ETSI TS 101 580-3 V2.1.1 (2013-12)

Core Network and Interoperability Testing (INT);
Diameter Conformance testing for Rx interface
(3GPP Release 10);
Part 3: Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma specification

Reference
RTS/INT-00081-3

Keywords
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Contents

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Foreword

This Technical Specification (TS) has been produced by ETSI Technical Committee Core Network and Interoperability Testing (INT).

The present document is part 3 of a multi-part deliverable covering the test specifications for the Diameter protocol on the Rx interface, as identified below:

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

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

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

1 Scope

The present document specifies the Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma for the test specifications for Diameter protocol on the Rx interface as specified in TS 129 214 [1] in compliance with the relevant requirements and in accordance with the relevant guidance given in ISO/IEC 9646-7 [4] and ETS 300 406 [5].

The test notation used in the ATS is TTCN-3 (see ES 201 873-1 [6]).

The following test specification and design considerations can be found in the body of the present document:

- the overall test suite structure;
- the testing architecture;
- the test methods and port definitions;
- the test configurations;
- TTCN styles and conventions;
- the partial PIXIT proforma;
- the modules containing the TTCN-3 ATS.

Annex A provides the Partial Implementation Extra Information for Testing (PIXIT) Proforma of the ATS.

Annex B provides the Testing and Test Control Notation (TTCN-3) part of the ATS.

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 TS 129 214 (V10.5.0): "Universal Mobile Telecommunications System (UMTS); LTE; Policy and charging control over Rx reference point (3GPP TS 29.214 version 10.5.0 Release 10)".

[2] ETSI TS 101 580-2: "Core Network and Interoperability Testing (INT); Diameter Conformance testing for Rx interface; (3GPP Release 10); Part 2: Test Suite Structure (TSS) and Test Purposes (TP)".

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

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

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

[6] 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".

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

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 ISO/IEC 9646-7 [4] and TS 129 214 [1] apply.

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in ISO/IEC 9646-1 [3], ISO/IEC 9646-7 [4], TS 129 214 [1] and the following apply:

LLP	Lower Layer Primitives
SDP	Session Description Protocol

4 ATS conventions

Test purposes of the present document address the Diameter protocol on the Rx interface.

4.1 Test Architecture

The test architecture defined in figures 1 and 2 apply. The communication covered by the test purposes of TS 101 580-2 [2] focuses on the Rx interface. For some tests the Gm interface is needed to trigger events on the Rx interface.

4.1.1 Test configuration

4.1.1.1 Configurations using Rx and Gm interface

The Gm interface is located between UE and the SUT. The Rx interface is located between PCRF and the SUT.

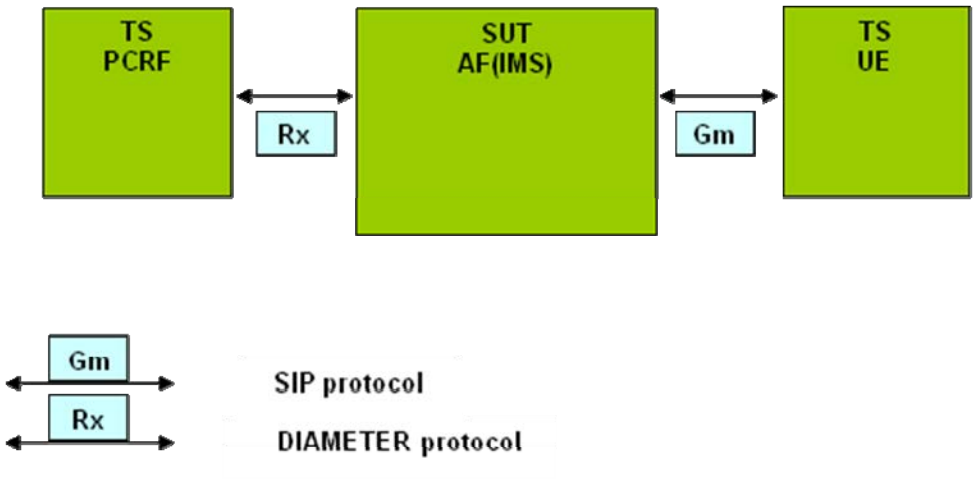

Figure 1: Test architecture with IMS as SUT

4.1.1.2 Configurations using Rx interface only

The Rx interface is located between AF and the SUT.

