primitive is given.

This configuration is used in the cases listed below [3]:

- ITS-S station internal-network PICS (PICS_S_INW) is set to false.
- The roles PICS (PICS_ROLE_RH) is set to true.

4.2.3 Test configuration CF02: ITS station-internal network

In test configuration CF02, the roles of ITS-S host and ITS-S router may be implemented in different ITS-SCUs. It is considered for testing that the functionality of FNTP is separated into two parts, one part available in an ITS-SCU with the role of an ITS-S host, and one part available in an ITS-SCU with the role of an ITS-S host. Further on, presence of an ITS station-internal network is required.

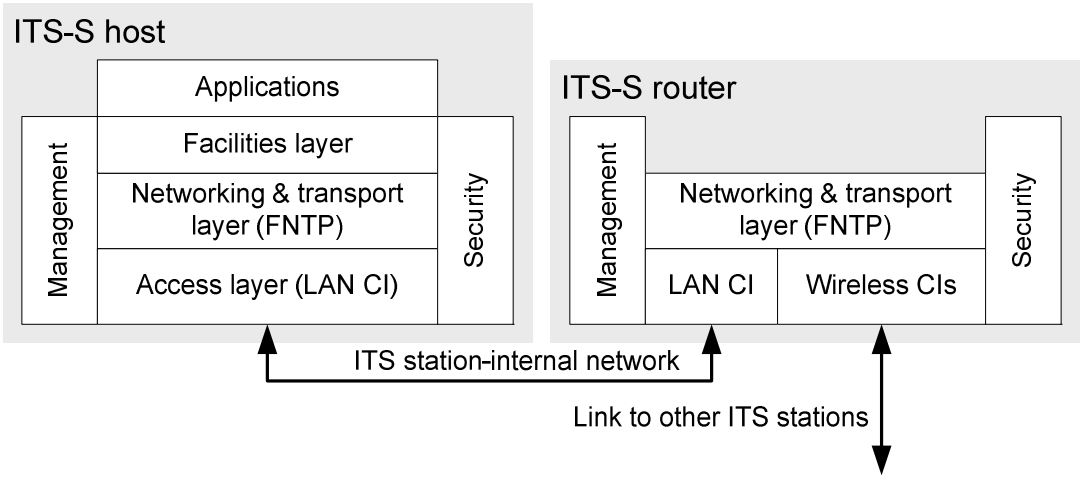

Figure 4: Test configuration CF02 architecture

In this test configuration, the FNTP part located in the ITS-SCU with role of an ITS-S router is connected to communication interfaces (CI) which establish a link to another instance of an ITS station, and to a communication interface which establishes the connection to the ITS station internal network. The following address elements contained in the element LinkID specified in [i.5] are used:

- To connect to the ITS station-internal network with IN-UNITDATA.request service primitive:
  - LocalCIID, identifying uniquely a CI to connect to another ITS station, specified in the following PIXIT variable:

    PX_LAN_LOCAL_CIID

  - RemoteCIID, identifying VCI for broadcast communications in destination_address.RemoteCIID of the IN-UNITDATA.request service primitive, specified in the following PIXIT variable:

    PX_LAN_REMOTE_CIID_BC

  - RemoteCIID, identifying VCI for unicast communications in source_address.RemoteCIID of the IN-UNITDATA.indication service primitive, specified in the following PIXIT variable:

    PX_LAN_REMOTE_CIID_UC

Note that communications on the ITS station-internal network could also be unicast communications.

- To connect to another ITS station, see test configuration CF01.

Note that for every known peer ITS station, a distinct VCI is given.

This configuration is used in the cases listed below [2]:

- ITS-S station internal-network PICS (PICS_S_INW) is set to true.
- Either one of the roles PICS (PICS_ROLE_RH, PICS_ROLE_RONLY, PICS_ROLE_HONLY) is set to true.

