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TECHNICAL SPECIFICATION

**Core Network and Interoperability Testing (INT);
Diameter Conformance testing for Cx and Dx interfaces;
(3GPP™ Release 10);
Part 1: Protocol Implementation
Conformance Statement (PICS)**

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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 1 of a multi-part deliverable covering the test specifications for the Diameter protocol on the Cx and Dx interfaces, 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) pro forma specification".

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).

"**must**" and "**must not**" are **NOT** allowed in ETSI deliverables except when used in direct citation.

Introduction

To evaluate protocol conformance of a particular implementation, it is necessary to have a statement of which capabilities and options have been implemented for a telecommunication specification. Such a statement is called a Protocol Implementation Conformance Statement (PICS).

1 Scope

The present document provides the Protocol Implementation Conformance Statement (PICS) pro forma for the test specifications for the Diameter protocol on the Cx and Dx interfaces as specified in ETSI TS 129 228 [1] and ETSI TS 129 229 [2] in compliance with the relevant requirements and in accordance with the relevant guidance given in ISO/IEC 9646-7 [5] and ETSI ETS 300 406 [6].

The supplier of a protocol implementation which is claimed to conform to ETSI TS 129 228 [1] and ETSI TS 129 229 [2] is required to complete a copy of the PICS pro forma provided in annex A of the present document and is required to provide the information necessary to identify both the supplier and the implementation.

2 References

2.1 Normative 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 https://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.

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

[1] ETSI TS 129 228 (V10.8.0): "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; IP Multimedia (IM) Subsystem Cx and Dx Interfaces; Signalling flows and message contents (3GPP TS 29.228 version 10.8.0 Release 10)".

[2] ETSI TS 129 229 (V10.5.0): "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Cx and Dx interfaces based on the Diameter protocol; Protocol details (3GPP TS 29.229 version 10.5.0 Release 10)".

[3] ETSI TS 123 380 (V10.3.0): "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; IMS Restoration Procedures (3GPP TS 23.380 version 10.3.0 Release 10)".

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

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

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

[7] ETSI TR 121 905 (V10.3.0): "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Vocabulary for 3GPP Specifications (3GPP TR 21.905 version 10.3.0 Release 10)".

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.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

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 ETSI TS 129 228 [1], ETSI TS 129 229 [2] and the following apply:

PICS pro forma: document, in the form of a questionnaire, designed by the protocol specifier or conformance test suite specifier, which, when completed for an OSI implementation or system, becomes the PICS

NOTE: See ISO/IEC 9646-1 [4].

Protocol Implementation Conformance Statement (PICS): statement made by the supplier of an Open Systems Interconnection (OSI) implementation or system, stating which capabilities have been implemented for a given OSI protocol

NOTE: See ISO/IEC 9646-1 [4].

static conformance review: review of the extent to which the static conformance requirements are met by the IUT, accomplished by comparing the PICS with the static conformance requirements expressed in the relevant standard(s)

NOTE: See ISO/IEC 9646-1 [4].

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in ETSI TS 129 228 [1], ETSI TS 129 229 [2] and ETSI TR 121 905 [7] apply.

4 Conformance

A PICS pro forma which conforms to this PICS pro forma specification shall be technically equivalent to annex A, and shall preserve the numbering and ordering of the items in annex A.

A PICS which conforms to this PICS pro forma specification shall:

a)   describe an implementation which claims to conform to ETSI TS 129 228 [1] and ETSI TS 129 229 [2];

b)   be a conforming ICS pro forma which has been completed in accordance with the instructions for completion given in clause A.1;

c)   include the information necessary to uniquely identify both the supplier and the implementation.

Annex A (normative):
PICS pro forma

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

A.1 Guidance for completing the ICS pro forma

A.1.1 Purposes and structure

The purpose of this PICS pro forma is to provide a mechanism whereby a supplier of an implementation of the requirements defined in relevant specifications may provide information about the implementation in a standardized manner.

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

- instructions for completing the PICS pro forma;

- identification of the implementation;

- identification of the protocol;

- PICS pro forma tables (for example: Major capabilities, etc.).

