TSG RAN Meeting #28 **RP-050227**
Quebec, Canada, 01 - 03 June 2005
Title **CRs (Rel-6 cat. F) on MBMS**

Source **TSG RAN WG3**
Agenda Item **8.4**

RAN3 Tdoc	Spec	CR	Rev	Cat	curr. Vers.	new Vers.	Rel	Work item	Title
R3-050458	25.413	741		F	6.5.0	6.6.0	Rel-6	MBMS-RAN	MBMS Session Duration IE
R3-050713	25.931	31	1	F	6.1.0	6.2.0	Rel-6	MBMS-RAN	Updates of MBMS scenarios
R3-050715	25.413	750	1	F	6.5.0	6.6.0	Rel-6	MBMS-RAN	Correction of MBMS figure title
R3-050809	25.413	745	2	F	6.5.0	6.6.0	Rel-6	MBMS-RAN	Enhancement for MBMS SESSION START message

3GPP TSG-RAN WG3 #47 ⌘***R3-050458***
Athens, Greece, 9th – 13th May 2005

CR-Form-v7.1

CHANGE REQUEST

⌘ **25.413** **CR** **741** ⌘**rev** **-** ⌘ Current version: **6.5.0** ⌘

*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:	⌘	MBMS Session Duration IE
Source:	⌘	RAN3
Work item code:	⌘	MBMS-RAN
Date:	⌘	09/05/2005
Category:	⌘	**F**
Release:	⌘	REL-6

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

Ph2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*
Rel-7	*(Release 7)*

Reason for change:	⌘	In R3-050447 (S2-050946) SA2 requested RAN3 to consider the mandatory presence of the MBMS Session Duration IE and modify their specifications accordingly.
Summary of change:	⌘	MBMS Session Duration IE presence has been changed to 'mandatory' in Session Start. Impact assessment towards the previous version of the specification (same release): This CR has isolated impact towards the previous version of the specification.
Consequences if not approved:	⌘	Misalignment of Session Duration with other groups.

Clauses affected:	⌘	8.36.2; 9.1.58; 9.3.3

Other specs affected: ⌘	Y	N		⌘
		X	Other core specifications	
		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.

********** START OF MODIFICATIONS **********

8.36 MBMS Session Start

8.36.1 General

The purpose of the MBMS Session Start procedure is to request the UTRAN to notify UEs about an upcoming MBMS Session of a given MBMS Bearer Service and to establish a MBMS RAB and MBMS Iu signalling connection for this MBMS Session.

The procedure uses connection oriented signalling.

8.36.2 Successful Operation

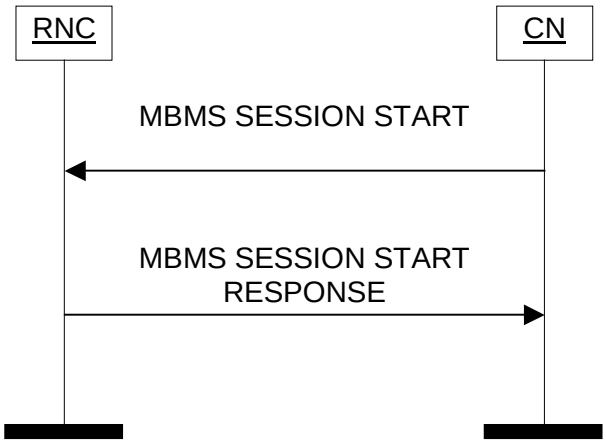


Figure 46: MBMS Session Start procedure. Successful operation.

The CN initiates the procedure by sending a MBMS SESSION START message.

The MBMS SESSION START message shall contain:

- TMGI;
- MBMS Bearer Service Type;
- MBMS Session Identity, if available;
- Iu Signalling Connection Identifier IE;
- RAB parameters (including e.g. Allocation/Retention Priority);
- PDP Type Information, if available;
- MBMS Session Duration~~, if available~~;
- MBMS Service Area;
- Frequency Layer Convergence Flag, if available;
- RA List of Idle Mode UEs, if available.
- Global CN-ID IE, only when the MBMS SESSION START message is sent from a CN node towards an RNC for which the sending CN node is not the default CN node;
- MBMS Session Repetition Number, if available.

Upon reception of the MBMS SESSION START message, the RNC shall store the *Iu Signalling Connection Identifier* IE for the duration of the MBMS Iu signalling connection. The *Iu Signalling Connection Identifier* IE contains an Iu signalling connection identifier which is allocated by the CN. The value for the *Iu Signalling Connection Identifier* IE shall be allocated so as to uniquely identify an Iu signalling connection for the involved CN node.

The *Global CN-ID* IE contains the identity of the CN node that sent the MBMS SESSION START message, and it shall, if included, be stored together with the Iu signalling connection identifier. If the *Global CN-ID* IE is not included, the MBMS SESSION START message shall be considered as coming from the default CN node.

Upon reception of the MBMS SESSION START message, the RNC shall store, if not already, and remember the *TMGI* IE, the *RAB parameters* IE and the other attributes of the session as part of the MBMS Service Context. The *TMGI* IE contains the TMGI identifier which uniquely identifies the MBMS Bearer Service.

Upon reception of the MBMS SESSION START message, the RNC shall initiate allocation of requested resources for the MBMS RAB if at least one of the following two conditions is fulfilled:

- the RNC controls at least one cell contained in the indicated MBMS Service Area and, if the *RA List of Idle Mode UEs* IE is included in MBMS SESSION START message, at least one RNC´s RA is contained in this list,

- the RNC serves UEs consuming radio resources from cells contained in the indicated MBMS Service Area.

In case the *RA List of Idle Mode UEs* IE is included in MBMS SESSION START message but none of above conditions is fulfilled, the RNC may decide to wait for either an update of the RA List of Idle Mode UEs or a UE linking to finally establish the MBMS RAB. If the RNC decides so, it shall report it immediately to the CN in the MBMS SESSION START RESPONSE message with the cause value "Successful MBMS Session Start - No Data Bearer Necessary".

The allocation of requested resources shall be made according to the values of the *Allocation/Retention Priority* IE (priority level, pre-emption indicators) and the resource situation as follows:

- The RNC shall consider the priority level of the requested MBMS RAB, when deciding on the resource allocation.

- The *Queuing Allowed* IE shall be ignored for MBMS RAB.

- The priority levels and the pre-emption indicators may (singularly or in combination) be used to determine whether the MBMS RAB establishment has to be performed unconditionally and immediately. If the requested MBMS RAB is marked as "may trigger pre-emption" and the resource situation requires so, the RNC may trigger the pre-emption procedure which may then cause the forced release of a lower priority RAB which is marked as "pre-emptable". Whilst the process and the extent of the pre-emption procedure is operator-dependent, the pre-emption indicators, if given in the MBMS SESSION START message, shall be treated as follows:

    1. If the *Pre-emption Capability* IE is set to "may trigger pre-emption", then this allocation request may trigger the pre-emption procedure. UTRAN shall only pre-empt RABs (other MBMS RABs or UE specific RABs) with lower priority, in ascending order of priority.

    2. If the *Pre-emption Capability* IE is set to "shall not trigger pre-emption", then this allocation request shall not trigger the pre-emption procedure.

    3. If the *Pre-emption Vulnerability* IE is set to "pre-emptable", then this connection shall be included in the pre-emption process.

    4. If the *Pre-emption Vulnerability* IE is set to "not pre-emptable", then this connection shall not be included in the pre-emption process.

    5. If the *Priority Level* IE is set to "no priority" the given values for the *Pre-emption Capability* IE and *Pre-emption Vulnerability* IE shall not be considered. Instead the values "shall not trigger pre-emption" and "not pre-emptable" shall prevail.

- If the *Allocation/Retention Priority* IE is not given in the MBMS SESSION START message, the allocation request shall not trigger the pre-emption process and the connection may be pre-empted and considered to have the value "lowest" as priority level. Moreover, queuing shall not be allowed.

The UTRAN shall use the *PDP Type Information* IE to configure any compression algorithms.

In case of successful MBMS RAB establishment, the RNC shall include the *Transport Layer Address* IE and the *Iu Transport Association* IE in the MBMS SESSION START RESPONSE message. The RNC may answer successfully even though the MBMS resources have not been established in all relevant cells.

If NNSF is active, the RNC may receive from several CN nodes for a certain MBMS Bearer Service the MBMS SESSION START message. In this case, if the RNC decides to establish the requested MBMS RAB, it shall only establish one MBMS Iu bearer and shall inform the selected CN node accordingly i.e. with MBMS SESSION START RESPONSE message including the *Transport Layer Address* IE and the *Iu Transport Association* IE.

If the RNC receives from several CN nodes for a certain MBMS Bearer Service the MBMS SESSION START message and all the MBMS SESSION START messages include the *RA List of Idle Mode UEs* IE, the RNC shall, if supported, maintain an MBMS Iu signalling connection toward all the CN nodes and inform them accordingly i.e. with MBMS SESSION START RESPONSE message and cause value "Successful MBMS Session Start - No Data Bearer Necessary" to all the CN nodes except the one, if any, towards which the RNC confirmed the successful MBMS RAB establishment.

The *MBMS Session Repetition Number* IE may be included in the MBMS SESSION START message in case the *MBMS Session Identity* IE is included in the same message. The *MBMS Session Repetition Number* IE may be used by RNC to recognise retransmissions of a particular session of a MBMS Bearer Service with identical contents. This IE may be used for counting purpose.

Transmission and reception of a MBMS SESSION START RESPONSE message terminate the procedure in the UTRAN and in the CN respectively.

8.36.3 Unsuccessful Operation

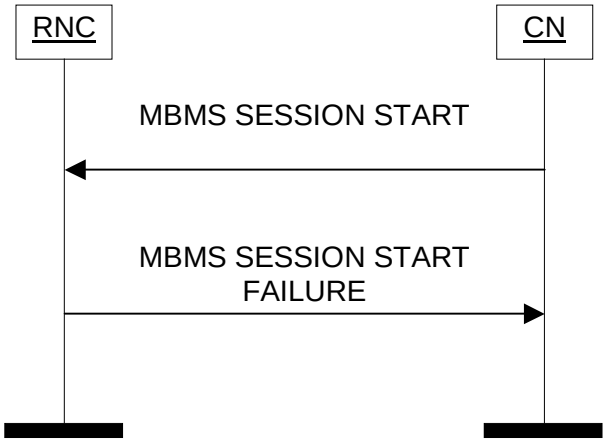


Figure 47: MBMS Session Start procedure. Unsuccessful operation.

If the RNC is not capable of correctly processing the request (e.g. the MBMS resources could not be established at all in any cell), the CN shall be informed by the MBMS SESSION START FAILURE message.

If NNSF is active and the RNC received from several CN nodes for a certain MBMS Bearer Service the MBMS SESSION START message, but not all of the MBMS SESSION START messages include the *RA List of Idle Mode UEs* IE, the RNC shall inform the respective CN nodes accordingly i.e. with MBMS SESSION START FAILURE message and cause value "MBMS - Superseded Due To NNSF" to all the CN nodes except the one towards which the RNC confirmed the successful MBMS RAB establishment with MBMS SESSION START RESPONSE message.

When UTRAN reports failure of the MBMS Session Start procedure, the cause value should be precise enough to enable the core network to know the reason for the failure. Typical cause values are: "MBMS - Superseded Due To NNSF", "Requested Traffic Class not Available", "Invalid RAB Parameters Value", "Requested Maximum Bit Rate not Available", "Requested Guaranteed Bit Rate not Available", "Requested Transfer Delay not Achievable", "Invalid RAB Parameters Combination", "Condition Violation for Guaranteed Bit Rate", "Iu Transport Connection Failed to Establish", "No Resource Available".

Transmission and reception of a MBMS SESSION START FAILURE message terminate the procedure in the UTRAN and in the CN respectively.

8.36.4 Abnormal Conditions

If, for a MBMS RAB requested to be set up, the *PDP Type Information* IE is not present, the RNC shall continue with the procedure.

********** UNAFFECTED TEXT **********

9.1.58 MBMS SESSION START

This message is sent by the CN to establish a MBMS Iu signalling connection and if needed a MBMS RAB.

Direction: CN → RNC.

Signalling bearer mode: Connection oriented.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.2.1.1		YES	reject
TMGI	M		9.2.3.37		YES	reject
MBMS Session Identity	O		9.2.3.38		YES	ignore
MBMS Bearer Service Type	M		9.2.3.39		YES	reject
Iu Signalling Connection Identifier	M		9.2.1.38		YES	reject
RAB parameters	M		9.2.1.3		YES	reject
PDP Type Information	O		9.2.1.40		YES	ignore
MBMS Session Duration	~~O~~M		9.2.3.40		YES	~~ignore~~reject
MBMS Service Area	M		9.2.3.41		YES	reject
Frequency Layer Convergence Flag	O		9.2.1.76		YES	ignore
RA List of Idle Mode UEs	O		9.2.3.42		YES	ignore
Global CN-ID IE	O		9.2.1.46		YES	reject
MBMS Session Repetition Number	O		9.2.3.48		YES	ignore