4.3 Test architecture

This ITS FNTP test specification implements the general TTCN-3 test architecture described in EG 202 798 [i.1], clauses 6.3.2 and 8.3.1.

Figure 5 shows the TTCN-3 test architecture used for the FNTP ATS.

- The MTC is of type ItsFNTP and communicates with the SUT over fntpPort in order to exchange FNTP NPDUs between the FNTP test component and the FNTP IUT. The "ITS lower layers transport" system adapter is used to enable usage of ITS lower layers in the SUT in case the IN-SAP is not directly accessible.
- The MTC communicates with the SUT over the utPort in order to trigger FNTP functionalities by simulating primitives from e.g. application or LDM entities. It is required to trigger the FNTP layer in the SUT to send FNTP messages, which are resulting from upper layer primitives. Furthermore, receiving FNTP messages may result for the FNTP layer in sending primitives to the upper layer. The "Upper tester transport" system adapter is used to adapt to the upper tester application implementation of the SUT.
- The MTC communicates with the SUT over the cfPort in order to perform settings in the SUT. The "Configuration transport" system adapter is used to adapt to the configuration access implementation of the SUT.

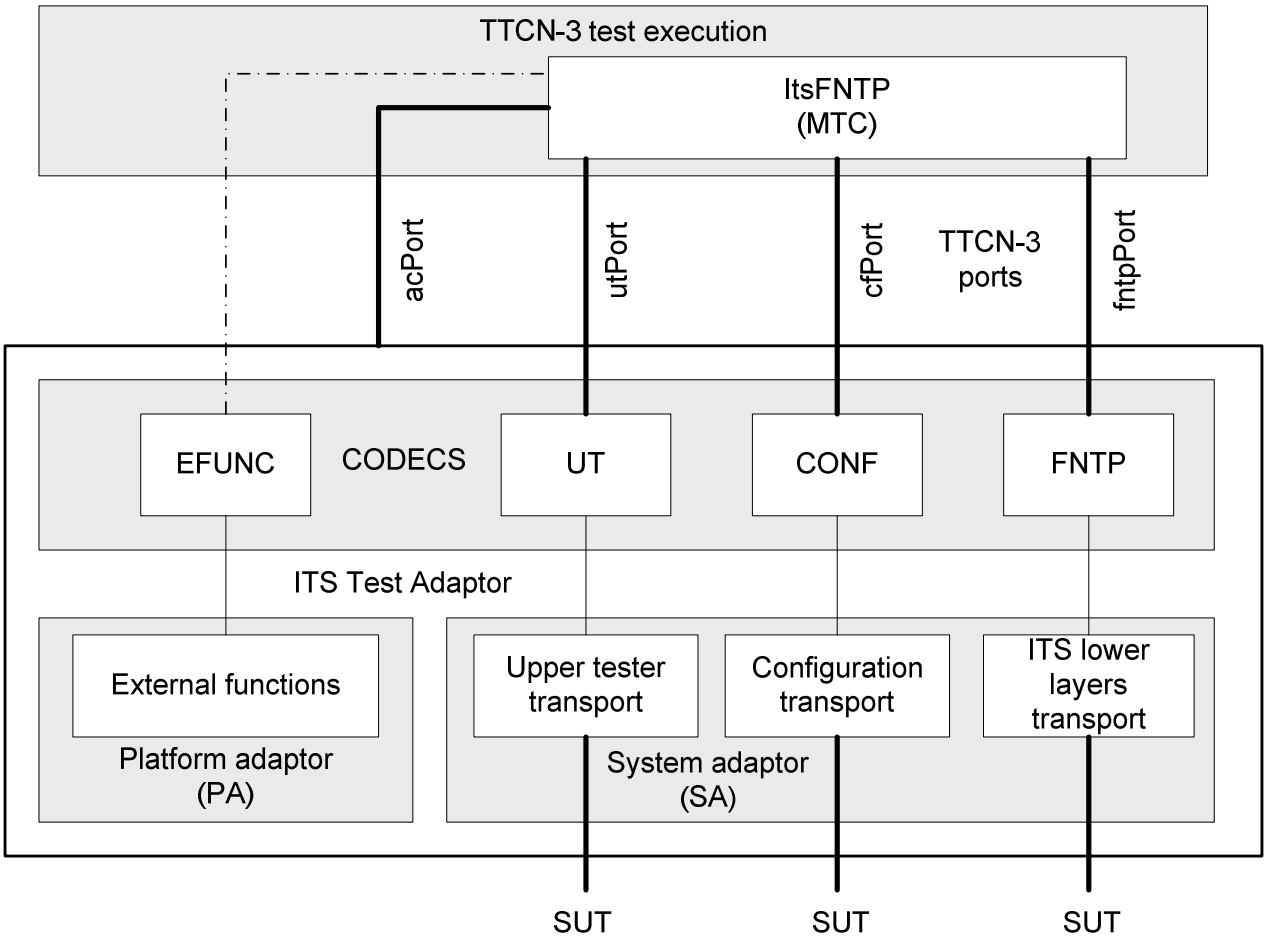

Figure 5: Test system architecture

NOTE: In CALM-compliant implementations, "Upper tester transport" and "Configuration Transport" may map on the same ITS station-internal network.

4.4 Ports and abstract service primitives

4.4.1 Overview

The following TTCN-3 ports are used by the FNTP ATS:

- The fntpPort of type FntpPort is used to receive messages from and transmit messages to the IUT (via IN-SAP).
- The utPort of type UpperTesterPort is used to receive service data units from and transmit service data units to the IUT (via NF-SAP).
- The cfPort of type CfPort is used to configure the FNTP (via MN-SAP).
- The acPort of type AdapterControlPort is not used.

Every port provides "Abstract Service Primitives" (ASPs) as specified in the following clauses.

