

3GPP TSG_CN#7
ETSI SMG3 Plenary Meeting #7,
Madrid, Spain
13th – 15th March 2000

NP-000133

Agenda item: 5.2.3
Source: TSG_N WG2
Title: CRs to 3G Work Item Security

Introduction:

This document contains “21” CRs on **Work Item Security**, that have been agreed by **TSG_N WG2**, and are forwarded to **TSG_N Plenary** meeting #7 for approval.

TDoc	SPEC	CR	REV	CAT	Rel	Old vers	New vers	SUBJECT
N2B000331	03.03	A038		C	R98	7.3.1		Modification of section 6.2 to enhance IMEI security
N2B000332	03.03	A039		C	R97	6.4.1		Modification of section 6.2 to enhance IMEI security
N2B000333	03.03	A040		C	R96	5.2.0		Modification of section 6.2 to enhance IMEI security
N2B000334	03.03	A041		C	Ph2	4.9.0		Modification of section 6.2 to enhance IMEI security
N2B000341	23.003	015	3	B	R99	3.3.0		Introduction of Encrypted MSI
N2B000335	23.003	017	1	C	R99	3.3.0		Modification of section 6.2 to enhance IMEI security
N2B000347	23.008	022	1	B	R99	3.2.0		Introduction of Enhanced User Identity Confidentiality
N2B000340	23.012	003	3	B	R99	3.1.0		Introduction of Enhanced User Identity Confidentiality
N2B000190	23.012	004		B	R99	3.1.0		Addition of Current Security Context to Send_Identification_PVLR
N2B000421	23.018	036	3	B	R99	3.3.0		Introduction of Enhanced User Identity Confidentiality
N2B000067	29.002	089			R99	3.3.0		Security interworking between release 99 and pre-99 MSC/VLRs
N2B000447	29.002	092	4	B	R99	3.3.1		Introduction of Enhanced User Identity Confidentiality
N2B000191	29.002	099		B	R99	3.3.0		Addition of Current Security Context to Send_Identification_PVLR
N2B000330	29.002	103	1	B	R99	3.3.0		Addition of UMTS security to MAP B interface
N2B000244	29.002	104		F	R99	3.3.0		Re-Synchronisation Info
N2B000446	29.060	080	2	C	R99	3.3.0		GTP Security
N2B000449	29.060	082	1	B	R99	3.3.0		Introduction of EUIC
N2B000380	29.002	102	2	F	R99	3.3.1		Clarification on Authentication Info Retrieval
N2B000454	29.002	110	1	B	R99	3.3.1		Introduction of Authentication Failure Report
N2B000315	23.018	049		B	R99	3.3.0		Introduction of Authentication Failure Report
N2B000316	23.012	005		B	R99	3.1.0		Introduction of Authentication Failure Report

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

03.03 CR A038

Current Version: **7.3.1**

GSM (AA.BB) or 3G (AA.BBB) specification number ↑

↑ CR number as allocated by MCC support team

For submission to: **CN#07**
list expected approval meeting # here ↑

for approval
for information

strategic (for SMG
non-strategic use only)

Form: CR cover sheet, version 2 for 3GPP and SMG The latest version of this form is available from: [ftp://ftp.3gpp.org/Information/CR-Form-v2.doc](http://ftp.3gpp.org/Information/CR-Form-v2.doc)

Proposed change affects: (U)SIM ME UTRAN / Radio Core Network
(at least one should be marked with an X)

Source: **N2**

Date: **07.02.00**

Subject: Modification of section 6.2 to enhance IMEI security

Work item: Security

Category:
(only one category shall be marked with an X)
F Correction
A Corresponds to a correction in an earlier release
B Addition of feature
C Functional modification of feature
D Editorial modification

<input type="checkbox"/>	Release: Phase 2
<input type="checkbox"/>	Release 96
<input type="checkbox"/>	Release 97
<input checked="" type="checkbox"/>	Release 98
<input type="checkbox"/>	Release 99
<input type="checkbox"/>	Release 00

Reason for change: The security of the IMEI is not sufficiently given by the present specification. Therefore GSM 02.16 was modified. GSM 03.03 needs to be aligned with GSM 02.16. The modification is reflected in this CR.

This CR contains the wording agreed at SMG #30 (Document P-99-776).

Clauses affected: Section 6.2.1 and 6.2.2

Other specs affected:
Other 3G core specifications
Other GSM core specifications
MS test specifications
BSS test specifications
O&M specifications

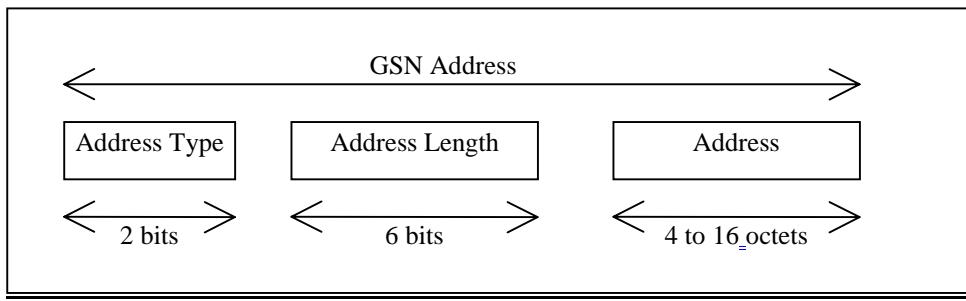
<input type="checkbox"/>	→ List of CRs:
<input type="checkbox"/>	→ List of CRs:
<input type="checkbox"/>	→ List of CRs:
<input type="checkbox"/>	→ List of CRs:
<input type="checkbox"/>	→ List of CRs:

Other comments: Category C3
Figures 9, 10 and 11 were not changed



help.doc

<----- double-click here for help and instructions on how to create a CR.

**Figure 9: Structure of GSN Address**

The GSN Address is composed of the following elements:

1. The Address Type which is a fixed length code (of 2 bits) identifying the type of address that is used in the Address field.
2. Address Length which is a fixed length code (of 6 bits) identifying the length of the Address field.
3. Address is a variable length field with either an IPv4 address or an IPv6 address.

Address Type 0 and Address Length 4 are used when Address is an IPv4 address.

Address Type 1 and Address Length 16 are used when Address is an IPv6 address.

The IP v4 address structure is defined in RFC 791.

The IP v6 address structure is defined in RFC 1883.

5.2 Identification of HLR for HLR restoration application

HLR may also be identified by one or several "HLR id(s)", consisting of the leading digits of the IMSI (MCC + MNC + leading digits of MSIN).

6 International Mobile Station Equipment Identity and Software Version Number

6.1 General

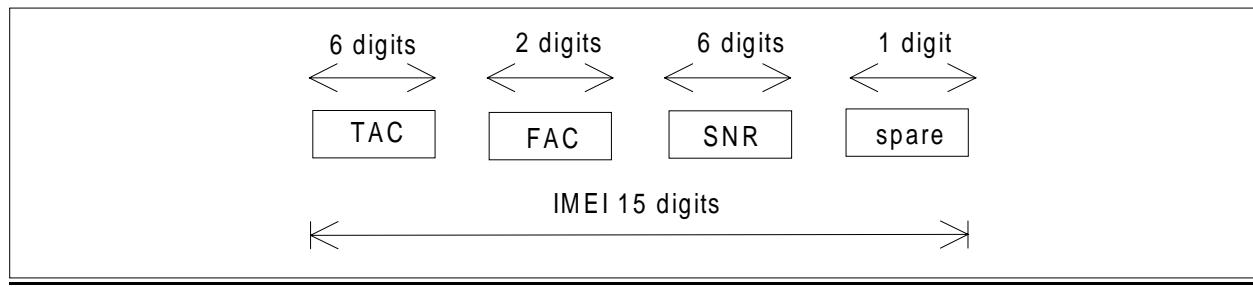
Below the structure and allocation principles of the International Mobile station Equipment Identity and Software Version Number (IMEISV) and the International Mobile station Equipment Identity (IMEI) are defined.

The Mobile Station Equipment is uniquely defined by the IMEI or the IMEISV.

6.2 Composition of IMEI and IMEISV

6.2.1 Composition of IMEI

The International Mobile station Equipment Identity (IMEI) is composed as shown in figure 10.

**Figure 10: Structure of IMEI**

The IMEI is composed of the following elements (each element shall consist of decimal digits only):

- Type Approval Code (TAC). Its length is 6 digits;
- Final Assembly Code (FAC) identifies the place of manufacture/final assembly. Its length is 2 digits;
- Serial Number (SNR) is an individual serial number uniquely identifying each equipment within each TAC and FAC. Its length is 6 digits.
- Spare digit: this digit shall be zero, when transmitted by the MS.

The TAC, FAC and SNR shall not be changed after the ME's final production process. These shall resist tampering, i.e. manipulation and change, by any means (e.g. physical, electrical and software) (see TS GSM 02.16).

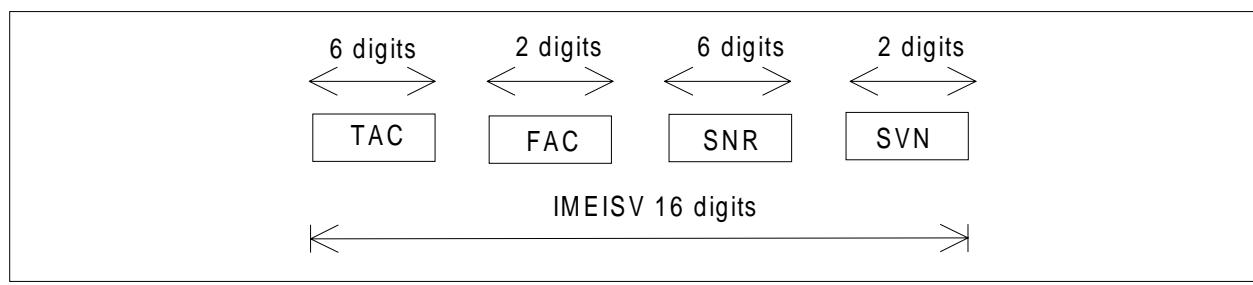
Note: This requirement is valid for new GSM Phase 2 and Release 96, 97 and 98 MEs type approved after 1st June 2002.

In addition, the agreed time after which no equipment is first placed on the market without improved IMEI security functionality as specified is considered as the very latest date. It is understood that typically requirements should be satisfied one year earlier.

~~The TAC, FAC and SNR shall be physically protected against unauthorized change (see GSM 02.09).~~

6.2.2 Composition of IMEISV

The International Mobile station Equipment Identity and Software Version Number (IMEISV) is composed as shown in figure 11.

**Figure 11: Structure of IMEISV**

The IMEISV is composed of the following elements (each element shall consist of decimal digits only):

- Type Approval Code (TAC). Its length is 6 digits;

- Final Assembly Code (FAC) identifies the place of manufacture/final assembly. Its length is 2 digits;
- Serial Number (SNR) is an individual serial number uniquely identifying each equipment within each TAC and FAC. Its length is 6 digits.
- Software Version Number (SVN) identifies the software version number of the mobile equipment. Its length is 2 digits.

Regarding updates of the IMEISV: The TAC, FAC and SNR shall not be changed after the ME's final production process. These shall resist tampering, i.e. manipulation and change, by any means (e.g. physical, electrical and software) (see TS GSM 02.16)~~the TAC, FAC and SNR shall be physically protected against unauthorized change (see GSM 02.09)~~; i.e. only the SVN part of the IMEISV can be modified.

Note: This requirement is valid for new GSM Phase 2 and Release 96, 97 and 98 MEs type approved after 1st June 2002.

In addition, the agreed time after which no equipment is first placed on the market without improved IMEI security functionality as specified is considered as the very latest date. It is understood that typically requirements should be satisfied one year earlier.

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

03.03 CR A039

Current Version: **6.4.1**

GSM (AA.BB) or 3G (AA.BBB) specification number ↑

↑ CR number as allocated by MCC support team

For submission to: **CN#07**
list expected approval meeting # here ↑

for approval
for information

strategic (for SMG
non-strategic use only)

Form: CR cover sheet, version 2 for 3GPP and SMG The latest version of this form is available from: [ftp://ftp.3gpp.org/Information/CR-Form-v2.doc](http://ftp.3gpp.org/Information/CR-Form-v2.doc)

Proposed change affects: (U)SIM ME UTRAN / Radio Core Network
(at least one should be marked with an X)

Source: **N2**

Date: **07.02.00**

Subject: Modification of section 6.2 to enhance IMEI security

Work item: Security

Category:
(only one category shall be marked with an X)
F Correction
A Corresponds to a correction in an earlier release
B Addition of feature
C Functional modification of feature
D Editorial modification

Release: Phase 2
Release 96
Release 97
X Release 98
Release 99
Release 00

Reason for change: The security of the IMEI is not sufficiently given by the present specification. Therefore GSM 02.16 was modified. GSM 03.03 needs to be aligned with GSM 02.16. The modification is reflected in this CR.

This CR contains the wording agreed at SMG #30 (Document P-99-776).

Clauses affected: Section 6.2.1 and 6.2.2

Other specs affected:
Other 3G core specifications
Other GSM core specifications
MS test specifications
BSS test specifications
O&M specifications

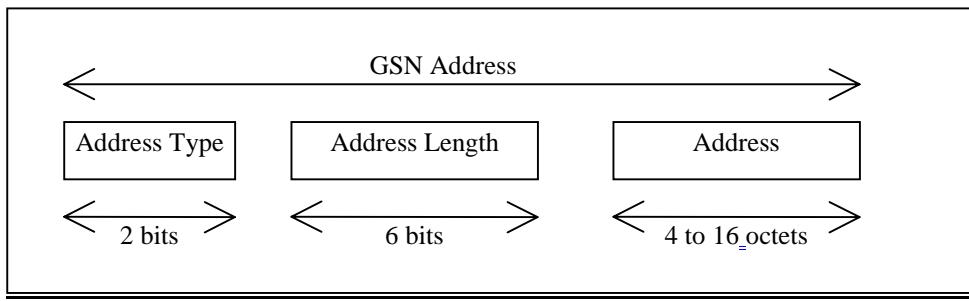
→ List of CRs:
→ List of CRs:
→ List of CRs:
→ List of CRs:
→ List of CRs:

Other comments: Category C3
Figures 9, 10 and 11 were not changed



help.doc

----- double-click here for help and instructions on how to create a CR.

**Figure 9: Structure of GSN Address**

The GSN Address is composed of the following elements:

1. The Address Type which is a fixed length code (of 2 bits) identifying the type of address that is used in the Address field.
2. Address Length which is a fixed length code (of 6 bits) identifying the length of the Address field.
3. Address is a variable length field with either an IPv4 address or an IPv6 address.

Address Type 0 and Address Length 4 are used when Address is an IPv4 address.

Address Type 1 and Address Length 16 are used when Address is an IPv6 address.

The IP v4 address structure is defined in RFC 791.

The IP v6 address structure is defined in RFC 1883.

5.2 Identification of HLR for HLR restoration application

HLR may also be identified by one or several "HLR id(s)", consisting of the leading digits of the IMSI (MCC + MNC + leading digits of MSIN).

6 International Mobile Station Equipment Identity and Software Version Number

6.1 General

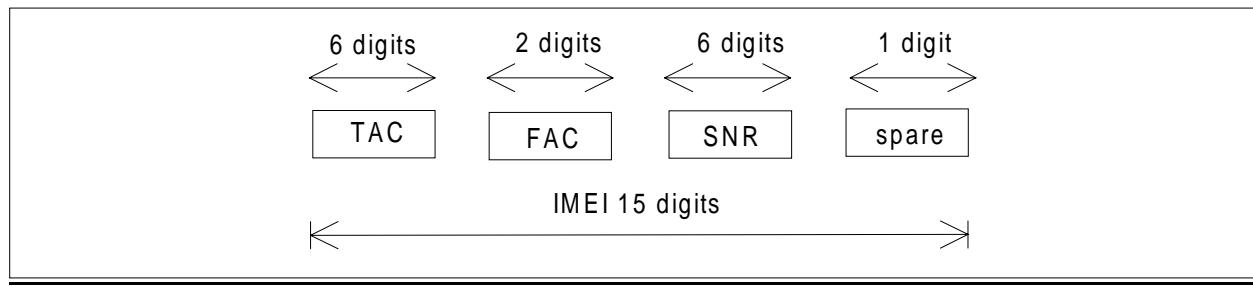
Below the structure and allocation principles of the International Mobile station Equipment Identity and Software Version Number (IMEISV) and the International Mobile station Equipment Identity (IMEI) are defined.

The Mobile Station Equipment is uniquely defined by the IMEI or the IMEISV.

6.2 Composition of IMEI and IMEISV

6.2.1 Composition of IMEI

The International Mobile station Equipment Identity (IMEI) is composed as shown in figure 10.

**Figure 10: Structure of IMEI**

The IMEI is composed of the following elements (each element shall consist of decimal digits only):

- Type Approval Code (TAC). Its length is 6 digits;
- Final Assembly Code (FAC) identifies the place of manufacture/final assembly. Its length is 2 digits;
- Serial Number (SNR) is an individual serial number uniquely identifying each equipment within each TAC and FAC. Its length is 6 digits.
- Spare digit: this digit shall be zero, when transmitted by the MS.

The TAC, FAC and SNR shall not be changed after the ME's final production process. These shall resist tampering, i.e. manipulation and change, by any means (e.g. physical, electrical and software) (see TS GSM 02.16).

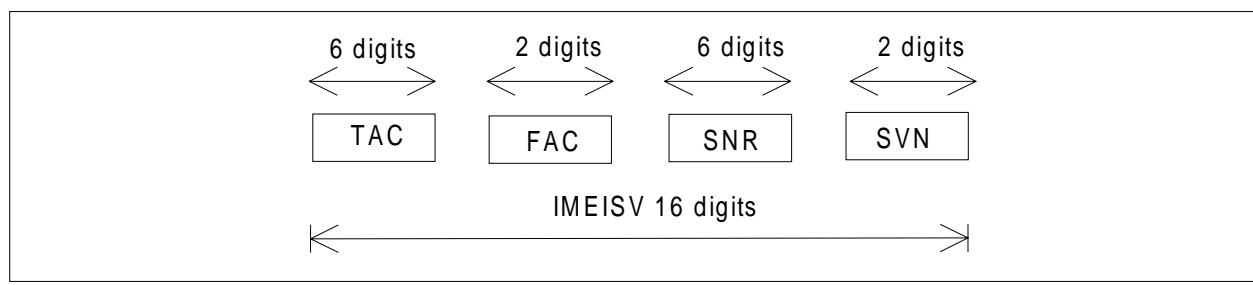
Note: This requirement is valid for new GSM Phase 2 and Release 96 and 97 MEs type approved after 1st June 2002.

In addition, the agreed time after which no equipment is first placed on the market without improved IMEI security functionality as specified is considered as the very latest date. It is understood that typically requirements should be satisfied one year earlier.

~~The TAC, FAC and SNR shall be physically protected against unauthorized change (see GSM 02.09).~~

6.2.2 Composition of IMEISV

The International Mobile station Equipment Identity and Software Version Number (IMEISV) is composed as shown in figure 11.

**Figure 11: Structure of IMEISV**

The IMEISV is composed of the following elements (each element shall consist of decimal digits only):

- Type Approval Code (TAC). Its length is 6 digits;

- Final Assembly Code (FAC) identifies the place of manufacture/final assembly. Its length is 2 digits;
- Serial Number (SNR) is an individual serial number uniquely identifying each equipment within each TAC and FAC. Its length is 6 digits.
- Software Version Number (SVN) identifies the software version number of the mobile equipment. Its length is 2 digits.

Regarding updates of the IMEISV: The TAC, FAC and SNR shall not be changed after the ME's final production process. These shall resist tampering, i.e. manipulation and change, by any means (e.g. physical, electrical and software) (see TS GSM 02.16)~~the TAC, FAC and SNR shall be physically protected against unauthorized change (see GSM 02.09)~~; i.e. only the SVN part of the IMEISV can be modified.

Note: This requirement is valid for new GSM Phase 2 and Release 96 and 97 MEs type approved after 1st June 2002.

In addition, the agreed time after which no equipment is first placed on the market without improved IMEI security functionality as specified is considered as the very latest date. It is understood that typically requirements should be satisfied one year earlier.

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

03.03 CR A040

Current Version: **5.2.0**

GSM (AA.BB) or 3G (AA.BBB) specification number ↑

↑ CR number as allocated by MCC support team

For submission to: **CN#07**
list expected approval meeting # here
↑

for approval
for information

strategic
non-strategic (for SMG use only)

Form: CR cover sheet, version 2 for 3GPP and SMG The latest version of this form is available from: <ftp://ftp.3gpp.org/Information/CR-Form-v2.doc>

Proposed change affects: (U)SIM ME UTRAN / Radio Core Network
(at least one should be marked with an X)

Source: Mannesmann Mobilfunk GmbH **Date:** 07.02.00

Subject: Modification of section 6.2 to enhance IMEI security

Work item: Security

Category:	F Correction	<input type="checkbox"/>	Release:	Phase 2
	A Corresponds to a correction in an earlier release		Release 96	<input checked="" type="checkbox"/>
<i>(only one category shall be marked with an X)</i>	B Addition of feature		Release 97	<input type="checkbox"/>
	C Functional modification of feature		Release 98	<input type="checkbox"/>
	D Editorial modification	Release 99	<input type="checkbox"/>	
		Release 00	<input type="checkbox"/>	

Reason for change: The security of the IMEI is not sufficiently given by the present specification. Therefore GSM 02.16 was modified. GSM 03.03 needs to be aligned with GSM 02.16. The modification is reflected in this CR.

This CR contains the wording agreed at SMG #30 (Document P-99-776).

Clauses affected: Section 6.2.1 and 6.2.2

Other specs affected:	Other 3G core specifications	<input type="checkbox"/>	→ List of CRs:
	Other GSM core specifications		→ List of CRs:
	MS test specifications		→ List of CRs:
	BSS test specifications		→ List of CRs:
	O&M specifications		→ List of CRs:

Other comments: Category C3

4.4 Location Number

A location number is a number which defines a specific location within a GSM PLMN. The Location number is formatted according to CCITT Recommendation E.164, as shown in figure 7. The country code (CC) and national destination code (NDC) fields of the location number are those which define the GSM PLMN of which the location is part.

.....	CC	NDC	LSP
-------	----	-------	-----	-------	-----	-------

Figure 7: Location Number Structure

The structure of the locally significant part (LSP) of the location number is a matter for agreement between the PLMN operator and the national numbering authority in the PLMN's country. It is desirable that the location number can be interpreted without the need for detailed knowledge of the internal structure of the PLMN; the LSP should therefore include the national destination code in the national numbering plan for the fixed network which defines the geographic area in which the location lies.

The set of location numbers for a GSM PLMN must be chosen so that a location number can be distinguished from the MSISDN of a subscriber of the PLMN. This will allow the PLMN to trap attempts by users to dial a location number.

5 Identification of MSCs and location registers

5.1 Identification for routing purpose

MSCs and location registers are identified by international PSTN/ISDN numbers and/or Signalling Point Codes ("entity number", ie. "HLR number", "VLR number", "MSC number") in each GSM PLMN.

5.2 Identification of HLR for HLR restoration application

HLR may also be identified by one or several "HLR id(s)", consisting of the leading digits of the IMSI (MCC + MNC + leading digits of MSIN).

6 International mobile station equipment identity and software version number

6.1 General

Below the structure and allocation principles of the International Mobile station Equipment Identity and Software Version Number (IMEISV) and the International Mobile Station Equipment Identity (IMEI) are defined.

The Mobile Station Equipment is uniquely defined by the IMEI or the IMEISV.

6.2 Composition of IMEI and IMEISV

6.2.1 Composition of IMEI

The International Mobile station Equipment Identity (IMEI) is composed as shown in figure 8.

6 digits <.....>	2 digits <.....>	6 digits <.....>	1 digit <.....>
..... • TAC • • FAC • • SNR • • spare •
IMEI 15 digits •<.....>•			

Figure 8: Structure of IMEI

The IMEI is composed of the following elements (each element shall consist of decimal digits only):

- Type Approval Code (TAC). Its length is 6 digits;

- Final Assembly Code (FAC) identifies the place of manufacture/final assembly. Its length is 2 digits;
- Serial Number (SNR) is an individual serial number uniquely identifying each equipment within each TAC and FAC. Its length is 6 digits.
- Spare digit: this digit shall be zero, when transmitted by the Mobile Station.

The TAC, FAC and SNR shall not be changed after the ME's final production process. These shall resist tampering, i.e. manipulation and change, by any means (e.g. physical, electrical and software) (see TS GSM 02.16).

Note: This requirement is valid for new GSM Phase 2 and Release 96 MEs type approved after 1st June 2002.

In addition, the agreed time after which no equipment is first placed on the market without improved IMEI security functionality as specified is considered as the very latest date. It is understood that typically requirements should be satisfied one year earlier.

The TAC, FAC and SNR shall be physically protected against unauthorized change (see GSM 02.09).

6.2.2 Composition of IMEISV

The International Mobile station Equipment Identity and Software Version Number (IMEISV) is composed as shown in figure 9.

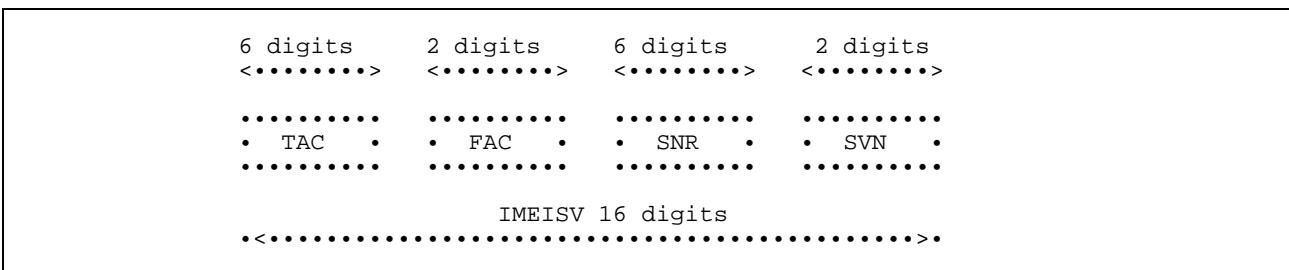


Figure 9: Structure of IMEISV

The IMEISV is composed of the following elements (each element shall consist of decimal digits only):

- Type Approval Code (TAC). Its length is 6 digits;
- Final Assembly Code (FAC) identifies the place of manufacture/final assembly. Its length is 2 digits;
- Serial Number (SNR) is an individual serial number uniquely identifying each equipment within each TAC and FAC. Its length is 6 digits.
- Software Version Number (SVN) identifies the software version number of the mobile equipment. Its length is 2 digits.

Regarding updates of the IMEISV: The TAC, FAC and SNR shall not be changed after the ME's final production process. These shall resist tampering, i.e. manipulation and change, by any means (e.g. physical, electrical and software) (see TS GSM 02.16) the TAC, FAC and SNR shall be physically protected against unauthorized change (see GSM 02.09); i.e. only the SVN part of the IMEISV can be modified.

Note: This requirement is valid for new GSM Phase 2 and Release 96 MEs type approved after 1st June 2002.

In addition, the agreed time after which no equipment is first placed on the market without improved IMEI security functionality as specified is considered as the very latest date. It is understood that typically requirements should be satisfied one year earlier.

6.3 Allocation principles

The Type Approval Code (TAC) is issued by a central body.

The place of final assembly (FAC) is encoded by the manufacturer.

Manufacturers shall allocate individual serial numbers (SNR) in a sequential order.

For a given ME, the combination of TAC, FAC and SNR used in the IMEI shall duplicate the combination of TAC, FAC and SNR used in the IMEISV.

The Software Version Number is allocated by the manufacturer after authorisation by the type approval authority. SVN value 99 is reserved for future use.

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

03.03 CR A041

Current Version: **4.9.0**

GSM (AA.BB) or 3G (AA.BBB) specification number ↑

↑ CR number as allocated by MCC support team

For submission to: **CN#07**
list expected approval meeting # here
↑

for approval
for information

strategic
non-strategic (for SMG use only)

Form: CR cover sheet, version 2 for 3GPP and SMG The latest version of this form is available from: <ftp://ftp.3gpp.org/Information/CR-Form-v2.doc>

Proposed change affects: (U)SIM ME UTRAN / Radio Core Network
(at least one should be marked with an X)

Source: **N2**

Date: **07.02.00**

Subject: Modification of section 6.2 to enhance IMEI security

Work item: Security

Category:
(only one category shall be marked with an X)
F Correction
A Corresponds to a correction in an earlier release
B Addition of feature
C Functional modification of feature
D Editorial modification

Release:
Phase 2
Release 96
Release 97
Release 98
Release 99
Release 00

Reason for change: The security of the IMEI is not sufficiently given by the present specification. Therefore GSM 02.16 was modified. GSM 03.03 needs to be aligned with GSM 02.16. The modification is reflected in this CR.

This CR contains the wording agreed at SMG #30 (Document P-99-776).

Clauses affected: Section 6.2.1 and 6.2.2

Other specs affected: Other 3G core specifications
Other GSM core specifications
MS test specifications
BSS test specifications
O&M specifications
→ List of CRs:
→ List of CRs:
→ List of CRs:
→ List of CRs:
→ List of CRs:

Other comments: Category C3

4.4 Location Number

A location number is a number which defines a specific location within a GSM PLMN. The Location number is formatted according to CCITT Recommendation E.164, as shown in figure 7. The country code (CC) and national destination code (NDC) fields of the location number are those which define the GSM PLMN of which the location is part.

.....	CC	NDC	LSP
-------	----	-------	-----	-------	-----	-------

Figure 7: Location Number Structure

The structure of the locally significant part (LSP) of the location number is a matter for agreement between the PLMN operator and the national numbering authority in the PLMN's country. It is desirable that the location number can be interpreted without the need for detailed knowledge of the internal structure of the PLMN; the LSP should therefore include the national destination code in the national numbering plan for the fixed network which defines the geographic area in which the location lies.

The set of location numbers for a GSM PLMN must be chosen so that a location number can be distinguished from the MSISDN of a subscriber of the PLMN. This will allow the PLMN to trap attempts by users to dial a location number.

5 Identification of MSCs and location registers

5.1 Identification for routing purpose

MSCs and location registers are identified by international PSTN/ISDN numbers and/or Signalling Point Codes ("entity number", ie. "HLR number", "VLR number", "MSC number") in each GSM PLMN.

5.2 Identification of HLR for HLR restoration application

HLR may also be identified by one or several "HLR id(s)", consisting of the leading digits of the IMSI (MCC + MNC + leading digits of MSIN).

6 International mobile station equipment identity and software version number

6.1 General

Below the structure and allocation principles of the International Mobile station Equipment Identity and Software Version Number (IMEISV) and the International Mobile Station Equipment Identity (IMEI) are defined.

The Mobile Station Equipment is uniquely defined by the IMEI or the IMEISV.

6.2 Composition of IMEI and IMEISV

6.2.1 Composition of IMEI

The International Mobile station Equipment Identity (IMEI) is composed as shown in figure 8.

6 digits <.....>	2 digits <.....>	6 digits <.....>	1 digit <.....>
..... • TAC • • FAC • • SNR • • spare •
IMEI 15 digits •<.....>•			

Figure 8: Structure of IMEI

The IMEI is composed of the following elements (each element shall consist of decimal digits only):

- Type Approval Code (TAC). Its length is 6 digits;

- Final Assembly Code (FAC) identifies the place of manufacture/final assembly. Its length is 2 digits;
- Serial Number (SNR) is an individual serial number uniquely identifying each equipment within each TAC and FAC. Its length is 6 digits.
- Spare digit: this digit shall be zero, when transmitted by the Mobile Station.

The TAC, FAC and SNR shall not be changed after the ME's final production process. These shall resist tampering, i.e. manipulation and change, by any means (e.g. physical, electrical and software) (see TS GSM 02.16).

Note: This requirement is valid for new GSM Phase 2 MEs type approved after 1st June 2002.

In addition, the agreed time after which no equipment is first placed on the market without improved IMEI security functionality as specified is considered as the very latest date. It is understood that typically requirements should be satisfied one year earlier.

The TAC, FAC and SNR shall be physically protected against unauthorized change (see GSM 02.09).

6.2.2 Composition of IMEISV

The International Mobile station Equipment Identity and Software Version Number (IMEISV) is composed as shown in figure 9.

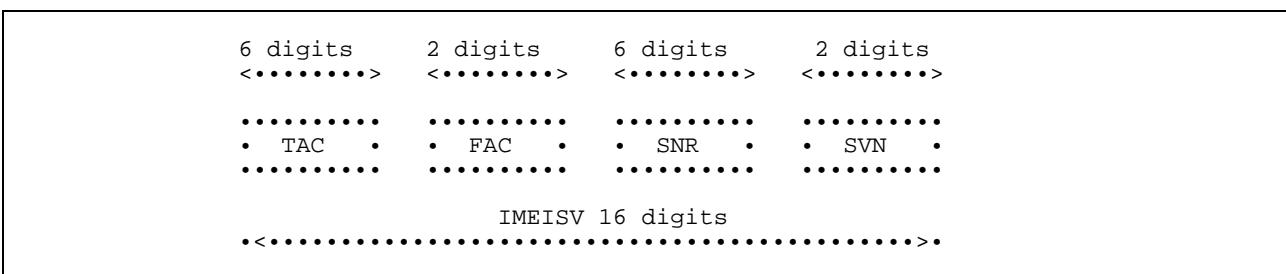


Figure 9: Structure of IMEISV

The IMEISV is composed of the following elements (each element shall consist of decimal digits only):

- Type Approval Code (TAC). Its length is 6 digits;
- Final Assembly Code (FAC) identifies the place of manufacture/final assembly. Its length is 2 digits;
- Serial Number (SNR) is an individual serial number uniquely identifying each equipment within each TAC and FAC. Its length is 6 digits.
- Software Version Number (SVN) identifies the software version number of the mobile equipment. Its length is 2 digits.

Regarding updates of the IMEISV: The TAC, FAC and SNR shall not be changed after the ME's final production process. These shall resist tampering, i.e. manipulation and change, by any means (e.g. physical, electrical and software) (see TS GSM 02.16) the TAC, FAC and SNR shall be physically protected against unauthorized change (see GSM 02.09); i.e. only the SVN part of the IMEISV can be modified.

Note: This requirement is valid for new GSM Phase 2 MEs type approved after 1st June 2002.

In addition, the agreed time after which no equipment is first placed on the market without improved IMEI security functionality as specified is considered as the very latest date. It is understood that typically requirements should be satisfied one year earlier.

6.3 Allocation principles

The Type Approval Code (TAC) is issued by a central body.

The place of final assembly (FAC) is encoded by the manufacturer.

Manufacturers shall allocate individual serial numbers (SNR) in a sequential order.

For a given ME, the combination of TAC, FAC and SNR used in the IMEI shall duplicate the combination of TAC, FAC and SNR used in the IMEISV.

The Software Version Number is allocated by the manufacturer after authorisation by the type approval authority. SVN value 99 is reserved for future use.

CHANGE REQUEST

23.003 CR 015r3

Current Version: **3.3.0**

GSM (AA.BB) or 3G (AA.BBB) specification number ↑

↑ CR number as allocated by MCC support team

For submission to: **CN#07**
list expected approval meeting # here ↑

for approval
for information

strategic
non-strategic (for SMG
use only)

Form: CR cover sheet, version 2 for 3GPP and SMG

The latest version of this form is available from: <ftp://ftp.3gpp.org/Information/CR-Form-v2.doc>

Proposed change affects: (U)SIM ME UTRAN / Radio Core Network
(at least one should be marked with an X)

Source:

N2

Date: **14.02.00**

Subject:

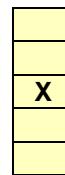
Introduction of the Encrypted MSI

Work item:

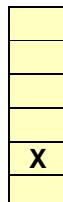
Security

Category:
(only one category shall be marked with an X)

- F Correction
- A Corresponds to a correction in an earlier release
- B Addition of feature
- C Functional modification of feature
- D Editorial modification



Release: Phase 2
Release 96
Release 97
Release 98
Release 99
Release 00



Reason for change:

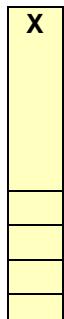
This CR is necessary to introduce Enhanced User Identity Confidentiality according the WI security.

Clauses affected:

2.1, new sections 2.5 and 2.6, 8.2

Other specs

Other 3G core specifications



→ List of CRs:
→ List of CRs:
→ List of CRs:
→ List of CRs:
→ List of CRs:

23.002-???, 23.008-???,
23.012-003r2, 23.018-036r2,
23.060-???, 24.008-???,
25.331-???, 29.002-???,
31.102-???, 33.103-???,
33.105-???

affected:

Other GSM core specifications
MS test specifications
BSS test specifications
O&M specifications

→ List of CRs:
→ List of CRs:
→ List of CRs:
→ List of CRs:

Other comments:



help.doc

<----- double-click here for help and instructions on how to create a CR.

2 Identification of mobile subscribers

2.1 General

A unique International Mobile Subscriber Identity (IMSI) shall be allocated to each mobile subscriber in the GSM system.

NOTE: This IMSI is the concept referred to by CCITT as "International Mobile Station Identity".

In order to support the subscriber identity confidentiality service the VLRs and SGSNs may allocate Temporary Mobile Subscriber Identities (TMSI) to visiting mobile subscribers. The VLR and SGSNs must be capable of correlating an allocated TMSI with the IMSI of the MS to which it is allocated.

An MS may be allocated two TMSIs, one for services provided through the MSC, and the other for services provided through the SGSN (P-TMSI for short).

In order to support enhanced subscriber identity confidentiality as defined in 3G TS 33.102, the following Identifications may be allocated to an MS:

- The Mobile Station will identify itself with an Encrypted Mobile Subscriber Identity (EMSI) instead of the IMSI. The VLR and the SGSN shall be able to request decryption of an EMSI in the home network of the visiting mobile subscriber.
- The Temporarily Encrypted Mobile Subscriber Identity (TEMSI) is calculated independently by the SIM and the UDN from the EMSI using a home network operator specific algorithm. The VLR and SGSN must be capable of correlating an allocated TEMSI with the IMSI and TMSI to which it is allocated. It is used if the MS can not be identified by an TMSI or P-TMSI.

For addressing on resources used for GPRS, a Temporary Logical Link Identity (TLLI) is used. The TLLI to use is built by the MS either on the basis of the P-TMSI (local or foreign TLLI), or directly (random TLLI).

In order to speed up the search for subscriber data in the VLR a supplementary Local Mobile Station Identity (LMSI) is defined.

The LMSI may be allocated by the VLR at location updating and is sent to the HLR together with the IMSI. The HLR makes no use of it but includes it together with the IMSI in all messages sent to the VLR concerning that MS.

2.2 Composition of IMSI

IMSI is composed as shown in figure 1.

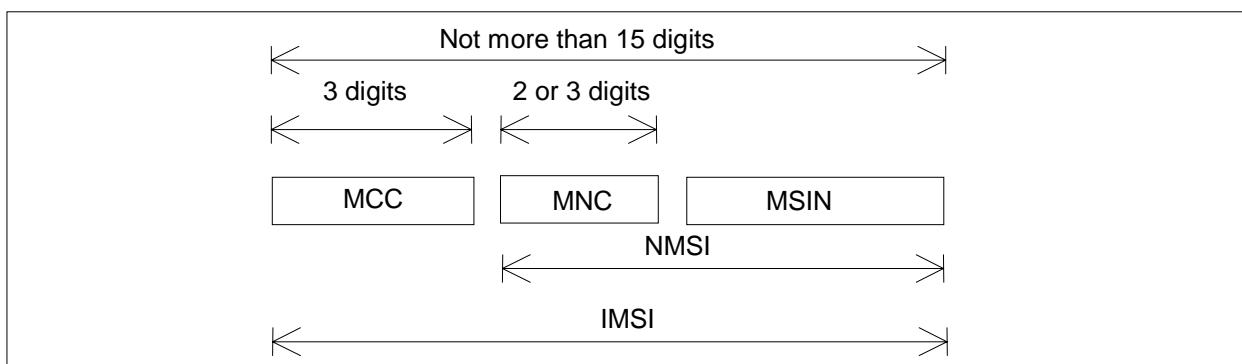


Figure 1: Structure of IMSI

IMSI is composed of three parts:

- i) Mobile Country Code (MCC) consisting of three digits. The MCC identifies uniquely the country of domicile of the mobile subscriber;

2.5 Structure of EMSI

The EMSI consists of maximum 12 octets. The structure of the EMSI is home network operator specific.

2.6 Structure of TEMSI

The TEMSI consists of 8 octets. It is calculated independently by the SIM and the UDN from the EMSI using a home network operator specific algorithm.

2.75 Structure of LMSI

The LMSI consists of 4 octets and may be allocated by the VLR.

2.86 Structure of TLLI

A TLLI is built by the MS or by the SGSN either on the basis of the P-TMSI (local or foreign TLLI), or directly (random or auxiliary TLLI), according to the following rules.

The TLLI consists of 32 bits, numbered from 0 to 31 by order of significance, with bit 0 being the LSB.

A local TLLI is built by a MS which has a valid P-TMSI as follows:

bits 31 down to 30 are set to 1; and

bits 29 down to 0 are set equal to bits 29 to 0 of the P-TMSI.

A foreign TLLI is built by a MS which has a valid P-TMSI as follows:

bit 31 is set to 1 and bit 30 is set to 0; and

bits 29 down to 0 are set equal to bits 29 to 0 of the P-TMSI.

A random TLLI is built by an MS as follows:

8 SCCP subsystem numbers

Subsystem numbers are used to identify applications within network entities which use SCCP signalling. In GSM, subsystem numbers may be used between PLMNs, in which case they are taken from the globally standardised range (1 - 31) or the part of the national network range (129 – 150) reserved for GSM use between PLMNs, or within a PLMN, in which case they are taken from the part of the national network range (32 – 128 & 151 - 254) not reserved for GSM use between PLMNs.

8.1 Globally standardised subsystem numbers used for GSM

The following globally standardised subsystem numbers have been allocated for use by GSM:

- 0000 0110 HLR (MAP);
- 0000 0111 VLR (MAP);
- 0000 1000 MSC (MAP);
- 0000 1001 EIR (MAP);
- 0000 1010 is allocated for evolution (possible Authentication centre).

8.2 National network subsystem numbers used for GSM

The following national network subsystem numbers have been allocated for use within GSM networks:

- 1111 1010 BSC (BSSAP-LE)
- 1111 1011 MSC (BSSAP-LE)
- 1111 1100 SMLC (BSSAP-LE)
- 1111 1101 BSS O&M (A interface);
- 1111 1110 BSSAP (A interface).

The following national network subsystem numbers have been allocated for use within and between GSM networks:

- 1000 1101 UDN(MAP);
- 1000 1110 RANAP;
- 1000 1111 RNSAP;
- 1001 0001 GMLC(MAP);
- 1001 0010 CAP;
- 1001 0011 gsmSCF(MAP);
- 1001 0100 SIWF(MAP);
- 1001 0101 SGSN(MAP);
- 1001 0110 GGSN(MAP);

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

23.003 CR 017r1

Current Version: 3.3.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑

↑ CR number as allocated by MCC support team

For submission to: **CN#07**
list expected approval meeting # here ↑

for approval
for information

strategic (for SMG
non-strategic use only)

Form: CR cover sheet, version 2 for 3GPP and SMG The latest version of this form is available from: <ftp://ftp.3gpp.org/Information/CR-Form-v2.doc>

Proposed change affects: (U)SIM ME UTRAN / Radio Core Network
(at least one should be marked with an X)

Source: N2

Date: 07.02.00

Subject: Modification of section 6.2 to enhance IMEI security

Work item: Security

Category:
(only one category shall be marked with an X)

F Correction	<input type="checkbox"/>
A Corresponds to a correction in an earlier release	<input type="checkbox"/>
B Addition of feature	<input type="checkbox"/>
C Functional modification of feature	<input type="checkbox"/>
D Editorial modification	<input checked="" type="checkbox"/>

Release: Phase 2
Release 96
Release 97
Release 98
Release 99
Release 00

<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

Reason for change: The security of the IMEI is not sufficiently given by the present specification. Therefore 3G TS 22.016 was modified. 3G TS 23.003 needs to be aligned with 3G TS 22.016. The modification is reflected in this CR.

This CR contains the wording agreed at SMG #30 (Document P-99-776).

Clauses affected: Section 6.2.1 and 6.2.2

Other specs affected: Other 3G core specifications
Other GSM core specifications
MS test specifications
BSS test specifications
O&M specifications

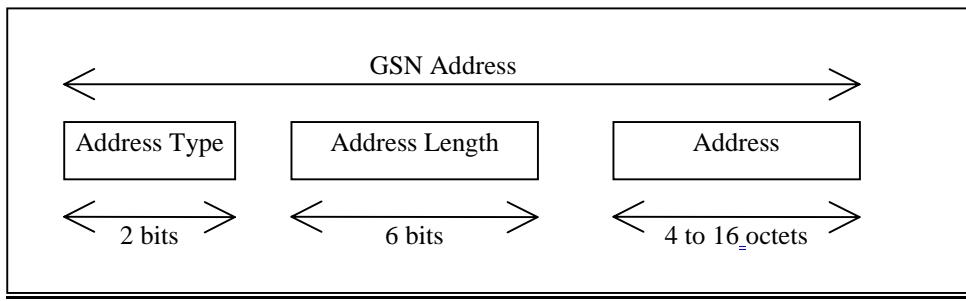
→ List of CRs:
→ List of CRs:
→ List of CRs:
→ List of CRs:
→ List of CRs:

Other comments: These changes were also valid for GSM 03.03 R98, R97, R96 and Phase2. Figures 9, 10 and 11 were not changed



help.doc

----- double-click here for help and instructions on how to create a CR.

**Figure 9: Structure of GSN Address**

The GSN Address is composed of the following elements:

1. The Address Type which is a fixed length code (of 2 bits) identifying the type of address that is used in the Address field.
2. Address Length which is a fixed length code (of 6 bits) identifying the length of the Address field.
3. Address is a variable length field with either an IPv4 address or an IPv6 address.

Address Type 0 and Address Length 4 are used when Address is an IPv4 address.

Address Type 1 and Address Length 16 are used when Address is an IPv6 address.

The IP v4 address structure is defined in RFC 791.

The IP v6 address structure is defined in RFC 1883.

5.2 Identification of HLR for HLR restoration application

HLR may also be identified by one or several "HLR id(s)", consisting of the leading digits of the IMSI (MCC + MNC + leading digits of MSIN).

6 International Mobile Station Equipment Identity and Software Version Number

6.1 General

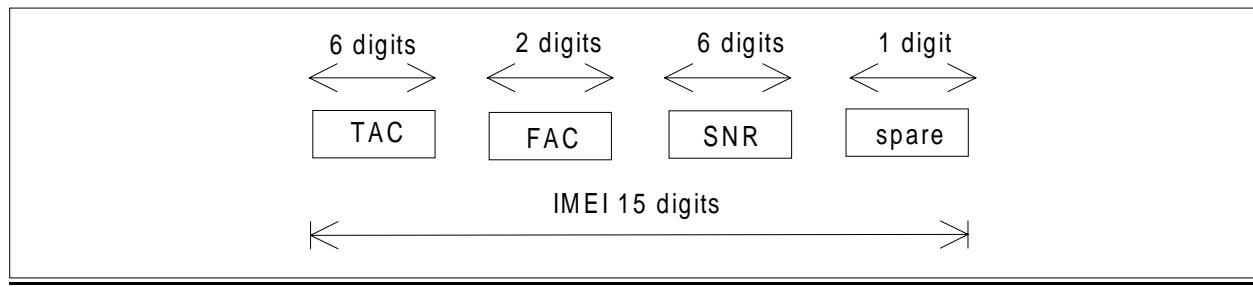
Below the structure and allocation principles of the International Mobile station Equipment Identity and Software Version Number (IMEISV) and the International Mobile station Equipment Identity (IMEI) are defined.

The Mobile Station Equipment is uniquely defined by the IMEI or the IMEISV.

6.2 Composition of IMEI and IMEISV

6.2.1 Composition of IMEI

The International Mobile station Equipment Identity (IMEI) is composed as shown in figure 10.

**Figure 10: Structure of IMEI**

The IMEI is composed of the following elements (each element shall consist of decimal digits only):

- Type Approval Code (TAC). Its length is 6 digits;
- Final Assembly Code (FAC) identifies the place of manufacture/final assembly. Its length is 2 digits;
- Serial Number (SNR) is an individual serial number uniquely identifying each equipment within each TAC and FAC. Its length is 6 digits.
- Spare digit: this digit shall be zero, when transmitted by the MS.

The TAC, FAC and SNR shall not be changed after the ME's final production process. These shall resist tampering, i.e. manipulation and change, by any means (e.g. physical, electrical and software) (see TS GSM 02.16).

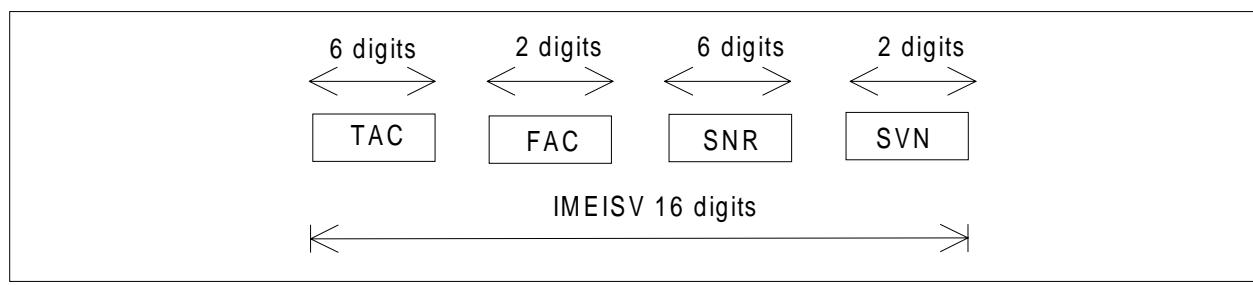
Note: This requirement is valid for new GSM Phase 2 and Release 96, 97, 98, 99 and UMTS Release 99 MEs type approved after 1st June 2002.

In addition, the agreed time after which no equipment is first placed on the market without improved IMEI security functionality as specified is considered as the very latest date. It is understood that typically requirements should be satisfied one year earlier.

~~The TAC, FAC and SNR shall be physically protected against unauthorized change (see GSM 02.09).~~

6.2.2 Composition of IMEISV

The International Mobile station Equipment Identity and Software Version Number (IMEISV) is composed as shown in figure 11.

**Figure 11: Structure of IMEISV**

The IMEISV is composed of the following elements (each element shall consist of decimal digits only):

- Type Approval Code (TAC). Its length is 6 digits;

- Final Assembly Code (FAC) identifies the place of manufacture/final assembly. Its length is 2 digits;
- Serial Number (SNR) is an individual serial number uniquely identifying each equipment within each TAC and FAC. Its length is 6 digits.
- Software Version Number (SVN) identifies the software version number of the mobile equipment. Its length is 2 digits.

Regarding updates of the IMEISV: The TAC, FAC and SNR shall not be changed after the ME's final production process. These shall resist tampering, i.e. manipulation and change, by any means (e.g. physical, electrical and software) (see TS GSM 02.16)~~the TAC, FAC and SNR shall be physically protected against unauthorized change (see GSM 02.09)~~; i.e. only the SVN part of the IMEISV can be modified.

Note: This requirement is valid for new GSM Phase 2 and Release 96, 97, 98, R99 and UMTS Release 99 MEs type approved after 1st June 2002.

In addition, the agreed time after which no equipment is first placed on the market without improved IMEI security functionality as specified is considered as the very latest date. It is understood that typically requirements should be satisfied one year earlier.

CHANGE REQUEST

23.008 CR 022r1

Current Version: **3.2.0**

GSM (AA.BB) or 3G (AA.BBB) specification number ↑

↑ CR number as allocated by MCC support team

For submission to: **CN#07**
list expected approval meeting # here ↑

for approval
for information

strategic (for SMG
non-strategic use only)

Form: CR cover sheet, version 2 for 3GPP and SMG

The latest version of this form is available from: <ftp://ftp.3gpp.org/Information/CR-Form-v2.doc>

Proposed change affects: (U)SIM ME UTRAN / Radio Core Network
(at least one should be marked with an X)

Source: **N2**

Date: **14.02.00**

Subject: **Introduction of the TEMSI**

Work item: **Security**

Category:
(only one category shall be marked with an X)
F Correction
A Corresponds to a correction in an earlier release
B Addition of feature
C Functional modification of feature
D Editorial modification

Release: Phase 2
Release 96
Release 97
Release 98
Release 99
Release 00

<input type="checkbox"/>
<input type="checkbox"/>
<input checked="" type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input checked="" type="checkbox"/>
<input type="checkbox"/>

Reason for change: This CR is necessary to introduce Enhanced User Identity Confidentiality according the WI security.

Clauses affected: new section 2.1.6

Other specs Other 3G core specifications

→ List of CRs:
23.002-???, 23.003-015,
23.012-003, 23.018-036,
23.060-???, 24.008-???,
25.331-???, 29.002-092,
31.102-???, 33.103-???,
33.105-???

<input type="checkbox"/>

affected: Other GSM core specifications
MS test specifications
BSS test specifications
O&M specifications

→ List of CRs:
→ List of CRs:
→ List of CRs:
→ List of CRs:

<input type="checkbox"/>

Other comments:



help.doc

<----- double-click here for help and instructions on how to create a CR.

2.1.5 Packet-Temporary Mobile Subscriber Identity (P-TMSI)

Packet-Temporary Mobile Subscriber Identity (P-TMSI) is defined in GSM 03.03. Its usage is described in GSM 03.60. P-TMSI is accompanied by the P-TMSI Signature, see subclause 2.3.7.

The P-TMSI is temporary subscriber data and is conditionally stored in the SGSN.

2.1.6 Temporarily Encrypted Mobile Subscriber Identity (TEMSI)

Temporarily Encrypted Subscriber Identity (TEMSI) is defined in 3G TS 23.003.

The TEMSI is temporary subscriber data and is conditionally stored in the VLR and SGSN. For use of TEMSI see 3G TS 33.102.

2.1.76 Temporary Link Layer Identifier (TLLI)

Temporary Link Layer Identifier (TLLI) is defined in GSM 03.03. It is derived from the P-TMSI by the MS and occurs in the variants Local TLLI and Foreign TLLI. The TLLI is temporary subscriber data and is conditionally stored in the SGSN. For use of TLLI see GSM 03.60.

2.1.87 Random TLLI

Random TLLI is chosen randomly by the MS. It is defined in GSM 03.03. Random TLLI is short living temporary subscriber data and is conditionally stored in the SGSN. For use of Random TLLI see GSM 03.60.

A Random TLLI may be used if no valid P-TMSI is available.

2.1.98 Local Mobile Station Identity (LMSI)

Local Mobile Station Identity (LMSI) is defined in GSM 03.03. The LMSI is temporary subscriber data. The LMSI may be stored in the VLR; if it is received in the HLR it must be stored there.

2.1.109 International Mobile Equipment Identity (IMEI)

International Mobile Equipment Identity (IMEI) is defined in GSM 03.03. The IMEI is temporary subscriber data and is conditionally stored in the SGSN.

