

ETSI TS 129 468 V15.7.0 (2019-10)



**Universal Mobile Telecommunications System (UMTS);
LTE;
Group Communication System Enablers for LTE (GCSE_LTE);
MB2 reference point;
Stage 3
(3GPP TS 29.468 version 15.7.0 Release 15)**



Reference

RTS/TSGC-0329468vf70

Keywords

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 prevailing version of an ETSI deliverable is the one made publicly available in PDF format at www.etsi.org/deliver.

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 <https://portal.etsi.org/TB/ETSIDeliverableStatus.aspx>

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

© ETSI 2019.
All rights reserved.

DECT™, **PLUGTESTS™**, **UMTS™** and the ETSI logo are trademarks of ETSI registered for the benefit of its Members. **3GPP™** and **LTE™** are trademarks of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners.

oneM2M™ logo is a trademark of ETSI registered for the benefit of its Members and of the oneM2M Partners.

GSM® and the GSM logo are trademarks registered and owned by the GSM Association.

Intellectual Property Rights

Essential patents

IPRs essential or potentially essential to normative deliverables 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.

Trademarks

The present document may include trademarks and/or tradenames which are asserted and/or registered by their owners. ETSI claims no ownership of these except for any which are indicated as being the property of ETSI, and conveys no right to use or reproduce any trademark and/or tradename. Mention of those trademarks in the present document does not constitute an endorsement by ETSI of products, services or organizations associated with those trademarks.

Legal Notice

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. These shall be interpreted as being references to the corresponding ETSI deliverables.

The cross reference between 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
Legal Notice	2
Modal verbs terminology.....	2
Foreword.....	6
1 Scope	7
2 References	7
3 Definitions, symbols and abbreviations	8
3.1 Definitions	8
3.2 Abbreviations	8
4 Architectural Overview	9
4.1 Reference Model	9
4.2 Functional Elements	9
4.2.1 Group Communication Service Application Server (GCS AS)	9
4.2.2 Broadcast-Multicast Service Centre (BM-SC).....	10
5 Procedures over the MB2 Reference Point	10
5.1 TMGI and Flow ID handling.....	10
5.2 TMGI Management	11
5.2.1 TMGI Allocation Procedure	11
5.2.2 TMGI Deallocation Procedure.....	11
5.2.3 TMGI Expiry Notification Procedure	12
5.3 MBMS Bearer Control Procedures	12
5.3.1 General.....	12
5.3.2 Activate MBMS Bearer Procedure	12
5.3.3 Deactivate MBMS Bearer Procedure.....	13
5.3.4 Modify MBMS Bearer Procedure.....	13
5.3.5 MBMS Bearer Status Indication Procedure	14
5.4 BM-SC selection	15
5.5 BM-SC overload control	15
5.6 Restoration Procedures	15
5.6.1 General.....	15
5.6.2 Restart Counter	15
5.6.3 GCS AS initiated Heartbeat Procedure	15
5.6.4 BM-SC initiated Heartbeat Procedure	16
5.6.5 GCS AS procedures after detection of BM-SC Restart	16
5.6.6 BM-SC procedures after detection of GCS AS Restart	16
5.6.7 GCS AS procedures upon detection of MB2-C path failure.....	16
5.6.8 BM-SC procedures upon detection of MB2-C path failure	16
6 MB2-C Protocol	16
6.1 Protocol support	16
6.1.1 Use of Diameter base protocol.....	16
6.1.2 Transport protocol	17
6.1.3 Advertising Application Support	17
6.2 Initialization and maintenance of connection and session.....	17
6.3 Security on the MB2-C interface.....	17
6.4 MB2-C specific AVPs.....	17
6.4.1 General.....	17
6.4.2 BMSC-Address AVP.....	18
6.4.3 BMSC-Port AVP	19
6.4.4 MBMS-Bearer-Event AVP.....	19
6.4.5 MBMS-Bearer-Event-Notification AVP	19
6.4.6 MBMS-Bearer-Request AVP	19
6.4.7 MBMS-Bearer-Response AVP	20

