

CR-Form-v7	
CHANGE REQUEST	
# 29.002 CR 473 # rev 3 #	Current version: 5.2.0 #

For **HELP** on using this form, see bottom of this page or look at the pop-up text over the # symbols.

Proposed change affects: UICC apps# ME Radio Access Network Core Network

Title:	# Available codecs list and selected codec indication		
Source:	# Nokia		
Work item code:	# OoBTC	Date:	# 29/08/2002
Category:	# F	Release:	# Rel-5
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	F (correction)		2 (GSM Phase 2)
	A (corresponds to a correction in an earlier release)		R96 (Release 1996)
	B (addition of feature),		R97 (Release 1997)
	C (functional modification of feature)		R98 (Release 1998)
	D (editorial modification)		R99 (Release 1999)
	Detailed explanations of the above categories can be found in 3GPP TR 21.900.		Rel-4 (Release 4)
			Rel-5 (Release 5)
			Rel-6 (Release 6)

Reason for change:	# Currently it is defined in 23.009 that during inter-MSC relocation '3G_MSC-A shall configure the RANAP RAB parameters according to the current selected codec'. However, since this codec is not indicated to 3G_MSC-B, it has no possibility to know which codec is in question. Any method based on reverse deducing of the codec (i.e. based on received RAB parameters) in 3G_MSC-B is not seen viable, since it is possible similar RAB parameters result from different codecs. Note that it is essential for 3G_MSC-B to know the current selected codec and available codecs for it to be able to allocate a correct transcoder in 3G_MSC/MGW. In R99 this problem does not exist since UMTS_AMR is the only possible codec. However, in later releases other codecs are possible as well and the currently specified relocation procedure is clearly requiring a correction.
	The 3G_MSC-A has to know if the 3G_MSC-B does not support codec selection based on current selected and available codecs (e.g. target MSC is R99 MSC), in which case 3G_MSC-A has to generate RAB parameters based on UMTS_AMR / UMTS_AMR2 codec. This will be achieved by introducing new application context version (version 4) for Handover Control Context.
	In addition, the 3G_MSC-B needs to know the set of available UMTS codecs due to potential subsequent intersystem handover to UMTS within 3G_MSC-B.
	MSC-A/3G_MSC-A needs to always know the selected codec for subsequent relocation and charging purposes. This will be achieved by introducing new service MAP_CODEEC_CHANGE.
Summary of change:	#
Consequences if not approved:	# Inter-MSC relocation procedure fails at user plane when different codec than UMTS_AMR/UMTS_AMR2 is originally in use at 3G_MSC-A, since 3G_MSC-B assumes

Clauses affected: ⌘ 7.6.6, 8.4.1, 8.4.4, 8.4.8, 17.1.6, 17.2.2.12, 17.3.2.12, 17.3.3, 17.5, 17.6.1, 17.7.1, 19.2.2.3, 19.2.3.4

	Y	N		⌘
Other specs affected:	X		Other core specifications	23.009 CR 073
		X	Test specifications	
		X	O&M Specifications	

Other comments: ⌘

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at <http://www.3gpp.org/specs/CR.htm>. Below is a brief summary:

- 1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.
- 2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under <ftp://ftp.3gpp.org/specs/>. For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.
- 3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

7.6.6 Radio parameters

7.6.6.1 - 7.6.6.4 Void

7.6.6.5 BSSMAP Service Handover

This parameter refers to the Service Handover information element defined in 3GPP TS 48.008

7.6.6.6 RANAP Service Handover

This parameter refers to the Service Handover information element defined in 3GPP TS 25.413.

7.6.6.7 HO-Number Not Required

This parameter indicates that no handover or relocation number allocation is necessary.

7.6.6.8 Integrity Protection Information

This parameter refers to the Integrity Protection Information element defined in 3G TS 25.413.

7.6.6.9 Encryption Information

This parameter refers to the Encryption Information element defined in 3G TS 25.413.

7.6.6.10 Radio Resource Information

This parameter refers to the Channel Type information element defined in 3GPP TS 48.008 [49].

7.6.6.10A Radio Resource List

This parameter refers to list of RAB-id's and their associated Channel Type information elements defined in 3G TS 48.008.

7.6.6.10B Chosen Radio Resource Information

This parameter refers to the Chosen Channel and Speech Version information elements defined in 3G TS 48.008.

7.6.6.11 Key Status

This parameter refers to the Key Status element defined in 3G TS 25.413.

7.6.6.12 Selected UMTS Algorithms

This parameters identifies the UMTS integrity and optionally encryption algorithms selected by MSC-B. Coding of this parameter is defined in 3G TS 25.413.

7.6.6.13 Allowed GSM Algorithms

This parameters identifies the allowed GSM algorithms in MSC-B. Coding of this parameter is defined in 3G TS 48.008.

7.6.6.14 Allowed UMTS Algorithms

This parameters identifies the allowed UMTS algorithms in MSC-B. Coding of this parameter is defined in 3G TS 25.413.

7.6.6.15 Selected GSM Algorithm

This parameter identifies the GSM algorithm selected by GSM BSC controlled by MSC-B. Coding of this parameter is defined in 3G TS 48.008.

7.6.6.16 Currently Used Codec

This parameter indicates the currently used codec in MSC-A.

7.6.6.17 Available Codecs List

This parameter indicates the available codecs in the MSC-A and the associated modes in priority order (the first entry being the highest priority codec). MSC-B uses this information to select the associated transcoder resources.

7.6.6.18 Selected Codec

This parameter indicates the codec selected by MSC-B.

7.6.6.19 Proposed Codec

This parameter indicates the codec MSC-B proposes to MSC-A to be taken into use as a result of TFO protocol.

****** NEXT MODIFIED SECTION ******

8.4.1 MAP_PREPARE_HANDOVER service

8.4.1.1 Definition

This service is used between MSC-A and MSC-B (E-interface) when a call is to be handed over or relocated from MSC-A to MSC-B.

The MAP_PREPARE_HANDOVER service is a confirmed service using the primitives from table 8.4/1.

8.4.1.2 Service primitives

Table 8.4/1: MAP_PREPARE_HANDOVER

Parameter name	Request	Indication	Response	Confirm
Invoke Id	M	M(=)	M(=)	M(=)
Target Cell Id	C	C(=)		
Target RNC Id	C	C(=)		
HO-NumberNotRequired	C	C(=)		
IMSI	C	C(=)		
Integrity Protection Information	C	C(=)		
Encryption Information	C	C(=)		
Radio Resource Information	C	C(=)		
AN-APDU	C	C(=)	C	C(=)
Allowed GSM Algorithms	C	C(=)		
Allowed UMTS Algorithms	C	C(=)		
Radio Resource List	C	C(=)		
RAB ID	C	C(=)		
BSSMAP Service Handover	C	C(=)		
RANAP Service Handover	C	C(=)		
<u>Currently Used Codec</u>	<u>C</u>	<u>C(=)</u>		
<u>Available Codecs List</u>	<u>C</u>	<u>C(=)</u>		
Handover Number			C	C(=)
Relocation Number List			C	C(=)
Multicall Bearer Information			C	C(=)
Multiple Bearer Requested	C	C(=)		
Multiple Bearer Not Supported			C	C(=)
Selected UMTS Algorithms			C	C(=)
Chosen Radio Resource Information			C	C(=)
<u>Selected Codec</u>			<u>C</u>	<u>C(=)</u>
User error			C	C(=)
Provider error				O

8.4.1.3 Parameter use

Invoke Id

For definition of this parameter see clause 7.6.1.