2.2 Data related to Mobile Station types

2.2.1 Mobile Station Category

Mobile Station Category has a structure identical to that of "Calling Party's Category" defined in ISUP (CCITT Recommendation Q.763).

The following values of category shall be supported:

- ordinary subscriber.

The category is assigned per IMSI.

Mobile Station Category is permanent subscriber data and is stored in HLR and VLR.

2.2.2 LMU Identifier

The LMU identifier is part of the subscriber data for a Type A LMU, when associated with an NSS based SMLC, and serves to distinguish a Type A LMU from a normal MS.

4 Accessing subscriber data

It shall be possible to retrieve or store subscriber data concerning a specific MS from the HLR by use of each of the following references:

- International Mobile Subscriber Identity (IMSI);
- Mobile Station ISDN Number (MSISDN)

It shall be possible to retrieve or store subscriber data concerning a specific MS from the VLR by use of each of the following references:

- International Mobile Subscriber Identity (IMSI);
- Temporary Mobile Subscriber Identity (TMSI).

It shall be possible to retrieve or store subscriber data concerning a specific MS from the SGSN by use of each of the following references:

- International Mobile Subscriber Identity (IMSI);
- Packet Temporary Mobile Subscriber identity (P-TMSI).

It shall be possible to retrieve or store subscriber data concerning a specific MS from the GGSN by use of the following reference:

- International Mobile Subscriber Identity (IMSI).

See clause 3 for explanation of M, C, T and P in table 1 and table 2.

Table 1: Overview of data stored for non-GPRS Network Access Mode

PARAMETER	SUBCLAUSE	HLR	VLR	TYPE
IMSI	2.1.1.1	M	M	P Note
Network Access Mode	2.1.1.2	M	-	P Note
International MS ISDN number	2.1.2	M	M	P
multinumbering MSISDNs	2.1.3	C	-	P Note
Basic MSISDN indicator	2.1.3.1	C	-	P
MSISDN-Alert indicator	2.1.3.2	C	-	P
TMSI	2.1.4	-	C	T
<u>TEMSI</u>	<u>2.1.6</u>	-	<u>C</u>	<u>T</u>
LMSI	2.1.98	C	C	T Note
Mobile Station Category	2.2.1	M	M	P
LMU Identifier	2.2.2	C	C	P
RAND, SRES and Kc	2.3.1		C	T
RAND, XRES, CK, IK and AUTN	2.3.2	M	C	T
Ciphering Key Sequence Number	2.3.3	-	M	T
MSRN	2.4.1	-	C	T Note
Location Area Identity	2.4.2	-	M	T
VLR number	2.4.5	M	-	T Note
MSC number	2.4.6	M	C	T
HLR number	2.4.7	-	C	T
Subscription restriction	2.4.10	C	-	P
RSZI lists	2.4.11.1	C	-	P
Zone Code List	2.4.11.2	-	C	P
MSC area restricted flag	2.4.12	M	-	T
LA not allowed flag	2.4.13	-	M	T
ODB-induced barring data	2.4.15.1	C	-	T
Roaming restriction due to unsupported feature	2.4.15.2	M	M	T
Cell ID	2.4.16	-	C	T
LSA Identity	2.4.17.1	C	C	P
LSA Priority	2.4.17.2	C	C	P
LSA Only Access Indicator	2.4.17.3	C	C	P
LSA Active Mode Indicator	2.4.17.4	C	C	P
VPLMN Identifier	2.4.17.5	C	-	P
Provision of bearer service	2.5.1	M	M	P
Provision of teleservice	2.5.2	M	M	P
BC allocation	2.5.3	C	C	P
IMSI detached flag	2.7.1	-	C	T
Confirmed by Radio Contact indicator	2.7.4.1	-	M	T
Subscriber Data Confirmed by HLR indicator	2.7.4.2	-	M	T
Location Information Confirmed in HLR indicator	2.7.4.3	-	M	T
Check SS indicator	2.7.4.4	M	-	T
MS purged for non-GPRS flag	2.7.5	M	-	T
MNRR	2.7.7	C	-	T
Subscriber status	2.8.1	C	C	P
Barring of outgoing calls	2.8.2.1	C	C	P
Barring of incoming calls	2.8.2.2	C	-	P
Barring of roaming	2.8.2.3	C	-	P
Barring of premium rate calls	2.8.2.4	C	C	P
Barring of supplementary service management	2.8.2.5	C	C	P
Barring of registration of call forwarding	2.8.2.6	C	-	P
Barring of invocation of call transfer	2.8.2.7	C	C	P
Operator determined barring PLMN-specific data	2.8.3	C	C	P
Handover Number	2.9.1	-	C	T
Messages Waiting Data	2.10.1	C	-	T
Mobile Station Not Reachable Flag	2.10.2	C	M	T
Memory Capacity Exceeded Flag	2.10.3	C	-	T

(continued)

Table 1 (concluded): Overview of data stored for non-GPRS Network Access Mode

PARAMETER	SUBCLAUSE	HLR	VLR	TYPE
Trace Reference	2.11.1	C	C	P
Trace Type	2.11.2	C	C	P
Operations Systems Identity	2.11.3	C	C	P
HLR Trace Type	2.11.4	C	-	P
MAP Error On Trace	2.11.5	C	-	T
Trace Activated in VLR	2.11.6	C	C	T
Foreign Subscriber Registered in VLR	2.11.7	-	C	P
VGCS Group Membership List	2.12.1	C	C	P
VBS Group Membership List	2.12.2	C	C	P
Broadcast Call Initiation Allowed List	2.12.2.1	C	C	P
Originating CAMEL Subscription Information (O-CSI)	2.14.1.1/3.1	C	C	P
Terminating CAMEL Subscription Information (T-CSI)	2.14.1.2	C	-	P
VMSC Terminating CAMEL Subscription Information (VT-CSI)	2.14.1.2/3.2	C	C	P
Location Information/Subscriber state Information	2.14.1.3	C	-	P
USSD CAMEL subscription information(U-CSI)	2.14.1.4	C	-	P
SS invocation notification (SS-CSI)	2.14.1.5/3.2	C	C	P
Translation information flag(TIF-CSI)	2.14.1.6/3.6	C	C	P
Dialled service CAMEL Subscription Information (D-CSI)	2.14.1.10/3.6	C	C	P
USSD General CAMEL service information (UG-CSI)	2.14.2	C	-	P
O-CSI Negotiated CAMEL Capability Handling	2.14.2.1	C		P
SS-CSI Negotiated CAMEL Capability Handling	2.14.2.1	C		P
VT-CSI Negotiated CAMEL Capability Handling	2.14.2.1	C		P
SMS-CSI VLR Negotiated CAMEL Capability Handling	2.14.2.1	C		P
M-CSI Negotiated CAMEL Capability Handling	2.14.2.1	C		P
VLR Supported CAMEL Phases	2.14.2.3	C		P
IST Alert Timer	2.15.1	C	C	P
Privacy Exception List	2.16.1.1	C	C	P
GMLC Numbers	2.16.1.2	C	C	P
MO-LR List	2.16.1.3	C	C	P
Age Indicator	2.17.1	C	C	T

Table 2: Overview of data used for GPRS Network Access Mode

PARAMETER	Subclause	HLR	VLR	SGSN	GGSN	TYPE	
IMSI	2.1.1.1	M	M	M	M	P	Note
Network Access Mode	2.1.1.2	M	-	C (a)	-	P	Note
International MS ISDN number	2.1.2	M	M	M	-	T	
multinumbering MSISDNs	2.1.3	C	-	-	-	T	Note
Basic MSISDN indicator	2.1.3.1	C	-	-	-	T.	
MSISDN-Alert indicator	2.1.3.2	C	-	-	-	T	
P-TMSI	2.1.5	-	-	C	-	T	Note
<u>TEMSI</u>	<u>2.1.6</u>	<u>-</u>	<u>C</u>	<u>C</u>	<u>-</u>	<u>T</u>	
TLLI	2.1.7 ₆	-	-	C	-	T	
Random TLLI	2.1.8 ₇	-	-	C	-	T	Note
IMEI	2.1.10 ₉	-	-	C	-	T	
RAND/SRES and Kc	2.3.1	-	-	C	-	T	
RAND, XRES, CK, IK, AUTN	2.3.2	M	-	C	-	T	
Ciphering Key Sequence Number	2.3.3	-	-	M	-	T	
Selected Ciphering Algorithm	2.3.5	-	-	M	-	T	
Current Kc	2.3.6	-	-	M	-	T	
P-TMSI Signature	2.3.7	-	-	C	-	T	
Routing Area Identity	2.4.3	-	-	M	-	T	
Cell Global Identification	2.4.4	-	-	C	-	T	
VLR Number	2.4.5	M	-	C (Gs)	-	T	
SGSN Number	2.4.8.1	M	C (Gs)	-	-	T	Note
GGSN Number	2.4.8.2	◎	-	-	-	P	Note
RSZI Lists	2.4.11.1	C	-	-	-	P	
Zone Code List	2.4.11.2	-	-	C	-	P	
LA not allowed flag	2.4.13	-	-	M	-	T	
SGSN area restricted flag	2.4.14	M	-	-	-	T	
Roaming Restriction in the SGSN ..	2.4.15.2	M	-	M	-	T	
Cell ID	2.4.16	-	-	C	-	T	
LSA Identity	2.4.17.1	C	C	C	-	P	
LSA Priority	2.4.17.2	C	C	C	-	P	
LSA Only Access Indicator	2.4.17.3	C	C	C	-	P	
LSA Active Mode Indicator	2.4.17.4	C	C	C	-	P	
VPLMN Identifier	2.4.17.5	C	-	-	-	P	
Provision of teleservice	2.5.2	C	-	C	-	P	
Transfer of SM option	2.5.4	M	-	-	-	P	
MNRG	2.7.2	M	-	M	M	T	
MM State	2.7.3	-	-	M	-	T	
Subscriber Data Confirmed by HLR Indicator	2.7.4.2	-	-	M	-	T	
Location Info Confirmed by HLR Indicator	2.7.4.3	-	-	M	-	T	
MS purged for GPRS flag	2.7.6	M	-	-	-	T	
MNRR	2.7.7	C	-	-	-	T	
Subscriber Status	2.8.1	C	-	C	-	P	
Barring of outgoing calls	2.8.2.1	C	-	C	-	P	
Barring of roaming	2.8.2.3	C	-	C	-	P	
ODB PLMN-specific data	2.8.3	C	-	C	-	P	
Trace Activated in SGSN	2.11.7	C	-	C	-	P	
PDP Type	2.13.1	C	-	C	M	P	
PDP Address	2.13.2	C	-	C	M	P	
NSAPI	2.13.3	-	-	C	C	T	
PDP State	2.13.4	-	-	C	-	T	
New SGSN Address	2.13.5	-	-	C	-	T	
Access Point Name	2.13.6	C	-	C	C	P/T Note	
GGSN Address in Use	2.13.7	-	-	C	-	T	
VPLMN Address Allowed	2.13.8	C	-	C	-	P	
Dynamic Address	2.13.9	-	-	-	C	T	
SGSN Address	2.13.10	-	-	-	M	T	
GGSN-list	2.13.11	M	-	-	-	T	

(continued)

Table 2 (concluded): Overview of data used for GPRS Network Access Mode

PARAMETER	Subclause	HLR	VLR	SGSN	GGSN TYPE	
Quality of Service Subscribed	2.13.12	C	-	C	-	P
Quality of Service Requested	2.13.13	-	-	C	-	T
Quality of Service Negotiated	2.13.14	-	-	C	M	T
SND	2.13.15	-	-	C	C	T
SNU	2.13.16	-	-	C	C	T
DRX Parameters	2.13.17	-	-	M	-	T
Compression	2.13.18	-	-	C	-	T
NGAF	2.13.19	-	-	C (Gs)	-	T
Classmark	2.13.20	-	-	M	-	T
TID	2.13.21	-	-	C	C	T
Radio Priority	2.13.22	-	-	C	-	T
Radio Priority SMS	2.13.23	-	-	C	-	T
Short Message Service CAMEL Subscription Information (SMS-CSI)	2.14.4.1/1.8	C	-	C	-	P
GPRS CAMEL Subscription Information (GPRS-CSI)	2.14.4.2/1.9	C	-	C	-	C
SMS-CSI SGSN Negotiated CAMEL Capability Handling	2.14.2.1	C	-	-	-	P
GPRS-CSI Negotiated CAMEL Capability Handling	2.14.2.1	C	-	-	-	P
SGSN Supported CAMEL Phases	2.14.2.3	C	-	-	-	P
Age Indicator	2.16.1	C	-	C	-	T

NOTE: The HLR column indicates only GPRS related use, i.e. if the HLR uses a parameter in non-GPRS Network Access Mode but not in GPRS Network Access Mode, it is not mentioned in this table 2.
(Gs): The VLR column is applicable if Gs interface is installed. It only indicates GPRS related data to be stored and is only relevant to GPRS subscribers registered in VLR.

a): This parameter is relevant in the SGSN only when the Gs interface is installed.

NOTE: For special condition of storage see in the clauses 2.x.y referred-to.
See clause 3 for explanation of M,C,T and P in table 2.

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

23.012 CR 003r3

Current Version: 3.1.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑

↑ CR number as allocated by MCC support team

For submission to: CN#07
list expected approval meeting # here ↑

for approval
for information

strategic (for SMG
non-strategic use only)

Form: CR cover sheet, version 2 for 3GPP and SMG The latest version of this form is available from: [ftp://ftp.3gpp.org/Information/CR-Form-v2.doc](http://ftp.3gpp.org/Information/CR-Form-v2.doc)

Proposed change affects: (U)SIM ME UTRAN / Radio Core Network
(at least one should be marked with an X)

Source: N2

Date: 17.01.00

Subject: Introduction of Enhanced User Identity Confidentiality

Work item: Security

Category: F Correction
A Corresponds to a correction in an earlier release
B Addition of feature
C Functional modification of feature
D Editorial modification
(only one category shall be marked with an X)

	Release: Phase 2
X	Release 96
	Release 97
	Release 98
	Release 99
X	Release 00

Reason for change: The procedures for Enhanced User Identity Confidentiality are introduced.

Clauses affected: 2.6, 4.1.2.1, 4.1.2.9

Other specs Other 3G core specifications

→ List of CRs: 23.002-???; 23.003-015r2, 23.018-036r2, 23.060-???, 24.008-???, 25.331-???, 29.002-???, 31.102-???, 33.103-???, 33.105-???

affected: Other GSM core specifications
MS test specifications
BSS test specifications
O&M specifications

→ List of CRs:
→ List of CRs:
→ List of CRs:
→ List of CRs:

Other comments:



help.doc

<----- double-click here for help and instructions on how to create a CR

2.4.2 Implicit IMSI detach

Implicit IMSI detach operation is the action taken by the VLR to mark an MS as detached when there has been no successful contact between the MS and the network for a time determined by the implicit detach timer. The value of the implicit detach timer is derived from the periodic location updating timer. During an established radio contact, the implicit detach timer shall be prevented from triggering implicit detach. At the release of the radio connection, the implicit detach timer shall be reset and restarted. Implicit IMSI detach shall also be performed in the case of a negative response to an IMEI check.

2.5 Use of the term mobile station (MS) in the present document

In order to simplify the text the term Mobile Station (MS) as used in relation to location management refers to the entity where the IMSI is stored, i.e., in card operated MSs the term Mobile Station (MS) refers to the card.

2.6 Enhanced User Identity Confidentiality

Enhanced User Identity Confidentiality is a mechanism used in the 3rd generation mobile telecommunication system to allow the identification of a user on the radio access by means of the Encrypted Mobile Subscriber Identity (EMSI) and Temporarily Mobile Subscriber Identity (TEMSI). For details concerning the structure of the EMSI and TEMSI see 3G TS 23.003.

The serving VLR shall be able to request decryption of the user identity by the User Identity Decryption Node (UIDN) of the home network.

As a result of the decryption of the EMSI the UIDN shall provide the IMSI and the TEMSI. The TEMSI shall be used by the VLR for addressing of the MS, if the MS can not be addressed with a TMSI.

For details concerning the 3rd generation Security Architecture see 3G TS 33.102.

3 General procedures in the network related to Location Management

3.1 Procedures in the MSC related to Location Updating

The MSC shall pass messages related to location updating between the MS and the VLR.

3.2 Procedures in the VLR related to Location Updating

FFS

3.3 Procedures in the HLR related to Location Updating

FFS

3.4 Normal Location Updating and IMSI detach/attach operation

When receiving a Location Updating Request or an IMSI detach/attach message from an MS, the MSC shall convey the message to its associated Visitor Location Register. Any response from the location register shall similarly be conveyed to the MS.

3.5 IMSI enquiry procedure

The MS shall identify itself by either the IMSI, [the EMSI](#) or the TMSI plus Location Area Identification of the previous VLR. In the latter case the new VLR shall attempt to request the IMSI and authentication parameters from the previous VLR by the methods defined in GSM 09.02.

3.6 Information transfer between Visitor and Home Location Registers

3.6.1 Procedures for location management

Detailed procedures for exchange of and location updating information between visitor and home location registers are given in GSM 09.02. Below follows an overview of these procedures.

3.6.1.1 Location updating procedure

This procedure is used when an MS registers with a Visitor Location Register.

The VLR provides its address to the HLR.

The VLR may also allocate an optional identity for the MS at location updating: the Local Mobile Station Identity (see GSM 03.03).

3.6.1.2 Downloading of subscriber parameters to the VLR

As a part of the location updating procedure, the Home Location Register will convey the subscriber parameters of the MS which need to be known by the visitor location register for proper call handling. This procedure is also used whenever there is a change in the subscriber parameters that need to be conveyed to the VLR (e.g. change in subscription, a change in supplementary services activation status).

If the HPLMN applies the multinumbering option, different MSISDNs are allocated for different Basic Services (see GSM 09.07) and stored in the HLR. Among these MSISDNs, the Basic MSISDN Indicator as part of the HLR subscriber data (see GSM 03.08) marks the 'Basic MSISDN' to be sent to the VLR at location update. It is used in the VLR for call handling as calling party and as line identity.

3.6.1.3 Location cancellation procedure

The procedure is used by the home location register to remove a MS from a visitor location register. The procedure will normally be used when the MS has moved to an area controlled by a different location register. The procedure can also be used in other cases, e.g. an MS ceases to be a subscriber of the Home PLMN.

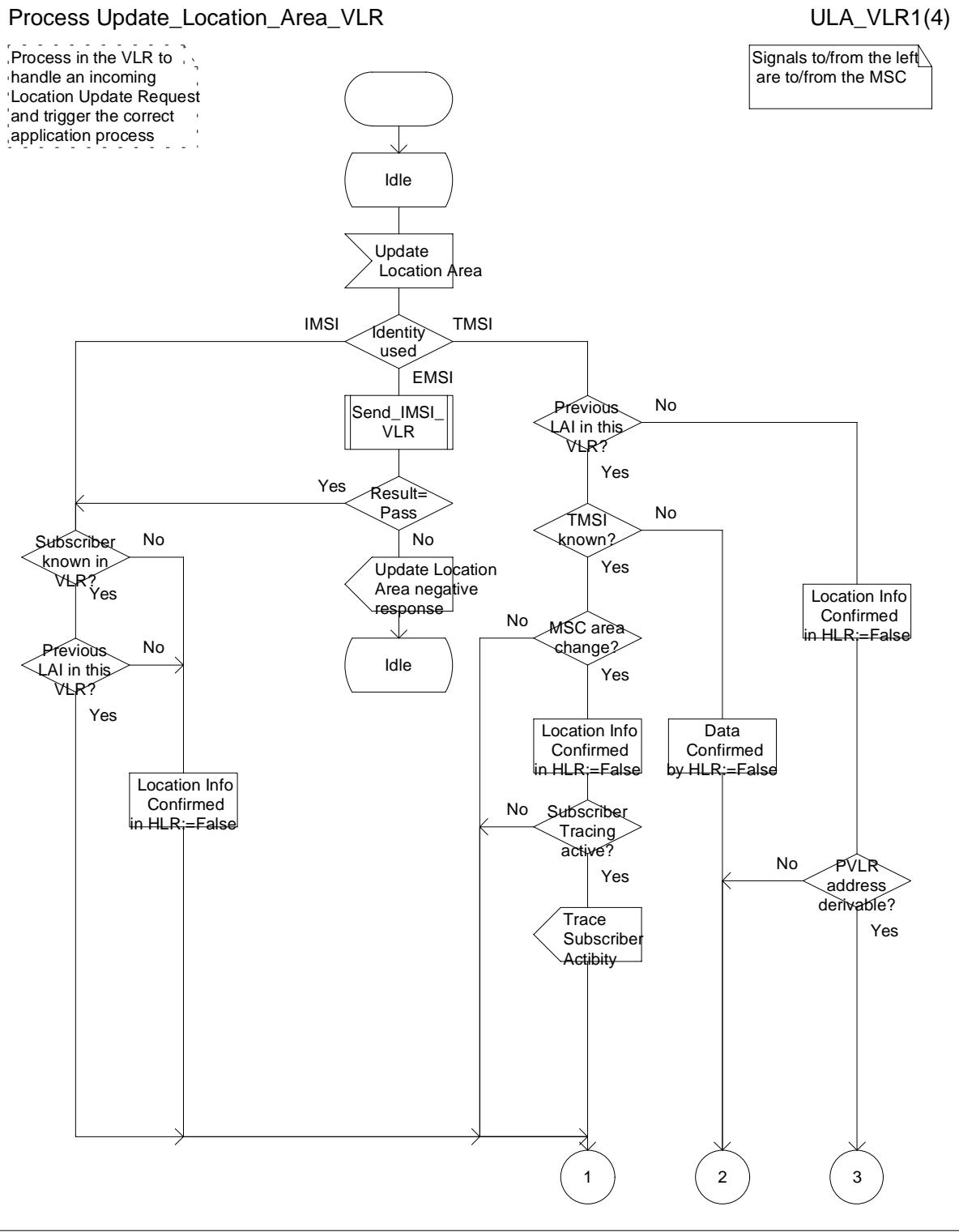
3.6.1.4 Mobile subscriber purging procedure

A VLR may purge the subscriber data for an MS which has not established radio contact for a period determined by the network operator. Purging means to delete the subscriber data and to "freeze" the TMSI that has been allocated to the purged MS in order to avoid double TMSI allocation. The VLR shall inform the HLR of the purging.

When the HLR is informed of the purging, it shall set the flag "MS purged" in the IMSI record of the MS concerned. Presence of the "MS purged" flag will cause any request for routing information for a call or short message to the MS to be treated as if the MS were not reachable.

In the VLR, the "frozen" TMSI is freed for usage in the TMSI allocation procedure by location updating for the purged MS in the same VLR, location cancellation for the purged MS or, in exceptional cases, by O&M.

In the HLR, the "MS purged" flag is reset by the location updating procedure and after reload of data from the non-volatile back-up that is performed when the HLR restarts after a failure.



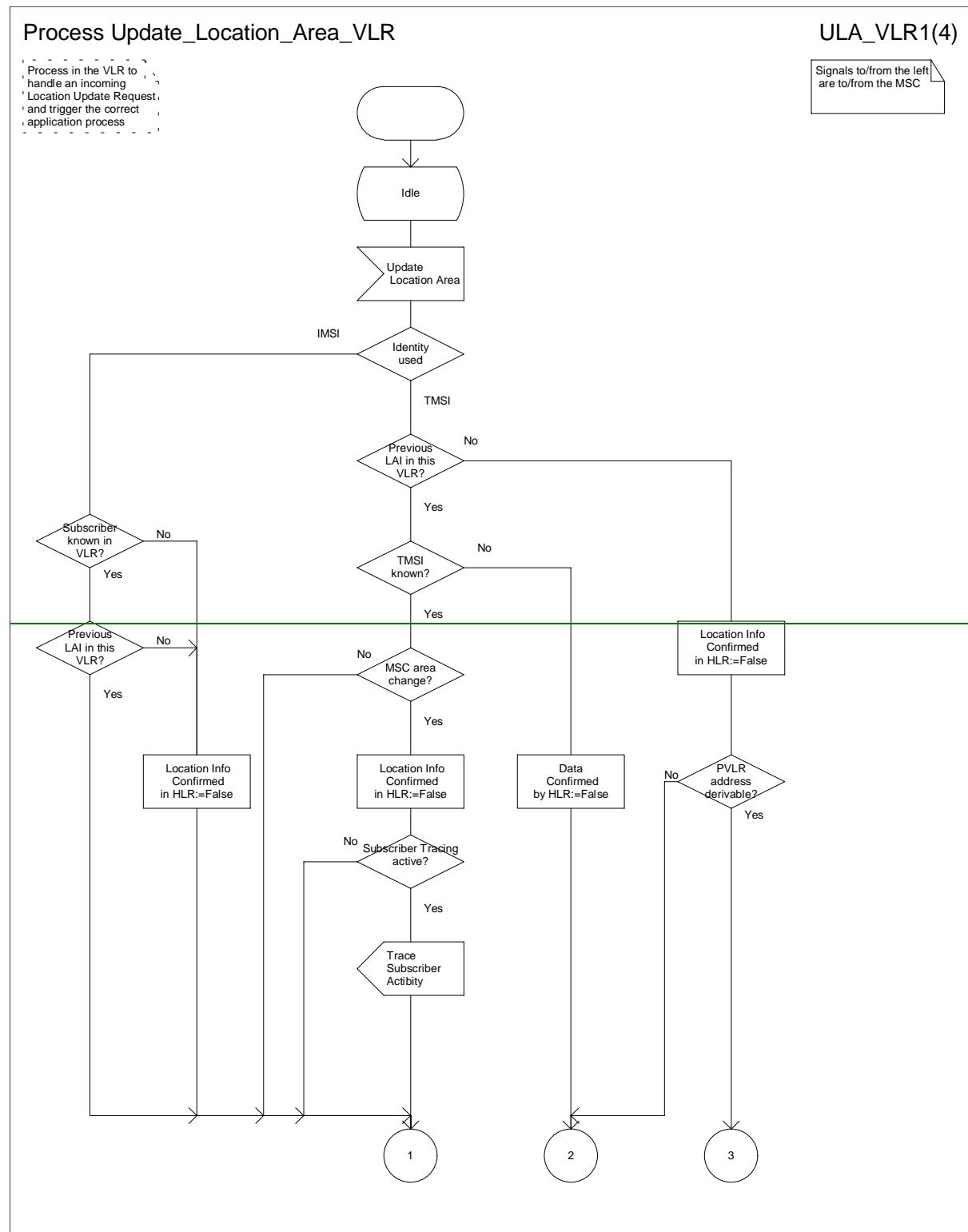


Figure 4.1.2.1 (sheet 1 of 4): Process Update_Location_Area_VLR

4.1.2.9 Procedure Send_IMSI_VLR

Procedure Send_IMSI_VLR

1(1)

[Procedure in the VLR to retrieve the IMSI from the UDN if an Encrypted Mobile Subscriber Identity (EMSI) is received from the MS]

/* Signals to/from the right are to/from the UDN */

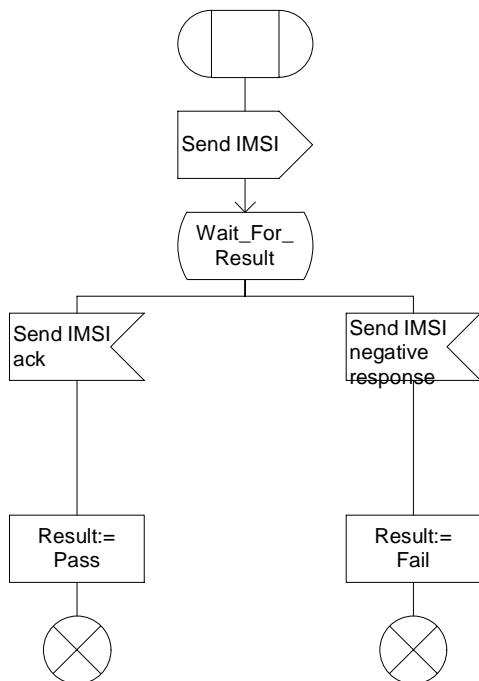


Figure 4.1.2.9: Procedure Send_IMSI_VLR

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

23.012 CR 004

Current Version: 3.1.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑

↑ CR number as allocated by MCC support team

For submission to: CN #07
list expected approval meeting # here ↑

for approval
for information

strategic (for SMG
non-strategic use only)

Form: CR cover sheet, version 2 for 3GPP and SMG The latest version of this form is available from: [ftp://ftp.3gpp.org/Information/CR-Form-v2.doc](http://ftp.3gpp.org/Information/CR-Form-v2.doc)

Proposed change affects: (at least one should be marked with an X) (U)SIM ME UTRAN / Radio Core Network

Source: N2

Date: 02.02.2000

Subject: Addition of Current Security Context Data to Send_Identification_PVLR

Work item: UMTS Security

Category:
(only one category shall be marked with an X)
F Correction
A Corresponds to a correction in an earlier release
B Addition of feature
C Functional modification of feature
D Editorial modification

Release:
Phase 2
Release 96
Release 97
Release 98
Release 99
Release 00

Reason for change: In TS 33.102 v3.3.1, subclause 6.3.4, the current security context data is required to be transferred from VLRO to VLRN (resp. from SGSNo to SGSNn). Figure 4.1.2.7 was edited to include a new check box "Send Current Security Context?" and the appropriate positive action "Set Current Security Context"

Clauses affected: 4.1.2.7

Other specs affected:

Other 3G core specifications
Other GSM core specifications
MS test specifications
BSS test specifications
O&M specifications

→ List of CRs:
→ List of CRs:
→ List of CRs:
→ List of CRs:
→ List of CRs:

Other comments:

Revision marks not visible

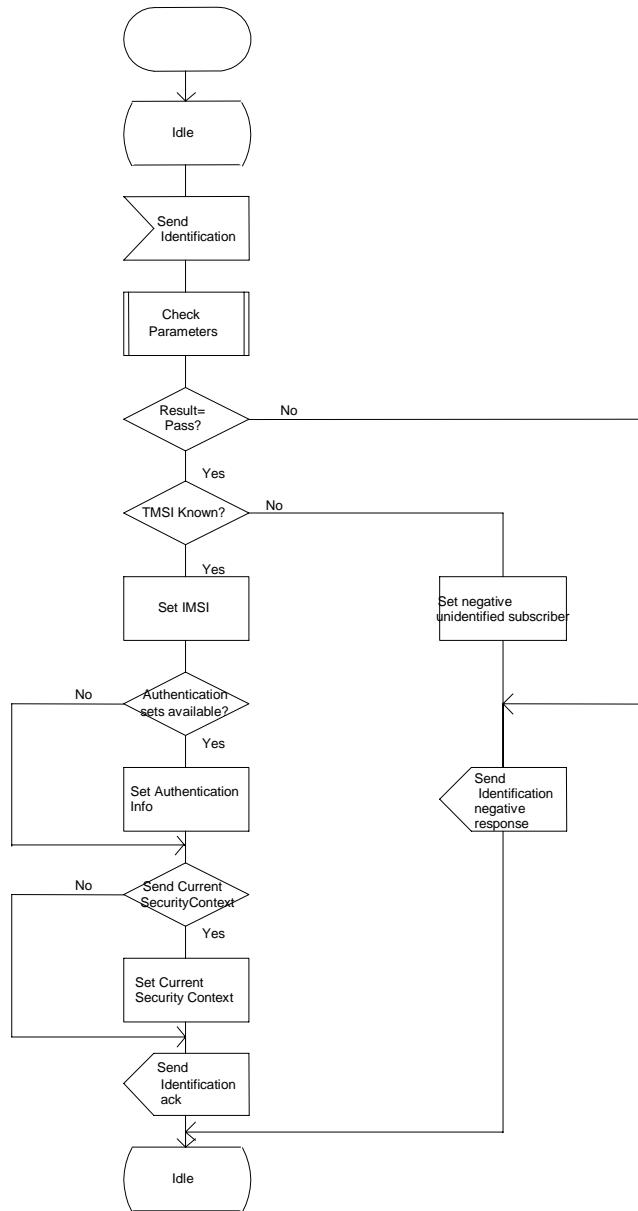


<----- double-click here for help and instructions on how to create a CR.

4.1.2.7 Process Send_Identification_PVLR

Process Send_Identification_PVLR

SI_PVLR1(1)

Handling of the Send
in the Previous VLR (PVLR)Signals to/from the
are to/from the new

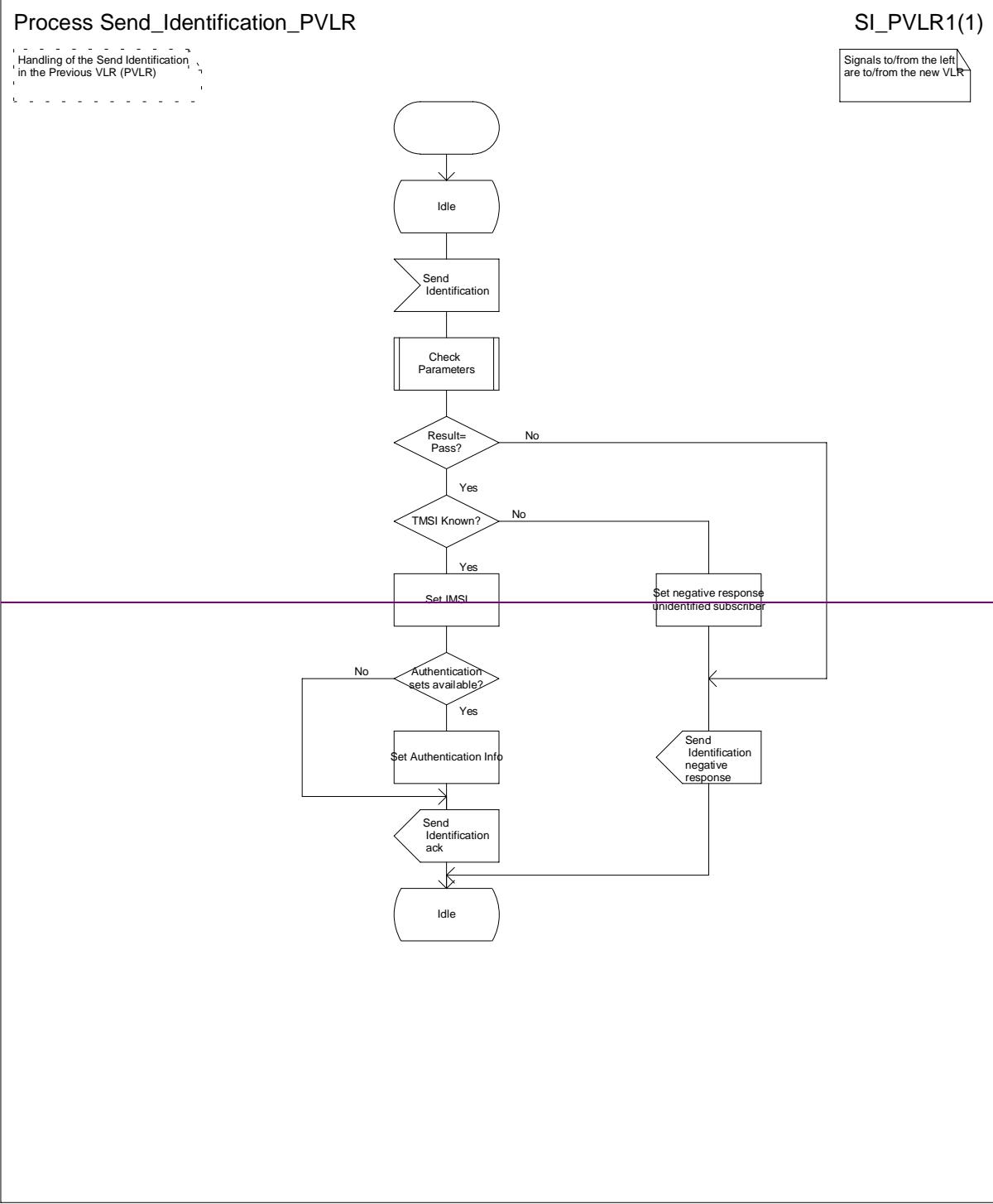


Figure 4.1.2.7 (sheet 1 of 1): Process Send_Identification_PVLR

CHANGE REQUEST

23.012 CR 005

Current Version: 3.1.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑

↑ CR number as allocated by MCC support team

For submission to: **CN#07**
list expected approval meeting # here ↑

for approval
for information

strategic (for SMG
use only)
non-strategic

Form: CR cover sheet, version 2 for 3GPP and SMG The latest version of this form is available from: [ftp://ftp.3gpp.org/Information/CR-Form-v2.doc](http://ftp.3gpp.org/Information/CR-Form-v2.doc)

Proposed change affects: (U)SIM ME UTRAN / Radio Core Network
(at least one should be marked with an X)

Source: N2

Date: 14.02.00

Subject: Introduction of Authentication Failure Report

Work item: Security

Category: *(only one category shall be marked with an X)*
F Correction
A Corresponds to a correction in an earlier release
B Addition of feature
C Functional modification of feature
D Editorial modification

Release: Phase 2
Release 96
Release 97
Release 98
Release 99
Release 00

Reason for change: This CR introduces the changes required for the Authentication Failure Report.

Clauses affected:

Other specs affected: Other 3G core specifications
Other GSM core specifications
MS test specifications
BSS test specifications
O&M specifications

→ List of CRs:
→ List of CRs:
→ List of CRs:
→ List of CRs:
→ List of CRs:

Other comments:



help.doc

<-----

Procedure Authenticate_MSC

Procedure in the MSC
to obtain an authentication
response from the MS
and relay it to the VLR

AUT_MSC1(1)

Signals to/from the left
are to/from the BSS;
Signals to/from the right
are to/from the VLR

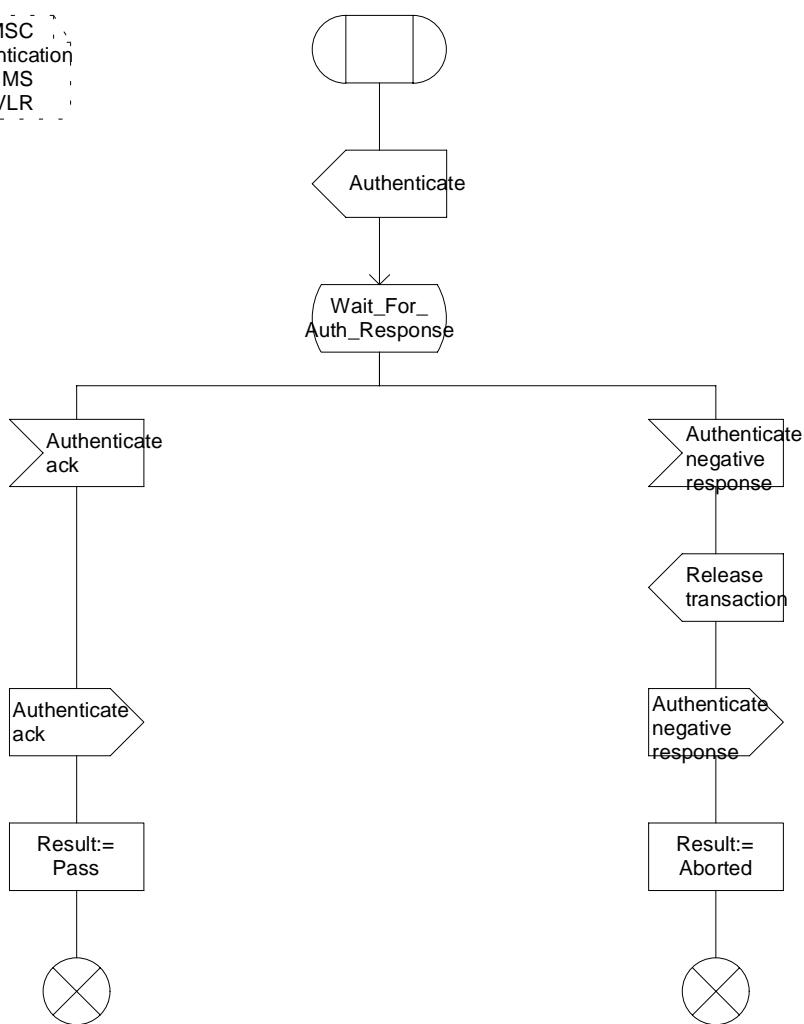


Figure 4.1.1.2 (sheet 1 of 1): Procedure Authenticate_MSC

Figure 4.1.2.2 (sheet 1 of 2): Procedure Authenticate_VLR

Procedure Authenticate_VLR

AUT_VLR1(2)

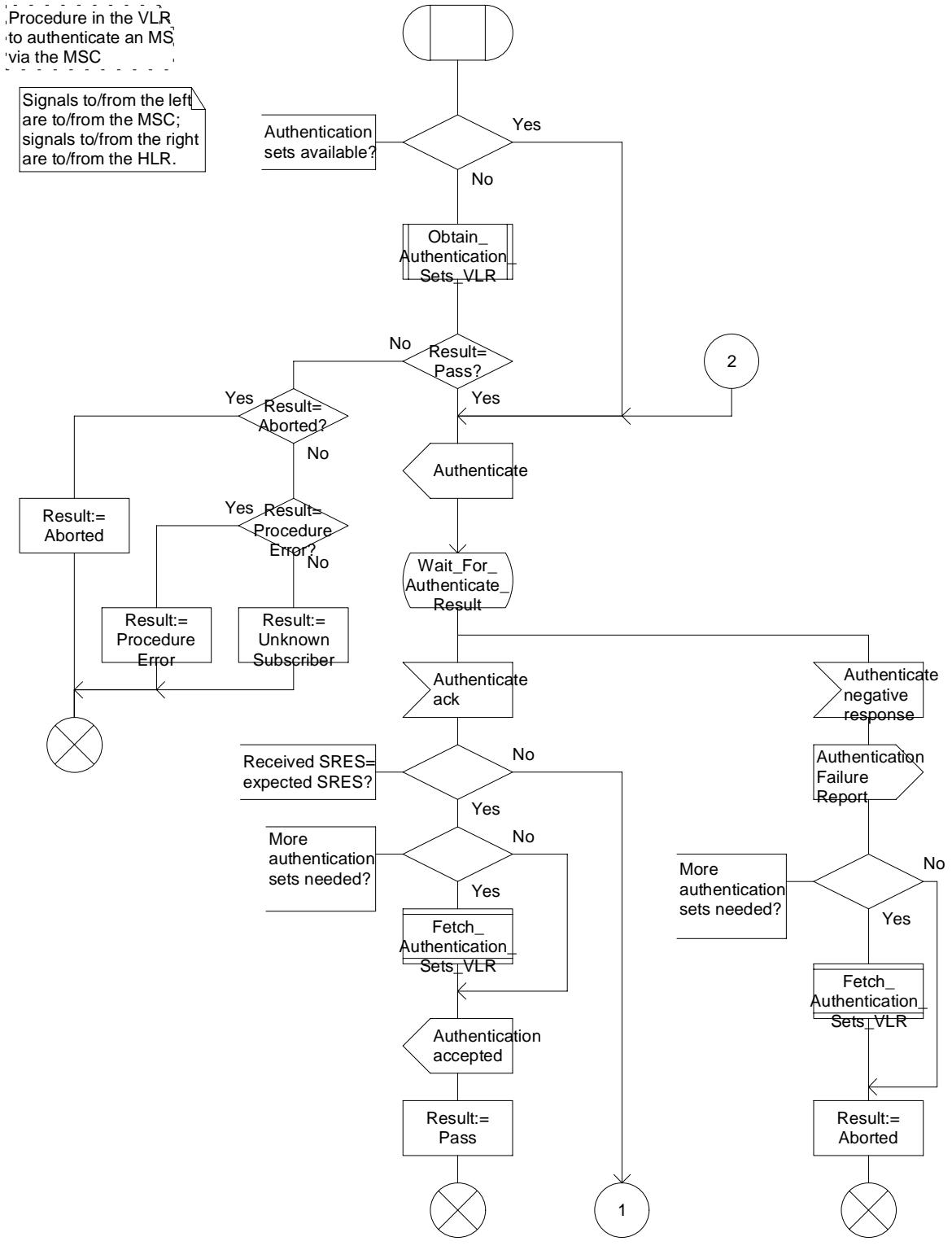


Figure 4.1.2.2 (sheet 2 of 2): Procedure

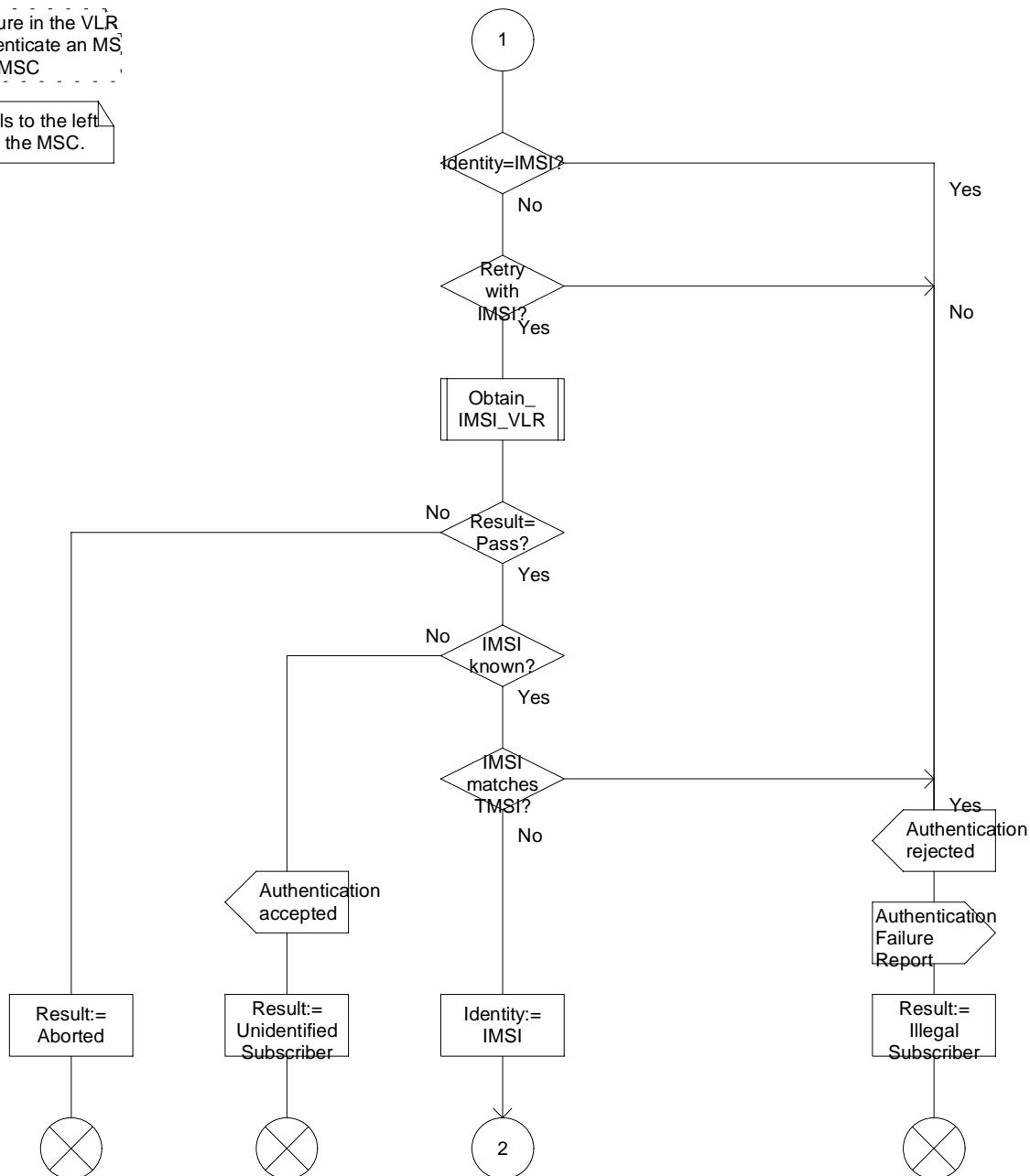
Authenticate_VLR

Procedure Authenticate_VLR

AUT_VLR2(2)

Procedure in the VLR
to authenticate an MS
via the MSC

Signals to the left
are to the MSC.



CHANGE REQUEST

23.018 CR 036r3

Current Version: 3.3.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑

↑ CR number as allocated by MCC support team

For submission to: **CN#07**
list expected approval meeting # here ↑

for approval
for information

strategic (for SMG
use only)
non-strategic

Form: CR cover sheet, version 2 for 3GPP and SMG The latest version of this form is available from: [ftp://ftp.3gpp.org/Information/CR-Form-v2.doc](http://ftp.3gpp.org/Information/CR-Form-v2.doc)

Proposed change affects: (U)SIM ME UTRAN / Radio Core Network
(at least one should be marked with an X)

Source: N2 **Date:** 01.03.00

Subject: Introduction of Enhanced User Identity Confidentiality

Work item: Security

Category: <i>(only one category shall be marked with an X)</i>	F Correction A Corresponds to a correction in an earlier release B Addition of feature C Functional modification of feature D Editorial modification	<input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Release: Phase 2 Release 96 Release 97 Release 98 Release 99 Release 00
--	--	---	--

Reason for change: This CR introduces the changes required for Enhanced User Identity Confidentiality.

Clauses affected: 7.1.2, 8.1.19, 8.1.28

Other specs	Other 3G core specifications	<input type="checkbox"/>	→ List of CRs: 23.002-???, 23.003-015, 23.008-???, 23.012-003, 23.060-???, 24.008-???, 25.331-???, 29.002-092, 31.102-???, 33.103-???, 33.105-???
affected:	Other GSM core specifications MS test specifications BSS test specifications O&M specifications	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	→ List of CRs: → List of CRs: → List of CRs: → List of CRs:

Other comments: Revision 2 of this CR was already approved during the Milano meeting, however due to comments received after approval a further revision was necessary.



help.doc



7.1.2 Functional requirements of VLR

7.1.2.1 Process_OCH_VLR

7.1.2.2 Procedure Process_Access_Request_VLR

Sheet 1: the procedure Send_IMSI_VLR is defined in the Location Management Procedures in 3G TS 23.012.

Sheet 1: it is a network operator decision (subject to MoU requirements) how often an MS should be authenticated.

Sheet 2: the processes Update_Location_VLR and Subscriber_Present_VLR are described in GSM 09.02 [23]

Sheet 2: it is a network operator decision (subject to MoU requirements) whether a connection should be ciphered.

Sheet 3: it is a network operator decision (subject to MoU requirements) how often an IMEI should be checked.

Sheet 3, sheet 4, sheet 5: the procedure CCBS_Report_MS_Activity is specific to CCBS; it is specified in GSM 03.93 [19].

Sheet 5: it is a network operator decision whether emergency calls are allowed from an ME with no SIM.

7.1.2.3 Procedure OG_Call_Subscription_Check_VLR

Sheet 1: it is an implementation option to carry out the check for operator determined barring of all outgoing calls before the check on provisioning of the requested basic service.

Sheet 1: the procedure OG_CUG_Check is specific to CUG. If the VLR does not support CUG, processing continues from the "Yes" exit of the test "Result=Call allowed?".

Sheet 1: the procedure Get_LI_Subscription_Info_MO_VLR is specific to CLIR and COLP. If the VLR supports neither CLIR nor COLP, the procedure call is omitted.

Sheet 1: the procedure Get_AoC_Subscription_Info_VLR is specific to AoC.

Sheet 1: the procedure UUS_OCH_Check_Provision is specific to UUS; it is specified in GSM 03.87 [17]. If the VMSC does not support UUS, processing continues from the "Yes" exit of the test "Result=Pass?".

Sheet 2: the procedure CAMEL_OCH_VLR is specific to CAMEL; it is specified in GSM 03.78 for CAMEL Phase 1 [8] and GSM 03.78 for CAMEL Phase 2 [9]. If the VLR does not support CAMEL, processing continues from connector 1 to the call to the procedure Check_OG_Barring.

Sheet 2: the negative response "call barred" indicates whether the reason is operator determined barring or supplementary service barring, according to the result returned by the procedure Check_OG_Barring.

7.1.2.4 Procedure Update_TEMSI_VLR

Sheet 1: the procedure Send_IMSI_VLR is defined in the Location Management Procedures in 3G TS 23.012.

7.1.2.4 Procedure Obtain_Identity_VLR

It is a network operator decision whether open (unciphered) identification of the MS by its IMSI is allowed.

