

ETSI TS 129 433 V8.1.1 (2009-01)

Technical Specification

**Digital cellular telecommunications system (Phase 2+);
Universal Mobile Telecommunications System (UMTS);
TISPAN;
IP Multimedia;
Diameter based protocol for the interfaces between the Call Session Control
Function and the User Profile Server Function/Subscription Locator
Function;
Signalling flows and protocol details [3GPP TS 29.228 and 29.229 modified]
(3GPP TS 29.433 version 8.1.1 Release 8)**



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ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

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Foreword

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Foreword

This Technical Specification (TS) was been produced by ETSI Technical Committee Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN) and originally published as ETSI TS 183 033 [7]. It was transferred to the 3rd Generation Partnership Project (3GPP) in December 2007.

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

- x the first digit:
 - 1 presented to TSG for information;
 - 2 presented to TSG for approval;
 - 3 or greater indicates TSG approved document under change control.
- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the document.

1 Scope

The present document provides the ETSI TISPAN endorsement of the 3GPP TS 29.228 [1] "Cx and Dx interfaces; Signalling flows and messages contents" and the 3GPP TS 29.229 [2] "IP Multimedia (IM) Subsystem Cx and Dx interfaces based on the DIAMETER protocol; Protocol details".

The present document provides the necessary adaptations to the above specifications, in order to comply with the requirements of NGN Release 2.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

Referenced documents which are not found to be publicly available in the expected location might be found at <http://docbox.etsi.org/Reference>.

For online referenced documents, information sufficient to identify and locate the source shall be provided. Preferably, the primary source of the referenced document should be cited, in order to ensure traceability. Furthermore, the reference should, as far as possible, remain valid for the expected life of the document. The reference shall include the method of access to the referenced document and the full network address, with the same punctuation and use of upper case and lower case letters.

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 indispensable for the application of the present document. For dated references, only the edition cited applies. For non-specific references, the latest edition of the referenced document (including any amendments) applies.

- [1] 3GPP TS 29.228: "3rd Generation Partnership Project; Technical Specification Group Core Network and Terminals; IP Multimedia (IM) Subsystem Cx and Dx interfaces; Signalling flows and message contents".
- [2] 3GPP TS 29.229: "3rd Generation Partnership Project; Technical Specification Group Core Network and Terminals; Cx and Dx interfaces based on the Diameter protocol; Protocol details".
- [3] Void.
- [4] IETF RFC 2617: "HTTP Authentication: Basic and Digest Access Authentication".
- [5] IETF RFC 3588: "Diameter Base Protocol".

2.2 Informative references

- [6] draft-ietf-aaa-diameter-sip-app-10: "Diameter Session Initiation Protocol (SIP) Application".

- [7] ETSI TS 183 033 V1.2.0: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); IP Multimedia; Diameter based protocol for the interfaces between the Call Session Control Function and the User Profile Server Function/Subscription Locator Function; Signalling flows and protocol details [3GPP TS 29.228 V6.8.0 and 3GPP TS 29.229 V6.6.0, modified]".

3 Abbreviations

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

AVP	Attribute-Value Pair
CSCF	Call Session Control Function
ETSI	European Telecommunications Standards Institute
HTTP	Hyper Text Transfer Protocol
IETF	Internet Engineering Task Force
RFC	Request For Comments
S-CSCF	Serving-CSCF
SIP	Session Initiation Protocol
UPSF	User Profile Server Function

4 Endorsement notice

The elements of 3GPP TS 29.228 [1] and 3GPP TS 29.229 [2] apply, with the following modifications.

NOTE: Underlining and/or strike-out are used to highlight detailed modifications where necessary.

5 Global modifications to 3GPP TS 29.228

Replace the clauses "Scope", "References" and "Definitions, symbols and abbreviations" with the following three clauses (Scope, References and Definitions, symbols and abbreviations).

1 Scope

The scope is endorsed with the replacement of the "HSS" by the "UPSF".

2 References

Replace the references in [1] as shown in table 1.