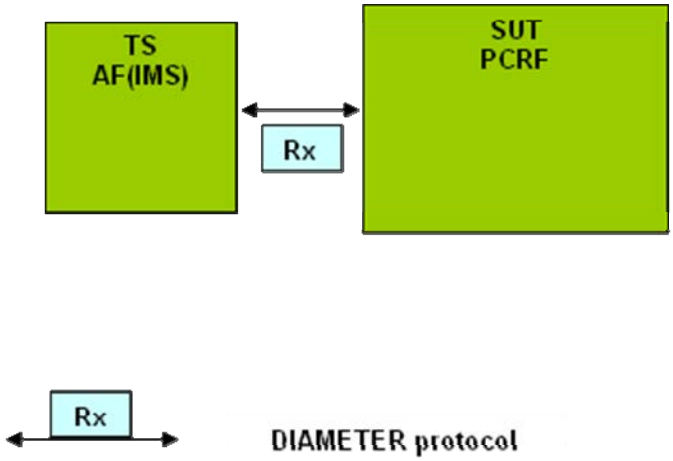

Figure 2: Test architecture with PCRF as SUT

4.1.2 Interconnection of TS and SUT

4.1.2.1 AF Role

Figure 3 shows the interconnection of TS and SUT in terms of signalling message flows. Diameter component exists from two ports which are connected to Test System. Diameter messages are transferred over DIAM port. Lower Layer Primitives are transferred over LLP port. For execution of tests the Test Adapter shall be developed. There are two possibilities to communicate over Test Adapter:

- ATS provide only Diameter messages; or
- ATS provide Diameter messages and LL primitives.