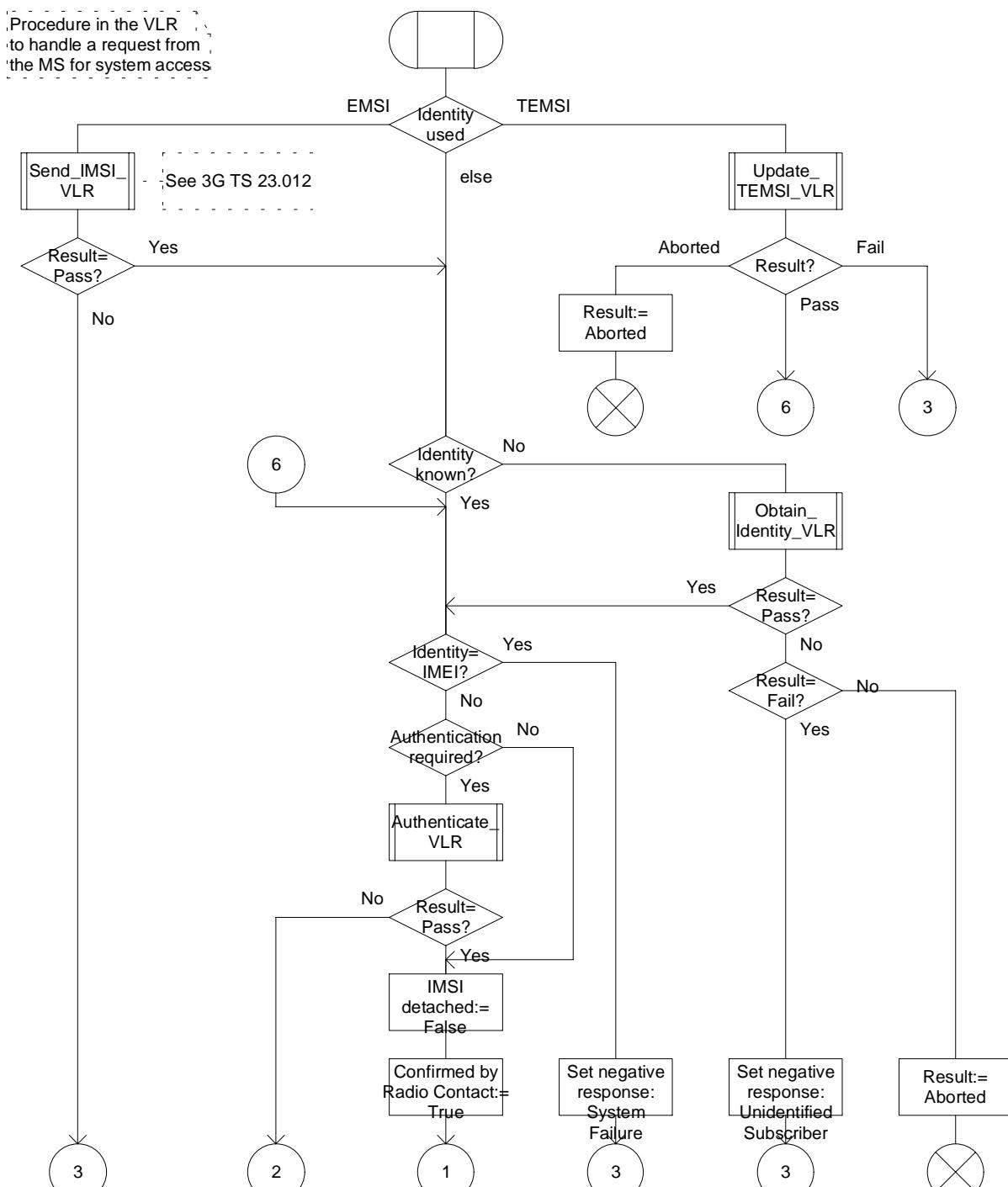
7.1.2.5 Procedure Obtain_IMSI_VLR

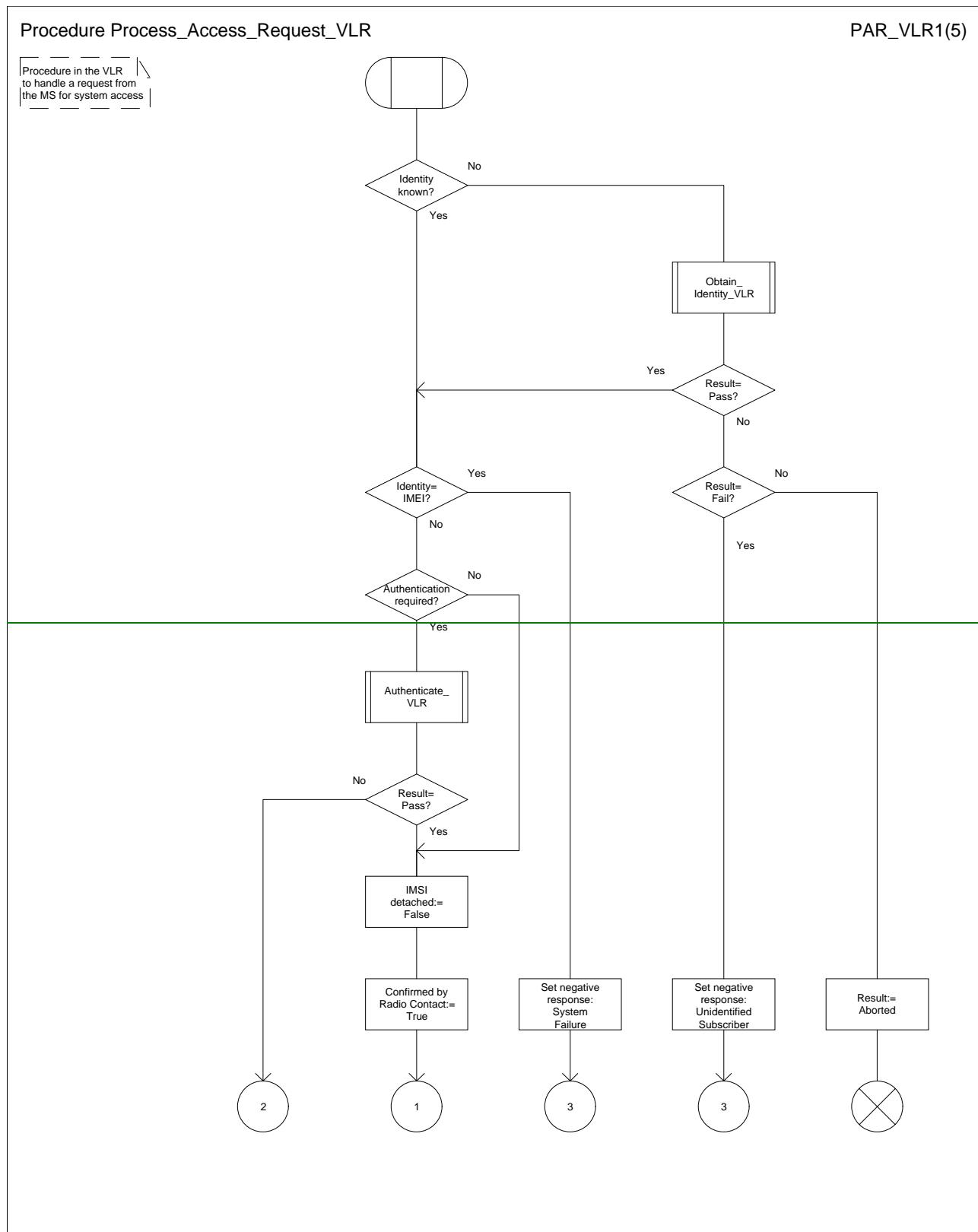
Sheet 1: the procedure Send_IMSI_VLR is defined in the Location Management Procedures in 3G TS 23.012.

Procedure Process_Access_Request_VLR

PAR_VLR1(5)

Procedure in the VLR
to handle a request from
the MS for system access



**Figure 20a: Procedure Process_Access_Request_VLR (sheet 1)**

Procedure Update_TEMSI_VLR

1(1)

Procedure in the VLR to update
a TEMSI if sucessfully used

Signals to/from the left
are to/from the MSC

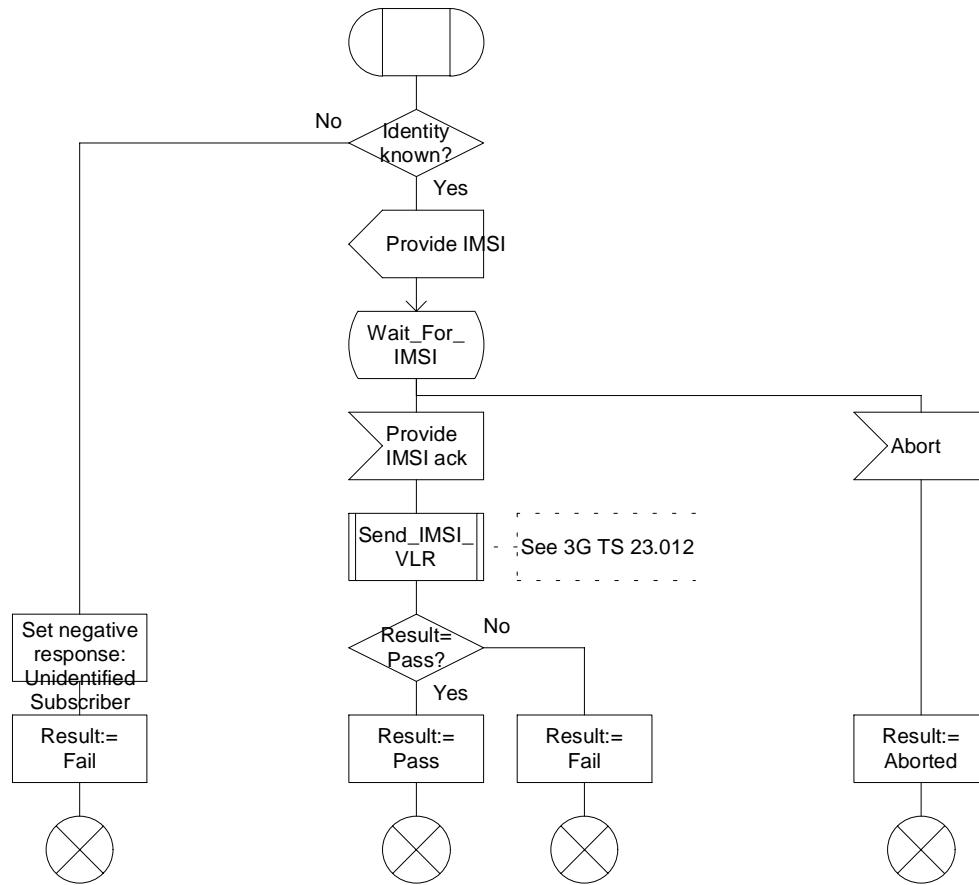


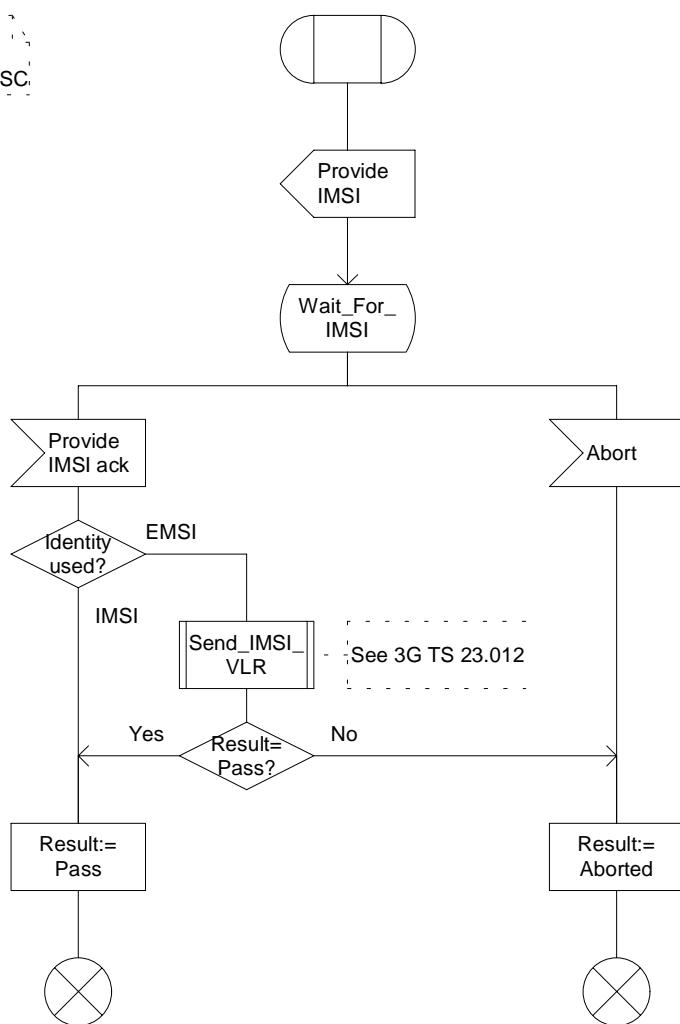
Figure 22: Procedure Update TEMSI VLR

Procedure Obtain_IMSI_VLR

Process in the VLR
to obtain the IMSI
from the MS via the MSC.

OIMSI_V1(1)

Signals to/from the left
are to/from the MSC.



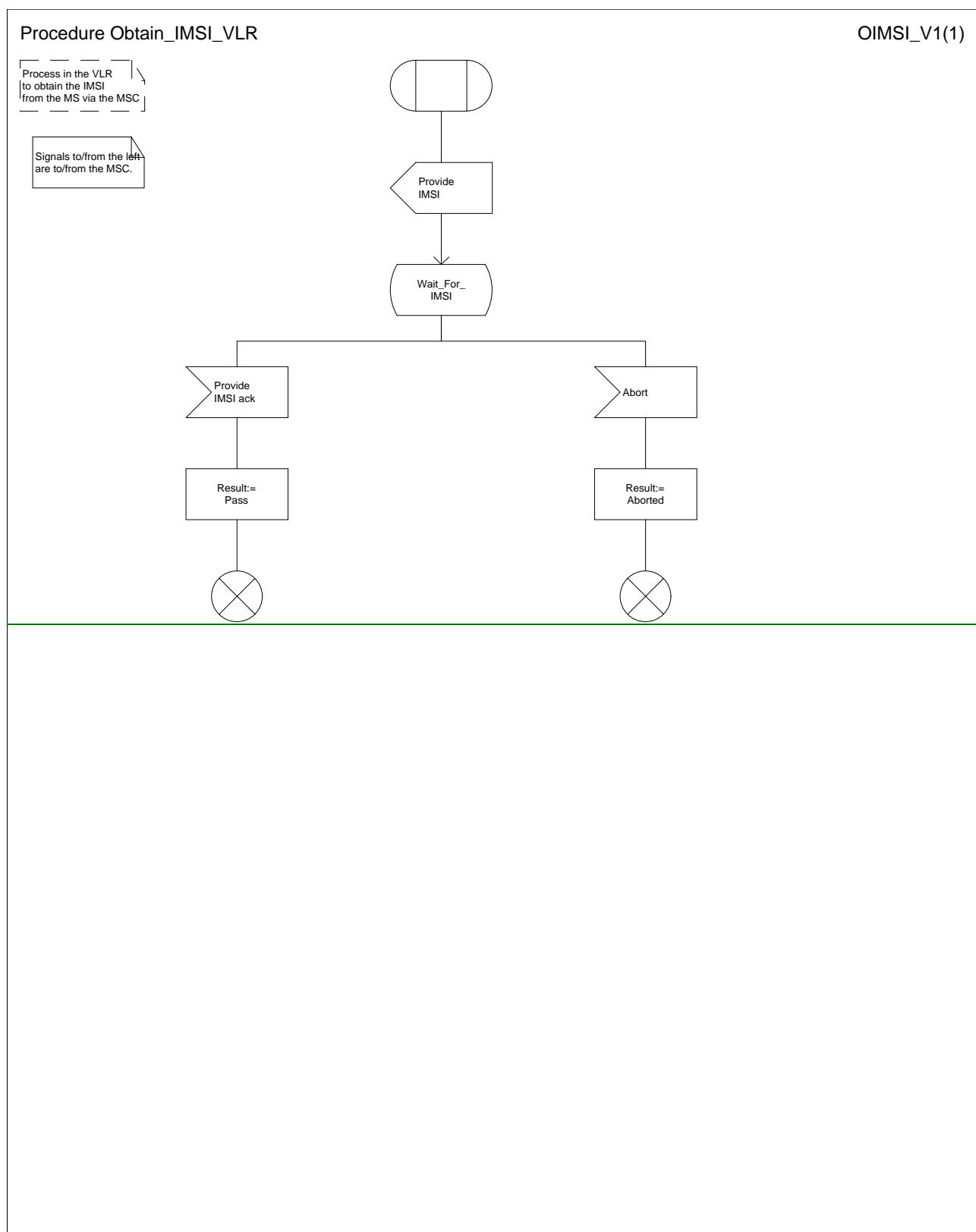


Figure 243: Procedure Obtain_IMSI_VLR

8.1.14 Obtain Subscriber Info

The following information elements are required:

Information element name	Required	Description
IMSI	M	IMSI of the MS for which information is required.
Subscriber state requested	C	Indicates that the VLR requires state information for the MS. Shall be present if state information is required; otherwise shall be absent.

8.1.15 Obtain Subscriber Info ack

The following information elements are required:

Information element name	Required	Description
Subscriber state	C	Indicates whether the MS is busy (i.e. engaged on a circuit-switched call) or assumed idle. Shall be present if the VLR requested state information; otherwise shall be absent.

8.1.16 Page MS

The following information elements are required:

Information element name	Required	Description
IMSI	M	IMSI of the MS to be paged.
Location area ID	M	Location area in which the MS is to be paged.
Page type	M	Indicates whether the paging is for a circuit-switched call, MT SMS delivery or SS activity
Paging via SGSN possible	C	Indicates that paging via the SGSN is possible. Shall be present if the VLR determines that the MS can be paged via the SGSN; otherwise shall be absent.
TEMPI	C	TEMPI to be broadcast to identify the MS. Shall be present if stored in the VLR and no TMSI is available for identification of the MS, otherwise shall be absent. Only one of TEMPI or TMSI shall be present.
TMSI	O	TMSI to be broadcast to identify the MS. Only one of TEMPI or TMSI shall be present.

8.1.17 Page MS negative response

The negative response information element can take the following values:

- Absent subscriber;
- Busy subscriber (More calls possible);
- Busy subscriber (NDUB);
- System failure;
- Unknown location area ID.

The Page MS negative response Busy subscriber (More calls possible) also indicates the basic service which applies for the established call.

8.1.18 Page MS via SGSN

The following information elements are required:

Information element name	Required	Description
IMSI	M	IMSI of the MS to be paged.
eMLPP priority	O	Circuit-switched paging priority.
TMSI	O	TMSI to be broadcast to identify the MS.
Channel type	O	Type of channel required for the call.

8.1.19 Process Access Request

The following information elements are required:

Information element name	Required	Description
CM service type	M	Indicates the type of access required: normal MO call, emergency call or page response. Other values (short message service and SS request) defined for this IE are not considered in this specification.
Access connection status	M	Indicates whether or not the connection to the MS is ciphered and whether or not it is authenticated.
Current location area ID	M	Identity of the location area from which the access request was received.
Serving cell ID	M	Identity of the cell in use by the served subscriber.
IMSI	C	IMSI of the MS requesting the access. For normal MO call <u>one of IMSI, EMSI or TMSI shall be present</u> . For page response, one of IMSI, <u>TEMSI or TMSI shall be present</u> . For emergency call, one of IMSI, TMSI, <u>EMSI or IMEI shall be present</u> .
TMSI	C	TMSI of the MS requesting the access. For normal MO call <u>one of IMSI, EMSI or TMSI shall be present</u> . For page response, one of IMSI, <u>TEMSI or TMSI shall be present</u> . For emergency call, one of IMSI, <u>EMSI, TMSI, EMSI or IMEI shall be present</u> .
<u>EMSI</u>	<u>C</u>	<u>EMSI of the MS requesting the access. For normal MO call one of IMSI, EMSI or TMSI shall be present. For emergency call, one of IMSI, TMSI, EMSI or IMEI shall be present.</u>
<u>UIDN Address</u>	<u>C</u>	<u>Indicates the Address of the UIDN (see 3G TS 33.102). It shall be present if the subscriber is identified by the EMSI, otherwise shall be absent.</u>
<u>TEMSI</u>	<u>C</u>	<u>TEMSI of the MS requesting the access. For page response, one of IMSI, TEMSI or TMSI shall be present.</u>
IMEI	C	IMEI of the MS requesting the access. For normal MO call or page response, one of IMSI or TMSI shall be present. For emergency call, one of IMSI, TMSI, <u>EMSI or IMEI shall be present</u> .
CKSN	C	Cipher key sequence number of the MS requesting the access. Shall be present if TMSI is present; otherwise shall be absent.

8.1.20 Process Access Request ack

The following information elements are required:

Information element name	Required	Description
IMSI	C	IMSI of the MS requesting the access. For normal MO call or page response, shall be present. For emergency call, one of IMSI or IMEI shall be present.
IMEI	C	IMEI of the MS requesting the access. For normal MO call or page response, shall be absent. For emergency call, one of IMSI or IMEI shall be present.
MSISDN	O	MSISDN of the MS requesting the access.

8.1.28 Provide IMSI ack

The following information element is required:

Information element name	Required	Description
IMSI	C _M	IMSI of the MS involved in the access request. <u>One of IMSI or EMSI shall be present.</u>
EMSI	C	<u>EMSI of the MS involved in the access request. One of IMSI or EMSI shall be present.</u>
UIDN Address	C	<u>Indicates the Address of the UIDN (see 3G TS 33.102). It shall be present if the subscriber is identified by the EMSI, otherwise shall be absent.</u>

8.1.29 Radio connection released

This message contains no information elements.

8.1.30 Search For MS

The following information elements are required:

Information element name	Required	Description
IMSI	M	IMSI of the MS to be paged in all location areas.
Page type	M	Indicates whether the paging is for a circuit-switched call, MT SMS delivery or SS activity
Paging via SGSN possible	C	Indicates that paging via the SGSN is possible. Shall be present if the VLR determines that the MS can be paged via the SGSN; otherwise shall be absent.
TEMSSI	C	<u>TEMSSI to be broadcast to identify the MS. Shall be present if stored in the VLR and no TMSI is available for identification of the MS, otherwise shall be absent. Only one of TEMSSI or TMSI shall be present.</u>
TMSI	O	TMSI to be broadcast to identify the MS. <u>Only one of TEMSSI or TMSI shall be present.</u>

8.1.31 Search For MS ack

The following information element is required:

Information element name	Required	Description
Location area ID	M	Location area in which the MS responded to the page.

8.1.32 Search For MS negative response

The negative response information element can take the following values:

- Absent subscriber;
- Busy subscriber (More calls possible);
- Busy subscriber (NDUB);
- System failure.

The Search For MS negative response Busy subscriber (More calls possible) also indicates the basic service which applies for the established call.

CHANGE REQUEST

23.018 CR 049

Current Version: 3.3.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑

↑ CR number as allocated by MCC support team

For submission to: **CN#07**
list expected approval meeting # here ↑

for approval
for information

strategic (for SMG
use only)
non-strategic

Form: CR cover sheet, version 2 for 3GPP and SMG The latest version of this form is available from: [ftp://ftp.3gpp.org/Information/CR-Form-v2.doc](http://ftp.3gpp.org/Information/CR-Form-v2.doc)

Proposed change affects: (U)SIM ME UTRAN / Radio Core Network
(at least one should be marked with an X)

Source: N2

Date: 14.02.00

Subject: Introduction of Authentication Failure Report

Work item: Security

Category: (only one category shall be marked with an X)
F Correction
A Corresponds to a correction in an earlier release
B Addition of feature
C Functional modification of feature
D Editorial modification

Release: Phase 2
Release 96
Release 97
Release 98
Release 99
Release 00

Reason for change: This CR introduces the changes required for the Authentication Failure Report.

Clauses affected:

Other specs affected: Other 3G core specifications
Other GSM core specifications
MS test specifications
BSS test specifications
O&M specifications

→ List of CRs:
→ List of CRs:
→ List of CRs:
→ List of CRs:
→ List of CRs:

Other comments:



help.doc

<-----

Procedure Authenticate_MSC

AUT_MSC1(1)

Procedure in the MSC
to obtain an authentication
response from the MS
and relay it to the VLR

Signals to/from the left
are to/from the BSS;
Signals to/from the right
are to/from the VLR

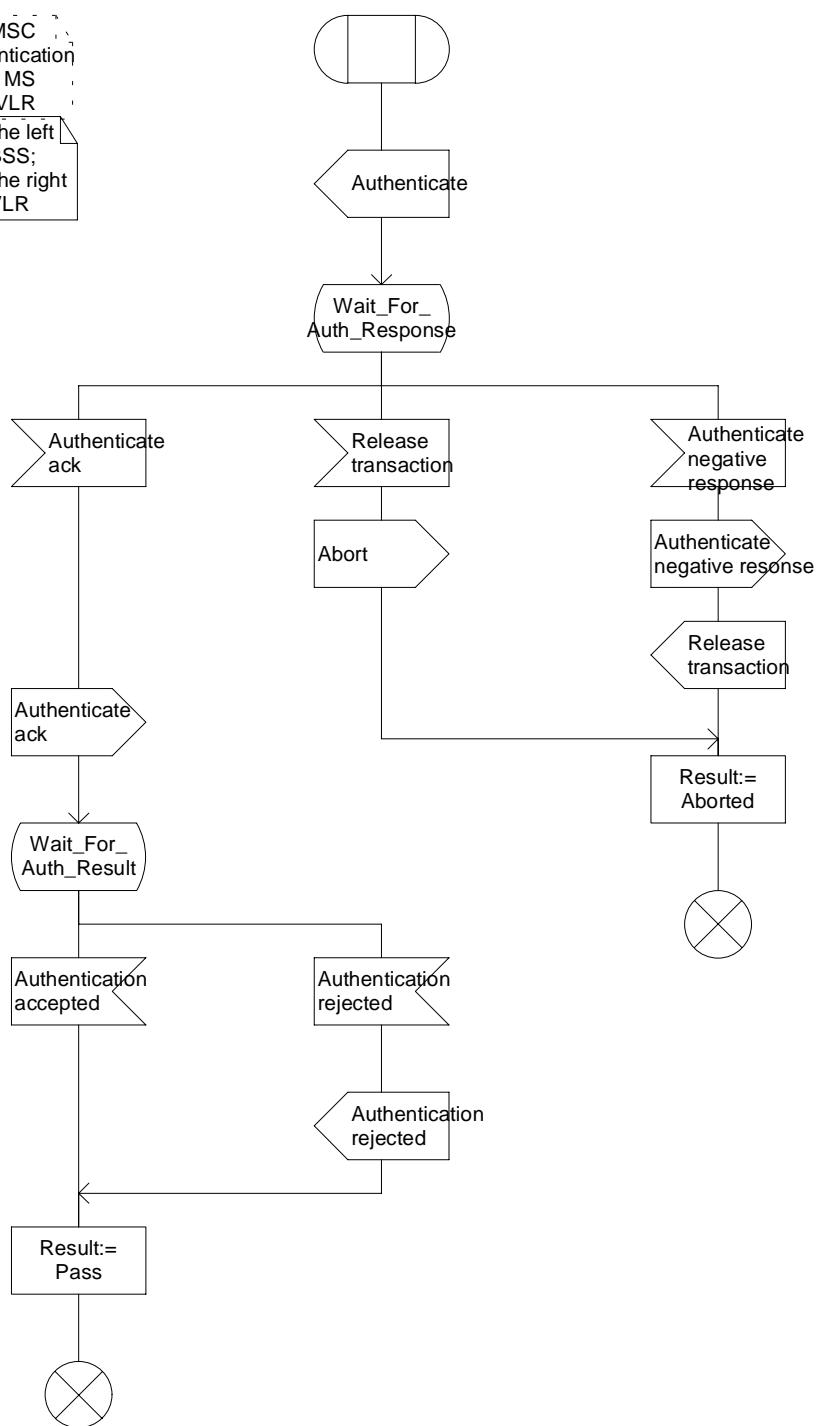


Figure 10: Procedure Authenticate_MSC

Procedure Authenticate_VLR

AUT_VLR1(2)

Procedure in the VLR
to authenticate an MS
via the MSC

Signals to/from the left
are to/from the MSC.

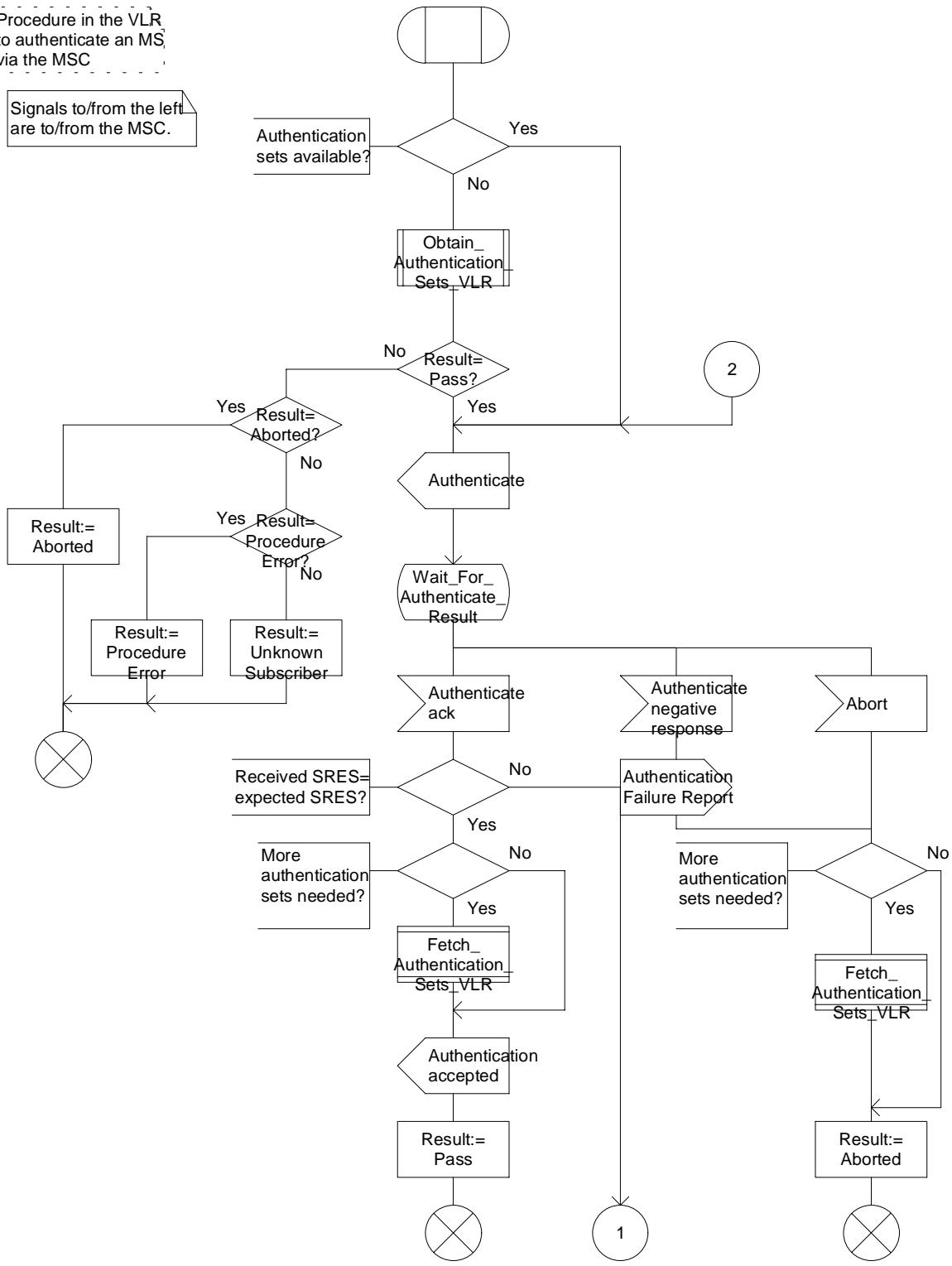


Figure 1a: Procedure Authenticate_VLR (sheet 1)

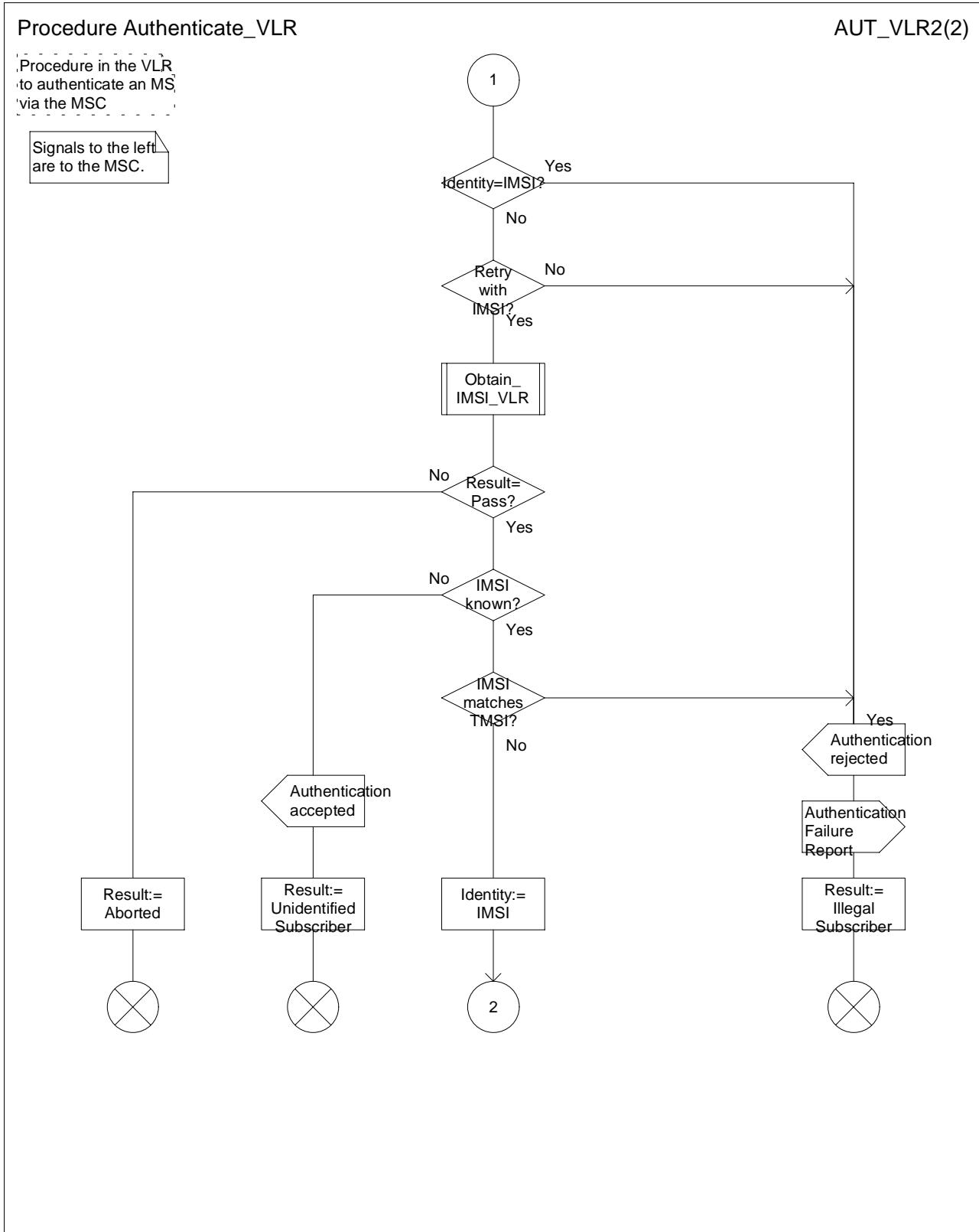


Figure 24b: Procedure Authenticate_VLR (sheet 2)

***Next modified section ***

8 Contents of messages

This clause specifies the content of each message shown in clauses 5 & 7, except for the following messages, which are not specific to call handling:

On the D interface (VLR-HLR):

- Abort;
- Activate Trace Mode
- Authentication Failure Report
- Insert Subscriber Data
- Send Authentication Info;
- Send Authentication Info ack;
- Send Authentication Info negative response;

In the tables which follow, information elements are shown as mandatory (M), conditional (C) or optional (O). A mandatory information element shall always be present. A conditional information element shall be present if certain conditions are fulfilled; if those conditions are not fulfilled it shall be absent. An optional element may be present or absent, at the discretion of the application at the sending entity.

***Next modified section ***

8.1.2 Authenticate

The following information elements are required:

Information element name	Required	Description
RAND	M	Random number challenge to be sent to the MS (GSM 03.20 [Error! Reference source not found.])
CKSN	M	Cipher key sequence number to be sent to the MS (GSM 03.20 [Error! Reference source not found.])

8.1.3 Authenticate ack

The following information element is required:

Information element name	Required	Description
SRES	M	Signature result returned by the MS (GSM 03.20 [Error! Reference source not found.])

8.1.4 Authenticate negative response

The negative response information element can take the following values:

- wrong network signature

3GPP TSG-CN WG2
Kyoto, Japan
17- 21 January 2000

Document N2B000067

e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xx

CHANGE REQUEST

29.002 CR 089

Current Version: 3.3.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑

↑ CR number as allocated by MCC support team

For submission to: CN#07
list expected approval meeting # here ↑

for approval
for information

strategic
non-strategic

(for SMG
use only)

Form: CR cover sheet, version 2 for 3GPP and SMG The latest version of this form is available from: [ftp://ftp.3gpp.org/Information/CR-Form-v2.doc](http://ftp.3gpp.org/Information/CR-Form-v2.doc)

Proposed change affects: (U)SIM ME UTRAN / Radio Core Network

Source: N2 **Date:** 13th January 2000

Subject: Security interworking between release 99 and pre-99 MSC/VLRs

Work item: Security

Category: <i>(only one category shall be marked with an X)</i>	F Correction A Corresponds to a correction in an earlier release B Addition of feature C Functional modification of feature D Editorial modification	<input checked="" type="checkbox"/>	Release: Phase 2 Release 96 Release 97 Release 98 Release 99 Release 00
--	--	-------------------------------------	--

Reason for change: If the MAP version negotiation between VLR and PVLR leads to MAP version 2 or lower, the VLR shall request authentication sets from the HLR to ensure that USIM is autenticated with 3G vectors

Clauses affected:

Other specs affected:	Other 3G core specifications Other GSM core specifications MS test specifications BSS test specifications O&M specifications	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	→ List of CRs: → List of CRs: → List of CRs: → List of CRs: → List of CRs:
------------------------------	--	--	--

Other comments:

1

2

3 <----- double-click here for help and instructions on how to create a CR.

4

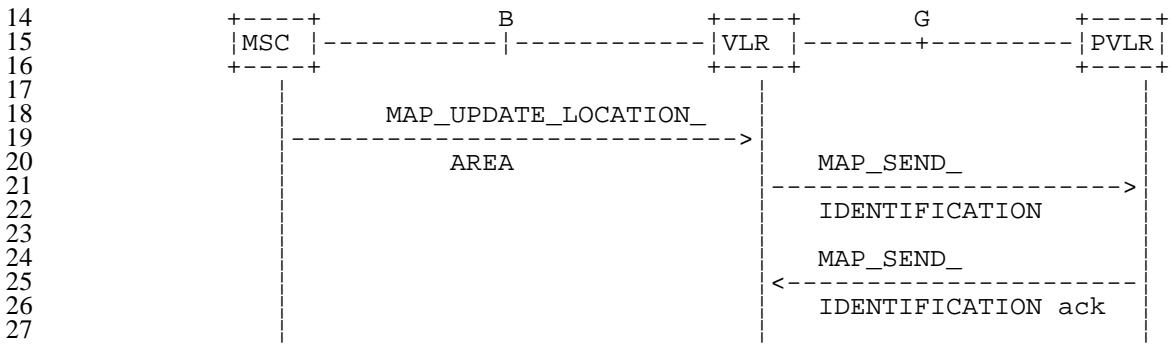
5 19.1.1.5 Send Identification

6 19.1.1.5.1 General

- 7 This service is invoked by a VLR when it receives a MAP_UPDATE_LOCATION_AREA indication containing a LAI
 8 indicating that the subscriber was registered in a different VLR (henceforth called the Previous VLR, PVLR). If the
 9 identity of the PVLR is derivable for the VLR (usually if both are within the same network), the IMSI and authentication
 10 sets are requested from the PVLR (see subclause 19.1.1.3), using the service described in subclause 8.1.4.

11 If the version negotiation between R99 VLR and pre-R99 PVLR leads to the MAP version 1 or 2, the VLR shall request
 12 authentication sets from the HLR.

13



29 NOTE: The service shown in dotted lines indicates the trigger provided by other MAP signalling.

30 **Figure 19.1.1/10: Interface and services for Send Identification**

31

CHANGE REQUEST

29.002 CR 092r4

Current Version: 3.3.1

GSM (AA.BB) or 3G (AA.BBB) specification number ↑

↑ CR number as allocated by MCC support team

For submission to: **CN#07**
list expected approval meeting # here ↑

for approval
for information

strategic (for SMG
use only)
non-strategic

Form: CR cover sheet, version 2 for 3GPP and SMG The latest version of this form is available from: [ftp://ftp.3gpp.org/Information/CR-Form-v2.doc](http://ftp.3gpp.org/Information/CR-Form-v2.doc)

Proposed change affects: (U)SIM ME UTRAN / Radio Core Network
(at least one should be marked with an X)

Source: N2

Date: 01/03/00

Subject: Introduction of Enhanced User Identity Confidentiality

Work item: Security

Category: F Correction
A Corresponds to a correction in an earlier release
B Addition of feature
C Functional modification of feature
D Editorial modification
(only one category shall be marked with an X)

Release: Phase 2
Release 96
Release 97
Release 98
Release 99
Release 00

Reason for change: This CR introduces the changes required for Enhanced User Identity Confidentiality.

Clauses affected:

Other specs Other 3G core specifications

→ List of CRs: 23.002-???, 23.003-015,
23.008-???, 23.012-003,
23.018-036, 23.060-???,
24.008-???, 25.331-???,
31.102-???, 33.103-???,
33.105-???

affected: Other GSM core specifications
MS test specifications
BSS test specifications
O&M specifications

→ List of CRs:
→ List of CRs:
→ List of CRs:
→ List of CRs:

Other comments:



help.doc

<-----

***** First Modified Section *****

5.1.2 Overload control for MAP entities

For all MAP entities, especially the HLR, the following overload control method is applied:

If overload of a MAP entity is detected requests for certain MAP operations (see tables 5.1/1, 5.1/2, 5.1/3 and 5.1/4) may be ignored by the responder. The decision as to which MAP Operations may be ignored is made by the MAP service provider and is based upon the priority of the application context.

Since most of the affected MAP operations are supervised in the originating entity by TC timers (medium) an additional delay effect is achieved for the incoming traffic.

If overload levels are applicable in the Location Registers the MAP operations should be discarded taking into account the priority of their application context (see table 5.1/1 for HLR, table 5.1/2 for MSC/VLR, table 5.1/3 for the SGSN and table 5.1/4 for the SMLC; the lowest priority is discarded first).

The ranking of priorities given in the tables 5.1/1, 5.1/2, 5.1/3 and 5.1/4 is not normative. The tables can only be seen as a proposal which might be changed due to network operator/implementation matters.

Table 5.1/1: Priorities of Application Contexts for HLR as Responder

	Responder = HLR	Initiating Entity
Priority high		
	<i><u>Mobility Management</u></i>	
	networkLocUp (updateLocation), (restoreData/v2), (sendParameters/v1)	VLR
	gprsLocationUpdate (updateGPRSLocation/v3),	SGSN
	infoRetrieval (sendAuthenticationInfo/v2/v3), (sendParameters/v1)	VLR/SGSN
	istAlerting (istAlert/v3) (purgeMS/v2/v3)	MSC msPurging VLR
	msPurging (purgeMS/v3)	SGSN
	<i><u>Short Message Service</u></i>	
	shortMsgGateway (sendRoutingInfoforSM), (reportSM-DeliveryStatus)	GMSC
	mwdMngt VLR/SGSN (readyForSM/v2/v3), (noteSubscriberPresent/v1)	
	<i><u>Mobile Terminating Traffic</u></i>	
	locInfoRetrieval (sendRoutingInfo)	GMSC
	anyTimeEnquiry (anyTimeInterrogation)	gsmSCF
	reporting (statusReport)	VLR
	<i><u>Location Services</u></i>	
	locationSvcGateway (sendRoutingInfoforLCS/v3)	GMLC
	<i><u>Subscriber Controlled Inputs (Supplementary Services)</u></i>	
	networkFunctionalSs (registerSS), (eraseSS), (activateSS), (deactivateSS), (interrogateSS), (registerPassword), (processUnstructuredSS-Data/v1), (beginSubscriberActivity/v1)	VLR
	callCompletion (registerCCEEntry), (eraseCCEEntry)	VLR
	networkUnstructuredSs (processUnstructuredSS-Request/v2)	VLR
	imsiRetrieval (sendIMSI/v2/v3)	VLR
	gprsLocationInfoRetrieval (sendRoutingInfoForGprs/v3)	GGSN/SGSN
	failureReport (failureReport/v3)	GGSN/SGSN
Priority low		

NOTE: The application context name is the last component but one of the object identifier.
 Operation names are given in brackets for information with "/vn" appended to vn only operations.

Table 5.1/3: Priorities of Application Contexts for SGSN as Responder

Responder = SGSN	Initiating Entity
<i>Priority high</i>	
	<i>Mobility and Location Register Management</i>
locationCancel (cancelLocation v3)	HLR
reset (reset)	HLR
subscriberDataMngt (insertSubscriberData v3), (deleteSubscriberData v3)	HLR
tracing (activateTraceMode), (deactivateTraceMode)	HLR
	<i>Short Message Service</i>
shortMsgMT-Relay (MT-ForwardSM v3) (forwardSM v1/v2)	MSC
	<i>Network-Requested PDP context activation</i>
gprsNotify HLR (noteMsPresentForGprs v3),	
<i>Priority low</i>	

NOTE: The application context name is the last component but one of the object identifier.
 Operation names are given in brackets for information with "/vn" appended to vn.

Table 5.1/2: Priorities of Application Contexts for MSC/VLR as Responder

Responder = MSC/VLR	Initiating Entity
<i>Priority high</i>	
<i>Handover</i>	
handoverControl (prepareHandover/v2), (performHandover/v1)	MSC
<i>Mobility and Location Register Management</i>	
locationCancel (cancelLocation)	HLR
reset (reset)	HLR
immediateTermination (istCommand/v3)	HLR
interVlrInfoRetrieval (sendIdentification/v2/v3), (sendParameters/v1)	VLR
subscriberDataMngt (insertSubscriberData), (deleteSubscriberData)	HLR
tracing (activateTraceMode), (deactivateTraceMode)	HLR
<i>Short Message Service</i>	
shortMsgMO-Relay (MO-ForwardSM v3) (forwardSM v1/v2)	MSC/SGSN
shortMsgMT-Relay (MT-ForwardSM v3) (forwardSM v1/v2)	MSC
shortMsgAlert (alertServiceCentre/v2), (alertServiceCentreWithoutResult/v1)	HLR
<i>Mobile Terminating Traffic</i>	
roamingNbEnquiry (provideRoamingNumber)	HLR
callControlTransfer (resumeCallHandling)	MSC
subscriberInfoEnquiry (provideSubscriberInformation)	HLR
reporting (remoteUserFree) (SetReportingState)	HLR
<i>Location Services</i>	
locationSvcEnquiry (provideSubscriberLocation v3)	GMLC
<i>Network-Initiated USSD</i>	
networkUnstructuredSs (unstructuredSS-Request/v2), (unstructuredSS-Notify/v2)	HLR
<i>Priority low</i>	

NOTE: The application context name is the last component but one of the object identifier.
Operation names are given in brackets for information with "/vn" appended to vn only operations.

***** Next Modified Section *****

6.1.3.11 Summary table

The following tables summarize the SCCP address used for invoke operations. As a principle, within a PLMN either an SPC or a GT may be used (network operation option), whereas when addressing an entity outside the PLMN the GT must be used. The address type mentioned in the table (e.g. MSISDN) is used as GT or to derive the SPC.

For a response, the originating address passed in the invoke is used as SCCP Called Party Address. For extra-PLMN addressing the own E.164 entity address is used as SCCP Calling Party Address; for intra-PLMN addressing an SPC derived from the entity number may be used instead. When using an SPC, the SPC may be taken directly from MTP.

Table 6.1/1

to from	fixed net work	HLR	VLR	MSC	EIR	gsmSCF	SIWF	SGSN	GGSN
fixed network	---	E:GT T:MSISDN	---	---	---	---	---	---	---
home location register	---	---	I:SPC/GT E:GT T:VLR NUMBER	---	---	I:SPC/GT E:GT T:gsmSCF NUMBER	---	I:SPC/GT E:GT T:SGSN NUMBER	I:SPC/GT E:GT T:GGSN NUMBER
visitor location register	---	I:SPC/GT E:GT T:MGT (outside World Zone 1)/MSISDN (World Zone 1)/HLR NUMBER (note)	I:SPC/GT E:GT T:VLR NUMBER	---	---	I:SPC/GT E:GT T:gsmSCF NUMBER	---	---	---
mobile- services switching centre	---	I:SPC/GT E:GT T:MSISDN	I:SPC/GT E:GT T:VLR NUMBER	I:SPC/GT E:GT T:MSC NUMBER	I:SPC/GT E:GT T:EIR NUMBER	I:SPC/GT E:GT T:gsmSCF NUMBER	I:SPC/GT E:GT T:SIWF NUMBER	I:SPC/GT E:GT T:SGSN NUMBER	---
gsm Service Control Function	---	I:SPC/GT E:GT T:MSISDN	---	---	---	---	---	---	---
Shared Inter Working Function	---	---	---	I:SPC/GT E:GT T:MSC NUMBER	---	---	---	---	---
Serving GPRS Support Node	---	I:SPC/GT E:GT T:MGT/ MSISDN/HL R NUMBER	---	I:SPC/GT E:GT T:MSC NUMBER	I:SPC/GT E:GT T:EIR NUMBER	---	---	---	---
Gateway GPRS Support Node	---	I:SPC/GT E:GT T:MGT	---	---	---	---	---	---	---
Gateway Mobile Location Center	---	I:SPC/GT E:GT T:MSISDN, MGT (outside World Zone 1) or IMSI (World Zone 1) (note)	---	I:SPC/GT E:GT T:MSC NUMBER	---	---	---	---	---

I: Intra-PLMN E: Extra(Inter)-PLMN

T: Address Type

GT: Global Title MGT: E.214 Mobile Global Title SPC: Signalling Point Code

NOTE: For initiating the location updating procedure and an authentication information retrieval from the HLR preceding it, the VLR has to derive the HLR address from the IMSI of the MS. The result can be an SPC or an E.214 Mobile Global Title if CCITT or ITU-T SCCP is used, or IMSI itself if ANSI SCCP is used (ANSI SCCP is used in World Zone 1).. When continuing the established update location dialogue (as with any other dialogue) the VLR must derive the routeing information towards the HLR from the Calling Party Address received with the first responding CONTINUE message until the dialogue terminating message is received.

For transactions invoked by the VLR after update location completion, the VLR may derive the information for addressing the HLR from addresses received in the course of the update location procedure (MSISDN or HLR number) or from the IMSI.

When invoking the Restore Data procedure and an authentication information retrieval from the HLR preceding it, the VLR must derive the information for addressing the HLR from the address information received in association with the roaming number request. This may be either the IMSI received as a parameter of the MAP message requesting the Roaming Number or the Calling Party Address associated with the MAP message requesting the Roaming Number.

The gsmSCF shall be addressed using more than one Global Title number. The first Global Title number is used to address a gsmSCF for MAP. The second Global Title number is used to address a gsmSCF for CAP.

For querying the HLR to obtain the VMS address to support location services, the GMLC has to derive the HLR address from either the MSISDN or IMSI of the target MS. When using the IMSI, the result can be an SPC or an E.214 Mobile Global Title if CCITT or ITU-T SCCP is used, or IMSI itself if ANSI SCCP is used (ANSI SCCP is used in World Zone 1).

Table 6.1/2

to from	UIDN	GMLC
fixed network	---	---
home location register	---	---
visitor location register	I:SPC/GT E:GT T:UIDN NUMBER	---
mobile-services switching centre	---	---
gsm Service Control Function	---	I:SPC/GT E:GT T:MSISDN
Shared Inter Working Function	---	---
Serving GPRS Support Node	I:SPC/GT E:GT T:UIDN NUMBER	---
Gateway GPRS Support Node	---	---
Gateway Mobile Location Center	---	---

I: Intra-PLMN

E: Extra(Inter)-PLMN

T: Address Type

GT: Global Title

MGT: E.214 Mobile Global Title

SPC: Signalling Point Code

***** Next Modified Section *****

7.6 Definition of parameters

Following is an alphabetic list of parameters used in the common MAP-services in subclause 7.3:

Application context name	7.3.1	Refuse reason	7.3.1
Destination address	7.3.1	Release method	7.3.2
Destination reference	7.3.1	Responding address	7.3.1
Diagnostic information	7.3.4	Result	7.3.1
Originating address	7.3.1	Source	7.3.5
Originating reference	7.3.1	Specific information	7.3.1/7.3.2/7.3.4
Problem diagnostic	7.3.6	User reason	7.3.4
Provider reason	7.3.5		

Following is an alphabetic list of parameters contained in this clause:

Absent Subscriber Diagnostic SM	7.6.8.9	IST Information Withdrawn	7.6.3.68
Access connection status	7.6.9.3	IST Support Indicator	7.6.3.69
Access signalling information	7.6.9.5	Kc	7.6.7.4
Additional Absent Subscriber Diagnostic SM	7.6.8.12	Linked Id	7.6.1.2
Additional number	7.6.2.46	LMSI	7.6.2.16
Additional signal info	7.6.9.10	Location Information	7.6.2.30
Additional SM Delivery Outcome	7.6.8.11	Location update type	7.6.9.6
Age Indicator	7.6.3.72	Lower Layer Compatibility	7.6.3.42
Alert Reason	7.6.8.8	LSA Information	7.6.3.56
Alert Reason Indicator	7.6.8.10	LSA Information Withdraw	7.6.3.58
Alerting Pattern	7.6.3.44	Mobile Not Reachable Reason	7.6.3.51
All GPRS Data	7.6.3.53	Modification request for CSI	7.6.3.81
All Information Sent	7.6.1.5	Modification request for SS Information	7.6.3.82
APN	7.6.2.42	More Messages To Send	7.6.8.7
Authentication set list	7.6.7.1	MS ISDN	7.6.2.17
B-subscriber Address	7.6.2.36	MSC number	7.6.2.11
B subscriber Number	7.6.2.48	MSIsdn-Alert	7.6.2.29
B subscriber subaddress	7.6.2.49	MWD status	7.6.8.3
Basic Service Group	7.6.4.40	Network Access Mode	7.6.3.50
Bearer service	7.6.4.38	Network node number	7.6.2.43
BSS-apdu	7.6.9.1	Network resources	7.6.10.1
Call Barring Data	7.6.3.83	Network signal information	7.6.9.8
Call barring feature	7.6.4.19	New password	7.6.4.20
Call barring information	7.6.4.18	No reply condition timer	7.6.4.7
Call Direction	7.6.5.8	North American Equal Access preferred Carrier Id	7.6.2.34
Call Forwarding Data	7.6.3.84	Number Portability Status	7.6.5.14
Call Info	7.6.9.9	ODB Data	7.6.3.85
Call reference	7.6.5.1	ODB General Data	7.6.3.9
Call Termination Indicator	7.6.3.67	ODB HPLMN Specific Data	7.6.3.10
Called number	7.6.2.24	OMC Id	7.6.2.18
Calling number	7.6.2.25	Originally dialled number	7.6.2.26
CAMEL Subscription Info	7.6.3.78	Originating entity number	7.6.2.10
CAMEL Subscription Info Withdraw	7.6.3.38	Override Category	7.6.4.4
Cancellation Type	7.6.3.52	P-TMSI	7.6.2.47
Category	7.6.3.1	PDP-Address	7.6.2.45
CCBS Feature	7.6.5.8	PDP-Context identifier	7.6.3.55
Channel Type	7.6.5.9	PDP-Type	7.6.2.44
Chosen Channel	7.6.5.10	Pre-paging supported	7.6.5.15
Ciphering mode	7.6.7.7	Previous location area Id	7.6.2.4
Cksn	7.6.7.5	Protocol Id	7.6.9.7
CLI Restriction	7.6.4.5	Provider error	7.6.1.3
CM service type	7.6.9.2	QoS-Subscribed	7.6.3.47
Complete Data List Included	7.6.3.54	Rand	7.6.7.2
CUG feature	7.6.3.26	Regional Subscription Data	7.6.3.11
CUG index	7.6.3.25	Regional Subscription Response	7.6.3.12
CUG info	7.6.3.22	Requested Info	7.6.3.31
CUG interlock	7.6.3.24	Requested Subscription Info	7.6.3.86
CUG Outgoing Access indicator	7.6.3.8	Roaming number	7.6.2.19
CUG subscription	7.6.3.23	Roaming Restricted In SGSN Due To Unsupported Feature	7.6.3.49
CUG Subscription Flag	7.6.3.37	Roaming Restriction Due To Unsupported Feature	7.6.3.13
Current location area Id	7.6.2.6	Service centre address	7.6.2.27
Current password	7.6.4.21	Serving Cell Id	7.6.2.37
eMLPP Information	7.6.4.41	SGSN address	7.6.2.39
EMSI	7.6.2.3	SGSN CAMEL Subscription Info	7.6.3.75
Equipment status	7.6.3.2	SGSN number	7.6.2.38
Extensible Basic Service Group	7.6.3.5	SIWF Number	7.6.2.35
Extensible Bearer service	7.6.3.3	SoLSA Support Indicator	7.6.3.57
Extensible Call barring feature	7.6.3.21	SM Delivery Outcome	7.6.8.6
Extensible Call barring information	7.6.3.20	SM-RP-DA	7.6.8.1
Extensible Call barring information for CSE	7.6.3.79	SM-RP-MTI	7.6.8.16
Extensible Forwarding feature	7.6.3.16	SM-RP-OA	7.6.8.2

Extensible Forwarding info	7.6.3.15	SM-RP-PRI	7.6.8.5
Extensible Forwarding information for CSE	7.6.3.80	SM-RP-SMEA	7.6.8.17
Extensible Forwarding Options	7.6.3.18	SM-RP-UI	7.6.8.4
Extensible No reply condition timer	7.6.3.19	Sres	7.6.7.3
Extensible QoS-Subscribed	7.6.3.74	SS-Code	7.6.4.1
Extensible SS-Data	7.6.3.29	SS-Data	7.6.4.3
Extensible SS-Info	7.6.3.14	SS-Event	7.6.4.42
Extensible SS-Status	7.6.3.17	SS-Event-Data	7.6.4.43
Extensible Teleservice	7.6.3.4	SS-Info	7.6.4.24
External Signal Information	7.6.9.4	SS-Status	7.6.4.2
Forwarded-to number	7.6.2.22	Stored location area Id	7.6.2.5
Forwarded-to subaddress	7.6.2.23	Subscriber State	7.6.3.30
Forwarding feature	7.6.4.16	Subscriber Status	7.6.3.7
Forwarding information	7.6.4.15	Super-Charger Supported in HLR	7.6.3.70
Forwarding Options	7.6.4.6	Super-Charger Supported in Serving	7.6.3.71
GGSN address	7.6.2.40	Network Entity	
GGSN number	7.6.2.41	Supported CAMEL Phases in VLR	7.6.3.36
GMSC CAMEL Subscription Info	7.6.3.34	Supported CAMEL Phases in SGSN	7.6.3.36A
GPRS enhancements support indicator	7.6.3.73	Suppress T-CSI	7.6.3.33
GPRS Node Indicator	7.6.8.14	Suppression of Announcement	7.6.3.32
GPRS Subscription Data	7.6.3.46	Target cell Id	7.6.2.8
GPRS Subscription Data Withdraw	7.6.3.45	Target location area Id	7.6.2.7
GPRS Support Indicator	7.6.8.15	Target MSC number	7.6.2.12
Group Id	7.6.2.33	Teleservice	7.6.4.39
GSM bearer capability	7.6.3.6	TEMSI	7.6.2.4
Guidance information	7.6.4.22	TMSI	7.6.2.2
Handover number	7.6.2.21	Trace reference	7.6.10.2
High Layer Compatibility	7.6.3.43	Trace type	7.6.10.3
HLR Id	7.6.2.15	User error	7.6.1.4
HLR number	7.6.2.13	USSD Data Coding Scheme	7.6.4.36
HO-Number Not Required	7.6.6.7	USSD String	7.6.4.37
IMEI	7.6.2.3	UU Data	7.6.5.12
IMSI	7.6.2.1	UUS CF Interaction	7.6.5.13
Inter CUG options	7.6.3.27	VBS Data	7.6.3.40
Intra CUG restrictions	7.6.3.28	VGCS Data	7.6.3.39
Invoke Id	7.6.1.1	VLR CAMEL Subscription Info	7.6.3.35
ISDN Bearer Capability	7.6.3.41	VLR number	7.6.2.14
IST Alert Timer	7.6.3.66	VPLMN address allowed	7.6.3.48
		Zone Code	7.6.2.28

*** **First New Section** ***

7.6.2.3 EMSI

This parameter is the Encrypted Mobile Subscriber Identity defined in 3G TS 23.003.