Table 1: Replacement of references in 3GPP TS 29.228

	Reference in 3GPP TS 29.228	Replaced references
1	3GPP TS 23.228: "IP Multimedia (IM) Subsystem - Stage 2".	ETSI TS 182 006: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); IP Multimedia Subsystem (IMS); Stage 2 description [3GPP TS 23.228 v7.2.0, modified]" (note 1).
2	3GPP TS 24.228: "Signalling flows for the IP multimedia call control based on SIP and SDP".	(note 2).
3	3GPP TS 33.203: "Access security for IP-based services".	(note 2).
4	3GPP TS 23.002 "Network architecture".	ETSI ES 282 001: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); NGN Functional Architecture Release 1" (note 1).
5	3GPP TS 29.229 [2]: "Cx Interface based on Diameter - Protocol details".	The present document (note 1).
8	3GPP TS 24.229: "IP Multimedia Call Control Protocol based on SIP and SDP" - stage 3.	ETSI ES 283 003: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); IP Multimedia Call Control Protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP) Stage 3 [3GPP TS 24.229 (Release 7), modified]" (note 1).
10	3GPP TS 23.141: "Presence Service; Architecture and Functional Description".	ETSI TS 182 008: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Presence Service; Architecture and functional description [Endorsement of 3GPP TS 23.141 and OMA-AD-Presence_SIMPLE-V1_0]" (note 1).
NOTE 1: The reference in [1] is replaced by the document listed on the right column. This replacement is applicable to all occurrences of the reference throughout the present document.		
NOTE 2: The reference in [1] contains 3GPP specific requirements and is not generally applicable to the present document.		

3 Definitions, symbols and abbreviations

Endorsed with changes.

3.1 Definitions

Endorsed with the replacement of the "HSS" by the "UPSF".

3.2 Abbreviations

Replace:

HSS Home Subscriber Server

By:

UPSF User Profile Server Function

Add the following abbreviation:

NASS Network Attachment SubSystem

NOTE: Throughout the present document, all occurrences of "HSS" are replaced by "UPSF".

Throughout the text of 3GPP TS 29.228 [1]

4.0 Main concept

Endorsed.

5 General Architecture

Endorsed.

6 Procedure Descriptions

Endorsed with changes.

6.3 Authentication procedures

Endorsed with changes.

Modify as follows:

This procedure is used between the S-CSCF and the HSS to exchange information to support the authentication between the end user and the home IMS network. The procedure is invoked by the S-CSCF, corresponds to the combination of the operations Cx-AV-Req and Cx-AV-Req-Resp (see 3GPP TS 33.203 [3]) and is used:

- To retrieve authentication vectors from the HSS for IMS-AKA authentication.
- To resolve synchronization failures between the sequence numbers in the UE and the HSS for IMS-AKA authentication.
- To promote the result of the NASS-level authentication to the IMS level.

Table 6.3.1 is endorsed with the following addition:

When the S-CSCF performs the operation Cx-AV-Req, if it may not know the authentication scheme at this point (e.g. in the non IMS-AKA cases), it can set SIP-Number-Auth-Items to any positive value.

Table 6.3.2 is endorsed with the following change:

When the S-CSCF performs the operation Cx-AV-Req, if it may not know the authentication scheme at this point (e.g. in the non IMS-AKA case), it should set the SIP-Authentication-scheme field to "unknown". Later the HSS changes this value based on the actual authentication scheme stored in the user authentication data.

Table 6.3.3 is endorsed with the following clarification:

Table 6.3.3 is applicable to IMS-AKA only.

Table 6.3.4 is modified as follows:

Table 6.3.4: Authentication Request Response

Information element name	Mapping to Diameter AVP	Cat.	Description
User Identity (See 7.2)	Public-Identity	C	Public User Identity. It shall be present when the result is DIAMETER_SUCCESS.
Private User Identity (See 7.3)	User-Name	C	Private User Identity. It shall be present when the result is DIAMETER_SUCCESS.
Number Authentication Items (See 7.10)	SIP-Number-Auth-Items	C	This AVP indicates the number of authentication vectors delivered in the Authentication Data information element. It shall be present when the result is DIAMETER_SUCCESS.
Authentication Data (See 7.9)	SIP-Auth-Data-Item	C	If the SIP-Number-Auth-Items AVP is equal to zero or it is not present, then this AVP shall not be present. See table 6.3.5 and table 6.3.A for the contents of this information element.
Result (See 7.6)	Result-Code / Experimental-Result	M	Result of the operation. Result-Code AVP shall be used for errors defined in the Diameter Base Protocol. Experimental-Result AVP shall be used for Cx/Dx errors. This is a grouped AVP which contains the 3GPP Vendor ID in the Vendor-Id AVP, and the error code in the Experimental-Result-Code AVP.

