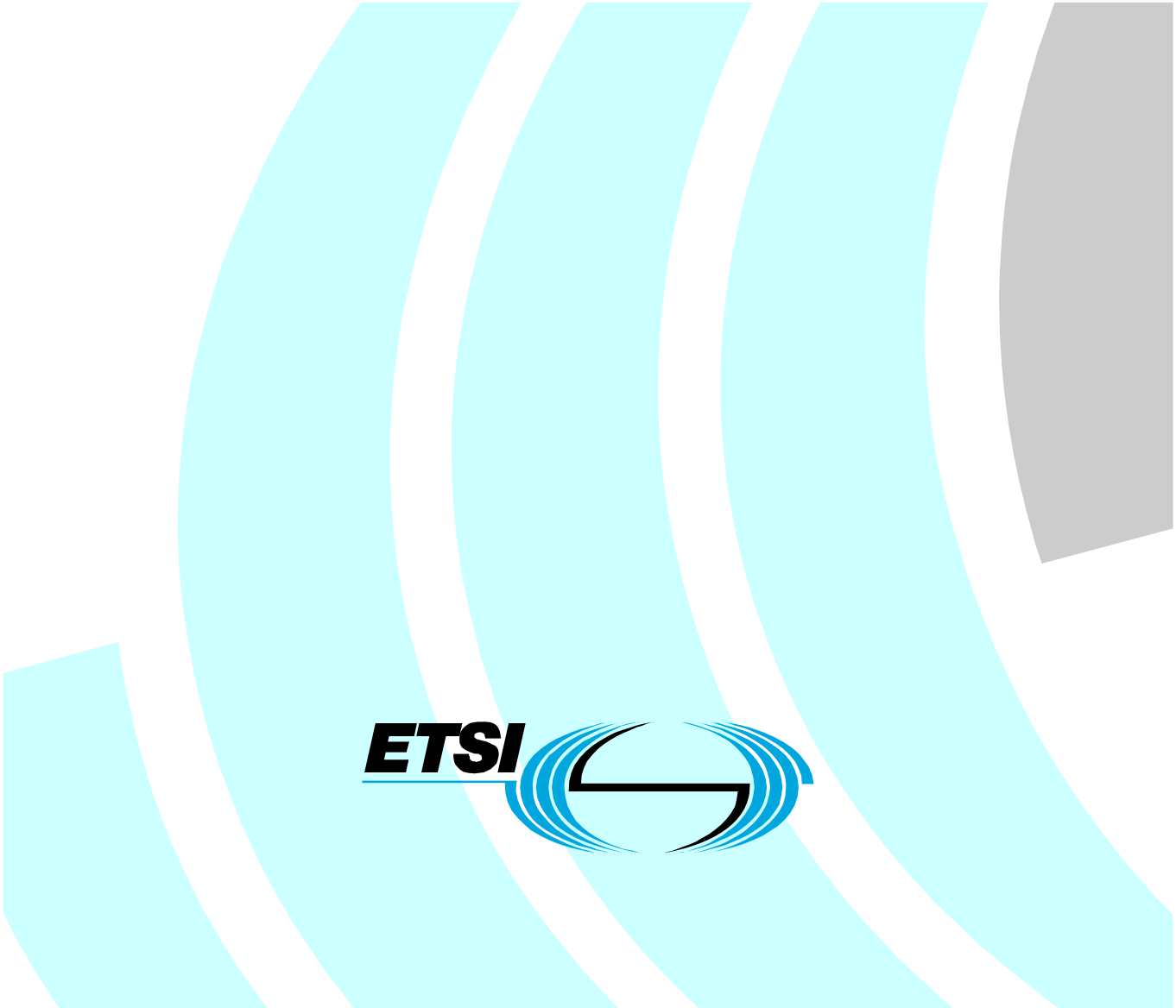
ETSI TS 101 376-3-3 V3.2.1 (2011-02)

Technical Specification

GEO-Mobile Radio Interface Specifications (Release 3);
Third Generation Satellite Packet Radio Service;
Part 3: Network specifications;
Sub-part 3: Numbering, addressing and identification;
GMR-1 3G 23.003



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Foreword

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- the second digit (m) is incremented for all other types of changes, i.e. technical enhancements, corrections, updates, etc.