A.1.2 Abbreviations and conventions

This annex does not reflect dynamic conformance requirements but static ones. In particular, a condition for support of a PDU parameter does not reflect requirements about the syntax of the PDU (i.e. the presence of a parameter) but the capability of the implementation to support the parameter.

In the sending direction, the support of a parameter means that the implementation is able to send this parameter (but it does not mean that the implementation always sends it).

In the receiving direction, it means that the implementation supports the whole semantic of the parameter that is described in the related protocol specification.

As a consequence, PDU parameter tables in this annex are not the same as the tables describing the syntax of a PDU in the reference specification.

The PICS pro forma contained in this annex is comprised of information in tabular form in accordance with the guidelines presented in ISO/IEC 9646-7 [5].

Item column

The item column contains a number which identifies the item in the table.

Item description column

The item description column describes in free text each respective item (e.g. parameters, timers, etc.). It implicitly means "is <item description> supported by the implementation?".

Reference column

The reference column gives reference to the relevant sections in core specifications.

Status column

The various status used in this annex are in accordance with the rules in table A.1.

Table A.1: Key to status codes

Status code	Status name	Meaning
m	mandatory	The capability shall be supported. It is a static view of the fact that the conformance requirements related to the capability in the reference specification are mandatory requirements. This does not mean that a given behaviour shall always be observed (this would be a dynamic view), but that it shall be observed when the implementation is placed in conditions where the conformance requirements from the reference specification compel it to do so. For instance, if the support for a parameter in a sent PDU is mandatory, it does not mean that it shall always be present, but that it shall be present according to the description of the behaviour in the reference specification (dynamic conformance requirement).
o	optional	The capability may or may not be supported. It is an implementation choice.
n/a	not applicable	It is impossible to use the capability. No answer in the support column is required.
c.<integer>	conditional	The requirement on the capability ("m", "o", "n/a") depends on the support of other optional or conditional items. <integer> is the identifier of the conditional expression.
o.<integer>	qualified optional	For mutually exclusive or selectable options from a set. <integer> is the identifier of the group of options, and the logic of selection of the options.

Mnemonic column

The Mnemonic column contains mnemonic identifiers for each item.

Support column

The support column shall be filled in by the supplier of the implementation. The following common notations, defined in ISO/IEC 9646-7 [5], are used for the support column:

Y or y   supported by the implementation.

N or n   not supported by the implementation

N/A, n/a or -   no answer required (allowed only if the status is N/A, directly or after evaluation of a conditional status)

References to items

For each possible item answer (answer in the support column) within the PICS pro forma there exists a unique reference, used, for example, in the conditional expressions. It is defined as the table identifier, followed by a solidus character "/", followed by the item number in the table.

EXAMPLE: A.5/4 is the reference to the answer of item 4 in table A.5.

A.1.3   Instructions for completing the PICS pro forma

The supplier of the implementation may complete the PICS pro forma in each of the spaces provided. More detailed instructions are given at the beginning of the different clauses of the PICS pro forma.

A.2   Identification of the Network Equipment

A.2.1   Date of the statement

Identification of the Network Equipment should be filled in so as to provide as much detail as possible regarding version numbers and configuration options.

The product supplier information and client information should both be filled in if they are different.

A person who can answer queries regarding information supplied in the PICS should be named as the contact person.

Date of the statement:

....

A.2.2   Network Equipment Under Test identification

Name:

....

....

Hardware configuration:

....

....

....

Software configuration:

....

....

....

A.2.3   Product supplier

Name:

....

Address:

....

....

....

Telephone number:

....

Facsimile number:

....

E-mail address:

....

Additional information:

....

....

....

A.2.4   Client

Name:

....

Address:

....

....

....

Telephone number:

....

Facsimile number:

....

E-mail address:

....

Additional information:

....

....

....

A.2.5   PICS contact person

Name:

....

Telephone number:

....

Facsimile number:

....

E-mail address:

....

Additional information:

....

....

A.3   Identification of the protocol

This PICS pro forma applies to the following specifications:

ETSI TS 129 228 [1] and ETSI TS 129 229 [2].