Table 6.3.5 is endorsed with the following clarification:

Table 6.3.5 is applicable to IMS-AKA only.

Add the following table:

Table 6.3.A: Authentication Data content - Response for NASS-Bundled Authentication

Information element name	Mapping to Diameter AVP	Cat.	Description
Authentication Scheme (See 7.9.2)	SIP-Authentication-Scheme	M	Authentication scheme. It shall contain "NASS-Bundled".
Line Identifier (See 7.9.8)	Line-Identifier	M	This information element contains a fixed broadband access line identifier associated to the user. This information element can be repeated.

6.3.1 Detailed behaviour

Clause 6.3.1 is endorsed with the following clarifications:

- between step 2 and step 3, the HSS checks the user authentication data for the authentication scheme stored in HSS.
- step 4 is only applicable to authentication schemes that support synchronization.

7 Information Element Contents

Endorsed with changes.

Modify clause 7.9.2 as follows:

7.9.2 Authentication Scheme

This information element contains the authentication scheme, which is used to encode the authentication parameters.

The scheme is "Digest-AKA-v1-MD5".

Add the following clause:

7.9.8 Line Identifier

This information element contains the line identifier of the user's network termination.

8 Error Handling procedures

Endorsed.

9 Protocol version identification

Endorsed.

10 Operational aspects

Endorsed.

Annex A (normative)

Endorsed with changes.

A.3 Cx message parameters to Diameter AVP mapping

Table A.3.1 is endorsed with the following addition:

Table A.3.1: Cx message parameters to Diameter AVP mapping

Cx parameter	AVP Name
...	...
<u>Line Identifier</u>	<u>Line-Identifier</u>

A.4 Message flows

Endorsed with changes.

A.4.1 Registration - user not registered

Endorsed with the following changes:

Figure A.4.1.1 is applicable to IMS-AKA.

Add the following figure:

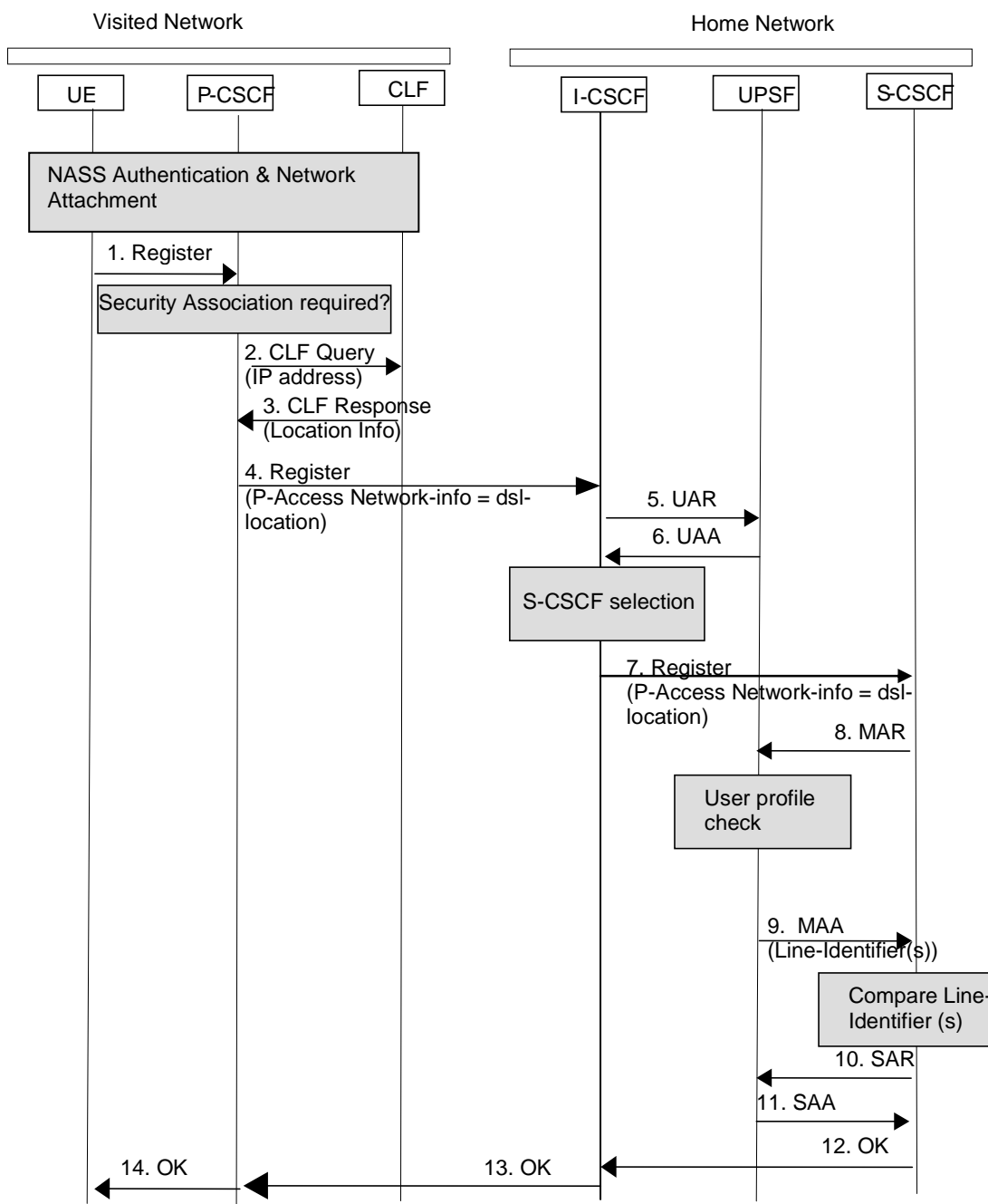


Figure A.4.1.1A: Registration - user not registered (NASS-Bundled authentication)

Annex E (normative)

Endorsed.

Annex F (normative)

Endorsed.

6 Global modifications to 3GPP TS 29.229

Replace the clauses "Scope", "References" and "Definitions, symbols and abbreviations" with the following three clauses (Scope, References, and Definitions, symbols and abbreviations).

1 Scope

The scope is endorsed with the replacement of the "HSS" by the "UPSF".

2 References

Replace the references in [2] as shown in table 2

Table 2: Replacement of references in 3GPP TS 29.229

	Reference in 3GPP TS 29.229	Replaced references
[1]	3GPP TS 29.228 [1] "IP Multimedia (IM) Subsystem Cx and Dx interface; signalling flows and message contents".	The present document (note 1).
[11]	3GPP TS 29.329 "Sh Interface based on the Diameter protocol; protocol details".	ETSI TS 183 037: "Endorsement of the Sh Interface based on the Diameter protocol; Protocol details (Release 6), NGN Release 1" (note 1).
NOTE 1: The reference in [2] is replaced by the document listed on the right column. This replacement is applicable to all occurrences of the reference throughout the present document.		
NOTE 2: The reference in [2] contains 3GPP specific requirements and is not generally applicable to the present document.		

3 Definitions, symbols and abbreviations

Endorsed with changes.

3.1 Definitions

Endorsed with the replacement of the "HSS" by the "UPSF".

3.2 Abbreviations

Replace:

HSS Home Subscriber Server

By:

UPSF User Profile Server Function

Add the following abbreviation:

NASS Network Attachment SubSystem

NOTE: Throughout the present document, all occurrences of "HSS" are replaced by "UPSF".

Throughout the text of 3GPP TS 29.229 [2]

4 General

Endorsed.

5 User of the Diameter Base Protocol

Endorsed with changes.

5.6 Advertising Application Support

Endorsed with the following changes:

The HSS, S-CSCF and I-CSCF shall advertise support of the Diameter Multimedia Application by including the value of the application identifier (see clause 6) in the Auth-Application-Id AVP within the Vendor-Specific-Application-Id grouped AVP of the Capabilities-Exchange-Request and Capabilities-Exchange-Answer commands.

The vendor identifier values of 3GPP (10415) and ETSI (13019) shall be included in the Supported-Vendor-Id AVP of the Capabilities-Exchange-Request and Capabilities-Exchange-Answer commands, and in the Vendor-Id AVP within the Vendor-Specific-Application-Id grouped AVP of the Capabilities-Exchange-Request and Capabilities-Exchange-Answer commands.

NOTE: The Vendor-Id AVP included in Capabilities-Exchange-Request and Capabilities-Exchange-Answer commands that is not included in the Vendor-Specific-Application-Id AVPs as described above shall indicate the manufacturer of the Diameter node as per RFC 3588 [6].

6 Diameter application for Cx interface

Endorsed with changes.

6.1 Command-Code values

Endorsed.

6.2 Result-Code AVP values

Endorsed.