The present document is part 3, sub-part 3 of a multi-part deliverable covering the GEO-Mobile Radio Interface Specifications (Release 3); Third Generation Satellite Packet Radio Service, as identified below:

Part 1: "General specifications";

Part 2: "Service specifications";

Part 3: "Network specifications":

Sub-part 1: "Network Functions";

Sub-part 2: "Network Architecture";

Sub-part 3: "Numbering, addressing and identification";

Sub-part 4: "Organization of Subscriber Data";

Sub-part 5: "Technical realization of Supplementary Services";

Sub-part 6: "Location Registration and Position Identification Procedures";

Sub-part 7: "Discontinuous Reception (DRX)";

Sub-part 8: "Support of Dual-Tone Multifrequency Signalling (DTMF)";

Sub-part 9: "Security related Network Functions";

Sub-part 10: "Functions related to Mobile Earth Station (MES) in idle mode";

Sub-part 11: "Technical realization of the Short Message Service (SMS) Point-to-Point (PP)";

Sub-part 12: "Technical realization of the Short Message Service Cell Broadcast (SMSCB)";

Sub-part 13: "Technical realization of group 3 facsimile using transparent mode of transmission";

Sub-part 14: "Transmission Planning Aspects of the Speech Service in the GMR-1 system";

Sub-part 15: "Line Identification supplementary service - Stage 2";

Sub-part 16: "Call Barring (CB) supplementary services - Stage 2";

Sub-part 17: "Unstructured Supplementary Service Data (USSD) - Stage 2";

Sub-part 18: "Terminal-to-Terminal Call (TtT)";

Sub-part 19: "Optimal Routing technical realization";

Sub-part 20: "Technical realization of High-Penetration Alerting";

Sub-part 21: "Position Reporting services; Stage 2 Service description";

Sub-part 22: "Overall description of the GMPRS radio interface; Stage 2";

Sub-part 23: "Radio Access Network; Overall description - Stage 2";

Part 4: "Radio interface protocol specifications";

Part 5: "Radio interface physical layer specifications";

Part 6: "Speech coding specifications";

Part 7: "Terminal adaptor specifications".

Introduction

GMR stands for GEO (Geostationary Earth Orbit) Mobile Radio interface, which is used for Mobile Satellite Services (MSS) utilizing geostationary satellite(s). GMR is derived from the terrestrial digital cellular standard GSM and supports access to GSM core networks.

The present document is part of the GMR Release 3 specifications. Release 3 specifications are identified in the title and can also be identified by the version number:

- Release 1 specifications have a GMR 1 prefix in the title and a version number starting with "1" (V1.x.x).
- Release 2 specifications have a GMPRS 1 prefix in the title and a version number starting with "2" (V2.x.x).
- Release 3 specifications have a GMR-1 3G prefix in the title and a version number starting with "3" (V3.x.x).

The GMR release 1 specifications introduce the GEO-Mobile Radio interface specifications for circuit mode Mobile Satellite Services (MSS) utilizing geostationary satellite(s). GMR release 1 is derived from the terrestrial digital cellular standard GSM (phase 2) and it supports access to GSM core networks.

The GMR release 2 specifications add packet mode services to GMR release 1. The GMR release 2 specifications introduce the GEO-Mobile Packet Radio Service (GMPRS). GMPRS is derived from the terrestrial digital cellular standard GPRS (included in GSM Phase 2+) and it supports access to GSM/GPRS core networks.

The GMR release 3 specifications evolve packet mode services of GMR release 2 to 3rd generation UMTS compatible services. The GMR release 3 specifications introduce the GEO-Mobile Radio Third Generation (GMR-1 3G) service. Where applicable, GMR-1 3G is derived from the terrestrial digital cellular standard 3GPP and it supports access to 3GPP core networks.

Due to the differences between terrestrial and satellite channels, some modifications to the GSM or 3GPP standard are necessary. Some GSM and 3GPP specifications are directly applicable, whereas others are applicable with modifications. Similarly, some GSM and 3GPP specifications do not apply, while some GMR specifications have no corresponding GSM or 3GPP specification.