A.4   Global statement of conformance

The implementation described in this PICS meets all the mandatory requirements of the referenced standard?

[ ] **Yes**

[ ] **No**

NOTE: Answering "No" to this question indicates non-conformance to the protocol specification. Non-supported mandatory capabilities are to be identified in the PICS, with an explanation of why the implementation is non-conforming. Explanations may be entered in the comments field at the bottom of each table or on attached pages.

In the tabulations which follow, all references are to ETSI TS 129 228 [1] unless another numbered reference is explicitly indicated.

A.5   PICS pro forma tables for the Cx interface

A.5.1   Roles

Table A.2: Roles for the Cx interface

Item	Roles	Reference	Status	Support
1	HSS		o.1	
2	CSCF		o.1	
2.1	I-CSCF		c.1	
2.2	S-CSCF		c.1	
o.1:	At least one of these roles shall be supported.			
c.1:	At least one of these roles shall be supported, if A.2/1 is supported, else n/a.			

A.5.2   PICS Items for HSS

A.5.2.1   System Capabilities for HSS

Table A.3 needs only to be completed for HSS implementations, where item A.2/1 above is supported.

Table A.4: System Capabilities for HSS

Item	Does the IUT support ...	Reference	Status	Support
1.1	correct handling of the non-receipt of mandatory information elements?	6, paragraph 2	m	
1.2	correct handling of the receipt and non-receipt of conditional information elements?	6, paragraphs 3, 4, 5	m	
1.3	correct handling of the receipt and non-receipt of optional information elements?	6, paragraph 6	m	
2	IMS Restoration Procedures?	ETSI TS 123 380 [3]	o	
3	location management procedures?	6.1	m	
3.1	processing of user registration status queries (Receipt of User-Authorization-Request and sending of User-Authorization-Answer)?	6.1.1	m	
3.1.1	inclusion of the Server-Capabilities AVP in the User-Authorization-Answer?	6.1.1.1, point 5, 6th and 7th dashed item, point 6, 9th dashed item	o	
3.1.1	the feature IMS Restoration Indication ("IMSRestorationInd") for the UAR/UAA message exchange?	ETSI TS 129 229 [2], table 7.1.1 line 3	o	
3.2	processing of S-CSCF registration/deregistration notifications (Receipt of Server-Assignment-Request and sending of Server-Assignment-Answer)?	6.1.2	m	
3.2.1	prioritization of termination session request based on priority level in Session-Priority AVP?	6.1.2.1, paragraph 4	o	
3.2.2	checking of HSS association of received public and private identities?	6.1.2.1, point 2	o	
3.2.3	error handling procedures for S-CSCF names that were not assigned during registration?	8.1.2	m	
3.2.4	error handling procedures for server assignment types that are not allowed?	8.1.3	m	
3.2.5	the feature Shared iFC sets ("SiFCd") for the SAR/SAA message exchange?	ETSI TS 129 229 [2], table 7.1.1 line 1	o	
3.2.6	the feature Alias Indication ("AliasInd") for the SAR/SAA message exchange?	ETSI TS 129 229 [2], table 7.1.1 line 2	m	
3.2.7	the feature IMS Restoration Indication ("IMSRestorationInd") for the SAR/SAA message exchange?	ETSI TS 129 229 [2], table 7.1.1 line 3	o	
3.3	invocation of network initiated de-registration (Sending of Registration-Termination-Request)?	6.1.3	m	
3.3.1	inclusion of all Public User Identities in the de-registration request?	6.1.3.1, 1st dashed item	o	
3.4	processing of user location queries (Receipt of Location-Info-Request and sending of Location-Info-Answer)?	6.1.4	m	
3.4.1	prioritization of user location requests based on priority level in Session-Priority AVP?	6.1.4.1, paragraph 1	o	
3.4.2	inclusion of server capabilities in the answer to the location query?	6.1.4.1, point 2a, 1st dashed item	c.2	
3.4.3	the feature IMS Restoration Indication ("IMSRestorationInd") for the LIR/LIA message exchange?	ETSI TS 129 229 [2], table 7.1.1 line 3	o	
4	user data handling procedures?	6.2	m	
4.1	delivery of user data and Service related information during the registration procedure?	6.2.1, 6.1.2	m	
4.2	HSS initiated update of user information (Sending of Push-Profile-Request)?	6.2.2	m	

