

ETSI TS 129 109 V13.0.0 (2016-01)



**Digital cellular telecommunications system (Phase 2+);
Universal Mobile Telecommunications System (UMTS);
LTE;
Generic Authentication Architecture (GAA);
Zh and Zn Interfaces based on the Diameter protocol;
Stage 3
(3GPP TS 29.109 version 13.0.0 Release 13)**



Reference

RTS/TSGC-0429109vd00

Keywords

GSM,LTE,UMTS

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

Important notice

The present document can be downloaded from:
<http://www.etsi.org/standards-search>

The present document may be made available in electronic versions and/or in print. The content of any electronic and/or print versions of the present document shall not be modified without the prior written authorization of ETSI. In case of any existing or perceived difference in contents between such versions and/or in print, the only prevailing document is the print of the Portable Document Format (PDF) version kept on a specific network drive within ETSI Secretariat.

Users of the present document should be aware that the document may be subject to revision or change of status. Information on the current status of this and other ETSI documents is available at
<http://portal.etsi.org/tb/status/status.asp>

If you find errors in the present document, please send your comment to one of the following services:
<https://portal.etsi.org/People/CommitteeSupportStaff.aspx>

Copyright Notification

No part may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm except as authorized by written permission of ETSI.

The content of the PDF version shall not be modified without the written authorization of ETSI.
The copyright and the foregoing restriction extend to reproduction in all media.

© European Telecommunications Standards Institute 2016.
All rights reserved.

DECT™, **PLUGTESTS™**, **UMTS™** and the ETSI logo are Trade Marks of ETSI registered for the benefit of its Members.
3GPP™ and **LTE™** are Trade Marks of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners.
GSM® and the GSM logo are Trade Marks registered and owned by the GSM Association.

Intellectual Property Rights

IPRs essential or potentially essential to the present document may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: *"Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards"*, which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (<https://ipr.etsi.org>).

Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Foreword

This Technical Specification (TS) has been produced by ETSI 3rd Generation Partnership Project (3GPP).

The present document may refer to technical specifications or reports using their 3GPP identities, UMTS identities or GSM identities. These should be interpreted as being references to the corresponding ETSI deliverables.

The cross reference between GSM, UMTS, 3GPP and ETSI identities can be found under <http://webapp.etsi.org/key/queryform.asp>.

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.

Contents

Intellectual Property Rights	2
Foreword.....	2
Modal verbs terminology.....	2
1 Scope	6
2 References	9
3 Definitions, symbols and abbreviations	11
3.1 Definitions	11
3.2 Symbols.....	11
3.3 Abbreviations	11
4 GBA Bootstrapping Zh interface and Zh' interface.....	13
4.1 Generic bootstrapping network architecture.....	13
4.2 Protocol Zh between BSF and HSS.....	13
4.3 Protocol Zh' between BSF and HLR	18
4.3.1 Public to Private Identity Resolution over Zh between BSF and HLR.....	19
5 GAA Application Zn and Zpn interfaces	21
5.1 Applications" network architecture	21
5.2 Protocol Zn between NAF and BSF based on Diameter	22
5.3 Protocol Zn between NAF and BSF based on Web Services	25
5.4 Protocol Zpn between NAF and BSF based on Diameter	28
5.5 Protocol Zpn between NAF and BSF based on Web Services	32
6 Diameter application for Zh, Zn and Zpn interfaces	35
6.0 Introduction	35
6.1 Command-Code values	35
6.2 Result-Code AVP values.....	35
6.2.1 Success.....	35
6.2.2 Permanent failures	35
6.2.2.1 DIAMETER_ERROR_IDENTITY_UNKNOWN (5401).....	35
6.2.2.2 DIAMETER_ERROR_NOT_AUTHORIZED (5402)	35
6.2.2.3 DIAMETER_ERROR_TRANSACTION_IDENTIFIER_INVALID (5403).....	36
6.2.2.4 Void.....	36
6.2.2.5 Void.....	36
6.2.2.6 Void.....	36
6.2.2.7 Void.....	36
6.3 AVPs	36
6.3.1 Common AVPs	37
6.3.1.1 GBA-UserSecSettings AVP.....	37
6.3.1.2 Transaction-Identifier AVP.....	37
6.3.1.3 NAF-Id	37
6.3.1.4 GAA-Service-Identifier AVP.....	37
6.3.1.5 Key-ExpiryTime AVP	37
6.3.1.6 ME-Key-Material AVP.....	37
6.3.1.7 UICC-Key-Material AVP	38
6.3.1.8 GBA_U-Awareness-Indicator.....	38
6.3.1.9 BootstrapInfoCreationTime AVP	38
6.3.1.10 GUSS-Timestamp AVP	38
6.3.1.11 GBA-Type.....	38
6.3.1.12 UE-Id.....	38
6.3.1.13 UE-Id-Type	38
6.3.1.14 UICC-App-Label	38
6.3.1.15 UICC-ME.....	39
6.3.1.16 Requested-Key-Lifetime	39
6.3.1.17 Private-Identity-Request	39