**********UNAFFECTED TEXT**********

9.3.3 PDU Definitions

```
-- **************************************************************
--
-- PDU definitions for RANAP.
--
-- **************************************************************

RANAP-PDU-Contents {
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
umts-Access (20) modules (3) ranap (0) version1 (1) ranap-PDU-Contents (1) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

-- **************************************************************
--
-- IE parameter types from other modules.
--
-- **************************************************************

IMPORTS
    AccuracyFulfilmentIndicator,
    APN,
    BroadcastAssistanceDataDecipheringKeys,
    LocationRelatedDataRequestType,
    LocationRelatedDataRequestTypeSpecificToGERANIuMode,
    DataVolumeReference,
    CellLoadInformation,
    AreaIdentity,
    CN-DomainIndicator,
    Cause,
    ClientType,
    CriticalityDiagnostics,
    ChosenEncryptionAlgorithm,
    ChosenIntegrityProtectionAlgorithm,
    ClassmarkInformation2,
    ClassmarkInformation3,
    DL-GTP-PDU-SequenceNumber,
    DL-N-PDU-SequenceNumber,
    DataVolumeReportingIndication,
    DeltaRAListofIdleModeUEs,
    DRX-CycleLengthCoefficient,
    EncryptionInformation,
```

```
    FrequenceLayerConvergenceFlag,
    GERAN-BSC-Container,
    GERAN-Classmark,
    GlobalCN-ID,
    GlobalRNC-ID,
    InformationExchangeID,
    InformationExchangeType,
    InformationRequested,
    InformationRequestType,
    InformationTransferID,
    InformationTransferType,
    InterSystemInformationTransferType,
    IntegrityProtectionInformation,
    InterSystemInformation-TransparentContainer,
    IPMulticastAddress,
    IuSignallingConnectionIdentifier,
    IuTransportAssociation,
    KeyStatus,
    L3-Information,
    LAI,
    LastKnownServiceArea,
    MBMS-PTP-RAB-ID,
    MBMSBearerServiceType,
    MBMSCNDe-Registration,
    MBMSRegistrationRequestType,
    MBMSServiceArea,
    MBMSSessionDuration,
    MBMSSessionIdentity,
    MBMSSessionRepetitionNumber,
    NAS-PDU,
    NAS-SequenceNumber,
    NAS-SynchronisationIndicator,
    NewBSS-To-OldBSS-Information,
    NonSearchingIndication,
    NumberOfSteps,
    OMC-ID,
    OldBSS-ToNewBSS-Information,
    PagingAreaID,
    PagingCause,
    PDP-TypeInformation,
    PermanentNAS-UE-ID,
    PLMNidentity,
    PositionData,
    PositionDataSpecificToGERANIuMode,
    PositioningPriority,
    ProvidedData,
    RAB-ID,
    RAB-Parameters,
```

```
    RAC,
    RAListofIdleModeUEs,
    RedirectionCompleted,
    RejectCauseValue,
    RelocationType,
    RequestType,
    Requested-RAB-Parameter-Values,
    ResponseTime,
    RRC-Container,
    SAI,
    SAPI,
    Service-Handover,
    SessionUpdateID,
    SNA-Access-Information,
    SourceID,
    SourceRNC-ToTargetRNC-TransparentContainer,
    TargetID,
    TargetRNC-ToSourceRNC-TransparentContainer,
    TemporaryUE-ID,
    TMGI,
    TracePropagationParameters,
    TraceReference,
    TraceType,
    UnsuccessfullyTransmittedDataVolume,
    TransportLayerAddress,
    TriggerID,
    UE-ID,
    UESBI-Iu,
    UL-GTP-PDU-SequenceNumber,
    UL-N-PDU-SequenceNumber,
    UP-ModeVersions,
    UserPlaneMode,
    VerticalAccuracyCode,
    Alt-RAB-Parameters,
    Ass-RAB-Parameters
FROM RANAP-IEs


    PrivateIE-Container{},
    ProtocolExtensionContainer{},
    ProtocolIE-ContainerList{},
    ProtocolIE-ContainerPair{},
    ProtocolIE-ContainerPairList{},
    ProtocolIE-Container{},
    RANAP-PRIVATE-IES,
    RANAP-PROTOCOL-EXTENSION,
    RANAP-PROTOCOL-IES,
    RANAP-PROTOCOL-IES-PAIR
```

```
FROM RANAP-Containers

    maxNrOfDTs,
    maxNrOfErrors,
    maxNrOfIuSigConIds,
    maxNrOfRABs,
    maxNrOfVol,
    maxnoofMulticastServicesPerUE,

    id-AccuracyFulfilmentIndicator,
    id-APN,
    id-AreaIdentity,
    id-Alt-RAB-Parameters,
    id-Ass-RAB-Parameters,
    id-BroadcastAssistanceDataDecipheringKeys,
    id-LocationRelatedDataRequestType,
    id-CN-DomainIndicator,
    id-Cause,
    id-ChosenEncryptionAlgorithm,
    id-ChosenIntegrityProtectionAlgorithm,
    id-ClassmarkInformation2,
    id-ClassmarkInformation3,
    id-ClientType,
    id-CNMBMSLinkingInformation,
    id-CriticalityDiagnostics,
    id-DeltaRAListofIdleModeUEs,
    id-DRX-CycleLengthCoefficient,
    id-DirectTransferInformationItem-RANAP-RelocInf,
    id-DirectTransferInformationList-RANAP-RelocInf,
    id-DL-GTP-PDU-SequenceNumber,
    id-EncryptionInformation,
    id-FrequenceLayerConvergenceFlag,
    id-GERAN-BSC-Container,
    id-GERAN-Classmark,
    id-GERAN-Iumode-RAB-Failed-RABAssgntResponse-Item,
    id-GERAN-Iumode-RAB-FailedList-RABAssgntResponse,
    id-GlobalCN-ID,
    id-GlobalRNC-ID,
    id-InformationExchangeID,
    id-InformationExchangeType,
    id-InformationRequested,
    id-InformationRequestType,
    id-InformationTransferID,
    id-InformationTransferType,
    id-IntegrityProtectionInformation,
    id-InterSystemInformationTransferType,
    id-InterSystemInformation-TransparentContainer,
    id-IPMulticastAddress,
```

```
    id-IuSigConId,
    id-IuSigConIdItem,
    id-IuSigConIdList,
    id-IuTransportAssociation,
    id-JoinedMBMSBearerServicesList,
    id-KeyStatus,
    id-L3-Information,
    id-LAI,
    id-LastKnownServiceArea,
    id-LeftMBMSBearerServicesList,
    id-LocationRelatedDataRequestTypeSpecificToGERANIuMode,
    id-MBMSBearerServiceType,
    id-MBMSCNDe-Registration,
    id-MBMSRegistrationRequestType,
    id-MBMSServiceArea,
    id-MBMSSessionDuration,
    id-MBMSSessionIdentity,
    id-MBMSSessionRepetitionNumber,
    id-NAS-PDU,
    id-NAS-SequenceNumber,
    id-NewBSS-To-OldBSS-Information,
    id-NonSearchingIndication,
    id-NumberOfSteps,
    id-OMC-ID,
    id-OldBSS-ToNewBSS-Information,
    id-PagingAreaID,
    id-PagingCause,
    id-PDP-TypeInformation,
    id-PermanentNAS-UE-ID,
    id-PositionData,
    id-PositionDataSpecificToGERANIuMode,
    id-PositioningPriority,
    id-ProvidedData,
    id-RAB-ContextItem,
    id-RAB-ContextList,
    id-RAB-ContextFailedtoTransferItem,
    id-RAB-ContextFailedtoTransferList,
    id-RAB-ContextItem-RANAP-RelocInf,
    id-RAB-ContextList-RANAP-RelocInf,
    id-RAB-DataForwardingItem,
    id-RAB-DataForwardingItem-SRNS-CtxReq,
    id-RAB-DataForwardingList,
    id-RAB-DataForwardingList-SRNS-CtxReq,
    id-RAB-DataVolumeReportItem,
    id-RAB-DataVolumeReportList,
    id-RAB-DataVolumeReportRequestItem,
    id-RAB-DataVolumeReportRequestList,
    id-RAB-FailedItem,
```

```
    id-RAB-FailedList,
    id-RAB-FailedtoReportItem,
    id-RAB-FailedtoReportList,
    id-RAB-ID,
    id-RAB-ModifyList,
    id-RAB-ModifyItem,
    id-RAB-Parameters,
    id-RAB-QueuedItem,
    id-RAB-QueuedList,
    id-RAB-ReleaseFailedList,
    id-RAB-ReleaseItem,
    id-RAB-ReleasedItem-IuRelComp,
    id-RAB-ReleaseList,
    id-RAB-ReleasedItem,
    id-RAB-ReleasedList,
    id-RAB-ReleasedList-IuRelComp,
    id-RAB-RelocationReleaseItem,
    id-RAB-RelocationReleaseList,
    id-RAB-SetupItem-RelocReq,
    id-RAB-SetupItem-RelocReqAck,
    id-RAB-SetupList-RelocReq,
    id-RAB-SetupList-RelocReqAck,
    id-RAB-SetupOrModifiedItem,
    id-RAB-SetupOrModifiedList,
    id-RAB-SetupOrModifyItem,
    id-RAB-SetupOrModifyList,
    id-RAC,
    id-RAListofIdleModeUEs,
    id-RedirectionCompleted,
    id-RedirectionIndication,
    id-RejectCauseValue,
    id-RelocationType,
    id-RequestType,
    id-ResponseTime,
    id-SAI,
    id-SAPI,
    id-SelectedPLMN-ID,
    id-SessionUpdateID,
    id-SNA-Access-Information,
    id-SourceID,
    id-SourceRNC-ToTargetRNC-TransparentContainer,
    id-SourceRNC-PDCP-context-info,
    id-TargetID,
    id-TargetRNC-ToSourceRNC-TransparentContainer,
    id-TemporaryUE-ID,
    id-TMGI,
    id-TracePropagationParameters,
    id-TraceReference,
```

```
    id-TraceType,
    id-TransportLayerAddress,
    id-TransportLayerInformation,
    id-TriggerID,
    id-UE-ID,
    id-UESBI-Iu,
    id-UL-GTP-PDU-SequenceNumber,
    id-UnsuccessfulLinkingList,
    id-VerticalAccuracyCode
FROM RANAP-Constants;

-- **************************************************************
--
-- Common Container Lists
--
-- **************************************************************

RAB-IE-ContainerList                 { RANAP-PROTOCOL-IES      : IEsSetParam } ::= ProtocolIE-ContainerList     { 1, maxNrOfRABs,   {IEsSetParam} }
RAB-IE-ContainerPairList             { RANAP-PROTOCOL-IES-PAIR : IEsSetParam } ::= ProtocolIE-ContainerPairList { 1, maxNrOfRABs,   {IEsSetParam} }
ProtocolError-IE-ContainerList       { RANAP-PROTOCOL-IES      : IEsSetParam } ::= ProtocolIE-ContainerList     { 1, maxNrOfRABs,   {IEsSetParam} }
IuSigConId-IE-ContainerList          { RANAP-PROTOCOL-IES      : IEsSetParam } ::= ProtocolIE-ContainerList     { 1, maxNrOfIuSigConIds,
{IEsSetParam} }
DirectTransfer-IE-ContainerList   { RANAP-PROTOCOL-IES      : IEsSetParam } ::= ProtocolIE-ContainerList     { 1, maxNrOfDTs,    {IEsSetParam} }

-- **************************************************************
--
-- Iu RELEASE ELEMENTARY PROCEDURE
--
-- **************************************************************

-- **************************************************************
--
-- Iu Release Command
--
-- **************************************************************

Iu-ReleaseCommand ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { {Iu-ReleaseCommandIEs} },
    protocolExtensions      ProtocolExtensionContainer { {Iu-ReleaseCommandExtensions} }            OPTIONAL,
    ...
}

Iu-ReleaseCommandIEs RANAP-PROTOCOL-IES ::= {
    { ID id-Cause                   CRITICALITY ignore  TYPE Cause                  PRESENCE mandatory  },
    ...
}

Iu-ReleaseCommandExtensions RANAP-PROTOCOL-EXTENSION ::= {
```

```
    ...
}

-- **************************************************************
--
-- Iu Release Complete
--
-- **************************************************************

Iu-ReleaseComplete ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { {Iu-ReleaseCompleteIEs} },
    protocolExtensions      ProtocolExtensionContainer { {Iu-ReleaseCompleteExtensions} }           OPTIONAL,
    ...
}

Iu-ReleaseCompleteIEs RANAP-PROTOCOL-IES ::= {
    { ID id-RAB-DataVolumeReportList        CRITICALITY ignore  TYPE RAB-DataVolumeReportList       PRESENCE optional } |
    { ID id-RAB-ReleasedList-IuRelComp      CRITICALITY ignore  TYPE RAB-ReleasedList-IuRelComp     PRESENCE optional } |
    { ID id-CriticalityDiagnostics          CRITICALITY ignore  TYPE CriticalityDiagnostics         PRESENCE optional   },
    ...
}

RAB-DataVolumeReportList               ::= RAB-IE-ContainerList { {RAB-DataVolumeReportItemIEs} }

RAB-DataVolumeReportItemIEs RANAP-PROTOCOL-IES ::= {
    { ID id-RAB-DataVolumeReportItem        CRITICALITY ignore  TYPE RAB-DataVolumeReportItem       PRESENCE mandatory  },
    ...
}

RAB-DataVolumeReportItem ::= SEQUENCE {
    rAB-ID                      RAB-ID,
    dl-UnsuccessfullyTransmittedDataVolume      DataVolumeList      OPTIONAL
    -- This IE shall always be present although its presence is optional --,
    iE-Extensions                   ProtocolExtensionContainer { {RAB-DataVolumeReportItem-ExtIEs} }      OPTIONAL,
    ...
}

RAB-DataVolumeReportItem-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

RAB-ReleasedList-IuRelComp             ::= RAB-IE-ContainerList { {RAB-ReleasedItem-IuRelComp-IEs} }

RAB-ReleasedItem-IuRelComp-IEs RANAP-PROTOCOL-IES ::= {
    { ID id-RAB-ReleasedItem-IuRelComp          CRITICALITY ignore  TYPE RAB-ReleasedItem-IuRelComp          PRESENCE mandatory  },
    ...
}
```

```
RAB-ReleasedItem-IuRelComp  ::= SEQUENCE {
        rAB-ID                      RAB-ID,
        dL-GTP-PDU-SequenceNumber   DL-GTP-PDU-SequenceNumber   OPTIONAL,
        uL-GTP-PDU-SequenceNumber   UL-GTP-PDU-SequenceNumber   OPTIONAL,
        iE-Extensions               ProtocolExtensionContainer { {RAB-ReleasedItem-IuRelComp-ExtIEs} }       OPTIONAL,
    ...
}

RAB-ReleasedItem-IuRelComp-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}


Iu-ReleaseCompleteExtensions RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- RELOCATION PREPARATION ELEMENTARY PROCEDURE
--
-- **************************************************************

-- **************************************************************
--
-- Relocation Required
--
-- **************************************************************

RelocationRequired ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { {RelocationRequiredIEs} },
    protocolExtensions      ProtocolExtensionContainer { {RelocationRequiredExtensions} }           OPTIONAL,
        ...
}

RelocationRequiredIEs RANAP-PROTOCOL-IES ::= {
    { ID id-RelocationType              CRITICALITY reject  TYPE RelocationType                 PRESENCE mandatory } |
    { ID id-Cause                   CRITICALITY ignore  TYPE Cause                  PRESENCE mandatory  } |
    { ID id-SourceID                CRITICALITY ignore  TYPE SourceID                   PRESENCE mandatory} |
    { ID id-TargetID                CRITICALITY reject  TYPE TargetID                   PRESENCE mandatory} |
    { ID id-ClassmarkInformation2           CRITICALITY reject  TYPE ClassmarkInformation2       PRESENCE conditional
    -- This IE shall be present if the Target ID IE contains a CGI IE --                           } |
    { ID id-ClassmarkInformation3           CRITICALITY ignore  TYPE ClassmarkInformation3       PRESENCE conditional
    -- This IE shall be present if the Target ID IE contains a CGI IE --                           } |
    { ID id-SourceRNC-ToTargetRNC-TransparentContainer
                            CRITICALITY reject  TYPE SourceRNC-ToTargetRNC-TransparentContainer PRESENCE conditional
    -- This IE shall be present if the Target ID IE contains a RNC-ID IE  --                                } |
    { ID id-OldBSS-ToNewBSS-Information     CRITICALITY ignore  TYPE OldBSS-ToNewBSS-Information    PRESENCE optional   } ,
```

```
    ...
}

RelocationRequiredExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 5 to enable GERAN support over Iu-cs --
    { ID id-GERAN-Classmark                 CRITICALITY ignore  EXTENSION GERAN-Classmark        PRESENCE optional } ,
    ...
}

-- **************************************************************
--
-- Relocation Command
--
-- **************************************************************

RelocationCommand ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { {RelocationCommandIEs} },
    protocolExtensions      ProtocolExtensionContainer { {RelocationCommandExtensions} }            OPTIONAL,
    ...
}

RelocationCommandIEs RANAP-PROTOCOL-IES ::= {
    { ID id-TargetRNC-ToSourceRNC-TransparentContainer
                            CRITICALITY reject  TYPE TargetRNC-ToSourceRNC-TransparentContainer PRESENCE optional  } |
    { ID id-L3-Information              CRITICALITY ignore  TYPE L3-Information             PRESENCE optional } |
    { ID id-RAB-RelocationReleaseList       CRITICALITY ignore  TYPE RAB-RelocationReleaseList       PRESENCE optional } |
    { ID id-RAB-DataForwardingList          CRITICALITY ignore  TYPE RAB-DataForwardingList      PRESENCE optional } |
    { ID id-CriticalityDiagnostics          CRITICALITY ignore  TYPE CriticalityDiagnostics          PRESENCE optional },
    ...
}

RAB-RelocationReleaseList               ::= RAB-IE-ContainerList { {RAB-RelocationReleaseItemIEs} }

RAB-RelocationReleaseItemIEs RANAP-PROTOCOL-IES ::= {
    { ID id-RAB-RelocationReleaseItem       CRITICALITY ignore  TYPE RAB-RelocationReleaseItem       PRESENCE mandatory   },
    ...
}

RAB-RelocationReleaseItem ::= SEQUENCE {
    rAB-ID                      RAB-ID,
    iE-Extensions                   ProtocolExtensionContainer { {RAB-RelocationReleaseItem-ExtIEs} }        OPTIONAL,
    ...
}

RAB-RelocationReleaseItem-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}
```

```
RAB-DataForwardingList                 ::= RAB-IE-ContainerList { {RAB-DataForwardingItemIEs} }

RAB-DataForwardingItemIEs RANAP-PROTOCOL-IES ::= {
    { ID id-RAB-DataForwardingItem          CRITICALITY ignore  TYPE RAB-DataForwardingItem      PRESENCE mandatory   },
    ...
}

RAB-DataForwardingItem ::= SEQUENCE {
    rAB-ID                      RAB-ID,
    transportLayerAddress               TransportLayerAddress,
    iuTransportAssociation              IuTransportAssociation,
    iE-Extensions                  ProtocolExtensionContainer { {RAB-DataForwardingItem-ExtIEs} }        OPTIONAL,
    ...
}

RAB-DataForwardingItem-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 5 to allow transfer of a second pair of TLA and association --
        {ID id-TransportLayerAddress    CRITICALITY ignore  EXTENSION TransportLayerAddress PRESENCE optional} |
        {ID id-IuTransportAssociation   CRITICALITY ignore  EXTENSION IuTransportAssociation    PRESENCE optional},
    ...
}

RelocationCommandExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 5 to enable Inter RAN Load Information Exchange over Iu --
    { ID id-InterSystemInformation-TransparentContainer     CRITICALITY ignore  EXTENSION InterSystemInformation-TransparentContainer
    PRESENCE optional   },
    ...
}

-- **************************************************************
--
-- Relocation Preparation Failure
--
-- **************************************************************

RelocationPreparationFailure ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { {RelocationPreparationFailureIEs} },
    protocolExtensions      ProtocolExtensionContainer { {RelocationPreparationFailureExtensions} }       OPTIONAL,
        ...
}

RelocationPreparationFailureIEs RANAP-PROTOCOL-IES ::= {
    { ID id-Cause                   CRITICALITY ignore  TYPE Cause                  PRESENCE mandatory  } |
    { ID id-CriticalityDiagnostics          CRITICALITY ignore  TYPE CriticalityDiagnostics         PRESENCE optional },
    ...
}

RelocationPreparationFailureExtensions RANAP-PROTOCOL-EXTENSION ::= {
```

```
-- Extension for Release 5 to enable Inter RAN Load Information Exchange over Iu --
    { ID id-InterSystemInformation-TransparentContainer     CRITICALITY ignore  EXTENSION InterSystemInformation-TransparentContainer         PRESENCE
optional    },
    ...
}

-- **************************************************************
--
-- RELOCATION RESOURCE ALLOCATION ELEMENTARY PROCEDURE
--
-- **************************************************************

-- **************************************************************
--
-- Relocation Request
--
-- **************************************************************

RelocationRequest ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { {RelocationRequestIEs} },
    protocolExtensions      ProtocolExtensionContainer { {RelocationRequestExtensions} }            OPTIONAL,
    ...
}

RelocationRequestIEs RANAP-PROTOCOL-IES ::= {
    { ID id-PermanentNAS-UE-ID          CRITICALITY ignore  TYPE PermanentNAS-UE-ID             PRESENCE optional  } |
    { ID id-Cause                   CRITICALITY ignore  TYPE Cause                  PRESENCE mandatory  } |
    { ID id-CN-DomainIndicator          CRITICALITY reject  TYPE CN-DomainIndicator             PRESENCE mandatory  } |
    { ID id-SourceRNC-ToTargetRNC-TransparentContainer
                            CRITICALITY reject  TYPE SourceRNC-ToTargetRNC-TransparentContainer PRESENCE mandatory  } |
    { ID id-RAB-SetupList-RelocReq          CRITICALITY reject  TYPE RAB-SetupList-RelocReq      PRESENCE optional } |
    { ID id-IntegrityProtectionInformation      CRITICALITY ignore  TYPE IntegrityProtectionInformation      PRESENCE optional } |
    { ID id-EncryptionInformation           CRITICALITY ignore  TYPE EncryptionInformation       PRESENCE optional } |
    { ID id-IuSigConId  CRITICALITY ignore TYPE IuSignallingConnectionIdentifier  PRESENCE mandatory },
    ...
}

RAB-SetupList-RelocReq                  ::= RAB-IE-ContainerList { {RAB-SetupItem-RelocReq-IEs} }

RAB-SetupItem-RelocReq-IEs RANAP-PROTOCOL-IES ::= {
    { ID id-RAB-SetupItem-RelocReq          CRITICALITY reject  TYPE RAB-SetupItem-RelocReq      PRESENCE mandatory   },
    ...
}

RAB-SetupItem-RelocReq ::= SEQUENCE {
    rAB-ID                      RAB-ID,
    nAS-SynchronisationIndicator    NAS-SynchronisationIndicator    OPTIONAL,
    rAB-Parameters                  RAB-Parameters,
```

```
    dataVolumeReportingIndication          DataVolumeReportingIndication   OPTIONAL
    -- This IE shall be present if the CN domain indicator IE is set to "PS domain" --,
    pDP-TypeInformation             PDP-TypeInformation     OPTIONAL
    -- This IE shall be present if the CN domain indicator IE is set to "PS domain" --,
    userPlaneInformation                UserPlaneInformation,
    transportLayerAddress               TransportLayerAddress,
    iuTransportAssociation              IuTransportAssociation,
    service-Handover                Service-Handover        OPTIONAL,
    iE-Extensions                   ProtocolExtensionContainer { {RAB-SetupItem-RelocReq-ExtIEs} }        OPTIONAL,
    ...
}

RAB-SetupItem-RelocReq-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 4 to enable RAB Quality of Service negotiation over Iu --
    {ID id-Alt-RAB-Parameters   CRITICALITY ignore      EXTENSION Alt-RAB-Parameters        PRESENCE optional} |
-- Extension for Release 5 to enable GERAN support over Iu-cs --
    { ID id-GERAN-BSC-Container                CRITICALITY ignore  EXTENSION GERAN-BSC-Container       PRESENCE optional },
    ...
}

UserPlaneInformation ::= SEQUENCE {
    userPlaneMode                   UserPlaneMode,
    uP-ModeVersions                 UP-ModeVersions,
    iE-Extensions                   ProtocolExtensionContainer { {UserPlaneInformation-ExtIEs} }       OPTIONAL,
    ...
}

UserPlaneInformation-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

RelocationRequestExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 4 --
    { ID id-GlobalCN-ID             CRITICALITY reject      EXTENSION GlobalCN-ID               PRESENCE optional} |
-- Extension for Release 5 to enable shared networks in connected mode --
    { ID id-SNA-Access-Information  CRITICALITY ignore      EXTENSION SNA-Access-Information    PRESENCE optional} |
-- Extension for Release 5 to enable specific behaviour by the RNC in relation with early UE handling --
    { ID id-UESBI-Iu    CRITICALITY ignore      EXTENSION UESBI-Iu  PRESENCE optional}|
-- Extension for Release 6 to convey the selected PLMN id in network sharing mobility scenarios --
    { ID id-SelectedPLMN-ID     CRITICALITY ignore  EXTENSION PLMNidentity      PRESENCE optional    }|
-- Extension for Release 6 to enable MBMS UE linking at relocation --
    { ID id-CNMBMSLinkingInformation    CRITICALITY ignore      EXTENSION CNMBMSLinkingInformation   PRESENCE optional},
    ...
}

CNMBMSLinkingInformation ::= SEQUENCE {
    joinedMBMSBearerService-IEs     JoinedMBMSBearerService-IEs,
    iE-Extensions                   ProtocolExtensionContainer { {CNMBMSLinkingInformation-ExtIEs} }    OPTIONAL,
```

```
    ...
}

CNMBMSLinkingInformation-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

JoinedMBMSBearerService-IEs ::= SEQUENCE (SIZE (1.. maxnoofMulticastServicesPerUE)) OF
    SEQUENCE {
        tMGI                TMGI,