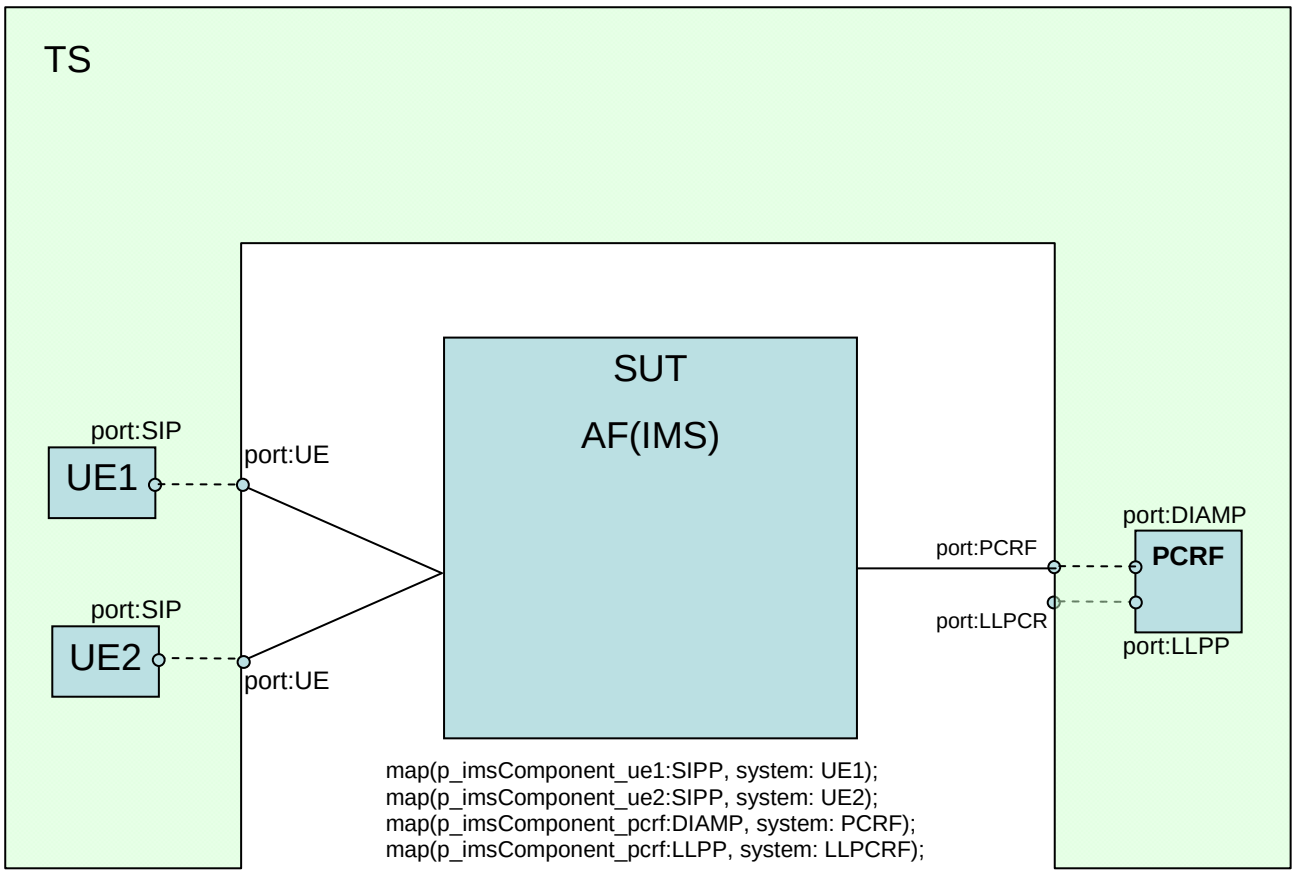

Figure 3: Interconnection for AF role

4.1.2.2 PCRF Role

Figure 4 shows the interconnection of TS and SUT in terms of signalling message flows. Diameter component exists from two ports which are connected to Test System. Diameter messages are transferred over DIAM port. Lower Layer Primitives are transferred over LLPP port. For execution of tests the Test Adapter shall be developed. There are two possibilities to communicate over Test Adapter:

- ATS provide only Diameter messages; or
- ATS provide Diameter messages and LL primitives.