4.4.2 ASPs of the fntpPort

Four ASPs are used in the fntpPort:

- The INsapPrimitivesUp primitive used to receive messages of type FNTPNPDU sent by the ITS-S access layer to the IUT [i.5].
- The INsapPrimitivesDown primitive used to receive messages of type FNTPNPDU sent by the IUT to ITS-S access layer [i.5].

These primitives use the FNTPNPDU type, which are declared in the CALMfntp module, following the ASN.1 definition from the base standard [1].

This port uses the following ASPs to trigger special behaviour in the Test Adapter:

- AcFntpPrimitive: Test adapter receives a triggered IN-SAP primitive message.
- AcFntpResponse: Test adapter shall generate a FNTP NPDU message.

4.4.3 ASPs of the utPort

The following ASPs are used in the utPort:

- The UtInitialize primitive is used to initialise IUT.
- The UtCommandRequest primitive is used to send NF-SAP service primitives to the IUT [1].
- The UtCommandConfirm primitive is used to receive NF-SAP service primitives from the IUT [1].
- The UtCommandIndication primitive is used to receive NF-SAP service primitives from the IUT [1].

4.4.4 ASPs of the cfPort

This port is used to simulate the behaviour of the ITS station management. The following ASPs are used in the mgtMNSapPort:

- The mgtMNSapCommandReq primitive is used to send and receive messages of types MgtMNSapCommandReq for MN-COMMAND.request service primitives [i.3].
- The mgtMNSapRequestReq primitive is used to send and receive messages of types MgtMNSapRequestReq for MN-REQUEST.request service primitives [i.3].
- The mgtMNSapCommandConfirm primitive is used to receive messages of types MgtMNSapCommandConfirm for MN-COMMAND.confirm service primitives [i.3].
- The mgtMNSapRequestConfirm primitive is used to send messages of types MgtMNSapRequestConfirmfor MN-REQUEST.confirm service primitives [i.3].

5 ATS conventions

The ATS conventions are intended to improve readability of the ATS specification. 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 ETS 300 406 [6] were considered.