6.4.8	MBMS-Bearer-Result AVP	20
6.4.9	MBMS-Start-Time AVP	21
6.4.10	Radio-Frequency AVP	21
6.4.11	TMGI-Allocation-Request AVP	21
6.4.12	TMGI-Allocation-Response AVP	22
6.4.13	TMGI-Allocation-Result AVP	22
6.4.14	TMGI-Deallocation-Request AVP	22
6.4.15	TMGI-Deallocation-Response AVP	22
6.4.16	TMGI-Deallocation-Result AVP	23
6.4.17	TMGI-Expiry AVP	23
6.4.18	TMGI-Number AVP	23
6.4.19	MB2U-Security AVP	23
6.4.20	Local-M1-Information AVP	24
6.4.21	Local-MB2-U-Information AVP	24
6.4.22	MBMS-eNB-IP-Multicast-Address AVP	24
6.4.23	MBMS-eNB-IPv6-Multicast-Address AVP	24
6.4.24	MBMS-GW-SSM-IP-Address AVP	24
6.4.25	MBMS-GW-SSM-IPv6-Address AVP	24
6.4.26	Common-Tunnel-Endpoint-Identifier AVP	24
6.4.27	FEC-Request AVP	24
6.4.28	ROHC-Request AVP	25
6.4.29	ROHC-Full-Header-Periodicity AVP	25
6.4.30	ROHC-Profile AVP	25
6.4.31	Userplane-Protocol-Result AVP	25
6.4.32	ROHC-Result AVP	25
6.4.33	FEC-Result AVP	26
6.4.34	ROHC-Max-CID AVP	26
6.5	MB2-C re-used AVPs	26
6.5.1	General	26
6.5.2	Supported-Feature-List AVP	28
6.5.2.1	Use of the Supported-Features AVP	28
6.5.2.2	Supported-Feature-List AVP for the MB2-C application	28
6.6	MB2-C Messages	29
6.6.1	Command-Code Values	29
6.6.2	GCS-Action-Request (GAR) command	29
6.6.3	GCS-Action-Answer (GAA) command	29
6.6.4	GCS-Notification-Request (GNR) command	30
6.6.5	GCS-Notification-Answer (GNA) command	30
7	MB2-U Protocol	31
7.1	Protocol Stack	31
7.2	Procedures	32
Annex A (informative): Call Flows		34
A.1	TMGI Management	34
A.1.1	TMGI Allocation Procedure	34
A.1.2	TMGI Deallocation Procedure	34
A.1.3	TMGI Expiry Notification	35
A.2	MBMS Bearer Control Procedures	36
A.2.1	Activate MBMS Bearer Procedure	36
A.2.2	Deactivate MBMS Bearer Procedure	36
A.2.3	Modify MBMS Bearer Procedure	37
A.2.4	MBMS Bearer Status Indication Procedure	38
A.3	Restoration Procedures	39
A.3.1	GCS AS initiated Heartbeat Procedure	39
A.3.2	BM-SC initiated Heartbeat Procedure	39
Annex B (normative): Diameter message priority mechanism		40
B.1	General	40
B.2	MB2-C interface	40

B.2.1 General.....40
B.2.2 GCS AS behaviour40
B.2.3 BM-SC behaviour.....40
C.1 General41
C.2 GCS AS behaviour41
C.3 BM-SC behaviour.....41

Annex D (informative): Change history42
History43

iTeh STANDARD PREVIEW
(standards.iteh.ai)
Full standard:
<https://standards.iteh.ai/catalog/standards/sist/6cd8efd1-f93d-4d42-acec-a5cd24bad2bd/etsi-ts-129-468-v15.7.0-2019-10>

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/6cd8efd1-f93d-4d42-acec-a5cd24bad2bd/etsi-ts-129-468-v15.7.0-2019-10>

1 Scope

This document defines the protocol for the MB2 reference point between the Group Communication Service Application Server (GCS AS) and the Broadcast-Multicast Service Centre (BM-SC).

The MB2 reference point and related stage 2 procedures are defined in TS 23.468 [4] as part of the Group Communication System Enablers for LTE. The stage 1 requirements for Group Communication System Enablers are specified in TS 22.468 [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*.

- [1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications"
- [2] 3GPP TS 22.468: "Group Communication System(GCSE)".
- [3] 3GPP TS 23.246: "Multimedia Broadcast/Multicast Service (MBMS); Architecture and functional description".
- [4] 3GPP TS 23.468: "Group Communication System Enablers for LTE (GCSE_LTE); stage 2".
- [5] 3GPP TS 26.346: "Multimedia Broadcast/Multicast Service (MBMS); Protocols and codecs".
- [6] 3GPP TS 29.061: "Interworking between the Public Land Mobile Network (PLMN) supporting packet based services and Packet Data Networks (PDN)".
- [7] 3GPP TS 29.212: "Policy and Charging Control (PCC); Reference points".
- [8] 3GPP TS 29.274: "3GPP Evolved Packet System (EPS); Evolved General Packet Radio Service (GPRS) Tunnelling Protocol for Control plane (GTPv2-C); Stage 3".
- [9] 3GPP TS 29.281: "General Packet Radio System (GPRS) Tunnelling Protocol User Plane (GTPv1-U)".
- [10] 3GPP TS 33.246: "Security of Multimedia Broadcast/Multicast Service (MBMS)".
- [11] IETF RFC 791: "Transmission Control Protocol".
- [12] IETF RFC 768: "User Datagram Protocol".
- [13] IETF RFC 2234: "Augmented BNF for syntax specifications".
- [14] Void
- [15] IETF RFC 4960: "Stream Control Transmission Protocol".
- [16] IETF RFC 5719: "Updated IANA Considerations for Diameter Command Code Allocations".
- [17] IETF RFC 5996: "The Internet Key Exchange (IKE)".
- [18] IETF RFC 3947: "Negotiation of NAT-Traversal in the IKE".
- [19] IETF RFC 3948: "UDP Encapsulation of IPsec ESP Packets".