        mBMS-PTP-RAB-ID     MBMS-PTP-RAB-ID,
        iE-Extensions       ProtocolExtensionContainer { {JoinedMBMSBearerService-ExtIEs} } OPTIONAL,
        ...
    }

JoinedMBMSBearerService-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- Relocation Request Acknowledge
--
-- **************************************************************

RelocationRequestAcknowledge ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { {RelocationRequestAcknowledgeIEs} },
    protocolExtensions      ProtocolExtensionContainer { {RelocationRequestAcknowledgeExtensions} }       OPTIONAL,
    ...
}

RelocationRequestAcknowledgeIEs RANAP-PROTOCOL-IES ::= {
    { ID id-TargetRNC-ToSourceRNC-TransparentContainer
                            CRITICALITY ignore  TYPE TargetRNC-ToSourceRNC-TransparentContainer PRESENCE optional  } |
    { ID id-RAB-SetupList-RelocReqAck       CRITICALITY ignore  TYPE RAB-SetupList-RelocReqAck      PRESENCE optional} |
    { ID id-RAB-FailedList              CRITICALITY ignore  TYPE RAB-FailedList             PRESENCE optional }|
    { ID id-ChosenIntegrityProtectionAlgorithm  CRITICALITY ignore  TYPE ChosenIntegrityProtectionAlgorithm     PRESENCE optional } |
    { ID id-ChosenEncryptionAlgorithm       CRITICALITY ignore  TYPE ChosenEncryptionAlgorithm       PRESENCE optional } |
    { ID id-CriticalityDiagnostics          CRITICALITY ignore  TYPE CriticalityDiagnostics          PRESENCE optional },
    ...
}

RAB-SetupList-RelocReqAck               ::= RAB-IE-ContainerList { {RAB-SetupItem-RelocReqAck-IEs} }

RAB-SetupItem-RelocReqAck-IEs RANAP-PROTOCOL-IES ::= {
    { ID id-RAB-SetupItem-RelocReqAck       CRITICALITY reject  TYPE RAB-SetupItem-RelocReqAck       PRESENCE mandatory   },
    ...
}
```

```
RAB-SetupItem-RelocReqAck ::= SEQUENCE {
    rAB-ID                      RAB-ID,
    transportLayerAddress               TransportLayerAddress   OPTIONAL,
    iuTransportAssociation              IuTransportAssociation  OPTIONAL,
    iE-Extensions                   ProtocolExtensionContainer { {RAB-SetupItem-RelocReqAck-ExtIEs} }        OPTIONAL,
    ...
}

RAB-SetupItem-RelocReqAck-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 4 to enable RAB Quality of Service negotiation over Iu --
    {ID id-Ass-RAB-Parameters   CRITICALITY ignore      EXTENSION Ass-RAB-Parameters        PRESENCE optional} |
-- Extension for Release 5 to allow transfer of a second pair of TLA and association --
    {ID id-TransportLayerAddress    CRITICALITY ignore  EXTENSION TransportLayerAddress PRESENCE optional} |
    {ID id-IuTransportAssociation   CRITICALITY ignore  EXTENSION IuTransportAssociation    PRESENCE optional},
    ...
}

RAB-FailedList                      ::= RAB-IE-ContainerList { {RAB-FailedItemIEs} }

RAB-FailedItemIEs RANAP-PROTOCOL-IES ::= {
    { ID id-RAB-FailedItem              CRITICALITY ignore  TYPE RAB-FailedItem             PRESENCE mandatory   },
    ...
}

RAB-FailedItem ::= SEQUENCE {
    rAB-ID                      RAB-ID,
    cause                       Cause,
    iE-Extensions                   ProtocolExtensionContainer { {RAB-FailedItem-ExtIEs} }       OPTIONAL,
    ...
}

RAB-FailedItem-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

RelocationRequestAcknowledgeExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 5 to enable Inter RAN Load Information Exchange over Iu --
    {ID id-NewBSS-To-OldBSS-Information     CRITICALITY ignore  EXTENSION NewBSS-To-OldBSS-Information    PRESENCE optional    },
    ...
}

-- **************************************************************
--
-- Relocation Failure
--
-- **************************************************************
```

```
RelocationFailure ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { {RelocationFailureIEs} },
    protocolExtensions      ProtocolExtensionContainer { {RelocationFailureExtensions} }            OPTIONAL,
    ...
}

RelocationFailureIEs RANAP-PROTOCOL-IES ::= {
    { ID id-Cause                   CRITICALITY ignore  TYPE Cause                  PRESENCE mandatory  } |
    { ID id-CriticalityDiagnostics          CRITICALITY ignore  TYPE CriticalityDiagnostics         PRESENCE optional },
    ...
}

RelocationFailureExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 5 to enable Inter RAN Load Information Exchange over Iu --
    { ID id-NewBSS-To-OldBSS-Information        CRITICALITY ignore  EXTENSION NewBSS-To-OldBSS-Information   PRESENCE optional } |
-- Extension for Release 5 to enable GERAN support over Iu-cs --
    { ID id-GERAN-Classmark                 CRITICALITY ignore  EXTENSION GERAN-Classmark        PRESENCE optional },
    ...
}

-- **************************************************************
--
-- RELOCATION CANCEL ELEMENTARY PROCEDURE
--
-- **************************************************************

-- **************************************************************
--
-- Relocation Cancel
--
-- **************************************************************

RelocationCancel ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { {RelocationCancelIEs} },
    protocolExtensions      ProtocolExtensionContainer { {RelocationCancelExtensions} }          OPTIONAL,
    ...
}

RelocationCancelIEs RANAP-PROTOCOL-IES ::= {
    { ID id-Cause                   CRITICALITY ignore  TYPE Cause                  PRESENCE mandatory  },
    ...
}

RelocationCancelExtensions RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
```

```
--
-- Relocation Cancel Acknowledge
--
-- **************************************************************

RelocationCancelAcknowledge ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { {RelocationCancelAcknowledgeIEs} },
    protocolExtensions      ProtocolExtensionContainer { {RelocationCancelAcknowledgeExtensions} }        OPTIONAL,
    ...
}

RelocationCancelAcknowledgeIEs RANAP-PROTOCOL-IES ::= {
    { ID id-CriticalityDiagnostics          CRITICALITY ignore  TYPE CriticalityDiagnostics      PRESENCE optional },
    ...
}

RelocationCancelAcknowledgeExtensions RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- SRNS CONTEXT TRANSFER OPEARATION
--
-- **************************************************************

-- **************************************************************
--
-- SRNS Context Request
--
-- **************************************************************

SRNS-ContextRequest ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { {SRNS-ContextRequestIEs} },
    protocolExtensions      ProtocolExtensionContainer { {SRNS-ContextRequestExtensions} }          OPTIONAL,
    ...
}

SRNS-ContextRequestIEs RANAP-PROTOCOL-IES ::= {
    { ID id-RAB-DataForwardingList-SRNS-CtxReq  CRITICALITY ignore  TYPE RAB-DataForwardingList-SRNS-CtxReq     PRESENCE mandatory   },
    ...
}

RAB-DataForwardingList-SRNS-CtxReq          ::= RAB-IE-ContainerList { {RAB-DataForwardingItem-SRNS-CtxReq-IEs} }

RAB-DataForwardingItem-SRNS-CtxReq-IEs RANAP-PROTOCOL-IES ::= {
    { ID id-RAB-DataForwardingItem-SRNS-CtxReq  CRITICALITY reject  TYPE RAB-DataForwardingItem-SRNS-CtxReq     PRESENCE mandatory   },
    ...
```

```
}

RAB-DataForwardingItem-SRNS-CtxReq ::= SEQUENCE {
    rAB-ID                      RAB-ID,
    iE-Extensions                   ProtocolExtensionContainer { {RAB-DataForwardingItem-SRNS-CtxReq-ExtIEs} }        OPTIONAL,
    ...
}

RAB-DataForwardingItem-SRNS-CtxReq-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

SRNS-ContextRequestExtensions RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- SRNS Context Response
--
-- **************************************************************

SRNS-ContextResponse ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { {SRNS-ContextResponseIEs} },
    protocolExtensions      ProtocolExtensionContainer { {SRNS-ContextResponseExtensions} }         OPTIONAL,
    ...
}

SRNS-ContextResponseIEs RANAP-PROTOCOL-IES ::= {
    { ID id-RAB-ContextList             CRITICALITY ignore  TYPE RAB-ContextList                PRESENCE optional  } |
    { ID id-RAB-ContextFailedtoTransferList     CRITICALITY ignore  TYPE RAB-ContextFailedtoTransferList     PRESENCE optional }|
    { ID id-CriticalityDiagnostics          CRITICALITY ignore  TYPE CriticalityDiagnostics       PRESENCE optional },
    ...
}

RAB-ContextList                     ::= RAB-IE-ContainerList { {RAB-ContextItemIEs} }

RAB-ContextItemIEs RANAP-PROTOCOL-IES ::= {
    { ID id-RAB-ContextItem             CRITICALITY ignore  TYPE RAB-ContextItem                PRESENCE mandatory },
    ...
}

RAB-ContextItem ::= SEQUENCE {
    rAB-ID                      RAB-ID,
    dl-GTP-PDU-SequenceNumber           DL-GTP-PDU-SequenceNumber   OPTIONAL,
    ul-GTP-PDU-SequenceNumber           UL-GTP-PDU-SequenceNumber   OPTIONAL,
    dl-N-PDU-SequenceNumber             DL-N-PDU-SequenceNumber     OPTIONAL,
    ul-N-PDU-SequenceNumber             UL-N-PDU-SequenceNumber     OPTIONAL,
```

```
    iE-Extensions                   ProtocolExtensionContainer { {RAB-ContextItem-ExtIEs} }       OPTIONAL,
    ...
}

RAB-ContextItem-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

RAB-ContextFailedtoTransferList                ::= RAB-IE-ContainerList { {RABs-ContextFailedtoTransferItemIEs} }

RABs-ContextFailedtoTransferItemIEs RANAP-PROTOCOL-IES ::= {
    { ID id-RAB-ContextFailedtoTransferItem     CRITICALITY ignore  TYPE RABs-ContextFailedtoTransferItem       PRESENCE mandatory   },
    ...
}

RABs-ContextFailedtoTransferItem::= SEQUENCE {
    rAB-ID                      RAB-ID,
    cause                       Cause,
    iE-Extensions                   ProtocolExtensionContainer { { RABs-ContextFailedtoTransferItem-ExtIEs} }       OPTIONAL,
    ...
}


RABs-ContextFailedtoTransferItem-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

SRNS-ContextResponseExtensions RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- SECURITY MODE CONTROL ELEMENTARY PROCEDURE
--
-- **************************************************************

-- **************************************************************
--
-- Security Mode Command
--
-- **************************************************************

SecurityModeCommand ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { {SecurityModeCommandIEs} },
    protocolExtensions      ProtocolExtensionContainer { {SecurityModeCommandExtensions} }          OPTIONAL,
    ...
}
```

```
SecurityModeCommandIEs RANAP-PROTOCOL-IES ::= {
    { ID id-IntegrityProtectionInformation      CRITICALITY reject  TYPE IntegrityProtectionInformation    PRESENCE mandatory   } |
    { ID id-EncryptionInformation           CRITICALITY ignore  TYPE EncryptionInformation        PRESENCE optional } |
    { ID id-KeyStatus                       CRITICALITY reject  TYPE KeyStatus                    PRESENCE mandatory},
    ...
}

SecurityModeCommandExtensions RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- Security Mode Complete
--
-- **************************************************************

SecurityModeComplete ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { {SecurityModeCompleteIEs} },
    protocolExtensions      ProtocolExtensionContainer { {SecurityModeCompleteExtensions} }         OPTIONAL,
    ...
}

SecurityModeCompleteIEs RANAP-PROTOCOL-IES ::= {
    { ID id-ChosenIntegrityProtectionAlgorithm  CRITICALITY reject  TYPE ChosenIntegrityProtectionAlgorithm   PRESENCE mandatory   } |
    { ID id-ChosenEncryptionAlgorithm       CRITICALITY ignore  TYPE ChosenEncryptionAlgorithm       PRESENCE optional } |
    { ID id-CriticalityDiagnostics          CRITICALITY ignore  TYPE CriticalityDiagnostics       PRESENCE optional },
    ...
}

SecurityModeCompleteExtensions RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- Security Mode Reject
--
-- **************************************************************

SecurityModeReject ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { {SecurityModeRejectIEs} },
    protocolExtensions      ProtocolExtensionContainer { {SecurityModeRejectExtensions} }           OPTIONAL,
    ...
}

SecurityModeRejectIEs RANAP-PROTOCOL-IES ::= {
```

```
    { ID id-Cause                   CRITICALITY ignore  TYPE Cause                  PRESENCE mandatory  } |
    { ID id-CriticalityDiagnostics          CRITICALITY ignore  TYPE CriticalityDiagnostics         PRESENCE optional },
    ...
}

SecurityModeRejectExtensions RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- DATA VOLUME REPORT ELEMENTARY PROCEDURE
--
-- **************************************************************

-- **************************************************************
--
-- Data Volume Report Request
--
-- **************************************************************

DataVolumeReportRequest ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { {DataVolumeReportRequestIEs} },
    protocolExtensions      ProtocolExtensionContainer { {DataVolumeReportRequestExtensions} }      OPTIONAL,
    ...
}

DataVolumeReportRequestIEs RANAP-PROTOCOL-IES ::= {
    { ID id-RAB-DataVolumeReportRequestList     CRITICALITY ignore  TYPE RAB-DataVolumeReportRequestList     PRESENCE mandatory   },
    ...
}

RAB-DataVolumeReportRequestList             ::= RAB-IE-ContainerList { {RAB-DataVolumeReportRequestItemIEs} }

RAB-DataVolumeReportRequestItemIEs RANAP-PROTOCOL-IES ::= {
    { ID id-RAB-DataVolumeReportRequestItem     CRITICALITY reject  TYPE RAB-DataVolumeReportRequestItem     PRESENCE mandatory   },
    ...
}

RAB-DataVolumeReportRequestItem ::= SEQUENCE {
    rAB-ID                      RAB-ID,
    iE-Extensions                   ProtocolExtensionContainer { {RAB-DataVolumeReportRequestItem-ExtIEs} }        OPTIONAL,
    ...
}

RAB-DataVolumeReportRequestItem-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}
```

```
DataVolumeReportRequestExtensions RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- Data Volume Report
--
-- **************************************************************

DataVolumeReport ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { {DataVolumeReportIEs} },
    protocolExtensions      ProtocolExtensionContainer { {DataVolumeReportExtensions} }          OPTIONAL,
    ...
}

DataVolumeReportIEs RANAP-PROTOCOL-IES ::= {
    { ID id-RAB-DataVolumeReportList        CRITICALITY ignore  TYPE RAB-DataVolumeReportList       PRESENCE optional } |
    { ID id-RAB-FailedtoReportList          CRITICALITY ignore  TYPE RAB-FailedtoReportList      PRESENCE optional } |
    { ID id-CriticalityDiagnostics          CRITICALITY ignore  TYPE CriticalityDiagnostics      PRESENCE optional },
    ...
}

DataVolumeReportExtensions RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

RAB-FailedtoReportList              ::= RAB-IE-ContainerList { {RABs-failed-to-reportItemIEs} }

RABs-failed-to-reportItemIEs RANAP-PROTOCOL-IES ::= {
    { ID id-RAB-FailedtoReportItem      CRITICALITY ignore  TYPE RABs-failed-to-reportItem       PRESENCE mandatory   },
    ...
}

RABs-failed-to-reportItem::= SEQUENCE {
    rAB-ID                      RAB-ID,
    cause                       Cause,
    iE-Extensions                   ProtocolExtensionContainer { { RABs-failed-to-reportItem-ExtIEs} }       OPTIONAL,
    ...
}


RABs-failed-to-reportItem-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}
```

```
-- **************************************************************
--
-- RESET ELEMENTARY PROCEDURE
--
-- **************************************************************

-- **************************************************************
--
-- Reset
--
-- **************************************************************

Reset ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { {ResetIEs} },
    protocolExtensions      ProtocolExtensionContainer { {ResetExtensions} }                    OPTIONAL,
    ...
}

ResetIEs RANAP-PROTOCOL-IES ::= {
    { ID id-Cause                   CRITICALITY ignore  TYPE Cause                  PRESENCE mandatory  } |
    { ID id-CN-DomainIndicator          CRITICALITY reject  TYPE CN-DomainIndicator             PRESENCE mandatory  } |
    { ID id-GlobalRNC-ID                CRITICALITY ignore  TYPE GlobalRNC-ID               PRESENCE optional },
    ...
}

ResetExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 4 --
    { ID id-GlobalCN-ID             CRITICALITY ignore      EXTENSION GlobalCN-ID               PRESENCE optional},
    ...
}

-- **************************************************************
--
-- Reset Acknowledge
--
-- **************************************************************

ResetAcknowledge ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { {ResetAcknowledgeIEs} },
    protocolExtensions      ProtocolExtensionContainer { {ResetAcknowledgeExtensions} }          OPTIONAL,
    ...
}

ResetAcknowledgeIEs RANAP-PROTOCOL-IES ::= {
    { ID id-CN-DomainIndicator          CRITICALITY reject  TYPE CN-DomainIndicator             PRESENCE mandatory  } |
     { ID id-CriticalityDiagnostics         CRITICALITY ignore  TYPE CriticalityDiagnostics       PRESENCE optional } |
    { ID id-GlobalRNC-ID                CRITICALITY ignore  TYPE GlobalRNC-ID               PRESENCE optional },
    ...
```

```
}

ResetAcknowledgeExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 4 --
    { ID id-GlobalCN-ID             CRITICALITY ignore      EXTENSION GlobalCN-ID               PRESENCE optional},
    ...
}
-- **************************************************************
--
-- RESET RESOURCE ELEMENTARY PROCEDURE
--
-- **************************************************************


-- **************************************************************
--
-- Reset Resource
--
-- **************************************************************

ResetResource ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { {ResetResourceIEs} },
    protocolExtensions      ProtocolExtensionContainer { {ResetResourceExtensions} }                OPTIONAL,
    ...
}

ResetResourceIEs RANAP-PROTOCOL-IES ::= {
    { ID id-CN-DomainIndicator          CRITICALITY reject  TYPE CN-DomainIndicator             PRESENCE mandatory  } |
    { ID id-Cause                   CRITICALITY ignore  TYPE Cause                  PRESENCE mandatory  } |
    { ID id-IuSigConIdList              CRITICALITY ignore  TYPE ResetResourceList              PRESENCE mandatory  } |
    { ID id-GlobalRNC-ID                CRITICALITY ignore  TYPE GlobalRNC-ID               PRESENCE optional },
    ...
}

ResetResourceList   ::= IuSigConId-IE-ContainerList{ {ResetResourceItemIEs} }

ResetResourceItemIEs RANAP-PROTOCOL-IES ::= {
    { ID id-IuSigConIdItem              CRITICALITY reject  TYPE    ResetResourceItem           PRESENCE mandatory  },
    ...
}

ResetResourceItem ::= SEQUENCE {
    iuSigConId                  IuSignallingConnectionIdentifier,
    iE-Extensions               ProtocolExtensionContainer { { ResetResourceItem-ExtIEs} }       OPTIONAL,
    ...
}

ResetResourceItem-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
```

```
    ...
}

ResetResourceExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 4 --
    { ID id-GlobalCN-ID             CRITICALITY ignore      EXTENSION GlobalCN-ID               PRESENCE optional},
    ...
}

-- **************************************************************
--
-- Reset Resource Acknowledge
--
-- **************************************************************

ResetResourceAcknowledge ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { {ResetResourceAcknowledgeIEs} },
    protocolExtensions      ProtocolExtensionContainer { {ResetResourceAcknowledgeExtensions} }        OPTIONAL,
    ...
}

ResetResourceAcknowledgeIEs RANAP-PROTOCOL-IES ::= {
    { ID id-CN-DomainIndicator          CRITICALITY reject  TYPE CN-DomainIndicator             PRESENCE mandatory  } |
    { ID id-IuSigConIdList              CRITICALITY ignore  TYPE ResetResourceAckList           PRESENCE mandatory  } |
    { ID id-GlobalRNC-ID                CRITICALITY ignore  TYPE GlobalRNC-ID               PRESENCE optional } |
    { ID id-CriticalityDiagnostics          CRITICALITY ignore  TYPE CriticalityDiagnostics       PRESENCE optional },
    ...
}
ResetResourceAckList    ::= IuSigConId-IE-ContainerList{ {ResetResourceAckItemIEs} }

ResetResourceAckItemIEs RANAP-PROTOCOL-IES ::= {
    { ID id-IuSigConIdItem              CRITICALITY reject  TYPE    ResetResourceAckItem          PRESENCE mandatory   },
    ...
}

ResetResourceAckItem ::= SEQUENCE {
    iuSigConId                  IuSignallingConnectionIdentifier,
    iE-Extensions               ProtocolExtensionContainer { { ResetResourceAckItem-ExtIEs} }       OPTIONAL,
    ...
}

ResetResourceAckItem-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

ResetResourceAcknowledgeExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 4 --
    { ID id-GlobalCN-ID             CRITICALITY ignore      EXTENSION GlobalCN-ID               PRESENCE optional},
```

```
    ...
}

-- **************************************************************
--
-- RAB RELEASE REQUEST ELEMENTARY PROCEDURE
--
-- **************************************************************

-- **************************************************************
--
-- RAB Release Request
--
-- **************************************************************

RAB-ReleaseRequest ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { {RAB-ReleaseRequestIEs} },
    protocolExtensions      ProtocolExtensionContainer { {RAB-ReleaseRequestExtensions} }           OPTIONAL,
    ...
}

RAB-ReleaseRequestIEs RANAP-PROTOCOL-IES ::= {
    { ID id-RAB-ReleaseList             CRITICALITY ignore  TYPE RAB-ReleaseList               PRESENCE mandatory },
    ...
}

RAB-ReleaseList                     ::= RAB-IE-ContainerList { {RAB-ReleaseItemIEs} }

RAB-ReleaseItemIEs RANAP-PROTOCOL-IES ::= {
    { ID id-RAB-ReleaseItem             CRITICALITY ignore  TYPE RAB-ReleaseItem               PRESENCE mandatory },
    ...
}

RAB-ReleaseItem ::= SEQUENCE {
    rAB-ID                      RAB-ID,
    cause                       Cause,
    iE-Extensions                   ProtocolExtensionContainer { {RAB-ReleaseItem-ExtIEs} }      OPTIONAL,
    ...
}

RAB-ReleaseItem-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

RAB-ReleaseRequestExtensions RANAP-PROTOCOL-EXTENSION ::= {
    ...
}
```

```
-- **************************************************************
--
-- Iu RELEASE REQUEST ELEMENTARY PROCEDURE
--
-- **************************************************************

-- **************************************************************
--
-- Iu Release Request
--
-- **************************************************************

Iu-ReleaseRequest ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { {Iu-ReleaseRequestIEs} },
    protocolExtensions      ProtocolExtensionContainer { {Iu-ReleaseRequestExtensions} }            OPTIONAL,
    ...
}

Iu-ReleaseRequestIEs RANAP-PROTOCOL-IES ::= {
    { ID id-Cause                   CRITICALITY ignore  TYPE Cause                  PRESENCE mandatory  },
    ...
}

Iu-ReleaseRequestExtensions RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- RELOCATION DETECT ELEMENTARY PROCEDURE
--
-- **************************************************************

-- **************************************************************
--
-- Relocation Detect
--
-- **************************************************************