7.6.2.4 TEMSI

This parameter is the Temporarily Encrypted Mobile Subscriber Identity defined in 3G TS 23.003.

*** **Next Modified Section** ***

8.1.4 MAP_SEND_IDENTIFICATION service

8.1.4.1 Definition

The MAP_SEND_IDENTIFICATION service is used between a VLR and a previous VLR to retrieve IMSI, TEMSI and authentication sets for a subscriber registering afresh in that VLR.

The MAP_SEND_IDENTIFICATION service is a confirmed service using the service primitives defined in table 8.1/4.

8.1.4.2 Service primitives

Table 8.1/4: MAP_SEND_IDENTIFICATION

Parameter name	Request	Indication	Response	Confirm
Invoke Id	M	M(=)	M(=)	M(=)
TMSI	M	M(=)		
Number of requested vectors	M	M(=)		
Segmentation prohibited indicator	C	C (=)		
IMSI			C	C(=)
TEMSI			C	C(=)
Authentication set			U	C(=)
User error			C	C(=)
Provider error				O

8.1.4.3 Parameter definitions and use

Invoke Id

See definition in subclause 7.6.1.

TMSI

See definition in subclause 7.6.2.

TEMSI

See definition in subclause 7.6.2. It shall be contained in the MAP_SERVICE_IDENTIFICATION Response and Confirm service if a TEMSI is stored in previous VLR. Otherwise it shall be absent.

Number of requested vectors

A number indicating how many authentication vectors the new VLR is prepared to receive.

Segmentation prohibited indicator

This parameter indicates if the new VLR or SGSN allows message segmentation.

IMSI

See definition in subclause 7.6.2. The IMSI is to be returned if the service succeeds.

Authentication set

See definition in subclause 7.6.7. If the service succeeds a list of up to five authentication sets is returned, if there are any available.

User error

This parameter is mandatory if the service fails. The following error cause defined in subclause 7.6.1 may be used, depending on the nature of the fault:

- unidentified subscriber.

Provider error

For definition of provider errors see subclause 7.6.1.

***** Next Modified Section *****

9.2.1 MAP-SEND-IMSI service

9.2.1.1 Definition

This service is used by a VLR in order to fetch the IMSI of a subscriber in case of some Operation & Maintenance procedure where subscriber data are needed in the Visited PLMN and MSISDN is the only subscriber's identity known. This service is used by a VLR or SGSN in order to fetch the IMSI and TEMSI of a subscriber if the Mobile station identifies itself with an Encrypted Mobile Subscriber Identity (EMSI).

It is a confirmed service and consists of the primitive shown in table 9.2/1.

9.2.1.2 Service primitives

Table 9.2/1: MAP-SEND-IMSI

Parameter name	Request	Indication	Response	Confirm
Invoke Id	M	M(=)	M(=)	M(=)
MSISDN	C	C(=)		
EMSI	C	C(=)		
IMSI			C	C(=)
TEMSI			C	C(=)
User error			C	C(=)
Provider error				O

9.2.1.3 Parameter use

All parameters are described in subclause 7.6. The following clarifications are applicable:

User error

Only one of the following values is applicable:

- Unknown subscriber;
- Unexpected data value;
- Data missing.

***** Next Modified Section *****

17.1.6 Application Contexts

The following informative table lists the latest versions of the Application Contexts used in this specification, with the operations used by them and, where applicable, whether or not the operation description is exactly the same as for previous versions. Information in sections 17.6 & 17.7 relates only to the ACs in this table.

AC Name	AC Version	Operations Used	Comments *
locationCancellationContext	v3	cancelLocation	
equipmentMngtContext	v2	checkIMEI	
imsiRetrievalContext	v3	sendIMSI	
infoRetrievalContext	v3	sendAuthenticationInfo	
interVlrInfoRetrievalContext	v3	sendIdentification	
handoverControlContext	v2	prepareHandover forwardAccessSignalling sendEndSignal processAccessSignalling prepareSubsequentHandover	
mwdMngtContext	v3	readyForSM	
msPurgingContext	v3	purgeMS	

shortMsgAlertContext	v2	alertServiceCentre	
resetContext	v2	reset	
networkUnstructuredSsContext	v2	processUnstructuredSS-Request unstructuredSS-Request unstructuredSS-Notify	
tracingContext	v3	activateTraceMode deactivateTraceMode	
networkFunctionalSsContext	v2	registerSS eraseSS activateSS deactivateSS registerPassword interrogateSS getPassword	
shortMsgMO-RelayContext	v3	mo-forwardSM	
shortMsgMT-RelayContext	v3	mt-forwardSM	
shortMsgGatewayContext	v3	sendRoutingInfoForSM reportSM-DeliveryStatus InformServiceCentre	the syntax of this operation has been extended in comparison with release 96 version
networkLocUpContext	v3	updateLocation forwardCheckSs-Indication restoreData insertSubscriberData activateTraceMode	the syntax is the same in v1 & v2
gprsLocationUpdateContext	v3	updateGprsLocation insertSubscriberData activateTraceMode	
subscriberDataMngtContext	v3	insertSubscriberData deleteSubscriberData	
roamingNumberEnquiryContext	v3	provideRoamingNumber	
locationInfoRetrievalContext	v3	sendRoutingInfo	
gprsNotifyContext	v3	noteMsPresentForGprs	
gprsLocationInfoRetrievalContext	v3	sendRoutingInfoForGprs	
failureReportContext	v3	failureReport	
callControlTransferContext	v4	resumeCallHandling	
subscriberInfoEnquiryContext	v3	provideSubscriberInfo	
anyTimeEnquiryContext	v3	anyTimeInterrogation	
anyTimeInfoHandlerContext	v3	anyTimeSubscriptionInterrogation anyTimeModification	
ss-InvocationNotificationContext	v3	ss-InvocationNotification	
siWFSAAllocationContext	v3	provideSIWFSNumber siWFSSignallingModify	
groupCallControlContext	v3	prepareGroupCall processGroupCallSignalling forwardGroupCallSignalling sendGroupCallEndSignal	
reportingContext	v3	setReportingState statusReport remoteUserFree	
callCompletionContext	v3	registerCC-Entry eraseCC-Entry	
istAlertingContext	v3	istAlert	
ImmediateTerminationContext	v3	istCommand	
locationSvcEnquiryContext	v3	provideSubscriberLocation subscriberLocationReport	
locationSvcGatewayContext	v3	sendRoutingInfoForLCS	
mm-EventReportingContext	v3	noteMM-Event	
subscriberDataModificationNotificationContext	v3	noteSubscriberDataModified	

NOTE (*): The syntax of the operations is not the same as in previous versions unless explicitly stated

***** Next Modified Section *****

17.2.2.6 IMSI retrieval

This operation package includes the operation required for the IMSI retrieval procedure between HLR and VLR. Furthermore it is used for retrieval of IMSI and TEMSI between UDN and VLR and between UDN and SGSN.

```
IMSIRetrievalPackage-v3 ::= OPERATION-PACKAGE
  -- Supplier is HLR if Consumer is VLR
  -- Supplier is UDN if Consumer is VLR
  -- Supplier is UDN if Consumer is SGSN
  CONSUMER INVOKES {
    sendIMSI}
```

The v2-equivalent package can be determined according to the rules described in subclause 17.2.1. ***** Next Modified Section *****

17.3.2.13 IMSI Retrieval

This application context is used for IMSI retrieval between HLR and VLR. Furthermore this application context is used for retrieval of IMSI and TEMSI between UDN and VLR or between UDN and SGSN. For the UDN - VLR and UDN - SGSN interfaces only version 3 of this application context is applicable.

```
imsiRetrievalContext-v3 APPLICATION-CONTEXT
  -- Responder is HLR if Initiator is VLR
  -- Responder is UDN if Initiator is VLR
  -- responder is UDN if Initiator is SGSN
  INITIATOR CONSUMER OF {
    IMSIRetrievalPackage-v3}
::= {map-ac imsiRetrieval(26) version3(3)}
```

The following application-context-name is assigned to the v2-equivalent application-context:

```
{map-ac imsiRetrieval(26) version2(2)}
*** Next Modified Section ***
```

17.3.3 ASN.1 Module for application-context-names

The following ASN.1 module summarizes the application-context-name assigned to MAP application-contexts.

```
MAP-ApplicationContexts {
  ccitt identified-organization (4) etsi (0) mobileDomain (0)
  gsm-Network (1) modules (3) map-ApplicationContexts (2) version6 (6)}

DEFINITIONS

::= 

BEGIN

-- EXPORTS everything

IMPORTS
  gsm-NetworkId,
  ac-Id
FROM MobileDomainDefinitions {
  ccitt (0) identified-organization (4) etsi (0) mobileDomain (0)
  mobileDomainDefinitions (0) version1 (1)}
;

-- application-context-names

map-ac OBJECT IDENTIFIER ::= {gsm-NetworkId ac-Id}
```

```
networkLocUpContext-v3 OBJECT IDENTIFIER ::=  
{map-ac networkLocUp(1) version3(3)}
```

```
locationCancellationContext-v3 OBJECT IDENTIFIER ::=  
{map-ac locationCancel(2) version3(3)}
```

```
roamingNumberEnquiryContext-v3 OBJECT IDENTIFIER ::=  
{map-ac roamingNbEnquiry(3) version3(3)}
```

```
locationInfoRetrievalContext-v3 OBJECT IDENTIFIER ::=  
{map-ac locInfoRetrieval(5) version3(3)}
```

```
resetContext-v2 OBJECT IDENTIFIER ::=  
{map-ac reset(10) version2(2)}
```

```
handoverControlContext-v2 OBJECT IDENTIFIER ::=  
{map-ac handoverControl(11) version2(2)}
```

```
equipmentMngtContext-v2 OBJECT IDENTIFIER ::=  
{map-ac equipmentMngt(13) version2(2)}
```

```
infoRetrievalContext-v3 OBJECT IDENTIFIER ::=  
{map-ac infoRetrieval(14) version3(3)}
```

```
interVlrInfoRetrievalContext-v3 OBJECT IDENTIFIER ::=  
{map-ac interVlrInfoRetrieval(15) version3(3)}
```

```
subscriberDataMngtContext-v3 OBJECT IDENTIFIER ::=  
{map-ac subscriberDataMngt(16) version3(3)}
```

```
tracingContext-v3 OBJECT IDENTIFIER ::=  
{map-ac tracing(17) version3(3)}
```

```
networkFunctionalSsContext-v2 OBJECT IDENTIFIER ::=  
{map-ac networkFunctionalSs(18) version2(2)}
```

```
networkUnstructuredSsContext-v2 OBJECT IDENTIFIER ::=  
{map-ac networkUnstructuredSs(19) version2(2)}
```

```
shortMsgGatewayContext-v3 OBJECT IDENTIFIER ::=  
{map-ac shortMsgGateway(20) version3(3)}
```

```
shortMsgMO-RelayContext-v3 OBJECT IDENTIFIER ::=  
{map-ac shortMsgMO-Relay(21) version3(3)}
```

```
shortMsgAlertContext-v2 OBJECT IDENTIFIER ::=  
{map-ac shortMsgAlert(23) version2(2)}
```

```
mwdMngtContext-v3 OBJECT IDENTIFIER ::=  
{map-ac mwdMngt(24) version3(3)}
```

```
shortMsgMT-RelayContext-v3 OBJECT IDENTIFIER ::=  
{map-ac shortMsgMT-Relay(25) version3(3)}
```

```
imsiRetrievalContext-v3 OBJECT IDENTIFIER ::=  
{map-ac imsiRetrieval(26) version3(3)}
```

```
msPurgingContext-v3 OBJECT IDENTIFIER ::=  
{map-ac msPurging(27) version3(3)}
```

```
subscriberInfoEnquiryContext-v3 OBJECT IDENTIFIER ::=  
{map-ac subscriberInfoEnquiry(28) version3(3)}
```

```
anyTimeInfoEnquiryContext-v3 OBJECT IDENTIFIER ::=  
{map-ac anyTimeInfoEnquiry(29) version3(3)}
```

```
callControlTransferContext-v4 OBJECT IDENTIFIER ::=  
{map-ac callControlTransfer(6) version4(4)}
```

```
ss-InvocationNotificationContext-v3 OBJECT IDENTIFIER ::=  
{map-ac ss-InvocationNotification(36) version3(3)}
```

```
slWFSAlocationContext-v3 OBJECT IDENTIFIER ::=  
{map-ac slWFSAlocation(12) version3(3)}
```

```
groupCallControlContext-v3 OBJECT IDENTIFIER ::=  
{map-ac groupCallControl(31) version3(3)}
```

```
gprsLocationUpdateContext-v3 OBJECT IDENTIFIER ::=  
{map-ac gprsLocationUpdate(32) version3(3)}
```

```
gprsLocationInfoRetrievalContext-v3 OBJECT IDENTIFIER ::=  
{map-ac gprsLocationInfoRetrieval(33) version3(3)}
```

```
failureReportContext-v3 OBJECT IDENTIFIER ::=  
{map-ac failureReport(34) version3(3)}
```

```
gprsNotifyContext-v3 OBJECT IDENTIFIER ::=  
{map-ac gprsNotify(35) version3(3)}
```

```
reportingContext-v3 OBJECT IDENTIFIER ::=  
{map-ac reporting(7) version3(3)}
```

```
callCompletionContext-v3 OBJECT IDENTIFIER ::=  
{map-ac callCompletion(8) version3(3)}
```

```
istAlertingContext-v3 OBJECT IDENTIFIER ::=  
{map-ac istAlerting(4) version3(3)}
```

```
serviceTerminationContext-v3 OBJECT IDENTIFIER ::=  
{map-ac immediateTermination(9) version3(3)}
```

```
locationSvcGatewayContext-v3 OBJECT IDENTIFIER ::=  
{map-ac locationSvcGateway(37) version3(3)}
```

```
locationSvcEnquiryContext-v3 OBJECT IDENTIFIER ::=  
{map-ac locationSvcEnquiry(38) version3(3)}
```

```
mm-EventReportingContext-v3 OBJECT IDENTIFIER ::=  
{map-ac mm-EventReporting(42) version3(3)}
```

```
anyTimeInfoHandlingContext-v3 OBJECT IDENTIFIER ::=  
{map-ac anyTimeInfoHandling(43) version3(3)}
```

```
subscriberDataModificationNotificationContext-v3 OBJECT IDENTIFIER ::=  
{map-ac subscriberDataModificationNotification(22) version3(3)}
```

-- The following Object Identifiers are reserved for application-
-- contexts existing in previous versions of the protocol

-- AC Name & Version	Object Identifier	
--		
-- networkLocUpContext-v1	map-ac networkLocUp (1)	version1 (1)
-- networkLocUpContext-v2	map-ac networkLocUp (1)	version2 (2)
-- locationCancellationContext-v1	map-ac locationCancellation (2)	version1 (1)
-- locationCancellationContext-v2	map-ac locationCancellation (2)	version2 (2)
-- roamingNumberEnquiryContext-v1	map-ac roamingNumberEnquiry (3)	version1 (1)
-- roamingNumberEnquiryContext-v2	map-ac roamingNumberEnquiry (3)	version2 (2)
-- locationInfoRetrievalContext-v1	map-ac locationInfoRetrieval (5)	version1 (1)
-- locationInfoRetrievalContext-v2	map-ac locationInfoRetrieval (5)	version2 (2)
-- resetContext-v1	map-ac reset (10)	version1 (1)
-- handoverControlContext-v1	map-ac handoverControl (11)	version1 (1)
-- equipmentMngtContext-v1	map-ac equipmentMngt (13)	version1 (1)
-- infoRetrievalContext-v1	map-ac infoRetrieval (14)	version1 (1)
-- infoRetrievalContext-v2	map-ac infoRetrieval (14)	version2 (2)
-- interVlrInfoRetrievalContext-v2	map-ac interVlrInfoRetrieval (15)	version2 (2)
-- subscriberDataMngtContext-v1	map-ac subscriberDataMngt (16)	version1 (1)
-- subscriberDataMngtContext-v2	map-ac subscriberDataMngt (16)	version2 (2)
-- tracingContext-v1	map-ac tracing (17)	version1 (1)
-- tracingContext-v2	map-ac tracing (17)	version2 (2)
-- networkFunctionalSsContext-v1	map-ac networkFunctionalSs (18)	version1 (1)
-- shortMsgGatewayContext-v1	map-ac shortMsgGateway (20)	version1 (1)
-- shortMsgGatewayContext-v2	map-ac shortMsgGateway (20)	version2 (2)
-- shortMsgRelayContext-v1	map-ac shortMsgRelay (21)	version1 (1)
-- shortMsgAlertContext-v1	map-ac shortMsgAlert (23)	version1 (1)
-- mwdMngtContext-v1	map-ac mwdMngt (24)	version1 (1)
-- mwdMngtContext-v2	map-ac mwdMngt (24)	version2 (2)
-- shortMsgMT-RelayContext-v2	map-ac shortMsgMT-Relay (25)	version2 (2)
-- msPurgingContext-v2	map-ac msPurging (27)	version2 (2)
-- callControlTransferContext-v3	map-ac callControlTransferContext (6)	version3 (3)
-- imsiRetrievalContext-v2	map-ac imsiRetrieval(26)	version2(2)}

END

***** Next Modified Section *****

17.7.1 Mobile Service data types

```

1 MAP-MS-DataTypes {
2   ccitt identified-organization (4) etsi (0) mobileDomain (0)
3   gsm-Network (1) modules (3) map-MS-DataTypes (11) version6 (6)
4
5 DEFINITIONS
6
7 IMPLICIT TAGS
8
9 ::==
10
11 BEGIN
12
13 EXPORTS
14
15   -- location registration types
16   UpdateLocationArg,
17   UpdateLocationRes,
18   CancelLocationArg,
19   CancelLocationRes,
20   PurgeMS-Arg,
21   PurgeMS-Res,
22   SendIdentificationArg,
23   SendIdentificationRes,
24   UpdateGprsLocationArg,
25   UpdateGprsLocationRes,
26   IST-SupportIndicator,
27
28
29   -- handover types
30   PrepareHO-Arg,
31   PrepareHO-Res,
32   PrepareSubsequentHO-Arg,
33
34   -- authentication management types
35   SendAuthenticationInfoArg,
36   SendAuthenticationInfoRes,
37

```

```

38   -- security management types
39   EquipmentStatus,
40   Kc,
41
42   -- subscriber management types
43   InsertSubscriberDataArg,
44   InsertSubscriberDataRes,
45   DeleteSubscriberDataArg,
46   DeleteSubscriberDataRes,
47   SubscriberData,
48   ODB-Data,
49   SubscriberStatus,
50   ZoneCodeList,
51   maxNumOfZoneCodes,
52   O-CSI,
53   D-CSI,
54   O-BcsmCamelTDPCriteriaList,
55   T-BCSM-CAMEL-TDP-CriteriaList,
56   SS-CSI,
57   ServiceKey,
58   DefaultCallHandling,
59   CamelCapabilityHandling,
60   BasicServiceCriteria,
61   SupportedCamelPhases,
62   maxNumOfCamelTDPData,
63   CUG-Index,
64   CUG-Interlock,
65   InterCUG-Restrictions,
66   IntraCUG-Options,
67   IST-AlertTimerValue,
68   T-CSI,
69   T-BcsmTriggerDetectionPoint,
70
71   -- fault recovery types
72   ResetArg,
73   RestoreDataArg,
74   RestoreDataRes,
75
76   -- subscriber information enquiry types
77   ProvideSubscriberInfoArg,
78   ProvideSubscriberInfoRes,
79   SubscriberInfo,
80   LocationInformation,
81   SubscriberState,
82
83   -- any time information enquiry types
84   AnyTimeInterrogationArg,
85   AnyTimeInterrogationRes,
86
87   -- any time information handling types
88   AnyTimeSubscriptionInterrogationArg,
89   AnyTimeSubscriptionInterrogationRes,
90   AnyTimeModificationArg,
91   AnyTimeModificationRes,
92
93   -- subscriber data modification notification types
94   NoteSubscriberDataModifiedArg,
95   NoteSubscriberDataModifiedRes,
96
97   -- gprs location information retrieval types
98   SendRoutingInfoForGprsArg,
99   SendRoutingInfoForGprsRes,
100
101  -- failure reporting types
102  FailureReportArg,
103  FailureReportRes,
104
105  -- gprs notification types
106  NoteMsPresentForGprsArg,
107  NoteMsPresentForGprsRes,
108
109  -- Mobility Management types
110  NoteMM-EventArgs,
111  NoteMM-EventRes
112
113
114 ;
115
116

```

```

117 IMPORTS
118   maxNumOfSS,
119   SS-SubscriptionOption,
120   SS-List,
121   SS-ForBS-Code,
122   Password
123 FROM MAP-SS-DataTypes {
124   ccitt identified-organization (4) etsi (0) mobileDomain (0)
125   gsm-Network (1) modules (3) map-SS-DataTypes (14) version6 (6)}
126
127   SS-Code
128 FROM MAP-SS-Code {
129   ccitt identified-organization (4) etsi (0) mobileDomain (0)
130   gsm-Network (1) modules (3) map-SS-Code (15) version6 (6)}
131
132   Ext-BearerServiceCode
133 FROM MAP-BS-Code {
134   ccitt identified-organization (4) etsi (0) mobileDomain (0)
135   gsm-Network (1) modules (3) map-BS-Code (20) version6 (6)}
136
137   Ext-TeleserviceCode
138 FROM MAP-TS-Code {
139   ccitt identified-organization (4) etsi (0) mobileDomain (0)
140   gsm-Network (1) modules (3) map-TS-Code (19) version6 (6)}
141
142
143   AddressString,
144   ISDN-AddressString,
145   ISDN-SubaddressString,
146   ExternalSignalInfo,
147   IMSI,
148   TMSI,
149   TEMSI,
150   HLR-List,
151   LMSI,
152   Identity,
153   GlobalCellId,
154   CellIdOrLAI,
155   Ext-BasicServiceCode,
156   NAEA-PreferredCI,
157   EMLPP-Info,
158   SubscriberIdentity,
159   AgeOfLocationInformation,
160   LCSClientExternalID,
161   LCSClientInternalID
162
163
164
165 FROM MAP-CommonDataTypes {
166   ccitt identified-organization (4) etsi (0) mobileDomain (0)
167   gsm-Network (1) modules (3) map-CommonDataTypes (18) version6 (6)}
168
169   ExtensionContainer
170 FROM MAP-ExtensionDataTypes {
171   ccitt identified-organization (4) etsi (0) mobileDomain (0)
172   gsm-Network (1) modules (3) map-ExtensionDataTypes (21) version6 (6)}
173
174   AbsentSubscriberDiagnosticSM
175 FROM MAP-ER-DataTypes {
176   ccitt identified-organization (4) etsi (0) mobileDomain (0)
177   gsm-Network (1) modules (3) map-ER-DataTypes (17) version6 (6)}
178
179 ;
180 ;
181
182
183 -- location registration types
184
185 UpdateLocationArg ::= SEQUENCE {
186   imsi                               IMSI,
187
188   msc-Number                         [1] ISDN-AddressString,
189   vlr-Number                          ISDN-AddressString,
190   lmsi                                [10] LMSI OPTIONAL,
191   extensionContainer                  ExtensionContainer
192   ...                                 OPTIONAL,
193   vlr-Capability                     [6] VLR-Capability
194                                         OPTIONAL }

```

```

195 VLR-Capability ::= SEQUENCE{
196     supportedCamelPhases           [0] SupportedCamelPhases      OPTIONAL,
197     extensionContainer             ExtensionContainer          OPTIONAL,
198     ... ,
199     solsaSupportIndicator         [2] NULL                  OPTIONAL,
200     istSupportIndicator          [1] IST-SupportIndicator    OPTIONAL,
201     superChargerSupportedInServingNetworkEntity [3] SuperChargerInfo   OPTIONAL }
202
203 SuperChargerInfo ::= CHOICE {
204     sendSubscriberData           [0] NULL,
205     subscriberDataStored        [1] AgeIndicator }
206
207 AgeIndicator ::= OCTET STRING (SIZE (1..6))
208     -- The internal structure of this parameter is implementation specific.
209
210
211 IST-SupportIndicator ::= ENUMERATED {
212     basicISTSupported            (0),
213     istCommandSupported          (1), ...
214     -- exception handling:
215     -- reception of values > 1 shall be mapped to 'istCommandSupported'
216
217
218 UpdateLocationRes ::= SEQUENCE {
219     hlr-Number                   ISDN-AddressString,
220
221     extensionContainer           ExtensionContainer        OPTIONAL,
222     ... }
223
224 CancellingLocationArg ::= [3] SEQUENCE {
225     identity                     Identity,
226     cancellationType             CancellationType        OPTIONAL,
227     extensionContainer           ExtensionContainer        OPTIONAL,
228     ... }
229
230
231 CancellationType ::= ENUMERATED {
232     updateProcedure               (0),
233     subscriptionWithdraw         (1),
234     ... }
235     -- The HLR shall not send values other than listed above
236
237
238 CancellingLocationRes ::= SEQUENCE {
239     extensionContainer           ExtensionContainer        OPTIONAL,
240     ... }
241
242 PurgeMS-Arg ::= [3] SEQUENCE {
243     imsi                        IMSI,
244     vlr-Number                   [0] ISDN-AddressString    OPTIONAL,
245     sgsn-Number                  [1] ISDN-AddressString    OPTIONAL,
246     extensionContainer           ExtensionContainer        OPTIONAL,
247     ... }
248
249 PurgeMS-Res ::= SEQUENCE {
250     freezeTMSI                   [0] NULL                  OPTIONAL,
251     freezeP-TMSI                 [1] NULL                  OPTIONAL,
252     extensionContainer           ExtensionContainer        OPTIONAL,
253     ... }
254
255 SendIdentificationArg ::= SEQUENCE {
256     tmsi                         TMSI,
257     numberOfRequestedVectors     NumberOfRequestedVectors,
258     segmentationProhibited      NULL                  OPTIONAL,
259     -- if segmentation is prohibited the previous VLR shall not send the result
260     -- within a TC-CONTINUE message.
261     extensionContainer           ExtensionContainer        OPTIONAL,
262     ... }
263

```

```

264 SendIdentificationRes ::= [3] SEQUENCE {
265     imsi                                IMSI                               OPTIONAL,
266     -- IMSI must be present if SendIdentificationRes is not segmented.
267     -- If the TC-Continue segmentation option is taken the IMSI must be
268     -- present in one segmented transmission of SendIdentificationRes.
269     temsi                                 [0] TEMSI                            OPTIONAL,
270     authenticationSetList                 [1] AuthenticationSetList          OPTIONAL,
271     extensionContainer                   [2] ExtensionContainer           OPTIONAL,
272     ...
273 }
274
274 AuthenticationSetList ::= CHOICE {
275     tripletList                         [0] TripletList,
276     quintupletList                      [1] QuintupletList
277 }
278
278 TripletList ::= SEQUENCE SIZE (1..5) OF
279     AuthenticationTriplet
280
281 QuintupletList ::= SEQUENCE SIZE (1..5) OF
282     AuthenticationQuintuplet
283
284 AuthenticationTriplet ::= SEQUENCE {
285     rand                                RAND,
286     sres                                SRES,
287     kc                                  Kc,
288     ...
289 }
290
290 AuthenticationQuintuplet ::= SEQUENCE {
291     rand                                RAND,
292     xres                                XRES,
293     ck                                  CK,
294     ik                                  IK,
295     autn                                AUTN,
296     ...
297 }
298 RAND ::= OCTET STRING (SIZE (16))
299
300 SRES ::= OCTET STRING (SIZE (4))
301
302 Kc ::= OCTET STRING (SIZE (8))
303
304 XRES ::= OCTET STRING (SIZE (4..16))
305
306 CK ::= OCTET STRING (SIZE (16))
307
308 IK ::= OCTET STRING (SIZE (16))
309
310 AUTN ::= OCTET STRING (SIZE (14..18))
311
312 AUTS ::= OCTET STRING (SIZE (12..16))
313
314     -- gprs location registration types
315
316 UpdateGprsLocationArg ::= SEQUENCE {
317     imsi                                IMSI,
318     sgsn-Number                         ISDN-AddressString,
319     sgsn-Address                          GSN-Address,
320     extensionContainer                   ExtensionContainer
321     ...
322     sgsn-Capability                     [0] SGSN-Capability
323                                         OPTIONAL
324 }
324
324 SGSN-Capability ::= SEQUENCE{
325     solsaSupportIndicator               NULL
326     extensionContainer                [1] ExtensionContainer
327     ...
328     superChargerSupportedInServingNetworkEntity [2] SuperChargerInfo
329     gprsEnhancementsSupportIndicator [3] NULL
330     supportedCamelPhases            [4] SupportedCamelPhases
331                                         OPTIONAL ,
332                                         OPTIONAL ,
333                                         OPTIONAL }
332
332 GSN-Address ::= OCTET STRING (SIZE (5..17))
333     -- Octets are coded according to TS GSM 03.03
334
335 UpdateGprsLocationRes ::= SEQUENCE {
336     hlr-Number                          ISDN-AddressString,
337     extensionContainer                  ExtensionContainer
338     ...
339 }

```

```

340 -- handover types
341
342 PrepareHO-Arg ::= SEQUENCE {
343     targetCellId          GlobalCellId
344     ho-NumberNotRequired NULL
345     bss-APDU              ExternalSignalInfo
346     ...
347 }
348
349 PrepareHO-Res ::= SEQUENCE {
350     handoverNumber        ISDN-AddressString
351     bss-APDU              ExternalSignalInfo
352     ...
353 }
354 PrepareSubsequentHO-Arg ::= SEQUENCE {
355     targetCellId          GlobalCellId,
356     targetMSC-Number      ISDN-AddressString,
357     bss-APDU              ExternalSignalInfo,
358     ...
359 -- authentication management types
360
361 SendAuthenticationInfoArg ::= SEQUENCE {
362     imsi                  [0] IMSI,
363     numberRequestedVectors NumberOfRequestedVectors,
364     segmentationProhibited NULL
365     -- if segmentation is prohibited the HLR shall not send the result within
366     -- a TC-CONTINUE message.
367     immediateResponsePreferred [1] NULL
368     -- if present, the HLR may send an immediate response with the available authentication
369     -- vectors (see § 8.5.2 for more information).
370     re-synchronisationInfo   Re-synchronisationInfo
371     extensionContainer       [2] ExtensionContainer
372     ...
373 }
374 NumberOfRequestedVectors ::= INTEGER (1..5)
375
376 Re-synchronisationInfo ::= SEQUENCE {
377     rand                  RAND,
378     rand-ms               RAND,
379     auts                 AUTS,
380     ...
381 }
382 SendAuthenticationInfoRes ::= [3] SEQUENCE {
383     authenticationSetList  AuthenticationSetList
384     extensionContainer     ExtensionContainer
385     ...
386 }
387
388 -- security management types
389
390 EquipmentStatus ::= ENUMERATED {
391     whiteListed (0),
392     blackListed (1),
393     greyListed (2)}
394
395
396 -- subscriber management types
397

```

```

398 InsertSubscriberDataArg ::= SEQUENCE {
399     imsi                               [0] IMSI                                OPTIONAL,
400     COMPONENTS OF
401     extensionContainer                 [14] ExtensionContainer                   OPTIONAL,
402     ...
403     naea-PreferredCI                  [15] NAEA-PreferredCI                      OPTIONAL,
404     -- naea-PreferredCI is included at the discretion of the HLR operator.
405     gprsSubscriptionData             [16] GPRSSubscriptionData                OPTIONAL,
406     roamingRestrictedInSgsnDueToUnsupportedFeature [23] NULL
407
408     networkAccessMode               [24] NetworkAccessMode                     OPTIONAL,
409     lsaInformation                  [25] LSAInformation                      OPTIONAL,
410     lmu-Indicator                  [21] NULL                                OPTIONAL,
411     lcsInformation                 [22] LCSInformation                      OPTIONAL,
412     istAlertTimer                  [26] IST-AlertTimerValue                  OPTIONAL,
413     superChargerSupportedInHLR    [27] AgeIndicator                         OPTIONAL
414 }
415 -- If the Network Access Mode parameter is sent, it shall be present only in
416 -- the first sequence if the segmentation is used
417
418 IST-AlertTimerValue ::= INTEGER (15..255)
419
420 LCSInformation ::= SEQUENCE {
421     gmlc-List [0]                      GMLC-List OPTIONAL,
422     lcs-PrivacyExceptionList          [1]  LCS-PrivacyExceptionList      OPTIONAL,
423     molr-List                          [2]  MOLR-List                         OPTIONAL,
424 ...}
425
426 GMLC-List ::= SEQUENCE SIZE (1..maxNumOfGMLC) OF
427                                         ISDN-AddressString
428     -- if segmentation is used, the complete GMLC-List shall be sent in one segment
429
430 maxNumOfGMLC INTEGER ::= 5
431
432
433 NetworkAccessMode ::= ENUMERATED {
434     bothMSCAndSGSN                  (0),
435     onlyMSC                         (1),
436     onlySGSN                        (2),
437     ...
438     -- if unknown values are received in NetworkAccessMode
439     -- they shall be discarded.
440
441 GPRSDataList ::= SEQUENCE SIZE (1..maxNumOfPDP-Contexts) OF
442                                         PDP-Context
443
444 maxNumOfPDP-Contexts INTEGER ::= 50
445
446 PDP-Context ::= SEQUENCE {
447     pdp-ContextId                  ContextId,
448     pdp-Type                        [16] PDP-Type,
449     pdp-Address                     [17] PDP-Address                      OPTIONAL,
450     qos-Subscribed                 [18] QoS-Subscribed,
451     vplmnAddressAllowed            [19] NULL OPTIONAL,
452     apn                            [20] APN ,
453     extensionContainer              [21] ExtensionContainer                   OPTIONAL,
454     ...
455     ext-QoS-Subscribed            [0] Ext-QoS-Subscribed                  OPTIONAL }
456     -- qos-Subscribed shall be discarded if ext-QoS-Subscribed is received and supported
457
458 ContextId ::= INTEGER (1..maxNumOfPDP-Contexts)
459
460 GPRSSubscriptionData ::= SEQUENCE {
461     completeDataListIncluded        NULL
462                                         OPTIONAL,
463
464     -- If segmentation is used, completeDataListIncluded may only be present in the
465     -- first segment.
466     gprsDataList                   [1]  GPRSDataList,
467     extensionContainer              [2]  ExtensionContainer                   OPTIONAL,
468     ...
469     sgsn-CAMEL-SubscriptionInfo   [3]  SGSN-CAMEL-SubscriptionInfo    OPTIONAL }

```

```

470 SGSN-CAMEL-SubscriptionInfo ::= SEQUENCE {
471   gprs-CSI                               [0] GPRS-CSI           OPTIONAL,
472   sms-CSI                                [1] SMS-CSI           OPTIONAL,
473   extensionContainer                      [2] ExtensionContainer OPTIONAL,
474   ...
475 }
476 GPRS-CSI ::= SEQUENCE {
477   gprs-CamelTDPDataList                  [0] GPRS-CamelTDPDataList,
478   camelCapabilityHandling                [1] CamelCapabilityHandling,
479   extensionContainer                     [2] ExtensionContainer    OPTIONAL,
480   notificationToCSE                    [3] NULL               OPTIONAL,
481   csiActive                            [4] NULL               OPTIONAL,
482   ...
483 -- notificationToCSE and csiActive shall not be present when GPRS-CSI is sent to SGSN.
484 -- They may only be included in ATSI/ATM Ack message.
485
486 GPRS-CamelTDPDataList ::= SEQUENCE SIZE (1..maxNumOfCamelTDPData) OF
487   GPRS-CamelTDPData
488 -- GPRS-CamelTDPDataList shall not contain more than one instance of
489 -- GPRS-CamelTDPData containing the same value for gprs-TriggerDetectionPoint.
490
491 GPRS-CamelTDPData ::= SEQUENCE {
492   gprs-TriggerDetectionPoint          [0] GPRS-TriggerDetectionPoint,
493   serviceKey                         [1] ServiceKey,
494   gsmSCF-Address                     [2] ISDN-AddressString,
495   defaultSessionHandling            [3] DefaultGPRS-Handling,
496   extensionContainer                 [4] ExtensionContainer    OPTIONAL,
497   ...
498 }
499
500 DefaultGPRS-Handling ::= ENUMERATED {
501   continueTransaction (0) ,
502   releaseTransaction (1) ,
503   ...
504 -- exception handling:
505 -- reception of values in range 2-31 shall be treated as "continueTransaction"
506 -- reception of values greater than 31 shall be treated as "releaseTransaction"
507
508 GPRS-TriggerDetectionPoint ::= ENUMERATED {
509   attach                           (1),
510   attachChangeOfPosition           (2),
511   pdp-ContextEstablishment       (11),
512   pdp-ContextEstablishmentAcknowledgement (12),
513   pdp-ContextChangeOfPosition     (14),
514   ...
515 -- exception handling:
516 -- For GPRS-CamelTDPData sequences containing this parameter with any
517 -- other value than the ones listed the receiver shall ignore the whole
518 -- GPRS-CamelTDPData sequence.
519
520 APN ::= OCTET STRING (SIZE (2..63))
521 -- Octets are coded according to TS GSM 03.03
522
523
524 PDP-Type ::= OCTET STRING (SIZE (2))
525 -- Octets are coded according to TS GSM 09.60
526
527 PDP-Address ::= OCTET STRING (SIZE (1..16))
528 -- Octets are coded according to TS GSM 09.60
529
530 -- The possible size values are:
531 -- 1-7 octets X.25 address type
532 -- 4 octets IPv4 address type
533 -- 16 octets Ipv6 address type
534
535 QoS-Subscribed ::= OCTET STRING (SIZE (3))
536 -- Octets are coded according to TS GSM 04.08.
537
538 Ext-QoS-Subscribed ::= OCTET STRING (SIZE (3..15))
539 -- Octets are coded according to 3G TS 24.008.
540

```

```

541 LSAOnlyAccessIndicator ::= ENUMERATED {
542     accessOutsideLSAsAllowed (0),
543     accessOutsideLSAsRestricted (1)}
544
545 LSADataList ::= SEQUENCE SIZE (1..maxNumOfLSAs) OF
546             LSAData
547
548 maxNumOfLSAs INTEGER ::= 20
549
550 LSAData ::= SEQUENCE {
551     lsaIdentity [0] LSAIdentity,
552     lsaPriority [1] LSAPriority,
553     lsaActiveModeIndicator [2] NULL OPTIONAL,
554     lsaActiveModeSupportIndicator [3] NULL OPTIONAL,
555     extensionContainer [4] ExtensionContainer OPTIONAL,
556     ...}
557
558 LSAInformation ::= SEQUENCE {
559     completeDataListIncluded NULL OPTIONAL,
560
561         -- If segmentation is used, completeDataListIncluded may only be present in the
562         -- first segment.
563     lsaOnlyAccessIndicator [1] LSAOnlyAccessIndicator OPTIONAL,
564     lsaDataList [2] LSADataList OPTIONAL,
565     extensionContainer [3] ExtensionContainer OPTIONAL,
566     ...}
567
568 LSAIdentity ::= OCTET STRING (SIZE (3))
569 -- Octets are coded according to TS GSM 03.03
570
571 LSAPriority ::= OCTET STRING (SIZE (1))
572 -- Octets are coded according to TS GSM 08.08
573
574
575 SubscriberData ::= SEQUENCE {
576     msisdn [1] ISDN-AddressString OPTIONAL,
577     category [2] Category OPTIONAL,
578     subscriberStatus [3] SubscriberStatus OPTIONAL,
579     bearerServiceList [4] BearerServiceList OPTIONAL,
580         -- The exception handling for reception of unsupported / not allocated
581         -- bearerServiceCodes is defined in section 6.8.1
582     teleserviceList [6] TeleserviceList OPTIONAL,
583         -- The exception handling for reception of unsupported / not allocated
584         -- teleserviceCodes is defined in section 6.8.1
585     provisionedSS [7] Ext-SS-InfoList OPTIONAL,
586     odb-Data [8] ODB-Data OPTIONAL,
587     roamingRestrictionDueToUnsupportedFeature [9] NULL OPTIONAL,
588     regionalSubscriptionData [10] ZoneCodeList OPTIONAL,
589     vbsSubscriptionData [11] VBSDataList OPTIONAL,
590     vgcsSubscriptionData [12] VGCSDataList OPTIONAL,
591     vlrCamelSubscriptionInfo [13] VlrCamelSubscriptionInfo OPTIONAL
592 }
593
594 Category ::= OCTET STRING (SIZE (1))
595 -- The internal structure is defined in CCITT Rec Q.763.
596
597 SubscriberStatus ::= ENUMERATED {
598     serviceGranted (0),
599     operatorDeterminedBarring (1)}
600
601 BearerServiceList ::= SEQUENCE SIZE (1..maxNumOfBearerServices) OF
602             Ext-BearerServiceCode
603
604 maxNumOfBearerServices INTEGER ::= 50
605
606 TeleserviceList ::= SEQUENCE SIZE (1..maxNumOfTeleservices) OF
607             Ext-TeleserviceCode
608
609 maxNumOfTeleservices INTEGER ::= 20
610
611 ODB-Data ::= SEQUENCE {
612     odb-GeneralData ODB-GeneralData,
613     odb-HPLMN-Data ODB-HPLMN-Data OPTIONAL,
614     extensionContainer ExtensionContainer OPTIONAL,
615     ...}
616

```

```

617 ODB-GeneralData ::= BIT STRING {
618   alLOG-CallsBarred (0),
619   internationalOGCallsBarred (1),
620   internationalOGCallsNotToHPLMN-CountryBarred (2),
621   interzonalogCallsBarred (6),
622   interzonalogCallsNotToHPLMN-CountryBarred (7),
623   interzonalogCallsAndInternationalOGCallsNotToHPLMN-CountryBarred (8),
624   premiumRateInformationOGCallsBarred (3),
625   premiumRateEntertainmentOGCallsBarred (4),
626   ss-AccessBarred (5),
627   allECT-Barred (9),
628   chargeableECT-Barred (10),
629   internationalECT-Barred (11),
630   interzonaleCT-Barred (12),
631   doublyChargeableECT-Barred (13),
632   multipleECT-Barred (14)} (SIZE (15..32))
633   -- exception handling: reception of unknown bit assignments in the
634   -- ODB-GeneralData type shall be treated like unsupported ODB-GeneralData
635

636 ODB-HPLMN-Data ::= BIT STRING {
637   plmn-SpecificBarringType1 (0),
638   plmn-SpecificBarringType2 (1),
639   plmn-SpecificBarringType3 (2),
640   plmn-SpecificBarringType4 (3)} (SIZE (4..32))
641   -- exception handling: reception of unknown bit assignments in the
642   -- ODB-HPLMN-Data type shall be treated like unsupported ODB-HPLMN-Data
643

644 Ext-SS-InfoList ::= SEQUENCE SIZE (1..maxNumOfSS) OF
645   Ext-SS-Info
646

647 Ext-SS-Info ::= CHOICE {
648   forwardingInfo [0] Ext-ForwInfo,
649   callBarringInfo [1] Ext-CallBarInfo,
650   cug-Info [2] CUG-Info,
651   ss-Data [3] Ext-SS-Data,
652   emlpp-Info [4] EMLPP-Info}
653

654

655 Ext-ForwInfo ::= SEQUENCE {
656   ss-Code,
657   forwardingFeatureList [0] ExtensionContainer OPTIONAL,
658   extensionContainer ...
659 }
660

661 Ext-ForwFeatureList ::= SEQUENCE SIZE (1..maxNumOfExt-BasicServiceGroups) OF
662   Ext-ForwFeature
663

664 Ext-ForwFeature ::= SEQUENCE {
665   basicService [0] Ext-BasicServiceCode OPTIONAL,
666   ss-Status [4] Ext-SS-Status,
667   forwardedToNumber [5] ISDN-AddressString OPTIONAL,
668   -- When this data type is sent from an HLR which supports CAMEL Phase 2
669   -- to a VLR that supports CAMEL Phase 2 the VLR shall not check the
670   -- format of the number
671   forwardedToSubaddress [8] ISDN-SubaddressString OPTIONAL,
672   forwardingOptions [6] Ext-ForwOptions OPTIONAL,
673   noReplyConditionTime [7] Ext-NoRepCondTime OPTIONAL,
674   extensionContainer [9] ExtensionContainer OPTIONAL,
675   ...
676 }

677 Ext-SS-Status ::= OCTET STRING (SIZE (1..5))
678
679   -- OCTET 1:
680   --
681   -- bits 8765: 0000 (unused)
682   -- bits 4321: Used to convey the "P bit", "R bit", "A bit" and "Q bit",
683   --             representing supplementary service state information
684   --             as defined in TS GSM 03.11
685
686   -- bit 4: "Q bit"
687
688   -- bit 3: "P bit"
689
690   -- bit 2: "R bit"
691
692   -- bit 1: "A bit"
693
694   -- OCTETS 2-5: reserved for future use. They shall be discarded if

```

```

695    -- received and not understood.
696
697
698 Ext-ForwOptions ::= OCTET STRING (SIZE (1..5))
699
700    -- OCTET 1:
701
702    -- bit 8: notification to forwarding party
703    -- 0 no notification
704    -- 1 notification
705
706    -- bit 7: redirecting presentation
707    -- 0 no presentation
708    -- 1 presentation
709
710    -- bit 6: notification to calling party
711    -- 0 no notification
712    -- 1 notification
713
714    -- bit 5: 0 (unused)
715
716    -- bits 4:3: forwarding reason
717    -- 00 ms not reachable
718    -- 01 ms busy
719    -- 10 no reply
720    -- 11 unconditional
721
722    -- bits 2:1: 00 (unused)
723
724    -- OCTETS 2-5: reserved for future use. They shall be discarded if
725    -- received and not understood.
726
727 Ext-NoRepCondTime ::= INTEGER (1..100)
728    -- Only values 5-30 are used.
729    -- Values in the ranges 1-4 and 31-100 are reserved for future use
730    -- If received:
731        -- values 1-4 shall be mapped on to value 5
732        -- values 31-100 shall be mapped on to value 30
733
734 Ext-CallBarInfo ::= SEQUENCE {
735     ss-Code                               SS-Code,
736     callBarringFeatureList                Ext-CallBarFeatureList,
737     extensionContainer                   ExtensionContainer
738     ...}                                     OPTIONAL,
739
740 Ext-CallBarFeatureList ::= SEQUENCE SIZE (1..maxNumOfExt-BasicServiceGroups) OF
741                                         Ext-CallBarringFeature
742
743 Ext-CallBarringFeature ::= SEQUENCE {
744     basicService                         Ext-BasicServiceCode
745     ss-Status [4] Ext-SS-Status,
746     extensionContainer                  ExtensionContainer
747     ...}                                     OPTIONAL,
748
749 CUG-Info ::= SEQUENCE {
750     cug-SubscriptionList                 CUG-SubscriptionList,
751     cug-FeatureList                     CUG-FeatureList
752     extensionContainer                  [0] ExtensionContainer
753     ...}                                     OPTIONAL,
754
755 CUG-SubscriptionList ::= SEQUENCE SIZE (0..maxNumOfCUG) OF
756                                         CUG-Subscription
757
758 CUG-Subscription ::= SEQUENCE {
759     cug-Index CUG-Index,
760     cug-Interlock                        CUG-Interlock,
761     intraCUG-Options                    IntraCUG-Options,
762     basicServiceGroupList               Ext-BasicServiceGroupList
763     extensionContainer                  [0] ExtensionContainer
764     ...}                                     OPTIONAL,
765
766 CUG-Index ::= INTEGER (0..32767)
767    -- The internal structure is defined in ETS 300 138.
768
769 CUG-Interlock ::= OCTET STRING (SIZE (4))
770

```

```

771 IntraCUG-Options ::= ENUMERATED {
772     noCUG-Restrictions (0),
773     cugIC-CallBarred (1),
774     cugOG-CallBarred (2)
775 }
776 maxNumOfCUG INTEGER ::= 10
777
778 CUG-FeatureList ::= SEQUENCE SIZE (1..maxNumOfExt-BasicServiceGroups) OF
779             CUG-Feature
780
781 Ext-BasicServiceGroupList ::= SEQUENCE SIZE (1..maxNumOfExt-BasicServiceGroups) OF
782             Ext-BasicServiceCode
783
784 maxNumOfExt-BasicServiceGroups INTEGER ::= 32
785
786 CUG-Feature ::= SEQUENCE {
787     basicService           Ext-BasicServiceCode          OPTIONAL,
788     preferentialCUG-Indicator CUG-Index OPTIONAL,
789     interCUG-Restrictions   InterCUG-Restrictions,
790     extensionContainer      ExtensionContainer        OPTIONAL,
791     ...
792 }
793 InterCUG-Restrictions ::= OCTET STRING (SIZE (1))
794
795 -- bits 876543: 000000 (unused)
796 -- Exception handling:
797 -- bits 876543 shall be ignored if received and not understood
798
799 -- bits 21
800 -- 00 CUG only facilities
801 -- 01 CUG with outgoing access
802 -- 10 CUG with incoming access
803 -- 11 CUG with both outgoing and incoming access
804
805 Ext-SS-Data ::= SEQUENCE {
806     ss-Code                SS-Code,
807     ss-Status [4] Ext-SS-Status,           SS-SubscriptionOption OPTIONAL,
808     ss-SubscriptionOption       Ext-BasicServiceGroupList OPTIONAL,
809     basicServiceGroupList      extensionContainer [5] ExtensionContainer OPTIONAL,
810     extensionContainer        ...
811 }
812
813 LCS-PrivacyExceptionList ::= SEQUENCE SIZE (1..maxNumOfPrivacyClass) OF
814             LCS-PrivacyClass
815
816 maxNumOfPrivacyClass INTEGER ::= 4
817
818 LCS-PrivacyClass ::= SEQUENCE {
819     ss-Code                SS-Code,
820     ss-Status               Ext-SS-Status,
821     privacyVerificationByMSuser [0] NULL          OPTIONAL,
822     -- privacyVerificationByMSuser is expected only for SS-code = callunrelated
823     externalClientList [1] ExternalClientList    OPTIONAL,
824     -- externalClientList is expected only for SS-code = callunrelated
825     plmnClientList [2] PLMNClientList            OPTIONAL,
826     -- plmnClientList is expected only for SS-code - plmn
827     extensionContainer [3] ExtensionContainer    OPTIONAL,
828     -- if segmentation is used, the complete LCS-PrivacyClass shall be sent in one segment
829     ...
830 }
831 ExternalClientList ::= SEQUENCE SIZE (0..maxNumOfExternalClient) OF
832             ExternalClient
833
834 maxNumOfExternalClient INTEGER ::= 5
835
836 PLMNClientList ::= SEQUENCE SIZE (1..maxNumOfPLMNClient) OF
837             LCSClientInternalID
838
839 maxNumOfPLMNClient INTEGER ::= 5
840