5.1 Testing conventions

5.1.1 Testing states

5.1.1.1 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.

5.1.1.2 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.

5.1.2 Message types - ASN.1 definitions

Message types are defined in ASN.1. ASN.1 definitions from the base standard are directly imported in TTCN-3 using the ASN.1 import method specified in ES 201 873-7 [8].

The following example shows the TTCN-3 import statement used to import ASN.1 definitions in the TTCN-3 modules:

```
import from CAMfntp language "ASN.1:1997" all;
```

5.2 Naming conventions

This test suite follows the naming convention guidelines provided in EG 202 798 [i.1].

5.2.1 General guidelines

Naming conventions are based on the following underlying principles:

- Identifiers should be prefixed with a short alphabetic string (specified in table 1) indicating the type of TTCN-3 element it represents.
- Suffixes should not be used except in those specific cases identified in table 1.
- 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 1 specifies the naming guidelines for each element of the TTCN-3 language indicating the recommended prefix and capitalization.

Table 1: ETSI TTCN-3 generic naming conventions

Language element	Naming convention	Prefix	Example identifier
Module	Use upper-case initial letter	none	FntpTemplates
Group within a module	Use lower-case initial letter	none	transmittingPackets
Data type	Use upper-case initial letter	none	FntpOptions
Message template	Use lower-case initial letter	m_	m_noFntpOptions
Message template with wildcard or matching expression	Use lower-case initial letters	mw_	mw_noFntpOptions
Modifying message template	Use lower-case initial letter	md_	md_NHopNFfntpOptions
Modifying message template with wildcard or matching expression	Use lower-case initial letters	mdw_	mdw_NHopNFfntpOptions
Signature template	Use lower-case initial letter	s_	s_callSignature
Port instance	Use lower-case initial letter	none	fntpPort
Test component instance	Use lower-case initial letter	none	userTerminal
Constant	Use lower-case initial letter	c_	c_portExt
Constant (defined within component)	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_cf01Up()
External function	Use lower-case initial letter	fx_	fx_calculateLength()
Altstep (incl. Default)	Use lower-case initial letter	a_	a_cf01Down()
Test case	Use ETSI numbering	TC_	TC_FNTP_TXP_BP_BV_01
Variable (local)	Use lower-case initial letter	v_	v_pduCounter
Variable (defined within a component)	Use lower-case initial letters	vc_	vc_pduCounter
Timer (local)	Use lower-case initial letter	t_	t_wait
Timer (defined within a component)	Use lower-case initial letters	tc_	tc_ac
Module parameters for PICS	Use all upper case letters	PICS_	PICS_ROLE_RH
Module parameters for other parameters	Use all upper case letters	PX_	PX_LINK_ID
Formal Parameters	Use lower-case initial letter	p_	p_commRef
Enumerated Values	Use lower-case initial letter	e_	e_success

5.2.2 ITS specific TTCN-3 naming conventions

In addition to the general naming conventions, table 2 shows specific naming conventions that apply to the ITS TTCN-3 test suite.

Table 2: ITS specific TTCN-3 naming conventions

Language element	Naming convention	Prefix	Example identifier
ITS Module	Use upper-case initial letter	Its"IUTname"_	ItsFntp_
Module containing types and values	Use upper-case initial letter	Its"IUTname"_TypesAndValues	ItsFntp_TypesAndValues
Module containing Templates	Use upper-case initial letter	Its"IUTname"_Templates	ItsFntp_Templates
Module containing test cases	Use upper-case initial letter	Its"IUTname"_TestCases	ItsFntp_TestCases
Module containing functions	Use upper-case initial letter	Its"IUTname"_Functions	ItsFntp_Functions
Module containing external functions	Use upper-case initial letter	Its"IUTname"_ExternalFunctions	ItsFntp_ExternalFunctions
Module containing components, ports and message definitions	Use upper-case initial letter	LibIts"IUTname"_	LibItsCalm_Interface
Module containing main component definitions	Use upper-case initial letter	LibIts"IUTname"_	LibItsCalm_TestSystem
Module containing the control part	Use upper-case initial letter	Its"IUTname"_TestControl	ItsFntp_TestControl