RelocationDetect ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { {RelocationDetectIEs} },
    protocolExtensions      ProtocolExtensionContainer { {RelocationDetectExtensions} }          OPTIONAL,
    ...
}

RelocationDetectIEs RANAP-PROTOCOL-IES ::= {
    ...
}
```

```
RelocationDetectExtensions RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- RELOCATION COMPLETE ELEMENTARY PROCEDURE
--
-- **************************************************************

-- **************************************************************
--
-- Relocation Complete
--
-- **************************************************************

RelocationComplete ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { {RelocationCompleteIEs} },
    protocolExtensions      ProtocolExtensionContainer { {RelocationCompleteExtensions} }           OPTIONAL,
    ...
}

RelocationCompleteIEs RANAP-PROTOCOL-IES ::= {
    ...
}

RelocationCompleteExtensions RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- PAGING ELEMENTARY PROCEDURE
--
-- **************************************************************

-- **************************************************************
--
-- Paging
--
-- **************************************************************

Paging ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { {PagingIEs} },
    protocolExtensions      ProtocolExtensionContainer { {PagingExtensions} }                   OPTIONAL,
    ...
}
```

```
PagingIEs RANAP-PROTOCOL-IES ::= {
    { ID id-CN-DomainIndicator          CRITICALITY ignore  TYPE CN-DomainIndicator            PRESENCE mandatory } |
    { ID id-PermanentNAS-UE-ID          CRITICALITY ignore  TYPE PermanentNAS-UE-ID            PRESENCE mandatory } |
    { ID id-TemporaryUE-ID              CRITICALITY ignore  TYPE TemporaryUE-ID            PRESENCE optional } |
    { ID id-PagingAreaID                CRITICALITY ignore  TYPE PagingAreaID              PRESENCE optional } |
    { ID id-PagingCause             CRITICALITY ignore  TYPE PagingCause               PRESENCE optional } |
    { ID id-NonSearchingIndication          CRITICALITY ignore  TYPE NonSearchingIndication      PRESENCE optional } |
    { ID id-DRX-CycleLengthCoefficient              CRITICALITY ignore  TYPE DRX-CycleLengthCoefficient         PRESENCE optional } ,
    ...
}

PagingExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 5 to enable NNSF --
    { ID id-GlobalCN-ID             CRITICALITY ignore  EXTENSION GlobalCN-ID              PRESENCE optional } ,
    ...
}

-- **************************************************************
--
-- COMMON ID ELEMENTARY PROCEDURE
--
-- **************************************************************

-- **************************************************************
--
-- Common ID
--
-- **************************************************************

CommonID ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { {CommonID-IEs} },
    protocolExtensions      ProtocolExtensionContainer { {CommonIDExtensions} }                OPTIONAL,
    ...
}

CommonID-IEs RANAP-PROTOCOL-IES ::= {
    { ID id-PermanentNAS-UE-ID          CRITICALITY ignore  TYPE PermanentNAS-UE-ID            PRESENCE mandatory },
    ...
}

CommonIDExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 5 to enable shared networks in connected mode --
    { ID id-SNA-Access-Information      CRITICALITY ignore  EXTENSION   SNA-Access-Information      PRESENCE optional   } |
-- Extension for Release 5 to enable specific behaviour by the RNC in relation with early UE handling --
    { ID id-UESBI-Iu    CRITICALITY ignore      EXTENSION UESBI-Iu  PRESENCE optional}|
-- Extension for Release 6 to indicate the selected plmn in GWCN configuration for network sharing non-supporting UEs --
    { ID id-SelectedPLMN-ID     CRITICALITY ignore  EXTENSION PLMNidentity      PRESENCE optional   },
```

```
    ...
}

-- **************************************************************
--
-- CN INVOKE TRACE ELEMENTARY PROCEDURE
--
-- **************************************************************

-- **************************************************************
--
-- CN Invoke Trace
--
-- **************************************************************

CN-InvokeTrace ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { {CN-InvokeTraceIEs} },
    protocolExtensions      ProtocolExtensionContainer { {CN-InvokeTraceExtensions} }            OPTIONAL,
    ...
}

CN-InvokeTraceIEs RANAP-PROTOCOL-IES ::= {
    { ID id-TraceType               CRITICALITY ignore  TYPE TraceType                  PRESENCE optional } |
    -- This information is mandatory for GERAN Iu Mode, not applicable to UTRAN --
    { ID id-TraceReference              CRITICALITY ignore  TYPE TraceReference             PRESENCE mandatory  } |
    { ID id-TriggerID               CRITICALITY ignore  TYPE TriggerID                  PRESENCE optional } |
    -- This information is mandatory for GERAN Iu Mode, not applicable to UTRAN --
    { ID id-UE-ID                   CRITICALITY ignore  TYPE UE-ID                  PRESENCE optional  } |
    -- This information is mandatory for UTRAN, optional for GERAN Iu mode --
    { ID id-OMC-ID                  CRITICALITY ignore  TYPE OMC-ID                 PRESENCE optional  },
    -- This information is mandatory for GERAN Iu Mode, not applicable to UTRAN --
    ...
}

CN-InvokeTraceExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 6 to enable signalling based activation for Subscriber and Equipment Trace over Iu interface --
    { ID id-TracePropagationParameters      CRITICALITY ignore  EXTENSION TracePropagationParameters      PRESENCE optional } ,
    ...
}

-- **************************************************************
--
-- CN DEACTIVATE TRACE ELEMENTARY PROCEDURE
--
-- **************************************************************

-- **************************************************************
--
```

```
-- CN Deactivate Trace
--
-- **************************************************************

CN-DeactivateTrace ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { {CN-DeactivateTraceIEs} },
    protocolExtensions      ProtocolExtensionContainer { {CN-DeactivateTraceExtensions} }           OPTIONAL,
    ...
}

CN-DeactivateTraceIEs RANAP-PROTOCOL-IES ::= {
    { ID id-TraceReference              CRITICALITY ignore  TYPE TraceReference            PRESENCE mandatory } |
    { ID id-TriggerID               CRITICALITY ignore  TYPE TriggerID                 PRESENCE optional },
    -- This information is optional for GERAN Iu Mode, not applicable to UTRAN --
    ...
}

CN-DeactivateTraceExtensions RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- LOCATION REPORTING CONTROL ELEMENTARY PROCEDURE
--
-- **************************************************************

-- **************************************************************
--
-- Location Reporting Control
--
-- **************************************************************

LocationReportingControl ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { {LocationReportingControlIEs} },
    protocolExtensions      ProtocolExtensionContainer { {LocationReportingControlExtensions} }     OPTIONAL,
    ...
}

LocationReportingControlIEs RANAP-PROTOCOL-IES ::= {
    { ID id-RequestType                 CRITICALITY ignore  TYPE RequestType               PRESENCE mandatory  },
    ...
}

LocationReportingControlExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 4 to enhance the location request over Iu --
    { ID id-VerticalAccuracyCode                CRITICALITY ignore  EXTENSION VerticalAccuracyCode          PRESENCE optional } |
-- Extension for Release 4 to enhance the location request over Iu --
```

```
    { ID id-ResponseTime               CRITICALITY ignore  EXTENSION ResponseTime              PRESENCE optional  } |
-- Extension for Release 4 to enhance the location request over Iu --
    { ID id-PositioningPriority                CRITICALITY ignore  EXTENSION PositioningPriority            PRESENCE optional } |
-- Extension for Release 4 to enhance the location request over Iu --
    { ID id-ClientType             CRITICALITY ignore  EXTENSION ClientType               PRESENCE optional },
    ...
}

-- **************************************************************
--
-- LOCATION REPORT ELEMENTARY PROCEDURE
--
-- **************************************************************

-- **************************************************************
--
-- Location Report
--
-- **************************************************************

LocationReport ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { {LocationReportIEs} },
    protocolExtensions      ProtocolExtensionContainer { {LocationReportExtensions} }            OPTIONAL,
    ...
}

LocationReportIEs RANAP-PROTOCOL-IES ::= {
    { ID id-AreaIdentity               CRITICALITY ignore  TYPE AreaIdentity              PRESENCE optional } |
    { ID id-Cause                  CRITICALITY ignore  TYPE Cause                 PRESENCE optional  } |
    { ID id-RequestType                CRITICALITY ignore  TYPE RequestType               PRESENCE optional }  ,
    ...
}

LocationReportExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 4 to enable report of Last Known Service Area with its Age over Iu --
    { ID id-LastKnownServiceArea    CRITICALITY ignore  EXTENSION LastKnownServiceArea  PRESENCE optional} |
-- Extension for Release 5 to pass the positioning methods that have been used --
    { ID id-PositionData    CRITICALITY ignore      EXTENSION PositionData  PRESENCE optional}|
-- Extension for Release 5 to pass the positioning methods that have been used for GERAN Iu mode --
    { ID id-PositionDataSpecificToGERANIuMode       CRITICALITY ignore  EXTENSION PositionDataSpecificToGERANIuMode   PRESENCE optional }|
    -- This extension is optional for GERAN Iu mode only, not applicable for UTRAN --
-- Extension for Release 6 to indicate whether the returned position estimate satisfies the requested accuracy or not --
    { ID id-AccuracyFulfilmentIndicator CRITICALITY ignore  EXTENSION AccuracyFulfilmentIndicator PRESENCE optional},
    ...
}

-- **************************************************************
--
```

```
-- INITIAL UE MESSAGE ELEMENTARY PROCEDURE
--
-- **************************************************************

-- **************************************************************
--
-- Initial UE Message
--
-- **************************************************************

InitialUE-Message ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { {InitialUE-MessageIEs} },
    protocolExtensions      ProtocolExtensionContainer { {InitialUE-MessageExtensions} }            OPTIONAL,
    ...
}

InitialUE-MessageIEs RANAP-PROTOCOL-IES ::= {
    { ID id-CN-DomainIndicator          CRITICALITY ignore  TYPE CN-DomainIndicator             PRESENCE mandatory } |
    { ID id-LAI                 CRITICALITY ignore  TYPE LAI                    PRESENCE mandatory   } |
    { ID id-RAC                 CRITICALITY ignore  TYPE RAC                    PRESENCE conditional
    -- This IE shall be present if the CN Domain Indicator IE is set to "PS domain"  --                                } |
    { ID id-SAI                 CRITICALITY ignore  TYPE SAI                    PRESENCE mandatory   } |
    { ID id-NAS-PDU                 CRITICALITY ignore  TYPE NAS-PDU                    PRESENCE mandatory } |
    { ID id-IuSigConId              CRITICALITY ignore  TYPE IuSignallingConnectionIdentifier     PRESENCE mandatory   } |
    { ID id-GlobalRNC-ID                CRITICALITY ignore  TYPE GlobalRNC-ID               PRESENCE mandatory   },

    ...
}

InitialUE-MessageExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 5 to enable GERAN support over Iu-cs --
    { ID id-GERAN-Classmark                 CRITICALITY ignore  EXTENSION GERAN-Classmark        PRESENCE optional } |
-- Extension for Release 6 to convey the selected PLMN id in shared networks --
    { ID id-SelectedPLMN-ID                 CRITICALITY ignore  EXTENSION PLMNidentity           PRESENCE optional    } |
-- Extension for Release 6 to enable rerouting in MOCN configuration for network sharing non-supporting UEs --
    { ID id-PermanentNAS-UE-ID              CRITICALITY ignore  EXTENSION PermanentNAS-UE-ID     PRESENCE optional } |
-- Extension for Release 6 to enable rerouting in MOCN configuration for network sharing non-supporting UEs --
    { ID id-NAS-SequenceNumber              CRITICALITY ignore  EXTENSION NAS-SequenceNumber     PRESENCE optional } ,
    ...
}

-- **************************************************************
--
-- DIRECT TRANSFER ELEMENTARY PROCEDURE
--
-- **************************************************************

-- **************************************************************
```

```
--
-- Direct Transfer
--
-- ************************************************************

DirectTransfer ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { {DirectTransferIEs} },
    protocolExtensions      ProtocolExtensionContainer { {DirectTransferExtensions} }            OPTIONAL,
    ...
}

DirectTransferIEs RANAP-PROTOCOL-IES ::= {
    { ID id-NAS-PDU                CRITICALITY ignore  TYPE NAS-PDU                  PRESENCE mandatory } |
    { ID id-LAI                CRITICALITY ignore  TYPE LAI                    PRESENCE optional } |
    { ID id-RAC                CRITICALITY ignore  TYPE RAC                    PRESENCE optional } |
    { ID id-SAI                CRITICALITY ignore  TYPE SAI                    PRESENCE optional } |
    { ID id-SAPI                   CRITICALITY ignore  TYPE SAPI                   PRESENCE optional   },
    ...
}

DirectTransferExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 6 to enable rerouting in MOCN configuration for network sharing non-supporting UEs --
    { ID id-RedirectionIndication          CRITICALITY ignore  EXTENSION RedirectionIndication          PRESENCE optional }|
-- Extension for Release 6 to indicate the MOCN rerouting is completed --
    { ID id-RedirectionCompleted           CRITICALITY ignore  EXTENSION RedirectionCompleted           PRESENCE optional },
    ...
}

RedirectionIndication ::= ProtocolIE-Container { {RedirectionIndication-IEs} }

RedirectionIndication-IEs RANAP-PROTOCOL-IES ::= {
    {   ID id-NAS-PDU              CRITICALITY ignore TYPE NAS-PDU             PRESENCE mandatory }|
    {   ID id-RejectCauseValue     CRITICALITY ignore TYPE RejectCauseValue    PRESENCE mandatory}|
    {   ID id-NAS-SequenceNumber   CRITICALITY ignore TYPE NAS-SequenceNumber  PRESENCE optional}|
    {   ID id-PermanentNAS-UE-ID   CRITICALITY ignore TYPE PermanentNAS-UE-ID  PRESENCE optional},
    ...
}

-- ************************************************************
--
-- OVERLOAD CONTROL ELEMENTARY PROCEDURE
--
-- ************************************************************

-- ************************************************************
--
-- Overload
--
```

```
-- **************************************************************

Overload ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { {OverloadIEs} },
    protocolExtensions      ProtocolExtensionContainer { {OverloadExtensions} }                OPTIONAL,
    ...
}

OverloadIEs RANAP-PROTOCOL-IES ::= {
    { ID id-NumberOfSteps               CRITICALITY ignore  TYPE NumberOfSteps              PRESENCE optional } |
    { ID id-GlobalRNC-ID                CRITICALITY ignore  TYPE GlobalRNC-ID               PRESENCE optional },
    ...
}

OverloadExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 99 to enable the indication to the RNC which CN domain is suffering the signalling traffic overload --
    { ID id-CN-DomainIndicator          CRITICALITY ignore  EXTENSION CN-DomainIndicator    PRESENCE optional } |
-- Extension for Release 5 to enable NNSF --
    { ID id-GlobalCN-ID                 CRITICALITY ignore  EXTENSION GlobalCN-ID           PRESENCE optional } ,
    ...
}

-- **************************************************************
--
-- ERROR INDICATION ELEMENTARY PROCEDURE
--
-- **************************************************************

-- **************************************************************
--
-- Error Indication
--
-- **************************************************************

ErrorIndication ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { {ErrorIndicationIEs} },
    protocolExtensions      ProtocolExtensionContainer { {ErrorIndicationExtensions} }           OPTIONAL,
    ...
}

ErrorIndicationIEs RANAP-PROTOCOL-IES ::= {
    { ID id-Cause                   CRITICALITY ignore  TYPE Cause                  PRESENCE optional   } |
    { ID id-CriticalityDiagnostics          CRITICALITY ignore  TYPE CriticalityDiagnostics       PRESENCE optional } |
    { ID id-CN-DomainIndicator          CRITICALITY ignore  TYPE CN-DomainIndicator             PRESENCE optional  } |
    { ID id-GlobalRNC-ID                CRITICALITY ignore  TYPE GlobalRNC-ID               PRESENCE optional },
    ...
}
```

```
ErrorIndicationExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 4 --
    { ID id-GlobalCN-ID             CRITICALITY ignore      EXTENSION GlobalCN-ID               PRESENCE optional},
    ...
}

-- **************************************************************
--
-- SRNS DATA FORWARD ELEMENTARY PROCEDURE
--
-- **************************************************************

-- **************************************************************
--
-- SRNS Data Forward Command
--
-- **************************************************************

SRNS-DataForwardCommand ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { {SRNS-DataForwardCommandIEs} },
    protocolExtensions      ProtocolExtensionContainer { {SRNS-DataForwardCommandExtensions} }      OPTIONAL,
    ...
}

SRNS-DataForwardCommandIEs RANAP-PROTOCOL-IES ::= {
    { ID id-RAB-DataForwardingList          CRITICALITY ignore  TYPE RAB-DataForwardingList      PRESENCE optional },
    ...
}

SRNS-DataForwardCommandExtensions RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- FORWARD SRNS CONTEXT ELEMENTARY PROCEDURE
--
-- **************************************************************

-- **************************************************************
--
-- Forward SRNS Context
--
-- **************************************************************

ForwardSRNS-Context ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { {ForwardSRNS-ContextIEs} },
    protocolExtensions      ProtocolExtensionContainer { {ForwardSRNS-ContextExtensions} }          OPTIONAL,
```

```
    ...
}

ForwardSRNS-ContextIEs RANAP-PROTOCOL-IES ::= {
    { ID id-RAB-ContextList             CRITICALITY ignore  TYPE RAB-ContextList               PRESENCE mandatory },
    ...
}

ForwardSRNS-ContextExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 5 to enable relocation of Source RNC PDCP context info --
    { ID id-SourceRNC-PDCP-context-info     CRITICALITY ignore  EXTENSION RRC-Container PRESENCE optional},
    ...
}

-- **************************************************************
--
-- RAB ASSIGNMENT ELEMENTARY PROCEDURE
--
-- **************************************************************

-- **************************************************************
--
-- RAB Assignment Request
--
-- **************************************************************

RAB-AssignmentRequest ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { {RAB-AssignmentRequestIEs} },
    protocolExtensions      ProtocolExtensionContainer { {RAB-AssignmentRequestExtensions} }        OPTIONAL,
    ...
}

RAB-AssignmentRequestIEs RANAP-PROTOCOL-IES ::= {
    { ID id-RAB-SetupOrModifyList           CRITICALITY ignore  TYPE RAB-SetupOrModifyList       PRESENCE optional } |
    { ID id-RAB-ReleaseList             CRITICALITY ignore  TYPE RAB-ReleaseList               PRESENCE optional  },
    ...
}

RAB-SetupOrModifyList                   ::= RAB-IE-ContainerPairList { {RAB-SetupOrModifyItem-IEs} }

RAB-SetupOrModifyItem-IEs RANAP-PROTOCOL-IES-PAIR ::= {
    { ID id-RAB-SetupOrModifyItem           FIRST CRITICALITY  reject   FIRST TYPE  RAB-SetupOrModifyItemFirst
                            SECOND CRITICALITY ignore   SECOND TYPE RAB-SetupOrModifyItemSecond
                                                         PRESENCE mandatory  },
    ...
}

RAB-SetupOrModifyItemFirst ::= SEQUENCE {
```

```
    rAB-ID                      RAB-ID,
    nAS-SynchronisationIndicator    NAS-SynchronisationIndicator    OPTIONAL,
    rAB-Parameters                  RAB-Parameters      OPTIONAL,
    userPlaneInformation                UserPlaneInformation        OPTIONAL,
    transportLayerInformation               TransportLayerInformation      OPTIONAL,
    service-Handover                    Service-Handover            OPTIONAL,
    iE-Extensions                   ProtocolExtensionContainer { {RAB-SetupOrModifyItemFirst-ExtIEs} }       OPTIONAL,
    ...
}

TransportLayerInformation ::= SEQUENCE {
    transportLayerAddress           TransportLayerAddress,
    iuTransportAssociation          IuTransportAssociation,
    iE-Extensions                   ProtocolExtensionContainer { {TransportLayerInformation-ExtIEs} }        OPTIONAL,
    ...
}

TransportLayerInformation-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

RAB-SetupOrModifyItemFirst-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

RAB-SetupOrModifyItemSecond ::= SEQUENCE {
    pDP-TypeInformation             PDP-TypeInformation             OPTIONAL,
    dataVolumeReportingIndication           DataVolumeReportingIndication   OPTIONAL,
    dl-GTP-PDU-SequenceNumber           DL-GTP-PDU-SequenceNumber   OPTIONAL,
    ul-GTP-PDU-SequenceNumber           UL-GTP-PDU-SequenceNumber   OPTIONAL,
    dl-N-PDU-SequenceNumber             DL-N-PDU-SequenceNumber     OPTIONAL,
    ul-N-PDU-SequenceNumber             UL-N-PDU-SequenceNumber     OPTIONAL,
    iE-Extensions                   ProtocolExtensionContainer { {RAB-SetupOrModifyItemSecond-ExtIEs} }      OPTIONAL,
    ...
}

RAB-SetupOrModifyItemSecond-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 4 to enable RAB Quality of Service negotiation over Iu --
    {   ID id-Alt-RAB-Parameters    CRITICALITY ignore      EXTENSION Alt-RAB-Parameters        PRESENCE optional  } |
-- Extension for Release 5 to enable GERAN support over Iu-cs --
    { ID id-GERAN-BSC-Container                 CRITICALITY ignore  EXTENSION GERAN-BSC-Container       PRESENCE optional } ,
    ...
}

RAB-AssignmentRequestExtensions RANAP-PROTOCOL-EXTENSION ::= {
    ...
}
```

```
-- **************************************************************
--
-- RAB Assignment Response
--
-- **************************************************************

RAB-AssignmentResponse ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { {RAB-AssignmentResponseIEs} },
    protocolExtensions      ProtocolExtensionContainer { {RAB-AssignmentResponseExtensions} }       OPTIONAL,
    ...
}

RAB-AssignmentResponseIEs RANAP-PROTOCOL-IES ::= {
    { ID id-RAB-SetupOrModifiedList         CRITICALITY ignore  TYPE RAB-SetupOrModifiedList        PRESENCE optional } |
    { ID id-RAB-ReleasedList            CRITICALITY ignore  TYPE RAB-ReleasedList               PRESENCE optional  } |

