

ETSI TS 143 318 V13.0.0 (2016-01)



**Digital cellular telecommunications system (Phase 2+);
Generic Access Network (GAN);
Stage 2
(3GPP TS 43.318 version 13.0.0 Release 13)**



Reference

RTS/TSGG-0143318vd00

Keywords

GSM

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 |
| Foreword..... | 7 |
| 1 Scope | 8 |
| 2 References | 8 |
| 3 Definitions, symbols and abbreviations | 10 |
| 3.1 Definitions | 10 |
| 3.2 Symbols..... | 11 |
| 3.3 Abbreviations | 11 |
| 4 Architecture | 13 |
| 4.1 GAN A/Gb mode architecture..... | 13 |
| 4.2 GAN Iu mode architecture | 14 |
| 5 Functional entities | 16 |
| 5.1 Mobile Station (MS)..... | 16 |
| 5.2 Generic Access Network Controller (GANC)..... | 16 |
| 5.2.1 GAN A/Gb mode..... | 16 |
| 5.2.2 GAN Iu mode | 17 |
| 6 Control and User Plane Architecture..... | 17 |
| 6.1 CS Domain (GAN A/Gb mode)..... | 17 |
| 6.1.1 CS Domain - Control Plane | 17 |
| 6.1.1.1 CS Domain - Control Plane - GAN Architecture..... | 17 |
| 6.1.1.2 CS Domain - Control Plane - MS Architecture..... | 19 |
| 6.1.2 CS Domain - User Plane | 20 |
| 6.1.2.1 CS Domain - User Plane - GAN Architecture..... | 20 |
| 6.2 PS Domain (GAN A/Gb mode)..... | 21 |
| 6.2.1 PS Domain - GAN Architecture | 21 |
| 6.2.1.1 PS Domain - Control Plane - GAN Architecture | 21 |
| 6.2.1.2 PS Domain - User Plane - GAN Architecture | 22 |
| 6.2.2 PS Domain - MS Architecture | 23 |
| 6.3 CS Domain (GAN Iu mode)..... | 24 |
| 6.3.1 CS Domain - Control Plane | 24 |
| 6.3.1.1 CS Domain - Control Plane - GAN Architecture..... | 24 |
| 6.3.1.2 CS Domain - Control Plane - MS Architecture..... | 25 |
| 6.3.2 CS Domain - User Plane | 26 |
| 6.3.2.1 CS Domain - User Plane - GAN Architecture..... | 26 |
| 6.3.2.2 CS Domain - User Plane - MS Architecture | 27 |
| 6.4 PS Domain (GAN Iu mode) | 28 |
| 6.4.1 PS Domain - Control Plane..... | 28 |
| 6.4.1.1 PS Domain - Control Plane - GAN Architecture | 28 |
| 6.4.1.2 PS Domain - Control Plane - MS Architecture | 29 |
| 6.4.2 PS Domain - User Plane | 30 |
| 6.4.2.1 PS Domain - User Plane - GAN Architecture..... | 30 |
| 6.4.2.2 PS Domain - User Plane - MS Architecture..... | 31 |
| 7 Management functionality..... | 32 |
| 7.1 State diagram for Generic Access | 32 |
| 7.2 GA-RC (Generic Access Resource Control) | 33 |
| 7.2.1 General..... | 33 |
| 7.2.2 States of the GA-RC sub-layer | 33 |
| 7.3 GA-CSR (Generic Access Circuit Switched Resources)..... | 33 |
| 7.3.1 General..... | 33 |