5.2.3 Usage of Log statements

All TTCN-3 log statements use the following format:

- Three asterisks followed by a blank character.
- The TTCN-3 test case or function identifier in which the log statement is defined followed by a colon and a blank character.
- One of the possible log categories: INFO, WARNING, ERROR, PASS, FAIL, INCONC, TIMEOUT followed by a colon and a blank character.
- Free text.
- A blank character followed by three asterisks.

EXAMPLE 1:

log("*** TC_FNTP_TXP_BP_BV_01: INFO: Preamble: FNTP Forwarding Table was setup properly ***");

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

- Log statements are used in the body of the functions, so that invocation of functions is visible in the test logs.
- All TTCN-3 setverdict statements are combined (as defined in TTCN-3 v3.4.1) with a log statement following the same above rules (see example below).

EXAMPLE 2:

setverdict(pass, "*** _FNTP_TXP_BP_BV_01: PASS: Received basic FNTP NPDU ***");

5.2.4 Test Case (TC) identifier

Table 3 shows the test case naming convention, which follows the same naming convention as the test purposes.

Table 3: TC naming convention

TC_<root>_<gr>_<sgr>_<x>_<nn>		
<root> = root	FNTP	Fast Networking & Transport Protocol
<gr> = group	TXP	Transmit Packets
	RXP	Receive Packets
	CIP	CIP Management
	INIT	Initialisation and maintenance
<sgr> = sub-group	BP	Basic Procedure
	EP	Extended Procedure
	FP	Forwarding Procedure
	GE	General
<x> = type of testing	BV	Valid Behaviour tests
	BI	Invalid Syntax or Behaviour Tests
<nn> = sequential number		01 to 99
NOTE 1: CIP management is only tested in the TPs of group "CIP". NOTE 2: The groups TXP and RXP are restricted to "transmit to / receive from an ITS peer station", i.e. the group TXP also includes TPs to test reception of an FNTP station-internal forwarding NPDU from another local ITS-SCU, and the group RXP also includes TPs to test transmission of an FNTP station-internal forwarding NPDU to another local ITS-SCU. NOTE 3: A sub-group may not apply for all groups.		

EXAMPLE: TP identifier: TP/FNTP/TXP/BP/BV/01
TC identifier: TC_FNTP_TXP_BP_BV_01.

Annex A (normative): Partial PIXIT proforma for FNTP

A.1 Identification summary

Table A.1

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

A.2 ATS summary

Table A.2: Summary

Protocol Specification:	ISO 29281-1 [1]
Protocol to be tested:	FNTP
ATS Specification:	TS 102 985-3
Abstract Test Method:	Clause 4

A.3 Test laboratory

Table A.3: Test laboratory

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

A.4 Client identification

Table A.4: Client identification

Client Identification:	
Client Test manager:	
Test Facilities required:	

A.5 SUT

Table A.5: SUT identification

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

A.6 Protocol layer information

A.6.1 Protocol identification

Table A.6: Protocol identification

Name:	ISO 29281-1 [1]
Version:	
PICS References:	TS 102 985-1 [2]