Item	Does the IUT support ...	Reference	Status	Support
4.2.1	the feature Shared iFC sets ("SiFCd") for the PPR/PPA message exchange?	ETSI TS 129 229 [2], table 7.1.1 line 1	o	
4.2.2	the feature Alias Indication ("AliasInd") for the PPR/PPA message exchange?	ETSI TS 129 229 [2], table 7.1.1 line 2	m	
5	authentication procedures (Receipt of Multimedia-Auth-Request and sending of Multimedia-Auth-Answer)?	6.3	m	
5.1	error handling procedures for S-CSCF names that were not assigned during registration?	8.1.1	m	
5.1.1	de-registration of data in the S-CSCF that was assigned during the registration?	8.1.1, paragraph 3	o	
6	implicit registration?	6.5	m	
6.1	S-CSCF initiated implicit registration procedures?	6.5.1	m	
6.2	HSS initiated implicit registration procedures?	6.5.2	m	
7	procedures for the download of relevant user profiles?	6.6, 6.6.1	m	
c.2:	o, if A.4/2 is supported, else n/a			

A.5.3   PICS Items for I-CSCF

A.5.3.1   System Capabilities for I-CSCF

Table A.5 needs only to be completed for I-CSCF implementations, where item A.2/2.1 above is supported.

Table A.6: System Capabilities for I-CSCF

Item	Does the IUT support ...	Reference	Status	Support
1.1	correct handling of the non-receipt of mandatory information elements?	6, paragraph 2	m	
1.2	correct handling of the receipt and non-receipt of conditional information elements?	6, paragraph 3, 4, 5	m	
1.3	correct handling of the receipt and non-receipt of optional information elements?	6, paragraph 6	m	
2	IMS Restoration Procedures?	ETSI TS 123 380 [3]	o	2
3	location management procedures?	6.1	m	
3.1	invocation of the user registration status queries (Sending of User-Authorization-Request)?	6.1.1	m	
3.1.1	the feature IMS Restoration Indication ("IMSRestorationInd") for the UAR/UAA message exchange?	ETSI TS 129 229 [2], table 7.1.1 line 3	o	
3.2	invocation of the user location queries (Sending of Location-Info-Request)?	6.1.4	m	
3.2.1	the feature IMS Restoration Indication ("IMSRestorationInd") for the LIR/LIA message exchange?	ETSI TS 129 229 [2], table 7.1.1 line 3	o	
4	IMS Emergency Registration	6.1.1.1, 1st dashed line within item 4 and ETSI TS 129 229 [2], clause 6.3.44	o	

A.5.4   PICS Items for S-CSCF

A.5.4.1   System Capabilities for S-CSCF

Tables A.7 and A.8 provided in this clause need only to be completed for S-CSCF implementations, where item A.2/2.1 above is supported.