Since GMR is derived from GSM and 3GPP, the organization of the GMR specifications closely follows that of GSM or 3GPP as appropriate. The GMR numbers have been designed to correspond to the GSM and 3GPP numbering system. All GMR specifications are allocated a unique GMR number. This GMR number has a different prefix for Release 2 and Release 3 specifications as follows:

- Release 1: GMR n xx.zyy
- Release 2: GMPRS n xx.zyy
- Release 3: GMR-1 3G xx.zyy

where:

- xx.0yy (z = 0) is used for GMR specifications that have a corresponding GSM or 3GPP specification. In this case, the numbers xx and yy correspond to the GSM or 3GPP numbering scheme.
- xx.2yy (z = 2) is used for GMR specifications that do not correspond to a GSM or 3GPP specification. In this case, only the number xx corresponds to the GSM or 3GPP numbering scheme and the number yy is allocated by GMR.
- n denotes the first (n = 1) or second (n = 2) family of GMR specifications.

A GMR system is defined by the combination of a family of GMR specifications and GSM and 3GPP specifications as follows:

- If a GMR specification exists it takes precedence over the corresponding GSM or 3GPP specification (if any). This precedence rule applies to any references in the corresponding GSM or 3GPP specifications.

NOTE: Any references to GSM or 3GPP specifications within the GMR specifications are not subject to this precedence rule. For example, a GMR specification may contain specific references to the corresponding GSM or 3GPP specification.

- If a GMR specification does not exist, the corresponding GSM or 3GPP specification may or may not apply. The applicability of the GSM and 3GPP specifications is defined in the present document.

1 Scope

The present document defines the principal purpose and use of International Mobile station Equipment Identities (IMEI) within the digital cellular telecommunications system and the GMR-1 system.

The present document defines:

a) an identification plan for mobile subscribers in the GMR-1 system;

b) principles of assigning telephone and ISDN numbers to MSs in the country of registration of the MS;

c) principles of assigning Mobile Station (MS) roaming numbers to visiting MSs;

d) an identification plan for location areas, routing areas, and base stations in the GSM system;

e) an identification plan for MSCs, SGSNs, GGSNs, and location registers in the GSM system;

f) principles of assigning international mobile equipment identities;

g) principles of assigning zones for regional subscription;

h) an identification plan for groups of subscribers to the Voice Group Call Service (VGCS) and to the Voice Broadcast Service (VBS); and identification plan for voice group calls and voice broadcast calls; an identification plan for group call areas;

i) principles for assigning Packet Data Protocol (PDP) addresses to mobile stations;

j) an identification plan for point-to-multipoint data transmission groups;

k) an identification plan for CN domain, RNC and service area in the UTRAN system;

l) an identification plan for mobile subscribers in the WLAN system.

The present document is based on GMPRS-1 03.003 [1].

2 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 reference document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at http://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.

2.1 Normative references

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

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] ETSI GMPRS-1 03.003 (ETSI TS 101 376-3-3): "GEO-Mobile Radio Interface Specifications (Release 2) General Packet Radio Service; Part 3: Network specifications; Sub-part 3: Numbering, addressing and identification".

NOTE: This is a reference to a GMR-1 Release 2 specification. See the introduction for more details.

[2] 3GPP TS 23.003 (ETSI TS 123 003): "3rd Generation Partnership Project; Technical Specification Group Core Network and Terminals; Numbering, addressing and identification".

[3] 3GPP TS 24.008 (ETSI TS 124 008): "3rd Generation Partnership Project; Technical Specification Group Core Network and Terminals; Mobile radio interface Layer 3 specification; Core network protocols; Stage 3".

[4] 3GPP TS 51.011 (ETSI TS 151 011): "3rd Generation Partnership Project; Technical Specification Group Core Network and Terminals; Specification of the Subscriber Identity Module - Mobile Equipment (SIM - ME) interface".

[5] 3GPP TS 31.102 (ETSI TS 131 102): "3rd Generation Partnership Project; Technical Specification Group Core Network and Terminals; Characteristics of the Universal Subscriber Identity Module (USIM) application".

[6] ETSI GMPRS-1 01.004 (ETSI TS 101 376-1-1): "GEO-Mobile Radio Interface Specifications (Release 2) General Packet Radio Service; Part 1: General specifications; Sub-part 1: Abbreviations and acronyms; GMPRS-1 01.004".

NOTE: This is a reference to a GMR-1 Release 2 specification. See the introduction for more details.

2.2 Informative references

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.

[i.1] ITU-T Recommendation E.212: "The international identification plan for mobile terminals and mobile users".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TS 23.003 [2] apply.