A.6.2 IUT information

Table A.7: Fntp Pixits

Identifier	Description	
PX_SERVICE_REF	Comment	A number uniquely identifying the endpoint at this host in an implementation specific way
	Type	Integer
	Def. value	0
PX_NF_SAP_UP_FILL_FIELD_VALUE	Comment	Defines the value to set to fill field for NFsapPrimitivesUp primitive
	Type	Bit6
	Def. value	'000000'B
PX_NF_SAP_DOWN_FILL_FIELD_VALUE	Comment	Defines the value to set to fill field for NFsapPrimitivesDown primitive
	Type	Bit7
	Def. value	'0000000'B
PX_ITS_FPDU	Comment	ITS-SP payload
	Type	ITSfpdu
	Def. value	A DENM message associated to a Slow vehicle in ASN.1 PER encoding
PX_USER_PRIORITY	Comment	The user priority as specified in ISO 21218 [i.5]
	Type	UserPriority
	Def. value	0
PX_HOST_SCU_ID	Comment	ITS-SCU-ID of the host ITS-SCU
	Type	ITS_scuId
	Def. value	8
PX_UNKNOWN_HOST_SCU_ID	Comment	ITS-SCU-ID of an unknown host ITS-SCU
	Type	ITS_scuId
	Def. value	65534
PX_WL_LOCAL_CIID	Comment	Identifies the CI on ITS-S router
	Type	EUI64
	Def. value	'030008FFFF010000'O
PX_WL_REMOTE_CIID_BC	Comment	Identifies an unknown CI on ITS-S router
	Type	EUI64
	Def. value	'FF0008FFFF01FFFF'O
PX_WL_REMOTE_CIID_MC	Comment	Identifies the VCI for broadcast on ITS-S router
	Type	EUI64
	Def. value	'EF0008FFFF011234'O
PX_WL_REMOTE_CIID_UC	Comment	Identifies the VCI for multicast on ITS-S router
	Type	EUI64
	Def. value	'F30008FFFF010001'O
PX_WL_REMOTE_CIID_UNKNOWN_UC	Comment	Identifies the VCI for multicast on ITS-S router
	Type	EUI64
	Def. value	'030008FFFF020001'O
PX_WL_REMOTE_CIID_UNKNOWN_BC	Comment	Identifies an unknown CI on ITS-S router
	Type	EUI64
	Def. value	'FF0008FFFF02FFFF'O
PX_WL_LOCAL_CIID_UNKNOWN	Comment	Identifies the VCI for unicast on ITS-S router
	Type	EUI64
	Def. value	'030008FFFF020000'O

Identifier	Description	
PX_LAN_LOCAL_CIID	Comment	Identifies the CI on ITS-S host
	Type	EUI64
	Def. value	'03000AFFFFFF0000'O
PX_LAN_REMOTE_CIID_BC	Comment	Identifies an unknown CI on ITS-S host
	Type	EUI64
	Def. value	'FF000AFFFFFFFFFF'O
PX_LAN_DIFFERENT_LOCAL_CIID	Comment	Identifies a different VCI on ITS-S host
	Type	EUI64
	Def. value	'03000AFFFFFE0000'O
PX_DEST_LOCAL_CIID	Comment	Identifies uniquely a specific CI in a specific "ITS-SCU"
	Type	EUI64
	Def. value	'030009FFFF010000'O
PX_DEST_REMOTE_CIID_BC	Comment	Identifies uniquely a specific VCI in a specific "ITS-SSCU" for broadcast
	Type	EUI64
	Def. value	'FF0009FFFF01FFFF'O
PX_DEST_REMOTE_CIID_MC	Comment	Identifies uniquely a specific VCI in a specific "ITS-SCU" for multicast
	Type	EUI64
	Def. value	'F30009FFFF010001'O
PX_DEST_REMOTE_CIID_UC	Comment	Identifies uniquely a specific VCI in a specific "ITS-SCU" for unicast
	Type	EUI64
	Def. value	'030009FFFF010001'O
PX_WL_LINK_ID_BC	Comment	Identify the VCI to be used to transmit the packet outside (e.g. G5), i.e. the peer station, for Broadcast,
	Type	Link_ID

	Def. value	{
		remoteCIID := PX_WL_REMOTE_CIID_BC,
		localCIID := PX_WL_LOCAL_CIID
		}

PX_LAN_LINK_ID_BC	Comment	Identify the VCI to be used to transmit the packet to the LAN, for Broadcast
	Type	Link_ID