| | | |
|-----------|--|----|
| 7.3.2 | States of the GA-CSR sub-layer | 34 |
| 7.4 | GA-PSR (Generic Access Packet Switched Resources)..... | 34 |
| 7.4.1 | States of the GA-PSR sub-layer..... | 34 |
| 7.4a | GA-RRC..... | 35 |
| 7.4a.1 | General..... | 35 |
| 7.4a.2 | States of the GA-RRC sub-layer..... | 35 |
| 7.5 | Security Mechanisms | 36 |
| 8 | High-Level Procedures for GAN A/Gb Mode | 36 |
| 8.1 | Mechanism of Mode Selection in Multi-mode terminals | 36 |
| 8.2 | PLMN Selection..... | 37 |
| 8.3 | Re-selection between GERAN/UTRAN/E-UTRAN and GAN modes | 38 |
| 8.3.1 | Rove-in (from GERAN/UTRAN/E-UTRAN mode to GAN mode)..... | 38 |
| 8.3.2 | Rove-out (from GAN mode to GERAN/UTRAN/E-UTRAN mode)..... | 39 |
| 8.4 | GAN Discovery and Registration related procedures..... | 39 |
| 8.4.1 | Discovery and Registration for Generic Access | 39 |
| 8.4.1.1 | General..... | 39 |
| 8.4.1.2 | Security Gateway Identification..... | 39 |
| 8.4.1.3 | GANC capabilities | 40 |
| 8.4.1.4 | MS capabilities..... | 40 |
| 8.4.1.4a | Required GAN Services..... | 40 |
| 8.4.1.4b | GAN Mode Selection..... | 40 |
| 8.4.1.5 | Discovery Procedure | 43 |
| 8.4.1.5.1 | Normal Case | 43 |
| 8.4.1.6 | Registration procedure | 44 |
| 8.4.1.6.1 | Normal case..... | 44 |
| 8.4.1.6.2 | Abnormal cases | 46 |
| 8.4.2 | De-Registration..... | 46 |
| 8.4.3 | Registration Update | 47 |
| 8.4.4 | Keep Alive..... | 48 |
| 8.4.5 | Cell Broadcast Information..... | 48 |
| 8.5 | Authentication | 49 |
| 8.6 | Encryption | 49 |
| 8.6.1 | Establishment of a Secure Association..... | 49 |
| 8.7 | GA-CSR Connection handling..... | 50 |
| 8.7.1 | GA-CSR Connection Establishment..... | 50 |
| 8.7.2 | GA-CSR Connection Release..... | 50 |
| 8.8 | Ciphering Configuration..... | 51 |
| 8.9 | GA-CSR Signalling and SMS Transport Procedures | 52 |
| 8.9.1 | Network initiated CS Signalling | 52 |
| 8.9.2 | MS initiated CS Signalling | 52 |
| 8.10 | Mobile Originated Call Flow..... | 53 |
| 8.11 | Mobile Terminated Call Flow | 55 |
| 8.12 | Call Clearing | 56 |
| 8.13 | Channel Modify | 56 |
| 8.14 | CS Handover between GAN A/Gb mode and GERAN/UTRAN mode..... | 57 |
| 8.14.1 | CS Handover to GAN A/Gb mode | 57 |
| 8.14.1.1 | GERAN to GAN CS Handover..... | 57 |
| 8.14.1.2 | UTRAN to GAN CS Handover..... | 59 |
| 8.14.2 | CS Handover from GAN A/Gb mode to GERAN | 61 |
| 8.14.3 | CS Handover from GAN A/Gb mode to UTRAN | 63 |
| 8.15 | Cell Change Order between GAN A/Gb mode and GERAN/UTRAN mode | 64 |
| 8.16 | GA-PSR Transport Channel Management Procedures..... | 65 |
| 8.16.1 | MS initiated Activation of GA-PSR Transport Channel..... | 65 |
| 8.16.2 | MS initiated Deactivation of the GA-PSR Transport Channel | 66 |
| 8.16.3 | Implicit Deactivation of the GA-PSR Transport Channel due to MS Deregistration | 67 |
| 8.16.4 | Network initiated GA-PSR Transport Channel Activation..... | 67 |
| 8.17 | GPRS Data, Signalling and SMS Transport..... | 68 |
| 8.17.1 | GA-PSR GPRS Data Transport Procedures..... | 68 |
| 8.17.2 | GA-PSR GPRS Signalling and SMS Transport Procedures | 68 |
| 8.17.2.1 | General | 68 |
| 8.17.2.2 | Network initiated GPRS Signalling | 69 |