6.3 AVPs

Endorsed with the following changes:

Add the following text at the end of the paragraph before table 6.3.1:

The Line-Identifier AVP has a Vendor-Id header set to ETSI (13019).

Table 6.3.1 is endorsed with the following addition:

Table 6.3.1: Diameter Multimedia Application AVPs

Attribute Name	AVP Code	Section defined	Value Type	AVP Flag rules				May encr.
				Must	May	Should not	Must not	
...
<u>Line-Identifier</u>	<u>500</u>	<u>6.3.34</u>	<u>OctetString</u>	<u>V</u>			<u>M</u>	<u>No</u>
NOTE 1: The AVP header bit denoted as "M" indicates whether support of the AVP is required. The AVP header bit denoted as "V" indicates whether the optional Vendor-ID field is present in the AVP header. For further details, see IETF RFC 3588 [6].								
NOTE 2: Depending on the concrete command.								

6.3.13 SIP-Auth-Data-Item AVP

Endorsed with the following change:

SIP-Auth-Data-Item ::= < AVP Header : 612 10415 >

[SIP-Item-Number]

[SIP-Authentication-Scheme]

[SIP-Authenticate]

[SIP-Authorization]

[SIP-Authentication-Context]

[Confidentiality-Key]

[Integrity-Key]

*[Line-Identifier]

* [AVP]

Add the following clause:

6.3.34 Line-Identifier AVP

The Line-Identifier AVP is of type OctetString. This AVP contains a fixed broadband access line identifier associated to the user.

6.4 Use of namespaces

Endorsed.

7 Special Requirements

7.1 Version Control

Endorsed with changes.

7.1.1 Defining a new feature

Endorsed with the following change:

Table 7.1.1 is endorsed with the following addition:

Table 7.1.1: Features of Feature-List-ID 1 used in Cx

Feature bit	Feature	M/O	Description
...
<u>0</u>	<u>NASS_BUNDLED</u>	<u>O</u>	<p><u>NGN extensions for NASS Bundled authentication.</u></p> <p><u>This feature is applicable for any command pair affected by NGN extensions for NASS Bundled authentication.</u></p> <p><u>When the S-CSCF and the UPSF support this feature, both nodes are able to handle Cx messages with the extensions and/or modifications for NASS Bundled authentication.</u></p>
<u>1</u>	<u>HTTP_DIGEST_MD5</u>	<u>O</u>	<u>NGN extensions for HTTP Digest authentication.</u>
<p>Feature bit: The order number of the bit within the Supported-Features AVP, e.g. '1'.</p> <p>Feature: A short name that can be used to refer to the bit and to the feature, e.g. 'MOM'.</p> <p>M/O: Defines if the implementation of the feature is mandatory ('M') or optional ('O').</p> <p>Description: A clear textual description of the feature.</p> <p>The Supported-Features AVP used to identify features added to this table by the present endorsement document shall contain the vendor ID of ETSI (13019).</p>			

7.2 Supported features

Endorsed.

7.3 Interface versions

Endorsed.

Annex ZA (informative):

Void

ZA.3 Additional Cx feature in support of HTTP Digest authentication

This feature is applicable for any command pair affected by NGN extensions for HTTP Digest authentication.

When the S-CSCF and the UPSF support this feature, both nodes are able to handle Cx messages with the extensions and/or modifications for HTTP Digest authentication.

See table 7.1.1 in the present endorsement of 3GPP TS 29.229 [2].

Annex ZB (informative): Change history

Change history							
Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Old	New
2006-04					Publication as ETSI TS 183 033		1.1.1
2007-04					Publication as ETSI TS 183 033		1.1.3
2007-10					Publication as ETSI TS 183 033		1.2.0
2007-12					Conversion to 3GPP TS 29.433		1.2.1
2008-03	CT#39	CP-080027			Version 1.2.1 approved in CP-080027 and version 7.0.0 created by MCC for publication	1.2.1	7.0.0
2008-03					Based on the decisions at CT#39 version 8.0.0 created by MCC, no technical change	7.0.0	8.0.0
2008-06	CT#40	CP-080276	0001	1	Removal of Informative SIP Digest Annex for NGN R2	8.0.0	8.1.0
2008-12	CT#42				Copyright Notification updated	8.1.0	8.1.1

History

Document history		
V8.0.0	April 2008	Publication
V8.1.0	July 2008	Publication
V8.1.1	January 2009	Publication