- [20] IETF RFC 4303: "IP Encapsulating Security Payload (ESP)".
- [21] IETF RFC 6347: "Datagram Transport Layer Security Version 1.2".#
- [22] 3GPP TS 23.007: "Restoration procedures".
- [23] 3GPP TS 29.229: "Cx and Dx interfaces based on the Diameter protocol".
- [24] 3GPP TS 36.300: "E-UTRA and E-UTRAN overall description; Stage 2".
- [25] IETF RFC 7944: "Diameter Routing Message Priority".
- [26] IETF RFC 8583: "Diameter Load Information Conveyance".
- [27] IETF RFC 6733: "Diameter Base Protocol".
- [28] 3GPP TS 23.285: "Architecture Enhancements for V2X services".
- [29] IETF RFC 5795: "The Robust Header Compression (ROHC) Framework".
- [30] IETF RFC 3095, "Robust Header Compression (ROHC): Framework and four profiles: RTP, UDP, ESP, and uncompressed"
- [31] IETF RFC 6363: "Forward Error Correction (FEC) Framework,".
- [32] IETF RFC 6364: "Session Description Protocol Elements for the Forward Error Correction (FEC) Framework,".
- [33] 3GPP TS 29.214: " Policy and Charging Control over Rx reference point".

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in TR 21.905 [1] and the following apply:

MBMS bearer: The service provided by the EPS to deliver the same IP datagrams to multiple receivers in a designated location.

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in TR 21.905 [1].

ARP	Allocation and Retention Priority
AVP	Attribute-Value Pair
BM-SC	Broadcast-Multicast Service Centre
DRMP	Diameter Routing Message Priority
DSCP	Differentiated Services Code Point
DTLS	Datagram Transport Layer Security
ESP	Encapsulating Security Payload
FEC	Forward Error Correction
GAA	GCS-Action-Answer
GAR	GCS-Action-Request
GCS	Group Communication Service
GCSE	Group Communication System Enablers
GCS AS	Group Communication Service Application Server
GNA	GCS-Notification-Answer
GNR	GCS-Notification-Request

MBMS-GW	MBMS Gateway
PCRF	Policy and Charging Rules Function
P-GW	PDN Gateway
ROHC	Robust Header Compression
TMGI	Temporary Mobile Group Identity
UDP	User Datagram Protocol
V2X	Vehicle-to-Everything

4 Architectural Overview

4.1 Reference Model

Figure 4.1-1 shows a high level reference model of the architectural elements relevant to understand the MB2 reference point. More complete reference models for GCSE are contained in TS 23.468 [4].