    { ID id-RAB-QueuedList              CRITICALITY ignore  TYPE RAB-QueuedList             PRESENCE optional } |
    { ID id-RAB-FailedList              CRITICALITY ignore  TYPE RAB-FailedList             PRESENCE optional } |
    { ID id-RAB-ReleaseFailedList           CRITICALITY ignore  TYPE RAB-ReleaseFailedList       PRESENCE optional } |
    { ID id-CriticalityDiagnostics          CRITICALITY ignore  TYPE CriticalityDiagnostics     PRESENCE optional },
    ...
}

RAB-SetupOrModifiedList                 ::= RAB-IE-ContainerList { {RAB-SetupOrModifiedItemIEs} }

RAB-SetupOrModifiedItemIEs RANAP-PROTOCOL-IES ::= {
    { ID id-RAB-SetupOrModifiedItem         CRITICALITY ignore  TYPE RAB-SetupOrModifiedItem        PRESENCE mandatory   },
    ...
}

RAB-SetupOrModifiedItem ::= SEQUENCE {
    rAB-ID                      RAB-ID,
    transportLayerAddress               TransportLayerAddress   OPTIONAL,
    iuTransportAssociation              IuTransportAssociation  OPTIONAL,
    dl-dataVolumes                  DataVolumeList      OPTIONAL,
    iE-Extensions                   ProtocolExtensionContainer { {RAB-SetupOrModifiedItem-ExtIEs} }       OPTIONAL,
    ...
}

RAB-SetupOrModifiedItem-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 4 to enable RAB Quality of Service negotiation over Iu --
    {   ID id-Ass-RAB-Parameters    CRITICALITY ignore      EXTENSION Ass-RAB-Parameters        PRESENCE optional  },
    ...
}

RAB-ReleasedList                    ::= RAB-IE-ContainerList { {RAB-ReleasedItemIEs} }

RAB-ReleasedItemIEs RANAP-PROTOCOL-IES ::= {
```

```
    { ID id-RAB-ReleasedItem            CRITICALITY ignore  TYPE RAB-ReleasedItem               PRESENCE mandatory },
    ...
}

RAB-ReleasedItem ::= SEQUENCE {
    rAB-ID                      RAB-ID,
    dl-dataVolumes                  DataVolumeList      OPTIONAL,
    dL-GTP-PDU-SequenceNumber       DL-GTP-PDU-SequenceNumber           OPTIONAL,
    uL-GTP-PDU-SequenceNumber       UL-GTP-PDU-SequenceNumber           OPTIONAL,
    iE-Extensions                   ProtocolExtensionContainer { {RAB-ReleasedItem-ExtIEs} }        OPTIONAL,
    ...
}

RAB-ReleasedItem-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

DataVolumeList ::= SEQUENCE (SIZE (1..maxNrOfVol)) OF
    SEQUENCE {
        dl-UnsuccessfullyTransmittedDataVolume      UnsuccessfullyTransmittedDataVolume,
        dataVolumeReference             DataVolumeReference OPTIONAL,
        iE-Extensions                   ProtocolExtensionContainer { {DataVolumeList-ExtIEs} }      OPTIONAL,
        ...
    }

DataVolumeList-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

RAB-QueuedList                      ::= RAB-IE-ContainerList { {RAB-QueuedItemIEs} }

RAB-QueuedItemIEs RANAP-PROTOCOL-IES ::= {
    { ID id-RAB-QueuedItem              CRITICALITY ignore  TYPE RAB-QueuedItem             PRESENCE mandatory  },
    ...
}

RAB-QueuedItem ::= SEQUENCE {
    rAB-ID                      RAB-ID,
    iE-Extensions                   ProtocolExtensionContainer { {RAB-QueuedItem-ExtIEs} }       OPTIONAL,
    ...
}

RAB-QueuedItem-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

RAB-ReleaseFailedList ::= RAB-FailedList
```

```
RAB-AssignmentResponseExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 5 to enable GERAN support over Iu-cs --
    { ID id-GERAN-Iumode-RAB-FailedList-RABAssgntResponse       CRITICALITY ignore  EXTENSION GERAN-Iumode-RAB-FailedList-RABAssgntResponse
    PRESENCE optional} ,
    ...
}

GERAN-Iumode-RAB-FailedList-RABAssgntResponse       ::= RAB-IE-ContainerList { {GERAN-Iumode-RAB-Failed-RABAssgntResponse-ItemIEs} }

GERAN-Iumode-RAB-Failed-RABAssgntResponse-ItemIEs RANAP-PROTOCOL-IES ::= {
    { ID id-GERAN-Iumode-RAB-Failed-RABAssgntResponse-Item      CRITICALITY ignore  TYPE GERAN-Iumode-RAB-Failed-RABAssgntResponse-Item       PRESENCE
mandatory   },
    ...
}

GERAN-Iumode-RAB-Failed-RABAssgntResponse-Item ::= SEQUENCE {
    rAB-ID                      RAB-ID,
    cause                       Cause,
    gERAN-Classmark             GERAN-Classmark     OPTIONAL,
    iE-Extensions               ProtocolExtensionContainer { {GERAN-Iumode-RAB-Failed-RABAssgntResponse-Item-ExtIEs} }      OPTIONAL,
    ...
}

GERAN-Iumode-RAB-Failed-RABAssgntResponse-Item-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- PRIVATE MESSAGE
--
-- **************************************************************

PrivateMessage ::= SEQUENCE {
    privateIEs      PrivateIE-Container  { {PrivateMessage-IEs } },
    ...
}

PrivateMessage-IEs RANAP-PRIVATE-IES ::= {
    ...
}

-- **************************************************************
--
-- RANAP RELOCATION INFORMATION ELEMENTARY PROCEDURE
--
-- **************************************************************
```

```
RANAP-RelocationInformation ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { {RANAP-RelocationInformationIEs} },
    protocolExtensions      ProtocolExtensionContainer { {RANAP-RelocationInformationExtensions} }        OPTIONAL,
    ...
}

RANAP-RelocationInformationIEs RANAP-PROTOCOL-IES ::= {
    { ID id-DirectTransferInformationList-RANAP-RelocInf
                            CRITICALITY ignore  TYPE DirectTransferInformationList-RANAP-RelocInf
                                                     PRESENCE optional   } |
    { ID id-RAB-ContextList-RANAP-RelocInf      CRITICALITY ignore  TYPE RAB-ContextList-RANAP-RelocInf    PRESENCE optional },
    ...
}

DirectTransferInformationList-RANAP-RelocInf        ::= DirectTransfer-IE-ContainerList { {DirectTransferInformationItemIEs-RANAP-RelocInf} }

DirectTransferInformationItemIEs-RANAP-RelocInf RANAP-PROTOCOL-IES ::= {
    { ID id-DirectTransferInformationItem-RANAP-RelocInf
                            CRITICALITY ignore  TYPE DirectTransferInformationItem-RANAP-RelocInf
                                                     PRESENCE mandatory  },
    ...
}

DirectTransferInformationItem-RANAP-RelocInf ::= SEQUENCE {
    nAS-PDU                     NAS-PDU,
    sAPI                        SAPI,
    cN-DomainIndicator          CN-DomainIndicator,
    iE-Extensions                   ProtocolExtensionContainer { {RANAP-DirectTransferInformationItem-ExtIEs-RANAP-RelocInf} }       OPTIONAL,
    ...
}

RANAP-DirectTransferInformationItem-ExtIEs-RANAP-RelocInf RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

RAB-ContextList-RANAP-RelocInf              ::= RAB-IE-ContainerList { {RAB-ContextItemIEs-RANAP-RelocInf} }

RAB-ContextItemIEs-RANAP-RelocInf RANAP-PROTOCOL-IES ::= {
    { ID id-RAB-ContextItem-RANAP-RelocInf      CRITICALITY ignore  TYPE RAB-ContextItem-RANAP-RelocInf      PRESENCE mandatory   },
    ...
}

RAB-ContextItem-RANAP-RelocInf ::= SEQUENCE {
    rAB-ID              RAB-ID,
    dl-GTP-PDU-SequenceNumber           DL-GTP-PDU-SequenceNumber   OPTIONAL,
    ul-GTP-PDU-SequenceNumber           UL-GTP-PDU-SequenceNumber   OPTIONAL,
    dl-N-PDU-SequenceNumber             DL-N-PDU-SequenceNumber     OPTIONAL,
    ul-N-PDU-SequenceNumber             UL-N-PDU-SequenceNumber     OPTIONAL,
```

```
    iE-Extensions                   ProtocolExtensionContainer { {RAB-ContextItem-ExtIEs-RANAP-RelocInf} }      OPTIONAL,
    ...
}

RAB-ContextItem-ExtIEs-RANAP-RelocInf RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

RANAP-RelocationInformationExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 5 to enable relocation of Source RNC PDCP context info --
    { ID id-SourceRNC-PDCP-context-info     CRITICALITY ignore  EXTENSION RRC-Container PRESENCE optional},
    ...
}

-- **************************************************************
--
-- RAB MODIFICATION REQUEST ELEMENTARY PROCEDURE
--
-- **************************************************************

-- **************************************************************
--
-- RAB Modify Request
--
-- **************************************************************

RAB-ModifyRequest ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { {RAB-ModifyRequestIEs} },
    protocolExtensions      ProtocolExtensionContainer { {RAB-ModifyRequestExtensions} }            OPTIONAL,
    ...
}

RAB-ModifyRequestIEs RANAP-PROTOCOL-IES ::= {
    { ID id-RAB-ModifyList          CRITICALITY ignore  TYPE RAB-ModifyList         PRESENCE mandatory},
    ...
}

RAB-ModifyList          ::= RAB-IE-ContainerList { {RAB-ModifyItemIEs} }

RAB-ModifyItemIEs RANAP-PROTOCOL-IES ::= {
    { ID id-RAB-ModifyItem      CRITICALITY ignore  TYPE RAB-ModifyItem     PRESENCE mandatory  },
    ...
}

RAB-ModifyItem ::= SEQUENCE {
    rAB-ID                      RAB-ID,
    requested-RAB-Parameter-Values  Requested-RAB-Parameter-Values,
    iE-Extensions                   ProtocolExtensionContainer { {RAB-ModifyItem-ExtIEs} }       OPTIONAL,
```

```
    ...
}

RAB-ModifyItem-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

RAB-ModifyRequestExtensions RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- LOCATION RELATED DATA ELEMENTARY PROCEDURE
--
-- **************************************************************

-- **************************************************************
--
-- Location Related Data Request
--
-- **************************************************************

LocationRelatedDataRequest ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { {LocationRelatedDataRequestIEs} },
    protocolExtensions      ProtocolExtensionContainer { {LocationRelatedDataRequestExtensions} }         OPTIONAL,
    ...
}

LocationRelatedDataRequestIEs RANAP-PROTOCOL-IES ::= {
    { ID id-LocationRelatedDataRequestType      CRITICALITY reject  TYPE LocationRelatedDataRequestType    PRESENCE optional },
    -- This IE is mandatory for UTRAN, optional for GERAN Iu Mode --
    ...
}

LocationRelatedDataRequestExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for Release 5 to enable LCS support for GERAN Iu mode --
    { ID id-LocationRelatedDataRequestTypeSpecificToGERANIuMode     CRITICALITY reject  EXTENSION LocationRelatedDataRequestTypeSpecificToGERANIuMode
    PRESENCE optional   },
    -- This extension is optional for GERAN Iu Mode only, not applicable for UTRAN --
    ...
}

-- **************************************************************
--
-- Location Related Data Response
--
-- **************************************************************
```

```
LocationRelatedDataResponse ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { { LocationRelatedDataResponseIEs} },
    protocolExtensions      ProtocolExtensionContainer { { LocationRelatedDataResponseExtensions} }          OPTIONAL,
    ...
}

LocationRelatedDataResponseIEs RANAP-PROTOCOL-IES ::= {
    { ID id-BroadcastAssistanceDataDecipheringKeys      CRITICALITY ignore  TYPE BroadcastAssistanceDataDecipheringKeys     PRESENCE optional },
    ...
}

LocationRelatedDataResponseExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for error handling
    { ID id-CriticalityDiagnostics          CRITICALITY ignore  EXTENSION CriticalityDiagnostics       PRESENCE optional },
    ...
}

-- **************************************************************
--
-- Location Related Data Failure
--
-- **************************************************************

LocationRelatedDataFailure ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { { LocationRelatedDataFailureIEs} },
    protocolExtensions      ProtocolExtensionContainer { { LocationRelatedDataFailureExtensions} }           OPTIONAL,
    ...
}

LocationRelatedDataFailureIEs RANAP-PROTOCOL-IES ::= {
    { ID id-Cause               CRITICALITY ignore  TYPE Cause                  PRESENCE mandatory   },
    ...
}

LocationRelatedDataFailureExtensions RANAP-PROTOCOL-EXTENSION ::= {
-- Extension for error handling
    { ID id-CriticalityDiagnostics      CRITICALITY ignore  EXTENSION CriticalityDiagnostics     PRESENCE optional },
    ...
}

-- **************************************************************
--
-- INFORMATION TRANSFER ELEMENTARY PROCEDURE
--
-- **************************************************************

-- **************************************************************
```

```
--
-- Information Transfer Indication
--
-- **************************************************************

InformationTransferIndication ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { { InformationTransferIndicationIEs} },
    protocolExtensions      ProtocolExtensionContainer { { InformationTransferIndicationExtensions} }           OPTIONAL,
    ...
}

InformationTransferIndicationIEs RANAP-PROTOCOL-IES ::= {
    { ID id-InformationTransferID       CRITICALITY reject  TYPE InformationTransferID      PRESENCE mandatory  } |
    { ID id-ProvidedData                CRITICALITY reject  TYPE ProvidedData               PRESENCE mandatory  } |
    { ID id-CN-DomainIndicator          CRITICALITY reject  TYPE CN-DomainIndicator         PRESENCE mandatory  } |
    { ID id-GlobalCN-ID                 CRITICALITY ignore  TYPE GlobalCN-ID                PRESENCE optional},
    ...
}

InformationTransferIndicationExtensions RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- Information Transfer Confirmation
--
-- **************************************************************

InformationTransferConfirmation ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { { InformationTransferConfirmationIEs} },
    protocolExtensions      ProtocolExtensionContainer { { InformationTransferConfirmationExtensions} }         OPTIONAL,
    ...
}

InformationTransferConfirmationIEs RANAP-PROTOCOL-IES ::= {
    { ID id-InformationTransferID       CRITICALITY ignore  TYPE InformationTransferID      PRESENCE mandatory  } |
    { ID id-CN-DomainIndicator          CRITICALITY ignore  TYPE CN-DomainIndicator         PRESENCE mandatory  } |
    { ID id-CriticalityDiagnostics      CRITICALITY ignore  TYPE CriticalityDiagnostics     PRESENCE optional   } |
    { ID id-GlobalRNC-ID                CRITICALITY ignore  TYPE GlobalRNC-ID               PRESENCE mandatory  },
    ...
}

InformationTransferConfirmationExtensions RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
```

```
--
-- Information Transfer Failure
--
-- **************************************************************

InformationTransferFailure ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { { InformationTransferFailureIEs} },
    protocolExtensions      ProtocolExtensionContainer { { InformationTransferFailureExtensions} }           OPTIONAL,
    ...
}

InformationTransferFailureIEs RANAP-PROTOCOL-IES ::= {
    { ID id-InformationTransferID       CRITICALITY ignore  TYPE InformationTransferID      PRESENCE mandatory  } |
    { ID id-CN-DomainIndicator          CRITICALITY ignore  TYPE CN-DomainIndicator         PRESENCE mandatory  } |
    { ID id-Cause                       CRITICALITY ignore  TYPE Cause                      PRESENCE mandatory  } |
    { ID id-CriticalityDiagnostics      CRITICALITY ignore  TYPE CriticalityDiagnostics     PRESENCE optional   } |
    { ID id-GlobalRNC-ID                CRITICALITY ignore  TYPE GlobalRNC-ID               PRESENCE mandatory  },
    ...
}

InformationTransferFailureExtensions RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- UE SPECIFIC INFORMATION ELEMENTARY PROCEDURE
--
-- **************************************************************

-- **************************************************************
--
-- UE Specific Information Indication
--
-- **************************************************************

UESpecificInformationIndication ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { {UESpecificInformationIndicationIEs} },
    protocolExtensions      ProtocolExtensionContainer { {UESpecificInformationIndicationExtensions} }             OPTIONAL,
    ...
}

UESpecificInformationIndicationIEs RANAP-PROTOCOL-IES ::= {
    { ID id-UESBI-Iu                CRITICALITY ignore  TYPE UESBI-Iu               PRESENCE optional   },
    ...
}

UESpecificInformationIndicationExtensions RANAP-PROTOCOL-EXTENSION ::= {
```

```
    ...
}

-- **************************************************************
--
-- DIRECT INFORMATION TRANSFER ELEMENTARY PROCEDURE
--
-- **************************************************************

-- **************************************************************
--
-- Direct Information Transfer
--
-- **************************************************************

DirectInformationTransfer ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { { DirectInformationTransferIEs} },
    protocolExtensions      ProtocolExtensionContainer { { DirectInformationTransferExtensions} }         OPTIONAL,
    ...
}

DirectInformationTransferIEs RANAP-PROTOCOL-IES ::= {
    { ID id-InterSystemInformationTransferType      CRITICALITY ignore  TYPE InterSystemInformationTransferType    PRESENCE optional }  |
    { ID id-CN-DomainIndicator          CRITICALITY ignore  TYPE CN-DomainIndicator             PRESENCE mandatory } |
    { ID id-GlobalRNC-ID            CRITICALITY ignore  TYPE GlobalRNC-ID               PRESENCE optional } |
    { ID id-GlobalCN-ID             CRITICALITY ignore  TYPE GlobalCN-ID                PRESENCE optional },
    ...
}

DirectInformationTransferExtensions RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- UPLINK INFORMATION EXCHANGE ELEMENTARY PROCEDURE
--
-- **************************************************************

-- **************************************************************
--
-- Uplink Information Exchange Request
--
-- **************************************************************

UplinkInformationExchangeRequest ::= SEQUENCE {
    protocolIEs             ProtocolIE-Container        { { UplinkInformationExchangeRequestIEs} },
    protocolExtensions      ProtocolExtensionContainer  { { UplinkInformationExchangeRequestExtensions} }       OPTIONAL,
```

```
    ...
}

UplinkInformationExchangeRequestIEs RANAP-PROTOCOL-IES ::= {
    { ID id-InformationExchangeID       CRITICALITY reject  TYPE InformationExchangeID      PRESENCE mandatory  } |
    { ID id-InformationExchangeType     CRITICALITY reject  TYPE InformationExchangeType    PRESENCE mandatory  } |
    { ID id-InformationTransferType     CRITICALITY reject  TYPE InformationTransferType    PRESENCE conditional
    -- This IE shall be present if the Information Exchange Type IE is set to "transfer"  --                              } |
    { ID id-InformationRequestType      CRITICALITY reject  TYPE InformationRequestType PRESENCE conditional
    -- This IE shall be present if the Information Exchange Type IE is set to "request"  --                            } |
    { ID id-CN-DomainIndicator          CRITICALITY reject  TYPE CN-DomainIndicator         PRESENCE mandatory  } |
    { ID id-GlobalRNC-ID                CRITICALITY reject  TYPE GlobalRNC-ID               PRESENCE mandatory  },
    ...
}

UplinkInformationExchangeRequestExtensions RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- Uplink Information Exchange Response
--
-- **************************************************************

UplinkInformationExchangeResponse ::= SEQUENCE {
    protocolIEs             ProtocolIE-Container        { { UplinkInformationExchangeResponseIEs} },
    protocolExtensions      ProtocolExtensionContainer  { { UplinkInformationExchangeResponseExtensions} }   OPTIONAL,
    ...
}

UplinkInformationExchangeResponseIEs RANAP-PROTOCOL-IES ::= {
    { ID id-InformationExchangeID       CRITICALITY ignore  TYPE InformationExchangeID      PRESENCE mandatory  } |
    { ID id-InformationRequested        CRITICALITY ignore  TYPE InformationRequested       PRESENCE optional   } |
    { ID id-CN-DomainIndicator          CRITICALITY ignore  TYPE CN-DomainIndicator         PRESENCE mandatory  } |
    { ID id-GlobalCN-ID                 CRITICALITY ignore  TYPE GlobalCN-ID                PRESENCE optional   } |
    { ID id-CriticalityDiagnostics      CRITICALITY ignore  TYPE CriticalityDiagnostics     PRESENCE optional   } ,
    ...
}

UplinkInformationExchangeResponseExtensions RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- Uplink Information Exchange Failure
--
```

```
-- **************************************************************

UplinkInformationExchangeFailure ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { { UplinkInformationExchangeFailureIEs} },
    protocolExtensions      ProtocolExtensionContainer { { UplinkInformationExchangeFailureExtensions} }           OPTIONAL,
    ...
}

UplinkInformationExchangeFailureIEs RANAP-PROTOCOL-IES ::= {
    { ID id-InformationExchangeID       CRITICALITY ignore  TYPE InformationExchangeID      PRESENCE mandatory   } |
    { ID id-CN-DomainIndicator          CRITICALITY ignore  TYPE CN-DomainIndicator         PRESENCE mandatory   } |
    { ID id-GlobalCN-ID                 CRITICALITY ignore  TYPE GlobalCN-ID                PRESENCE optional    } |
    { ID id-Cause                       CRITICALITY ignore  TYPE Cause                      PRESENCE mandatory   } |
    { ID id-CriticalityDiagnostics      CRITICALITY ignore  TYPE CriticalityDiagnostics     PRESENCE optional    } ,
    ...
}

UplinkInformationExchangeFailureExtensions RANAP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- MBMS SESSION START PROCEDURE
--
-- **************************************************************

-- **************************************************************
--
-- MBMS Session Start
--
-- **************************************************************

MBMSSessionStart ::= SEQUENCE {
    protocolIEs             ProtocolIE-Container        { { MBMSSessionStartIEs} },
    protocolExtensions      ProtocolExtensionContainer  { { MBMSSessionStartExtensions} }        OPTIONAL,
    ...
}

MBMSSessionStartIEs RANAP-PROTOCOL-IES ::= {
    { ID id-TMGI                        CRITICALITY reject  TYPE TMGI                               PRESENCE mandatory   } |
    { ID id-MBMSSessionIdentity     CRITICALITY ignore  TYPE MBMSSessionIdentity                PRESENCE optional } |
    { ID id-MBMSBearerServiceType       CRITICALITY reject  TYPE MBMSBearerServiceType              PRESENCE mandatory   } |
    { ID id-IuSigConId                  CRITICALITY reject  TYPE IuSignallingConnectionIdentifier   PRESENCE mandatory   }|
    { ID id-RAB-Parameters              CRITICALITY reject  TYPE RAB-Parameters                     PRESENCE mandatory   } |
    { ID id-PDP-TypeInformation         CRITICALITY ignore  TYPE PDP-TypeInformation                PRESENCE optional    } |
    { ID id-MBMSSessionDuration         CRITICALITY ~~ignore~~reject    TYPE MBMSSessionDuration            PRESENCE ~~optional~~mandatory    } |
    { ID id-MBMSServiceArea             CRITICALITY reject  TYPE MBMSServiceArea                    PRESENCE mandatory   } |
```

```
    { ID id-FrequenceLayerConvergenceFlag   CRITICALITY ignore  TYPE FrequenceLayerConvergenceFlag  PRESENCE optional    } |
    { ID id-RAListofIdleModeUEs         CRITICALITY ignore  TYPE RAListofIdleModeUEs                PRESENCE optional    } |
    { ID id-GlobalCN-ID                 CRITICALITY reject  TYPE GlobalCN-ID                        PRESENCE optional    } |
    { ID id-MBMSSessionRepetitionNumber CRITICALITY ignore  TYPE MBMSSessionRepetitionNumber        PRESENCE optional    } ,
    ...
}

MBMSSessionStartExtensions RANAP-PROTOCOL-EXTENSION ::= {
    ...
}
```