Target Cell Id

For definition of this parameter see clause 7.6.2. This parameter is only included if the service is not in an ongoing transaction. This parameter shall also be excluded if the service is a part of the Inter-MSC SRNS Relocation procedure or the inter-system handover GSM to UMTS procedure described in 3G TS 23.009.

Target RNC Id

For definition of this parameter see clause 7.6.2. This parameter shall be included if the service is a part of the Inter-MSC SRNS Relocation procedure or the inter-system handover GSM to UMTS procedure described in 3G TS 23.009.

HO-Number Not Required

For definition of this parameter see clause 7.6.6.

IMSI

For definition of this parameter see clause 7.6.2. This UMTS parameter shall be included if:

- available and
- if the access network protocol is BSSAP and
- there is an indication that the MS also supports UMTS.

Integrity Protection Information

For definition of this parameter see clause 7.6.6. This UMTS parameter shall be included if available and if the access network protocol is BSSAP.

Encryption Information

For definition of this parameter see clause 7.6.6. This UMTS parameter shall be included if available and if the access network protocol is BSSAP.

Radio Resource Information

For definition of this parameter see clause 7.6.6. This GSM parameter shall be included if the access network protocol is RANAP and there is an indication that the UE also supports GSM. If the parameter Radio Resource List is sent, the parameter Radio Resource Information shall not be sent.

AN-APDU

For definition of this parameter see clause 7.6.9.

Allowed GSM Algorithms

For definition of this parameter see clause 7.6.6. This parameter includes allowed GSM algorithms. This GSM parameter shall be included if:

- the service is a part of the Inter-MSC SRNS Relocation procedure and
- Ciphering or Security Mode Setting procedure has been performed, and
- there is an indication that the UE also supports GSM.

Allowed UMTS Algorithms

For definition of this parameter see clause 7.6.6. This UMTS parameter shall be included if all of the following conditions apply:

- access network protocol is BSSAP and
- Integrity Protection Information and Encryption Information are not available and

Ciphering or Security Mode Setting procedure has been performed.

Radio Resource List

For definition of this parameter see clause 7.6.6. This parameter shall be included if the access network protocol is RANAP and there is an indication that the UE also supports GSM. This parameter shall be sent when MSC-A requests multiple bearers to MSC-B. If the parameter Radio Resource Information is sent, the parameter Radio Resource List shall not be sent.

RAB ID

For definition of this parameter see subclause 7.6.2. This parameter shall be included when MSC-A supports multiple bearers and access network protocol is BSSAP and the RAB ID has a value other than 1.

BSSMAP Service Handover

For definition of this parameter see clause 7.6.6. It shall be present if it is available.

RANAP Service Handover

For definition of this parameter see clause 7.6.6. It shall be present if it is available.

Currently Used Codec

For definition of this parameter see subclause 7.6.6. This parameter shall be included if the call is a speech call.

Available Codecs List

For definition of this parameter see subclause 7.6.6. This parameter shall be included if the call is a speech call and the Currently Used Codec, if available, is not the only available codec. This parameter shall not be available if Currently Used Codec is not available.

Handover Number

For definition of this parameter see clause 7.6.2. This parameter shall be returned at handover, unless the parameter HO-NumberNotRequired is sent. If the parameter Handover Number is returned, the parameter Relocation Number List shall not be returned.

Relocation Number List

For definition of this parameter see clause 7.6.2. This parameter shall be returned at relocation, unless the parameter HO-NumberNotRequired is sent. If the parameter Relocation Number List is returned, the parameter Handover Number shall not be returned.

Multicall Bearer Information

For a definition of this parameter see clause 7.6.2. This parameter shall be returned at relocation in the case that MSC-B supports multiple bearers.

Multiple Bearer Requested

For a definition of this parameter see clause 7.6.2. This parameter shall be sent when MSC-A requests multiple bearers to MSC-B.

Multiple Bearer Not Supported

For a definition of this parameter see clause 7.6.2. This parameter shall be returned at relocation when MSC-B receives Multiple Bearer Requested parameter and MSC-B does not support multiple bearers.

Selected UMTS Algorithms

For definition of this parameter see clause 7.6.6. This parameters includes the UMTS integrity and optionally encryption algorithms selected by RNC under the control of MSC-B. This UMTS parameter shall be included if the service is a part of the inter MSC inter system handover from GSM to UMTS.

Chosen Radio Resource Information

For definition of this parameter see clause 7.6.6. This parameter shall be returned at relocation if the encapsulated PDU is RANAP RAB Assignment Response and MS is in GSM access.

Selected Codec

For definition of this parameter see subclause 7.6.6. This parameter shall be included always if MSC-B supports the selection of codec based on Available Codecs List, even if Selected Codec is equal to the Currently Used Codec received in the service request. This parameter shall not be included if Available Codecs List was not received in the service request.

User error

For definition of this parameter see clause 7.6.1. The following errors defined in clause 7.6.1 may be used, depending on the nature of the fault:

- No handover number available.
- Target cell outside group call area;
- System failure.
- Unexpected data value.
- Data Missing.

Provider error

See definition of provider errors in clause 7.6.1.

****** NEXT MODIFIED SECTION ******

8.4.4 MAP_FORWARD_ACCESS_SIGNALLING service

8.4.4.1 Definition

This service is used between MSC-A and MSC-B (E-interface) to pass information to be forwarded to the A-interface or Iu-interface of MSC-B.

The MAP_FORWARD_ACCESS_SIGNALLING service is a non-confirmed service using the primitives from table 8.4/4.

8.4.4.2 Service primitives

Table 8.4/4: MAP_FORWARD_ACCESS_SIGNALLING

Parameter name	Request	Indication
Invoke Id	M	M(=)
Integrity Protection Information	C	C(=)
Encryption Information	C	C(=)
Key Status	C	C(=)
AN-APDU	M	M(=)
Allowed GSM Algorithms	C	C(=)
Allowed UMTS Algorithms	C	C(=)
Radio Resource Information	C	C(=)
Radio Resource List	C	C(=)
BSSMAP Service Handover	C	C(=)
RANAP Service Handover	C	C(=)
Currently Used Codec	C	C(=)
Available Codecs List	C	C(=)

8.4.4.3 Parameter use

For the definition and use of all parameters and errors, see clause 7.6.1.

Invoke Id

For definition of this parameter see clause 7.6.1.

Integrity Protection Information

For definition of this parameter see clause 7.6.6. This UMTS parameter shall be included if available and if the encapsulated PDU is BSSMAP Cipher Mode Command.

Encryption Information

For definition of this parameter see clause 7.6.6. This UMTS parameter shall be included if available and if the encapsulated PDU is BSSMAP Cipher Mode Command.

Key Status

For definition of this parameter see clause 7.6.6. This UMTS parameter shall be included if available and if the encapsulated PDU is BSSMAP Cipher Mode Command.

AN-APDU

For definition of this parameter see clause 7.6.9.