	Def. value	{
		remoteCIID := PX_LAN_REMOTE_CIID_BC,
		localCIID := PX_LAN_LOCAL_CIID
		}

PX_WL_LINK_ID_UNKWNON_BC	Comment	Identify an unknown VCI to be used to transmit the packet, i.e. the peer station, for Broadcast
	Type	Link_ID

	Def. value	{
		remoteCIID := PX_WL_REMOTE_CIID_UNKNOWN_BC,
		localCIID := PX_WL_LOCAL_CIID_UNKNOWN
		}

PX_WL_LINK_ID_UNKWNON_UC	Comment	Identify an unknown VCI to be used to transmit the packet, i.e. the peer station, for Unicast
	Type	Link_ID

	Def. value	{
		remoteCIID :=PX_WL_REMOTE_CIID_UNKNOWN_UC,
		localCIID := PX_WL_LOCAL_CIID_UNKNOWN
		}

PX_WL_LINK_ID_UC	Comment	Identify the VCI to be used to transmit the packet, i.e. the peer station, for Unicast
	Type	Link_ID

	Def. value	{
		remoteCIID := PX_WL_REMOTE_CIID_UC,
		localCIID := PX_WL_LOCAL_CIID
		}

Identifier	Description	
PX_APP_ PORT_NUMBER	Comment	Indicate the application port number, used instead of c_portDyn
	Type	PortNumber
	Def. value	{ portLong := 12345 }
PX_LOCAL_PORT_NUMBER	Comment	Indicate the source port number, i.e. the local endpoint
	Type	PortNumber
	Def. value	{ portLong := 5555 }
PX_REMOTE_PORT_NUMBER	Comment	Indicate the destination port number, i.e. the local endpoint
	Type	PortNumber
	Def. value	{ portLong := 5556 }
PX_SECOND_REMOTE_PORT_NUMBER	Comment	Indicate a second destination port number
	Type	PortNumber
	Def. value	{ portLong := 5557 }
PX_UNKNOWN_REMOTE_PORT_NUMBER	Comment	Indicate the destination port number, i.e. the peer ITS-SP
	Type	PortNumber
	Def. value	{ portLong := 666 }
PX_FORWARDING_SRC_PORT	Comment	Indicate the forwarding source port number, i.e. the originator endpoint
	Type	PortNumber
	Def. value	{ portLong := 5550 }
PX_FORWARDING_DST_PORT	Comment	Indicate the forwarding destination port number, i.e. the destinator endpoint
	Type	PortNumber
	Def. value	{ portLong := 5551 }
PX_SERVICE_PORT	Comment	Indicate the forwarding destination port number, i.e. the destinator endpoint
	Type	PortNumber
	Def. value	{ portLong := 32700 }
PX_CLIENT_ID	Comment	The client identifier
	Type	ITSaid

	Def. value	{
		Content := 0
		}

PX_HOP	Comment	Single hop value
	Type	FNTPhopCount
	Def. value	0
PX_NHOPS	Comment	N-hops value
	Type	FNTPhopCount
	Def. value	5
PX_CIP_RX_SETTINGS	Comment	Access parameters settings for reception
	Type	RXcip
	Def. value	'CAFEDECA'O
PX_CIP_TX_SETTINGS	Comment	Access parameters settings for transmission
	Type	TXcip
	Def. value	'C0CAC01A'O

Annex B (normative): TTCN-3 library modules

This ATS has been produced using the Testing and Test Control Notation (TTCN) according to ES 201 873-2 [7]. The ATS was developed on a separate TTCN software tool and therefore the TTCN tables are not completely referenced in the table of contents. The ATS itself contains a test suite overview part which provides additional information and references.

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

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

The TTCN-3 library modules, which form parts of the present document, are contained in archive ts_10298503v010101p0.zip which accompanies the present document.

History

Document history		
V1.1.1	July 2012	Publication