**********END OF MODIFICATIONS**********

3GPP TSG-RAN WG3 #47 ⌘***R3-050809***
Athens, Greece, 9th – 13 th May 2005

CR-Form-v7.1

CHANGE REQUEST

⌘ **25.413** **CR** **745** ⌘**rev** **2** ⌘ Current version: **6.5.0** ⌘

*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 [X] Core Network [X]

Title:	⌘	Enhancement for MBMS SESSION START message
Source:	⌘	RAN3
Work item code:	⌘	MBMS-RAN
Date:	⌘	13/05/2005
Category:	⌘	**F**
Release:	⌘	REL-6

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
Ph2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
Rel-4 (Release 4)
Rel-5 (Release 5)
Rel-6 (Release 6)
Rel-7 (Release 7)

Reason for change: ⌘ SGSN will send the same RA list to all RNCs in order to simplify the operation in the CN. However this brings much more processing load in the RNC. Whenever the RNC receives the RA list, it has to compare whether it controls the RAs contained in the RA list and determine to which cell the MBMS Notification shall be transmitted.

In RAN3#46, it was agreed that an indicator is included in the MBMS SESSION START message if the SGSN finds all RAs with PMM_IDLE UEs. In this way, RNC doesn't have to compare whether it controls the cells in all RAs and transmit MBMS Notification directly in all cells belonging to an MBMS service area.

Summary of change: ⌘ REV 2
- Editorial changes were made.

REV 1
- Text added to reflect that an MBMS notification is transmitted to all the cells belonging to an MBMS service area.

If SGSN finds all its RAs having PMM_IDLE UEs, the SGSN can just indicate this to the RNC by an indicator. Thus the RNC doesn't need to check whether it controls cells in the RA list and transmit MBMS notification directly in all its cells belong to the MBMS service area.

Impact assessment towards the previous version of the specification (same release):

		This CR has isolated impact towards the previous version of the specification because it is only related to MBMS.
Consequences if not approved:	⌘	The processing load in the RNC might be high when receiving a long list of RAs in the SESSION START message.

Clauses affected:	⌘	8.36.2, 9.2.3.42, 9.3.3			
Other specs affected:	⌘	**Y**	**N**		
			X	Other core specifications	⌘
			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.

8.36 MBMS Session Start

The purpose of the MBMS Session Start procedure is to request the UTRAN to notify UEs about an upcoming MBMS Session of a given MBMS Bearer Service and to establish a MBMS RAB and MBMS Iu signalling connection for this MBMS Session.

The procedure uses connection oriented signalling.

8.36.2 Successful Operation

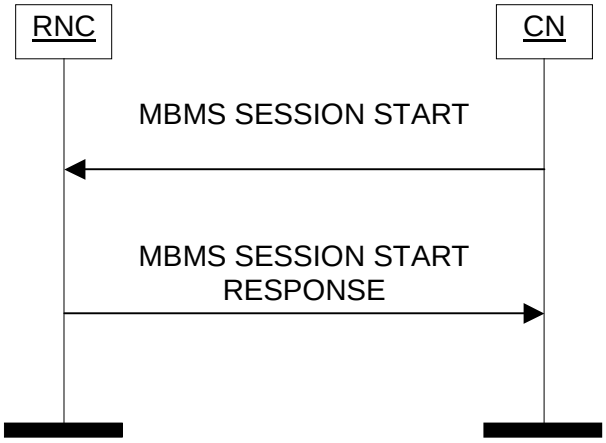


Figure 46: MBMS Session Start procedure. Successful operation.

The CN initiates the procedure by sending a MBMS SESSION START message.

The MBMS SESSION START message shall contain:

- TMGI;
- MBMS Bearer Service Type;
- MBMS Session Identity, if available;
- Iu Signalling Connection Identifier IE;
- RAB parameters (including e.g. Allocation/Retention Priority);
- PDP Type Information, if available;
- MBMS Session Duration, if available;
- MBMS Service Area;
- Frequency Layer Convergence Flag, if available;
- RA List of Idle Mode UEs, if available.
- Global CN-ID IE, only when the MBMS SESSION START message is sent from a CN node towards an RNC for which the sending CN node is not the default CN node;
- MBMS Session Repetition Number, if available.

Upon reception of the MBMS SESSION START message, the RNC shall store the *Iu Signalling Connection Identifier* IE for the duration of the MBMS Iu signalling connection. The *Iu Signalling Connection Identifier* IE contains an Iu signalling connection identifier which is allocated by the CN. The value for the *Iu Signalling Connection Identifier* IE shall be allocated so as to uniquely identify an Iu signalling connection for the involved CN node.

The *Global CN-ID* IE contains the identity of the CN node that sent the MBMS SESSION START message, and it shall, if included, be stored together with the Iu signalling connection identifier. If the *Global CN-ID* IE is not included, the MBMS SESSION START message shall be considered as coming from the default CN node.

Upon reception of the MBMS SESSION START message, the RNC shall store, if not already, and remember the *TMGI* IE, the *RAB parameters* IE and the other attributes of the session as part of the MBMS Service Context. The *TMGI* IE contains the TMGI identifier which uniquely identifies the MBMS Bearer Service.

Upon reception of the MBMS SESSION START message, the RNC shall initiate allocation of requested resources for the MBMS RAB if at least one of the following two conditions is fulfilled:

- the RNC controls at least one cell contained in the indicated MBMS Service Area and, if the *RA List of Idle Mode UEs* IE is included in MBMS SESSION START message, at least one RNC´s RA is contained in this list, or if *Empty/Full RA List of Idle Mode UEs* IE included in MBMS SESSION START message is set to "fulllist",

- the RNC serves UEs consuming radio resources from cells contained in the indicated MBMS Service Area.

In case the *RA List of Idle Mode UEs* IE is included in MBMS SESSION START message but none of above conditions is fulfilled, the RNC may decide to wait for either an update of the RA List of Idle Mode UEs or a UE linking to finally establish the MBMS RAB. If the RNC decides so, it shall report it immediately to the CN in the MBMS SESSION START RESPONSE message with the cause value "Successful MBMS Session Start - No Data Bearer Necessary".

If the *Empty/Full RA List of Idle Mode UEs* IE included in MBMS SESSION START message is set to "fulllist", the RNC shall initiate the MBMS Notification over Uu in all the cells under its control which belong to the indicated MBMS service area.

9.2.3.42 RA List of Idle Mode UEs

Indicates the list of RAs where idle-mode UEs interested in a given Multicast Service are.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice **RA List of Idle Mode UEs**				
> Not Empty RA List of Idle Mode UEs				The same Routing Area Code must only be present once.
>> RA of Idle Mode UEs		1 to <maxMBMSRA>		
>> RAC	M		9.2.3.7	
> Empty/Full RA List of Idle Mode UEs			ENUMERATED (emptylist, fulllist,…)	

Range bound	Explanation
maxMBMSRA	Maximum no. of Routing Areas where idle-mode UEs interested in a given Multicast Service are. The value for maxMBMSRA is 65536.

9.3.3 PDU Definitions

```
RAListofIdleModeUEs ::= CHOICE {
    notEmptyRAListofIdleModeUEs         NotEmptyRAListofIdleModeUEs,
    emptyFullRAListofIdleModeUEs            ENUMERATED {emptylist,fulllist,...},
    ...
}
```

3GPP TSG-RAN WG3 Meeting #47
Athens, Greece, 9th - 13th May 2005

Tdoc ⌘R3-050715

CR-Form-v7.1

CHANGE REQUEST

⌘ **25.413** **CR** **750** ⌘ **rev** **1** ⌘ Current version: **6.5.0** ⌘

*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 [X] Core Network [X]

Title:	⌘	Correction of MBMS figure title
Source:	⌘	RAN3
Work item code:	⌘	MBMS-RAN
Date:	⌘	10/05/2005
Category:	⌘	**F**
Release:	⌘	Rel-6

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

Ph2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*
Rel-7	*(Release 7)*

Reason for change:	⌘	Appears a bit strange to use figure title “Initial UE Message Procedure” for a figure describing the MBMS RAB establishment indication. .
Summary of change:	⌘	The figure title is changed to “MBMS RAB Establishment Indication Procedure. Successful operation”.
Consequences if not approved:	⌘	

Clauses affected:	⌘	8.42.2			
Other specs affected:	⌘	**Y**	**N**		
			X	Other core specifications	⌘
			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.

8.42 MBMS RAB Establishment Indication

8.42.1 General

The purpose of the MBMS RAB Establishment Indication procedure is to inform the CN of the establishment of the MBMS RAB corresponding to the MBMS Iu signalling connection used for this procedure.

The procedure uses connection oriented signalling.

8.42.2 Successful Operation

Figure 55: ~~Initial UE Message~~MBMS RAB Establishment Indication procedure. Successful operation.

When the RNC has not yet established the MBMS RAB for a particular Multicast Service and is informed that a given UE joined this particular Multicast Service, the RNC shall initiate the MBMS RAB Establishment Indication procedure and send the MBMS RAB ESTABLISHMENT INDICATION message to the CN. If NNSF is active, the selection of the CN node is implementation dependant.

The MBMS RAB ESTABLISHMENT INDICATION message shall include the *Transport Layer Address* IE and the *Iu Transport Association* IE.

8.42.3 Abnormal Conditions

Not applicable.

3GPP TSG-RAN3 Meeting #47 ***Tdoc ⌘R3-050713***
Athens, Greece, 9th – 13th May 2005

CR-Form-v7.1

CHANGE REQUEST

⌘ **25.931** **CR** **031** ⌘**rev** **1** ⌘ Current version: **6.1.0** ⌘

*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 [X] Radio Access Network [X] Core Network [X]

Title:	⌘	Updates of MBMS scenarios
Source:	⌘	RAN3
Work item code:	⌘	MBMS-RAN
Date:	⌘	02/05/2005
Category:	⌘	**F**
Release:	⌘	Rel-6

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
Ph2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
Rel-4 (Release 4)
Rel-5 (Release 5)
Rel-6 (Release 6)
Rel-7 (Release 7)

Reason for change: ⌘ Cell Update parameters were marked FFS. RAN2 decided to not provide MBMS Service ID in Cell Update.
RAN2 decided to continue to provide Bearer type information in DCCH: Modified services information. The scenarios were based on not providing this information.
Various editorial errors.

Summary of change: ⌘ Parameters for Cell Update to request PTP bearer are included. As per the decision, SRNC will not be aware of which MBMS service the user is requesting and must set up all the MBMS services in the cell that the user has subscribed and being offered PTP.
A new scenario included to consider the use the DCCH Modified Services information for Cell-DCH users in DRNC. This scenario also includes the use of RNSAP MBMS Channel Type Reconfiguration Indication.
Editorial correction of RRC message names in the table and in the figures.

R1: CR34 merged with this CR:
Modify following sections:
1. 7.19.2 Session Start Request message should be sent to all the RNC has a connection to the SGSN.
2. 7.19.3 parameter of Radio Link Setup Request message is MBMS Bearer Service List; parameter of Radio Link Setup Response message is Active MBMS Bearer Service List;including the "MBMS RB list released to change transfer mode" IE in the Radio bearer release message. This indicates that RB is released due to the transmission mode changing.
3. 7.19.4 Cell update cause “MBMS reception” is added;

		Adding MBMS Attach Command message sent from SRNC to DRNC to create a UE Link in the DRNC. After reception of MBMS Channel Type Reconfiguration, the SRNC will initiate the PTP RB setup procedure. 4. 7.19.6 change the title to the right one “RA update procedure during a MBMS Session”; The sender and receiver of step 4 is corrected. Adding a description of which cell(s) the RNC will send the MBMS Notification Update Command message to.
Consequences if not approved:	⌘	Use of Cell Update will not be clear. Scenario for users in DRNC in Cell-DCH will not be clear Errors in message names will remain.

Clauses affected:	⌘	4.7, 7.19.2, 7.19.2a (new), 7.19.4, 7.19.5, 7.19.6			
Other specs affected:	⌘	**Y**	**N**		
			X	Other core specifications	⌘
			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.

4.7 RRC Procedures & Messages

For a detailed description of RRC procedures and messages refer to [8]. Only Messages mentioned in the present document are shown. For each message is also given the list of example procedures where the message is used, as provided by this document.

Table 5

Message Name	UTRAN Procedure	Direction
Active Set Update	Soft Handover	RNC ⇒ UE
Active Set Update Complete	Soft Handover	UE ⇒ RNC
Cell Update	RRC Connection Re-establishment Cell Update	UE ⇒ RNC UE ⇒ RNC
Cell Update Confirm	RRC Connection Re-establishment Cell Update	RNC ⇒ UE RNC ⇒ UE
Direct Transfer	NAS Signalling Conn. Establishment	UE ⇔ RNC
Downlink Direct Transfer	Downlink Direct Transfer	RNC ⇒ UE
Initial Direct Transfer	NAS Signalling Connection Establishment	UE ⇒ RNC
Measurement Control	Downlink Power Control	RNC ⇒ UE
Measurement Report	Downlink Power Control	UE ⇒ RNC
Paging Type 1	Paging for a UE in RRC Idle Mode and RRC connected mode (CELL_PCH and URA_PCH states)Paging for a UE in RRC Connected Mode	RNC ⇒ UE
Paging Type 2	Paging for a UE in RRC Connected Mode (CELL_DCH and CELL_FACH states)	RNC ⇒ UE
Physical Channel Reconfiguration	Physical Channel Reconfiguration Hard Handover	RNC ⇒ UE RNC ⇒ UE
Physical Channel Reconfiguration Allocation	USCH/DSCH Configuration and Capacity Allocation [TDD]	RNC ⇒ UE
Physical Channel Reconfiguration Complete	Physical Channel Reconfiguration Hard Handover	UE ⇒ RNC UE ⇒ RNC
PUSCH Capacity Request	USCH/DSCH Configuration and Capacity Allocation [TDD]	UE ⇒ RNC
RB Reconfiguration	USCH/DSCH Configuration and Capacity Allocation [TDD]	RNC ⇒ UE
RB Reconfiguration Complete	USCH/DSCH Configuration and Capacity Allocation [TDD]	UE ⇒ RNC
RB Release	Radio Access Bearer Release	RNC ⇒ UE
RB Release Complete	Radio Access Bearer Release	UE ⇒ RNC
RB Setup	Radio Access Bearer Establishment	RNC ⇒ UE
RB Setup Complete	Radio Access Bearer Establishment	UE ⇒ RNC
RRC Connection Release	RRC Connection Release	RNC ⇒ UE
RRC Connection Release Complete	RRC Connection Release	UE ⇒ RNC
RRC Connection Request	RRC Connection Establishment.	UE ⇒ RNC
RRC Connection Setup	RRC Connection Establishment	RNC ⇒ UE
RRC Connection Setup Complete	RRC Connection Establishment	UE ⇒ RNC
System Information	System Information Broadcasting	Node B ⇒ UE
Transport Channel Reconfiguration	Physical Channel Reconfiguration	RNC ⇒ UE
Transport Channel Reconfiguration Complete	Physical Channel Reconfiguration	UE ⇒ RNC
UE Capability Information	NAS Signalling Conn. Establishment.	UE ⇒ RNC
Uplink Direct Transfer	Uplink Direct Transfer	UE ⇒ RNC
URA Update	Cell Update	UE ⇒ RNC
URA Update Confirm	Cell Update	RNC ⇒ UE
UTRAN Mobility Information Confirm	RRC Connection Re-establishment Cell Update URA Update	UE ⇒ RNC UE ⇒ RNC UE ⇒ RNC
Handover from UTRAN Command	UTRAN to GSM/BSS handover	RNC ⇒ UE
Handover to UTRAN Complete	GSM /BSS to UTRAN handover	UE ⇒ RNC
Cell Change Order from UTRAN	UMTS to GPRS Cell Reselection	RNC ⇒ UE
MBMS Modified Services Information	MBMS Notification (MCCH) MBMS Notification (DCCH)	RNC ⇒ UE
MBMS Unmodified Services Information	MBMS Notification	RNC ⇒ UE
MBMS Access Information	MBMS counting	RNC ⇒ UE
MBMS Common P-T-M RB information	MBMS P-T-M RB ~~establishment~~configuration	RNC ⇒ UE
MBMS Current Cell P-T-M RB Information	MBMS P-T-M RB configuration~~establishment~~	RNC ⇒ UE
MBMS Neighbouring cell P-T-M RB Information	MBMS P-T-M RB configuration~~establishment~~	RNC ⇒ UE
MBMS Modification Request	UE MBMS prioritisation	UE ⇒ RNC

********NEXT CHANGE ********

7.19 MBMS Specific Procedures

7.19.1 MBMS Service Activation

The following scenario gives an example message flow for UE joining an MBMS service. The example chosen is the one where the UE is in DRNC in state Cell-DCH receiving possible other services. This is the first UE joining the MBMS service in SRNC and DRNC.

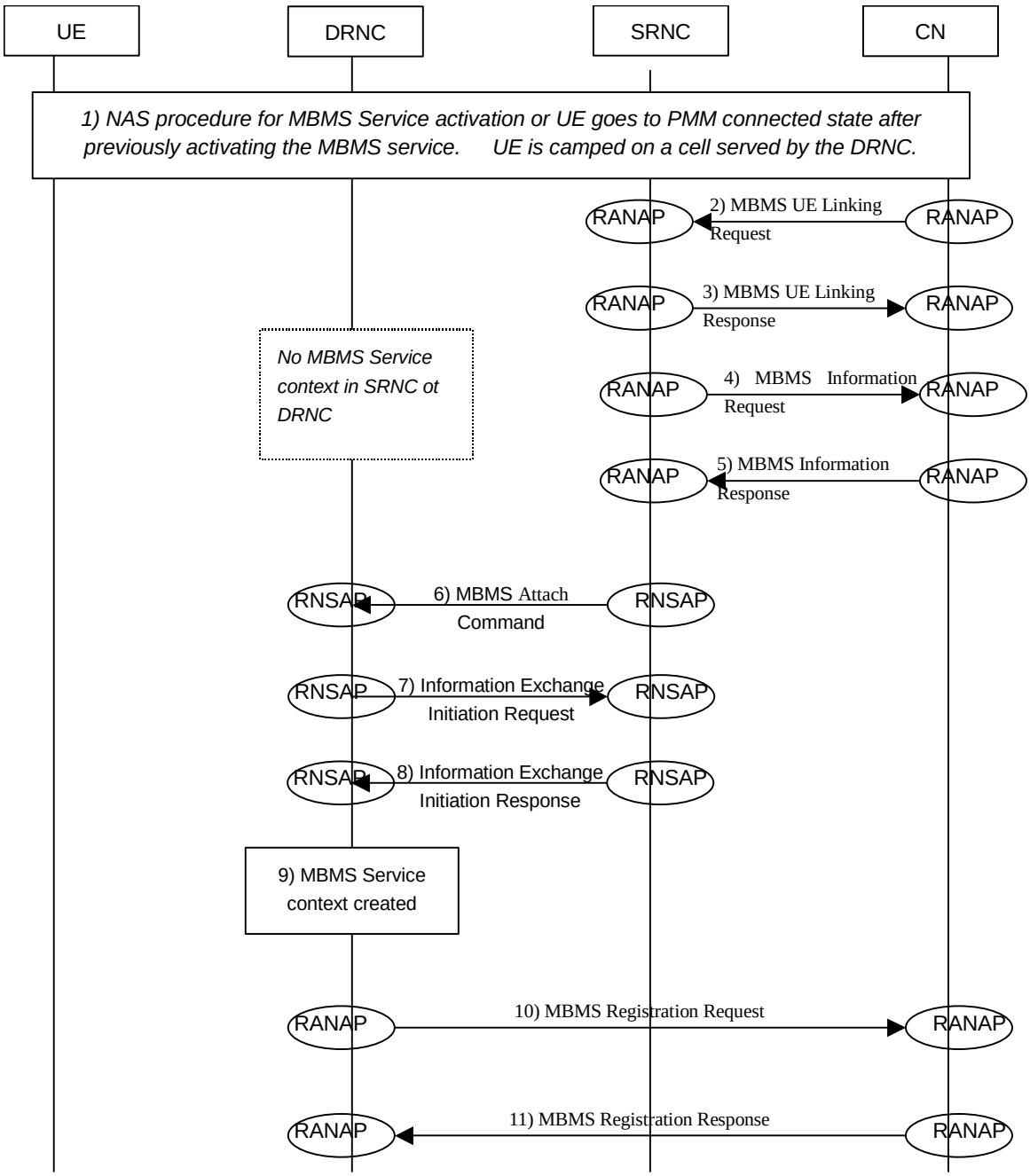


Figure 46: MBMS Service Activation

1. UE performs NAS procedure for MBMS Service Activation or having activated the service previously goes into PMM connected state. UE is in a cell in the DRNC. There is no MBMS context for this service in the DRNC.