```

```

841 ExternalClient ::= SEQUENCE {
842     clientIdentity                  LCSClientExternalID,
843     gmlc-Restriction                [0] GMLC-Restriction          OPTIONAL,
844     notificationToMSUser            [1] NotificationToMSUser      OPTIONAL,
845     extensionContainer              [2] ExtensionContainer        OPTIONAL,
846     ...
847 }
848 GMLC-Restriction ::= ENUMERATED {
849     gmlc-List                      (0),
850     home-Country                   (1)}
851
852 NotificationToMSUser ::= ENUMERATED {
853     notification                  (0),
854     notificationWithPrivacyVerification (1)}
855
856 MOLR-List ::= SEQUENCE SIZE (1..maxNumOfMOLR-Class) OF
857                                     MOLR-Class
858
859 maxNumOfMOLR-Class   INTEGER ::= 3
860
861 MOLR-Class ::= SEQUENCE {
862     ss-Code                         SS-Code,
863     ss-Status                       Ext-SS-Status,
864     extensionContainer              [0] ExtensionContainer        OPTIONAL,
865     ...
866 }
867 ZoneCodeList ::= SEQUENCE SIZE (1..maxNumOfZoneCodes)
868                                     OF ZoneCode
869
870 ZoneCode ::= OCTET STRING (SIZE (2))
871 -- internal structure is defined in TS GSM 03.03
872
873 maxNumOfZoneCodes   INTEGER ::= 10
874
875 InsertSubscriberDataRes ::= SEQUENCE {
876     teleserviceList                 [1] TeleserviceList           OPTIONAL,
877     bearerServiceList               [2] BearerServiceList         OPTIONAL,
878     ss-List                         [3] SS-List                  OPTIONAL,
879     odb-GeneralData                 [4] ODB-GeneralData          OPTIONAL,
880     regionalSubscriptionResponse   [5] RegionalSubscriptionResponse OPTIONAL,
881     supportedCamelPhases          [6] SupportedCamelPhases    OPTIONAL,
882     extensionContainer              [7] ExtensionContainer        OPTIONAL,
883     ...
884 }
885
886 RegionalSubscriptionResponse ::= ENUMERATED {
887     networkNode-AreaRestricted    (0),
888     tooManyZoneCodes              (1),
889     zoneCodesConflict             (2),
890     regionalSubscNotSupported    (3)}
891
892 DeleteSubscriberDataArg ::= SEQUENCE {
893     imsi                           [0] IMSI,
894     basicServiceList                [1] BasicServiceList          OPTIONAL,
895     -- The exception handling for reception of unsupported/not allocated
896     -- basicServiceCodes is defined in section 6.8.2
897     ss-List                         [2] SS-List                  OPTIONAL,
898     roamingRestrictionDueToUnsupportedFeature [4] NULL
899     regionalSubscriptionIdentifier [5] ZoneCode                 OPTIONAL,
900     vbsGroupIndication              [7] NULL
901     vgcsGroupIndication            [8] NULL OPTIONAL,
902     camelSubscriptionInfoWithdraw [9] NULL OPTIONAL,
903     extensionContainer              [6] ExtensionContainer        OPTIONAL,
904     ...,
905     gprsSubscriptionDataWithdraw   [10] GPRSSubscriptionDataWithdraw OPTIONAL,
906     roamingRestrictedInSgsnDueToUnsuppportedFeature [11] NULL
907     lsaInformationWithdraw         [12] LSAInformationWithdraw    OPTIONAL,
908     gmlc-ListWithdraw              [13] NULL
909     istInformationWithdraw         [14] NULL
910 }
911 GPRSSubscriptionDataWithdraw ::= CHOICE {
912     allGPRSData                    NULL,
913     contextIdList                  ContextIdList}
914
915 ContextIdList ::= SEQUENCE SIZE (1..maxNumOfPDP-Contexts) OF
916                                     ContextId
917

```

```

918 LSAInformationWithdraw ::= CHOICE {
919     allLSAData
920     lsaIdentityList
921             NULL,
922             LSAIdentityList }
923
924 LSAIdentityList ::= SEQUENCE SIZE (1..maxNumOfLSAs) OF
925             LSAIdentity
926
927 BasicServiceList ::= SEQUENCE SIZE (1..maxNumOfBasicServices) OF
928             Ext-BasicServiceCode
929
930 maxNumOfBasicServices INTEGER ::= 70
931
932 DeleteSubscriberDataRes ::= SEQUENCE {
933     regionalSubscriptionResponse [0]
934             RegionalSubscriptionResponse OPTIONAL,
935     extensionContainer ExtensionContainer OPTIONAL,
936     ... }
937
938 VlrCamelSubscriptionInfo ::= SEQUENCE {
939     o-CSI [0] O-CSI OPTIONAL,
940     extensionContainer [1] ExtensionContainer OPTIONAL,
941     ...
942     ss-CSI [2] SS-CSI OPTIONAL,
943     o-BcsmCamelTDP-CriteriaList [4] O-BcsmCamelTDPCriteriaList OPTIONAL,
944     tif-CSI [3] NULL OPTIONAL,
945     m-CSI [5] M-CSI OPTIONAL,
946     sms-CSI [6] SMS-CSI OPTIONAL,
947     vt-CSI [7] T-CSI OPTIONAL,
948     t-BCSM-CAMEL-TDP-CriteriaList [8] T-BCSM-CAMEL-TDP-CriteriaList OPTIONAL,
949     d-CSI [9] D-CSI OPTIONAL
950 }
951
952 D-CSI ::= SEQUENCE {
953     dp-AnalysedInfoCriteriaList DP-AnalysedInfoCriteriaList,
954     camelCapabilityHandling CamelCapabilityHandling,
955     extensionContainer ExtensionContainer OPTIONAL,
956     ... }
957
958 DP-AnalysedInfoCriteriaList ::= SEQUENCE SIZE (1..maxNumOfDP-AnalysedInfoCriteria) OF
959             DP-AnalysedInfoCriterium
960
961 maxNumOfDP-AnalysedInfoCriteria INTEGER ::= 10
962
963 DP-AnalysedInfoCriterium ::= SEQUENCE {
964     dialledNumber ISDN-AddressString,
965     serviceKey ServiceKey,
966     gsmSCF-Address ISDN-AddressString,
967     defaultCallHandling DefaultCallHandling,
968     extensionContainer ExtensionContainer OPTIONAL,
969     ... }
970
971 SS-CSI ::= SEQUENCE {
972     ss-CamelData SS-CamelData,
973     extensionContainer ExtensionContainer OPTIONAL,
974     ... }
975
976 SS-CamelData ::= SEQUENCE {
977     ss-EventList SS-EventList,
978     gsmSCF-Address ISDN-AddressString,
979     extensionContainer [0] ExtensionContainer OPTIONAL,
980     ...
981     notificationToCSE [1] NULL OPTIONAL,
982     csiActive [2] NULL OPTIONAL
983     }
984
985 -- notificationToCSE and csiActive shall not be present when SS-CSI is sent to VLR.
986 -- They may only be included in ATSI/ATM Ack message.
987
988 SS-EventList ::= SEQUENCE SIZE (1..maxNumOfCamelSSEvents) OF SS-Code
989
990     -- Actions for the following SS-Code values are defined in CAMEL Phase 3:
991     -- ect SS-Code ::= '00110001'B
992     -- multiPTY SS-Code ::= '01010001'B
993     -- cd SS-Code ::= '00100100'B
994     -- ccbs SS-Code ::= '01000100'B
995
996     -- all other SS codes shall be ignored
997
998 maxNumOfCamelSSEvents INTEGER ::= 10
999

```

```

995 o-CSI ::= SEQUENCE {
996   o-BcsmCamelTDPDataList
997   extensionContainer
998   ...
999   camelCapabilityHandling
1000  notificationToCSE
1001  csiActive
1002 }
1003 -- notificationToCSE and csiActive shall not be present when o-CSI is sent to VLR/GMSC.
1004 -- They may only be included in ATSI/ATM Ack message.
1005
1006 O-BcsmCamelTDPDataList ::= SEQUENCE SIZE (1..maxNumOfCamelTDPData) OF
1007   O-BcsmCamelTDPData
1008   -- O-BcsmCamelTDPDataList shall not contain more than one instance of
1009   -- O-BcsmCamelTDPData containing the same value for o-BcsmTriggerDetectionPoint.
1010   -- For CAMEL Phase 2, this means that only one instance of O-BcsmCamelTDPData is allowed
1011   -- with o-BcsmTriggerDetectionPoint being equal to DP2.
1012
1013 maxNumOfCamelTDPData  INTEGER ::= 10
1014
1015 O-BcsmCamelTDPData ::= SEQUENCE {
1016   o-BcsmTriggerDetectionPoint
1017   serviceKey
1018   gsmSCF-Address
1019   defaultCallHandling
1020   extensionContainer
1021   ...
1022 }
1023
1024 ServiceKey ::= INTEGER (0..2147483647)
1025
1026 O-BcsmTriggerDetectionPoint ::= ENUMERATED {
1027   collectedInfo (2),
1028   ...
1029   routeSelectFailure (4)
1030 }
1031 -- exception handling:
1032 -- For O-BcsmCamelTDPData sequences containing this parameter with any
1033 -- other value than the ones listed the receiver shall ignore the whole
1034 -- O-BcsmCamelTDPData sequence.
1035 -- For O-BcsmCamelTDP-Criteria sequences containing this parameter with any
1036 -- other value than the ones listed the receiver shall ignore the whole
1037 -- O-BcsmCamelTDP-Criteria sequence.
1038
1039 O-BcsmCamelTDPCriteriaList ::= SEQUENCE SIZE (1..maxNumOfCamelTDPData) OF
1040   O-BcsmCamelTDP-Criteria
1041
1042 T-BCSM-CAMEL-TDP-CriteriaList ::= SEQUENCE SIZE (1..maxNumOfCamelTDPData) OF
1043   T-BCSM-CAMEL-TDP-Criteria
1044
1045 O-BcsmCamelTDP-Criteria ::= SEQUENCE {
1046   o-BcsmTriggerDetectionPoint
1047   destinationNumberCriteria
1048   basicServiceCriteria
1049   callTypeCriteria
1050   ...
1051   o-CauseValueCriteria
1052   extensionContainer
1053 }
1054 -- exception handling:
1055 -- For T-BCSM-CAMEL-TDP-Criteria sequences containing this parameter with any
1056 -- other value than the ones listed the receiver shall ignore the whole
1057 -- T-BCSM-CAMEL-TDP-Criteria sequence.
1058
1059 DestinationNumberCriteria ::= SEQUENCE {
1060   matchType
1061   destinationNumberList
1062   destinationNumberLengthList
1063   -- one or both of destinationNumberList and destinationNumberLengthList
1064   -- shall be present
1065   ...
1066 }
1067
1068 DestinationNumberList ::= SEQUENCE SIZE (1..maxNumOfCamelDestinationNumbers) OF
1069   ISDN-AddressString
1070   -- The receiving entity shall not check the format of a number in
1071   -- the dialled number list

```

```

1072 DestinationNumberLengthList ::= SEQUENCE SIZE (1..maxNumOfCamelDestinationNumberLengths) OF
1073     INTEGER(1..maxNumOfISDN-AddressDigits)
1074
1075 BasicServiceCriteria ::= SEQUENCE SIZE(1..maxNumOfCamelBasicServiceCriteria) OF
1076     Ext-BasicServiceCode
1077
1078 maxNumOfISDN-AddressDigits INTEGER ::= 15
1079
1080 maxNumOfCamelDestinationNumbers INTEGER ::= 10
1081
1082 maxNumOfCamelDestinationNumberLengths INTEGER ::= 3
1083
1084 maxNumOfCamelBasicServiceCriteria INTEGER ::= 5
1085
1086 CallTypeCriteria ::= ENUMERATED {
1087     forwarded (0),
1088     notForwarded (1)}
1089
1090 MatchType ::= ENUMERATED {
1091     inhibiting (0),
1092     enabling (1)}
1093
1094 O-CauseValueCriteria ::= SEQUENCE SIZE(1..maxNumOfCAMEL-O-CauseValueCriteria) OF
1095     CauseValue
1096
1097 T-CauseValueCriteria ::= SEQUENCE SIZE(1..maxNumOfCAMEL-T-CauseValueCriteria) OF
1098     CauseValue
1099
1100 maxNumOfCAMEL-O-CauseValueCriteria INTEGER ::= 5
1101
1102 maxNumOfCAMEL-T-CauseValueCriteria INTEGER ::= 5
1103
1104 CauseValue ::= OCTET STRING (SIZE(1))
1105 -- Type extracted from Cause parameter in ITU-T Recommendation Q.763.
1106 -- For the use of cause value refer to ITU-T Recommendation Q.850.
1107
1108
1109 DefaultCallHandling ::= ENUMERATED {
1110     continueCall (0),
1111     releaseCall (1),
1112     ...}
1113 -- exception handling:
1114 -- reception of values in range 2-31 shall be treated as "continueCall"
1115 -- reception of values greater than 31 shall be treated as "releaseCall"
1116
1117 CamelCapabilityHandling ::= INTEGER(1..16)
1118 -- value 1 = CAMEL phase 1,
1119 -- value 2 = CAMEL phase 2,
1120 -- value 3 = CAMEL Phase 3:
1121 -- reception of values greater than 3 shall be treated as CAMEL phase 3.
1122
1123 SupportedCamelPhases ::= BIT STRING {
1124     phase1 (0),
1125     phase2 (1),
1126     phase3 (2) } (SIZE (1..16))
1127 -- A node shall mark in the BIT STRING all CAMEL Phases it supports.
1128 -- Other values than listed above shall be discarded.
1129
1130 SMS-CSI ::= SEQUENCE {
1131     sms-CAMEL-TDP-DataList [0] SMS-CAMEL-TDP-DataList,
1132     camelCapabilityHandling [1] CamelCapabilityHandling ,
1133     extensionContainer [2] ExtensionContainer OPTIONAL,
1134     notificationToCSE [3] NULL OPTIONAL,
1135     csiActive [4] NULL OPTIONAL,
1136     ...}
1137 -- notificationToCSE and csiActive shall not be present when SMS-CSI is sent to VLR/SGSN.
1138 -- They may only be included in ATSI/ATM Ack message.
1139
1140 SMS-CAMEL-TDP-DataList ::= SEQUENCE SIZE (1..maxNumOfCamelTDPData) OF
1141     SMS-CAMEL-TDP-Data
1142 -- SMS-CAMEL-TDP-DataList shall not contain more than one instance of
1143 -- SMS-CAMEL-TDP-Data containing the same value for sms-TriggerDetectionPoint.
1144

```

```

1145 SMS-CAMEL-TDP-Data ::= SEQUENCE {
1146     sms-TriggerDetectionPoint [0] SMS-TriggerDetectionPoint,
1147     serviceKey [1] ServiceKey,
1148     gsmSCF-Address [2] ISDN-AddressString,
1149     defaultSMS-Handling [3] DefaultSMS-Handling,
1150     extensionContainer [4] ExtensionContainer OPTIONAL,
1151     ...
1152 }
1153
1154 SMS-TriggerDetectionPoint ::= ENUMERATED {
1155     sms-CollectedInfo (1),
1156     ...
1157 -- exception handling:
1158 -- For SMS-CAMEL-TDP-Data sequences containing this parameter with any
1159 -- other value than the ones listed the receiver shall ignore the whole
1160 -- SMS-CAMEL-TDP-Data sequence.
1161
1162 DefaultSMS-Handling ::= ENUMERATED {
1163     continueTransaction (0) ,
1164     releaseTransaction (1) ,
1165     ...
1166 -- exception handling:
1167 -- reception of values in range 2-31 shall be treated as "continueTransaction"
1168 -- reception of values greater than 31 shall be treated as "releaseTransaction"
1169
1170 M-CSI ::= SEQUENCE {
1171     mobilityTriggers MobilityTriggers,
1172     serviceKey ServiceKey,
1173     gsmSCF-Address [0] ISDN-AddressString,
1174     extensionContainer [1] ExtensionContainer OPTIONAL,
1175     notificationToCSE [2] NULL OPTIONAL,
1176     csiActive [3] NULL OPTIONAL,
1177     ...
1178 -- notificationToCSE and csiActive shall not be present when M-CSI is sent to VLR.
1179 -- They may only be included in ATSI/ATM Ack message.
1180
1181 MobilityTriggers ::= SEQUENCE SIZE (1..maxNumOfMobilityTriggers) OF
1182     MM-Code
1183
1184 maxNumOfMobilityTriggers INTEGER ::= 10
1185
1186 MM-Code ::= OCTET STRING (SIZE (1))
1187 -- This type is used to indicate a Mobility Management event.
1188 -- Actions for the following M-Code values are defined in CAMEL Phase 3:
1189 --
1190 -- Location-update-in-same-VLR      MM-Code ::= '00000000'B
1191 -- Location-update-to-other-VLR    MM-Code ::= '00000001'B
1192 -- IMSI-Attach                   MM-Code ::= '00000010'B
1193 -- MS-initiated-IMSI-Detach     MM-Code ::= '00000011'B
1194 -- Network-initiated-IMSI-Detach MM-Code ::= '00000100'B
1195 --
1196 -- If any other MM-code is received in M-CSI, then that MM-code shall be
1197 -- ignored.
1198
1199 T-CSI ::= SEQUENCE {
1200     t-BcsmCamelTDPDataList T-BcsmCamelTDPDataList,
1201     extensionContainer ExtensionContainer OPTIONAL,
1202     ...,
1203     camelCapabilityHandling [0] CamelCapabilityHandling OPTIONAL,
1204     notificationToCSE [1] NULL OPTIONAL,
1205     csi-Active [2] NULL OPTIONAL
1206   }
1207 -- notificationToCSE and csi-Active shall not be present when T-CSI is sent to VLR/GMSC.
1208 -- They may only be included in ATSI/ATM Ack message.
1209
1210 T-BcsmCamelTDPDataList ::= SEQUENCE SIZE (1..maxNumOfCamelTDPData) OF
1211     T-BcsmCamelTDPData
1212 --- T-BcsmCamelTDPDataList shall not contain more than one instance of
1213 --- T-BcsmCamelTDPData containing the same value for t-BcsmTriggerDetectionPoint.
1214 --- For CAMEL Phase 2, this means that only one instance of T-BcsmCamelTDPData is allowed
1215 --- with t-BcsmTriggerDetectionPoint being equal to DP12.
1216 --- For CAMEL Phase 3, more TDP's are allowed.
1217

```

```

1218 T-BcsmCamelTDPData ::= SEQUENCE {
1219     t-BcsmTriggerDetectionPoint          T-BcsmTriggerDetectionPoint,
1220     serviceKey                         ServiceKey,
1221     gsmSCF-Address                      [0] ISDN-AddressString,
1222     defaultCallHandling                 [1] DefaultCallHandling,
1223     extensionContainer                  [2] ExtensionContainer
1224     ...}                                OPTIONAL,
1225
1226 T-BcsmTriggerDetectionPoint ::= ENUMERATED {
1227     termAttemptAuthorized (12),
1228     ...
1229     tBusy (13),
1230     tNoAnswer (14)}
1231 -- exception handling:
1232 -- For T-BcsmCamelTDPData sequences containing this parameter with any other
1233 -- value than the ones listed above, the receiver shall ignore the whole
1234 -- T-BcsmCamelTDPData sequence.
1235
1236
1237 -- gprs location information retrieval types
1238
1239 SendRoutingInfoForGprsArg ::= SEQUENCE {
1240     imsi                               [0] IMSI,
1241     ggsn-Address                       [1] GSN-Address
1242     OPTIONAL,
1243     ggsn-Number                        [2] ISDN-AddressString,
1244     extensionContainer                  [3] ExtensionContainer
1245     ...}                                OPTIONAL,
1246
1247 SendRoutingInfoForGprsRes ::= SEQUENCE {
1248     sgsn-Address                      [0] GSN-Address,
1249     ggsn-Address                       [1] GSN-Address
1250     OPTIONAL,
1251     mobileNotReachableReason         [2] AbsentSubscriberDiagnosticSM
1252     OPTIONAL,
1253     extensionContainer                [3] ExtensionContainer
1254     ...}                                OPTIONAL,
1255
1256 -- failure report types
1257
1258 FailureReportArg ::= SEQUENCE {
1259     imsi                               [0] IMSI,
1260     ggsn-Number                        [1] ISDN-AddressString
1261     ,
1262     ggsn-Address                       [2] GSN-Address
1263     OPTIONAL,
1264     extensionContainer                 [3] ExtensionContainer
1265     ...}                                OPTIONAL,
1266
1267 FailureReportRes ::= SEQUENCE {
1268     ggsn-Address                      [0] GSN-Address
1269     OPTIONAL,
1270     extensionContainer                 [1] ExtensionContainer
1271     ...}                                OPTIONAL,
1272
1273 -- gprs notification types
1274
1275 NoteMsPresentForGprsArg ::= SEQUENCE {
1276     imsi                               [0] IMSI,
1277     sgsn-Address                      [1] GSN-Address,
1278     ggsn-Address                       [2] GSN-Address
1279     OPTIONAL,
1280     extensionContainer                 [3] ExtensionContainer
1281     ...}                                OPTIONAL,
1282
1283 NoteMsPresentForGprsRes ::= SEQUENCE {
1284     extensionContainer                 [0] ExtensionContainer
1285     OPTIONAL,
1286     ...}
1287
1288 -- fault recovery types
1289
1290 ResetArg ::= SEQUENCE {
1291     hlr-Number                         ISDN-AddressString,
1292     hlr-List                            HLR-List
1293     OPTIONAL,
1294     ...}
1295
1296 RestoreDataArg ::= SEQUENCE {
1297     imsi                               IMSI,
1298     lmsi                               LMSI
1299     OPTIONAL,
1300     extensionContainer                 ExtensionContainer
1301     OPTIONAL,
1302     ...
1303     vlr-Capability                     [6] VLR-Capability
1304     OPTIONAL }
1305

```

```

1295 RestoreDataRes ::= SEQUENCE {
1296     hlr-Number                      ISDN-AddressString,
1297     msNotReachable                  NULL
1298     extensionContainer              ExtensionContainer
1299     ...
1300 }
1301 -- VBS/VGCS types
1302 VBSDataList ::= SEQUENCE SIZE (1..maxNumOfVBSGroupIds) OF
1303     VoiceBroadcastData
1304
1305 VGCSDataList ::= SEQUENCE SIZE (1..maxNumOfVGCSGroupIds) OF
1306     VoiceGroupCallData
1307
1308 maxNumOfVBSGroupIds INTEGER ::= 50
1309
1310 maxNumOfVGCSGroupIds INTEGER ::= 50
1311
1312 VoiceGroupCallData ::= SEQUENCE {
1313     groupId                         GroupId,
1314     extensionContainer              ExtensionContainer
1315     ...
1316 }
1317 VoiceBroadcastData ::= SEQUENCE {
1318     groupId                         GroupId,
1319     broadcastInitEntitlement        NULL
1320     extensionContainer              ExtensionContainer
1321     ...
1322 }
1323 GroupId ::= OCTET STRING (SIZE (3))
1324     -- Refers to the Group Identification as specified in GSM TS 03.03
1325     -- and 03.68/ 03.69
1326
1327 -- provide subscriber info types
1328
1329 ProvideSubscriberInfoArg ::= SEQUENCE {
1330     imsi      [0] IMSI,
1331     lmsi      [1] LMSI
1332     requestedInfo                   OPTIONAL,
1333     extensionContainer              ExtensionContainer
1334     ...
1335 }
1336 ProvideSubscriberInfoRes ::= SEQUENCE {
1337     subscriberInfo                 SubscriberInfo,
1338     extensionContainer              ExtensionContainer
1339     ...
1340 }
1341 SubscriberInfo ::= SEQUENCE {
1342     locationInformation            [0] LocationInformation
1343     subscriberState                [1] SubscriberState
1344     extensionContainer              [2] ExtensionContainer
1345     ...
1346 }
1347 RequestedInfo ::= SEQUENCE {
1348     locationInformation            [0] NULL
1349     subscriberState                [1] NULL
1350     extensionContainer              [2] ExtensionContainer
1351     ...
1352 }
1353 LocationInformation ::= SEQUENCE {
1354     ageOfLocationInformation       AgeOfLocationInformation
1355     geographicalInformation       [0] GeographicalInformation
1356     vlr-number                     [1] ISDN-AddressString
1357     locationNumber                [2] LocationNumber
1358     cellIdOrLAI                   [3] CellIdOrLAI
1359     extensionContainer             [4] ExtensionContainer
1360     ...
1361     selectedLSA-Id                [5] LSAIdentity
1362     msc-Number                     [6] ISDN-AddressString
1363     geodeticInformation            [7] GeodeticInformation
1364 }

```

```

1365 GeographicalInformation ::= OCTET STRING (SIZE (8))
1366 -- Refers to geographical Information defined in GSM 03.32.
1367 -- Only the description of an ellipsoid point with uncertainty circle
1368 -- as specified in GSM 03.32 is allowed to be used
1369 -- The internal structure according to GSM 03.32 is as follows:
1370 --     Type of shape (ellipsoid point with uncertainty circle)          1 octet
1371 --     Degrees of Latitude                                              3 octets
1372 --     Degrees of Longitude                                             3 octets
1373 --     Uncertainty code                                                 1 octet
1374

GeodeticInformation ::= OCTET STRING (SIZE (10))
-- Refers to Calling Geodetic Location defined in Q.763 (1999).
-- Only the description of an ellipsoid point with uncertainty circle
-- as specified in Q.763 (1999) is allowed to be used
-- The internal structure according to Q.763 (1999) is as follows:
--     Screening and presentation indicators                            1 octet
--     Type of shape (ellipsoid point with uncertainty circle)          1 octet
--     Degrees of Latitude                                              3 octets
--     Degrees of Longitude                                             3 octets
--     Uncertainty code                                                 1 octet
--     Confidence                                                       1 octet

1375
1376 LocationNumber ::= OCTET STRING (SIZE (2..10))
1377 -- the internal structure is defined in CCITT Rec Q.763
1378

1379 SubscriberState ::= CHOICE {
1380     assumedIdle                               [0] NULL,
1381     camelBusy [1] NULL,
1382     netDetNotReachable                      NotReachableReason,
1383     notProvidedFromVLR                      [2] NULL}
1384

1385 NotReachableReason ::= ENUMERATED {
1386     msPurged (0),
1387     imsiDetached (1),
1388     restrictedArea (2),
1389     notRegistered (3)}
1390

1391 -- any time interrogation info types
1392

1393 AnyTimeInterrogationArg ::= SEQUENCE {
1394     subscriberIdentity                   [0] SubscriberIdentity,
1395     requestedInfo                      [1] RequestedInfo,
1396     gsmSCF-Address                     [3] ISDN-AddressString,
1397     extensionContainer                  [2] ExtensionContainer
1398     ...}                                OPTIONAL,
1399

1400 AnyTimeInterrogationRes ::= SEQUENCE {
1401     subscriberInfo                      SubscriberInfo,
1402     extensionContainer                  ExtensionContainer
1403     ...}                                OPTIONAL,
1404

1405 -- any time information handling types
1406

1407 AnyTimeSubscriptionInterrogationArg ::= SEQUENCE {
1408     subscriberIdentity                 [0] SubscriberIdentity,
1409     requestedSubscriptionInfo         [1] RequestedSubscriptionInfo,
1410     gsmSCF-Address                   [2] ISDN-AddressString,
1411     extensionContainer                [3] ExtensionContainer
1412     ...}                                OPTIONAL,
1413

1414 AnyTimeSubscriptionInterrogationRes ::= SEQUENCE {
1415     callForwardingData               [1] CallForwardingData
1416     callBarringData                 [2] CallBarringData
1417     odb-Info                        [3] ODB-Info
1418     camel-SubscriptionInfo          [4] CAMEL-SubscriptionInfo
1419     supportedVLR-CAMEL-Phases      [5] SupportedCamelPhases
1420     supportedSGSN-CAMEL-Phases     [6] SupportedCamelPhases
1421     extensionContainer              [7] ExtensionContainer
1422     ...}                                OPTIONAL,
1423
1424

```

```

1425 RequestedSubscriptionInfo ::= SEQUENCE {
1426   requestedSS-Info                  [1] SS-ForBS-Code           OPTIONAL,
1427   odb                           [2] NULL                   OPTIONAL,
1428   requestedCAMEL-SubscriptionInfo  [3] RequestedCAMEL-SubscriptionInfo OPTIONAL,
1429   supportedVLR-CAMEL-Phases      [4] NULL                   OPTIONAL,
1430   supportedSGSN-CAMEL-Phases     [5] NULL                   OPTIONAL,
1431   extensionContainer             [6] ExtensionContainer    OPTIONAL,
1432   ...
1433 }
1434 RequestedCAMEL-SubscriptionInfo ::= ENUMERATED {
1435   o-CSI                         (0),
1436   t-CSI                         (1),
1437   vt-CSI                        (2),
1438   tif-CSI                        (3),
1439   gprs-CSI                      (4),
1440   sms-CSI                       (5),
1441   ss-CSI                        (6),
1442   m-CSI                         (7),
1443   d-csi                         (8)}
1444
1445 CallForwardingData ::= SEQUENCE {
1446   forwardingFeatureList          Ext-ForwFeatureList,
1447   notificationToCSE             NULL                   OPTIONAL,
1448   extensionContainer            [0] ExtensionContainer  OPTIONAL,
1449   ...
1450 }
1451 CallBarringData ::= SEQUENCE {
1452   callBarringFeatureList         Ext-CallBarFeatureList,
1453   password                      Password,
1454   wrongPasswordAttemptsCounter  WrongPasswordAttemptsCounter,
1455   notificationToCSE             NULL                   OPTIONAL,
1456   extensionContainer            ExtensionContainer    OPTIONAL,
1457   ...
1458 }
1459 WrongPasswordAttemptsCounter ::= INTEGER (0..4)
1460
1461 ODB-Info ::= SEQUENCE {
1462   odb-Data                      ODB-Data,
1463   notificationToCSE              NULL                   OPTIONAL,
1464   extensionContainer             ExtensionContainer  OPTIONAL,
1465   ...
1466 }
1467 CAMEL-SubscriptionInfo ::= SEQUENCE {
1468   o-CSI                         [0] O-CSI                 OPTIONAL,
1469   o-BcsmCamelTDP-CriteriaList   [1] O-BcsmCamelTDPCriteriaList OPTIONAL,
1470   t-CSI                          [2] T-CSI                 OPTIONAL,
1471   t-BCSM-CAMEL-TDP-CriteriaList [3] T-BCSM-CAMEL-TDP-CriteriaList OPTIONAL,
1472   vt-CSI                        [4] T-CSI                 OPTIONAL,
1473   vt-BCSM-CAMEL-TDP-CriteriaList [5] T-BCSM-CAMEL-TDP-CriteriaList OPTIONAL,
1474   tif-CSI                        [6] NULL                  OPTIONAL,
1475   tif-CSI-NotificationToCSE     [7] NULL                  OPTIONAL,
1476   gprs-CSI                      [8] GPRS-CSI             OPTIONAL,
1477   sms-CSI                       [9] SMS-CSI              OPTIONAL,
1478   ss-CSI                        [10] SS-CSI              OPTIONAL,
1479   m-CSI                         [11] M-CSI               OPTIONAL,
1480   extensionContainer            [12] ExtensionContainer  OPTIONAL,
1481   ...
1482 }
1483 AnyTimeModificationArg ::= SEQUENCE {
1484   subscriberIdentity             [0] SubscriberIdentity,
1485   gsmSCF-Address                [1] ISDN-AddressString,
1486   modificationRequestFor-SS-Info [2] ModificationRequestFor-SS-Info OPTIONAL,
1487   modificationRequestFor-CSI     [3] ModificationRequestFor-CSI  OPTIONAL,
1488   extensionContainer             [4] ExtensionContainer  OPTIONAL,
1489   ...
1490 }
1491 AnyTimeModificationRes ::= SEQUENCE {
1492   ss-InfoFor-CSE                [0] Ext-SS-InfoFor-CSE    OPTIONAL,
1493   camel-SubscriptionInfo        [1] CAMEL-SubscriptionInfo  OPTIONAL,
1494   extensionContainer            [2] ExtensionContainer  OPTIONAL,
1495   ...
1496 }

```

```

1497 ModificationRequestFor-SS-Info ::= SEQUENCE {
1498     ss-Code                               [0] SS-Code,
1499     basicService                          [1] Ext-BasicServiceCode      OPTIONAL,
1500     ss-Status                             [2] Ext-SS-Status           OPTIONAL,
1501     forwardedToNumber                    [3] AddressString          OPTIONAL,
1502     forwardedToSubaddress                [4] ISDN-SubaddressString   OPTIONAL,
1503     noReplyConditionTime               [5] Ext-NoRepCondTime       OPTIONAL,
1504     modifyNotificationToCSE            [6] ModificationInstruction  OPTIONAL,
1505     extensionContainer                  [7] ExtensionContainer      OPTIONAL,
1506     ...
1507 }
1508 ModificationRequestFor-CSI ::= SEQUENCE {
1509     requestedCamelSubscriptionInfo    [0] RequestedCAMEL-SubscriptionInfo OPTIONAL,
1510     modifyNotificationToCSE          [1] ModificationInstruction      OPTIONAL,
1511     modifyCSI-State                 [2] ModificationInstruction      OPTIONAL,
1512     extensionContainer              [3] ExtensionContainer        OPTIONAL,
1513     ...
1514 }
1515 ModificationInstruction ::= ENUMERATED {
1516     deactivate                         (0),
1517     activate                           (1)
1518 }
1519 -- subscriber data modification notification types
1520
1521 NoteSubscriberDataModifiedArg ::= SEQUENCE {
1522     imsi                                IMSI,
1523     msisdn                             ISDN-AddressString,
1524     typeOfModification                  TypeOfModification,
1525     extensionContainer                  ExtensionContainer      OPTIONAL,
1526     ...
1527 }
1528 NoteSubscriberDataModifiedRes ::= SEQUENCE {
1529     extensionContainer                  ExtensionContainer      OPTIONAL,
1530     ...
1531 }
1532 TypeOfModification ::= ENUMERATED {
1533     callForwardingSS-Data             (0),
1534     callBarringSS-Data               (1),
1535     operatorDeterminedBarringData   (2),
1536     camelSubscriptionInformation    (3),
1537     ...
1538 }
1539 -- exception handling:
1540 -- reception of other values shall be treated as unexpected data
1541
1542 -- mobility management event notificatioon info types
1543
1544 NoteMM-EventArg ::= SEQUENCE {
1545     serviceKey                           ServiceKey,
1546     eventMet                            [0] MM-Code,
1547     imsi                                [1] IMSI,
1548     msisdn                             [2] ISDN-AddressString,
1549     locationInformation                 [3] LocationInformation      OPTIONAL,
1550     lsaIdentity                         [4] LSAIdentity            OPTIONAL,
1551     supportedCAMELPhases              [5] SupportedCamelPhases   OPTIONAL,
1552     extensionContainer                  [6] ExtensionContainer      OPTIONAL,
1553     ...
1554 }
1555 NoteMM-EventRes ::= SEQUENCE {
1556     extensionContainer                  ExtensionContainer      OPTIONAL,
1557     ...
1558 }
1559 Ext-SS-InfoFor-CSE ::= CHOICE {
1560     forwardingInfoFor-CSE            [0] Ext-ForwardingInfoFor-CSE,
1561     callBarringInfoFor-CSE          [1] Ext-CallBarringInfoFor-CSE
1562 }
1563
1564 Ext-ForwardingInfoFor-CSE ::= SEQUENCE {
1565     ss-Code                             [0] SS-Code,
1566     forwardingFeatureList            [1] Ext-ForwFeatureList,
1567     notificationToCSE                 [2] NULL,
1568     extensionContainer                  [3] ExtensionContainer      OPTIONAL,
1569     ...
1570 }

```

```

1571 Ext-CallBarringInfoFor-CSE ::= SEQUENCE {
1572   ss-Code                               [0]  SS-Code,
1573   callBarringFeatureList                [1]  Ext-CallBarFeatureList,
1574   password                               [2]  Password,
1575   wrongPasswordAttemptsCounter        [3]  WrongPasswordAttemptsCounter,
1576   notificationToCSE                   [4]  NULL,
1577   extensionContainer                  [5]  ExtensionContainer
1578   ...
1579 }
1580 END

```

***** Next Modified Section *****

17.6.2 Operation and Maintenance Operations

```

1 MAP-OperationAndMaintenanceOperations {
2   ccitt identified-organization (4) etsi (0) mobileDomain (0)
3   gsm-Network (1) modules (3) map-OperationAndMaintenanceOperations (6)
4   version6 (6)
5
6   DEFINITIONS
7
8   ::==
9
10 BEGIN
11
12 EXPORTS
13   ActivateTraceMode,
14   DeactivateTraceMode,
15   SendIMSI
16 ;
17
18 IMPORTS
19   OPERATION
20   FROM TCAPMessages {
21     ccitt recommendation q 773 modules (2) messages (1) version2 (2)}
22
23   SystemFailure,
24   DataMissing,
25   UnexpectedDataValue,
26   FacilityNotSupported,
27   UnknownSubscriber,
28   UnidentifiedSubscriber,
29   TracingBufferFull
30   FROM MAP-Errors {
31     ccitt identified-organization (4) etsi (0) mobileDomain (0)
32     gsm-Network (1) modules (3) map-Errors (10) version6 (6)}
33
34   ActivateTraceModeArg,
35   ActivateTraceModeRes,
36   DeactivateTraceModeArg,
37   DeactivateTraceModeRes
38   FROM MAP-OM-DataTypes {
39     ccitt identified-organization (4) etsi (0) mobileDomain (0)
40     gsm-Network (1) modules (3) map-OM-DataTypes (12) version6 (6)}
41 ;
42
43
44 ActivateTraceMode ::= OPERATION
45   ARGUMENT
46     activateTraceModeArg          ActivateTraceModeArg
47   RESULT
48     activateTraceModeRes         ActivateTraceModeRes
49     -- optional
50   ERRORS {
51     SystemFailure,
52     DataMissing,
53     UnexpectedDataValue,
54     FacilityNotSupported,
55     UnidentifiedSubscriber,
56     TracingBufferFull}
57

```

```

58 DeactivateTraceMode ::= OPERATION --Timer m
59   ARGUMENT
60     deactivateTraceModeArg      DeactivateTraceModeArg
61   RESULT
62     deactivateTraceModeRes    DeactivateTraceModeRes
63     -- optional
64   ERRORS {
65     SystemFailure,
66     DataMissing,
67     UnexpectedDataValue,
68     FacilityNotSupported,
69     UnidentifiedSubscriber}
70
71 SendIMSI ::= OPERATION --Timer m
72   ARGUMENT
73     sendIMSI-Arg            SendIMSI-Arg
74   RESULT
75     sendIMSI-Res           SendIMSI-Res
76   ERRORS {
77     SystemFailure
78     DataMissing,
79     UnexpectedDataValue,
80     UnknownSubscriber}
81
82 END

```

***** Next Modified Section *****

17.7.2 Operation and maintenance data types

```

1 MAP-OM-DataTypes {
2   ccitt identified-organization (4) etsi (0) mobileDomain (0)
3   gsm-Network (1) modules (3) map-OM-DataTypes (12) version6 (6)}
4
5 DEFINITIONS
6
7 IMPLICIT TAGS
8
9 ::==
10
11 BEGIN
12
13 EXPORTS
14   ActivateTraceModeArg,
15   ActivateTraceModeRes,
16   DeactivateTraceModeArg,
17   DeactivateTraceModeRes
18 ;
19
20 IMPORTS
21   AddressString,
22   IMSI,
23   EMSI,
24   TEMSI
25
26 FROM MAP-CommonDataTypes {
27   ccitt identified-organization (4) etsi (0) mobileDomain (0)
28   gsm-Network (1) modules (3) map-CommonDataTypes (18) version6 (6)}
29
30   ExtensionContainer
31 FROM MAP-ExtensionDataTypes {
32   ccitt identified-organization (4) etsi (0) mobileDomain (0)
33   gsm-Network (1) modules (3) map-ExtensionDataTypes (21) version6 (6)}
34
35
36 ;
37
38
39 ActivateTraceModeArg ::= SEQUENCE {
40   imsi                      [0] IMSI          OPTIONAL,
41   traceReference             [1] TraceReference,
42   traceType [2] TraceType,
43   omc-Id                    [3] AddressString  OPTIONAL,
44   extensionContainer         [4] ExtensionContainer OPTIONAL,
45   ...}
46
47 TraceReference ::= OCTET STRING (SIZE (1..2))

```

```

48
49 TraceType ::= INTEGER
50   (0..255)
51   -- Trace types are fully defined in TS GSM 12.08.
52
53 ActivateTraceModeRes ::= SEQUENCE {
54   extensionContainer           [0] ExtensionContainer      OPTIONAL,
55   ...
56 }
57
58 DeactivateTraceModeArg ::= SEQUENCE {
59   imsi                      [0] IMSI                  OPTIONAL,
60   traceReference             [1] TraceReference,        OPTIONAL,
61   extensionContainer         [2] ExtensionContainer    OPTIONAL,
62   ...
63 }
64
65 DeactivateTraceModeRes ::= SEQUENCE {
66   extensionContainer         [0] ExtensionContainer    OPTIONAL,
67   ...
68 }
69
70 SendIMSI-Arg SEQUENCE {
71   msisdn                    [0] ISDN-AddressString  OPTIONAL,
72   emsi                      [1] EMSI                 OPTIONAL,
73   extensionContainer         [2] ExtensionContainer    OPTIONAL,
74   ...
75 }
76
77 SendIMSI-Res SEQUENCE {
78   imsi                      [0] IMSI                  OPTIONAL,
79   temsi                     [1] TEMSI                OPTIONAL,
80   extensionContainer         [2] ExtensionContainer    OPTIONAL,
81   ...
82 }
83
84 END

```

***** Next Modified Section *****

17.7.8 Common data types

```

1 MAP-CommonDataTypes {
2   ccitt identified-organization (4) etsi (0) mobileDomain (0)
3   gsm-Network (1) modules (3) map-CommonDataTypes (18) version6 (6)
4
5 DEFINITIONS
6
7 IMPLICIT TAGS
8
9 ::= :
10
11 BEGIN
12
13 EXPORTS
14
15   -- general data types and values
16   AddressString,
17   ISDN-AddressString,
18   maxISDN-AddressLength,
19   ISDN-SubaddressString,
20   ExternalSignalInfo,
21   Ext-ExternalSignalInfo,
22   SignalInfo,
23   maxSignalInfoLength,
24   AlertingPattern,
25
26   -- data types for numbering and identification
27   IMSI,
28   TMSI,
29   EMSI,
30   TEMSI,
31   Identity,
32   SubscriberId,
33   IMEI,
34   HLR-List,
35   LMSI,
36   GlobalCellId,
37   NetworkResource,
38   NAEA-PreferredCI,
39   NAEA-CIC,
40   ASCI-CallReference,
41   SubscriberIdentity,
42

```

```

43    -- data types for CAMEL
44    CellIdOrLAI,
45
46    -- data types for subscriber management
47    BasicServiceCode,
48    Ext-BasicServiceCode,
49    EMLPP-Info,
50    EMLPP-Priority,
51
52    -- data types for geographic location
53    AgeOfLocationInformation,
54    LCSClientExternalID,
55    LCSClientInternalID
56 ;
57
58 IMPORTS
59   TeleserviceCode,
60   Ext-TeleserviceCode
61 FROM MAP-TS-Code {
62   ccitt identified-organization (4) etsi (0) mobileDomain (0)
63   gsm-Network (1) modules (3) map-TS-Code (19) version6 (6)}
64
65   BearerServiceCode,
66   Ext-BearerServiceCode
67 FROM MAP-BS-Code {
68   ccitt identified-organization (4) etsi (0) mobileDomain (0)
69   gsm-Network (1) modules (3) map-BS-Code (20) version6 (6)}
70
71   ExtensionContainer
72 FROM MAP-ExtensionDataTypes {
73   ccitt identified-organization (4) etsi (0) mobileDomain (0)
74   gsm-Network (1) modules (3) map-ExtensionDataTypes (21) version6 (6)}
75 ;
76
77
78 -- general data types
79
80 TBCD-STRING ::= OCTET STRING
81   -- This type (Telephony Binary Coded Decimal String) is used to
82   -- represent several digits from 0 through 9, *, #, a, b, c, two
83   -- digits per octet, each digit encoded 0000 to 1001 (0 to 9),
84   -- 1010 (*), 1011 (#), 1100 (a), 1101 (b) or 1110 (c); 1111 used
85   -- as filler when there is an odd number of digits.
86
87   -- bits 8765 of octet n encoding digit 2n
88   -- bits 4321 of octet n encoding digit 2(n-1) +1
89

```

```

90 AddressString ::= OCTET STRING (SIZE (1..maxAddressLength))
91   -- This type is used to represent a number for addressing
92   -- purposes. It is composed of
93   --   a) one octet for nature of address, and numbering plan
94   --      indicator.
95   --   b) digits of an address encoded as TBCD-String.
96
97   -- a) The first octet includes a one bit extension indicator, a
98   --      3 bits nature of address indicator and a 4 bits numbering
99   --      plan indicator, encoded as follows:
100
101  -- bit 8: 1 (no extension)
102
103  -- bits 765: nature of address indicator
104  -- 000 unknown
105  -- 001 international number
106  -- 010 national significant number
107  -- 011 network specific number
108  -- 100 subscriber number
109  -- 101 reserved
110  -- 110 abbreviated number
111  -- 111 reserved for extension
112
113  -- bits 4321: numbering plan indicator
114  -- 0000 unknown
115  -- 0001 ISDN/Telephony Numbering Plan (Rec CCITT E.164)
116  -- 0010 spare
117  -- 0011 data numbering plan (CCITT Rec X.121)
118  -- 0100 telex numbering plan (CCITT Rec F.69)
119  -- 0101 spare
120  -- 0110 land mobile numbering plan (CCITT Rec E.212)
121  -- 0111 spare
122  -- 1000 national numbering plan
123  -- 1001 private numbering plan
124  -- 1111 reserved for extension
125
126  -- all other values are reserved.
127
128  -- b) The following octets representing digits of an address
129  -- encoded as a TBCD-STRING.
130

```

```
131 maxAddressLength INTEGER ::= 20
132
```

```
133 ISDN-AddressString ::=
134   AddressString (SIZE (1..maxISDN-AddressLength))
135   -- This type is used to represent ISDN numbers.
136
```

```
137 maxISDN-AddressLength INTEGER ::= 9
138
```

```

139 ISDN-SubaddressString ::= OCTET STRING (SIZE (1..maxISDN-SubaddressLength))
140   -- This type is used to represent ISDN subaddresses.
141   -- It is composed of
142     -- a) one octet for type of subaddress and odd/even indicator.
143     -- b) 20 octets for subaddress information.
144
145   -- a) The first octet includes a one bit extension indicator, a
146   -- 3 bits type of subaddress and a one bit odd/even indicator,
147   -- encoded as follows:
148
149     -- bit 8: 1 (no extension)
150
151     -- bits 765: type of subaddress
152       000 NSAP (X.213/ISO 8348 AD2)
153       010 User Specified
154       All other values are reserved
155
156     -- bit 4: odd/even indicator
157       0 even number of address signals
158       1 odd number of address signals
159       The odd/even indicator is used when the type of subaddress
160       is "user specified" and the coding is BCD.
161
162     -- bits 321: 000 (unused)
163
164     -- b) Subaddress information.
165     -- The NSAP X.213/ISO8348AD2 address shall be formatted as specified
166     -- by octet 4 which contains the Authority and Format Identifier
167     -- (AFI). The encoding is made according to the "preferred binary
168     -- encoding" as defined in X.213/ISO834AD2. For the definition
169     -- of this type of subaddress, see CCITT Rec I.334.
170
171     -- For User-specific subaddress, this field is encoded according
172     -- to the user specification, subject to a maximum length of 20
173     -- octets. When interworking with X.25 networks BCD coding should
174     -- be applied.
175
176

```

```
177 maxISDN-SubaddressLength INTEGER ::= 21
```

```

178
179 ExternalSignalInfo ::= SEQUENCE {
180   protocolId                  ProtocolId,
181   signalInfo                   SignalInfo,
182   -- Information about the internal structure is given in
183   -- subclause 7.6.9.
184   extensionContainer           ExtensionContainer          OPTIONAL,
185   -- extensionContainer must not be used in version 2
186   ...}
187

```

```
188 SignalInfo ::= OCTET STRING (SIZE (1..maxSignalInfoLength))
```

```

189
190 maxSignalInfoLength INTEGER ::= 200
191   -- This NamedValue represents the theoretical maximum number of
192   -- octets which are available to carry a single data type,
193   -- without requiring segmentation to cope with the network layer
194   -- service. However, the actual maximum size available for a data
195   -- type may be lower, especially when other information elements
196   -- have to be included in the same component.
197

```

```

198 ProtocolId ::= ENUMERATED {
199   gsm-0408 (1),
200   gsm-0806 (2),
201   gsm-BSSMAP (3),
202   -- Value 3 is reserved and must not be used
203   ets-300102-1 (4)}
204

```

```

205 Ext-ExternalSignalInfo ::= SEQUENCE {
206   ext-ProtocolId               Ext-ProtocolId,
207   signalInfo                   SignalInfo,
208   -- Information about the internal structure is given in
209   -- subclause 7.6.9.10
210   extensionContainer           ExtensionContainer          OPTIONAL,
211   ...}
212

```

```

213 Ext-ProtocolId ::= ENUMERATED {
214     ets-300356 (1),
215     ...
216 }
217 -- exception handling:
218 -- For Ext-ExternalSignalInfo sequences containing this parameter with any
219 -- other value than the ones listed the receiver shall ignore the whole
220 -- Ext-ExternalSignalInfo sequence.
221
222 AlertingPattern ::= OCTET STRING (SIZE (1) )
223     -- This type is used to represent Alerting Pattern
224
225     -- bits 8765 : 0000 (unused)
226
227     -- bits 43 : type of Pattern
228     --    00 level
229     --    01 category
230     --    10 category
231     --    all other values are reserved.
232
233     -- bits 21 : type of alerting
234
235 alertingLevel-0 AlertingPattern ::= '00000000'B
236 alertingLevel-1 AlertingPattern ::= '00000001'B
237 alertingLevel-2 AlertingPattern ::= '00000010'B
238     -- all other values of Alerting level are reserved
239     -- Alerting Levels are defined in GSM 02.07
240
241 alertingCategory-1 AlertingPattern ::= '00000100'B
242 alertingCategory-2 AlertingPattern ::= '00000101'B
243 alertingCategory-3 AlertingPattern ::= '00000110'B
244 alertingCategory-4 AlertingPattern ::= '00000111'B
245 alertingCategory-5 AlertingPattern ::= '00001000'B
246     -- all other values of Alerting Category are reserved
247     -- Alerting categories are defined in GSM 02.07
248
249
250     -- data types for numbering and identification
251
252 IMSI ::= TBCD-STRING (SIZE (3..8))
253     -- digits of MCC, MNC, MSIN are concatenated in this order.
254
255 Identity ::= CHOICE {
256     imsi                                IMSI,
257     imsi-WithLMSI                      IMSI-WithLMSI}
258
259 IMSI-WithLMSI ::= SEQUENCE {
260     imsi                                IMSI,
261     lmsi                                LMSI,
262     -- a special value 00000000 indicates that the LMSI is not in use
263     ...}
264
265 ASCII-CallReference ::= TBCD-STRING (SIZE (1..8))
266     -- digits of VGCS/VBC-area,Group-ID are concatenated in this order.
267
268
269 TMSI ::= OCTET STRING (SIZE (1..4))
270
271 EMSI ::= OCTET STRING (SIZE (1..12))
272
273 TEMSI ::= OCTET STRING (SIZE (1..8))
274
275 SubscriberId ::= CHOICE {
276     imsi                                [0] IMSI,
277     tmsi                                [1] TMSI}
278
279 IMEI ::= TBCD-STRING (SIZE (8))
280     -- Refers to International Mobile Station Equipment Identity
281     -- and Software Version Number (SVN) defined in TS GSM 03.03.
282     -- If the SVN is not present the last octet shall contain the
283     -- digit 0 and a filler.
284     -- If present the SVN shall be included in the last octet.
285
286 HLR-Id ::= IMSI
287     -- leading digits of IMSI, i.e. (MCC, MNC, leading digits of
288     -- MSIN) forming HLR Id defined in TS GSM 03.03.
289

```

```

290 HLR-List ::= SEQUENCE SIZE (1..maxNumOfHLR-Id) OF
291     HLR-Id
292
293 maxNumOfHLR-Id INTEGER ::= 50
294
295 LMSI ::= OCTET STRING (SIZE (4))
296
297 GlobalCellId ::= OCTET STRING (SIZE (5..7))
298 -- Refers to Cell Global Identification defined in TS GSM 03.03.
299 -- The internal structure is defined as follows:
300 -- octet 1 bits 4321           Mobile Country Code 1st digit
301 --         bits 8765           Mobile Country Code 2nd digit
302 -- octet 2 bits 4321           Mobile Country Code 3rd digit
303 --         bits 8765           Mobile Network Code 3rd digit
304 --           or filler (1111) for 2 digit MNCs
305 -- octet 3 bits 4321           Mobile Network Code 1st digit
306 --         bits 8765           Mobile Network Code 2nd digit
307 -- octets 4 and 5            Location Area Code according to TS GSM 04.08
308 -- octets 6 and 7            Cell Identity (CI) according to TS GSM 04.08
309
310 NetworkResource ::= ENUMERATED {
311     plmn (0),
312     hlr (1),
313     vlr (2),
314     pvlr (3),
315     controllingMSC (4),
316     vmsc (5),
317     eir (6),
318     rss (7)}
319
320 NAEA-PreferredCI ::= SEQUENCE {
321     naea-PreferredCIC [0] NAEA-CIC,
322     extensionContainer [1] ExtensionContainer OPTIONAL,
323     ...}
324
325 NAEA-CIC ::= OCTET STRING (SIZE (3))
326 -- The internal structure is defined by the Carrier Identification
327 -- parameter in ANSI T1.113.3. Carrier codes between "000" and "999" may
328 -- be encoded as 3 digits using "000" to "999" or as 4 digits using
329 -- "0000" to "0999". Carrier codes between "1000" and "9999" are encoded
330 -- using 4 digits.
331
332 SubscriberIdentity ::= CHOICE {
333     imsi [0] IMSI,
334     msisdn [1] ISDN-AddressString
335     }
336
337 LCSClientExternalID ::= SEQUENCE {
338     externalAddress [0] AddressString OPTIONAL,
339     extensionContainer [1] ExtensionContainer OPTIONAL,
340     ...}
341
342 LCSClientInternalID ::= ENUMERATED {
343     broadcastService (0),
344     o-andM-HPLMN (1),
345     o-andM-VPLMN (2),
346     anonymousLocation (3),
347     targetMSsubscribedService (4),
348     ...}
349
350
351 -- data types for CAMEL
352
353 CellIdOrLAI ::= CHOICE {
354     cellIdFixedLength [0] CellIdFixedLength,
355     laiFixedLength [1] LAIFixedLength}
356

```

```

357 CellIdFixedLength ::= OCTET STRING (SIZE (7))
358   -- Refers to Cell Global Identification defined in TS GSM 03.03.
359   -- The internal structure is defined as follows:
360   -- octet 1 bits 4321           Mobile Country Code 1st digit
361   --     bits 8765              Mobile Country Code 2nd digit
362   -- octet 2 bits 4321           Mobile Country Code 3rd digit
363   --     bits 8765              Mobile Network Code 3rd digit
364   --                           or filler (1111) for 2 digit MNCs
365   -- octet 3 bits 4321           Mobile Network Code 1st digit
366   --     bits 8765              Mobile Network Code 2nd digit
367   -- octets 4 and 5            Location Area Code according to TS GSM 04.08
368   -- octets 6 and 7            Cell Identity (CI) according to TS GSM 04.08
369
370 LAIFixedLength ::= OCTET STRING (SIZE (5))
371   -- Refers to Location Area Identification defined in TS GSM 03.03.
372   -- The internal structure is defined as follows:
373   -- octet 1 bits 4321           Mobile Country Code 1st digit
374   --     bits 8765              Mobile Country Code 2nd digit
375   -- octet 2 bits 4321           Mobile Country Code 3rd digit
376   --     bits 8765              Mobile Network Code 3rd digit
377   --                           or filler (1111) for 2 digit MNCs
378   -- octet 3 bits 4321           Mobile Network Code 1st digit
379   --     bits 8765              Mobile Network Code 2nd digit
380   -- octets 4 and 5            Location Area Code according to TS GSM 04.08
381
382
383   -- data types for subscriber management
384
385 BasicServiceCode ::= CHOICE {
386   bearerService                [2] BearerServiceCode,
387   teleservice                  [3] TeleserviceCode}
388
389 Ext-BasicServiceCode ::= CHOICE {
390   ext-BearerService            [2] Ext-BearerServiceCode,
391   ext-Teleservice              [3] Ext-TeleserviceCode}
392
393 EMLPP-Info ::= SEQUENCE {
394   maximumUplinkPriority        EMLPP-Priority,
395   defaultPriority               EMLPP-Priority,
396   extensionContainer            ExtensionContainer
397   ...}                           OPTIONAL,
398
399 EMLPP-Priority ::= INTEGER (0..15)
400   -- The mapping from the values A,B,0,1,2,3,4 to the integer-value is
401   -- specified as follows where A is the highest and 4 is the lowest
402   -- priority level
403   -- the integer values 7-15 are spare and shall be mapped to value 4
404
405 priorityLevelA                   EMLPP-Priority ::= 6
406 priorityLevelB                   EMLPP-Priority ::= 5
407 priorityLevel0                  EMLPP-Priority ::= 0
408 priorityLevel1                  EMLPP-Priority ::= 1
409 priorityLevel2                  EMLPP-Priority ::= 2
410 priorityLevel3                  EMLPP-Priority ::= 3
411 priorityLevel4                  EMLPP-Priority ::= 4
412
413
414   -- data types for geographic location
415
416 AgeOfLocationInformation ::= INTEGER (0..32767)
417   -- the value represents the elapsed time in minutes since the last
418   -- network contact of the mobile station (i.e. the actuality of the
419   -- location information).
420   -- value "0" indicates that the MS is currently in contact with the
421   -- network
422   -- value "32767" indicates that the location information is at least
423   --      32767 minutes old
424
425 END

```

25.6 Procedures for Enhanced User Identity Confidentiality

In the procedure for Enhanced User Identity Confidentiality the IMSI and the TEMSI of the subscriber is retrieved from the UIDN. The procedure is shown in figure 25.6/1.