Allowed GSM Algorithms

This parameters includes allowed GSM algorithms. This GSM parameter shall be included if the encapsulated PDU is RANAP Security Mode Command and there is an indication that the UE also supports GSM.

Allowed UMTS Algorithms

For definition of this parameter see clause 7.6.6. This UMTS parameter shall be included if Integrity Protection Information and Encryption Information are not available and the encapsulated PDU is BSSMAP Cipher Mode Command.

Radio Resource Information

For definition of this parameter see clause 7.6.6. This parameter shall be sent if the encapsulated PDU is RANAP RAB Assignment Request. If the parameter Radio Resource List is sent, the parameter Radio Resource Information shall not be sent.

Radio Resource List

For definition of this parameter see clause 7.6.6. This parameter shall be sent if the encapsulated PDU is RANAP RAB Assignment Request and MSC-A requests modification of multiple bearers. If the parameter Radio Resource Information is sent, the parameter Radio Resource List shall not be sent.

BSSMAP Service Handover

For definition of this parameter see clause 7.6.6. It shall be present if it is available and the encapsulated PDU is RANAP RAB Assignment Request or BSSMAP Assignment Request.

RANAP Service Handover

For definition of this parameter see clause 7.6.6. It shall be present if it is available and the encapsulated PDU is BSSMAP Assignment Request or RANAP RAB Assignment Request.

Currently Used Codec

For definition of this parameter see subclause 7.6.6. This parameter shall be included if the encapsulated PDU is RANAP RAB Assignment Request and the bearer is modified from data to speech.

Available Codecs List

For definition of this parameter see subclause 7.6.6. This parameter shall be included if the encapsulated PDU is RANAP RAB Assignment Request, the bearer is modified from data to speech and the Currently Used Codec, if available, is not the only available codec. This parameter shall not be included if Available Codecs List was not received in the service request.

****** NEXT MODIFIED SECTION ******

8.4.8 MAP CODEC CHANGE service

8.4.8.1 Definition

This service is used between MSC-B and MSC-A (E-interface) to pass information about codec change or proposed codec change in MSC-B.

The MAP CODEC CHANGE service is a non-confirmed service using the primitives from table 8.4/8.

8.4.8.2 Service primitives

Table 8.4/8: MAP CODEC CHANGE

<u>Parameter name</u>	<u>Request</u>	<u>Indication</u>
<u>Invoke Id</u>	<u>M</u>	<u>M(=)</u>
<u>Selected Codec</u>	<u>C</u>	<u>C(=)</u>
<u>Proposed Codec</u>	<u>C</u>	<u>C(=)</u>

8.4.8.3 Parameter use

Invoke Id

For definition of this parameter see clause 7.6.1.

Selected Codec

For definition of this parameter see subclause 7.6.6. This parameter shall be included if MSC-B changes the selected codec or in case of intersystem handover to UMTS is performed in MSC-B. This parameter shall not be present if parameter Proposed Codec is present.

Proposed Codec

For definition of this parameter see subclause 7.6.6. This parameter shall be included if MSC-B proposes to MSC-A to change the codec as a result of TFO protocol. This parameter shall not be present if parameter Selected Codec is present.

**** 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 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	v3 4	PrepareHandover forwardAccessSignalling sendEndSignal processAccessSignalling prepareSubsequentHandover <u>codecChange</u>	the syntax of this operation has been extended in comparison with release 98-9 version
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	

AC Name	AC Version	Operations Used	Comments
		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	v4	sendRoutingInfoForGprs	
FailureReportContext	v3	failureReport	
CallControlTransferContext	v4	resumeCallHandling	
SubscriberInfoEnquiryContext	v3	provideSubscriberInfo	
AnyTimeEnquiryContext	v3	anyTimeInterrogation	
AnyTimeInfoHandlingContext	v3	anyTimeSubscriptionInterrogation anyTimeModification	
ss-InvocationNotificationContext	v3	ss-InvocationNotification	
SIWFSAAllocationContext	v3	provideSIWFSSNumber 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	
SecureTransportHandlingContext	v3	secureTransportClass1 secureTransportClass2 secureTransportClass3 secureTransportClass4	

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

**** NEXT MODIFIED SECTION ****

17.2.2.12 Handover Control

This operation package includes the operations required for handover procedures between MSCs.

```
HandoverControlPackage-v34 ::= OPERATION-PACKAGE
-- Supplier is MSCB if Consumer is MSCA
CONSUMER INVOKES {
    prepareHandover,
    forwardAccessSignalling}
SUPPLIER INVOKES {
    sendEndSignal,
    processAccessSignalling,
    prepareSubsequentHandover,
    codecChange}
```

The v2-equivalent and v3-equivalent packages can be determined according to the rules described in clause 17.2.1.

****** NEXT MODIFIED SECTION ******

17.3.2.12 Handover control

This application context is used for handover procedures between MSCs.

```
handoverControlContext-v34 APPLICATION-CONTEXT
-- Responder is MSCB if Initiator is MSCA
INITIATOR CONSUMER OF {
    HandoverControlPackage-v34}
::= {map-ac handoverControl(11) version34(34)}
```

The following application-context-name is assigned to the v3-equivalent application-context:

```
{map-ac handoverControl(11) version3(3)}
```

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

```
{map-ac handoverControl(11) version2(2)}
```

The following application-context-name is assigned to the v1-equivalent application-context:

```
{map-ac handoverControl(11) version1(1)}
```

****** NEXT MODIFIED SECTION ******

17.3.3 ASN.1 Module for application-context-names

The following ASN.1 module summarises 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) version7 (7)}
```

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)}

authenticationFailureReportContext-v3 OBJECT IDENTIFIER ::= {map-ac authenticationFailureReport(39) version3(3)}

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

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

handoverControlContext-v34 OBJECT IDENTIFIER ::= {map-ac handoverControl(11) version34(34)}

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-v2 OBJECT IDENTIFIER ::= {map-ac imsiRetrieval(26) version2(2)}

```
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)}
```

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

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

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

```
gprsLocationInfoRetrievalContext-v4 OBJECT IDENTIFIER ::=
    {map-ac gprsLocationInfoRetrieval(33) version4(4)}
```

```
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)}
```

```
secureTransportHandlingContext-v3 OBJECT IDENTIFIER ::=
    {map-ac secureTransportHandling(40) 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)
-- handoverControlContext-v2	map-ac handoverControl (11)	version2 (2)
-- handoverControlContext-v3	map-ac handoverControl (11)	version3 (3)
-- equipmentMngtContext-v1	map-ac equipmentMngt (13)	version1 (1)
-- infoRetrievalContext-v1	map-ac infoRetrieval (14)	version1 (1)
-- infoRetrievalContext-v2	map-ac infoRetrieval (14)	version2 (2)
-- interVlInfoRetrievalContext-v2	map-ac interVlInfoRetrieval (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)
-- gprsLocationInfoRetrievalContext-v3	map-ac gprsLocationInfoRetrievalContext (33)	version3 (3)

END

**** NEXT MODIFIED SECTION ****

17.5 MAP operation and error codes

```
MAP-Protocol {
    ccitt-identified-organization (4) etsi (0) mobileDomain (0)
    gsm-Network (1) modules (3) map-Protocol (4) version8 (8)}
```