| | | |
|------------|--|-----|
| 8.17.2.3 | MS initiated GPRS Signalling..... | 69 |
| 8.18 | GA-PSR Specific Signalling Procedures..... | 69 |
| 8.18.1 | Packet Paging for GPRS Data Service..... | 69 |
| 8.18.2 | Packet Paging for CS Domain Service | 70 |
| 8.18.3 | GPRS Suspend Procedure..... | 70 |
| 8.18.4 | GPRS Resume Procedure | 71 |
| 8.18.5 | MS Initiated Downlink Flow Control | 72 |
| 8.18.6 | Uplink Flow Control..... | 73 |
| 8.19 | Short Message Service | 73 |
| 8.19.1 | GSM based SMS..... | 73 |
| 8.19.2 | GPRS based SMS | 74 |
| 8.20 | Supplementary Services | 74 |
| 8.21 | Emergency Services | 74 |
| 8.21.1 | General..... | 74 |
| 8.21.2 | North American Emergency Calls | 74 |
| 8.21.2.1 | Phase 1 Solution..... | 74 |
| 8.21.2.1.1 | Phase 1 Requirements..... | 74 |
| 8.21.2.1.2 | Phase 1 Mechanism | 75 |
| 8.21.2.2 | Phase 2 Solution..... | 75 |
| 8.21.2.2.1 | Phase 2 Requirements..... | 75 |
| 8.21.2.2.2 | Phase 2 Mechanism | 75 |
| 8.22 | Location Services | 75 |
| 8.23 | PS Handovers between GAN A/Gb mode and GERAN/UTRAN mode..... | 76 |
| 9 | High-Level Procedures for GAN Iu Mode..... | 76 |
| 9.1 | Mechanism of Mode Selection in Multi-mode terminals | 76 |
| 9.2 | PLMN Selection..... | 76 |
| 9.3 | Re-selection between GERAN/UTRAN/E-UTRAN and GAN modes | 76 |
| 9.4 | GAN Discovery and Registration related procedures..... | 76 |
| 9.5 | Authentication | 76 |
| 9.6 | Encryption | 76 |
| 9.7 | GA-RRC Connection handling..... | 76 |
| 9.7.1 | GA-RRC Connection Establishment | 77 |
| 9.7.2 | GA-RRC Connection Release..... | 77 |
| 9.7.3 | GA-RRC Connection Release Request..... | 78 |
| 9.8 | Security Mode Control | 78 |
| 9.9 | NAS Signalling Procedures..... | 79 |
| 9.10 | Mobile Originated CS Call..... | 80 |
| 9.11 | Mobile Terminated CS Call..... | 82 |
| 9.12 | CS Call Clearing..... | 84 |
| 9.12.1 | CS Call Release | 84 |
| 9.12.2 | CS Channel Release..... | 84 |
| 9.13 | CS Channel Modification..... | 85 |
| 9.14 | CS Handover between GAN Iu mode and GERAN/UTRAN mode | 86 |
| 9.14.1 | CS Handover from GERAN to GAN | 86 |
| 9.14.1.1 | Normal case: IMSI is present in Relocation Request message | 87 |
| 9.14.1.2 | Exception Case: No IMSI in Relocation Request | 89 |
| 9.14.2 | CS Handover from UTRAN to GAN..... | 90 |
| 9.14.2.1 | Normal Case: IMSI is present in Relocation Request message..... | 91 |
| 9.14.2.2 | Exception Case: No IMSI in Relocation Request | 92 |
| 9.14.3 | CS Handover from GAN Iu mode to GERAN | 93 |
| 9.14.4 | CS Handover from GAN Iu mode to UTRAN | 95 |
| 9.15 | Cell Change Order between GAN Iu mode and GERAN mode..... | 97 |
| 9.16 | GA-RRC Packet Transport Channel Management Procedures | 97 |
| 9.16.1 | States of the GA-RRC Packet Transport Channel | 98 |
| 9.16.2 | PTC Activation | 98 |
| 9.16.2.1 | PTC Activation when GANC receives RAB Assignment Request..... | 98 |
| 9.16.2.2 | PTC Activation when GANC receives Relocation Request..... | 100 |
| 9.16.3 | PTC Data transfer | 101 |
| 9.16.4 | MS initiated PTC De-activation..... | 101 |
| 9.16.5 | MS initiated PTC Re-activation..... | 102 |
| 9.16.6 | Network initiated PTC De-activation | 103 |