Table A.9: System Capabilities for S-CSCF

Item	Does the IUT support ...	Reference	Status	Support
1.1	correct handling of the non-receipt of mandatory information elements?	6 paragraph 2	m	
1.2	correct handling of the receipt and non-receipt of conditional information elements?	6 paragraph 3, 4, 5	m	
1.3	correct handling of the receipt and non-receipt of optional information elements?	6 paragraph 6	m	
2	IMS Restoration Procedures?	ETSI TS 123 380 [3]	o	2
3	location management procedures?	6.1	m	
3.1	invocation of S-CSCF registration/deregistration notifications (Sending of Server-Assignment-Request)?	6.1.2	m	
3.1.1	the feature Shared iFC sets ("SiFCd") for the SAR/SAA message exchange?	ETSI TS 129 229 [2], table 7.1.1 line 1	o	
3.1.2	the feature Alias Indication ("AliasInd") for the SAR/SAA message exchange?	ETSI TS 129 229 [2], table 7.1.1 line 2	m	
3.1.3	the feature IMS Restoration Indication ("IMSRestorationInd") for the SAR/SAA message exchange?	ETSI TS 129 229 [2], table 7.1.1 line 3	o	
3.2	processing of network initiated de-registration requests (Receipt of Registration-Termination-Request and sending of Registration-Termination-Answer)?	6.1.3	m	
4	user data handling procedures?	6.2	m	
4.1	receipt of user data and Service related information during the registration procedure?	6.2.1, 6.1.2	m	
4.2	processing of HSS initiated update of user information (Receipt of Push-Profile-Request and sending of Push-Profile-Answer)?	6.2.2	m	
4.2.1	the feature Shared iFC sets ("SiFCd") for the PPR/PPA message exchange?	ETSI TS 129 229 [2], table 7.1.1 line 1	o	
4.2.2	the feature Alias Indication ("AliasInd") for the PPR/PPA message exchange?	ETSI TS 129 229 [2], table 7.1.1 line 2	m	
5	authentication procedures (Sending of Multimedia-Auth-Request)?	6.3	m	
6	implicit registration?	6.5	m	
6.1	S-CSCF initiated implicit registration procedures?	6.5.1	m	
6.2	HSS initiated implicit registration procedures?	6.5.2	m	
7	procedures for the download of relevant user profiles?	6.6, 6.6.2	m	

A.5.4.2 S-CSCF Capabilities

Table A.10: S-CSCF Capabilities

Item	Does the IUT support ...	Reference	Status	Support
1	handling of Wildcarded PSIs (Capability: "Wildcarded PSI")?	Table 6.7 line 1	m	
2	processing iFCs with a Session Case "Originating_Unregistered" received from the HSS in the user profile (Capability: "OrigUnreg SPT")?	Table 6.7 line 2	m	
3	processing iFCs with a Session Case "Originating_CDIV" received from the HSS in the user profile (Capability: "OrigCDIV SPT")?	Table 6.7 line 3	m	
4	"SiFC" feature defined in the ETSI TS 129 229 [2] (Capability: "Shared iFC sets")?	Table 6.7 line 4	o	
5	handling of "Display Name". (Capability: "Display Name")?	Table 6.7 line 5	o	
6	"AliasInd" feature defined in ETSI TS 129 229 [2] (Capability: "Alias")?	Table 6.7 line 6	o	
7	handling of SIP Digest Authentication (Capability: "SIP Digest Authentication")?	Table 6.7 line 7	m	
8	handling of NASS Bundled Authentication (Capability: "NASS Bundled Authentication")?	Table 6.7 line 8	m	
9	handling of Wildcarded Public User Identities (Capability: "Wildcarded IMPUs")?	Table 6.7 line 9	m	
10	the loose-route mechanism (Capability: "Loose-Route ")?	Table 6.7 line 10	m	
11	network default pre-configured namespaces and associated Service Priority Levels (Capability: "Priority Service")?	Table 6.7 line 11	m	
12	priority namespaces and associated Priority Levels (Capability: "Extended Priority ")?	Table 6.7 line 12	m	
13	GIBA (Capability: "Early IMS Security")?	Table 6.7 line 13	m	
14	privileged sender (Capability: "Privileged-Sender")?	Table 6.7 line 14	m	
15	handling of IMSIs (Capability: "IMSI")?	Table 6.7 line 15	m	
16	handling of IMS-AKA Authentication (Capability: "Digest-AKAv1-MD5")?	Table 6.3.2 line 1	o	

A.6   PICS pro forma tables for the Dx interface

A.6.1   Roles

Table A.11: Roles for the Dx interface

Item	Roles	Reference	Status	Support
1	SLF		o.1	
2	CSCF		o.1	
2.1	I-CSCF		c.1	
2.2	S-CSCF		c.1	
o.1:	At least one of these roles shall be supported.			
c.1:	At least one of these roles shall be supported, if A.11/1 is supported, else n/a.			

History

Document history		
V1.1.1	October 2014	Publication
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