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in GMPRS-1 01.004 [6] apply.

4 General comments to references

Same as clause 4 of GMPRS-1 03.003 [1].

5 Conventions on bit ordering

Same as clause 1.4 of 3GPP TS 23.003 [2].

6 Identification of mobile subscribers

6.1 General

Same as clause 2.1 of 3GPP TS 23.003 [2].

6.2 Composition of IMSI

Same as clause 2.2 of 3GPP TS 23.003 [2].

6.3 Allocation principles

Same as clause 2.3 of 3GPP TS 23.003 [2].

6.4 Structure of TMSI

Same as clause 2.4 of 3GPP TS 23.003 [2].

6.5 Structure of LMSI

Same as clause 2.5 of 3GPP TS 23.003 [2].

6.6 Structure of TLLI

Same as clause 2.6 of 3GPP TS 23.003 [2].

6.7 Structure of P-TMSI Signature

Same as clause 2.7 of 3GPP TS 23.003 [2].

7 Numbering plan for mobile stations

7.1 General

Same as clause 3.1 of 3GPP TS 23.003 [2].

7.2 Numbering plan requirements

Same as clause 3.2 of 3GPP TS 23.003 [2].

7.3 Structure of MS international PSTN/ISDN number (MSISDN)

Same as clause 3.3 of 3GPP TS 23.003 [2].

7.4 Mobile Station Roaming Number (MSRN) for PSTN/ISDN routeing

Same as clause 3.4 of 3GPP TS 23.003 [2].

7.5 Structure of Mobile Station International Data Number

Same as clause 3.5 of 3GPP TS 23.003 [2].

7.6 Handover Number

Same as clause 3.6 of 3GPP TS 23.003 [2].

7.7 Structure of an IP v4 address

Same as clause 3.7 of 3GPP TS 23.003 [2].

7.8 Structure of an IP v6 address

Same as clause 3.8 of 3GPP TS 23.003 [2].

8 Identification of location areas and base stations

8.1 Composition of the Location Area Identification (LAI) (A/Gb Mode)

The Location Area Identification (LAI) shall be composed as shown in figure 8.1.

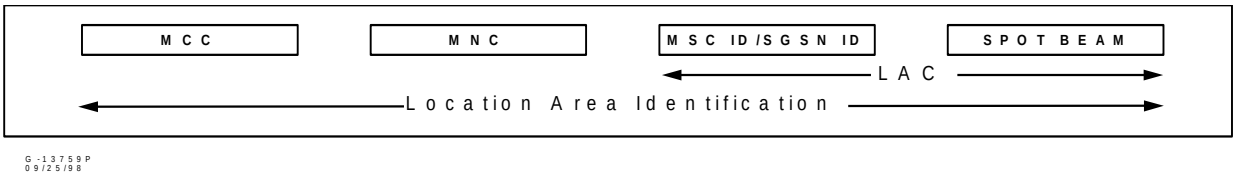

Figure 8.1: Structure of Location Area Identification (LAI)

The LAI is composed of the following elements:

- Mobile Country Code (MCC) identifies the country in which the PLMN is located. The value of the MCC is the same as the three digits MCC contained in international mobile subscriber identity (IMSI);
- Mobile Network Code (MNC) is a code identifying the PLMN in that country. The MNC takes the same value as the two digits MNC contained in IMSI.

NOTE 1: The specific MCC and MNC values that are reserved for a satellite network are defined in ITU-T Recommendation E.212 [i.1].

- Location Area Code (LAC) which is a fixed length code (of 2 octets) identifying a location area within a GMR-1 Satellite Network. LAC is composed of two parts:

  i) Mobile Switching Centre ID (MSCID) which identifies a Mobile Switching Centre (MSC) within a GMR-1 Satellite Network or SGSN ID, which identifies an SGSN within a GMR-1 Satellite Network. Its length is six bits.

  ii) Spot beam ID (spot beam ID) which identifies a spot beam within GMR-1 Satellite Network. Its length is ten bits.

NOTE 2: This usage of the LAC is specific to a GMR-1 Satellite Network.

8.1a Composition of the Location Area Identification (LAI) (Iu Mode)

The Location Area Identification (LAI) shall be composed as shown in figure 8.1a.

