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Evropski digitalni celiļ ni telekomunikacijski sistem (faza 2) ï Preslikava elementov informacije med mobilno postajo in sistemom baznih postaj (MS-BSS) ter sistemom baznih postaj ï komutacijo mobilnih storitev (BSS-MSC) ï Postopki signalizacije in del za mobilne aplikacije (MAP) (GSM 09.10)

European digital cellular telecommunications system (Phase 2); Information element mapping between Mobile Station - Base Station System (MS - BSS) and Base Station System - Mobile-services Switching Centre (BSS - MSC) Signalling procedures and the Mobile Application Part (MAP) (GSM 09.10)

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Contents

Foreword 5

1 Introduction 7
1.1 Scope 7
1.2 Normative references 7
1.3 Definitons and abbreviations 8

2 Classification of interworking cases 8
2.1 Transparent procedures 8
2.2 Non-transparent procedures 8

3 Interworking in the MSC, Transparent case 9
3.1 General 9
3.2 Location area updating 11
3.3 Detach IMSI 12
3.4 Authentication 12
3.5 Retrieval of the IMSI from the MS 13
3.6 Reallocation of TMSI 14
3.7 Retrieval of the IMEI from the MS 14
3.8 Tracing subscriber activity 15

4 Non-transparent cases 15
4.1 General 15
4.2 Outgoing call set-up (MS originating call) 15
4.3 Incoming call set-up (MS terminating call) 20
4.4 Cipher mode setting 22
4.5 Inter-MSC Handover 22
4.5.1 Basic Inter-MSC Handover 22
4.5.2 Subsequent Inter-MSC Handover back to MSC-A 29
4.5.3 Subsequent Inter-MSC Handover to third MSC 34
4.5.4 BSSAP Messages transfer on E-Interface 39
4.5.5 Processing in MSC-B, and information transfer on E-interface 40
4.5.5.1 Encryption Information 41
4.5.5.2 Channel Type 42
4.5.5.3 Classmark 42
4.5.5.4 Downlink DTX-Flag 43
4.5.5.5 Priority 43
4.5.5.6 MSC/BSC-Invoke Trace Information Elements 43
4.5.6 Overview of the Technical Specifications GSM interworking for the Inter-MSC Handover 44

History 45

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Foreword

This European Telecommunication Standard (ETS) has been produced by the Special Mobile Group (SMG) Technical Committee (TC) of the European Telecommunications Standards Institute (ETSI) and is now submitted for publication.

This ETS describes information element mapping between Mobile Station - Base Station System (MS - BSS) and Base Station System - Mobile-services Switching Centre (BSS - MSC), signalling procedures and the Mobile Application Part (MAP), within the European digital cellular telecommunications system (Phase 2).

This ETS corresponds to GSM technical specification GSM 09.10 version 4.2.2.

The specification from which this ETS has been derived was originally based on CEPT documentation, hence the presentation of this ETS may not be entirely in accordance with the ETSI/PNE rules.

NOTE: TC-SMG has produced documents which give the technical specifications for the implementation of the European digital cellular telecommunications system. Historically, these documents have been identified as GSM Technical Specifications (GSM-TSs). These TSs may have subsequently become I-ETSs (Phase 1), or ETSs (Phase 2), whilst others may become ETSI Technical Reports (ETRs). GSM-TSs are, for editorial reasons, still referred to in current GSM ETSs.

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1 Introduction

1.1 Scope

The scope of this Technical Specification is:

i) to provide a detailed specification for the interworking between information elements contained in layer 3 messages sent on the MS-MSC interface (Call Control and Mobility Management parts of TS GSM 04.08) and parameters contained in MAP services sent over the MSC-VLR interface (TS GSM 09.02) where the MSC acts as a transparent relay of information;

ii) to provide a detailed specification for the interworking between information elements contained in BSSMAP messages sent on the BSC-MSC interface (TS GSM 08.08) and parameters contained in MAP services sent over the MSC-VLR interface (TS GSM 09.02) where the MSC acts as a transparent relay of information;

iii) to provide a detailed specification for the interworking as in i) and ii) above when the MSC also processes the information.

Interworking for supplementary services is given in TS GSM 09.11. Interworking for the short message service is given in TSs GSM 03.40 and GSM 04.11. Interworking between the call control signalling of TS GSM 04.08 and the PSTN/ISDN is given in TSs GSM 09.03, GSM 09.07 and GSM 09.08. Interworking between the 'A' and 'E' interfaces for inter-MSC handover signalling is given in TSs GSM 09.07 and 09.08.

1.2 Normative references

This ETS incorporates by dated and undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this ETS only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies.

[1] GSM 01.04 (ETR 100): "European digital cellular telecommunications system (Phase 2); Abbreviations and acronyms".

[2] GSM 03.09 (ETS 300 527): "European digital cellular telecommunications system (Phase 2); Handover procedures".

[3] GSM 03.40 (ETS 300 536): "European digital cellular telecommunications system (Phase 2); Technical realization of the Short Message Service (SMS) Point to Point (PP)".