| | | |
|---|--|------------|
| 9.16.7 | Network initiated PTC Re-activation..... | 104 |
| 9.16.7.1 | Active PDP Context, PS Signalling Connection Exists | 104 |
| 9.16.7.2 | Active PDP Context, No PS Signalling Connection | 105 |
| 9.16.8 | Implicit PTC De-activation due to MS De-registration | 106 |
| 9.16.9 | PTC Modification | 106 |
| 9.17 | (void)..... | 107 |
| 9.18 | (void)..... | 107 |
| 9.19 | Short Message Service | 107 |
| 9.19.1 | SMS via the CS domain..... | 107 |
| 9.19.2 | SMS via the PS domain | 107 |
| 9.20 | Supplementary Services | 108 |
| 9.21 | Emergency Services | 108 |
| 9.22 | Location Services | 108 |
| 9.23 | PS Handover between GAN Iu mode and GERAN/UTRAN mode..... | 108 |
| 9.23.1 | PS Handover from GERAN to GAN | 108 |
| 9.23.1.1 | Preparation Phase..... | 108 |
| 9.23.1.2 | Execution Phase | 109 |
| 9.23.2 | PS Handover from UTRAN to GAN | 110 |
| 9.23.2.1 | Preparation Phase..... | 110 |
| 9.23.2.2 | Execution Phase | 112 |
| 9.23.3 | PS Handover from GAN to GERAN | 113 |
| 9.23.3.1 | Preparation Phase..... | 113 |
| 9.23.3.2 | Execution Phase | 114 |
| 9.23.4 | PS handover from GAN to UTRAN..... | 115 |
| 9.23.4.1 | Preparation Phase..... | 115 |
| 9.23.4.2 | Execution Phase | 116 |
| Annex A (normative): Security mechanisms | | 117 |
| A.1 | EAP based Authentication..... | 117 |
| A.1.1 | EAP-SIM Procedure for authentication..... | 117 |
| A.1.2 | EAP-AKA Procedure for authentication | 119 |
| A.1.3 | Fast Re-authentication | 120 |
| A.1.3.1 | EAP-SIM Fast Re-authentication | 121 |
| A.1.3.2 | EAP-AKA Fast Re-authentication | 122 |
| A.2 | Profile of IKEv2 | 123 |
| A.3 | Profile of IPsec ESP | 123 |
| Annex B (informative): Configuration Information | | 124 |
| B.1 | GAN A/Gb mode ARFCN/BSIC for handover-to-GAN | 124 |
| B.2 | GAN Iu mode UARFCN/PSC for handover-to-GAN..... | 124 |
| B.2.1 | Cell Measurement Quantities and Values | 124 |
| Annex C (informative): Identifiers in GAN | | 125 |
| C.1 | Identifiers for MSs and generic IP access network | 125 |
| C.2 | Cell identifiers for GAN A/Gb mode | 125 |
| C.2.1 | GAN Cell Id for Location Services & Billing | 125 |
| C.2.1.1 | Assigning GAN Cell Id based on GSM location | 125 |
| C.2.2 | GAN Cell Id for handover-to-GAN | 126 |
| C.2.3 | GAN ARFCN/BSIC for handover-to-GAN | 126 |
| C.3 | (void)..... | 126 |
| Annex D (informative): Change history | | 127 |
| History | | 128 |

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.

iTeh STANDARD PREVIEW
(standards.iteh.ai)
Full standard:
<https://standards.iteh.ai/catalog/standards/sist/3490c8e-195c-4fef-8c70-970d704407e1/etsi-ts-143-318-v13.0.0-2016-01>

1 Scope

The present document defines the stage 2 service description for a Generic Access Network (GAN) . It describes the GAN system concepts, documents the reference architecture, functional entities, network interfaces, and high-level procedures.