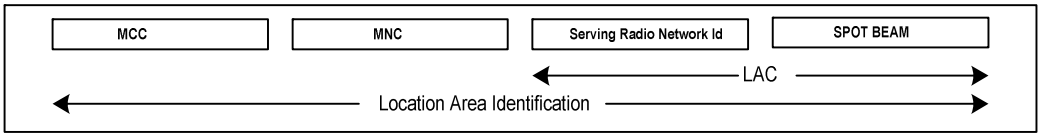

Figure 8.1a: Structure of Location Area Identification (LAI)

The LAI is composed of the following elements:

- Mobile Country Code (MCC) identifies the country in which the PLMN is located. The value of the MCC is the same as the three digits MCC contained in international mobile subscriber identity (IMSI);
- Mobile Network Code (MNC) is a code identifying the PLMN in that country. The MNC takes the same value as the two digits MNC contained in IMSI.

NOTE 1: The specific MCC and MNC values that are reserved for a satellite network are defined in ITU-T Recommendation E.212 [i.1].

- Location Area Code (LAC) which is a fixed length code (of 2 octets) identifying a location area within a GMR-1 Satellite Network. LAC is composed of two parts:

  i) Serving Radio Network Id wjocj identifies Satellite GERAN within GMR-1 Satellite Network. Its length is six bits.

  ii) Spot beam ID (spot beam ID) which identifies a spot beam within GMR-1 Satellite Network. Its length is ten bits.

The following hexadecimal values of LAC are reserved:

0000, and

FFFE.

These reserved values are used in some special cases when no valid LAI exists in the MS (see 3GPP TS 24.008 [3], 3GPP TS 31.102 [5] and 3GPP TS 51.011 [4]).

NOTE 2: This usage of the LAC is specific to a GMR-1 Satellite Network.

8.2 Composition of the Routing Area Identification (RAI)

The Routing Area Identification (RAI) shall be composed as shown in figure 8.2.

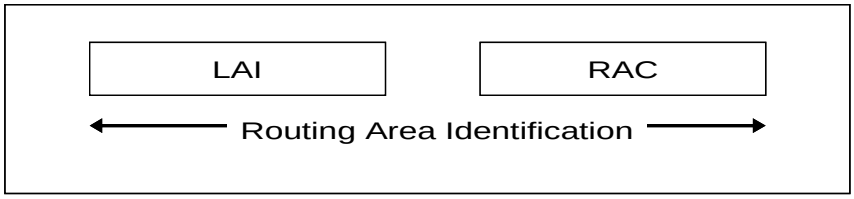

Figure 8.2: Structure of Routing Area Identification (RAI)

The RAI is composed of the following elements:

- A valid Location Area Identity (LAI) as defined in clause 8.1.
- Routing Area Code (RAC), which is a fixed length code (of 1 octet) identifying a routing area within a location area.

Usage of the RAC is specific to a GMR-1 Satellite Network.

8.3 Base station identification

8.3.1 Cell Identity (CI) and Cell Global Identification (CGI)

Same as clause 4.3.1 of 3GPP TS 23.003 [2].

8.3.2 Base Station Identify Code (BSIC)

This identity is not applicable to GMR-1.

8.4 Regional Subscription Zone Identity (RSZI)

Same as clause 4.4 of 3GPP TS 23.003 [2].

8.5 Location Number

Same as clause 4.5 of 3GPP TS 23.003 [2].

9 Identification of MSCs, GSNs and location registers

9.1 Identification for routeing purposes

Same as clause5.1 of 3GPP TS 23.003 [2].

9.2 Identification of HLR for HLR restoration application

Same as clause 5.2 of 3GPP TS 23.003 [2].

10 International Mobile Station Equipment Identity and Software Version Number

10.1 General

Same as clause 6.1 of 3GPP TS 23.003 [2].

10.2 Composition of IMEI and IMEISV

10.2.1 Composition of IMEI

Same as clause 6.2.1 of 3GPP TS 23.003 [2].

10.2.2 Composition of IMEISV

Same as clause 6.2.2 of 3GPP TS 23.003 [2].

10.3 Allocation principles

Same as clause 6.3 of 3GPP TS 23.003 [2].

11 Identification of Voice Group Call and Voice Broadcast Call Entities

These identities are not applicable to GMR-1.

12 SCCP subsystem numbers

Same as clause 8 of 3GPP TS 23.003 [2].