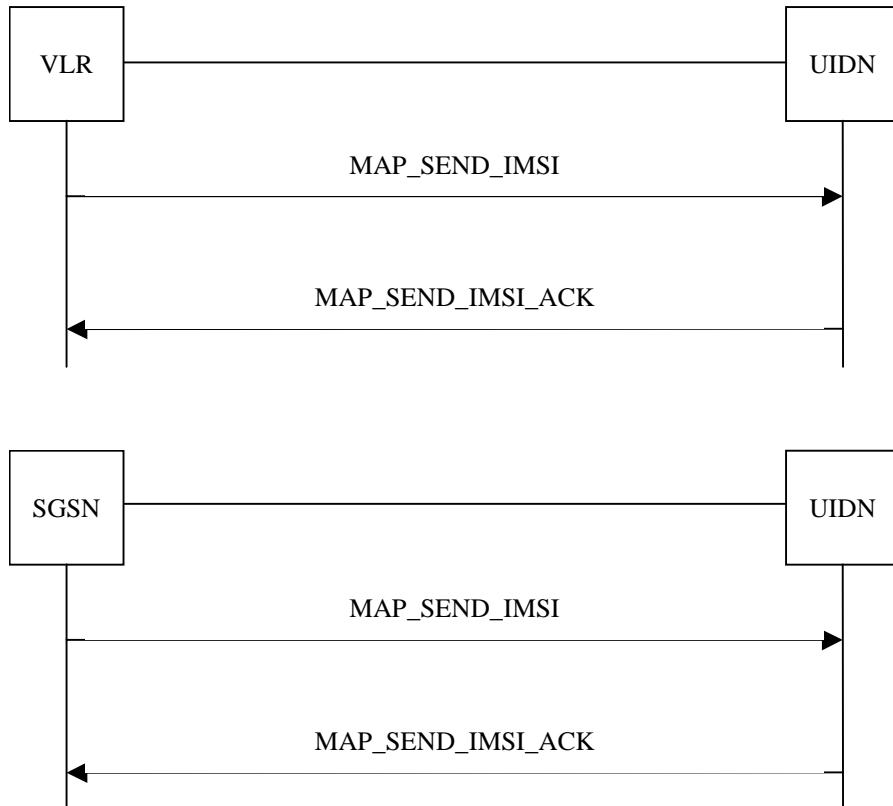


Figure 25.6/1: Message Flows to Enhanced User Identity Confidentiality

25.6.1 Enhanced user identity confidentiality procedure in the UIDN

Opening of the dialogue is described in the macro Receive_Open_Ind in subclause 25.1, with outcomes:

- procedure termination; or
- dialogue acceptance, with proceeding as below.

When receiving the MAP_SEND_IMSI indication, the UIDN will check the parameters and data in the primitive. Data errors are reported as an unexpected data value error or a data missing error depending on the nature of the error.

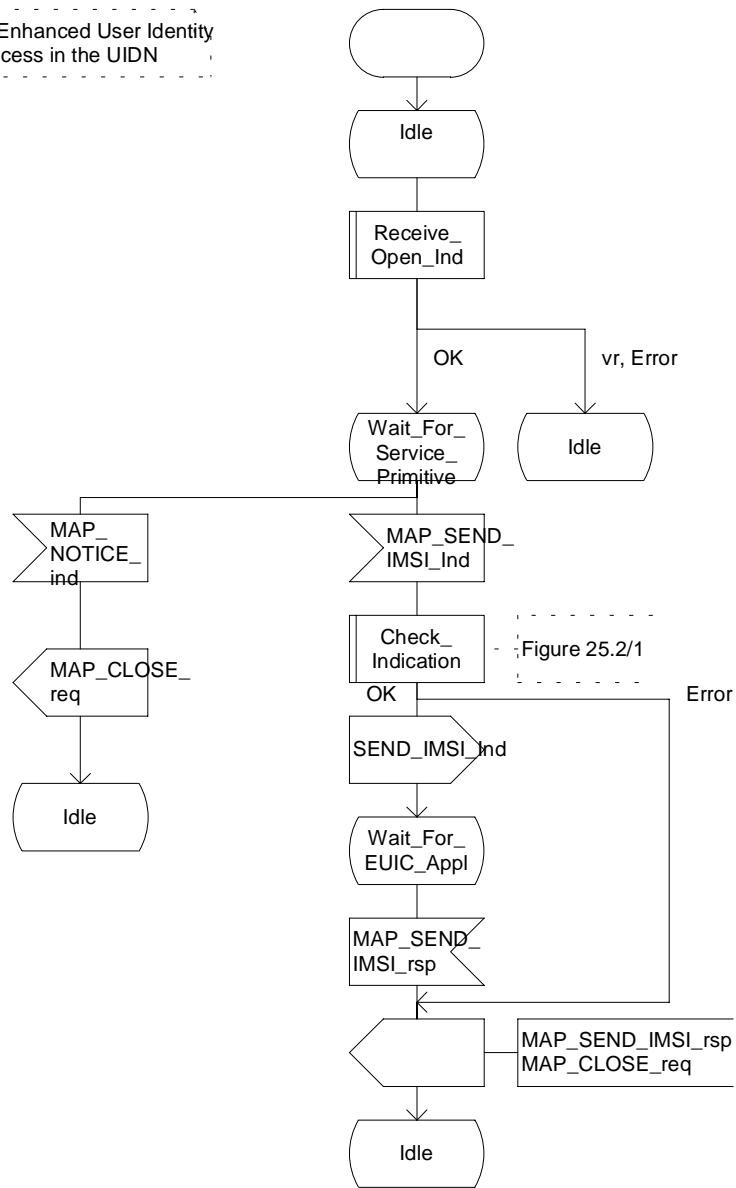
The UIDN will request decryption of the EMSI received in the MAP_SEND_IMSI indication from the decryption application. When the UIDN receives a SEND_IMSI response from the decryption application then it shall pass this to the requesting entity and close the MAP provider service.

The enhanced user identity confidentiality procedure in the HLR is shown in figure 25.6/2.

Process EUIC_UIDN

25.6_2(1)

Figure 25.6/2 The Enhanced User Identity Confidentiality Process in the UIDN



Signals to/from the left are to/from the VLR;
signals to/from the right are to/from the decryption application in the UIDN

Figure 25.6/2: Process EUIC_HLR

25.6.2 Enhanced user identity confidentiality procedure in the VLR

When the Send IMSI request is received from the Location Management application, the VLR will send the MAP_SEND_IMSI request to the UIDN. The contents of the response is sent to the Location Management application.

The subscriber identity procedure in the VLR is shown in figure 25.6/3.

Process EUIC_VLR

25.6_3(1)

Figure 25.6/3 The Enhanced User Identity Confidentiality Process in the VLR

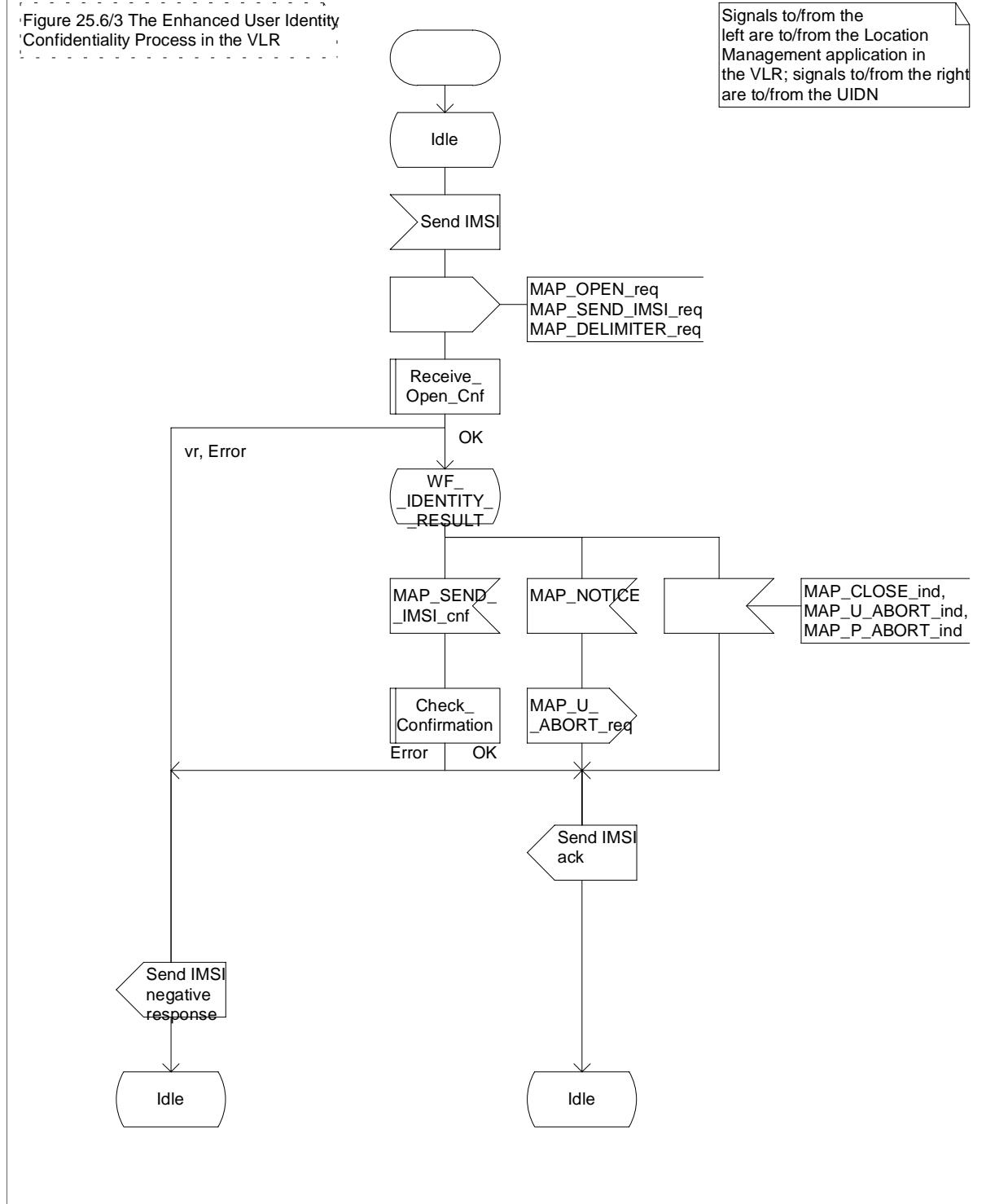


Figure 25.6/3: Process EUIC_VLR

25.6.2 Enhanced user identity confidentiality procedure in the SGSN

When the Send IMSI request is received from the Location Management application, the SGSN will send the MAP_SEND_IMSI request to the UIDN. The contents of the response is sent to the Location Management application.

The subscriber identity procedure in the VLR is shown in figure 25.6/4.

Process EUIC_SGSN

25.6_4(1)

Figure 25.6/4 The Enhanced User Identity Confidentiality Process in the SGSN

Signals to/from the left are to/from the process in the SGSN; signals to/from the right are to/from the UDN

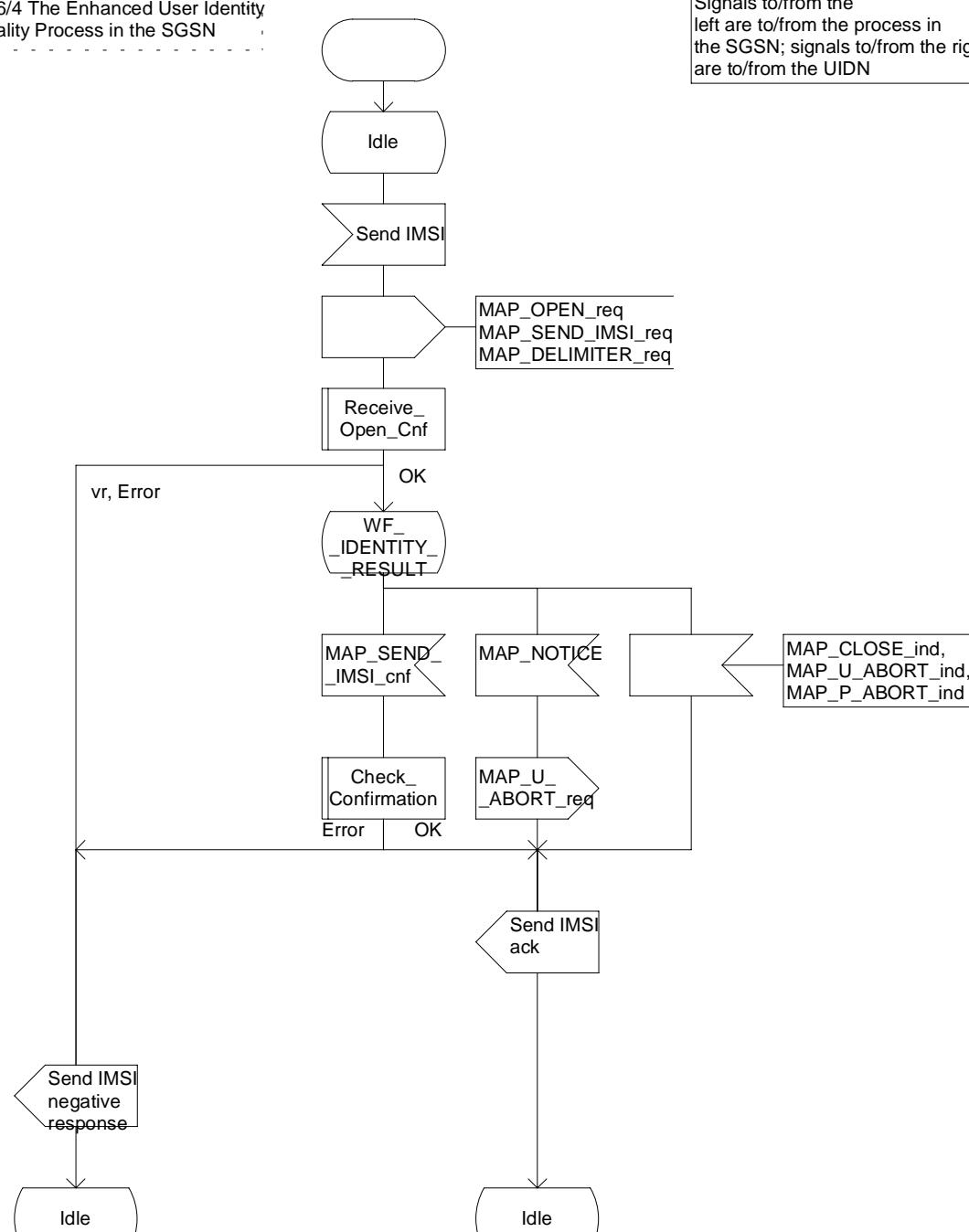


Figure 25.6/4: Process EUIC_SGSN

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

29.002 CR 099

Current Version: 3.3.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑

↑ CR number as allocated by MCC support team

For submission to: CN #7
list expected approval meeting # here ↑

for approval
for information

strategic
non-strategic (for SMG use only)

Form: CR cover sheet, version 2 for 3GPP and SMG The latest version of this form is available from: <ftp://ftp.3gpp.org/Information/CR-Form-v2.doc>

Proposed change affects:
(at least one should be marked with an X)

(U)SIM ME UTRAN / Radio Core Network

Source: N2

Date: 07.02.2000

Subject: UMTS Authentication

Work item: Security

Category:
(only one category shall be marked with an X)

F Correction	<input type="checkbox"/>
A Corresponds to a correction in an earlier release	<input type="checkbox"/>
B Addition of feature	<input checked="" type="checkbox"/>
C Functional modification of feature	<input type="checkbox"/>
D Editorial modification	<input type="checkbox"/>

Release: Phase 2
Release 96
Release 97
Release 98
Release 99
Release 00

<input type="checkbox"/>
<input checked="" type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>

Reason for change: In TS 33.102 v3.3.1, subclause 6.3.4, the current security context data is required to be transferred from VLRo to VLRe

Clauses affected: 7.6, 8.1.4, 17.7.1

Other specs affected:

- Other 3G core specifications
- Other GSM core specifications
- MS test specifications
- BSS test specifications
- O&M specifications

→ List of CRs:
→ List of CRs:
→ List of CRs:
→ List of CRs:
→ List of CRs:

Other comments:



help.doc

<----- double-click here for help and instructions on how to create a CR.

7.6 Definition of parameters

Following is an alphabetic list of parameters used in the common MAP-services in subclause 7.3:

Application context name	7.3.1	Refuse reason	7.3.1
Destination address	7.3.1	Release method	7.3.2
Destination reference	7.3.1	Responding address	7.3.1
Diagnostic information	7.3.4	Result	7.3.1
Originating address	7.3.1	Source	7.3.5
Originating reference	7.3.1	Specific information	7.3.1/7.3.2/7.3.4
Problem diagnostic	7.3.6	User reason	7.3.4
Provider reason	7.3.5		

Following is an alphabetic list of parameters contained in this clause:

Absent Subscriber Diagnostic SM	7.6.8.9	Invoke Id	7.6.1.1
Access connection status	7.6.9.3	ISDN Bearer Capability	7.6.3.41
		IST Alert Timer	7.6.3.66
		IST Information Withdrawn	7.6.3.68
		IST Support Indicator	7.6.3.69
Access signalling information	7.6.9.5	Kc	7.6.7.4
Additional Absent Subscriber	7.6.8.12	Linked Id	7.6.1.2
Diagnostic SM			
Additional number	7.6.2.46	LMSI	7.6.2.16
Additional signal info	7.6.9.10	Location Information	7.6.2.30
Additional SM Delivery Outcome	7.6.8.11		
Age Indicator	7.6.3.72	Location update type	7.6.9.6
Alert Reason	7.6.8.8	Lower Layer Compatibility	7.6.3.42
		LSA Information	7.6.3.56
		LSA Information Withdraw	7.6.3.58
Alert Reason Indicator	7.6.8.10	Mobile Not Reachable Reason	7.6.3.51
Alerting Pattern	7.6.3.44	Modification request for CSI	7.6.3.81
All GPRS Data	7.6.3.53	Modification request for SS Information	7.6.3.82
All Information Sent	7.6.1.5	More Messages To Send	7.6.8.7
APN	7.6.2.42	MS ISDN	7.6.2.17
Authentication set list	7.6.7.1	MSC number	7.6.2.11
B-subscriber Address	7.6.2.36	MSIsdn-Alert	7.6.2.29
B subscriber Number	7.6.2.48	MWD status	7.6.8.3
B subscriber subaddress	7.6.2.49	Network Access Mode	7.6.3.50
Basic Service Group	7.6.4.40	Network node number	7.6.2.43
Bearer service	7.6.4.38	Network resources	7.6.10.1
BSS-apdu	7.6.9.1	Network signal information	7.6.9.8
Call Barring Data	7.6.3.83	New password	7.6.4.20
Call barring feature	7.6.4.19	No reply condition timer	7.6.4.7
Call barring information	7.6.4.18	North American Equal Access	7.6.2.34
		preferred Carrier Id	
Call Direction	7.6.5.8	Number Portability Status	7.6.5.14
Call Forwarding Data	7.6.3.84	ODB Data	7.6.3.85
Call Info	7.6.9.9	ODB General Data	7.6.3.9
Call reference	7.6.5.1	ODB HPLMN Specific Data	7.6.3.10
Call Termination Indicator	7.6.3.67		
Called number	7.6.2.24	OMC Id	7.6.2.18
Calling number	7.6.2.25	Originally dialled number	7.6.2.26
CAMEL Subscription Info	7.6.3.78	Originating entity number	7.6.2.10
CAMEL Subscription Info Withdraw	7.6.3.38	Override Category	7.6.4.4
Cancellation Type	7.6.3.52	P-TMSI	7.6.2.47
Category	7.6.3.1	PDP-Address	7.6.2.45
CCBS Feature	7.6.5.8	PDP-Context identifier	7.6.3.55
Channel Type	7.6.5.9	PDP-Type	7.6.2.44
Chosen Channel	7.6.5.10	Pre-paging supported	7.6.5.15
Ciphering mode	7.6.7.7	Previous location area Id	7.6.2.4
Cksn	7.6.7.5	Protocol Id	7.6.9.7
CLI Restriction	7.6.4.5	Provider error	7.6.1.3
CM service type	7.6.9.2	QoS-Subscribed	7.6.3.47
Complete Data List Included	7.6.3.54	Rand	7.6.7.2
CUG feature	7.6.3.26	Regional Subscription Data	7.6.3.11
CUG index	7.6.3.25	Regional Subscription Response	7.6.3.12
CUG info	7.6.3.22	Requested Info	7.6.3.31
CUG interlock	7.6.3.24	Requested Subscription Info	7.6.3.86
CUG Outgoing Access indicator	7.6.3.8	Roaming number	7.6.2.19
CUG subscription	7.6.3.23	Roaming Restricted In SGSN Due To	7.6.3.49
		Unsupported Feature	
CUG Subscription Flag	7.6.3.37	Roaming Restriction Due To	7.6.3.13
		Unsupported Feature	
		Current Security Context	7.6.7.8
Current location area Id	7.6.2.6	Service centre address	7.6.2.27
Current password	7.6.4.21	Serving Cell Id	7.6.2.37
eMLPP Information	7.6.4.41	SGSN address	7.6.2.39
Equipment status	7.6.3.2	SGSN CAMEL Subscription Info	7.6.3.75
Extensible Basic Service Group	7.6.3.5	SGSN number	7.6.2.38
Extensible Bearer service	7.6.3.3	SIWF Number	7.6.2.35
		SoLSA Support Indicator	7.6.3.57
Extensible Call barring feature	7.6.3.21	SM Delivery Outcome	7.6.8.6
Extensible Call barring information	7.6.3.20	SM-RP-DA	7.6.8.1
Extensible Call barring information for	7.6.3.79	SM-RP-MTI	7.6.8.16

CSE			
Extensible Forwarding feature	7.6.3.16	SM-RP-OA	7.6.8.2
Extensible Forwarding info	7.6.3.15	SM-RP-PRI	7.6.8.5
Extensible Forwarding information for CSE	7.6.3.80	SM-RP-SMEA	7.6.8.17
Extensible Forwarding Options	7.6.3.18	SM-RP-UI	7.6.8.4
Extensible No reply condition timer	7.6.3.19	Sres	7.6.7.3
Extensible QoS-Subscribed	7.6.3.74	SS-Code	7.6.4.1
Extensible SS-Data	7.6.3.29	SS-Data	7.6.4.3
Extensible SS-Info	7.6.3.14	SS-Event	7.6.4.42
Extensible SS-Status	7.6.3.17	SS-Event-Data	7.6.4.43
Extensible Teleservice	7.6.3.4	SS-Info	7.6.4.24
External Signal Information	7.6.9.4	SS-Status	7.6.4.2
Forwarded-to number	7.6.2.22	Stored location area Id	7.6.2.5
Forwarded-to subaddress	7.6.2.23	Subscriber State	7.6.3.30
Forwarding feature	7.6.4.16	Subscriber Status	7.6.3.7
Forwarding information	7.6.4.15	Super-Charger Supported in HLR	7.6.3.70
Forwarding Options	7.6.4.6	Super-Charger Supported in Serving	7.6.3.71
GGSN address	7.6.2.40	Network Entity	
GGSN number	7.6.2.41	Supported CAMEL Phases in VLR	7.6.3.36
GMSC CAMEL Subscription Info	7.6.3.34	Supported CAMEL Phases in SGSN	7.6.3.36A
GPRS enhancements support indicator	7.6.3.73	Suppress T-CSI	7.6.3.33
GPRS Node Indicator	7.6.8.14	Suppression of Announcement	7.6.3.32
GPRS Subscription Data	7.6.3.46	Target cell Id	7.6.2.8
GPRS Subscription Data Withdraw	7.6.3.45	Target location area Id	7.6.2.7
GPRS Support Indicator	7.6.8.15	Target MSC number	7.6.2.12
Group Id	7.6.2.33	Teleservice	7.6.4.39
GSM bearer capability	7.6.3.6	TMSI	7.6.2.2
Guidance information	7.6.4.22	Trace reference	7.6.10.2
Handover number	7.6.2.21	Trace type	7.6.10.3
High Layer Compatibility	7.6.3.43	User error	7.6.1.4
HLR Id	7.6.2.15	USSD Data Coding Scheme	7.6.4.36
HLR number	7.6.2.13	USSD String	7.6.4.37
HO-Number Not Required	7.6.6.7	UU Data	7.6.5.12
IMEI	7.6.2.3	UUS CF Interaction	7.6.5.13
IMSI	7.6.2.1	VBS Data	7.6.3.40
Inter CUG options	7.6.3.27	VGCS Data	7.6.3.39
Intra CUG restrictions	7.6.3.28	VLR CAMEL Subscription Info	7.6.3.35
		VLR number	7.6.2.14
		VPLMN address allowed	7.6.3.48
		Zone Code	7.6.2.28

7.6.7 Authentication parameters

7.6.7.1 Authentication set list

This parameter represents a list of sets of authentication parameters for a given subscriber.

The list either contains Authentication Triplets (Rand, Sres, Kc) or Authentication Quintuplets (Rand, Xres, Ck, Ik, Autn). If the list contains Authentication Quintuplets, the order of sequence in this list is chronological, the first quintuplet in the list is the oldest one.

7.6.7.2 Rand

This parameter represents a random number used for authentication.

7.6.7.3 Sres

This parameter represents the response to an authentication request.

7.6.7.4 Kc

This parameter refers to a key used for ciphering purposes.

7.6.7.5 Xres

This parameter represents the response to an UMTS authentication request.

7.6.7.5A Ck

This parameter refers to a key used for UMTS ciphering purposes.

7.6.7.5B Ik

This parameter refers to the Integrity Key.

7.6.7.5C Autn

This parameter refers to the Authentication Token.

7.6.7.6 Cksn

This parameter refers to a ciphering key sequence number.

7.6.7.6A Ksi

This parameter refers to a key set identifier.

7.6.7.6B Auts

This parameter refers to the resynchronisation token.

7.6.7.7 Ciphering mode

This parameter refers to the ciphering mode which is associated with a radio channel. It may take values as follows:

- no encryption;
- identification of specific ciphering algorithm.

7.6.7.8 Current Security Context

This parameter represents a list of security context parameters for a given subscriber.

The list either contains GSM Security Context data (Kc, Cksn) or UMTS Security Context Data (Ck, Ik, KsI).

8.1.4 MAP_SEND_IDENTIFICATION service

8.1.4.1 Definition

The MAP_SEND_IDENTIFICATION service is used between a VLR and a previous VLR to retrieve IMSI and authentication sets data for a subscriber registering afresh in that VLR.

The MAP_SEND_IDENTIFICATION service is a confirmed service using the service primitives defined in table 8.1/4.

8.1.4.2 Service primitives

Table 8.1/4: MAP_SEND_IDENTIFICATION

Parameter name	Request	Indication	Response	Confirm
Invoke Id	M	M(=)	M(=)	M(=)
TMSI	M	M(=)		
Number of requested vectors	M	M(=)		
Segmentation prohibited indicator	C	C (=)		
IMSI				C(=)
Authentication set			U	C(=)
<u>Current Security Context</u>			U	C(=)
User error			C	C(=)
Provider error				O

8.1.4.3 Parameter definitions and use

Invoke Id

See definition in subclause 7.6.1.

TMSI

See definition in subclause 7.6.2.

Number of requested vectors

A number indicating how many authentication vectors the new VLR is prepared to receive.

Segmentation prohibited indicator

This parameter indicates if the new VLR or SGSN allows message segmentation.

IMSI

See definition in subclause 7.6.2. The IMSI is to be returned if the service succeeds.

Authentication set

See definition in subclause 7.6.7. If the service succeeds a list of up to five authentication sets is returned, if there are any available.

Current Security Context

See definition in subclause 7.6.7. If the service succeeds, a list of either GSM or UMTS Security Context parameters can be returned.

User error

This parameter is mandatory if the service fails. The following error cause defined in subclause 7.6.1 may be used, depending on the nature of the fault:

- unidentified subscriber.

Provider error

For definition of provider errors see subclause 7.6.1.

17.7.1 Mobile Service data types

```

MAP-MS-DataTypes {
    ccitt identified-organization (4) etsi (0) mobileDomain (0)
    gsm-Network (1) modules (3) map-MS-DataTypes (11) version6 (6)}

DEFINITIONS

IMPLICIT TAGS

::=


BEGIN

EXPORTS

    -- location registration types
    UpdateLocationArg,
    UpdateLocationRes,
    CancelLocationArg,
    CancelLocationRes,
    PurgeMS-Arg,
    PurgeMS-Res,
    SendIdentificationArg,
    SendIdentificationRes,
    UpdateGprsLocationArg,
    UpdateGprsLocationRes,
    IST-SupportIndicator,

    -- handover types
    PrepareHO-Arg,
    PrepareHO-Res,
    PrepareSubsequentHO-Arg,

    -- authentication management types
    SendAuthenticationInfoArg,
    SendAuthenticationInfoRes,

    -- security management types
    EquipmentStatus,
    Kc,

    -- subscriber management types
    InsertSubscriberDataArg,
    InsertSubscriberDataRes,
    DeleteSubscriberDataArg,
    DeleteSubscriberDataRes,
    SubscriberData,
    ODB-Data,
    SubscriberStatus,
    ZoneCodeList,
    maxNumOfZoneCodes,
    O-CSI,
    D-CSI,
    O-BcsmCamelTDPCriteriaList,
    T-BCSM-CAMEL-TDP-CriteriaList,
    SS-CSI,
    ServiceKey,
    DefaultCallHandling,
    CamelCapabilityHandling,
    BasicServiceCriteria,
    SupportedCamelPhases,
    maxNumOfCamelTDPData,
    CUG-Index,
    CUG-Interlock,
    InterCUG-Restrictions,
    IntraCUG-Options,
    IST-AlertTimerValue,
    T-CSI,
    T-BcsmTriggerDetectionPoint,

    -- fault recovery types
    ResetArg,
    RestoreDataArg,
    RestoreDataRes,

    -- subscriber information enquiry types
    ProvideSubscriberInfoArg,
    ProvideSubscriberInfoRes,

```

```

SubscriberInfo,
LocationInformation,
SubscriberState,

-- any time information enquiry types
AnyTimeInterrogationArg,
AnyTimeInterrogationRes,

-- any time information handling types
AnyTimeSubscriptionInterrogationArg,
AnyTimeSubscriptionInterrogationRes,
AnyTimeModificationArg,
AnyTimeModificationRes,

-- subscriber data modification notification types
NoteSubscriberDataModifiedArg,
NoteSubscriberDataModifiedRes,

-- gprs location information retrieval types
SendRoutingInfoForGprsArg,
SendRoutingInfoForGprsRes,

-- failure reporting types
FailureReportArg,
FailureReportRes,

-- gprs notification types
NoteMsPresentForGprsArg,
NoteMsPresentForGprsRes,

-- Mobility Management types
NoteMM-EventArg,
NoteMM-EventRes

;

IMPORTS
    maxNumOfSS,
    SS-SubscriptionOption,
    SS-List,
    SS-ForBS-Code,
    Password
FROM MAP-SS-DataTypes {
    ccitt identified-organization (4) etsi (0) mobileDomain (0)
    gsm-Network (1) modules (3) map-SS-DataTypes (14) version6 (6)}

    SS-Code
FROM MAP-SS-Code {
    ccitt identified-organization (4) etsi (0) mobileDomain (0)
    gsm-Network (1) modules (3) map-SS-Code (15) version6 (6)}

    Ext-BearerServiceCode
FROM MAP-BS-Code {
    ccitt identified-organization (4) etsi (0) mobileDomain (0)
    gsm-Network (1) modules (3) map-BS-Code (20) version6 (6)}

    Ext-TeleserviceCode
FROM MAP-TS-Code {
    ccitt identified-organization (4) etsi (0) mobileDomain (0)
    gsm-Network (1) modules (3) map-TS-Code (19) version6 (6)}

    AddressString,
ISDN-AddressString,
ISDN-SubaddressString,
ExternalSignalInfo,
IMSI,
TMSI,
HLR-List,
LMSI,
Identity,
GlobalCellId,
CellIdOrLAI,
Ext-BasicServiceCode,
NAEA-PreferredCI,
EMLPP-Info,
SubscriberIdentity,
AgeOfLocationInformation,
LCSClientExternalID,
LCSClientInternalID

```

```

FROM MAP-CommonDataTypes {
    ccitt identified-organization (4) etsi (0) mobileDomain (0)
    gsm-Network (1) modules (3) map-CommonDataTypes (18) version6 (6)

    ExtensionContainer
FROM MAP-ExtensionDataTypes {
    ccitt identified-organization (4) etsi (0) mobileDomain (0)
    gsm-Network (1) modules (3) map-ExtensionDataTypes (21) version6 (6)

    AbsentSubscriberDiagnosticSM
FROM MAP-ER-DataTypes {
    ccitt identified-organization (4) etsi (0) mobileDomain (0)
    gsm-Network (1) modules (3) map-ER-DataTypes (17) version6 (6)}
}

;

-- location registration types

```

UpdateLocationArg ::= SEQUENCE {		
imsi	IMSI,	
msc-Number	[1] ISDN-AddressString,	
vlr-Number	ISDN-AddressString,	
lmsi	[10] LMSI OPTIONAL,	
extensionContainer	ExtensionContainer	OPTIONAL,
...		
vlr-Capability	[6] VLR-Capability	OPTIONAL }

VLR-Capability ::= SEQUENCE{		
supportedCamelPhases	[0] SupportedCamelPhases	OPTIONAL,
extensionContainer	ExtensionContainer	OPTIONAL,
...		
solsaSupportIndicator	[2] NULL	OPTIONAL,
istSupportIndicator	[1] IST-SupportIndicator	OPTIONAL,
superChargerSupportedInServingNetworkEntity	[3] SuperChargerInfo	OPTIONAL }

SuperChargerInfo ::= CHOICE {		
sendSubscriberData	[0] NULL,	
subscriberDataStored	[1] AgeIndicator }	

AgeIndicator ::= OCTET STRING (SIZE (1..6))		
-- The internal structure of this parameter is implementation specific.		

IST-SupportIndicator ::= ENUMERATED {		
basicISTSupported	(0),	
istCommandSupported	(1), ...}	
-- exception handling:		
-- reception of values > 1 shall be mapped to ' istCommandSupported '		

UpdateLocationRes ::= SEQUENCE {		
hlr-Number	ISDN-AddressString,	
extensionContainer	ExtensionContainer	OPTIONAL,
...		

CancelLocationArg ::= [3] SEQUENCE {		
identity	Identity,	
cancellationType	CancellationType	OPTIONAL,
extensionContainer	ExtensionContainer	OPTIONAL,
...		

CancellationType ::= ENUMERATED {		
updateProcedure	(0),	
subscriptionWithdraw	(1),	
...		
-- The HLR shall not send values other than listed above		

CancelLocationRes ::= SEQUENCE {		
extensionContainer	ExtensionContainer	OPTIONAL,
...		

```
PurgeMS-Arg ::= [3] SEQUENCE {
    imsi                                IMSI,
    vlr-Number                           [0] ISDN-AddressString      OPTIONAL,
    sgsn-Number                           [1] ISDN-AddressString      OPTIONAL,
    extensionContainer                   ExtensionContainer        OPTIONAL,
    ...
}
```

```
PurgeMS-Res ::= SEQUENCE {
    freezeTMSI                          [0] NULL                  OPTIONAL,
    freezeP-TMSI                         [1] NULL                  OPTIONAL,
    extensionContainer                   ExtensionContainer        OPTIONAL,
    ...
}
```

```
SendIdentificationArg ::= SEQUENCE {
    tmsi                                TMSI,
    numberRequestedVectors                NumberOfRequestedVectors,
    segmentationProhibited              NULL                  OPTIONAL,
    -- if segmentation is prohibited the previous VLR shall not send the result
    -- within a TC-CONTINUE message.
    extensionContainer                   ExtensionContainer        OPTIONAL,
    ...
}
```

```
SendIdentificationRes ::= [3] SEQUENCE {
    imsi                                IMSI                  OPTIONAL,
    -- IMSI must be present if SendIdentificationRes is not segmented.
    -- If the TC-Continue segmentation option is taken the IMSI must be
    -- present in one segmented transmission of SendIdentificationRes.
    authenticationSetList                AuthenticationSetList   OPTIONAL,
    currentSecurityContext              [1] CurrentSecurityContext OPTIONAL,
    extensionContainer                  ExtensionContainer     OPTIONAL,
    ...
}
```

```
AuthenticationSetList ::= CHOICE {
    tripletList                         [0] TripletList,
    quintupletList                      [1] QuintupletList }
```

```
TripletList ::= SEQUENCE SIZE (1..5) OF
    AuthenticationTriplet
```

```
QuintupletList ::= SEQUENCE SIZE (1..5) OF
    AuthenticationQuintuplet
```

```
AuthenticationTriplet ::= SEQUENCE {
    rand                                RAND,
    sres                                SRES,
    kc                                   Kc,
    ...
}
```

```
AuthenticationQuintuplet ::= SEQUENCE {
    rand                                RAND,
    xres                                XRES,
    ck                                   CK,
    ik                                   IK,
    autn                               AUTN,
    ...
}
```

```
CurrentSecurityContext ::= CHOICE {
    gsm-SecurityContextData            [0] GSM-SecurityContextData,
    umts-SecurityContextData          [1] UMTS-SecurityContextData }
```

```
GSM-SecurityContextData ::= SEQUENCE {
    kc                                  Kc,
    cksn                             Cksn,
    ...
}
```

```
UMTS-SecurityContextData ::= SEQUENCE {
    ck                                  CK,
    ik                                  IK,
   ksi                                 KSI,
    ...
}
```

```
RAND ::= OCTET STRING (SIZE (16))
```

```
SRES ::= OCTET STRING (SIZE (4))
```

```
Kc ::= OCTET STRING (SIZE (8))
```

```
XRES ::= OCTET STRING (SIZE (4..16))
```

CK ::= OCTET STRING (SIZE (16))

IK ::= OCTET STRING (SIZE (16))

AUTN ::= OCTET STRING (SIZE (14..18))

AUTS ::= OCTET STRING (SIZE (12..16))

Cksn ::= OCTET STRING (SIZE (1))

-- The internal structure is defined in 3G TS 24.008

KSI ::= OCTET STRING (SIZE (1))

-- The internal structure is defined in 3G TS 24.008

CHANGE REQUEST		<i>Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.</i>	
29.002 CR 102r2		Current Version: 3.3.1	
GSM (AA.BB) or 3G (AA.BBB) specification number ↑		↑ CR number as allocated by MCC support team	
For submission to:	CN#07 <i>list expected approval meeting # here</i> ↑	for approval	<input checked="" type="checkbox"/>
		for information	<input type="checkbox"/>
		strategic	<input type="checkbox"/>
		non-strategic	<input checked="" type="checkbox"/> (for SMG use only)
<small>Form: CR cover sheet, version 2 for 3GPP and SMG The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc</small>			
Proposed change affects: <i>(at least one should be marked with an X)</i>	(U)SIM <input type="checkbox"/> ME <input type="checkbox"/> UTRAN / Radio <input type="checkbox"/> Core Network <input checked="" type="checkbox"/>		
Source:	N2		
Subject:	Clarification on Authentication Info Retrieval		
Work item:	Security		
Category: <i>(only one category shall be marked with an X)</i>	F Correction A Corresponds to a correction in an earlier release B Addition of feature C Functional modification of feature D Editorial modification	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Release: Phase 2 Release 96 Release 97 Release 98 Release 99 Release 00
Reason for change:	To clarify the use of the Immediate Response Preferred Indicator in Send Authentication Info. To clarify the use of the parameter "Number of requested vectors" in Send Authentication Info and Send Identification. To clarify that the HLR returns triplets for GSM subscribers and quintuplets for UMTS subscribers.		
Clauses affected:	8.1.4, 8.5.2, 17.7.1, 25.5.5		
Other specs affected:	Other 3G core specifications Other GSM core specifications MS test specifications BSS test specifications O&M specifications	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	→ List of CRs: → List of CRs: → List of CRs: → List of CRs: → List of CRs:
Other comments:			



help.doc

<----- Double-click here for help and instructions on how to create a CR.

8.1.4 MAP_SEND_IDENTIFICATION service

8.1.4.1 Definition

The MAP_SEND_IDENTIFICATION service is used between a VLR and a previous VLR to retrieve IMSI and authentication sets for a subscriber registering afresh in that VLR.

The MAP_SEND_IDENTIFICATION service is a confirmed service using the service primitives defined in table 8.1/4.

8.1.4.2 Service primitives

Table 8.1/4: MAP_SEND_IDENTIFICATION

Parameter name	Request	Indication	Response	Confirm
Invoke Id	M	M(=)	M(=)	M(=)
TMSI	M	M(=)		
Number of requested vectors	M	M(=)		
Segmentation prohibited indicator	C	C (=)	C	C(=)
IMSI			U	C(=)
Authentication set			C	C(=)
User error				O
Provider error				

8.1.4.3 Parameter definitions and use

Invoke Id

See definition in subclause 7.6.1.

TMSI

See definition in subclause 7.6.2.

Number of requested vectors

A number indicating how many authentication vectors the new VLR is prepared to receive. [The previous VLR shall not return more vectors than indicated by this parameter.](#)

Segmentation prohibited indicator

This parameter indicates if the new VLR or SGSN allows message segmentation.

IMSI

See definition in subclause 7.6.2. The IMSI is to be returned if the service succeeds.

Authentication set

See definition in subclause 7.6.7. If the service succeeds a list of up to five authentication sets is returned, if there are any available.

User error

This parameter is mandatory if the service fails. The following error cause defined in subclause 7.6.1 may be used, depending on the nature of the fault:

- unidentified subscriber.

Provider error

For definition of provider errors see subclause 7.6.1.

.....

8.5.2 MAP_SEND_AUTHENTICATION_INFO service

8.5.2.1 Definition

This service is used between the VLR and the HLR for the VLR to retrieve authentication information from the HLR. The VLR requests up to five authentication vectors.

Also this service is used between the SGSN and the HLR for the SGSN to retrieve authentication information from the HLR. The SGSN requests up to five authentication vectors.

[If the user is a UMTS subscriber, the HLR shall return authentication quintuplets. If the user is a GSM subscriber, the HLR shall return authentication triplets.](#)

If the HLR cannot provide the VLR or the SGSN with triplets, an empty response is returned. The VLR or the SGSN may then re-use old authentication triplets, except where this is forbidden under the conditions specified in GSM 03.20 [24].

If the HLR cannot provide the VLR or the SGSN with quintuplets, an empty response is returned. The VLR or the SGSN shall not re-use old authentication quintuplets.

If the VLR or SGSN receives a MAP-SEND_AUTHENTICATION_INFO response containing a User Error parameter as part of the handling of an authentication procedure, the authentication procedure in the VLR or SGSN shall fail.

Security related network functions are further described in GSM 03.20 and 3GPP TS 33.102.

The service is a confirmed service and consists of four service primitives.

8.5.2.2 Service primitives

The service primitives are shown in table 8.5/2.

Table 8.5/2: MAP_SEND_AUTHENTICATION_INFOPARAMETERS parameters

Parameter name	Request	Indication	Response	Confirm
Invoke id	M	M(=)		
IMSI	M	M(=)		
Number of requested vectors	M	M(=)		
Re-synchronisation Info	C	C(=)		
Segmentation prohibited indicator	C	C (=)		
Immediate response preferred indicator	UG	C (=)		
AuthenticationSetList			C	C(=)
User error			C	C(=)
Provider error				O

8.5.2.3 Parameter use

Invoke id

See subclause 7.6.1 for the use of this parameter.

IMSI

See subclause 7.6.2 for the use of this parameter.

Number of requested vectors

A number indicating how many authentication vectors the VLR or SGSN is prepared to receive. The HLR shall not return more vectors than indicated by this parameter.

Re-synchronisation Info

For definition and use of this parameter see 3G TS 33.102.

Segmentation prohibited indicator

This parameter indicates if the VLR or SGSN allows message segmentation.

Immediate response preferred indicator

This parameter indicates that one of the requested authentication vectors is requested for immediate use in the VLR or SGSN. requests that the HLR immediately sends back the available authentication vectors. It may be used by the HLR together with the number of requested vectors and the number of vectors stored in the HLR to determine the number of vectors to be obtained from the AuC. It shall be ignored if the number of available vectors is lessgreater than the number of requested vectors and if the VLR or SGSN or the HLR does not support message segmentation.

AuthenticationSetList

A set of one to five authentication vectors are transferred from the HLR to the VLR or from the HLR to the SGSN, if the outcome of the service was successful.

User error

One of the following error causes defined in subclause 7.6.1 shall be sent by the user in case of unsuccessful outcome of the service, depending on the respective failure reason:

- unknown subscriber;
- unexpected data value;
- system failure;

- data missing.

Provider error

See subclause 7.6.1 for the use of this parameter.

17.7.1 Mobile Service data types

```
.....
SendIdentificationArg ::= SEQUENCE {
    tmsi                               TMSI,
    numberRequestedVectors           NumberOfRequestedVectors      OPTIONAL,
    -- if segmentation is used, numberRequestedVectors shall be present in
    -- the first segment and shall not be present in subsequent segments. If received
    -- in a subsequent segment it shall be discarded.
    segmentationProhibited        NULL                  OPTIONAL,
    -- if segmentation is prohibited the previous VLR shall not send the result
    -- within a TC-CONTINUE message.
    extensionContainer            ExtensionContainer      OPTIONAL,
    ...
}
```

.....

```
SendAuthenticationInfoArg ::= SEQUENCE {
    imsi                         [ 0 ] IMSI,
    numberRequestedVectors       NumberOfRequestedVectors      OPTIONAL,
    -- if segmentation is used, numberRequestedVectors shall be present in
    -- the first segment and shall not be present in subsequent segments. If received
    -- in a subsequent segment it shall be discarded.
    segmentationProhibited        NULL                  OPTIONAL,
    -- if segmentation is prohibited the HLR shall not send the result within
    -- a TC-CONTINUE message.
    immediateResponsePreferred   [ 1 ] NULL
    OPTIONAL,
    -- if present, the HLR may send an immediate response with the available
    authentication
    -- vectors (see § 8.5.2 for more information).
    -- if segmentation is used, immediateResponsePreferred shall not be present in
    -- subsequent segments. If received in a subsequent segment it shall be discarded.
    re-synchronisationInfo        Re-synchronisationInfo      OPTIONAL,
    extensionContainer            [ 2 ] ExtensionContainer      OPTIONAL,
    ...
}
```

25.5.5 Process Obtain_Auth_Sets_HLR

Opening of the dialogue is described in the macro Receive_Open_Ind in subclause 25.1, with outcomes:

- reversion to version one or two procedure;
- procedure termination; or
- dialogue acceptance, with proceeding as below.

This process is used by the HLR to obtain authentication vectors from the AuC, upon request from the VLR or from the SGSN. The process acts as follows:

- a MAP_SEND_AUTHENTICATION_INFO indication is received by the HLR;
- the HLR checks the service indication for errors. If any, they are reported to the VLR or to the SGSN in the MAP_SEND_AUTHENTICATION_INFO response. If no errors are detected, authentication vectors are fetched from the AuC. Further details are found in GSM 03.20;
- if errors are detected they are reported to the VLR or to the SGSN in the MAP_SEND_AUTHENTICATION_INFO response. Otherwise the authentication vectors are returned.

- if segmentation of the response message is required and allowed, a MAP_SEND_AUTHENTICATION_INFO_response, containing at least one authentication vector, followed by a MAP_DELIMITER_request is returned to the VLR or SGSN, the remaining authentication vectors are stored and the HLR waits for a new service indication from the VLR or SGSN.

The process is described in figure 25.5/5.