DEFINITIONS

::=

BEGIN

IMPORTS

```
    UpdateLocation,
    CancelLocation,
    PurgeMS,
    SendIdentification,
    UpdateGprsLocation,
    PrepareHandover,
    SendEndSignal,
    ProcessAccessSignalling,
    ForwardAccessSignalling,
    PrepareSubsequentHandover,
    CodecChange,
    SendAuthenticationInfo,
    AuthenticationFailureReport,
    CheckIMEI,
    InsertSubscriberData,
    DeleteSubscriberData,
    Reset,
    ForwardCheckSS-Indication,
    RestoreData,
    ProvideSubscriberInfo,
```

AnyTimeInterrogation,
AnyTimeSubscriptionInterrogation,
AnyTimeModification,
SendRoutingInfoForGprs,
FailureReport,
NoteMsPresentForGprs,
NoteMM-Event,
NoteSubscriberDataModified

FROM MAP-MobileServiceOperations {
ccitt identified-organization (4) etsi (0) mobileDomain (0)
gsm-Network (1) modules (3) map-MobileServiceOperations (5)
version8 (8)}

ActivateTraceMode,
DeactivateTraceMode,
SendIMSI

FROM MAP-OperationAndMaintenanceOperations {
ccitt identified-organization (4) etsi (0) mobileDomain (0)
gsm-Network (1) modules (3) map-OperationAndMaintenanceOperations (6)
version8 (8)}

SendRoutingInfo,
ProvideRoamingNumber,
ResumeCallHandling,
ProvideSIWFSSNumber,
SIWFSSignallingModify,
SetReportingState,
StatusReport,
RemoteUserFree,
IST-Alert,
IST-Command

FROM MAP-CallHandlingOperations {
ccitt identified-organization (4) etsi (0) mobileDomain (0)
gsm-Network (1) modules (3) map-CallHandlingOperations (7)
version8 (8)}

RegisterSS,
EraseSS,
ActivateSS,
DeactivateSS,
InterrogateSS,
ProcessUnstructuredSS-Request,
UnstructuredSS-Request,
UnstructuredSS-Notify,
RegisterPassword,
GetPassword,
SS-InvocationNotification,
RegisterCC-Entry,
EraseCC-Entry

FROM MAP-SupplementaryServiceOperations {
ccitt identified-organization (4) etsi (0) mobileDomain (0)
gsm-Network (1) modules (3) map-SupplementaryServiceOperations (8)
version8 (8)}

SendRoutingInfoForSM,
MO-ForwardSM,
MT-ForwardSM,
ReportSM-DeliveryStatus,
AlertServiceCentre,
InformServiceCentre,
ReadyForSM

FROM MAP-ShortMessageServiceOperations {
ccitt identified-organization (4) etsi (0) mobileDomain (0)
gsm-Network (1) modules (3) map-ShortMessageServiceOperations (9)
version8 (8)}

PrepareGroupCall,
ProcessGroupCallSignalling,
ForwardGroupCallSignalling,
SendGroupCallEndSignal

FROM MAP-Group-Call-Operations {
ccitt identified-organization (4) etsi (0) mobileDomain (0)
gsm-Network (1) modules (3) map-Group-Call-Operations (22)
version8 (8)}

```
ProvideSubscriberLocation,  
SendRoutingInfoForLCS,  
SubscriberLocationReport  
FROM MAP-LocationServiceOperations {  
  ccitt identified-organization (4) etsi (0) mobileDomain (0)  
  gsm-Network (1) modules (3) map-LocationServiceOperations (24)  
  version8 (8)}
```

```
SecureTransportClass1,  
SecureTransportClass2,  
SecureTransportClass3,  
SecureTransportClass4
```

```
FROM MAP-SecureTransportOperations {  
  ccitt identified-organization (4) etsi (0) mobileDomain (0)  
  gsm-Network (1) modules (3) map-SecureTransportOperations (26)  
  version8 (8)}
```

```
SystemFailure,  
DataMissing,  
UnexpectedDataValue,  
FacilityNotSupported,  
UnknownSubscriber,  
NumberChanged,  
UnknownMSC,  
UnidentifiedSubscriber,  
UnknownEquipment,  
RoamingNotAllowed,  
IllegalSubscriber,  
IllegalEquipment,  
BearerServiceNotProvisioned,  
TeleserviceNotProvisioned,  
NoHandoverNumberAvailable,  
SubsequentHandoverFailure,  
TracingBufferFull,  
OR-NotAllowed,  
NoRoamingNumberAvailable,  
AbsentSubscriber,  
BusySubscriber,  
NoSubscriberReply,  
CallBarred,  
ForwardingViolation,  
ForwardingFailed,  
CUG-Reject,  
ATI-NotAllowed,  
IllegalSS-Operation,  
SS-ErrorStatus,  
SS-NotAvailable,  
SS-SubscriptionViolation,  
SS-Incompatibility,  
UnknownAlphabet,  
USSD-Busy,  
PW-RegistrationFailure,  
NegativePW-Check,  
NumberOfPW-AttemptsViolation,  
SubscriberBusyForMT-SMS,  
SM-DeliveryFailure,  
MessageWaitingListFull,  
AbsentSubscriberSM,  
ResourceLimitation,  
NoGroupCallNumberAvailable,  
ShortTermDenial,  
LongTermDenial,  
IncompatibleTerminal,  
UnauthorizedRequestingNetwork,  
UnauthorizedLCSCClient,  
PositionMethodFailure,  
UnknownOrUnreachableLCSCClient,  
ATSI-NotAllowed,  
ATM-NotAllowed,  
InformationNotAvailable,  
MM-EventNotSupported,  
TargetCellOutsideGroupCallArea,  
SecureTransportError
```

```
FROM MAP-Errors {
```



```
ccitt identified-organization (4) etsi (0) mobileDomain (0)
gsm-Network (1) modules (3) map-Errors (10) version8 (8)}
;
```

-- location registration operation codes

```
updateLocation UpdateLocation ::= localValue 2
cancelLocation CancelLocation ::= localValue 3
purgeMS PurgeMS ::= localValue 67
sendIdentification SendIdentification ::= localValue 55
```

-- handover operation codes

```
prepareHandover PrepareHandover ::= localValue 68
sendEndSignal SendEndSignal ::= localValue 29
processAccessSignalling ProcessAccessSignalling ::= localValue 33
forwardAccessSignalling ForwardAccessSignalling ::= localValue 34
prepareSubsequentHandover PrepareSubsequentHandover ::=
____localValue 69
codecChange ::= localValue xx
```

...