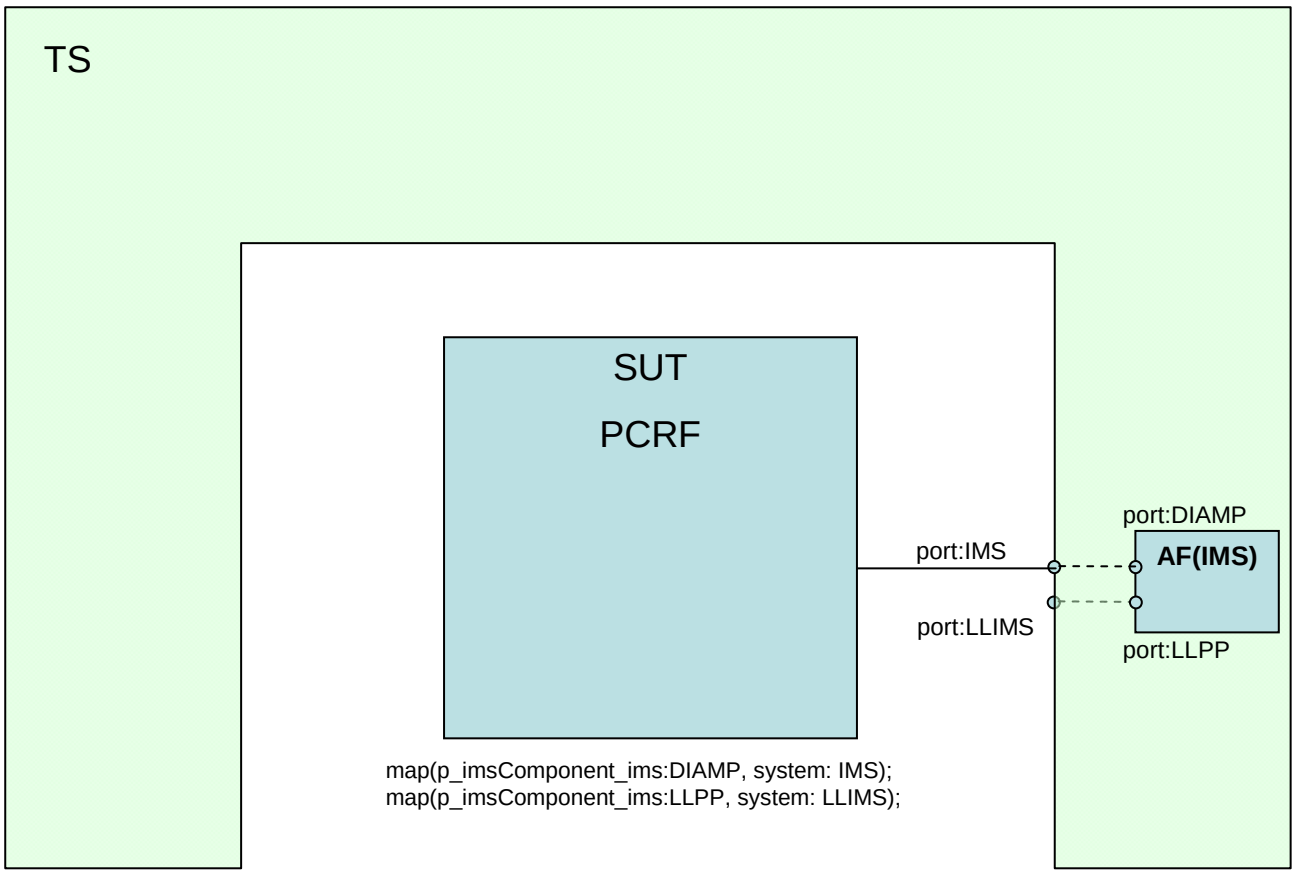

Figure 4: Interconnection for PCRF role

4.2 ATS structure

4.2.1 Test case grouping

The ATS structure is based on the Test Purposes for the Diameter protocol on the Rx interface as defined in TS 101 580-2 [2].

4.2.2 Test case identifiers

The test case names are built up according to the following scheme:

"<TC>"_"<Group index>"_"<TC number>"

NOTE: This naming scheme provides a 1-1 correspondence of TP identifiers as defined in TS 101 580-2 [2] and test case names.
The TP identifier of TC_xxx_01 is TP_xxx_01.

The test cases have been divided according to the functionalities into several groups.

Annex A (normative): Partial PIXIT 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 Partial PIXIT proforma in this annex so that it can be used for its intended purposes and may further publish the completed Partial PIXIT.

The PIXIT Proforma is based on ISO/IEC 9646-6 [7]. Any additional information which may be needed can be found in this international standard document.

A.1 Identification summary

Table A.1

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

A.2 ATS summary

Table A.2

Protocol Specification:	TS 129 214 [1] (3GPP TS 29.214 version 10.5.0 Release 10)
Protocol to be tested:	
ATS Specification:	TS 101 580-2 [2]
Abstract Test Method:	TS 101 580-3 (the present document), clause 4

A.3 Test laboratory

Table A.3

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

A.4 Client identification

Table A.4

Client Identification:	
Client Test manager:	
Test Facilities required:	

A.5 SUT

Table A.5

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

Name:	TS 129 214 [1] (3GPP TS 29.214 version 10.5.0 Release 10)
Version:	
PICS References:	

A.7 PIXIT items

Each PIXIT item corresponds to a Module Parameter of the ATS.

A.7.1 Diameter related PIXIT items

Table A.7: Diameter related PIXIT items

Id	Identifier	Type	Description
		Configuration	
1	PX_DIAM_LLP_ENABLED	Boolean	True, if Lower Layer Primitives and Port are enabled False, if Lower Layer Primitives and Port are disabled
2	PX_IPv6	Boolean	True, if IPv6 addresses are used False, if IPv4 addresses are used
		IP addresses and port numbers	
3	PX_DIAMETER_RX_ETS_IPADDR	Charstring	IP address of the test system
4	PX_DIAMETER_RX_SUT_IPADDR	Charstring	IP address of the system under test
5	PX_DIAMETER_RX_ETS_PORT	Integer	Port number of the test system
6	PX_DIAMETER_RX_ETS_PORT	Integer	Port number of the system under test
7	PX_UE_framedIpAddress	Octetstring	IPv4 address of the User Equipment having initiated the session that causes the Diameter messages exchange between AF and PCRF
8	PX_UE_framedIp6Address	Octetstring	IPv6 address of the User Equipment having initiated the session that causes the Diameter messages exchange between AF and PCRF
		Field values	
9	PX_SessionID	UTF8String	The Session-Id identifying a specific session
10	PX_OriginHost	Charstring	The Origin-Host identifying the endpoint that originates the Diameter messages
11	PX_OriginRealm	Charstring	The Origin-Realm identifying the Realm of the originator of any Diameter messages
12	PX_DestinationHost	Charstring	The Destination-Host identifying the endpoint to which the Diameter messages are destined
13	PX_DestinationRealm	Charstring	The Destination -Realm identifying the Realm of the destination of any Diameter messages
14	PX_ANCA_ipv4	IPv4Addr	The Access-Network-Charging-Address in IPv4 format
15	PX_ANCA_ipv6	IPv6Addr	The Access-Network-Charging-Address in IPv6 format
16	PX_SPONSOR_ID	Charstring	A sponsor identity for the Sponsor-Identity AVP in Sponsored-Connectivity AVPs
17	PX_APPLICATION_SERVICE_PROVIDER_ID	Charstring	An application service provider identity for the Application_Service_Provider AVP in Sponsored-Connectivity AVPs
		IMS Switch	
18	PX_SIPsupport	Boolean	TRUE, if two Gm interfaces are accessible to trigger Diameter messages at the Rx interface of the P-CSCF (see note).
NOTE: If TRUE, table A.8 needs to be completed.			