Process Obtain_Auth_Sets_HLR

1(2)

Figure 25.5/5: Process in the HLR to obtain authentication sets from the AuC and relay them to the VLR

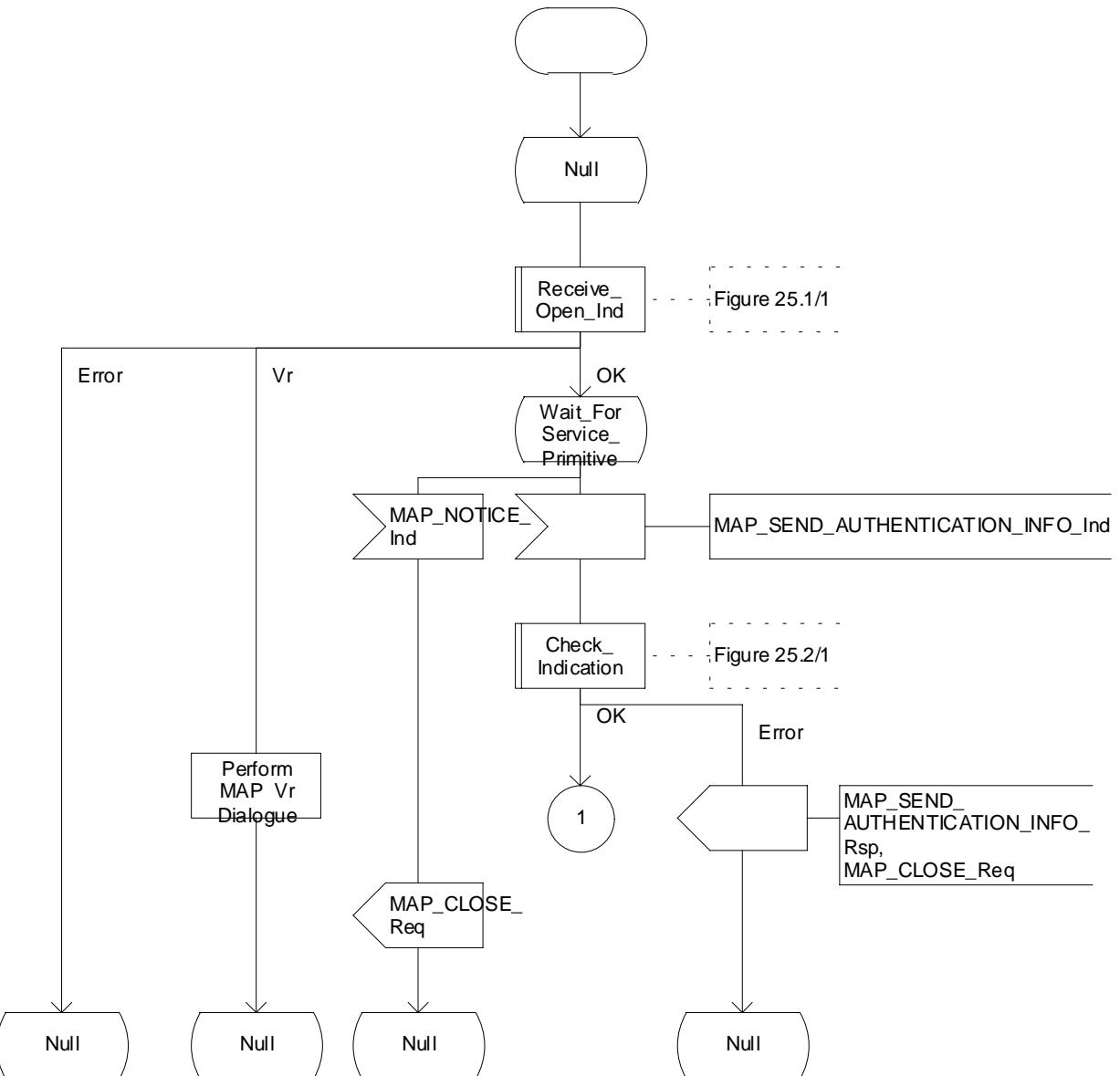
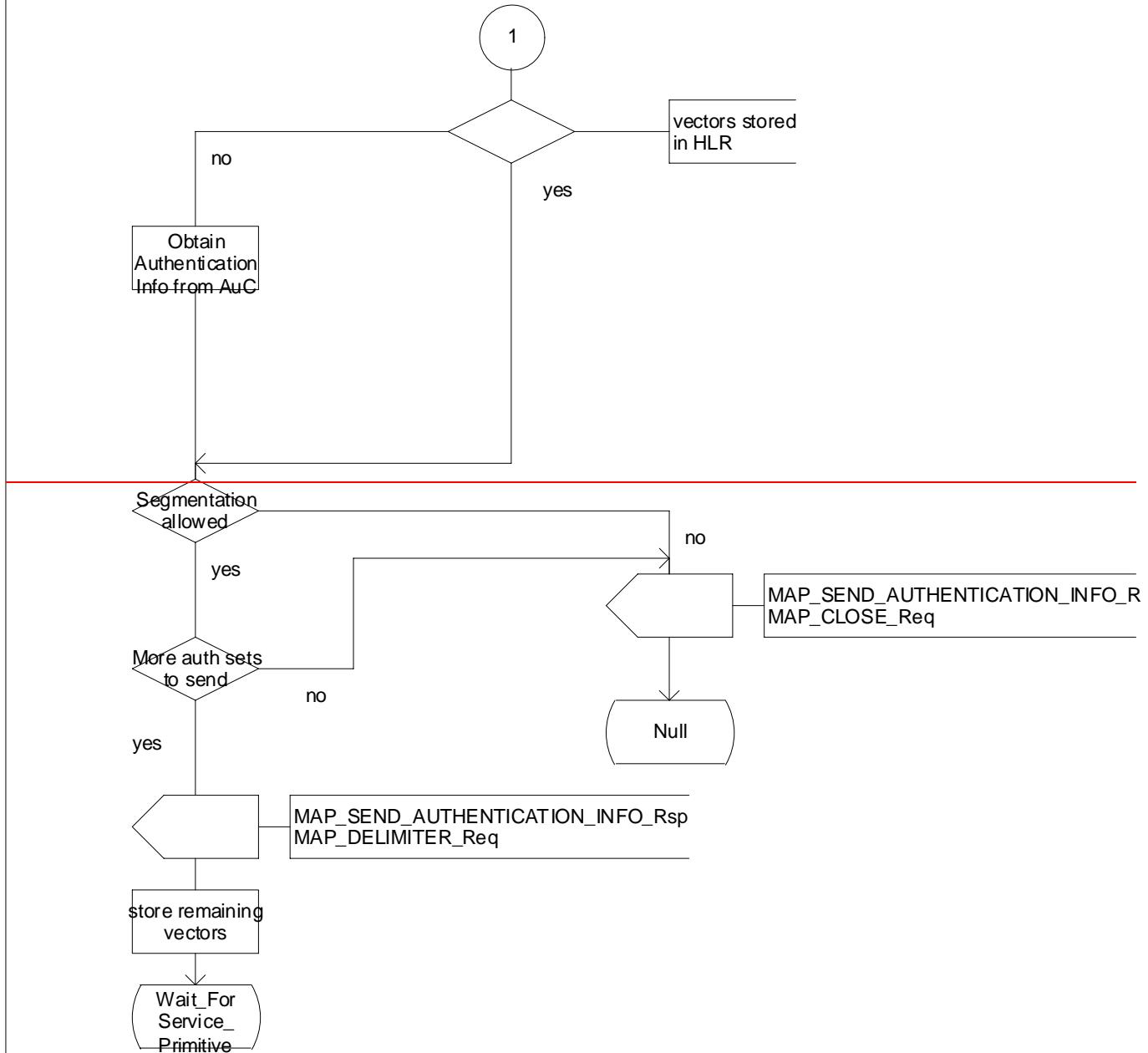


Figure 25.5/5 (sheet 1 of 2): Process Obtain_Auth_Sets_HLR

Process Obtain_Auth_Sets_HLR

Figure 25.5/5: Process in the HLR to obtain authentication sets from the AuC and relay them to the VLR



Process Obtain_Auth_Sets_HLR

2(2)

Figure 25.5/5: Process in the HLR to obtain authentication sets from the AuC and relay them to the VLR

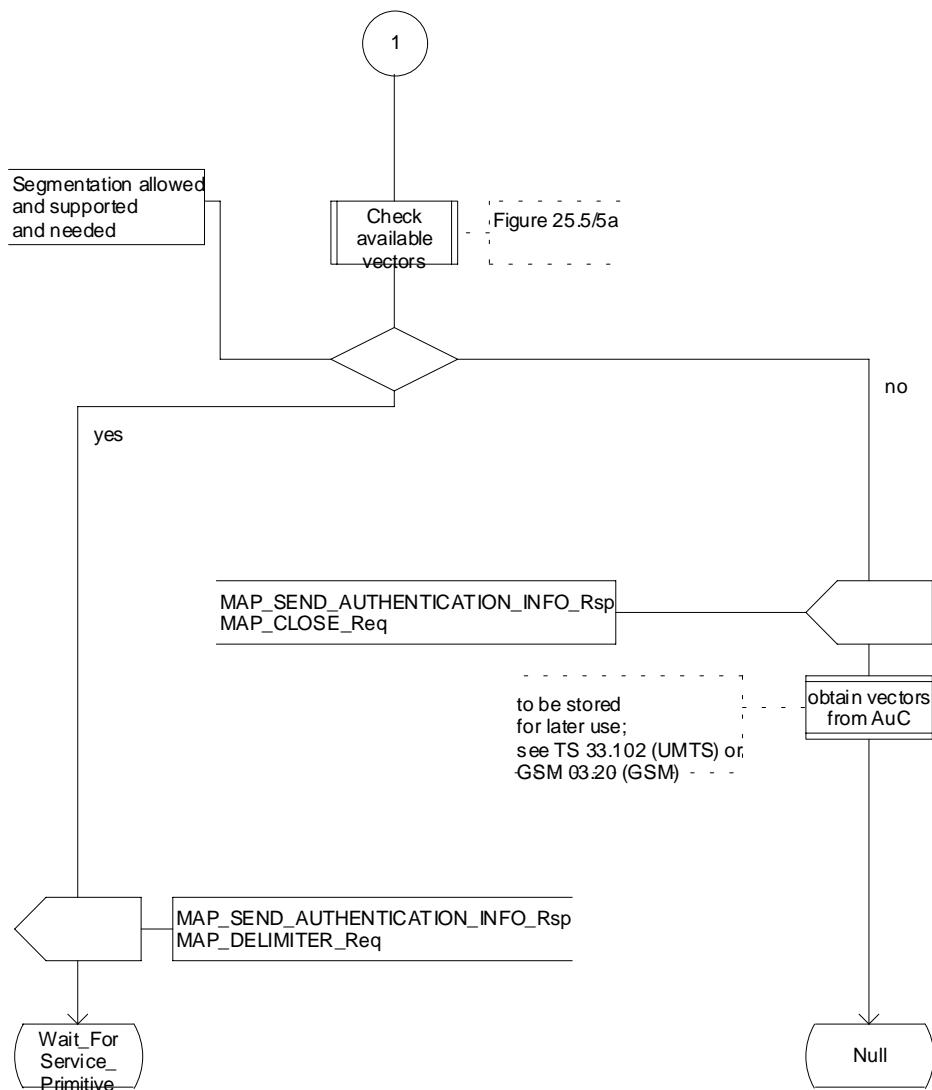


Figure 25.5/5 (sheet 2 of 2): Process Obtain_Auth_Sets_HLR

Procedure Check_Available_Vectors

Figure 25.5/5a,

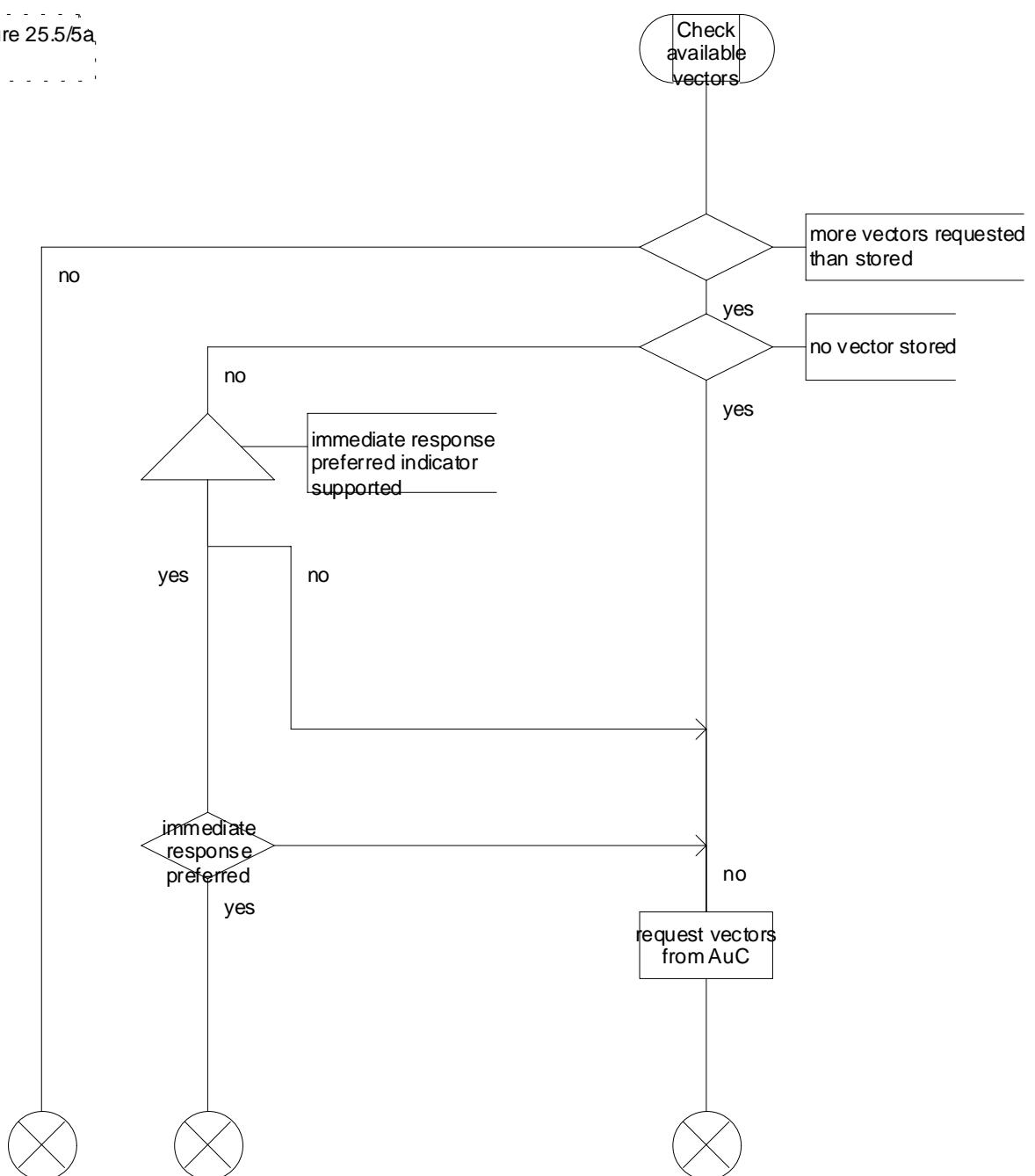


Figure 25.5/5a: Procedure Check Available Vectors

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

29.002 CR 103r1

Current Version: 3.3.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑

↑ CR number as allocated by MCC support team

For submission to: CN#07
list expected approval meeting # here

for approval
for information

X

strategic
non-strategic

X

(for SMG
use only)

Form: CR cover sheet, version 2 for 3GPP and SMG The latest version of this form is available from: <ftp://ftp.3gpp.org/Information/CR-Form-v2.doc>

Proposed change affects:
(at least one should be marked with an X)

(U)SIM ME UTRAN / Radio Core Network

Source: N2

Date: 14/02/2000

Subject: Addition of UMTS security to MAP B interface

Work item: Security

Category:
(only one category shall be marked with an X)

- F Correction
- A Corresponds to a correction in an earlier release
- B Addition of feature
- C Functional modification of feature
- D Editorial modification

X

Release:
Phase 2
Release 96
Release 97
Release 98
Release 99
Release 00

X

Reason for change: To add the required parameters to the MAP_AUTHENTICATE and MAP_SET_CIPHERING_MODE services by referencing 23.018

Clauses affected: 8.5.1, 8.6.1, 25.5

Other specs affected:
Other 3G core specifications
Other GSM core specifications
MS test specifications
BSS test specifications
O&M specifications

- List of CRs:

Other comments:



help.doc

<----- Double-click here for help and instructions on how to create a CR.

8.5.1 MAP_AUTHENTICATE service

The MAP_AUTHENTICATE service is used on the MAP B interface. This interface is not fully operational specified. It is strongly recommended not to implement the B-interface as an external interface.

8.5.1.1 Definition

This service is used between the VLR and the MSC when the VLR receives a MAP service indication from the MSC concerning a location registration, call set-up, operation on a supplementary service or a request from the MSC to initiate authentication.

The service is a confirmed service and consists of four service primitives.

8.5.1.2 Service primitives

The service primitives are shown in table 8.5/1

Table 8.5/1: MAP_AUTHENTICATE parameters

Parameter name	Request	Indication	Response	Confirm
Invoke id	M	M(=)	M(=)	M(=)
RAND	M	M(=)		
CKSN	M	M(=)		
SRES			M	M(=)
Provider error				O

8.5.1.3 Parameter use

Invoke id

See subclause 7.6.1 for the use of this parameter.

RAND

See subclause 7.6.7 for the use of this parameter.

CKSN

See subclause 7.6.7 for the use of this parameter.

SRES

See subclause 7.6.7 for the use of this parameter.

Provider error

See subclause 7.6.1 for the use of this parameter.

8.6.1 MAP_SET_CIPHERING_MODE service

8.6.1.1 Definitions

This service is used between the VLR and the MSC to set the ciphering mode and to start ciphering if applicable. It is called when another service requires that information is to be sent on the radio path in encrypted form. The service is a non-confirmed service and consists of two service primitives.

8.6.1.2 Service primitives

The service primitives are shown in table 8.6/1

Table 8.6/1: MAP_SET_CIPHERING_MODE parameters

Parameter name	Request	Indication
Invoke id	M	M(=)
Ciphering mode	M	M(=)
Kc	C	C(=)

8.6.1.3 Parameter use

Invoke id

See subclause 7.6.1 for the use of this parameter.

Ciphering mode

See subclause 7.6.7 for the use of this parameter.

Kc

The Kc parameter should be included when the ciphering mode parameter indicates that ciphering must be performed.

25.5.2 Macro Authenticate_VLR

This macro is used by the VLR to control the authentication of a subscriber. The macro proceeds as follows:

- if there are not enough authentication tripletsvectors in the VLR to perform the authentication, then the macro "Obtain_Authent_Para_VLR" described below is invoked. If this macro fails, then the corresponding error (Unknown Subscriber or Procedure Error) is returned to the calling process;
- if there are enough authentication tripletsvectors in the VLR, or the Obtain_Authent_Para_VLR macro was successful, then a MAP_AUTHENTICATE request is sent to the MSC. This request contains the RAND, and CKSN or KSI, and possibly AUTN parameters as indicated in the service description;
- the VLR then waits for a response from the MSC;
- if a MAP_U_ABORT, MAP_P_ABORT or MAP_CLOSE indication is received from the MSC in this wait state, the VLR checks whether authentication sets are available. If no sets are available the process Obtain_Authent_Sets_VLR is invoked to fetch authentication sets from the HLR. The "Null" exit is then used;
- if a MAP_NOTICE indication is received from the MSC in this wait state, the VLR closes the dialogue with the MSC, then checks whether authentication sets are available. If no sets are available the process Obtain_Authent_Sets_VLR is invoked to fetch authentication sets from the HLR. The "Null" exit is then used;
- if a MAP_AUTHENTICATE confirmation is received by the VLR, it checks whether the received Signed Result (SRES) is identical to the stored one (see GSM 03.20), or whether the received RES is identical to the stored XRES. If this is not the case, the "Illegal Subscriber" exit is used. If the SRES values or RES and XRES are identical, then the "OK" exit is used;
- before exit, the VLR may fetch a new set of triplets from the HLR. This is done by initiating a separate Obtain_Authent_Sets_VLR process described below.

The macro is described in figure 25.5/2.

25.5.3 Process Obtain_Authentication_Sets_VLR

This process is initiated by the VLR to fetch authentication vectorstriplets from a subscriber's HLR in a stand-alone, independent manner. The Obtain_Authent_Para_VLR macro described below is simply called; the process is described in figure 25.5/3.

CHANGE REQUEST		<small>Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.</small>	
29.002 CR 104		Current Version: 3.3.0	
GSM (AA.BB) or 3G (AA.BBB) specification number ↑		↑ CR number as allocated by MCC support team	
For submission to:	CN#07 <small>list expected approval meeting # here</small> ↑	for approval for information	<input checked="" type="checkbox"/> strategic <input type="checkbox"/> non-strategic <small>(for SMG use only)</small>

Form: CR cover sheet, version 2 for 3GPP and SMG The latest version of this form is available from: [ftp://ftp.3gpp.org/Information/CR-Form-v2.doc](http://ftp.3gpp.org/Information/CR-Form-v2.doc)

Proposed change affects: (at least one should be marked with an X) (U)SIM ME UTRAN / Radio Core Network

Source: N2 **Date:** 28/01/2000

Subject: Re-Synchronisation Info

Work item: UMTS Security

Category: <small>(only one category shall be marked with an X)</small>	F Correction A Corresponds to a correction in an earlier release B Addition of feature C Functional modification of feature D Editorial modification	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Release: Phase 2 Release 96 Release 97 Release 98 Release 99 Release 00	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>
--	--	---	--	---

Reason for change: To align with 33.102 (CR 37r1)

Clauses affected: 17.7.1

Other specs affected:	Other 3G core specifications Other GSM core specifications MS test specifications BSS test specifications O&M specifications	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	→ List of CRs: → List of CRs: → List of CRs: → List of CRs: → List of CRs:
------------------------------	--	--	--

Other comments:



help.doc

<----- Double-click here for help and instructions on how to create a CR.

17.7.1 Mobile Service data types

```
Re-synchronisationInfo ::= SEQUENCE {
    rand                                RAND,
    rand-ms                               RAND,
    auts                                 AUTS,
    ...
}
```

CHANGE REQUEST

29.002 CR 110r1

Current Version: 3.3.1

GSM (AA.BB) or 3G (AA.BBB) specification number ↑

↑ CR number as allocated by MCC support team

For submission to: **CN#07**
list expected approval meeting # here ↑

for approval
for information

strategic (for SMG
use only)
non-strategic

Form: CR cover sheet, version 2 for 3GPP and SMG The latest version of this form is available from: [ftp://ftp.3gpp.org/Information/CR-Form-v2.doc](http://ftp.3gpp.org/Information/CR-Form-v2.doc)

Proposed change affects: (U)SIM ME UTRAN / Radio Core Network
(at least one should be marked with an X)

Source: N2

Date: 14.02.00

Subject: Introduction of Authentication Failure Report

Work item: Security

Category: (only one category shall be marked with an X)
F Correction
A Corresponds to a correction in an earlier release
B Addition of feature
C Functional modification of feature
D Editorial modification

Release: Phase 2
Release 96
Release 97
Release 98
Release 99
Release 00

Reason for change: This CR introduces the changes required for the Authentication Failure Report.

Clauses affected:

Other specs affected: Other 3G core specifications
Other GSM core specifications
MS test specifications
BSS test specifications
O&M specifications

→ List of CRs:
→ List of CRs:
→ List of CRs:
→ List of CRs:
→ List of CRs:

Other comments:



help.doc

<-----

***** *First Modified Section* *****

5.1.2 Overload control for MAP entities

For all MAP entities, especially the HLR, the following overload control method is applied:

If overload of a MAP entity is detected requests for certain MAP operations (see tables 5.1/1, 5.1/2, 5.1/3 and 5.1/4) may be ignored by the responder. The decision as to which MAP Operations may be ignored is made by the MAP service provider and is based upon the priority of the application context.

Since most of the affected MAP operations are supervised in the originating entity by TC timers (medium) an additional delay effect is achieved for the incoming traffic.

If overload levels are applicable in the Location Registers the MAP operations should be discarded taking into account the priority of their application context (see table 5.1/1 for HLR, table 5.1/2 for MSC/VLR, table 5.1/3 for the SGSN and table 5.1/4 for the SMLC; the lowest priority is discarded first).

The ranking of priorities given in the tables 5.1/1, 5.1/2, 5.1/3 and 5.1/4 is not normative. The tables can only be seen as a proposal which might be changed due to network operator/implementation matters.

Table 5.1/1: Priorities of Application Contexts for HLR as Responder

	Responder = HLR	Initiating Entity
Priority high		
	<i><u>Mobility Management</u></i>	
	networkLocUp (updateLocation), (restoreData/v2), (sendParameters/v1)	VLR
	gprsLocationUpdate (updateGPRSLocation/v3),	SGSN
	infoRetrieval (sendAuthenticationInfo/v2/v3), (sendParameters/v1)	VLR/SGSN
	istAlerting (istAlert/v3) (purgeMS/v2/v3)	MSC msPurging VLR
	msPurging (purgeMS/v3)	SGSN
	<i><u>Short Message Service</u></i>	
	shortMsgGateway (sendRoutingInfoforSM), (reportSM-DeliveryStatus)	GMSC
	mwdMngt VLR/SGSN (readyForSM/v2/v3), (noteSubscriberPresent/v1)	
	<i><u>Mobile Terminating Traffic</u></i>	
	locInfoRetrieval (sendRoutingInfo)	GMSC
	anyTimeEnquiry (anyTimeInterrogation)	gsmSCF
	reporting (statusReport)	VLR
	<i><u>Location Services</u></i>	
	locationSvcGateway (sendRoutingInfoforLCS/v3)	GMLC
	<i><u>Subscriber Controlled Inputs (Supplementary Services)</u></i>	
	networkFunctionalSs (registerSS), (eraseSS), (activateSS), (deactivateSS), (interrogateSS), (registerPassword), (processUnstructuredSS-Data/v1), (beginSubscriberActivity/v1)	VLR
	callCompletion (registerCCEEntry), (eraseCCEEntry)	VLR
	networkUnstructuredSs (processUnstructuredSS-Request/v2)	VLR
	imsiRetrieval (sendIMSI/v2)	VLR
	gprsLocationInfoRetrieval (sendRoutingInfoForGprs/v3)	GGSN/SGSN
	failureReport (failureReport/v3)	GGSN/SGSN
	authenticationFailureReport (authenticationFailureReport/v3)	VLR/SGSN
Priority low		

NOTE: The application context name is the last component but one of the object identifier.
Operation names are given in brackets for information with "/vn" appended to vn only operations.

***** First New Section *****

7.6 Definition of parameters

Following is an alphabetic list of parameters used in the common MAP-services in subclause 7.3:

Application context name	7.3.1	Refuse reason	7.3.1
Destination address	7.3.1	Release method	7.3.2
Destination reference	7.3.1	Responding address	7.3.1
Diagnostic information	7.3.4	Result	7.3.1
Originating address	7.3.1	Source	7.3.5
Originating reference	7.3.1	Specific information	7.3.1/7.3.2/7.3.4
Problem diagnostic	7.3.6	User reason	7.3.4
Provider reason	7.3.5		

Following is an alphabetic list of parameters contained in this clause:

Absent Subscriber Diagnostic SM	7.6.8.9	Invoke Id	7.6.1.1
Access connection status	7.6.9.3	ISDN Bearer Capability	7.6.3.41
		IST Alert Timer	7.6.3.66
		IST Information Withdrawn	7.6.3.68
		IST Support Indicator	7.6.3.69
Access signalling information	7.6.9.5	Kc	7.6.7.4
Additional Absent Subscriber Diagnostic SM	7.6.8.12	Linked Id	7.6.1.2
Additional number	7.6.2.46	LMSI	7.6.2.16
Additional signal info	7.6.9.10	Location Information	7.6.2.30
Additional SM Delivery Outcome	7.6.8.11	Location update type	7.6.9.6
Age Indicator	7.6.3.72	Lower Layer Compatibility	7.6.3.42
Alert Reason	7.6.8.8	LSA Information	7.6.3.56
		LSA Information Withdraw	7.6.3.58
Alert Reason Indicator	7.6.8.10	Mobile Not Reachable Reason	7.6.3.51
Alerting Pattern	7.6.3.44	Modification request for CSI	7.6.3.81
All GPRS Data	7.6.3.53	Modification request for SS Information	7.6.3.82
All Information Sent	7.6.1.5	More Messages To Send	7.6.8.7
APN	7.6.2.42	MS ISDN	7.6.2.17
Authentication set list	7.6.7.1	MSC number	7.6.2.11
B-subscriber Address	7.6.2.36	MSIsdn-Alert	7.6.2.29
B subscriber Number	7.6.2.48	MWD status	7.6.8.3
B subscriber subaddress	7.6.2.49	Network Access Mode	7.6.3.50
Basic Service Group	7.6.4.40	Network node number	7.6.2.43
Bearer service	7.6.4.38	Network resources	7.6.10.1
BSS-apdu	7.6.9.1	Network signal information	7.6.9.8
Call Barring Data	7.6.3.83	New password	7.6.4.20
Call barring feature	7.6.4.19	No reply condition timer	7.6.4.7
Call barring information	7.6.4.18	North American Equal Access preferred Carrier Id	7.6.2.34
		Number Portability Status	7.6.5.14
Call Direction	7.6.5.8	ODB Data	7.6.3.85
Call Forwarding Data	7.6.3.84	ODB General Data	7.6.3.9
Call Info	7.6.9.9	ODB HPLMN Specific Data	7.6.3.10
Call reference	7.6.5.1		
Call Termination Indicator	7.6.3.67	OMC Id	7.6.2.18
Called number	7.6.2.24	Originally dialled number	7.6.2.26
Calling number	7.6.2.25	Originating entity number	7.6.2.10
CAMEL Subscription Info	7.6.3.78	Override Category	7.6.4.4
CAMEL Subscription Info Withdraw	7.6.3.38	P-TMSI	7.6.2.47
Cancellation Type	7.6.3.52	PDP-Address	7.6.2.45
Category	7.6.3.1	PDP-Context identifier	7.6.3.55
CCBS Feature	7.6.5.8	PDP-Type	7.6.2.44
Channel Type	7.6.5.9	Pre-paging supported	7.6.5.15
Chosen Channel	7.6.5.10	Previous location area Id	7.6.2.4
Ciphering mode	7.6.7.7	Protocol Id	7.6.9.7
Cksn	7.6.7.5	Provider error	7.6.1.3
CLI Restriction	7.6.4.5	QoS-Subscribed	7.6.3.47
CM service type	7.6.9.2	Rand	7.6.7.2
Complete Data List Included	7.6.3.54	Regional Subscription Data	7.6.3.11
CUG feature	7.6.3.26	Regional Subscription Response	7.6.3.12
CUG index	7.6.3.25	Requested Info	7.6.3.31
CUG info	7.6.3.22	Requested Subscription Info	7.6.3.86
CUG interlock	7.6.3.24	Roaming number	7.6.2.19
CUG Outgoing Access indicator	7.6.3.8	Roaming Restricted In SGSN Due To Unsupported Feature	7.6.3.49
CUG subscription	7.6.3.23	Unsupported Feature	7.6.3.13
		Roaming Restriction Due To Unsupported Feature	7.6.3.13
CUG Subscription Flag	7.6.3.37	Service centre address	7.6.2.27
		Serving Cell Id	7.6.2.37
Current location area Id	7.6.2.6	SGSN address	7.6.2.39
Current password	7.6.4.21	SGSN CAMEL Subscription Info	7.6.3.75
eMLPP Information	7.6.4.41	SGSN number	7.6.2.38
Equipment status	7.6.3.2	SIWF Number	7.6.2.35
Extensible Basic Service Group	7.6.3.5	SoLSA Support Indicator	7.6.3.57
Extensible Bearer service	7.6.3.3	SM Delivery Outcome	7.6.8.6
		SM-RP-DA	7.6.8.1
Extensible Call barring feature	7.6.3.21		
Extensible Call barring information	7.6.3.20		

Extensible Call barring information for CSE	7.6.3.79	SM-RP-MTI	7.6.8.16
Extensible Forwarding feature	7.6.3.16	SM-RP-OA	7.6.8.2
Extensible Forwarding info	7.6.3.15	SM-RP-PRI	7.6.8.5
Extensible Forwarding information for CSE	7.6.3.80	SM-RP-SMEA	7.6.8.17
Extensible Forwarding Options	7.6.3.18	SM-RP-UI	7.6.8.4
Extensible No reply condition timer	7.6.3.19	Sres	7.6.7.3
Extensible QoS-Subscribed	7.6.3.74	SS-Code	7.6.4.1
Extensible SS-Data	7.6.3.29	SS-Data	7.6.4.3
Extensible SS-Info	7.6.3.14	SS-Event	7.6.4.42
Extensible SS-Status	7.6.3.17	SS-Event-Data	7.6.4.43
Extensible Teleservice	7.6.3.4	SS-Info	7.6.4.24
External Signal Information	7.6.9.4	SS-Status	7.6.4.2
Failure Cause	7.6.7.8	Stored location area Id	7.6.2.5
Forwarded-to number	7.6.2.22	Subscriber State	7.6.3.30
Forwarded-to subaddress	7.6.2.23	Subscriber Status	7.6.3.7
Forwarding feature	7.6.4.16	Super-Charger Supported in HLR	7.6.3.70
Forwarding information	7.6.4.15	Super-Charger Supported in Serving Network Entity	7.6.3.71
Forwarding Options	7.6.4.6	Supported CAMEL Phases in VLR	7.6.3.36
GGSN address	7.6.2.40	Supported CAMEL Phases in SGSN	7.6.3.36A
GGSN number	7.6.2.41	Suppress T-CSI	7.6.3.33
GMSC CAMEL Subscription Info	7.6.3.34	Suppression of Announcement	7.6.3.32
GPRS enhancements support indicator	7.6.3.73	Target cell Id	7.6.2.8
GPRS Node Indicator	7.6.8.14	Target location area Id	7.6.2.7
GPRS Subscription Data	7.6.3.46	Target MSC number	7.6.2.12
GPRS Subscription Data Withdraw	7.6.3.45	Teleservice	7.6.4.39
GPRS Support Indicator	7.6.8.15	TMSI	7.6.2.2
Group Id	7.6.2.33	Trace reference	7.6.10.2
GSM bearer capability	7.6.3.6	Trace type	7.6.10.3
Guidance information	7.6.4.22	User error	7.6.1.4
Handover number	7.6.2.21	USSD Data Coding Scheme	7.6.4.36
High Layer Compatibility	7.6.3.43	USSD String	7.6.4.37
HLR Id	7.6.2.15	UU Data	7.6.5.12
HLR number	7.6.2.13	UUS CF Interaction	7.6.5.13
HO-Number Not Required	7.6.6.7	VBS Data	7.6.3.40
IMEI	7.6.2.3	VGCS Data	7.6.3.39
IMSI	7.6.2.1	VLR CAMEL Subscription Info	7.6.3.35
Inter CUG options	7.6.3.27	VLR number	7.6.2.14
Intra CUG restrictions	7.6.3.28	VPLMN address allowed	7.6.3.48
		Zone Code	7.6.2.28

*** First New Section ***

7.6.7.8 Failure cause

This parameter refers to an authentication failure which has occurred. It may take values as follows:

- wrong user response;
- wrong network signature.

*** Next New Section ***

8.5.3 MAP_AUTHENTICATION_FAILURE_REPORT service

8.5.2.1 Definition

This service is used between the VLR and the HLR or between the SGSN or HLR for reporting of authentication failures.

8.5.2.2 Service primitives

The service primitives are shown in table 8.5/3.

Table 8.5/3: MAP_AUTHENTICATION_FAILURE_REPORT parameters

Parameter name	Request	Indication	Response	Confirm
Invoke id	M	M(=)	M(=)	M(=)
IMSI	M	M(=)		
Failure cause	M	M(=)	C	
User error				C(=)
Provider error				O

8.5.2.3 Parameter use

Invoke id

See subclause 7.6.1 for the use of this parameter.

IMSI

See subclause 7.6.2 for the use of this parameter.

Failure Cause

See subclause 7.6.7 for use of this parameter..

User error

This parameter is sent by the responder upon unsuccessful outcome of the service, and then takes one of the following values defined in subclause 7.6.1:

- Unknown Subscriber ;
- System Failure;
- Unexpected Data Value;
- Data Missing.

Provider error

These are defined in subclause 7.6.

***** *First Modified Section* *****

16.2.2 Use of other parameters of component handling primitives

16.2.2.1 Dialogue Id

The value of this parameter is associated with the MAP PM invocation in an implementation dependent manner.

16.2.2.2 Class

The value of this parameter is set by the MAP PM according to the type of the operation to be invoked.

16.2.2.3 Linked Id

When a service response is mapped to a class 4 operation, the value of this parameter is set by the MAP PM and corresponds to the value assigned by the user to the initial service request (i.e. the value of the invoke ID parameter of

the request primitive). Otherwise if such a parameter is included in MAP request/indication primitives it is directly mapped to the linked ID parameter of the associated TC-INVOKE request/indication primitives.

16.2.2.4 Operation

When mapping a request primitive on to a Remote Operations PDU (invoke), the MAP PM shall set the operation code according to the mapping described in table 16.2/1.

When mapping a response primitive on to a Remote Operations service, the MAP PM shall set the operation code of the TC-RESULT-L/NL primitive (if required) to the same value as the one received at invocation time.

Table 16.2/1: Mapping of MAP specific services on to MAP operations

MAP-SERVICE	operation
MAP-ACTIVATE-SS	activateSS
MAP-ACTIVATE-TRACE-MODE	activateTraceMode
MAP-ALERT-SERVICE-CENTRE	alertServiceCentre
MAP-ANY-TIME-INTERROGATION	anyTimeInterrogation
MAP_AUTHENTICATION_FAILURE_REPORT	authenticationFailureReport
MAP-CANCEL-LOCATION	cancelLocation
MAP-CHECK-IMEI	checkIMEI
MAP-DEACTIVATE-SS	deactivateSS
MAP-DEACTIVATE-TRACE-MODE	deactivateTraceMode
MAP-DELETE-SUBSCRIBER-DATA	deleteSubscriberData
MAP-ERASE-CC-ENTRY	eraseCC-Entry
MAP-ERASE-SS	eraseSS
MAP-FAILURE-REPORT	failureReport
MAP-FORWARD-ACCESS-SIGNALLING	forwardAccessSignalling
MAP-FORWARD-CHECK-SS-INDICATION	forwardCheckSSIndication
MAP-FORWARD-GROUP-CALL-SIGNALLING	forwardGroupCallSignalling
MAP-MT-FORWARD-SHORT-MESSAGE	mt-forwardSM
MAP-MO-FORWARD-SHORT-MESSAGE	mo-forwardSM
MAP-GET-PASSWORD	getPassword
MAP-INFORM-SERVICE-CENTRE	informServiceCentre
MAP-INSERT-SUBSCRIBER-DATA	insertSubscriberData
MAP-INTERROGATE-SS	interrogateSS
MAP-IST-ALERT	istAlert
MAP-IST-COMMAND	istCommand
MAP-LCS-ASSIGN-TRAFFIC-CHANNEL	lcsAssignTrafficChannel
MAP_LCS_INFORMATION_REPORT	lcsInformationReport
MAP_LCS_INFORMATION_REQUEST	lcsInformationRequest
MAP_LCS_REGISTRATION	lcsRegistration
MAP_LCS_RESET	lcsReset
MAP-NOTE-MS-PRESENT-FOR-GPRS	noteMsPresentForGprs
MAP-PERFORM-LOCATION	performLocation
MAP-PREPARE-GROUP-CALL	prepareGroupCall
MAP-PREPARE-HANDOVER	prepareHandover
MAP-PREPARE-SUBSEQUENT-HANDOVER	prepareSubsequentHandover
MAP-PROCESS-ACCESS-SIGNALLING	processAccessSignalling
MAP-PROCESS-GROUP-CALL-SIGNALLING	processGroupCallSignalling
MAP-PROCESS-UNSTRUCTURED-SS-REQUEST	processUnstructuredSS-Request
MAP-PROVIDE-ROAMING-NUMBER	provideRoamingNumber
MAP-PROVIDE-SIWFS-NUMBER	provideSIWFSNumber
MAP-PROVIDE-SUBSCRIBER-LOCATION	provideSubscriberLocation
MAP-PROVIDE-SUBSCRIBER-INFO	provideSubscriberInfo
MAP-PURGE-MS	purgeMS
MAP-READY-FOR-SM	readyForSM
MAP-REGISTER-CC-ENTRY	registerCC-Entry
MAP-REGISTER-PASSWORD	registerPassword
MAP-REGISTER-SS	registerSS
MAP-REMOTE-USER-FREE	remoteUserFree
MAP-REPORT-SM-DELIVERY-STATUS	reportSmDeliveryStatus
MAP-RESET	reset
MAP-RESTORE-DATA	restoreData
MAP-SEND_GROUP-CALL_END_SIGNAL	sendGroupCallEndSignal
MAP-SEND-END-SIGNAL	sendEndSignal
MAP-SEND-AUTHENTICATION-INFO	sendAuthenticationInfo
MAP-SEND-IMSI	sendIMSI
MAP-SEND-IDENTIFICATION	sendIdentification
MAP-SEND-ROUTING-INFO-FOR-SM	sendRoutingInfoForSM
MAP-SEND-ROUTING-INFO-FOR-GPRS	sendRoutingInfoForGprs
MAP-SEND-ROUTING-INFO-FOR-LCS	sendRoutingInfoForLcs
MAP-SEND-ROUTING-INFORMATION	sendRoutingInfo
MAP-SET-REPORTING-STATE	setReportingState
MAP-SIWFS-SIGNALLING-MODIFY	SIWFSSignallingModify
MAP-STATUS-REPORT	statusReport

MAP-SUBSCRIBER-LOCATION-REPORT	subscriberLocationReport
MAP-SUPPLEMENTARY-SERVICE-INVOCATION-NOTIFICATION	ss-Invocation-Notification
MAP-UNSTRUCTURED-SS-NOTIFY	unstructuredSS-Notify
MAP-UNSTRUCTURED-SS-REQUEST	unstructuredSS-Request
MAP-UPDATE-GPRS-LOCATION	updateGprsLocation
MAP-UPDATE-LOCATION	updateLocation

***** Next Modified Section *****

17.1.6 Application Contexts

The following informative table lists the latest versions of the Application Contexts used in this specification, with the operations used by them and, where applicable, whether or not the operation description is exactly the same as for previous versions. Information in sections 17.6 & 17.7 relates only to the ACs in this table.

AC Name	AC Version	Operations Used	Comments *
locationCancellationContext	v3	cancelLocation	
equipmentMngtContext	v2	checkIMEI	
imsiRetrievalContext	v2	sendIMSI	
infoRetrievalContext	v3	sendAuthenticationInfo	
interVlrInfoRetrievalContext	v3	sendIdentification	
handoverControlContext	v2	prepareHandover forwardAccessSignalling sendEndSignal processAccessSignalling prepareSubsequentHandover	
mwdMngtContext	v3	readyForSM	
msPurgingContext	v3	purgeMS	
shortMsgAlertContext	v2	alertServiceCentre	
resetContext	v2	reset	
networkUnstructuredSsContext	v2	processUnstructuredSS-Request unstructuredSS-Request unstructuredSS-Notify	
tracingContext	v3	activateTraceMode deactivateTraceMode	
networkFunctionalSsContext	v2	registerSS eraseSS activateSS deactivateSS registerPassword interrogateSS getPassword	
shortMsgMO-RelayContext	v3	mo-forwardSM	
shortMsgMT-RelayContext	v3	mt-forwardSM	
shortMsgGatewayContext	v3	sendRoutingInfoForSM reportSM-DeliveryStatus InformServiceCentre	the syntax of this operation has been extended in comparison with release 96 version
networkLocUpContext	v3	updateLocation forwardCheckSs-Indication restoreData insertSubscriberData activateTraceMode	the syntax is the same in v1 & v2
gprsLocationUpdateContext	v3	updateGprsLocation insertSubscriberData	

		activateTraceMode	
subscriberDataMngtContext	v3	insertSubscriberData deleteSubscriberData	
roamingNumberEnquiryContext	v3	provideRoamingNumber	
locationInfoRetrievalContext	v3	sendRoutingInfo	
gprsNotifyContext	v3	noteMsPresentForGprs	
gprsLocationInfoRetrievalContext	v3	sendRoutingInfoForGprs	
failureReportContext	v3	failureReport	
callControlTransferContext	v4	resumeCallHandling	
subscriberInfoEnquiryContext	v3	provideSubscriberInfo	
anyTimeEnquiryContext	v3	anyTimeInterrogation	
anyTimeInfoHandlingContext	v3	anyTimeSubscriptionInterrogation anyTimeModification	
ss-InvocationNotificationContext	v3	ss-InvocationNotification	
siWFSAAllocationContext	v3	provideSIWFSNumber siWFSSignallingModify	
groupCallControlContext	v3	prepareGroupCall processGroupCallSignalling forwardGroupCallSignalling sendGroupCallEndSignal	
reportingContext	v3	setReportingState statusReport remoteUserFree	
callCompletionContext	v3	registerCC-Entry eraseCC-Entry	
istAlertingContext	v3	istAlert	
ImmediateTerminationContext	v3	istCommand	
locationSvcEnquiryContext	v3	provideSubscriberLocation subscriberLocationReport	
locationSvcGatewayContext	v3	sendRoutingInfoForLCS	
mm-EventReportingContext	v3	noteMM-Event	
subscriberDataModificationNotificationContext	v3	noteSubscriberDataModified	
authenticationFailureReportContext	v3	authenticationFailureReport	

***** Next New Section *****

17.2.2.52 Authentication Failure Report

This operation package includes the operation required for procedures between VLR and HLR or the SGSN and the HLR for reporting of authentication failures.

```
AuthenticationFailureReportPackage-v3 ::= OPERATION-PACKAGE
  -- Supplier is HLR if Consumer is VLR
  -- Supplier is HLR if Consumer is SGSN
  CONSUMER INVOKES {
    authenticationFailureReport}
```

This package is v3 only.

***** Next New Section *****

17.3.2.47 Authentication Failure Report

This application context is used between VLR and HLR or SGSN and HLR for reporting of authentication failures.

```
authenticationFailureReportContext-v3 APPLICATION-CONTEXT
  -- Responder is HLR if Initiator is VLR
  -- Responder is HLR if Initiator is SGSN
  INITIATOR CONSUMER OF {
    AuthenticationFailureReportPackage-v3 }
::= {map-ac failureReport(XX) version3(3)}
```

This application-context is v3 only.

***** Next Modified Section *****

17.5 MAP operation and error codes

```
1 MAP-Protocol {
2   ccitt identified-organization (4) etsi (0) mobileDomain (0)
3   gsm-Network (1) modules (3) map-Protocol (4) version6 (6)}
4
5 DEFINITIONS
6
7 ::= 
8
9 BEGIN
10
11 IMPORTS
12   UpdateLocation,
13   CancelLocation,
14   PurgeMS,
15   SendIdentification,
16   UpdateGprsLocation,
17   PrepareHandover,
18   SendEndSignal,
19   ProcessAccessSignalling,
20   ForwardAccessSignalling,
21   PrepareSubsequentHandover,
22   SendAuthenticationInfo,
23   AuthenticationFailureReport,
24   CheckIMEI,
25   InsertSubscriberData,
26   DeleteSubscriberData,
27   Reset,
28   ForwardCheckSS-Indication,
29   RestoreData,
30   ProvideSubscriberInfo,
31   AnyTimeInterrogation,
32   AnyTimeSubscriptionInterrogation,
33   AnyTimeModification,
34   SendRoutingInfoForGprs,
35   FailureReport,
36   NoteMsPresentForGprs,
37   NoteMM-Event,
38   NoteSubscriberDataModified
39
40
41 FROM MAP-MobileServiceOperations {
42   ccitt identified-organization (4) etsi (0) mobileDomain (0)
43   gsm-Network (1) modules (3) map-MobileServiceOperations (5)
44   version6 (6)}
45
46   ActivateTraceMode,
47   DeactivateTraceMode,
48   SendIMSI
49 FROM MAP-OperationAndMaintenanceOperations {
50   ccitt identified-organization (4) etsi (0) mobileDomain (0)
51   gsm-Network (1) modules (3) map-OperationAndMaintenanceOperations (6)
52   version6 (6)}
53
54   SendRoutingInfo,
```

```

55 ProvideRoamingNumber,
56 ResumeCallHandling,
57 ProvideSIWFSDNumber,
58 SIWFSSignallingModify,
59 SetReportingState,
60 StatusReport,
61 RemoteUserFree,
62 IST-Alert,
63 IST-Command
64 FROM MAP-CallHandlingOperations {
65   ccitt identified-organization (4) etsi (0) mobileDomain (0)
66   gsm-Network (1) modules (3) map-CallHandlingOperations (7)
67   version6 (6)}
68
69 RegisterSS,
70 EraseSS,
71 ActivateSS,
72 DeactivateSS,
73 InterrogateSS,
74 ProcessUnstructuredSS-Request,
75 UnstructuredSS-Request,
76 UnstructuredSS-Notify,
77 RegisterPassword,
78 GetPassword,
79 SS-InvocationNotification,
80 RegisterCC-Entry,
81 EraseCC-Entry
82 FROM MAP-SupplementaryServiceOperations {
83   ccitt identified-organization (4) etsi (0) mobileDomain (0)
84   gsm-Network (1) modules (3) map-SupplementaryServiceOperations (8)
85   version6 (6)}
86
87 SendRoutingInfoForSM,
88 MO-ForwardSM,
89 MT-ForwardSM,
90 ReportSM-DeliveryStatus,
91 AlertServiceCentre,
92 InformServiceCentre,
93 ReadyForSM
94 FROM MAP-ShortMessageServiceOperations {
95   ccitt identified-organization (4) etsi (0) mobileDomain (0)
96   gsm-Network (1) modules (3) map-ShortMessageServiceOperations (9)
97   version6 (6)}
98
99 PrepareGroupCall,
100 ProcessGroupCallSignalling,
101 ForwardGroupCallSignalling,
102 SendGroupCallEndSignal
103 FROM MAP-Group-Call-Operations {
104   ccitt identified-organization (4) etsi (0) mobileDomain (0)
105   gsm-Network (1) modules (3) map-Group-Call-Operations (22)
106   version6 (6)}
107
108 ProvideSubscriberLocation,
109 SendRoutingInfoForLCS,
110 SubscriberLocationReport
111 FROM MAP-LocationServiceOperations {
112   ccitt identified-organization (4) etsi (0) mobileDomain (0)
113   gsm-Network (1) modules (3) map-LocationServiceOperations (24)
114   version6 (6)}
115
116 SystemFailure,
117 DataMissing,
118 UnexpectedDataValue,
119 FacilityNotSupported,
120 UnknownSubscriber,
121 NumberChanged,
122 UnknownMSC,
123 UnidentifiedSubscriber,
124 UnknownEquipment,
125 RoamingNotAllowed,
126 IllegalSubscriber,
127 IllegalEquipment,
128 BearerServiceNotProvisioned,
129 TeleserviceNotProvisioned,
130 NoHandoverNumberAvailable,
131 SubsequentHandoverFailure,
132 TracingBufferFull,
133 OR-NotAllowed,

```

```

134    NoRoamingNumberAvailable,
135    AbsentSubscriber,
136    BusySubscriber,
137    NoSubscriberReply,
138    CallBarred,
139    ForwardingViolation,
140    ForwardingFailed,
141    CUG-Reject,
142    ATI-NotAllowed,
143    IllegalSS-Operation,
144    SS-ErrorStatus,
145    SS-NotAvailable,
146    SS-SubscriptionViolation,
147    SS-Incompatibility,
148    UnknownAlphabet,
149    USSD-Busy,
150    PW-RegistrationFailure,
151    NegativePW-Check,
152    NumberOfPW-AttemptsViolation,
153    SubscriberBusyForMT-SMS,
154    SM-DeliveryFailure,
155    MessageWaitingListFull,
156    AbsentSubscriberSM,
157    ResourceLimitation,
158    NoGroupCallNumberAvailable,
159    ShortTermDenial,
160    LongTermDenial,
161    IncompatibleTerminal,
162    UnauthorizedRequestingNetwork,
163    UnauthorizedLCSClient,
164    PositionMethodFailure,
165    UnknownOrUnreachableLCSClient,
166    ATSI-NotAllowed,
167    ATM-NotAllowed,
168    InformationNotAvailable,
169    MM-EventNotSupported
170
171 FROM MAP-Errors {
172   ccitt identified-organization (4) etsi (0) mobileDomain (0)
173   gsm-Network (1) modules (3) map-Errors (10) version6 (6)}
174 ;
175
176
177 -- location registration operation codes
178
179 updateLocation UpdateLocation ::= localValue 2
180 cancelLocation CancelLocation ::= localValue 3
181 purgeMS PurgeMS ::= localValue 67
182 sendIdentification SendIdentification ::= localValue 55
183
184
185 -- handover operation codes
186
187 prepareHandover PrepareHandover ::= localValue 68
188 sendEndSignal SendEndSignal ::= localValue 29
189 processAccessSignalling ProcessAccessSignalling ::= localValue 33
190 forwardAccessSignalling ForwardAccessSignalling ::= localValue 34
191 prepareSubsequentHandover PrepareSubsequentHandover ::=
192   localValue 69
193
194
195 -- authentication operation codes
196
197 sendAuthenticationInfo SendAuthenticationInfo ::= localValue 56
198 authenticationFailureReport AuthenticationFailureReport ::= localValue XX
199
200
201 -- IMEI MANAGEMENT operation codes
202
203 checkIMEI CheckIMEI ::= localValue 43
204
205
206 -- subscriber management operation codes
207
208 insertSubscriberData InsertSubscriberData ::= localValue 7
209 deleteSubscriberData DeleteSubscriberData ::= localValue 8
210
211

```

```

212 -- fault recovery operation codes
213
214 reset Reset ::= localValue 37
215 forwardCheckSS-Indication ForwardCheckSS-Indication ::= localValue 38
216 restoreData RestoreData ::= localValue 57
217
218
219 -- operation and maintenance operation codes
220
221 activateTraceMode ActivateTraceMode ::= localValue 50
222 deactivateTraceMode DeactivateTraceMode ::= localValue 51
223 sendIMSI SendIMSI ::= localValue 58
224
225
226
227 -- call handling operation codes
228
229 sendRoutingInfo SendRoutingInfo ::= localValue 22
230 provideRoamingNumber ProvideRoamingNumber ::= localValue 4
231 resumeCallHandling ResumeCallHandling ::= localValue 6
232 provideSIWFSSNumber ProvideSIWFSSNumber ::= localValue 31
233 siWFSSignallingModify SIWFSSignallingModify ::= localValue 32
234 setReportingState SetReportingState ::= localValue 73
235 statusReport StatusReport ::= localValue 74
236 remoteUserFree RemoteUserFree ::= localValue 75
237 istAlert IST-Alert ::= localValue 87
238 istCommand IST-Command ::= localValue 88
239
240
241 -- supplementary service handling operation codes
242
243 registerSS RegisterSS ::= localValue 10
244 erasESS ErasESS ::= localValue 11
245 activateSS ActivateSS ::= localValue 12
246 deactivateSS DeactivateSS ::= localValue 13
247 interrogateSS InterrogateSS ::= localValue 14
248 processUnstructuredSS-Request ProcessUnstructuredSS-Request ::= localValue 59
249
250 unstructuredSS-Request UnstructuredSS-Request ::= localValue 60
251 unstructuredSS-Notify UnstructuredSS-Notify ::= localValue 61
252 registerPassword RegisterPassword ::= localValue 17
253 getPassword GetPassword ::= localValue 18
254 registerCC-Entry RegisterCC-Entry ::= localValue 76
255 eraseCC-Entry EraseCC-Entry ::= localValue 77
256
257
258 -- short message service operation codes
259
260 sendRoutingInfoForSM SendRoutingInfoForSM ::= localValue 45
261 mo-forwardSM MO-ForwardSM ::= localValue 46
262 mt-forwardSM MT-ForwardSM ::= localValue 44
263 reportSM-DeliveryStatus ReportSM-DeliveryStatus ::= localValue 47
264 informServiceCentre InformServiceCentre ::= localValue 63
265 alertServiceCentre AlertServiceCentre ::= localValue 64
266 readyForSM ReadyForSM ::= localValue 66
267
268 -- provide subscriber info operation codes
269
270 provideSubscriberInfo ProvideSubscriberInfo ::= localValue 70
271
272 -- any time interrogation operation codes
273
274 anyTimeInterrogation AnyTimeInterrogation ::= localValue 71
275
276 -- any time information handling operation codes
277
278 anyTimeSubscriptionInterrogation AnyTimeSubscriptionInterrogation ::= localValue 62
279 anyTimeModification AnyTimeModification ::= localValue 65
280
281 -- subscriber data modification notification operation codes
282
283 noteSubscriberDataModified NoteSubscriberDataModified ::= localValue 5
284
285 -- supplementary service invocation notification operation codes
286
287 ss-InvocationNotification SS-InvocationNotification ::= localValue 72
288

```

```

289
290 --Group Call operation codes
291
292 prepareGroupCall PrepareGroupCall ::= localValue 39
293 sendGroupCallEndSignal SendGroupCallEndSignal ::= localValue 40
294 processGroupCallSignalling ProcessGroupCallSignalling ::= localValue 41
295 forwardGroupCallSignalling ForwardGroupCallSignalling ::= localValue 42
296
297
298 -- gprs location updating operation codes
299
300 updateGprsLocation UpdateGprsLocation ::= localValue 23
301
302 -- gprs location information retrieval operation codes
303
304 sendRoutingInfoForGprs SendRoutingInfoForGprs ::= localValue 24
305
306 -- failure reporting operation codes
307
308 failureReport FailureReport ::= localValue 25
309
310 -- GPRS notification operation codes
311
312 noteMsPresentForGprs NoteMsPresentForGprs ::= localValue 26
313
314 -- Location service operation codes
315
316 provideSubscriberLocation ProvideSubscriberLocation ::= localValue 83
317 sendRoutingInfoForLCS SendRoutingInfoForLCS ::= localValue 85
318 subscriberLocationReport SubscriberLocationReport ::= localValue 86
319
320
321 -- Mobility Management operation codes
322
323 noteMM-Event NoteMM-Event ::= localValue 89
324
325
326 -- generic error codes
327
328 systemFailure SystemFailure ::= localValue 34
329 dataMissing DataMissing ::= localValue 35
330 unexpectedDataValue UnexpectedDataValue ::= localValue 36
331 facilityNotSupported FacilityNotSupported ::= localValue 21
332 incompatibleTerminal IncompatibleTerminal ::= localValue 28
333 resourceLimitation ResourceLimitation ::= localValue 51
334
335
336 -- identification and numbering error codes
337
338 unknownSubscriber UnknownSubscriber ::= localValue 1
339 numberChanged NumberChanged ::= localValue 44
340 unknownMSC UnknownMSC ::= localValue 3
341 unidentifiedSubscriber UnidentifiedSubscriber ::= localValue 5
342 unknownEquipment UnknownEquipment ::= localValue 7
343
344
345 -- subscription error codes
346
347 roamingNotAllowed RoamingNotAllowed ::= localValue 8
348 illegalSubscriber IllegalSubscriber ::= localValue 9
349 illegalEquipment IllegalEquipment ::= localValue 12
350 bearerServiceNotProvisioned BearerServiceNotProvisioned ::=
351     localValue 10
352 teleserviceNotProvisioned TeleserviceNotProvisioned ::=
353     localValue 11
354
355
356 -- handover error codes
357
358 noHandoverNumberAvailable NoHandoverNumberAvailable ::=
359     localValue 25
360 subsequentHandoverFailure SubsequentHandoverFailure ::=
361     localValue 26
362
363
364 -- operation and maintenance error codes
365