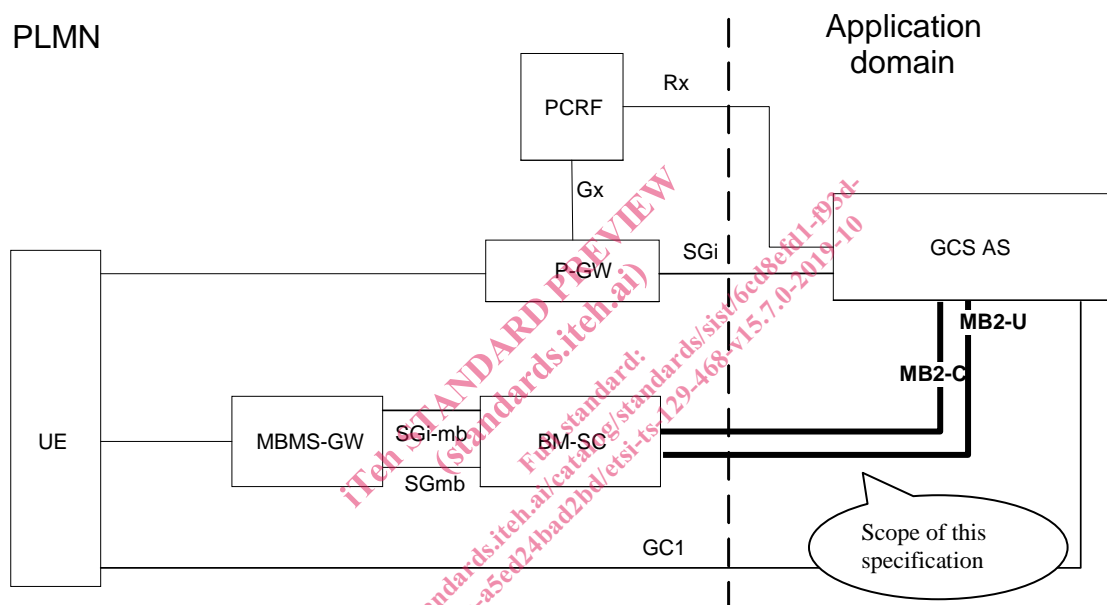


Figure 4.1-1: Reference Model

NOTE: The GC1 reference point between the UE and the GCS AS is unspecified in the present release. Data related to the GC1 reference point are transported via the Sgi reference point between GCS AS and P-GW.

For the V2X Localized User Plane supported feature, the reference model in Annex B.3 of 3GPP TS 23.285 [28] applies.

4.2 Functional Elements

4.2.1 Group Communication Service Application Server (GCS AS)

The GCS AS is defined in TS 23.468 [4] and supports the following functionality:

- Exchanging GC1 signalling with the UE.
- Receiving unicast uplink data from the UE via the SGI reference point.
- Delivery of data to all the UEs belonging to a group using unicast delivery over the SGI reference point and/or MBMS delivery over the MB2 reference point.
- Support for service continuity procedures for a UE to switch between unicast delivery and MBMS delivery.

- For MBMS delivery:
 - MB2-C procedures defined in TS 23.468 [4], for requesting the BM-SC to activate, deactivate, modify an MBMS bearer, allocate/deallocate TMGI.
 - Forwarding of data to be delivered via an MBMS bearer to the BM-SC via the MB2-U reference point.

In addition to the functions defined in 3GPP TS 23.468 [4], an GCS AS which acts as a V2X Application Server may support the following functions:

- For the V2X Localized User Plane supported feature, MB2-C procedures defined in 3GPP TS 23.285 [28] subclause 5.4.2.2 for requesting the BM-SC to activate an MBMS bearer for local MBMS based MBMS data delivery.

4.2.2 Broadcast-Multicast Service Centre (BM-SC)

The BM-SC is defined in TS 23.246 [3], with additions related to the MB2 reference point in TS 23.468 [4], and supports the following functionality:

- MBMS Broadcast Mode procedures defined in TS 23.246 [3] (stage 2) and in TS 29.061 [6] (stage 3).
- MB2-C procedures defined in TS 23.468 [4], for activating, deactivating, modifying an MBMS bearer, allocating/deallocating TMGI and notifying the TMGI expiry or the MBMS Bearer condition to GCS AS.
- SGmb procedures for controlling MBMS broadcast bearers defined in TS 29.061 [6].
- Reception of user data from the GCS AS via the MB2-U reference point and forwarding those data via the SGi-mb reference point as described in TS 29.061 [6].

In addition to the functions defined in 3GPP TS 23.468 [4], the BM-SC may support the following functions for V2X services:

- For the V2X Localized User Plane supported feature, MB2-C procedures defined in 3GPP TS 23.285 [28] subclause 5.4.2.2 for receiving Local MBMS information defined in 3GPP TS 23.285 [28] from an GCS AS which acts as a V2X Application Server.

5 Procedures over the MB2 Reference Point

5.1 TMGI and Flow ID handling

The combination of TMGI and Flow Identifier shall uniquely identify an MBMS bearer. TMGI and Flow Identifier are defined in TS 23.246 [3].

A TMGI shall be assigned by the BM-SC upon request of the GCS AS. The BM-SC shall provide an expiration time for each assigned TMGI or group of TMGIs to the GCS AS. The BM-SC shall assign a TMGI, which is different from any other TMGI, which the BM-SC has previously assigned and for which the timer has not yet expired and there is no active MBMS broadcast bearer. The GCS AS may request the BM-SC to refresh the expiration timer for a TMGI. The BM-SC and GCS AS shall store the TMGI until the timer expires.

NOTE: As defined in TS 23.246 [3], TMGIs need to be globally unique. It is assumed that the BM-SC uses a configured range of TMGI values.