2. The Core Network initiates the MBMS UE Linking procedure by sending RANAP **MBMS UE Linking Request** message to provide the SRNC with the list of MBMS Service Ids activated by this UE.
   Parameters: TMGIs, PTP RB id

3. RNC sends an RANAP **MBMS UE Linking Response** message to Core Network after RNC updates the MBMS Service Context.

4. As the SRNC has no MBMS context for this service, it does not know the IP Multicast address or APN for this service. The SRNC request these from the SGSN using the connectionless RANAP **Uplink Information Exchange Request** message.
   Parameters: TMGI.

5. SGSN responds with RANAP **Uplink Information Exchange Response** message.
   Parameters: TMGI, IP Multicast Address and APN.

6. UE linking in the DRNC is performed using the RNSAP **MBMS Attach Command** message over the Iur interface.
   Parameters: TMGIs

7. As the DRNC has no MBMS context for this service, it does not know the IP Multicast Address and APN for this service. The DRNC request these from the SRNC using the connectionless RNSAP **Information Exchange Initiation Request** message.
   Parameters: MBMS Bearer Service List

8. SRNC responds with RNSAP **Information Exchange Initiation Response** message
   Parameters: TMGI, IP Multicast Address and APN

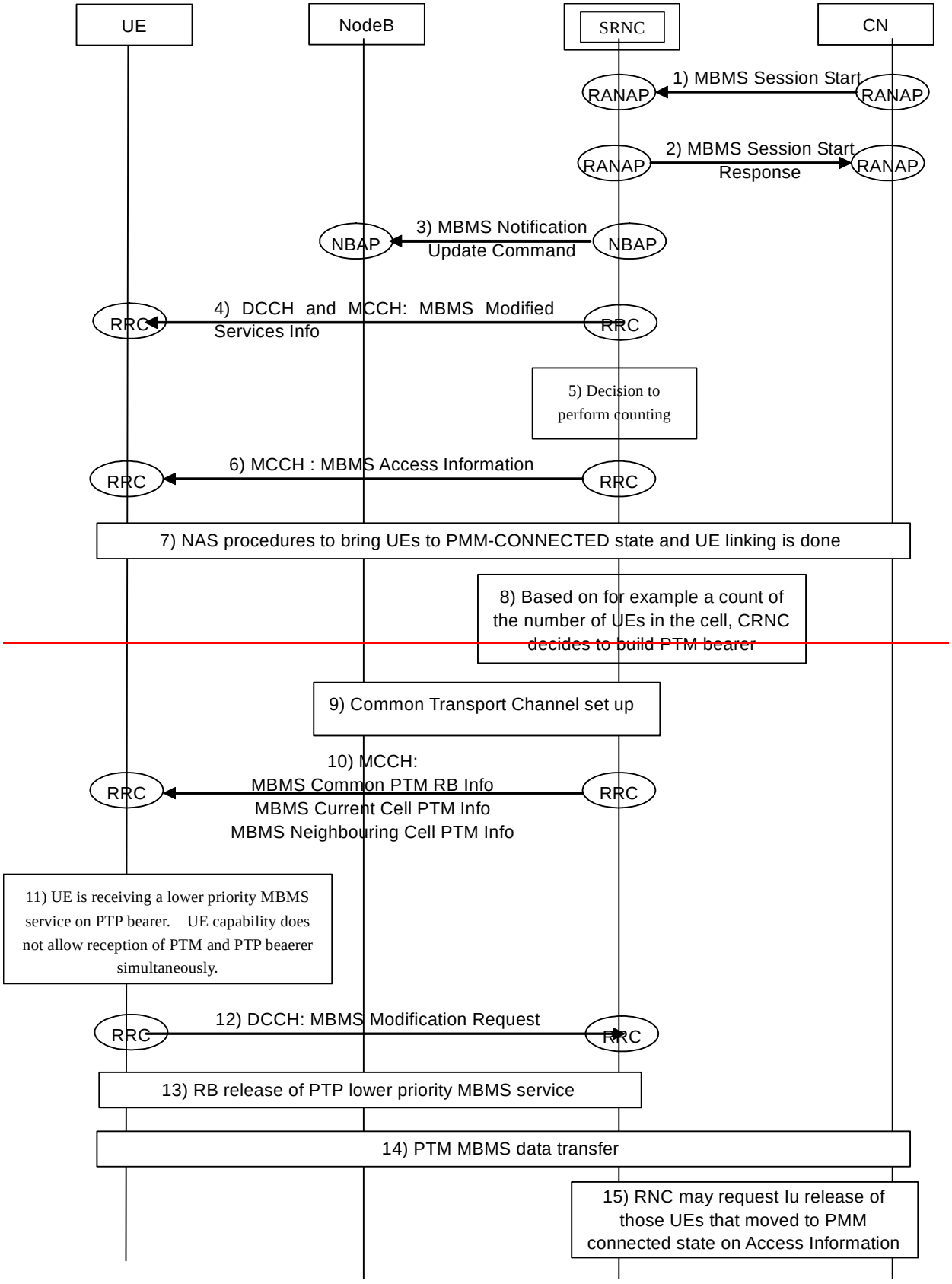
9. An MBMS Service Context for the service is created in the DRNC.

10. The DRNC informs the Core Network that it would like to receive MBMS Session Start Request messages by sending an RANAP **MBMS Registration Request** message.
    Parameters: Registration Request type, TMGI, IP Multicast Address, APN, Global RNC id.

11. Core Network replies with an RANAP **MBMS Registration Response** message.

7.19.2 MBMS Session Start

The following is an example scenario for an MBMS Session Start. The RNC decides to perform counting and offer the service over PTM bearer. The UE is receiving a lower priority MBMS service over a PTP bearer. The UE capability does not allow reception of PTP and PTM bearers simultaneously.


UE
NodeB
SRNC
CN
RANAP
1) MBMS Session Start
RANAP
RANAP
2) MBMS Session Start Response
RANAP
NBAP
3) MBMS Notification Update Command
NBAP
RRC
4) DCCH and MCCH: MBMS Modified Services Info
RRC
5) Decision to perform counting
RRC
6) MCCH : MBMS Access Information
RRC
7) NAS procedures to bring UEs to PMM-CONNECTED state and UE linking is done
8) Based on for example a count of the number of UEs in the cell, CRNC decides to build PTM bearer
9) Common Transport Channel set up
RRC
10) MCCH:
MBMS Common PTM RB Info
MBMS Current Cell PTM Info
MBMS Neighbouring Cell PTM Info
RRC
11) UE is receiving a lower priority MBMS service on PTP bearer. UE capability does not allow reception of PTM and PTP beaerer simultaneously.
RRC
12) DCCH: MBMS Modification Request
RRC
13) RB release of PTP lower priority MBMS service
14) PTM MBMS data transfer
15) RNC may request Iu release of those UEs that moved to PMM connected state on Access Information

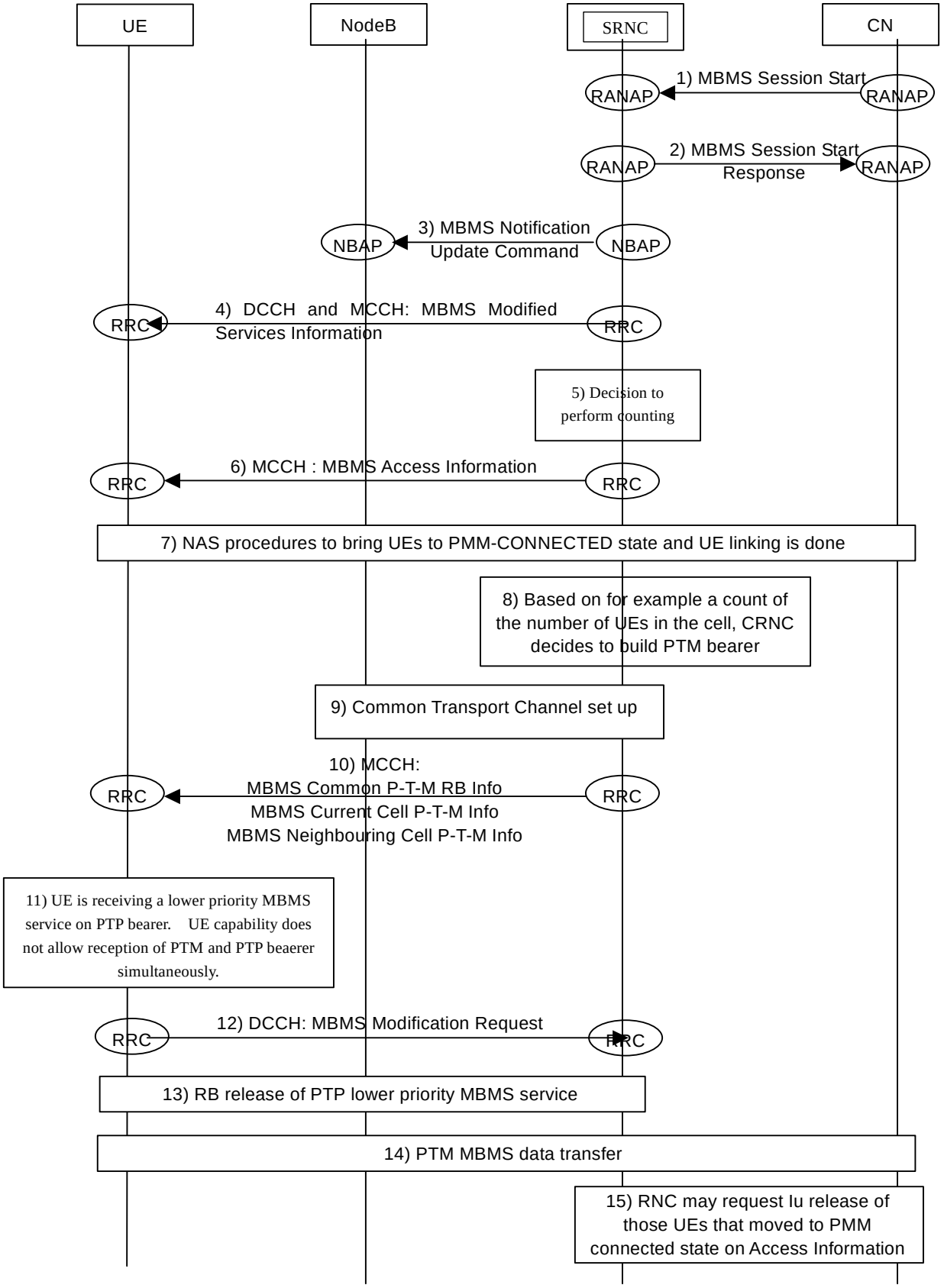


Figure 47: MBMS Session Start

1. When the MBMS session starts the SGSN informs all ~~registered~~ RNCs that is connected to this SGSN of the availability of data and requests the establishment of the User plane bearer using RANAP **MBMS Session Start** message . This also establishes the SCCP connection for the MBMS service.
   Parameters***:*** TMGI, Session id, Repetition number, Bearer Service type, Iu signaling connection id, RAB

parameters, PDP type, Session Duration, Service Area, Frequency layer convergence flag, RA list of idle mode UEs, Global CN-id

2. The RNC responds with an RANAP **MBMS Session Start Response** message. Since there are UEs in this RNC that have joined the service, it sets up the RAB for the MBMS service.
   Parameters: Iu transport layer information

3. CRNC updates the MICH using NBAP **MBMS Notificaiton Update Command**. This message is updated for every change in MICH.
   Parameters: C-ID, Common Physical Channel ID, Modification Period, MICH CFN, NI Information.

4. RNC is in the Service Area for the service. The RNC notifies the UE(s) about the start of the MBMS service by updating the RRC **MBMS Modified Services Info** message on the MCCH. This is sent on DCCH for UEs in Cell-DCH and on MCCH for other UEs.
   Parameters: TMGI, Session id, UE action required, MBMS preferred frequency, Continued MCCH reading

5. RNC takes a decision to perform UE counting in order to evaluate what is the optimal method for MBMS delivery.

6. RNC requests UE to set up PMM connection using RRC **MBMS Access Info** message on MCCH.
   Parameters: TMGI and probability factor.

7. A fraction of~~f~~ (or all) UEs who have joined the MBMS service establishes PMM connection towards CN. UE linking is done by the CN when Iu-ps connection is established for these UEs.

8. After counting, CRNC has enough information to make PTP/PTM decision. In this scenario there were enough UEs to exceed the threshold to justify ptm transmission.

9. The CRNC establishes the S-CCPCH and FACH which will carry the MTCH by using the Common Transport Channel Setup procedure.

10. CRNC informs UE of the MTCH channel used for the MBMS service in the cell and its neighbouring cells using the RRC **MBMS Common P-T-M RB Info, MBMS Current Cell P-T-M RB Info, MBMS Neighbouring Cell P-T-M RB Info** messages on MCCH.
    Parameters**:** TMGI, MBMS UTRAN Cell Group Identifier, logical channel, transport channel, physical channel information, MSCHInformation per MBMS service.

11. UE is receiving a lower priority MBMS service on a PTP bearer. UE capability does not allow reception of a PTP and PTM bearer simultaneously.

12. UE requests the release of the PTP bearer for the other lower priority service using RRC **MBMS Modification Request** message**.**
    Parameters: RB to be released.

13. RNC releases the PTP RB of the other lower priority MBMS service.

14. MBMS data transmission for this service on the PTM bearer.

15. RNC may request the release of the Iu connection for the UEs that were moved to PMM connected state during the counting process.

7.19.2a MBMS Session Start for UE in Cell-DCH in DRNC

The following is an example scenario for an MBMS Session Start for a UE in Cell-DCH in a DRNC. The DRNC decides to offer the service in PTM mode. The UE capability does not allow reception of PTP and PTM bearers simultaneously. The UE prioritises to receive MBMS service over the dedicated service.

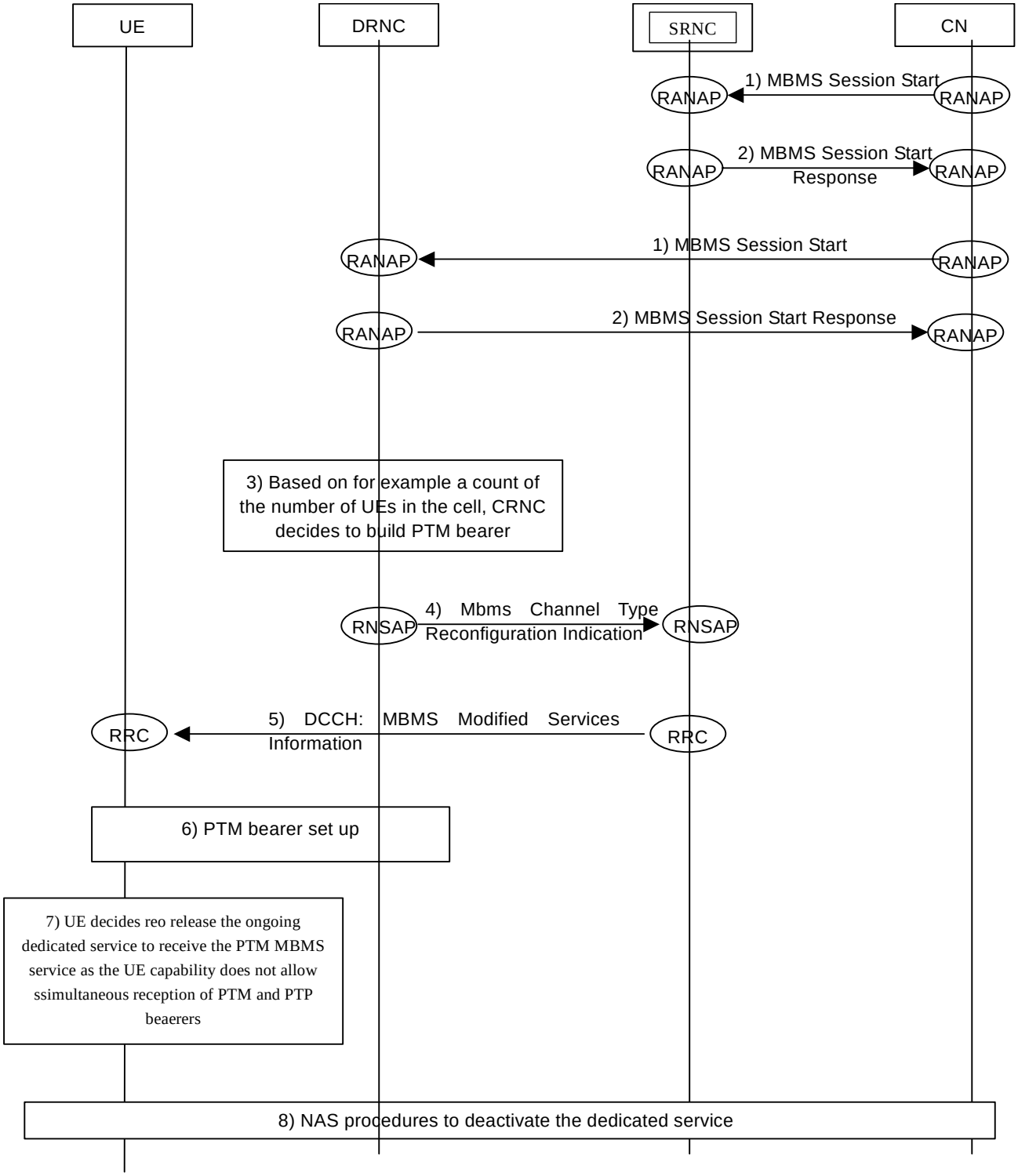


Figure 47a: MBMS Session Start for UE in Cell-DCH in DRNC

1. When the MBMS session starts the SGSN informs all registered RNCs of the availability of data and requests the establishment of the User plane bearer using RANAP **MBMS Session Start** message . This also establishes the SCCP connection for the MBMS service.
   Parameters**:** TMGI, Session id, Repetition number, Bearer Service type, Iu signaling connection id, RAB parameters, PDP type, Session Duration, Service Area, Frequency layer convergence flag, RA list of idle mode UEs, Global CN-id

2. The RNCs responds with an RANAP **MBMS Session Start Response** message. Since there are UEs in this RNC that have joined the service, it sets up the RAB for the MBMS service.
   Parameters: Iu transport layer information

3. CRNC makes PTP/PTM decision. In this scenario the CRNC makes a PTM decision.

4. The CRNC as DRNC sends MBMS Channel Type Reconfiguration Indication for all the cells for which it is the DRNC to the SRNCs.
   Paramaters: DRNC-ID, C-ID, TMGI, Transmission mode (PTM)

5. SRNC notifies users in Cell-DCH over DCCH using MBMS Modified Services information.
   Parameters: TMGI, MBMS required UE action (acquire PTM RB Info), MBMS preferred frequency

6. PTM Radio beares are set up by CRNC.

7. UE decides that it wants to receive MBMS service. In this scenario, the UE is not capable of receiving both PTM and dedicated services.

8. UE invokes NAS procedures to request the release of the dedicated services.

7.19.3 MBMS UE Mobility from a PTP to PTM cell

This example shows a UE receiving MBMS service over a PTP bearer in the SRNC moving into DRNC area where the service is available over a PTM bearer.

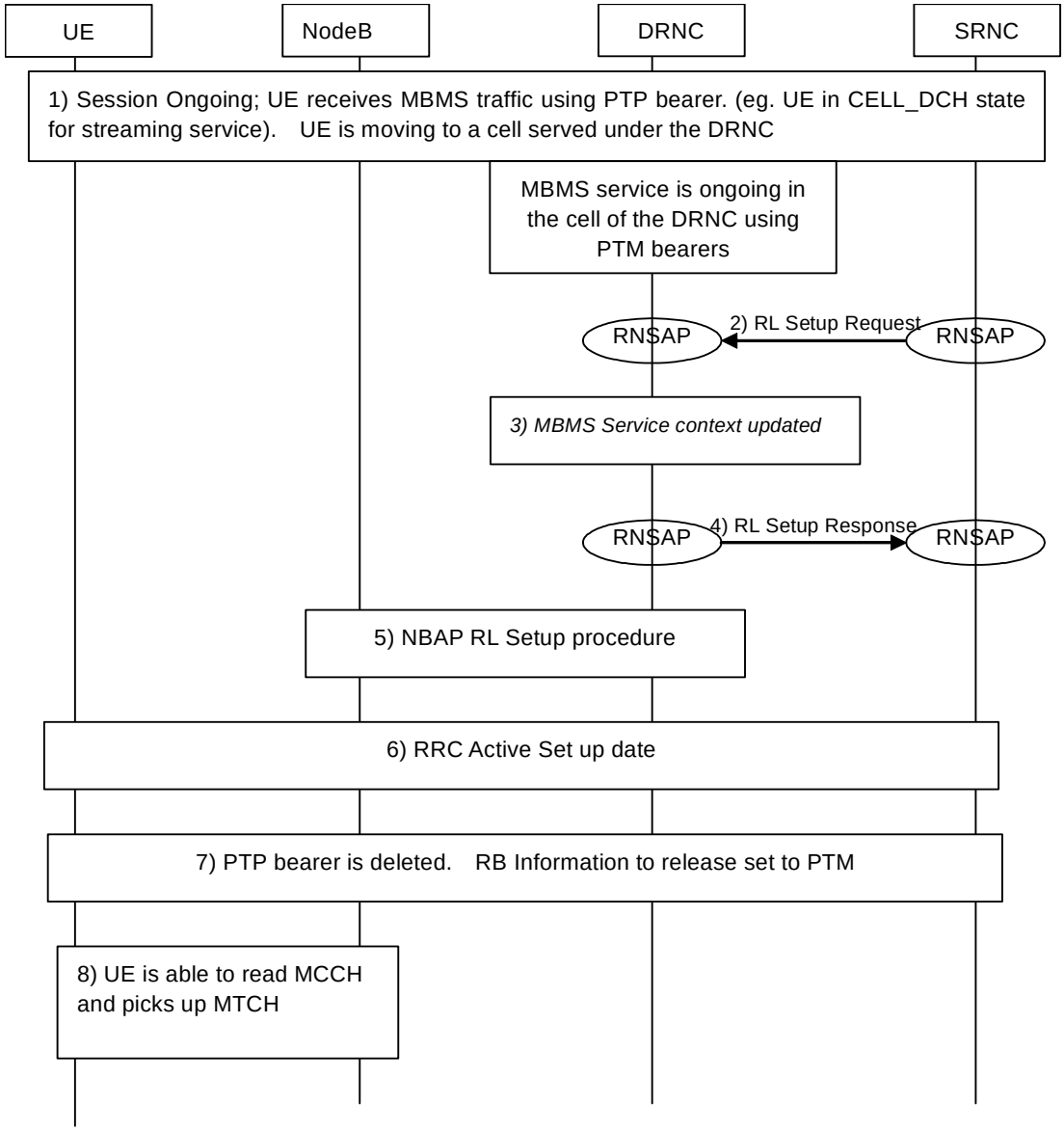


Figure 48: MBMS User mobility from PTP to PTM cell

1. MBMS Service has been activated and is currently ongoing. UE is receiving the MBMS traffic using a PTP bearer. SRNC makes the decision that to add a cell in the DNRC to the active set. The Cell already has PTM bearer for the MBMS service.