****** NEXT MODIFIED SECTION ******

17.6.1 Mobile Service Operations

```
MAP-MobileServiceOperations {
  ccitt identified-organization (4) etsi (0) mobileDomain (0)
  gsm-Network (1) modules (3) map-MobileServiceOperations (5)
  version8 (8)}
```

DEFINITIONS

::=

BEGIN

EXPORTS

```

  -- location registration operations
  UpdateLocation,
  CancelLocation,
  PurgeMS,
  SendIdentification,

  -- gprs location registration operations
  UpdateGprsLocation,

  -- subscriber information enquiry operations
  ProvideSubscriberInfo,

  -- any time information enquiry operations
  AnyTimeInterrogation,

  -- any time information handling operations
  AnyTimeSubscriptionInterrogation,
  AnyTimeModification,

  -- subscriber data modification notification operations
  NoteSubscriberDataModified,

  -- handover operations
  PrepareHandover,
  SendEndSignal,
  ProcessAccessSignalling,
  ForwardAccessSignalling,
  PrepareSubsequentHandover,
  CodecChange,

  -- authentication management operations
  SendAuthenticationInfo,
  AuthenticationFailureReport,

  -- IMEI management operations
  CheckIMEI,

  -- subscriber management operations
  InsertSubscriberData,
  DeleteSubscriberData,

  -- fault recovery operations
  Reset,
  ForwardCheckSS-Indication,
  RestoreData,

-- gprs location information retrieval operations
  SendRoutingInfoForGprs,

  -- failure reporting operations
  FailureReport,

  -- gprs notification operations
  NoteMsPresentForGprs,

  -- Mobility Management operations
  NoteMM-Event
```

;

IMPORTS

OPERATION

```
FROM TCAPMessages {
  ccitt recommendation q 773 modules (2) messages (1) version2 (2)}
```

```
SystemFailure,
DataMissing,
UnexpectedDataValue,
UnknownSubscriber,
UnknownMSC,
UnidentifiedSubscriber,
UnknownEquipment,
RoamingNotAllowed,
ATI-NotAllowed,
NoHandoverNumberAvailable,
SubsequentHandoverFailure,
AbsentSubscriber,
MM-EventNotSupported,
ATSI-NotAllowed,
ATM-NotAllowed,
BearerServiceNotProvisioned,
TeleserviceNotProvisioned,
CallBarred,
IllegalSS-Operation,
SS-ErrorStatus,
SS-NotAvailable,
SS-Incompatibility,
SS-SubscriptionViolation,
InformationNotAvailable,
TargetCellOutsideGroupCallArea
```

```
FROM MAP-Errors {
  ccitt identified-organization (4) etsi (0) mobileDomain (0)
  gsm-Network (1) modules (3) map-Errors (10) version8 (8)}
```

```
UpdateLocationArg,
UpdateLocationRes,
CancelLocationArg,
CancelLocationRes,
PurgeMS-Arg,
PurgeMS-Res,
SendIdentificationArg,
SendIdentificationRes,
UpdateGprsLocationArg,
UpdateGprsLocationRes,
PrepareHO-Arg,
PrepareHO-Res,
ForwardAccessSignalling-Arg,
ProcessAccessSignalling-Arg,
SendEndSignal-Arg,
SendEndSignal-Res,
PrepareSubsequentHO-Res,
PrepareSubsequentHO-Arg,
SendAuthenticationInfoArg,
SendAuthenticationInfoRes,
AuthenticationFailureReportArg,
AuthenticationFailureReportRes,
EquipmentStatus,
InsertSubscriberDataArg,
InsertSubscriberDataRes,
DeleteSubscriberDataArg,
DeleteSubscriberDataRes,
ResetArg,
RestoreDataArg,
RestoreDataRes,
ProvideSubscriberInfoArg,
ProvideSubscriberInfoRes,
AnyTimeSubscriptionInterrogationArg,
AnyTimeSubscriptionInterrogationRes,
AnyTimeModificationArg,
AnyTimeModificationRes,
NoteSubscriberDataModifiedArg,
NoteSubscriberDataModifiedRes,
AnyTimeInterrogationArg,
AnyTimeInterrogationRes,
SendRoutingInfoForGprsArg,
SendRoutingInfoForGprsRes,
FailureReportArg,
FailureReportRes,
NoteMsPresentForGprsArg,
```

```
NoteMsPresentForGprsRes,
NoteMM-EventArg,
NoteMM-EventRes
```

```
FROM MAP-MS-DataTypes {
  ccitt identified-organization (4) etsi (0) mobileDomain (0)
  gsm-Network (1) modules (3) map-MS-DataTypes (11) version8 (8)}
```

```
IMEI
```

```
FROM MAP-CommonDataTypes {
  ccitt identified-organization (4) etsi (0) mobileDomain (0)
  gsm-Network (1) modules (3) map-CommonDataTypes (18) version8 (8)}
;
```

```
-- location registration operations
```

<pre>UpdateLocation ::= OPERATION ARGUMENT updateLocationArg UpdateLocationArg RESULT updateLocationRes UpdateLocationRes ERRORS { SystemFailure, DataMissing, UnexpectedDataValue, UnknownSubscriber, RoamingNotAllowed}</pre>	--Timer m
--	-----------

<pre>CancelLocation ::= OPERATION ARGUMENT cancelLocationArg CancelLocationArg RESULT cancelLocationRes CancelLocationRes -- optional ERRORS { DataMissing, UnexpectedDataValue}</pre>	--Timer m
---	-----------

<pre>PurgeMS ::= OPERATION ARGUMENT purgeMS-Arg PurgeMS-Arg RESULT purgeMS-Res PurgeMS-Res -- optional ERRORS { DataMissing, UnexpectedDataValue, UnknownSubscriber}</pre>	--Timer m
--	-----------

<pre>SendIdentification ::= OPERATION ARGUMENT sendIdentificationArg SendIdentificationArg RESULT sendIdentificationRes SendIdentificationRes ERRORS { DataMissing, UnidentifiedSubscriber}</pre>	--Timer s
--	-----------

```
-- gprs location registration operations
```

<pre>UpdateGprsLocation ::= OPERATION ARGUMENT updateGprsLocationArg UpdateGprsLocationArg RESULT updateGprsLocationRes UpdateGprsLocationRes ERRORS { SystemFailure, UnexpectedDataValue, UnknownSubscriber, RoamingNotAllowed}</pre>	--Timer m
---	-----------

```
-- subscriber information enquiry operations
```

```

ProvideSubscriberInfo ::= OPERATION --Timer m
  ARGUMENT
    provideSubscriberInfoArg      ProvideSubscriberInfoArg
  RESULT
    provideSubscriberInfoRes      ProvideSubscriberInfoRes
  ERRORS {
    DataMissing,
    UnexpectedDataValue}

```

-- any time information enquiry operations

```

AnyTimeInterrogation ::= OPERATION --Timer m
  ARGUMENT
    anyTimeInterrogationArg      AnyTimeInterrogationArg
  RESULT
    anyTimeInterrogationRes      AnyTimeInterrogationRes
  ERRORS {
    SystemFailure,
    ATI-NotAllowed,
    DataMissing,
    UnexpectedDataValue,
    UnknownSubscriber}

```

-- any time information handling operations

```

AnyTimeSubscriptionInterrogation ::= OPERATION --Timer m
  ARGUMENT
    anyTimeSubscriptionInterrogationArg AnyTimeSubscriptionInterrogationArg
  RESULT
    anyTimeSubscriptionInterrogationRes AnyTimeSubscriptionInterrogationRes
  ERRORS {
    ATSI-NotAllowed,
    DataMissing,
    UnexpectedDataValue,
    UnknownSubscriber,
    BearerServiceNotProvisioned,
    TeleserviceNotProvisioned,
    CallBarred,
    IllegalSS-Operation,
    SS-NotAvailable,
    InformationNotAvailable}