GAN supports two modes of operation:

- GAN A/Gb mode
- GAN Iu mode

GAN A/Gb mode supports an extension of GSM/GPRS mobile services that is achieved by tunnelling Non Access Stratum (NAS) protocols between the MS and the Core Network over an IP network and the A and Gb interfaces to the MSC and SGSN, respectively.

GAN Iu mode supports an extension of UMTS mobile services that is achieved by tunnelling Non Access Stratum (NAS) protocols between the user equipment (MS) and the Core Network over an IP network and the Iu-cs and Iu-ps interfaces to the MSC and SGSN, respectively.

Both GAN modes are complements to traditional GERAN/UTRAN/E-UTRAN radio access network coverage.

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*.

- [1] 3GPP TS 23.002: "Network architecture".
- [2] 3GPP TS 23.009: "Handover procedures".
- [3] 3GPP TS 23.271: "Location Services (LCS); Functional description; Stage 2".
- [4] 3GPP TS 23.122: "Non-Access-Stratum functions related to Mobile Station (MS) in idle mode".
- [5] 3GPP TS 23.236: "Intra-domain connection of Radio Access Network (RAN) nodes to multiple Core Network (CN) nodes".
- [6] 3GPP TS 24.008: "Mobile radio interface layer 3 specification; Core network protocols; Stage 3".
- [7] 3GPP TS 26.071: "AMR speech codec; General description".
- [8] 3GPP TS 29.234, v11.2.0: "3GPP system to Wireless Local Area Network (WLAN) interworking, Stage 3".
- [9] 3GPP TS 33.234: "3G security; Wireless Local Area Network (WLAN) interworking security".
- [10] 3GPP TS 43.020: "Security related network functions".
- [11] 3GPP TS 48.004: "Base Station System - Mobile-services Switching Centre (BSS-MSC) interface; Layer 1 specification".

- [12] 3GPP TS 48.006: "Signalling transport mechanism specification for the Base Station System - Mobile-services Switching Centre (BSS-MSC) interface".
- [13] 3GPP TS 48.008: "Mobile Switching Centre - Base Station System (MSC-BSS) interface; Layer 3 specification".
- [14] 3GPP TS 48.014: "General Packet Radio Service (GPRS); Base Station System (BSS) - Serving GPRS Support Node (SGSN) interface; Gb interface Layer 1".
- [15] 3GPP TS 48.016: "General Packet Radio Service (GPRS); Base Station System (BSS) - Serving GPRS Support Node (SGSN) interface; Network Service".
- [16] 3GPP TS 48.018: "General Packet Radio Service (GPRS); Base Station System (BSS) - Serving GPRS Support Node (SGSN) interface; BSS GPRS protocol".
- [17] 3GPP TS 43.059: "Functional stage 2 description of Location Services (LCS) in GERAN".
- [18] 3GPP TS 45.008: "Radio subsystem link control".
- [19] IETF RFC 793: "Transmission Control Protocol".
- [20] IETF RFC 3550: "RTP: A Transport Protocol for Real-Time Applications".
- [21] Void.
- [22] Void.
- [23] Void.
- [24] Void.
- [25] Void.
- [26] Void.
- [27] Void.
- [28] Void.
- [29] Void.
- [30] IETF RFC 4186: "Extensible Authentication Protocol Method for Global System for Mobile Communications (GSM) Subscriber Identity Modules (EAP-SIM)".
- [31] Void.
- [32] IETF RFC 5996: "Internet Key Exchange Protocol Version 2 (IKEv2)".
- [33] Void.
- [34] Void.
- [35] Void.
- [36] IETF RFC 2486: "The Network Access Identifier".
- [37] IETF RFC 768: "User Datagram Protocol".
- [38] IETF RFC 4187: "Extensible Authentication Protocol Method for 3rd Generation Authentication and Key Agreement (EAP-AKA)".
- [39] IETF RFC 791: "Internet Protocol".
- [40] 3GPP TS 25.331: "Radio Resource Control (RRC) protocol specification".
- [41] 3GPP TS 23.032: "Universal Geographical Area Description (GAD)".
- [42] Void.