[4] GSM 04.08 (ETS 300 557): "European digital cellular telecommunications system (Phase 2); Mobile radio interface layer 3 specification".

[5] GSM 04.10 (ETS 300 558): "European digital cellular telecommunications system (Phase 2); Mobile radio interface layer 3 Supplementary services specification General aspects".

[6] GSM 04.11 (ETS 300 559): "European digital cellular telecommunications system (Phase 2); Point-to-Point (PP) Short Message Service (SMS) support on mobile radio interface".

[7] GSM 08.08 (ETS 300 590): "European digital cellular telecommunications system (Phase 2); Mobile Switching Centre - Base Station System (MSC - BSS) interface Layer 3 specification".

[8] GSM 09.02 (ETS 300 599): "European digital cellular telecommunications system (Phase 2); Mobile Application Part (MAP) specification".

[9] GSM 09.03 (ETS 300 600): "European digital cellular telecommunications system (Phase 2); Signalling requirements on interworking between the Integrated Services Digital Network (ISDN) or Public Switched Telephone Network (PSTN) and the Public Land Mobile Network (PLMN)".

[10] GSM 09.07 (ETS 300 604): "European digital cellular telecommunications system (Phase 2); General requirements on interworking between the Public Land Mobile Network (PLMN) and the Integrated Services Digital Network (ISDN) or Public Switched Telephone Network (PSTN)".

[11] GSM 09.08 (ETS 300 626): "European digital cellular telecommunications system (Phase 2); Application of the Base Station System Application Part (BSSAP) on the E-interface"

[12] GSM 09.11 (ETS 300 606): "European digital cellular telecommunications system (Phase 2); Signalling interworking for supplementary services".

1.3 Definitons and abbreviations

Abbreviations used in this specification are listed in GSM 01.04.

2 Classification of interworking cases

2.1 Transparent procedures

The following MSC procedures require transparent mapping of BSSAP information elements into MAP parameters and vice versa (see TS GSM 09.02 for definitions and the use of the procedures):

- update location area;
- detach IMSI;
- forward new TMSI;
- provide IMSI;
- obtain IMEI;
- check IMEI;
- authenticate;
- trace subscriber activity.

2.2 Non-transparent procedures

Procedures in this class require processing in the MSC and information element mapping. These procedures include those related to:

- outgoing call set-up;
- incoming call set-up;
- handover;
- cipher mode setting.

3 Interworking in the MSC, Transparent case

3.1 General

When the MSC receives a forward message from the BSS (possibly forwarded transparently from the MS), it will invoke the desired MAP service and establish a cross reference between the BSSAP procedure and the MAP procedure in order to return the result of the operation to the BSS (which may forward it transparently to the MS. The cross reference is deleted when the MSC terminates the MAP procedure.

Positive or negative results of the MAP procedure are returned in the appropriate BSSAP message.

The parameters of the forward BSSAP message are mapped by a one-to-one mapping into the parameters of the MAP service. However, in some cases parameters received on the radio path may be suppressed at the MSC because they are related to another protocol entity, e.g. information related to RR-management may be included in MM-management messages. Similarly, parameters received in the (positive) MAP service response are mapped one-to-one into parameters of the corresponding backward BSSAP message.

A negative outcome, as carried in various MAP services (MAP specific service response, MAP_U_ABORT, MAP_P_ABORT, MAP_NOTICE and premature MAP_CLOSE, see TS GSM 09.02 for definitions) is mapped into a cause value in the required backward BSSAP message. In this case several negative results of MAP may be mapped into the same BSSAP cause value, i.e. without discrimination between these negative results.

NOTE: For O & M purposes, the MAP procedure entity in the MSC may require a more detailed overview of negative results than the MS.

These principles are illustrated in figure 1.