```

```

366 tracingBufferFull TracingBufferFull ::= localValue 40
367
368
369 -- call handling error codes
370
371 noRoamingNumberAvailable NoRoamingNumberAvailable ::= localValue 39
372 absentSubscriber AbsentSubscriber ::= localValue 27
373 busySubscriber BusySubscriber ::= localValue 45
374 noSubscriberReply NoSubscriberReply ::= localValue 46
375 callBarred CallBarred ::= localValue 13
376 forwardingFailed ForwardingFailed ::= localValue 47
377 or-NotAllowed OR-NotAllowed ::= localValue 48
378 forwardingViolation ForwardingViolation ::= localValue 14
379 cug-Reject CUG-Reject ::= localValue 15
380
381
382 -- any time interrogation error codes
383
384 ati-NotAllowed ATI-NotAllowed ::= localValue 49
385
386 -- any time information handling error codes
387 atsi-NotAllowed ATSI-NotAllowed ::= localValue 60
388 atm-NotAllowed ATM-NotAllowed ::= localValue 61
389 informationNotAvailable InformationNotAvailable ::= localValue 62
390
391
392 -- Group Call error codes
393 noGroupCallNumberAvailable NoGroupCallNumberAvailable ::= localValue 50
394
395
396 -- supplementary service error codes
397
398 illegalSS-Operation IllegalSS-Operation ::= localValue 16
399 ss-ErrorStatus SS-ErrorStatus ::= localValue 17
400 ss-NotAvailable SS-NotAvailable ::= localValue 18
401 ss-SubscriptionViolation SS-SubscriptionViolation ::= localValue 19
402 ss-Incompatibility SS-Incompatibility ::= localValue 20
403 unknownAlphabet UnknownAlphabet ::= localValue 71
404 ussd-Busy USSD-Busy ::= localValue 72
405 pw-RegistrationFailure PW-RegistrationFailure ::= localValue 37
406 negativePW-Check NegativePW-Check ::= localValue 38
407 numberOfPW-AttemptsViolation NumberOfPW-AttemptsViolation ::=
408     localValue 43
409 shortTermDenial ShortTermDenial ::= localValue 29
410 longTermDenial LongTermDenial ::= localValue 30
411
412
413 -- short message service error codes
414
415 subscriberBusyForMT-SMS SubscriberBusyForMT-SMS ::= localValue 31
416 sm-DeliveryFailure SM-DeliveryFailure ::= localValue 32
417 messageWaitingListFull MessageWaitingListFull ::= localValue 33
418 absentSubscriberSM AbsentSubscriberSM ::= localValue 6
419
420 -- location service error codes
421
422 unauthorizedRequestingNetwork UnauthorizedRequestingNetwork ::= localValue 52
423 unauthorizedLCSClient UnauthorizedLCSClient ::= localValue 53
424 positionMethodFailure PositionMethodFailure ::= localValue 54
425 unknownOrUnreachableLCSClient UnknownOrUnreachableLCSClient ::= localValue 58
426
427
428 -- Mobility Management error codes
429 mm-EventNotSupported MM-EventNotSupported ::= localValue 59
430
431 -- The following operation codes are reserved for operations
432 -- existing in previous versions of the protocol
433

```

```

434 -- Operation Name          AC used           Oper. Code
435 --
436 -- sendParameters          map-ac infoRetrieval (14) version1 (1) localValue 9
437 -- processUnstructuredSS-Data map-ac networkFunctionalSs (18) version1 (1) localValue 19
438 -- performHandover         map-ac handoverControl (11) version1 (1) localValue 28
439 -- performSubsequentHandover map-ac handoverControl (11) version1 (1) localValue 30
440 -- noteInternalHandover    map-ac handoverControl (11) version1 (1) localValue 35
441 -- noteSubscriberPresent   map-ac mwdMngt (24) version1 (1) localValue 48
442 -- alertServiceCentreWithoutResult map-ac shortMsgAlert (23) version1 (1) localValue 49
443 -- traceSubscriberActivity map-ac handoverControl (11) version1 (1) localValue 52
444 -- beginSubscriberActivity map-ac networkFunctionalSs (18) version1 (1) localValue 54
445
446 -- The following error codes are reserved for errors
447 -- existing in previous versions of the protocol
448
449 -- Error Name              AC used           Error Code
450 --
451 -- unknownBaseStation      map-ac handoverControl (11) version1 (1) localValue 2
452 -- invalidTargetBaseStation map-ac handoverControl (11) version1 (1) localValue 23
453 -- noRadioResourceAvailable map-ac handoverControl (11) version1 (1) localValue 24
454
455
456 END

```

***** Next Modified Section *****

17.6.1 Mobile Service Operations

```

1 MAP-MobileServiceOperations {
2     ccitt identified-organization (4) etsi (0) mobileDomain (0)
3     gsm-Network (1) modules (3) map-MobileServiceOperations (5)
4     version6 (6)
5
6     DEFINITIONS
7
8     ::=-
9
10    BEGIN
11
12    EXPORTS
13
14    -- location registration operations
15    UpdateLocation,
16    CancelLocation,
17    PurgeMS,
18    SendIdentification,
19
20    -- gprs location registration operations
21    UpdateGprsLocation,
22
23    -- subscriber information enquiry operations
24    ProvideSubscriberInfo,
25
26    -- any time information enquiry operations
27    AnyTimeInterrogation,
28
29    -- any time information handling operations
30    AnyTimeSubscriptionInterrogation,
31    AnyTimeModification,
32
33    -- subscriber data modification notification operations
34    NoteSubscriberDataModified,
35
36
37    -- handover operations
38    PrepareHandover,
39    SendEndSignal,
40    ProcessAccessSignalling,
41    ForwardAccessSignalling,
42    PrepareSubsequentHandover,
43
44    -- authentication management operations
45    SendAuthenticationInfo,
46    AuthenticationFailureReport,
47
48    -- IMEI management operations
49    CheckIMEI,

```

```

50
51    -- subscriber management operations
52    InsertSubscriberData,
53    DeleteSubscriberData,
54
55    -- fault recovery operations
56    Reset,
57    ForwardCheckSS-Indication,
58    RestoreData,
59
60    -- gprs location information retrieval operations
61    SendRoutingInfoForGprs,
62
63    -- failure reporting operations
64    FailureReport,
65
66    -- gprs notification operations
67    NoteMsPresentForGprs,
68
69    -- Mobility Management operations
70    NoteMM-Event
71
72
73
74
75 ;
76
77 IMPORTS
78     OPERATION
79 FROM TCAPMessages {
80     ccitt recommendation q 773 modules (2) messages (1) version2 (2)}
81
82     SystemFailure,
83     DataMissing,
84     UnexpectedDataValue,
85     UnknownSubscriber,
86     UnknownMSC,
87     UnidentifiedSubscriber,
88     UnknownEquipment,
89     RoamingNotAllowed,
90     ATI-NotAllowed,
91     NoHandoverNumberAvailable,
92     SubsequentHandoverFailure,
93     AbsentSubscriber,
94     MM-EventNotSupported,
95     ATSI-NotAllowed,
96     ATM-NotAllowed,
97     BearerServiceNotProvisioned,
98     TeleserviceNotProvisioned,
99     CallBarred,
100    IllegalSS-Operation,
101    SS-ErrorStatus,
102    SS-NotAvailable,
103    SS-Incompatibility,
104    SS-SubscriptionViolation,
105    InformationNotAvailable
106
107
108 FROM MAP-Errors {
109     ccitt identified-organization (4) etsi (0) mobileDomain (0)
110     gsm-Network (1) modules (3) map-Errors (10) version6 (6)}
111
112     UpdateLocationArg,
113     UpdateLocationRes,
114     CancelLocationArg,
115     CancelLocationRes,
116     PurgeMS-Arg,
117     PurgeMS-Res,
118     SendIdentificationArg,
119     SendIdentificationRes,
120     UpdateGprsLocationArg,
121     UpdateGprsLocationRes,
122     PrepareHO-Arg,
123     PrepareHO-Res,
124     PrepareSubsequentHO-Arg,
125     SendAuthenticationInfoArg,
126     SendAuthenticationInfoRes,
127     AuthenticationFailureReportArg,
128     AuthenticationFailureReportRes,

```

```

129 EquipmentStatus,
130 InsertSubscriberDataArg,
131 InsertSubscriberDataRes,
132 DeleteSubscriberDataArg,
133 DeleteSubscriberDataRes,
134 ResetArg,
135 RestoreDataArg,
136 RestoreDataRes,
137 ProvideSubscriberInfoArg,
138 ProvideSubscriberInfoRes,
139 AnyTimeSubscriptionInterrogationArg,
140 AnyTimeSubscriptionInterrogationRes,
141 AnyTimeModificationArg,
142 AnyTimeModificationRes,
143 NoteSubscriberDataModifiedArg,
144 NoteSubscriberDataModifiedRes,
145 AnyTimeInterrogationArg,
146 AnyTimeInterrogationRes,
147 SendRoutingInfoForGprsArg,
148 SendRoutingInfoForGprsRes,
149 FailureReportArg,
150 FailureReportRes,
151 NoteMsPresentForGprsArg,
152 NoteMsPresentForGprsRes,
153 NoteMM-EventArg,
154 NoteMM-EventRes
155
156
157 FROM MAP-MS-DataTypes {
158   ccitt identified-organization (4) etsi (0) mobileDomain (0)
159   gsm-Network (1) modules (3) map-MS-DataTypes (11) version6 (6)}
160
161 ExternalSignalInfo,
162 IMEI
163 FROM MAP-CommonDataTypes {
164   ccitt identified-organization (4) etsi (0) mobileDomain (0)
165   gsm-Network (1) modules (3) map-CommonDataTypes (18) version6 (6)}
166 ;
167
168
169 -- location registration operations
170
171 UpdateLocation ::= OPERATION --Timer m
172   ARGUMENT
173     updateLocationArg           UpdateLocationArg
174   RESULT
175     updateLocationRes          UpdateLocationRes
176   ERRORS {
177     SystemFailure,
178     DataMissing,
179     UnexpectedDataValue,
180     UnknownSubscriber,
181     RoamingNotAllowed}
182
183 CancellingLocation ::= OPERATION --Timer m
184   ARGUMENT
185     cancelLocationArg          CancelLocationArg
186   RESULT
187     cancelLocationRes          CancelLocationRes
188     -- optional
189   ERRORS {
190     DataMissing,
191     UnexpectedDataValue}
192
193 PurgeMS ::= OPERATION --Timer m
194   ARGUMENT
195     purgeMS-Arg                PurgeMS-Arg
196   RESULT
197     purgeMS-Res                PurgeMS-Res
198     -- optional
199   ERRORS{
200     DataMissing,
201     UnexpectedDataValue,
202     UnknownSubscriber}
203

```

```

204 SendIdentification ::= OPERATION --Timer s
205   ARGUMENT
206     sendIdentificationArg      SendIdentificationArg
207   RESULT
208     sendIdentificationRes     SendIdentificationRes
209   ERRORS {
210     DataMissing,
211     UnidentifiedSubscriber}
212
213 -- gprs location registration operations
214
215 UpdateGprsLocation ::= OPERATION --Timer m
216   ARGUMENT
217     updateGprsLocationArg    UpdateGprsLocationArg
218   RESULT
219     updateGprsLocationRes   UpdateGprsLocationRes
220   ERRORS {
221     SystemFailure,
222     UnexpectedDataValue,
223     UnknownSubscriber,
224     RoamingNotAllowed}
225
226 -- subscriber information enquiry operations
227
228 ProvideSubscriberInfo ::= OPERATION --Timer m
229   ARGUMENT
230     provideSubscriberInfoArg ProvideSubscriberInfoArg
231   RESULT
232     provideSubscriberInfoRes ProvideSubscriberInfoRes
233   ERRORS {
234     DataMissing,
235     UnexpectedDataValue}
236
237 -- any time information enquiry operations
238
239 AnyTimeInterrogation ::= OPERATION --Timer m
240   ARGUMENT
241     anyTimeInterrogationArg  AnyTimeInterrogationArg
242   RESULT
243     anyTimeInterrogationRes AnyTimeInterrogationRes
244   ERRORS {
245     SystemFailure,
246     ATI-NotAllowed,
247     DataMissing,
248     UnexpectedDataValue,
249     UnknownSubscriber}
250
251 -- any time information handling operations
252
253 AnyTimeSubscriptionInterrogation ::= OPERATION --Timer m
254   ARGUMENT
255     anyTimeSubscriptionInterrogationArg AnyTimeSubscriptionInterrogationArg
256   RESULT
257     anyTimeSubscriptionInterrogationRes AnyTimeSubscriptionInterrogationRes
258   ERRORS {
259     ATSI-NotAllowed,
260     DataMissing,
261     UnexpectedDataValue,
262     UnknownSubscriber,
263     BearerServiceNotProvisioned,
264     TeleserviceNotProvisioned,
265     CallBarred,
266     IllegalSS-Operation,
267     SS-NotAvailable,
268     InformationNotAvailable}
269

```

```

270 AnyTimeModification ::= OPERATION --Timer m
271   ARGUMENT
272     anyTimeModificationArg      AnyTimeModificationArg
273   RESULT
274     anyTimeModificationRes    AnyTimeModificationRes
275   ERRORS {
276     ATM-NotAllowed,
277     DataMissing,
278     UnexpectedDataValue,
279     UnknownSubscriber,
280     BearerServiceNotProvisioned,
281     TeleserviceNotProvisioned,
282     CallBarred,
283     IllegalSS-Operation,
284     SS-SubscriptionViolation,
285     SS-ErrorStatus,
286     SS-Incompatibility,
287     InformationNotAvailable}
288
289 -- subscriber data modification notification operations
290
291 NoteSubscriberDataModified ::= OPERATION --Timer m
292   ARGUMENT
293     noteSubscriberDataModifiedArg NoteSubscriberDataModifiedArg
294   RESULT
295     noteSubscriberDataModifiedRes NoteSubscriberDataModifiedRes
296     -- optional
297   ERRORS {
298     UnexpectedDataValue,
299     UnknownSubscriber}
300
301
302 -- handover operations
303
304 PrepareHandover ::= OPERATION --Timer m
305   ARGUMENT
306     prepareHO-Arg            PrepareHO-Arg
307   RESULT
308     prepareHO-Res            PrepareHO-Res
309   ERRORS {
310     SystemFailure,
311     DataMissing,
312     UnexpectedDataValue,
313     NoHandoverNumberAvailable}
314
315 SendEndSignal ::= OPERATION --Timer l
316   ARGUMENT
317     bss-APDU                 ExternalSignalInfo
318   RESULT
319
320 ProcessAccessSignalling ::= OPERATION --Timer s
321   ARGUMENT
322     bss-APDU                 ExternalSignalInfo
323
324 ForwardAccessSignalling ::= OPERATION --Timer s
325   ARGUMENT
326     bss-APDU                 ExternalSignalInfo
327
328 PrepareSubsequentHandover ::= OPERATION --Timer m
329   ARGUMENT
330     prepareSubsequentHO-Arg  PrepareSubsequentHO-Arg
331   RESULT
332     bss-APDU                 ExternalSignalInfo
333   ERRORS {
334     UnexpectedDataValue,
335     DataMissing,
336     UnknownMSC,
337     SubsequentHandoverFailure}
338
339 -- authentication management operations
340

```

```

341 SendAuthenticationInfo ::= OPERATION --Timer m
342   ARGUMENT
343     sendAuthenticationInfoArg    SendAuthenticationInfoArg
344   RESULT
345     sendAuthenticationInfoRes   SendAuthenticationInfoRes
346     -- optional
347   ERRORS {
348     SystemFailure,
349     DataMissing,
350     UnexpectedDataValue,
351     UnknownSubscriber}
352
353 AuthenticationFailureReport ::= OPERATION --Timer m
354   ARGUMENT
355     authenticationFailureReportArg AuthenticationFailureReportArg
356   RESULT
357     authenticationFailureReportRes AuthenticationFailureReportRes
358     -- optional
359   ERRORS {
360     SystemFailure,
361     UnexpectedDataValue,
362     UnknownSubscriber}
363
364 -- IMEI management operations
365
366 CheckIMEI ::= OPERATION --Timer m
367   ARGUMENT
368     imei                      IMEI
369   RESULT
370     equipmentStatus            EquipmentStatus
371   ERRORS {
372     SystemFailure,
373     DataMissing,
374     UnknownEquipment}
375
376 -- subscriber management operations
377
378 InsertSubscriberData ::= OPERATION --Timer m
379   ARGUMENT
380     insertSubscriberDataArg   InsertSubscriberDataArg
381   RESULT
382     insertSubscriberDataRes  InsertSubscriberDataRes
383     -- optional
384   ERRORS {
385     DataMissing,
386     UnexpectedDataValue,
387     UnidentifiedSubscriber}
388
389 DeleteSubscriberData ::= OPERATION --Timer m
390   ARGUMENT
391     deleteSubscriberDataArg  DeleteSubscriberDataArg
392   RESULT
393     deleteSubscriberDataRes DeleteSubscriberDataRes
394     -- optional
395   ERRORS {
396     DataMissing,
397     UnexpectedDataValue,
398     UnidentifiedSubscriber}
399
400 -- fault recovery operations
401
402 Reset ::= OPERATION --Timer m
403   ARGUMENT
404     resetArg                  ResetArg
405
406 ForwardCheckSS-Indication ::= OPERATION --Timer s
407
408 RestoreData ::= OPERATION --Timer m
409   ARGUMENT
410     restoreDataArg           RestoreDataArg
411   RESULT
412     restoreDataRes           RestoreDataRes
413   ERRORS {
414     SystemFailure,
415     DataMissing,
416     UnexpectedDataValue,
417     UnknownSubscriber}
418

```

```

419 -- gprs location information retrieval operations
420
421 SendRoutingInfoForGprs ::= OPERATION
422   ARGUMENT
423     sendRoutingInfoForGprsArg      SendRoutingInfoForGprsArg
424   RESULT
425     sendRoutingInfoForGprsRes    SendRoutingInfoForGprsRes
426   ERRORS {
427     AbsentSubscriber,
428     SystemFailure,
429     DataMissing,
430     UnexpectedDataValue,
431     UnknownSubscriber}
432
433 -- failure reporting operations
434
435 FailureReport ::= OPERATION
436   ARGUMENT
437     failureReportArg            FailureReportArg
438   RESULT
439     failureReportRes           FailureReportRes
440     -- optional
441   ERRORS {
442     SystemFailure,
443     DataMissing,
444     UnexpectedDataValue,
445     UnknownSubscriber}
446
447 -- gprs notification operations
448
449 NoteMsPresentForGprs ::= OPERATION
450   ARGUMENT
451     noteMsPresentForGprsArg    NoteMsPresentForGprsArg
452   RESULT
453     noteMsPresentForGprsRes  NoteMsPresentForGprsRes
454     -- optional
455   ERRORS {
456     SystemFailure,
457     DataMissing,
458     UnexpectedDataValue,
459     UnknownSubscriber}
460
461
462 NoteMM-Event ::= OPERATION
463   ARGUMENT
464     noteMM-EventArg            NoteMM-EventArg
465   RESULT
466     noteMM-EventRes           NoteMM-EventRes
467   ERRORS {
468     DataMissing,
469     UnexpectedDataValue,
470     UnknownSubscriber,
471     MM-EventNotSupported}
472
473 END

```

***** Next Modified Section *****

17.7.1 Mobile Service data types

```

1 MAP-MS-DataTypes {
2   ccitt identified-organization (4) etsi (0) mobileDomain (0)
3   gsm-Network (1) modules (3) map-MS-DataTypes (11) version6 (6)
4
5 DEFINITIONS
6
7 IMPLICIT TAGS
8
9 ::=
10
11 BEGIN
12
13 EXPORTS
14
15   -- location registration types
16   UpdateLocationArg,
17   UpdateLocationRes,

```

```

18 CancelLocationArg,
19 CancelLocationRes,
20 PurgeMS-Arg,
21 PurgeMS-Res,
22 SendIdentificationArg,
23 SendIdentificationRes,
24 UpdateGprsLocationArg,
25 UpdateGprsLocationRes,
26 IST-SupportIndicator,
27
28
29 -- handover types
30 PrepareHO-Arg,
31 PrepareHO-Res,
32 PrepareSubsequentHO-Arg,
33
34 -- authentication management types
35 SendAuthenticationInfoArg,
36 SendAuthenticationInfoRes,
37 AuthenticationFailureReportArg,
38 AuthenticationFailureReportRes,
39
40 -- security management types
41 EquipmentStatus,
42 Kc,
43
44 -- subscriber management types
45 InsertSubscriberDataArg,
46 InsertSubscriberDataRes,
47 DeleteSubscriberDataArg,
48 DeleteSubscriberDataRes,
49 SubscriberData,
50 ODB-Data,
51 SubscriberStatus,
52 ZoneCodeList,
53 maxNumOfZoneCodes,
54 O-CSI,
55 D-CSI,
56 O-BcsmCamelTDPCriteriaList,
57 T-BCSM-CAMEL-TDP-CriteriaList,
58 SS-CSI,
59 ServiceKey,
60 DefaultCallHandling,
61 CamelCapabilityHandling,
62 BasicServiceCriteria,
63 SupportedCamelPhases,
64 maxNumOfCamelTDPData,
65 CUG-Index,
66 CUG-Interlock,
67 InterCUG-Restrictions,
68 IntraCUG-Options,
69 IST-AlertTimerValue,
70 T-CSI,
71 T-BcsmTriggerDetectionPoint,
72
73 -- fault recovery types
74 ResetArg,
75 RestoreDataArg,
76 RestoreDataRes,
77
78 -- subscriber information enquiry types
79 ProvideSubscriberInfoArg,
80 ProvideSubscriberInfoRes,
81 SubscriberInfo,
82 LocationInformation,
83 SubscriberState,
84
85 -- any time information enquiry types
86 AnyTimeInterrogationArg,
87 AnyTimeInterrogationRes,
88
89 -- any time information handling types
90 AnyTimeSubscriptionInterrogationArg,
91 AnyTimeSubscriptionInterrogationRes,
92 AnyTimeModificationArg,
93 AnyTimeModificationRes,
94
95 -- subscriber data modification notification types
96 NoteSubscriberDataModifiedArg,

```

```

97     NoteSubscriberDataModifiedRes,
98
99     -- gprs location information retrieval types
100    SendRoutingInfoForGprsArg,
101    SendRoutingInfoForGprsRes,
102
103    -- failure reporting types
104    FailureReportArg,
105    FailureReportRes,
106
107    -- gprs notification types
108    NoteMsPresentForGprsArg,
109    NoteMsPresentForGprsRes,
110
111    -- Mobility Management types
112    NoteMM-EventArg,
113    NoteMM-EventRes
114
115
116
117 ;
118
119 IMPORTS
120     maxNumOfSS,
121     SS-SubscriptionOption,
122     SS-List,
123     SS-ForBS-Code,
124     Password
125 FROM MAP-SS-DataTypes {
126     ccitt identified-organization (4) etsi (0) mobileDomain (0)
127     gsm-Network (1) modules (3) map-SS-DataTypes (14) version6 (6)}
128
129     SS-Code
130 FROM MAP-SS-Code {
131     ccitt identified-organization (4) etsi (0) mobileDomain (0)
132     gsm-Network (1) modules (3) map-SS-Code (15) version6 (6)}
133
134     Ext-BearerServiceCode
135 FROM MAP-BS-Code {
136     ccitt identified-organization (4) etsi (0) mobileDomain (0)
137     gsm-Network (1) modules (3) map-BS-Code (20) version6 (6)}
138
139     Ext-TeleserviceCode
140 FROM MAP-TS-Code {
141     ccitt identified-organization (4) etsi (0) mobileDomain (0)
142     gsm-Network (1) modules (3) map-TS-Code (19) version6 (6)}
143
144
145     AddressString,
146     ISDN-AddressString,
147     ISDN-SubaddressString,
148     ExternalSignalInfo,
149     IMSI,
150     TMSI,
151     HLR-List,
152     LMSI,
153     Identity,
154     GlobalCellId,
155     CellIdOrLAI,
156     Ext-BasicServiceCode,
157     NAEA-PreferredCI,
158     EMLPP-Info,
159     SubscriberIdentity,
160     AgeOfLocationInformation,
161     LCSClientExternalID,
162     LCSClientInternalID
163
164
165
166 FROM MAP-CommonDataTypes {
167     ccitt identified-organization (4) etsi (0) mobileDomain (0)
168     gsm-Network (1) modules (3) map-CommonDataTypes (18) version6 (6)}
169
170     ExtensionContainer
171 FROM MAP-ExtensionDataTypes {
172     ccitt identified-organization (4) etsi (0) mobileDomain (0)
173     gsm-Network (1) modules (3) map-ExtensionDataTypes (21) version6 (6)}
174
175     AbsentSubscriberDiagnosticSM

```

```

176 FROM MAP-ER-DataTypes {
177   ccitt identified-organization (4) etsi (0) mobileDomain (0)
178   gsm-Network (1) modules (3) map-ER-DataTypes (17) version6 (6)
179
180 ;
181
182
183
184 -- location registration types
185
186 UpdateLocationArg ::= SEQUENCE {
187   imsi                               IMSI,
188
189   msc-Number                         [1] ISDN-AddressString,
190   vlr-Number                          ISDN-AddressString,
191   lmsi                                [10] LMSI OPTIONAL,
192   extensionContainer                  ExtensionContainer           OPTIONAL,
193   ... ,
194   vlr-Capability                     [6] VLR-Capability          OPTIONAL }
195
196 VLR-Capability ::= SEQUENCE{
197   supportedCamelPhases              [0] SupportedCamelPhases    OPTIONAL,
198   extensionContainer                ExtensionContainer           OPTIONAL,
199   ... ,
200   solsaSupportIndicator            [2] NULL                   OPTIONAL,
201   istSupportIndicator               [1] IST-SupportIndicator    OPTIONAL,
202   superChargerSupportedInServingNetworkEntity [3] SuperChargerInfo    OPTIONAL }
203
204 SuperChargerInfo ::= CHOICE {
205   sendSubscriberData                [0] NULL,
206   subscriberDataStored              [1] AgeIndicator }
207
208 AgeIndicator ::= OCTET STRING (SIZE (1..6))
209   -- The internal structure of this parameter is implementation specific.
210
211
212 IST-SupportIndicator ::= ENUMERATED {
213   basicISTSupported                 (0),
214   istCommandSupported               (1), ... }
215   -- exception handling:
216   -- reception of values > 1 shall be mapped to ' istCommandSupported '
217
218
219 UpdateLocationRes ::= SEQUENCE {
220   hlr-Number                        ISDN-AddressString,
221
222   extensionContainer                ExtensionContainer           OPTIONAL,
223   ... }
224
225 CancellLocationArg ::= [3] SEQUENCE {
226   identity                           Identity,
227   cancellationType                  CancellationType          OPTIONAL,
228   extensionContainer                ExtensionContainer           OPTIONAL,
229   ... }
230
231
232 CancellationType ::= ENUMERATED {
233   updateProcedure                   (0),
234   subscriptionWithdraw             (1),
235   ... }
236   -- The HLR shall not send values other than listed above
237
238
239 CancellLocationRes ::= SEQUENCE {
240   extensionContainer                ExtensionContainer           OPTIONAL,
241   ... }
242
243 PurgeMS-Arg ::= [3] SEQUENCE {
244   imsi                               IMSI,
245   vlr-Number                         [0] ISDN-AddressString    OPTIONAL,
246   sgsn-Number                        [1] ISDN-AddressString    OPTIONAL,
247   extensionContainer                  ExtensionContainer           OPTIONAL,
248   ... }
249

```

```

250 PurgeMS-Res ::= SEQUENCE {
251   freezeTMSI                               [0] NULL                                OPTIONAL,
252   freezeP-TMSI                             [1] NULL                                OPTIONAL,
253   extensionContainer                      ExtensionContainer                         OPTIONAL,
254   ...
255 }
256 SendIdentificationArg ::= SEQUENCE {
257   tmsi                                     TMSI,
258   numberRequestedVectors      NumberOfRequestedVectors,
259   segmentationProhibited    NULL                                OPTIONAL,
260   -- if segmentation is prohibited the previous VLR shall not send the result
261   -- within a TC-CONTINUE message.
262   extensionContainer                  ExtensionContainer                         OPTIONAL,
263   ...
264 }
265 SendIdentificationRes ::= [3] SEQUENCE {
266   imsi                                     IMSI
267   -- IMSI must be present if SendIdentificationRes is not segmented.
268   -- If the TC-Continue segmentation option is taken the IMSI must be
269   -- present in one segmented transmission of SendIdentificationRes.
270   authenticationSetList       AuthenticationSetList          OPTIONAL,
271   extensionContainer                  [2] ExtensionContainer        OPTIONAL,
272   ...
273 }
274 -- authentication management types
275
276 AuthenticationSetList ::= CHOICE {
277   tripletList                           [0] TripletList,
278   quintupletList                      [1] QuintupletList }
279
280 TripletList ::= SEQUENCE SIZE (1..5) OF
281   AuthenticationTriplet
282
283 QuintupletList ::= SEQUENCE SIZE (1..5) OF
284   AuthenticationQuintuplet
285
286 AuthenticationTriplet ::= SEQUENCE {
287   rand                                    RAND,
288   sres                                    SRES,
289   kc                                      Kc,
290   ...
291 }
292 AuthenticationQuintuplet ::= SEQUENCE {
293   rand                                    RAND,
294   xres                                    XRES,
295   ck                                      CK,
296   ik                                      IK,
297   autn                                    AUTN,
298   ...
299 }
300 RAND ::= OCTET STRING (SIZE (16))
301
302 SRES ::= OCTET STRING (SIZE (4))
303
304 Kc ::= OCTET STRING (SIZE (8))
305
306 XRES ::= OCTET STRING (SIZE (4..16))
307
308 CK ::= OCTET STRING (SIZE (16))
309
310 IK ::= OCTET STRING (SIZE (16))
311
312 AUTN ::= OCTET STRING (SIZE (14..18))
313
314 AUTS ::= OCTET STRING (SIZE (12..16))
315
316 AuthenticationFailureReportArg ::= SEQUENCE {
317   imsi                                     IMSI,
318   failureCause                FailureCause
319   extensionContainer                  ExtensionContainer                         OPTIONAL,
320   ...
321 }
322 AuthenticationFailureReportRes ::= SEQUENCE {
323   extensionContainer                  ExtensionContainer                         OPTIONAL,
324   ...
325 }
```

```

326 FailureCause ::= ENUMERATED {
327   wrongUserResponse (0),
328   wrongNetworkSignature (1)}
329
330 -- gprs location registration types

```

***** Next New Section *****

25.5.7 Process Authentication_Failure_Report

25.5.7.1 General

The Authentication Failure Report procedure is used to notify a HLR about the occurrence of an authentication failure in the SGSN or VLR.

The procedure is shown in figure 25.5/7.

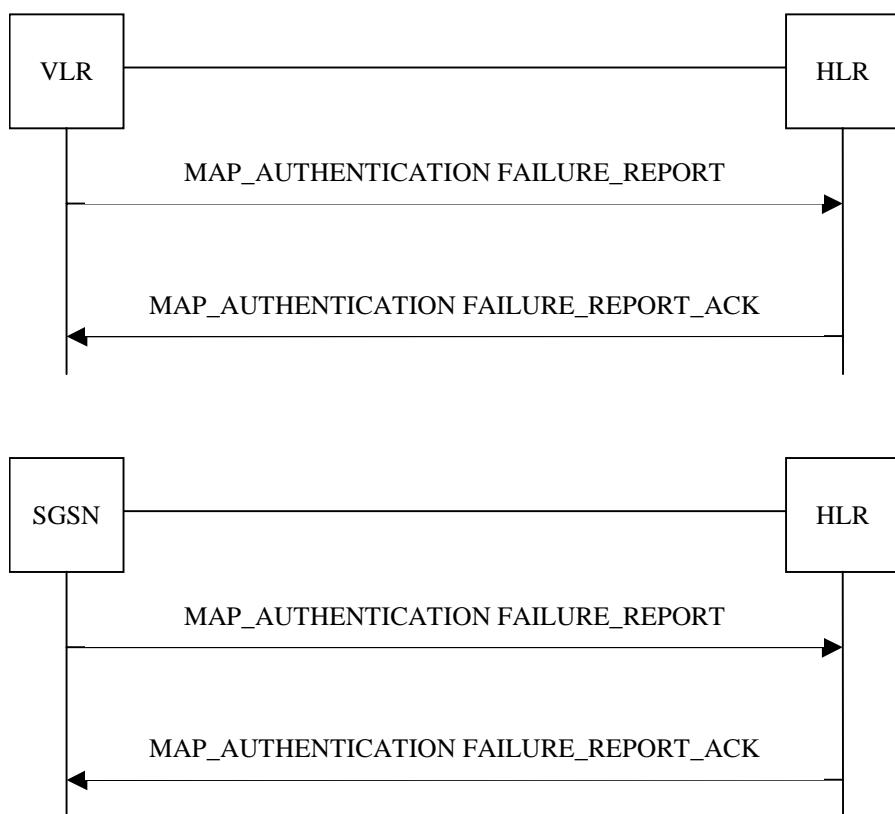


Figure 25.6/7: Message Flows to Authentication Failure Report

25.5.7.2 Process in the VLR

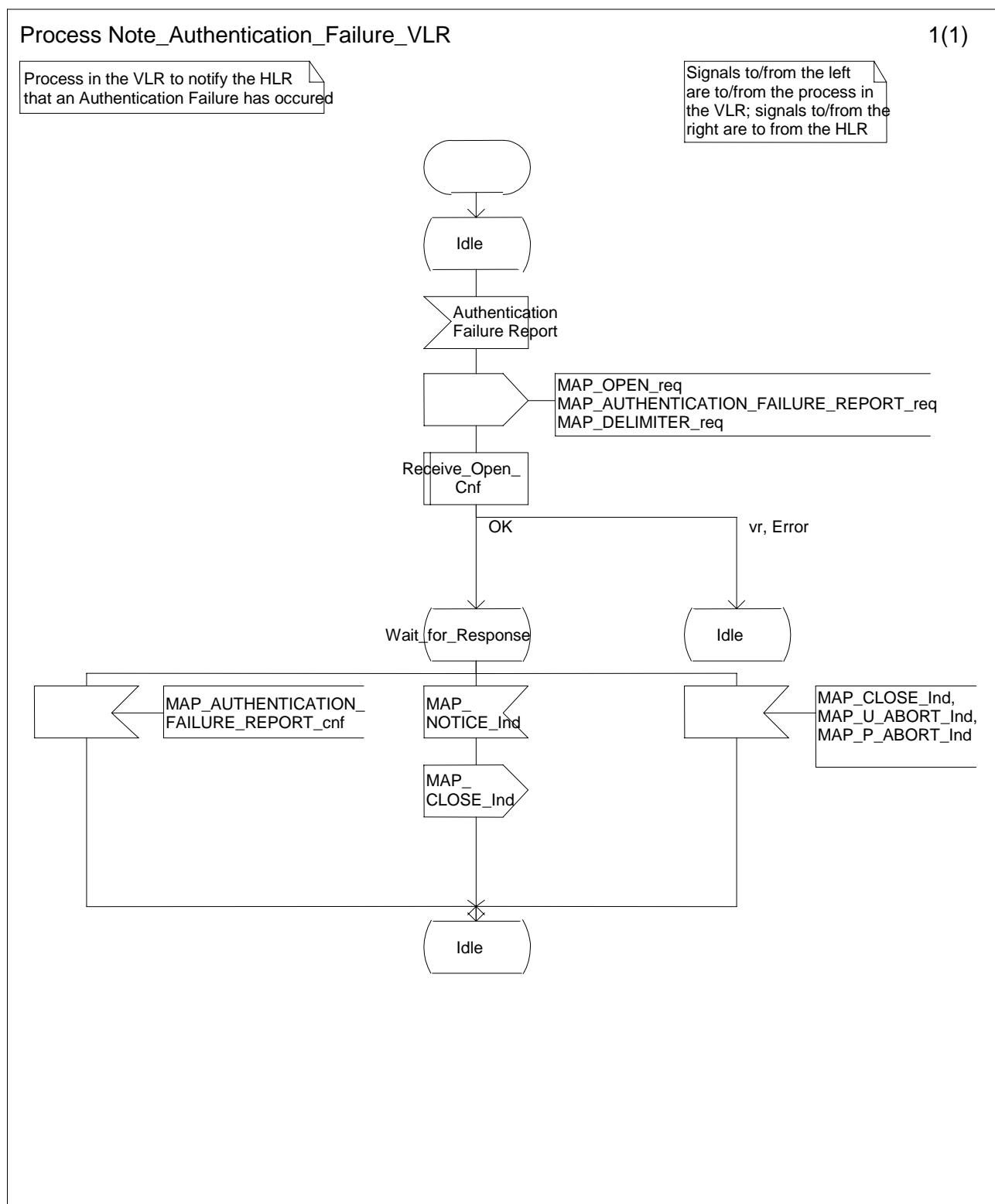


Figure 25.6/8: Process Note_Authentication_Failure_VLR

25.5.7.3 Process in the SGSN

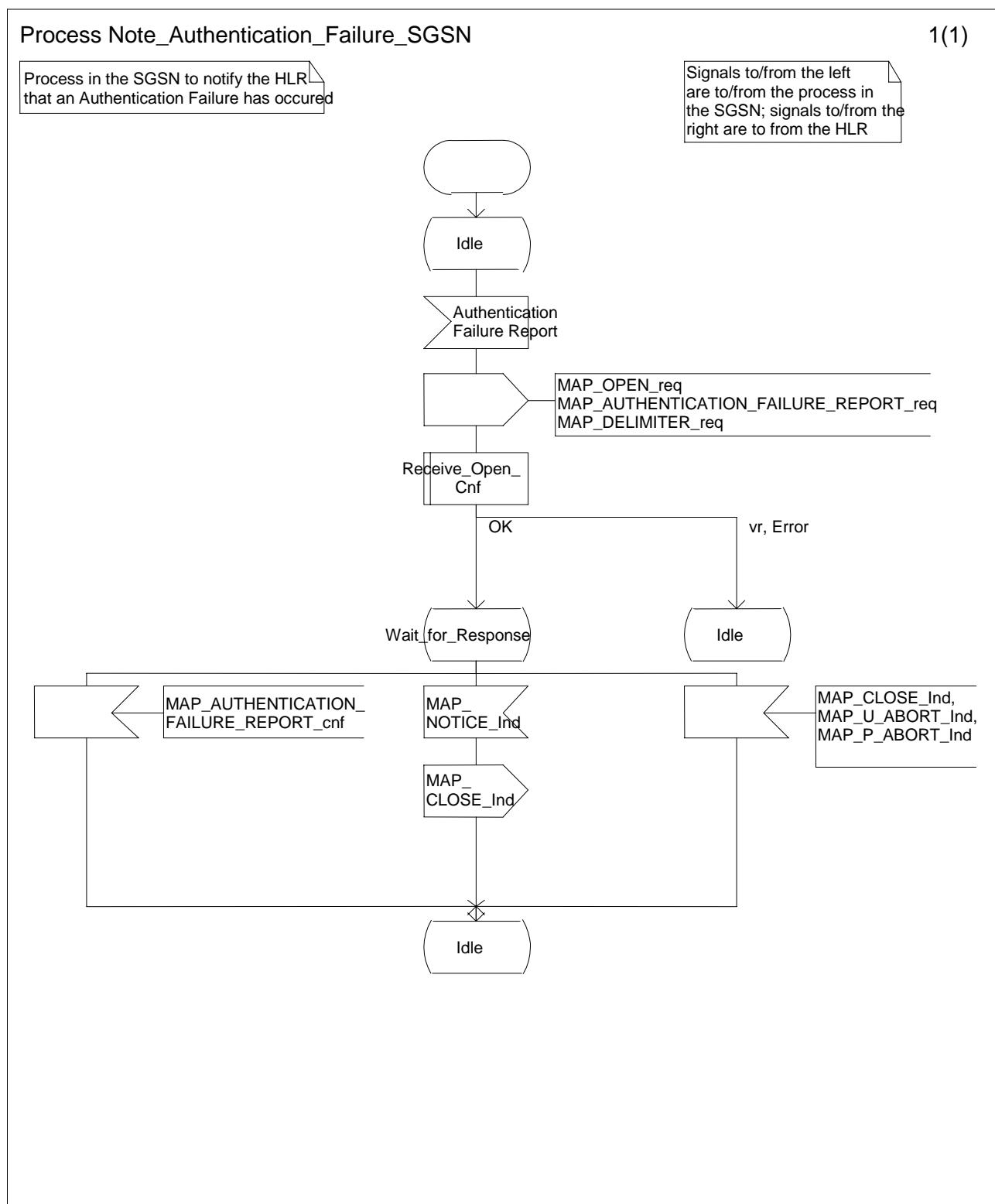


Figure 25.6/9: Process Note_Authentication_Failure_SGSN

25.5.7.4 Process in the HLR

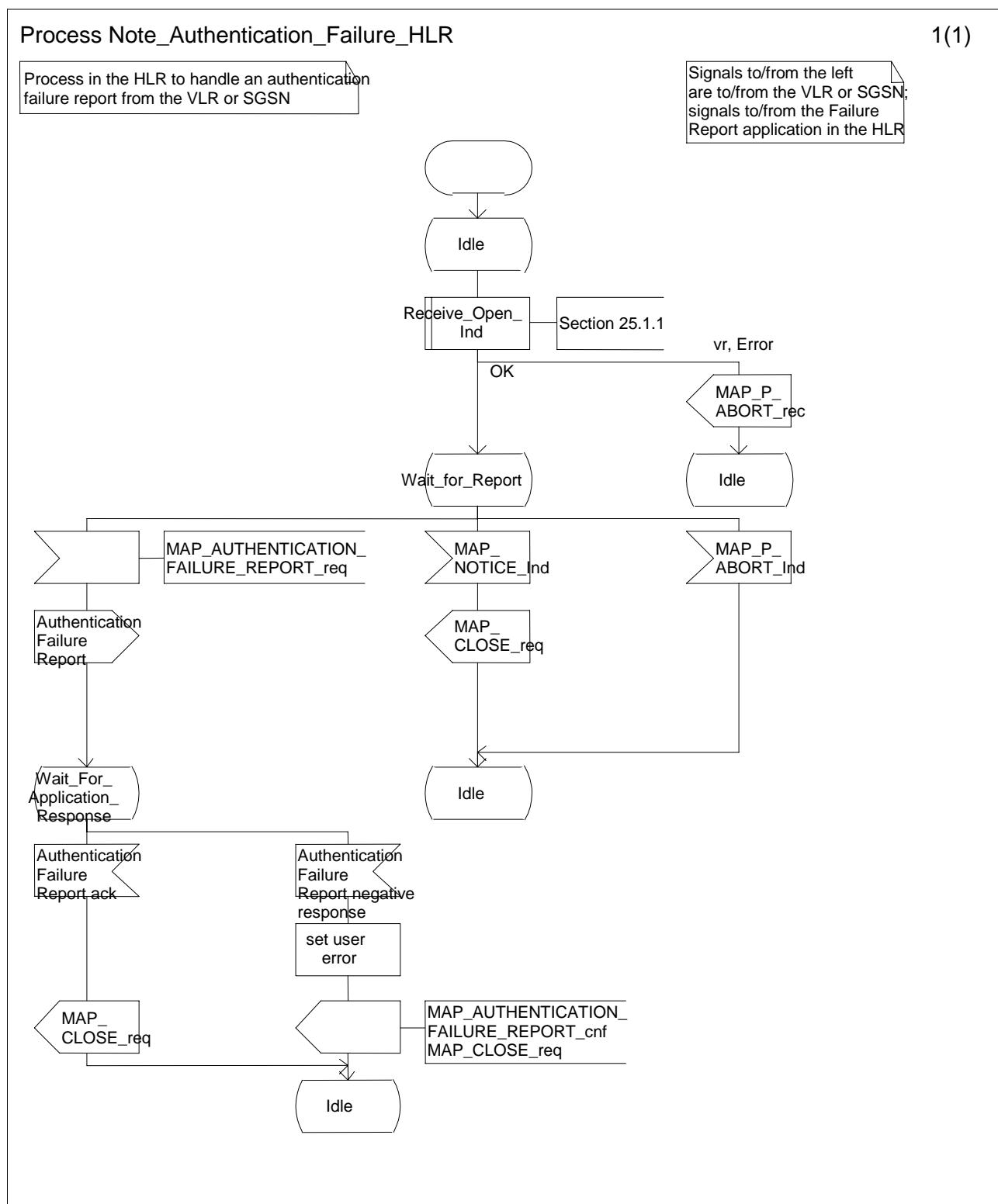


Figure 25.6/10: Process Note_Authentication_Failure_HLR

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

29.060 CR 080r2

Current Version: 3.3.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑

↑ CR number as allocated by MCC support team

For submission to: CN#7
list expected approval meeting # here ↑

for approval
for information

strategic
non-strategic (for SMG use only)

Form: CR cover sheet, version 2 for 3GPP and SMG The latest version of this form is available from: <ftp://ftp.3gpp.org/Information/CR-Form-v2.doc>

Proposed change affects: (U)SIM ME UTRAN / Radio Core Network
(at least one should be marked with an X)

Source: N2

Date: 2000-03-02

Subject: GTP Security

Work item: GTP Enhancements

Category:
(only one category shall be marked with an X)
F Correction
A Corresponds to a correction in an earlier release
B Addition of feature
C Functional modification of feature
D Editorial modification

<input type="checkbox"/>	Release: Phase 2
<input type="checkbox"/>	Release 96
<input type="checkbox"/>	Release 97
<input checked="" type="checkbox"/>	Release 98
<input type="checkbox"/>	Release 99
<input type="checkbox"/>	Release 00

Reason for change: The Security Group (S3) have requirements on the Core Network signalling protocols (MAP and GTP).

For GTP signalling it is proposed that, since IP is the transport technology used, IP Security shall be. A reference to 3G TS 33.102 is proposed to be made in a new section 13.3 on GTP Security.

Clauses affected: Clause 4 (changes), 13.3 (new)

Other specs affected: Other 3G core specifications Other GSM core specifications
MS test specifications BSS test specifications
O&M specifications → List of CRs: CR 33.102-xxx
→ List of CRs:
→ List of CRs:
→ List of CRs:
→ List of CRs:

Other comments: The CR to TS 33.102 is linked to this CR, i.e. the two CRs must be approved or rejected together as a package.



help.doc

<----- double-click here for help and instructions on how to create a CR.

4 General

This document defines the GPRS Tunnelling Protocol (GTP), i.e. the protocol between GPRS Support Nodes (GSNs) in the UMTS/GPRS backbone network. It includes both the GTP signalling (GTP-C) and data transfer (GTP-U) procedures. It also lists the messages and information elements used by the GTP based charging protocol GTP', which is described in GSM 12.15.

GTP is defined for the Gn interface, i.e. the interface between GSNs within a PLMN, and for the Gp interface between GSNs in different PLMNs. Only GTP-U is defined for the Iu interface between Serving GPRS Support Node (SGSN) and the UMTS Terrestrial Radio Access Network (UTRAN).

The Internet protocol (IP) is the transport network technology used to carry GTP. In order to secure GTP signalling IP Security is used.

On the Iu interface, the Radio Access Network Application Part (RANAP) protocol is performing the control function for GTP-U.

GTP' is defined for the interface between CDR generating functional network elements and Charging Gateway(s) within a PLMN. Charging Gateway(s) and GTP' protocol are optional, as the Charging Gateway Functionalities may either be located in separate network elements (Charging Gateways), or alternatively be embedded into the CDR generating network elements (GSNs) when the GSN-CGF interface is not necessarily visible outside the network element. These interfaces relevant to GTP are between the grey boxes shown in the figure below.

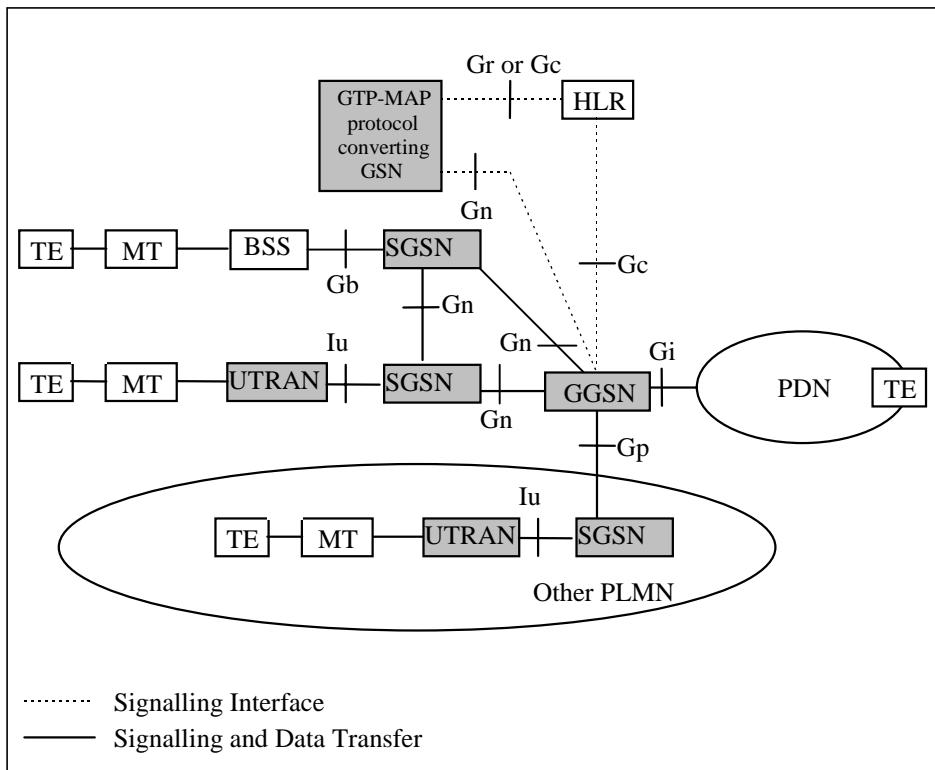


Figure 1: GPRS Logical Architecture with interface name denotations

GTP allows multiprotocol packets to be tunnelled through the UMTS/GPRS Backbone between GSNs and between SGSN and UTRAN.

In the signalling plane, GTP specifies a tunnel control and management protocol (GTP-C) which allows the SGSN to provide packet data network access for an MS. Signalling is used to create, modify and delete tunnels.

In the transmission plane, GTP uses a tunnelling mechanism (GTP-U) to provide a service for carrying user data packets. The choice of path is dependent on whether the user data to be tunnelled requires a reliable link or not.

The GTP-U protocol is implemented by SGSNs and GGSNs in the UMTS/GPRS Backbone and by Radio Network Controllers (RNCs) in the UTRAN. The GTP-C protocol is implemented by SGSNs and GGSNs in the UMTS/GPRS Backbone. No other systems need to be aware of GTP. UMTS/GPRS MSs are connected to an SGSN without being aware of GTP.

It is assumed that there will be a many-to-many relationship between SGSNs and GGSNs. A SGSN may provide service to many GGSNs. A single GGSN may associate with many SGSNs to deliver traffic to a large number of geographically diverse mobile stations.

SGSN and GGSN implementing GTP protocol version 1 should be able to fallback to GTP protocol version 0. All GSNs should be able to support all earlier GTP versions.

**** Next Change ****

13.3 GTP Security

In order to secure GTP signalling IP Security mechanisms ~~is~~are used. The requirements on GTP Security and the mechanisms to be used are further described in 3G TS 33.102 “3G Security: Security Architecture” [18].

CHANGE REQUEST

29.060 CR 082r1

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

Current Version: 3.3.1

GSM (AA.BB) or 3G (AA.BBB) specification number ↑

↑ CR number as allocated by MCC support team

For submission to: **CN#07**
list expected approval meeting # here ↑

for approval
for information

strategic (for SMG use only)
non-strategic

Form: CR cover sheet, version 2 for 3GPP and SMG The latest version of this form is available from: [ftp://ftp.3gpp.org/Information/CR-Form-v2.doc](http://ftp.3gpp.org/Information/CR-Form-v2.doc)

Proposed change affects: (U)SIM ME UTRAN / Radio Core Network
(at least one should be marked with an X)

Source: N2

Date: 01.03.00

Subject: Introduction of Enhanced User Identity Confidentiality

Work item: Security

Category: (only one category shall be marked with an X)
F Correction
A Corresponds to a correction in an earlier release
B Addition of feature
C Functional modification of feature
D Editorial modification

Release: Phase 2
Release 96
Release 97
Release 98
Release 99
Release 00

Reason for change: This CR introduces the changes required for Enhanced User Identity Confidentiality.

Clauses affected:

Other specs	Other 3G core specifications	<input checked="" type="checkbox"/>	→ List of CRs: 23.002-???, 23.003-015, 23.008-???, 23.012-003, 23.060-???, 24.008-???, 25.331-???, 29.002-092, 31.102-???, 33.103-???, 33.105-???
affected:	Other GSM core specifications MS test specifications BSS test specifications O&M specifications	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	→ List of CRs: → List of CRs: → List of CRs: → List of CRs:

Other comments: The Type allocation for the new parameter TEMSI needs to be done if the CR is incorporated in the specification.



help.doc



***** First Modified Section *****

7.5.2 Identification Response

The old SGSN shall send an Identification Response to the new SGSN as a response to a previous Identification Request.

Possible Cause values are:

- ‘Request Accepted’
- ‘IMSI not known’
- ‘System failure’
- ‘Mandatory IE incorrect’
- ‘Mandatory IE missing’
- ‘Optional IE incorrect’
- ‘Invalid message format’
- ‘Version not supported’
- ‘P-TMSI Signature mismatch’

Only the Cause information element shall be included in the response if the Cause contains another value than ‘Request accepted’.

The IMSI information element is mandatory if the Cause contains the value ‘Request accepted’.

The TEMSI information element shall be included if a TEMSI was stored in the old SGSN and the Cause contains the value ‘Request accepted’.

One or several Authentication Triplet information elements or up to 5 Authentication Quintuplet information elements may be included in the message if the Cause contains the value ‘Request accepted’.

The optional Private Extension contains vendor or operator specific information.

Table 28: Information elements in an Identification Response

Information element	Presence requirement	Reference
Cause	Mandatory	7.7.1
IMSI	Conditional	7.7.2
Authentication Triplet	Conditional	7.7.7
Authentication Quintuplet	Optional	7.7.27
TEMSI	Conditional	7.7.35
Private Extension	Optional	7.7.26

***** New Section *****

7.7.35 Temporarily Encrypted Mobile Subscriber Identity (TEMSI)

The TEMSI information element is given by:

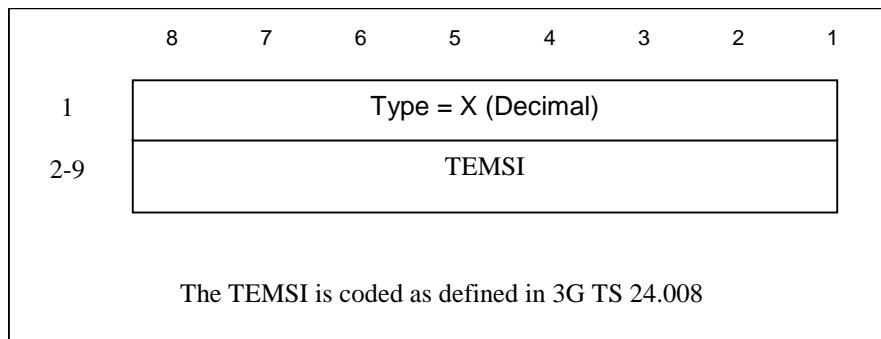


Figure 49: TEMSI information element