```

```

AnyTimeModification ::= OPERATION --Timer m
  ARGUMENT
    anyTimeModificationArg      AnyTimeModificationArg
  RESULT
    anyTimeModificationRes      AnyTimeModificationRes
  ERRORS {
    ATM-NotAllowed,
    DataMissing,
    UnexpectedDataValue,
    UnknownSubscriber,
    BearerServiceNotProvisioned,
    TeleserviceNotProvisioned,
    CallBarred,
    IllegalSS-Operation,
    SS-SubscriptionViolation,
    SS-ErrorStatus,
    SS-Incompatibility,
    InformationNotAvailable}

```

-- subscriber data modification notification operations

```

NoteSubscriberDataModified ::= OPERATION --Timer m
  ARGUMENT
    noteSubscriberDataModifiedArg NoteSubscriberDataModifiedArg
  RESULT
    noteSubscriberDataModifiedRes NoteSubscriberDataModifiedRes
    -- optional
  ERRORS {
    DataMissing,
    UnexpectedDataValue,
    UnknownSubscriber}

```

-- handover operations

```

PrepareHandover ::= OPERATION --Timer m
  ARGUMENT
    prepareHO-Arg          PrepareHO-Arg
  RESULT
    prepareHO-Res          PrepareHO-Res
  ERRORS {
    SystemFailure,
    DataMissing,
    UnexpectedDataValue,
    NoHandoverNumberAvailable,
    TargetCellOutsideGroupCallArea }

```

```

SendEndSignal ::= OPERATION --Timer l
  ARGUMENT
    sendEndSignal-Arg      SendEndSignal-Arg
  RESULT
    sendEndSignal-Res      SendEndSignal-Res

```

```

ProcessAccessSignalling ::= OPERATION --Timer s
  ARGUMENT
    processAccessSignalling-Arg ProcessAccessSignalling-Arg

```

```

ForwardAccessSignalling ::= OPERATION --Timer s
  ARGUMENT
    forwardAccessSignalling-Arg ForwardAccessSignalling-Arg

```

```

PrepareSubsequentHandover ::= OPERATION --Timer m
  ARGUMENT
    prepareSubsequentHO-Arg PrepareSubsequentHO-Arg
  RESULT
    prepareSubsequentHO-Res PrepareSubsequentHO-Res
  ERRORS {
    UnexpectedDataValue,
    DataMissing,
    UnknownMSC,
    SubsequentHandoverFailure}

```

```

CodecChange ::= OPERATION --Timer s
  ARGUMENT
    codecChange-Arg        CodecChange-Arg

```

-- authentication management operations

```

SendAuthenticationInfo ::= OPERATION --Timer m
  ARGUMENT
    sendAuthenticationInfoArg SendAuthenticationInfoArg
    -- optional
    -- within a dialogue sendAuthenticationInfoArg shall not be present in
    -- subsequent invoke components. If received in a subsequent invoke component
    -- it shall be discarded.
  RESULT
    sendAuthenticationInfoRes SendAuthenticationInfoRes
    -- optional
  ERRORS {
    SystemFailure,
    DataMissing,
    UnexpectedDataValue,
    UnknownSubscriber}

```

```

AuthenticationFailureReport ::= OPERATION --Timer m
  ARGUMENT
    authenticationFailureReportArg AuthenticationFailureReportArg
  RESULT
    authenticationFailureReportRes AuthenticationFailureReportRes
    -- optional
  ERRORS {
    SystemFailure,
    UnexpectedDataValue,
    UnknownSubscriber}

```

-- IMEI management operations

CheckIMEI ::= OPERATION		--Timer m
ARGUMENT		
imei	IMEI	
RESULT		
equipmentStatus	EquipmentStatus	
ERRORS {		
SystemFailure,		
DataMissing,		
UnknownEquipment}		

-- subscriber management operations

InsertSubscriberData ::= OPERATION		--Timer m
ARGUMENT		
insertSubscriberDataArg	InsertSubscriberDataArg	
RESULT		
insertSubscriberDataRes	InsertSubscriberDataRes	
-- optional		
ERRORS {		
DataMissing,		
UnexpectedDataValue,		
UnidentifiedSubscriber}		

DeleteSubscriberData ::= OPERATION		--Timer m
ARGUMENT		
deleteSubscriberDataArg	DeleteSubscriberDataArg	
RESULT		
deleteSubscriberDataRes	DeleteSubscriberDataRes	
-- optional		
ERRORS {		
DataMissing,		
UnexpectedDataValue,		
UnidentifiedSubscriber}		

-- fault recovery operations

Reset ::= OPERATION		--Timer m
ARGUMENT		
resetArg	ResetArg	

ForwardCheckSS-Indication ::= OPERATION	--Timer s
--	-----------

RestoreData ::= OPERATION		--Timer m
ARGUMENT		
restoreDataArg	RestoreDataArg	
RESULT		
restoreDataRes	RestoreDataRes	
ERRORS {		
SystemFailure,		
DataMissing,		
UnexpectedDataValue,		
UnknownSubscriber}		

-- gprs location information retrieval operations

SendRoutingInfoForGprs ::= OPERATION		--Timer m
ARGUMENT		
sendRoutingInfoForGprsArg	SendRoutingInfoForGprsArg	
RESULT		
sendRoutingInfoForGprsRes	SendRoutingInfoForGprsRes	
ERRORS {		
AbsentSubscriber,		
SystemFailure,		
DataMissing,		
UnexpectedDataValue,		
UnknownSubscriber,		
CallBarred }		

-- failure reporting operations

```

FailureReport ::= OPERATION --Timer m
  ARGUMENT
    failureReportArg          FailureReportArg
  RESULT
    failureReportRes          FailureReportRes
    -- optional
  ERRORS {
    SystemFailure,
    DataMissing,
    UnexpectedDataValue,
    UnknownSubscriber}

```

-- gprs notification operations

```

NoteMsPresentForGprs ::= OPERATION --Timer m
  ARGUMENT
    noteMsPresentForGprsArg    NoteMsPresentForGprsArg
  RESULT
    noteMsPresentForGprsRes    NoteMsPresentForGprsRes
    -- optional
  ERRORS {
    SystemFailure,
    DataMissing,
    UnexpectedDataValue,
    UnknownSubscriber}

```

```

NoteMM-Event ::= OPERATION --Timer m
  ARGUMENT
    noteMM-EventArg           NoteMM-EventArg
  RESULT
    noteMM-EventRes           NoteMM-EventRes
  ERRORS {
    DataMissing,
    UnexpectedDataValue,
    UnknownSubscriber,
    MM-EventNotSupported}

```

END

**** NEXT MODIFIED SECTION ****

17.7 MAP constants and data types

17.7.1 Mobile Service data types

....