- [43] 3GPP TS 23.003: "Numbering, addressing and identification".
- [44] 3GPP TS 43.129: " Packet-switched handover for GERAN A/Gb mode; Stage 2".
- [45] 3GPP TS 25.410: "UTRAN Iu Interface: general aspects and principles".
- [46] 3GPP TS 25.411: "UTRAN Iu interface layer 1".
- [47] 3GPP TS 25.412: "UTRAN Iu interface signalling transport".
- [48] 3GPP TS 25.413: "UTRAN Iu interface Radio Access Network Application Part (RANAP) signalling".
- [49] 3GPP TS 25.414: "UTRAN Iu interface data transport & transport signalling".
- [50] 3GPP TS 25.415: "UTRAN Iu interface user plane protocols".
- [51] 3GPP TS 25.419: "UTRAN Iu-BC interface: Service Area Broadcast Protocol (SABP)".
- [52] 3GPP TS 25.450: "UTRAN Iupc interface general aspects and principles".
- [53] 3GPP TS 22.011: "Service accessibility".
- [54] IETF RFC 4867, April 2007: "RTP Payload Format and File Storage Format for the Adaptive Multi-Rate (AMR) and Adaptive Multi-Rate Wideband (AMR-WB) Audio Codecs".
- [55] 3GPP TS 33.210: "Network Domain Security (NDS); IP network layer security".
- [56] IETF RFC 4303: "IP Encapsulating Security Payload (ESP)".

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

AP-ID: The AP-ID (Access Point-ID) is the physical identity (e.g. MAC address) of the generic IP access network point through which the MS is accessing GAN service. This identifier is provided by the MS (obtained via broadcast from the AP) to the GANC via the Up interface, when it requests GAN service. The AP-ID may be used by the GANC to support location services. The AP-ID may also be used by the service provider to restrict GAN service access via only authorized APs.

GERAN/UTRAN Mode: MS mode of operation where the NAS layers communicate through either the GERAN RR or the UTRAN RRC entities.

GERAN/UTRAN/E-UTRAN Mode: MS mode of operation where the NAS layers communicate through either the GERAN RR, the UTRAN RRC or the E-UTRAN RRC entities.

GAN A/Gb Mode: MS mode of operation where the NAS layers communicate through the GA-CSR and GA-PSR entities.

GAN Iu Mode: MS mode of operation where the NAS layers communicate through the GA-RRC CS and GA-RRC PS entities.

GAN Mode: This term is used when a procedure applies to both GAN A/Gb mode and GAN Iu mode (e.g., see clause 8.1, 'Mechanism of Mode Selection in Multi-mode terminals').

Generic Access Network: access network providing access to A/Gb or Iu interfaces via an IP network

Generic Access Network Controller: network node that connects to the MSC and SGSN via the A-interface and Gb interface (GAN A/Gb mode) or the Iu-cs interface and Iu-ps interface (GAN Iu mode) and enables access via a generic IP network.

Three different logical roles for the GANC are defined in this specification: Provisioning GANC, Default GANC and Serving GANC.

default GANC: logical role of a GANC in the HPLMN, which redirects an MS performing the GAN Registration Procedure to a preferred Serving GANC within the HPLMN or VPLMN. The Serving GANC and Default GANC may be the same entity, in which case no redirection is required.

discovery procedure: process by which the MS discovers the Default GANC in the HPLMN.

CS handover: mobile station engaged in a call (a CS domain service) moves between 3GPP access networks and GAN.

handover in: mobile station moves from 3GPP access networks to GAN.

handover out: mobile station moves from GAN to 3GPP access networks.