A.7.2 IMS related PIXIT items

Table A.2 contains PIXIT items related to the communication between UE1 and UE via the AF that will cause the Diameter exchange between AF and PCRF. The UE1 and UE2 are simulated by the test system, the system under test is the AF. For testing the PCRF the values in table A.2 will not be used.

Table A.8: IMS related PIXIT items

Id	Identifier	Type	Description
P-CSCF IP parameters			
1	PX_IMS_SUT_PCSCF1_PORT	Integer	SUT – P-CSCF port number to exchange SIP messages - connection point for the UE1.
2	PX_IMS_SUT_PCSCF1_IPADDR	Charstring	SUT – P-CSCF IP address to exchange SIP messages - connection point for the UE1.
4	PX_IMS_SUT_PCSCF1_HOME_DOMAIN	Charstring	SUT – P-CSCF domain - connection point for UE1.
5	PX_IMS_SUT_PCSCF2_PORT	Integer	SUT – P-CSCF port number to exchange SIP messages - connection point for the UE2.
6	PX_IMS_SUT_PCSCF2_IPADDR	Charstring	SUT – P-CSCF IP address to exchange SIP messages - connection point for the UE2.
7	PX_IMS_SUT_PCSCF2_HOME_DOMAIN	Charstring	SUT – P-CSCF domain - connection point for UE2.
UE1 parameters			
8	PX_IMS_TS_UE1_PORT	Integer	Port number used by UE1 to exchange SIP messages.
9	PX_IMS_TS_UE1_IPADDR	Charstring	IP address used by UE1 to exchange SIP messages.
10	PX_IMS_SUT_UE1_BEARER_IPADDR	Charstring	IP address used by the test system to exchange media streams for the UE1.
11	PX_IMS_SUT_UE1_HOME_DOMAIN	Charstring	Identity of the UE1 local domain.
12	PX_IMS_SUT_UE1_PUBLIC_USER	Charstring	Identity of the UE1 local user.
13	PX_IMS_SUT_UE1_QOP	Charstring	Quoted string of one or more tokens indicating the "quality of protection" values for UE1.
14	PX_IMS_SUT_UE1_PRIVAT_USERNAME	Charstring	Private user name for UE1.
15	PX_IMS_SUT_UE1_PRIVAT_PASSWD	Charstring	Private password for UE1.
16	PX_IMS_SUT_UE1_REGISTRAR	Charstring	SUT- REGISTRAR domain of UE1.
UE2 parameters			
17	PX_IMS_TS_UE2_PORT	Integer	Port number used by UE2 to exchange SIP messages.
18	PX_IMS_TS_UE2_IPADDR	Charstring	IP address used by UE2 to exchange SIP messages.
19	PX_IMS_SUT_UE2_BEARER_IPADDR	Charstring	IP address used by the test system to exchange media streams for UE2.
20	PX_IMS_SUT_UE2_HOME_DOMAIN	Charstring	Identity of the UE2 local domain.
21	PX_IMS_SUT_UE2_PUBLIC_USER	Charstring	Identity of the UE2 local user.
22	PX_IMS_SUT_UE2_QOP	Charstring	Quoted string of one or more tokens indicating the "quality of protection" values for UE2.
23	PX_IMS_SUT_UE2_PRIVAT_USERNAME	Charstring	Private user name for the UE2.
24	PX_IMS_SUT_UE2_PRIVAT_PASSWD	Charstring	Private password for the UE2.
25	PX_IMS_SUT_UE2_REGISTRAR	Charstring	SUT- REGISTRAR domain of UE2.
SDP parameters			
26	PX_SIP_SDP_dyn	Charstring	SDP dynamic port.
27	PX_SIP_SDP_encoding	Charstring	SDP media attribute encoding.
28	PX_SIP_REGISTER_AUTHENTICATION_ENABLED	Boolean	True, if authentication for REGISTER messages is enabled. False, if authentication for REGISTER messages is disabled.

Annex B (informative): TTCN-3 library modules

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

The TTCN-3 library modules are contained in archive ts_10158003v020101p0.zip which accompanies the present document.

This ATS has been produced using the Testing and Test Control Notation (TTCN) according to ES 201 873-1 [6].

History

Document history		
V1.1.1	April 2012	Publication
V2.1.1	December 2013	Publication