-- handover types

```

ForwardAccessSignalling-Arg ::= [3] SEQUENCE {
  an-APDU                AccessNetworkSignalInfo,
  integrityProtectionInfo [0] IntegrityProtectionInformation OPTIONAL,
  encryptionInfo         [1] EncryptionInformation             OPTIONAL,
  keyStatus               [2] KeyStatus                       OPTIONAL,
  allowedGSM-Algorithms   [4] AllowedGSM-Algorithms           OPTIONAL,
  allowedUMTS-Algorithms [5] AllowedUMTS-Algorithms           OPTIONAL,
  radioResourceInformation [6] RadioResourceInformation         OPTIONAL,
  extensionContainer      [3] ExtensionContainer                OPTIONAL,
  ...
  radioResourceList       [7] RadioResourceList                OPTIONAL,
  bssmap-ServiceHandover [9] BSSMAP-ServiceHandover           OPTIONAL,
  ranap-ServiceHandover   [8] RANAP-ServiceHandover            OPTIONAL,
  currentlyUsedCodec      [xx] Codec                           OPTIONAL,
  availableCodecsList     [xx] AvailableCodecsList              OPTIONAL,
  ...
}
-- availableCodecsList shall be present only if currentlyUsedCodec is present,
-- availableCodecsList shall be discarded by the receiving node if received
-- when currentlyUsedCodec is not present.

```



```

AllowedGSM-Algorithms ::= OCTET STRING (SIZE (1))
-- internal structure is coded as Algorithm identifier octet from
-- Permitted Algorithms defined in 3G TS 48.008
-- A node shall mark all GSM algorithms that are allowed in MSC-B

```

```

AllowedUMTS-Algorithms ::= SEQUENCE {
  integrityProtectionAlgorithms [0] PermittedIntegrityProtectionAlgorithms
  OPTIONAL,
  encryptionAlgorithms [1] PermittedEncryptionAlgorithms OPTIONAL,
  extensionContainer [2] ExtensionContainer OPTIONAL,
  ...}

```

```

PermittedIntegrityProtectionAlgorithms ::=
  OCTET STRING (SIZE (1..maxPermittedIntegrityProtectionAlgorithmsLength))
-- Octets contain a complete PermittedIntegrityProtectionAlgorithms data type
-- as defined in 3G TS 25.413, encoded according to the encoding scheme
-- mandated by 3G TS 25.413.
-- Padding bits are included, if needed, in the least significant bits of the
-- last octet of the octet string.

```

```

maxPermittedIntegrityProtectionAlgorithmsLength INTEGER ::= 9

```

```

PermittedEncryptionAlgorithms ::=
  OCTET STRING (SIZE (1..maxPermittedEncryptionAlgorithmsLength))
-- Octets contain a complete PermittedEncryptionAlgorithms data type
-- as defined in 3G TS 25.413, encoded according to the encoding scheme
-- mandated by 3G TS 25.413
-- Padding bits are included, if needed, in the least significant bits of the
-- last octet of the octet string.

```

```

maxPermittedEncryptionAlgorithmsLength INTEGER ::= 9

```

```

KeyStatus ::= ENUMERATED {
  old (0),
  new (1),
  ...}
-- exception handling:
-- received values in range 2-31 shall be treated as "old"
-- received values greater than 31 shall be treated as "new"

```

```

PrepareHO-Arg ::= [3] SEQUENCE {
  targetCellId [0] GlobalCellId OPTIONAL,
  ho-NumberNotRequired NULL OPTIONAL,
  targetRNCId [1] RNCId OPTIONAL,
  an-APDU [2] AccessNetworkSignalInfo OPTIONAL,
  multipleBearerRequested [3] NULL OPTIONAL,
  imsi [4] IMSI OPTIONAL,
  integrityProtectionInfo [5] IntegrityProtectionInformation OPTIONAL,
  encryptionInfo [6] EncryptionInformation OPTIONAL,
  radioResourceInformation [7] RadioResourceInformation OPTIONAL,
  allowedGSM-Algorithms [9] AllowedGSM-Algorithms OPTIONAL,
  allowedUMTS-Algorithms [10] AllowedUMTS-Algorithms OPTIONAL,
  radioResourceList [11] RadioResourceList OPTIONAL,
  extensionContainer [8] ExtensionContainer OPTIONAL,
  ...}
  rab-Id [12] RAB-Id OPTIONAL,
  bssmap-ServiceHandover [13] BSSMAP-ServiceHandover OPTIONAL,
  ranap-ServiceHandover [14] RANAP-ServiceHandover OPTIONAL,
  ...}
  currentlyUsedCodec [xx] Codec OPTIONAL,
  availableCodecsList [xx] AvailableCodecsList OPTIONAL,
  ...}
-- availableCodecsList shall be present only if currentlyUsedCodec is present,
-- availableCodecsList shall be discarded by the receiving node if received
-- when currentlyUsedCodec is not present.

```

```

BSSMAP-ServiceHandover ::= OCTET STRING (SIZE (1))
-- Octets are coded according the Service Handover information element in
-- 3G TS 48.008.

```

```

RANAP-ServiceHandover ::= OCTET STRING (SIZE (1))
  -- Octet contains a complete Service-Handover data type
  -- as defined in 3G TS 25.413, encoded according to the encoding scheme
  -- mandated by 3G TS 25.413
  -- Padding bits are included in the least significant bits.

```

```

RadioResourceList ::= SEQUENCE SIZE (2.. maxNumOfRadioResources) OF
  RadioResource

```

```

RadioResource ::= SEQUENCE {
  radioResourceInformation      RadioResourceInformation,
  rab-Id                        RAB-Id,
  -- RAB Identity is needed to relate the radio resources with the radio access bearers.
  ...}

```

```

maxNumOfRadioResources INTEGER ::= 7

```

```

PrepareHO-Res ::= [3] SEQUENCE {
  handoverNumber                [0] ISDN-AddressString      OPTIONAL,
  relocationNumberList          [1] RelocationNumberList     OPTIONAL,
  an-APDU                       [2] AccessNetworkSignalInfo OPTIONAL,
  multicallBearerInfo           [3] MulticallBearerInfo      OPTIONAL,
  multipleBearerNotSupported    NULL                       OPTIONAL,
  selectedUMTS-Algorithms       [5] SelectedUMTS-Algorithms  OPTIONAL,
  chosenRadioResourceInformation [6] ChosenRadioResourceInformation OPTIONAL,
  selectedCodec                 [x] Codec                    OPTIONAL,
  extensionContainer            [4] ExtensionContainer        OPTIONAL,
  ...}

```

```

SelectedUMTS-Algorithms ::= SEQUENCE {
  integrityProtectionAlgorithm [0] ChosenIntegrityProtectionAlgorithm OPTIONAL,
  encryptionAlgorithm         [1] ChosenEncryptionAlgorithm   OPTIONAL,
  extensionContainer           [2] ExtensionContainer           OPTIONAL,
  ...}

```

```

ChosenIntegrityProtectionAlgorithm ::= OCTET STRING (SIZE (1))
  -- Octet contains a complete IntegrityProtectionAlgorithm data type
  -- as defined in 3G TS 25.413, encoded according to the encoding scheme
  -- mandated by 3G TS 25.413
  -- Padding bits are included in the least significant bits.

```

```

ChosenEncryptionAlgorithm ::= OCTET STRING (SIZE (1))
  -- Octet contains a complete EncryptionAlgorithm data type
  -- as defined in 3G TS 25.413, encoded according to the encoding scheme
  -- mandated by 3G TS 25.413
  -- Padding bits are included in the least significant bits.