PS handover: A mobile station with one or more ongoing PS domain services moves between a GAN cell and a GERAN/UTRAN cell.

provisioning GANC: logical role of a GANC in the HPLMN of an MS. When an MS performs the Discovery Procedure to this GANC, the MS is provided the address of the Default GANC in the HPLMN.

redirection: process by which a Default or Serving GANC redirects an MS to an alternative Serving GANC. This alternative GANC is likely to become the Serving GANC for the MS.

registration procedure: process by which an MS requests the Generic Access Service from a GANC.

rove in: mobile station reselects from 3GPP access networks to GAN.

rove out: mobile station reselects from GAN to 3GPP access networks.

roving: action of re-selection between 3GPP access technology and GAN for a mobile station in idle mode.

seamless: free from noticeable transitions (i.e. no end-user action is required; speech interruptions are short; service interruptions are short; incoming calls are not missed; packet sessions are maintained; services work identically).

serving GANC: logical role of the GANC in a PLMN which provides an MS with the Generic Access service.

suitable cell: this is a cell on which an MS may camp. It must satisfy criteria which are defined for A/Gb mode in 3GPP TS 43.022 and for Iu mode in 3GPP TS 25.304.

user equipment: generally referred to as 'mobile station' in this document.

3.2 Symbols

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

Up Interface between MS and GANC

3.3 Abbreviations

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

| | |
|--------|---|
| AAA | Authentication, Authorization and Accounting |
| AKA | Authentication and Key Agreement |
| AP | Access Point |
| AS | Access Stratum |
| BSC | Base Station Controller |
| BSS | Base Station Subsystem |
| BSSGP | Base Station System GPRS Protocol |
| BSSMAP | Base Station System Management Application Part |
| CC | Call Control |
| CGI | Cell Global Identification |
| CM | Connection Management |
| CN | Core Network |

| | |
|---------|---|
| CS | Circuit Switched |
| CTM | Cellular Text Telephone Modem |
| DNS | Domain Name System |
| DTM | Dual Transfer Mode |
| E-UTRAN | Evolved UTRAN |
| EAP | Extensible Authentication Protocol |
| ETSI | European Telecommunications Standards Institute |
| FCC | US Federal Communications Commission |
| FQDN | Fully Qualified Domain Name |
| GA-CSR | Generic Access - Circuit Switched Resources |
| GAD | Geographical Area Description |
| GAN | Generic Access Network |
| GANC | Generic Access Network Controller |
| GA-PSR | Generic Access - Packet Switched Resources |
| GA-RC | Generic Access - Resource Control |
| GA-RRC | Generic Access - Radio Resource Control |
| GERAN | GSM EDGE Radio Access Network |
| GGSN | Gateway GPRS Support Node |
| GMM/SM | GPRS Mobility Management and Session Management |
| GPRS | General Packet Radio Service |
| GSM | Global System for Mobile communications |
| GSN | GPRS Support Node |
| HLR | Home Location Register |
| HPLMN | Home PLMN |
| IETF | Internet Engineering Task Force |
| IKE | Internet Key Exchange |
| IMEISV | International Mobile station Equipment Identity and Software Version number |
| IMSI | International Mobile Subscriber Identity |
| IP | Internet Protocol |
| LA | Location Area |
| LAI | Location Area Identity |
| LLC | Logical Link Control |
| MAC | Medium Access Control |
| MAC | Message Authentication Code |
| MM | Mobility Management |
| MS | Mobile Station |
| MSC | Mobile Switching Center |
| MTP1 | Message Transfer Part layer 1 |
| MTP2 | Message Transfer Part layer 2 |
| MTP3 | Message Transfer Part layer 3 |
| NAS | Non-Access Stratum |
| PDP | Packet Data Protocol |
| PDU | Protocol Data Unit |
| PLMN | Public Land Mobile Network |
| PS | Packet Switched |
| PSAP | Public Safety Answering Point |

NOTE: A PSAP is an emergency services network element that is responsible for answering emergency calls.

| | |
|--------|------------------------------------|
| PSTN | Public Switched Telephone Network |
| P-TMSI | Packet - TMSI |
| QoS | Quality of Service |
| RA | Routing Area |
| RAC | Routing Area Code |
| RAI | Routing Area Identity |
| RAT | Radio Access Technology |
| RLC | Radio Link Control |
| RNC | Radio Network Controller |
| RTCP | Real Time Control Protocol |
| RTP | Real Time Protocol |
| SCCP | Signalling Connection Control Part |
| SEGW | SEcurity GateWay |