6.3.1.18	GBA-Push-Info	39
6.3.1.19	NAF-SA-Identifier	39
6.3.1.20	Security-Feature-Request	39
6.3.1.21	Security-Feature-Response	39
6.4	User identity to HSS resolution	39
7	Use of namespaces	41
7.1	AVP codes	41
7.2	Experimental-Result-Code AVP values	41
7.3	Command Code values	41
Annex A (normative):	GBA-UserSecSettings XML definition	42
Annex B (normative):	GAA Service Type Codes	47
Annex C (normative):	GAA Authorization flag codes	48
Annex D (normative):	Web Services Definition for Zn interface	49
Annex E (informative):	Liberty authentication context definitions for GBA	51
E.1	Introduction	51
E.2	GBA Authentication context statement data model	51
E.3	GBA authentication context statement schema	52
E.4	GBA authentication context classes	53
E.4.1	GBAOneFactorUnregistered	53
E.4.1.1	Associated 3GPP URI	53
E.4.1.2	Class schema	53
E.4.2	GBATwoFactorUnregistered	54
E.4.2.1	Associated 3GPP URI	54
E.4.2.2	Class schema	54
E.4.3	GBAOneFactorContract	55
E.4.3.1	Associated 3GPP URI	55
E.4.3.2	Class schema	55
E.4.4	GBATwoFactorContract	56
E.4.4.1	Associated 3GPP URI	56
E.4.4.2	Class schema	56
Annex F (informative):	SAML authentication context definitions for GBA	58
F.1	Introduction	58
F.2	GBA authentication context declaration data model	58
F.3	GBA authentication context declaration types	59
F.4	GBA authentication context declaration classes	60
F.4.1	GBAOneFactorUnregistered	60
F.4.1.1	Associated 3GPP URI	60
F.4.1.2	Class schema	60
F.4.2	GBATwoFactorUnregistered	62
F.4.2.1	Associated 3GPP URI	62
F.4.2.2	Class schema	62
F.4.3	GBAOneFactorContract	64
F.4.3.1	Associated 3GPP URI	64
F.4.3.2	Class schema	64
F.4.4	GBATwoFactorContract	66
F.4.4.1	Associated 3GPP URI	67
F.4.4.2	Class schema	67
Annex G (normative):	Web Services Definition for Zpn interface	70
Annex H (informative):	Change history	72
History		74

Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

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 stage 3 specification defines the Diameter based implementation for bootstrapping Zh interface (BSF-HSS) and Dz interface (BSF-SLF) for HSS resolution for the BSF, the MAP based implementation for bootstrapping Zh' interface (BSF-HLR) and GAA Application Zn interface (BSF-NAF) in Generic Authentication Architecture (GAA). This specification also defines the Web Services based implementation for GAA Application Zn reference point (BSF-NAF). The definition contains procedures, message contents and coding. The procedures for bootstrapping and usage of bootstrapped security association are defined in 3GPP TS 33.220 [5].

The present document also specifies the Diameter and Web Services based implementation for the GAA Application Push Function Zpn reference point (BSF-NAF). The procedures for bootstrapping are defined in 3GPP TS 33.223 [23].

This specification is a part of the Generic Authentication Architecture (GAA) specification series.

The diameter based implementation for the Zh interface is based on re-usage of Cx interface Multimedia-Auth-Request/Answer messages originally between CSCF and HSS. These messages are defined in 3GPP TS 29.229 [3]. The 3GPP IMS mobility management uses the same definitions between CSCF and HSS. The present document defines how the defined messages are used with the bootstrapping and GAA application procedures (e.g. subscriber certificates) and the application logic that is needed in GAA network elements (BSF, HSS, and NAF).

Figure 1.1 depicts the relationships of these specifications to the other specifications for the Diameter based implementations.

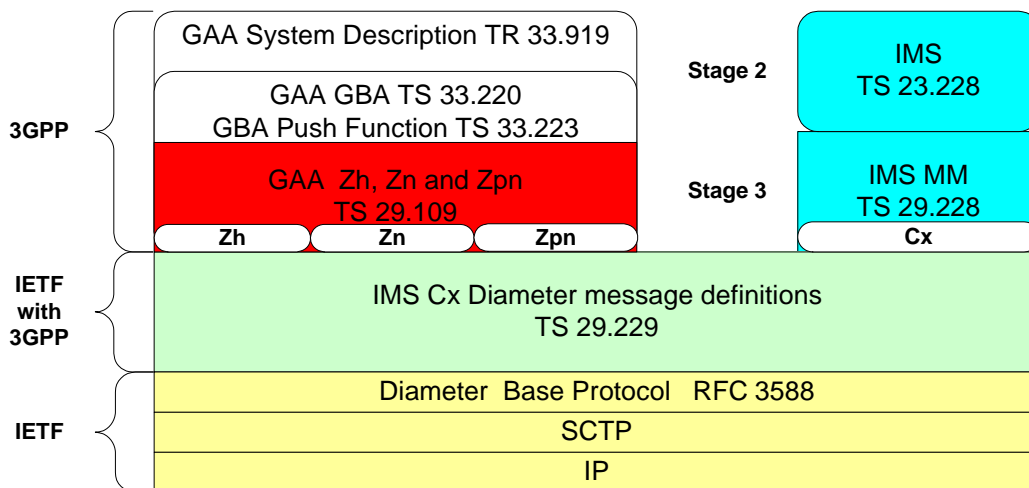


Figure 1.1: Relationships to other specifications

Figure 1.2 provides an informal overall quick introduction to the whole signalling procedures in GAA system. The important identifiers are marked bold and optional data items are italicised. The Ub and Ua interfaces, not defined in this TS, are simplified.

NOTE: The Zh' interface (BSF-HLR) is not represented in this figure.