```

```

ChosenRadioResourceInformation ::= SEQUENCE {
  chosenChannelInfo             [0] ChosenChannelInfo        OPTIONAL,
  chosenSpeechVersion           [1] ChosenSpeechVersion       OPTIONAL,
  ...}

```

```

ChosenChannelInfo ::= OCTET STRING (SIZE (1))
  -- Octets are coded according the Chosen Channel information element in 3G TS 48.008

```

```

ChosenSpeechVersion ::= OCTET STRING (SIZE (1))
  -- Octets are coded according the Speech Version (chosen) information element in 3G TS
  -- 48.008

```

```

PrepareSubsequentHO-Arg ::= [3] SEQUENCE {
  targetCellId                 [0] GlobalCellId              OPTIONAL,
  targetMSC-Number              [1] ISDN-AddressString,
  targetRNCId                  [2] RNCId                     OPTIONAL,
  an-APDU                      [3] AccessNetworkSignalInfo  OPTIONAL,
  selectedRab-Id               [4] RAB-Id                    OPTIONAL,
  extensionContainer            [5] ExtensionContainer        OPTIONAL,
  ...}

```

```

PrepareSubsequentHO-Res ::= [3] SEQUENCE {
  an-APDU                               AccessNetworkSignalInfo,
  extensionContainer                      [0] ExtensionContainer          OPTIONAL,
  ...}

```

```

ProcessAccessSignalling-Arg ::= [3] SEQUENCE {
  an-APDU                               AccessNetworkSignalInfo,
  selectedUMTS-Algorithms                [1] SelectedUMTS-Algorithms      OPTIONAL,
  selectedGSM-Algorithm                  [2] SelectedGSM-Algorithm        OPTIONAL,
  chosenRadioResourceInformation          [3] ChosenRadioResourceInformation OPTIONAL,
  selectedRab-Id                         [4] RAB-Id                       OPTIONAL,
  extensionContainer                      [0] ExtensionContainer          OPTIONAL,
  ...}

```

```

SelectedGSM-Algorithm ::= OCTET STRING (SIZE (1))
  -- internal structure is coded as Algorithm identifier octet from Chosen Encryption
  -- Algorithm defined in 3G TS 48.008
  -- A node shall mark only the selected GSM algorithm

```

```

CodecChange-Arg ::= [3] SEQUENCE {
  selectedCodec                          [0] Codec                       OPTIONAL,
  proposedCodec                          [1] Codec                       OPTIONAL,
  extensionContainer                      [2] ExtensionContainer          OPTIONAL,
  ...}

```

```

SendEndSignal-Arg ::= [3] SEQUENCE {
  an-APDU                               AccessNetworkSignalInfo,
  extensionContainer                      [0] ExtensionContainer          OPTIONAL,
  ...}

```

```

SendEndSignal-Res ::= SEQUENCE {
  extensionContainer                      [0] ExtensionContainer          OPTIONAL,
  ...}

```

```

RNCId ::= OCTET STRING (SIZE (7))
  -- The internal structure is defined as follows:
  -- octet 1 bits 4321      Mobile Country Code 1st digit
  --      bits 8765        Mobile Country Code 2nd digit
  -- octet 2 bits 4321      Mobile Country Code 3rd digit
  --      bits 8765        Mobile Network Code 3rd digit
  --                        or filler (1111) for 2 digit MNCs
  -- octet 3 bits 4321      Mobile Network Code 1st digit
  --      bits 8765        Mobile Network Code 2nd digit
  -- octets 4 and 5        Location Area Code according to 3G TS 24.008
  -- octets 6 and 7        RNC Id value according to 3G TS 25.413

```

```

RelocationNumberList ::= SEQUENCE SIZE (1..maxNumOfRelocationNumber) OF
  RelocationNumber

```

```

MulticallBearerInfo ::= INTEGER (1..maxNumOfRelocationNumber)

```

```

RelocationNumber ::= SEQUENCE {
  handoverNumber                        ISDN-AddressString,
  rab-Id                                RAB-Id,
  -- RAB Identity is needed to relate the calls with the radio access bearers.
  ...}

```

```

RAB-Id ::= INTEGER (1..maxNrOfRABs)

```

```

maxNrOfRABs INTEGER ::= 255

```

```

maxNumOfRelocationNumber INTEGER ::= 7

```

```

RadioResourceInformation ::= OCTET STRING (SIZE (3..13))
  -- Octets are coded according the Channel Type information element in 3G TS 48.008

```

```

IntegrityProtectionInformation ::= OCTET STRING (SIZE (18..maxNumOfIntegrityInfo))
  -- Octets contain a complete IntegrityProtectionInformation data type
  -- as defined in 3G TS 25.413, encoded according to the encoding scheme
  -- mandated by 3G TS 25.413
  -- Padding bits are included, if needed, in the least significant bits of the
  -- last octet of the octet string.

```

```
maxNumOfIntegrityInfo INTEGER ::= 100
```

```
EncryptionInformation ::= OCTET STRING (SIZE (18..maxNumOfEncryptionInfo))
-- Octets contain a complete EncryptionInformation data type
-- as defined in 3G TS 25.413, encoded according to the encoding scheme
-- mandated by 3G TS 25.413
-- Padding bits are included, if needed, in the least significant bits of the
-- last octet of the octet string.
```

```
maxNumOfEncryptionInfo INTEGER ::= 100
```

```
AvailableCodecsList ::= SEQUENCE {
    utranCodecList          [0] CodecList          OPTIONAL,
    geranCodecList          [1] CodecList          OPTIONAL,
    extensionContainer      [2] ExtensionContainer  OPTIONAL,
    ...}

```

```
CodecList ::= SEQUENCE {
    codec1          [1] Codec,
    codec2          [2] Codec          OPTIONAL,
    codec3          [3] Codec          OPTIONAL,
    codec4          [4] Codec          OPTIONAL,
    codec5          [5] Codec          OPTIONAL,
    codec6          [6] Codec          OPTIONAL,
    codec7          [7] Codec          OPTIONAL,
    codec8          [8] Codec          OPTIONAL,
    extensionContainer [9] ExtensionContainer OPTIONAL,
    ...}
-- Codecs are sent in priority order where codec1 has highest priority
```

```
Codec ::= OCTET STRING (SIZE (1..4))
-- The internal structure is defined as follows:
-- octet 1          Coded as Codec Identification code in 3GPP TS 26.103
-- octets 2,3,4    Parameters for the Codec as defined in 3GPP TS
--                26.103, if available, length depending on the codec
```

****** NEXT MODIFIED SECTION ******

19.2.2.3 Other procedures in stable handover situation

During a call and after handover or relocation, a number of procedures between MSC-A and BSS-B or RNS-B controlled by or reported to MSC-A may be initiated in both directions by invoking a MAP_FORWARD_ACCESS_SIGNALLING request and reception of a MAP_PROCESS_ACCESS_SIGNALLING indication. MSC-A can also be informed about change of codec or proposed change of codec in MSC-B by reception of a MAP_CODEC_CHANGE indication.

****** NEXT MODIFIED SECTION ******

19.2.3.4 Other procedures in stable handover situation

During a call and after handover or relocation, a number of procedures between MSC-A and BSS-B or RNS-B controlled by or reported to MSC-A may be initiated by involving access signalling transfer in both directions. MSC-B can also inform MSC-A about codec change or proposed codec change in MSC-B by invoking a MAP_CODEC_CHANGE request.