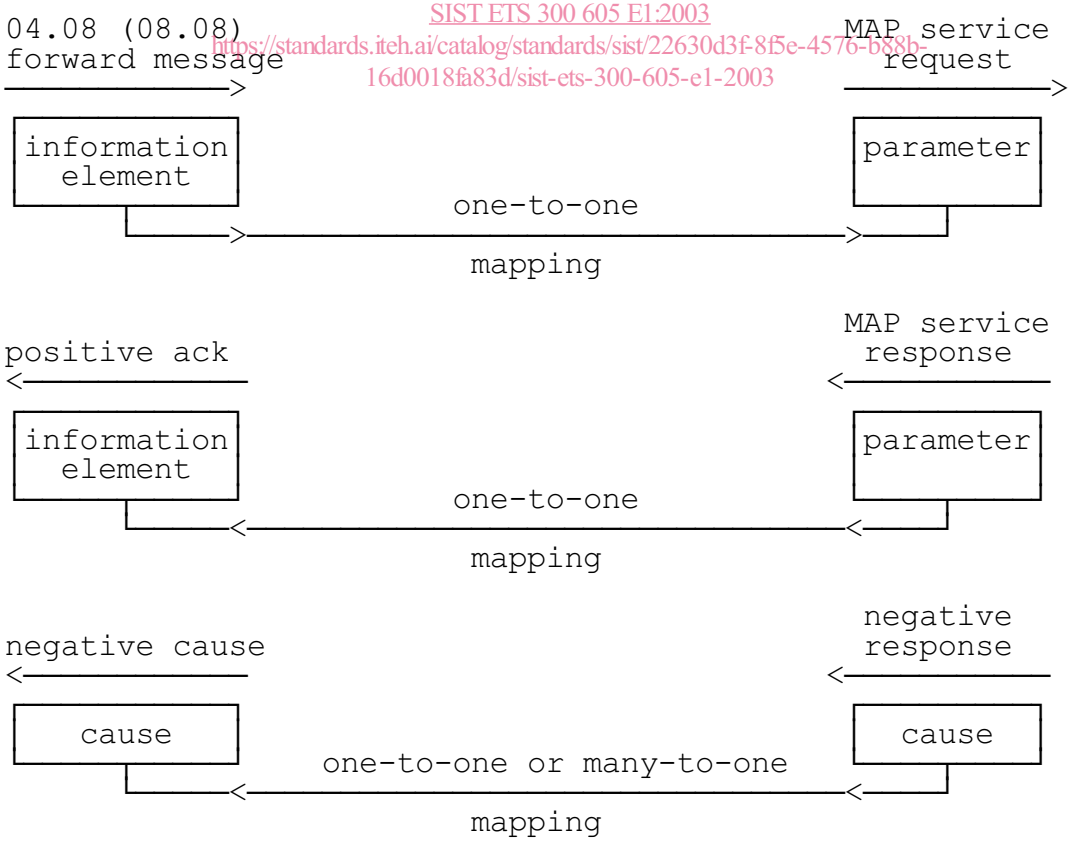

Figure 1: Illustration of mapping principles in the MSC

For each of the transparent operations listed in section 2.1, the following format is used to show the mapping.

	04.08 or 08.08		09.02	Notes
Forward message	MS/BSS to MSC message name information element 1 information element 2	 <---> <--->	MSC to VLR MAP service request parameter 1 parameter 2	
Positive result	MSC to MS/BSS message name information element 1 information element 2	 <---> <--->	VLR to MSC positive response parameter 1 parameter 2	
Negative result	MSC to MS/BSS message name cause 1 cause 2 cause 3 cause 3 cause 3	 <---> <---> <---> <---> <--->	VLR to MSC negative response cause 1 cause 2 MAP_U/P_ABORT MAP_NOTICE MAP_CLOSE	

Equivalent mapping principles apply for operations invoked by the VLR towards the BSS/MS. However, negative results are generally not received from the BSS/MS but are generated in the MSC. Therefore, for such operations the interworking for negative results is not normally shown.

3.2 Location area updating

	08.08/04.08	09.02	Notes
Forward message	COMPLETE LAYER 3 INFO (LOCATION UPDATING REQUEST)	MAP_UPDATE_LOCATION_AREA request	
	Location area id	Previous LA Id	
	Mobile identity	IMSI or TMSI	
	Mobile station classmark 1	-	4
	Ciphering key seq number	CKSN	
	Location update type	Location update type	3
	Cell identifier	Target LA Id	1
	Chosen channel	-	
Positive results	DTAP (LOCATION UPDATING ACCEPT)	MAP_UPDATE_LOCATION AREA response	
	Location area identity	-	
	Mobile identity	-	5
	Follow on proceed	-	
Negative results	DTAP (LOCATION UPDATING REJECT)	MAP_UPDATE_LOCATION AREA response	
	IMSI unknown in HLR	Unknown subscriber	
	Network failure	Unknown LA	2
	PLMN not allowed	Roaming not allowed: PLMN not allowed	
	LA not allowed	LA not allowed	
	National roaming not allowed in this LA	National Roaming not allowed	
	PLMN not allowed	Operator determined barring	
	Illegal MS	Illegal subscriber	
	Illegal ME	Illegal equipment	
	Network failure	System Failure	
	Network failure	Unexpected data value	
	Network failure	MAP_U/P_ABORT	
	Network failure	MAP_NOTICE	
	Network failure	MAP_CLOSE	

NOTE 1: The Target LA Id parameter is derived by the MSC from the Cell identifier information element.

NOTE 2: The Unknown LA error is only generated as a result of incorrect information being inserted by the MSC or BSS.

NOTE 3: This parameter can be used by the VLR to decide whether (eg) Authentication or IMEI checking is needed.

NOTE 4 As the mobile station classmark (1 or 2) is received by the MSC at the establishment of every RR connection, this information need not be stored in the VLR, but it is stored in the MSC as long as the RR connection exists.

NOTE 5 The mobile identity is inserted by the MSC if it is received in a MAP_FORWARD_NEW_TMSI service. If a TMSI is included, the MS should respond with a TMSI REALLOCATION COMPLETE message.