The BM-SC shall assign Flow Identifier values, which shall be unique for the corresponding TMGI. For each assigned TMGI, both BM-SC and GCS AS shall store all assigned Flow Identifiers until the expiry of the timer of the TMGI, or until GCS AS requests the deallocation of the TMGI.

5.2 TMGI Management

5.2.1 TMGI Allocation Procedure

The TMGI Allocation procedure may be used by the GCS AS to request a set of TMGIs, or to request the renewal of the expiration time for already allocated TMGIs.

To apply this procedure, the GCS AS shall send a GCS-Action-Request (GAR) command including the TMGI-Allocation-Request AVP. Within the TMGI-Allocation-Request AVP, the GCS AS shall indicate the number of requested new TMGIs, excluding any TMGIs for which only an expiration timer renewal is requested, in the TMGI-Number AVP, and may include within TMGI AVPs TMGIs that are already allocated to the GCS AS, and for which the GCS AS wishes to obtain a later expiration time. The number of TMGIs requested may be zero, if this procedure is used only to renew the expiration time for already allocated TMGIs.

Upon reception of a GCS-Action-Request (GAR) command including the TMGI-Allocation-Request AVP, the BM-SC shall determine whether the GCS AS is authorized to receive the requested TMGIs. If no Route-Record AVP(s) are present, the BM-SC shall derive the identity of the GCS AS from the Origin-Host AVP. If Route-Record AVP(s) are present, the BM-SC shall authorize the request if the identity within the first Route-Record AVP matches the GCS AS authorized to use the TMGIs. If the renewal of TMGIs has been requested, the BM-SC shall also determine whether the TMGIs are allocated to the requesting GCS AS and if yes, whether the renewal of TMGI expiration times is possible. The BM-SC shall also determine an expiration time, which shall be applicable for all new TMGIs and all TMGIs for which the timer was renewed.

NOTE 1: During the TMGI Allocation Procedure, the BM-SC does not activate MBMS. However TMGIs, for which the expiration time is renewed, may already have active MBMS bearers.

The BM-SC shall then send the GCS-Action-Answer (GAA) command including the TMGI-Allocation-Response AVP. For a successful TMGI allocation, the TMGI-Allocation-Response AVP shall include TMGI AVPs and the MBMS-Session-Duration AVP. The TMGI AVPs shall contain all successfully allocated or refreshed TMGIs and the MBMS-Session-Duration AVP shall indicate their common new expiration time. For an unsuccessful TMGI allocation request, the TMGI-Allocation-Response AVP shall include the TMGI-Allocation-Result AVP. For a partial success (i.e. if some, but not all of the requested TMGIs are allocated or timers refreshed), the TMGI-Allocation-Response AVP shall include the TMGI AVPs, the MBMS-Session-Duration AVP and the TMGI-Allocation-Result AVP. The TMGI AVPs shall contain all successfully allocated or refreshed TMGIs and the MBMS-Session-Duration AVP shall indicate their common new expiration time. The TMGI-Allocation-Result AVP shall indicate both success and the reason(s) why the allocation or refresh failed for some TMGIs.

5.2.2 TMGI Deallocation Procedure

The TMGI Deallocation procedure may be used by the GCS AS to immediately release a set of TMGIs, irrespective of their expiration times.

To apply this procedure, the GCS AS shall send a GCS-Action-Request (GAR) command including the TMGI-Deallocation-Request AVP. If the GCS AS desires to deallocate some, but not all currently allocated TMGIs, it shall include TMGI AVPs for all TMGIs that are to be deallocated within the TMGI-Deallocation-Request AVP. If the GCS AS desires to deallocate all currently allocated TMGIs, it shall not include TMGI AVPs within the TMGI-Deallocation-Request AVP.

Upon reception of a GCS-Action-Request (GAR) command including the TMGI-Deallocation-Request AVP, the BM-SC shall determine whether the GCS AS is authorized to deallocate the TMGIs. If no Route-Record AVP(s) are present, the BM-SC shall derive the identity of the GCS AS from the Origin-Host AVP. If Route-Record AVP(s) are present, the BM-SC shall authorize the request if the identity within the first Route-Record AVP matches the GCS AS authorized to use the TMGIs.

The BM-SC shall then send the GCS-Action-Answer (GAA) command and shall include a TMGI-Deallocation-Response AVP for each TMGI contained in the TMGI-Deallocation-Request AVP. Each TMGI-Deallocation-Response AVP shall include the affected TMGI in the TMGI AVP. For an unsuccessful TMGI deallocation, the TMGI-Deallocation-Response AVP shall also include the TMGI-Deallocation-Result AVP.

When the GCS AS requests the deallocation of a TMGI with some related active MBMS bearers, the BM-SC shall terminate those bearer(s).