12.1 Globally standardized subsystem numbers used for GSM/UMTS

Same as clause 8.1 of 3GPP TS 23.003 [2].

12.2 National network subsystem numbers used for GSM/UMTS

Same as clause 8.2 of 3GPP TS 23.003 [2].

13 Definition of Access Point Name

Same as clause 9 of 3GPP TS 23.003 [2].

13.1 Structure of APN

Same as clause 9.1 of 3GPP TS 23.003 [2].

13.1.1 Format of APN Network Identifier

Same as clause 9.1.1 of 3GPP TS 23.003 [2].

13.1.2 Format of APN Operator Identifier

Same as clause 9.1.2 of 3GPP TS 23.003 [2].

13.2 Definition of the Wild Card APN

Same as clause 9.2 of 3GPP TS 23.003 [2].

13.2.1 Coding of the Wild Card APN

Same as clause 9.2.1 of 3GPP TS 23.003 [2].

14 Identification of the Cordless Telephony System entities

These identities are not applicable to GMR-1.

15 Identification of Localised Service Area

These identities are not applicable to GMR-1.

16 Identification of PLMN, RNC, Service Area, CN domain and Shared Network Area

Same as clause 12 of 3GPP TS 23.003 [2].

16.1 PLMN Identifier

Same as clause 12.1 of 3GPP TS 23.003 [2].

16.2 CN Domain Identifier

Same as clause 12.2 of 3GPP TS 23.003 [2].

16.3 CN Identifier

Same as clause 12.3 of 3GPP TS 23.003 [2].

16.4 RNC Identifier

Same as clause 12.4 of 3GPP TS 23.003 [2].

16.5 Service Area Identifier

Same as clause 12.5 of 3GPP TS 23.003 [2].

16.6 Shared Network Area Identifier

This identity is not applicable to GMR-1.

17 Numbering, addressing and identification within the IP multimedia core network subsystem

17.1 Introduction

Same as clause 13.1 of 3GPP TS 23.003 [2].

17.2 Home network domain name

Same as clause 13.2 of 3GPP TS 23.003 [2].

17.3 Private user identity

Same as clause 13.3 of 3GPP TS 23.003 [2].

17.4 Public User Identity

Same as clause 13.4 of 3GPP TS 23.003 [2].

17.5 Public service identity (PSI)

Same as clause 13.5 of 3GPP TS 23.003 [2].

18 Numbering, addressing and identification for 3GPP System to WLAN Interworking

These identities are not applicable to GMR-1.

19 Identification of Multimedia Broadcast/Multicast Service

19.1 Introduction

Same as clause 15.1 of 3GPP TS 23.003 [2].

19.2 Structure of TMGI

Same as clause 15.2 of 3GPP TS 23.003 [2].

19.3 Structure of MBMS SAI

Same as clause 15.3 of 3GPP TS 23.003 [2].

20 Numbering, addressing and identification within the GAA subsystem

These identities are not applicable to GMR-1.

21 Numbering, addressing and identification within the Generic Access Network

These identities are not applicable to GMR-1.

Annex A (informative): Colour Codes

A.1 Utilization of the BSIC

Color codes are not applicable to GMR-1.

A.2 Guidance for planning

Not applicable to GMR-1.

A.3 Example of PLMN colour codes (NCCs) for the European region

Not applicable to GMR-1.

Annex B (normative): IMEI Check Digit computation

B.1 Representation of IMEI

Same as clause B.1 of 3GPP TS 23.003 [2].

B.2 Computation of CD for an IMEI

Same as clause B.3 of 3GPP TS 23.003 [2].

B.3 Example of computation

Same as clause B.3 of 3GPP TS 23.003 [2].

Annex C (normative): Naming convention

Same as annex C of 3GPP TS 23.003 [2].

C.1 Routing Area Identities

Same as clause C.1 of 3GPP TS 23.003 [2].

C.2 GPRS Support Nodes

Same as clause C.2 of 3GPP TS 23.003 [2].

C.3 Target ID

Same as clause C.3 of 3GPP TS 23.003 [2].

Annex D (informative): Applicability and use of the "3gppnetwork.org" domain name

Same as annex D of 3GPP TS 23.003 [2].

Annex E (normative): Procedure for sub-domain allocation

Same as annex E of 3GPP TS 23.003 [2].

History

Document history		
V3.2.1	February 2011	Publication