2. UE Linking is performed via using RNSAP **Radio Link Setup Request** message to add the radio link in the new cell.
   Parameters: MBMS Bearer Service List~~TMGIs~~,

3. MBMS service context in the DRNC is updated.

4. DRNC responds with RNSAP **RL set up response** message.
   Parameters: Active MBMS Bearer Service List

5. NBAP RL Set up procedure to set up the RL on the NodeB

6. RRC Active Set Update to the UE to add the PTP radio link on the new cell to the active set.

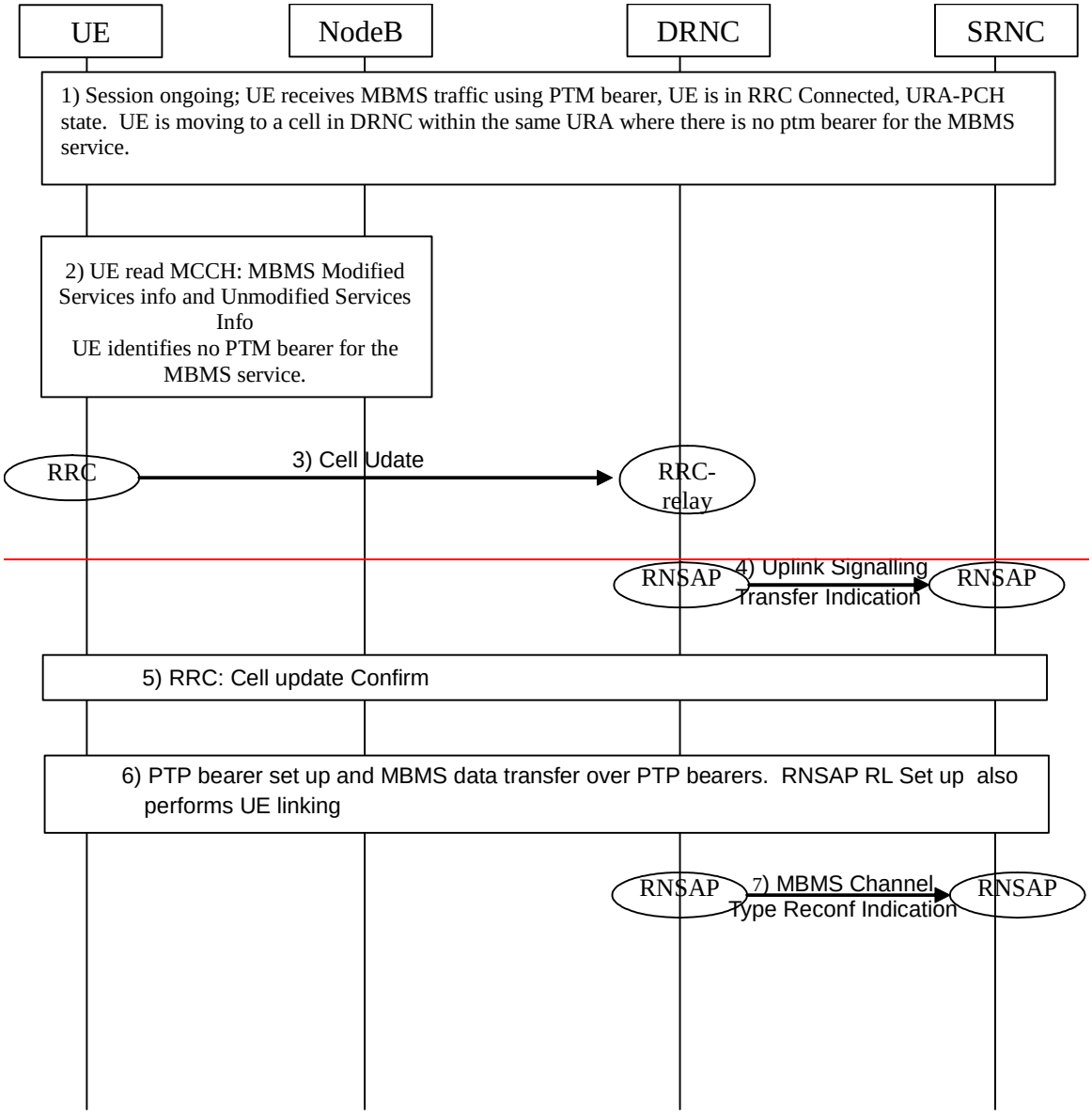
7. When the cell in the DRNC is good enough to provide MBMS service to UE, the SRNC deletes the PTP radio bearer. The RRC **Radio Bearer Release** message includes the "MBMS RB list released to change transfer mode" IE ~~sets the RB Information to release~~ to indicate that the release is due to transfer mode change, i.e. PTM availability.

Parameters (only MBMS specific ones listed): MBMS FLC capability, MBMS RB list released to change transfer mode

8. UE is able now to read information regarding the MBMS Service on the MCCH and picks up MTCH.

7.19.4 MBMS UE Mobility from PTM cell to PTP cell

This example shows an example scenario for the case when the UE moves from a cell in the SRNC with PTM bearer for the MBMS service to another cell in the DRNC. The DRNC chooses PTP transmission for the service.


UE
NodeB
DRNC
SRNC
1) Session ongoing; UE receives MBMS traffic using PTM bearer, UE is in RRC Connected, URA-PCH state. UE is moving to a cell in DRNC within the same URA where there is no ptm bearer for the MBMS service.
2) UE read MCCH: MBMS Modified Services info and Unmodified Services Info
UE identifies no PTM bearer for the MBMS service.
RRC
3) Cell Udate
RRC-relay
RNSAP
4) Uplink Signalling Transfer Indication
RNSAP
5) RRC: Cell update Confirm
6) PTP bearer set up and MBMS data transfer over PTP bearers. RNSAP RL Set up also performs UE linking
RNSAP
7) MBMS Channel Type Reconf Indication
RNSAP

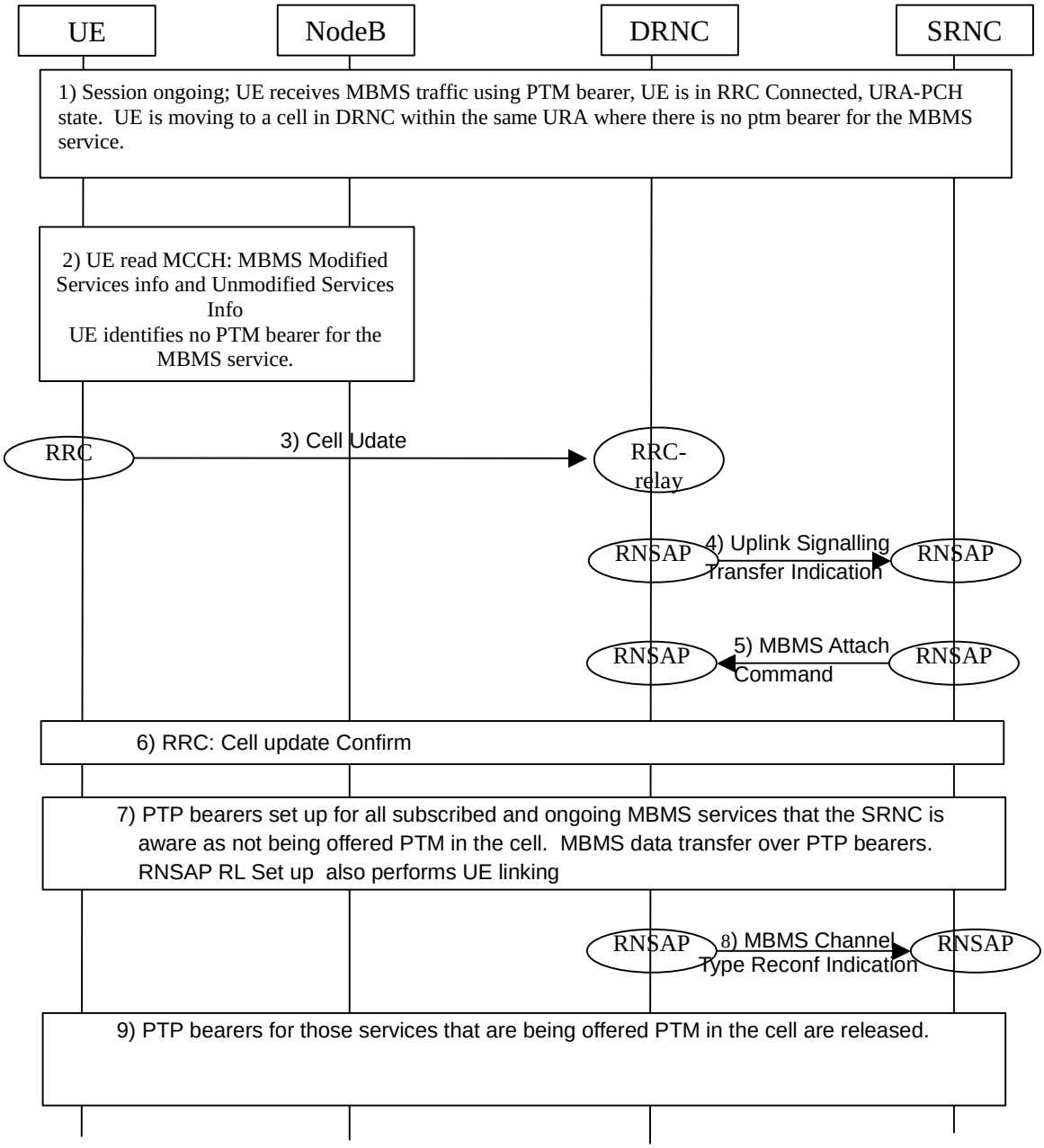


Figure 49: MBMS UE mobility from PTM to PTP cell

1. MBMS Service has been activated and is currently ongoing. UE is in URA-PCH state in the DRNC coverage area and is receiving the MBMS traffic using a PTM bearer. UE performs cell re-selection to a cell where there is no PTM bearer for the MBMS service within the same URA.

2. UE reads the RRC **Modified Services Info** and **Unmodified Services Info** messages on MCCH and identifies that there is no PTM bearer for the service in this cell.

3. UE sends a RRC **Cell Update** message.
Parameters: ~~FFS~~Cause Value set to MBMS reception.

4. DRNC relays the Cell update to the SRNC in RNSAP **Uplink ~~Singalling~~Signalling Transfer Indication** message. Since this is the first access in the DRNC for this UE (UE linking information is not available in the DRNC), the DRNC cannot include the channel type indication to the SRNC.

5. SRNC sends MBMS ATTACH COMMAND to create a UE link in the DRNC, using the connection oriented service of the signalling bearer.
Parameters: MBMS Bearer Service List, D-RNTI if UE in Cell_FACH/Cell_PCH or SRNC-ID+URA-ID if UE in URA-PCH.

6. SRNC sends the RRC Cell Update Confirm message to the UE.

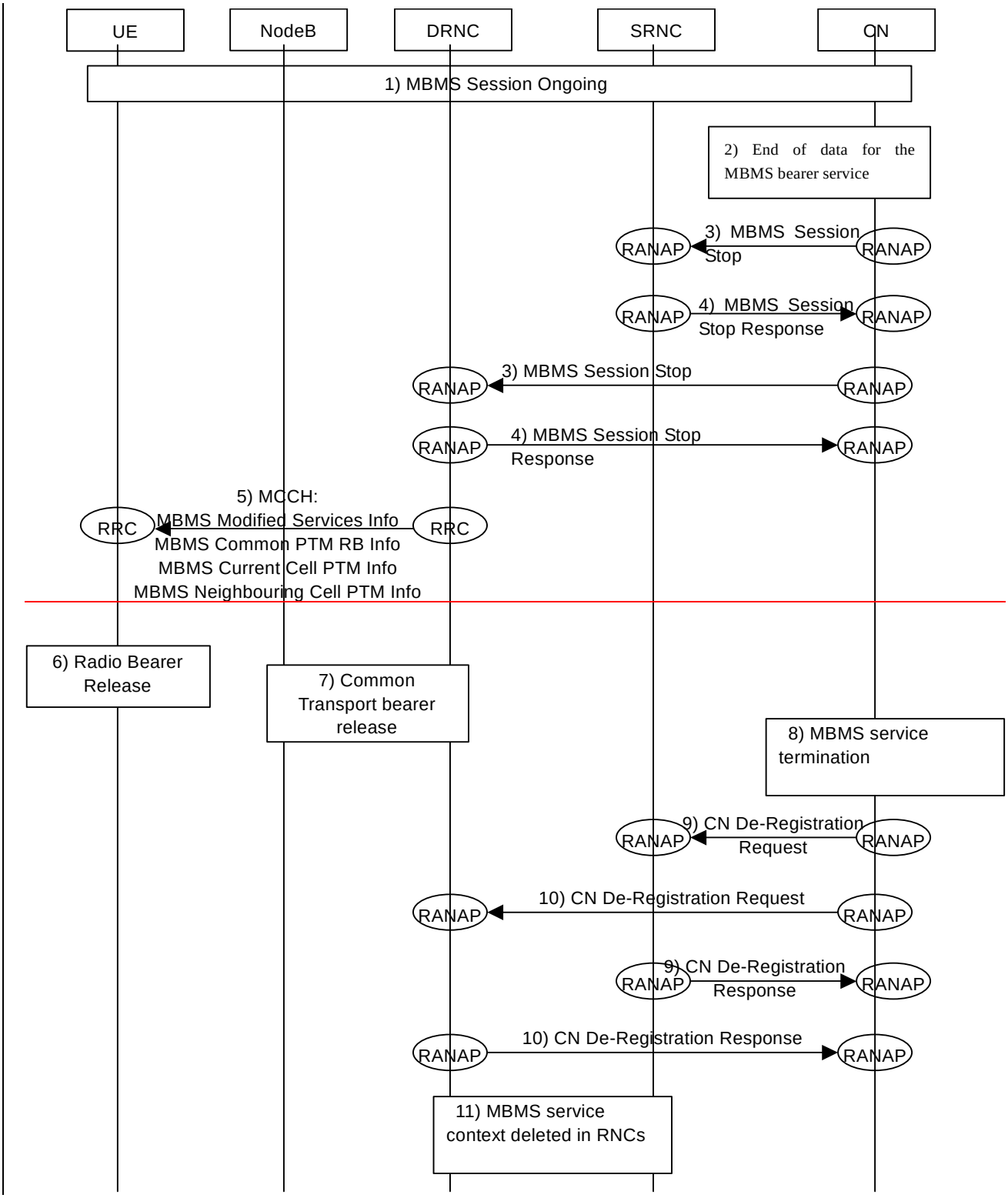
7~~6~~. SRNC sets up PTP bearer for all the ongoing MBMS the ~~-~~services that the user has subscribed to and that the SRNC is not aware as being offered PTM in the cell. The RNSAP **RL set up Request** message also performs UE linking. UE starts to receive MBMS service over PTP bearer.

7. ~~7.~~ DRNC ~~un~~is aware of activated MBMS service(s) for the UE and ~~that the RL is for this MBMS service~~ sends the connectionless RNSAP **MBMS Channel Type Reconfiguration Indication** message indicating PTP bearer type. This message includes the transmission mode for all the ongoing UE linked MBMS services. Parameters: DRNC-id, C-ID, TMGI, Transmission mode, S-RNTI of affected UE.

8. SRNC releases the PTP bearers for those services that it is now aware as being offered PTM in the cell. UE starts to receive MBMS service over PTP bearer.

7.19.5 MBMS Session Stop and Service termination

The following example shows a scenario for MBMS session ends followed by a termination of the MBMS service.


UE
NodeB
DRNC
SRNC
CN
1) MBMS Session Ongoing
2) End of data for the MBMS bearer service
RANAP
3) MBMS Session Stop
RANAP
RANAP
4) MBMS Session Stop Response
RANAP
3) MBMS Session Stop
RANAP
RANAP
4) MBMS Session Stop Response
RANAP
5) MCCH:
MBMS Modified Services Info
MBMS Common PTM RB Info
MBMS Current Cell PTM Info
MBMS Neighbouring Cell PTM Info
RRC
RRC
6) Radio Bearer Release
7) Common Transport bearer release
8) MBMS service termination
RANAP
9) CN De-Registration Request
RANAP
RANAP
10) CN De-Registration Request
RANAP
RANAP
9) CN De-Registration Response
RANAP
RANAP
10) CN De-Registration Response
RANAP
11) MBMS service context deleted in RNCs

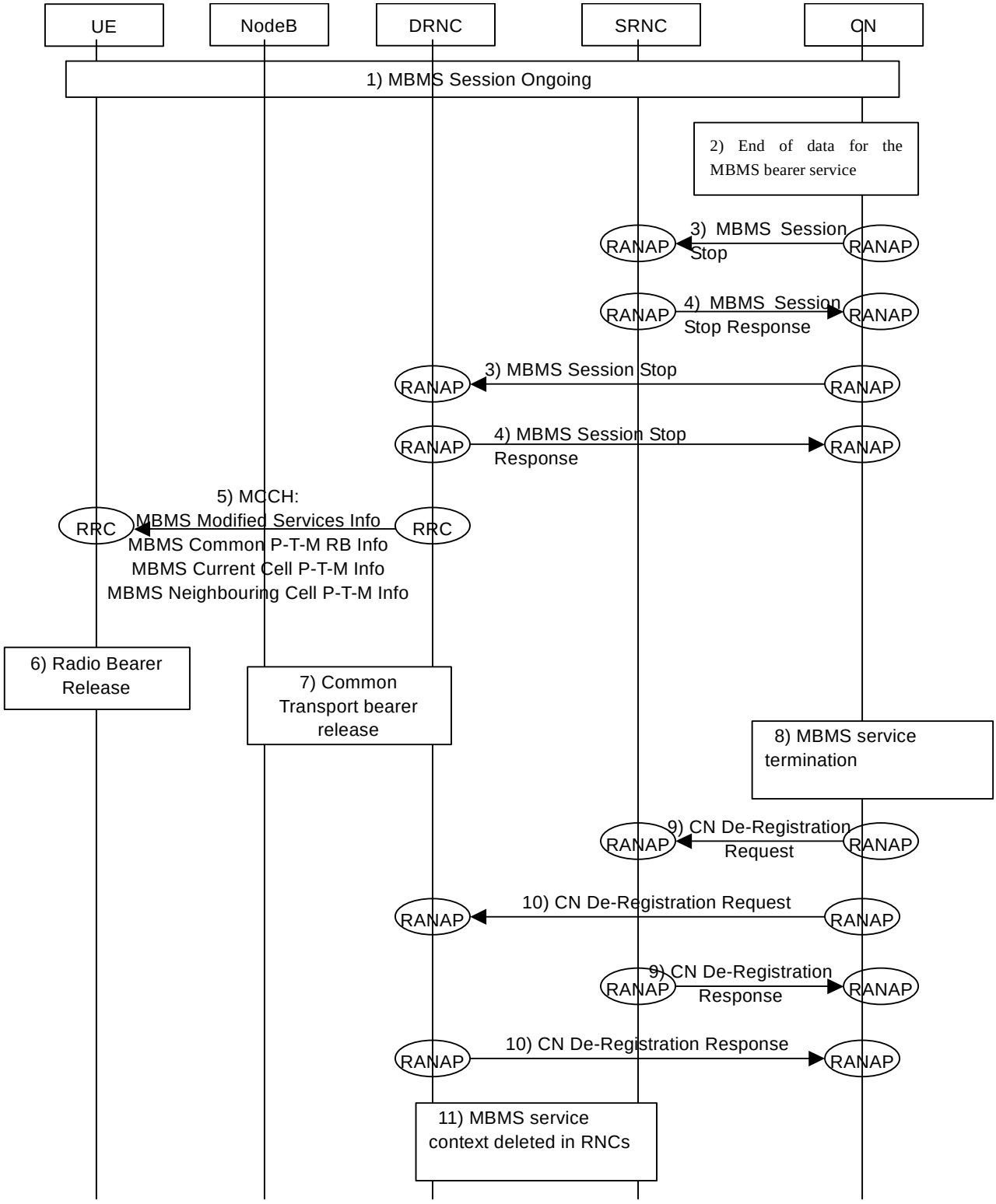


Figure 50: MBMS Session stop and Service termination

1. In this scenario it is assumed that an MBMS Session is ongoing with UE in DRNC receiving MBMS service over PTM bearers.

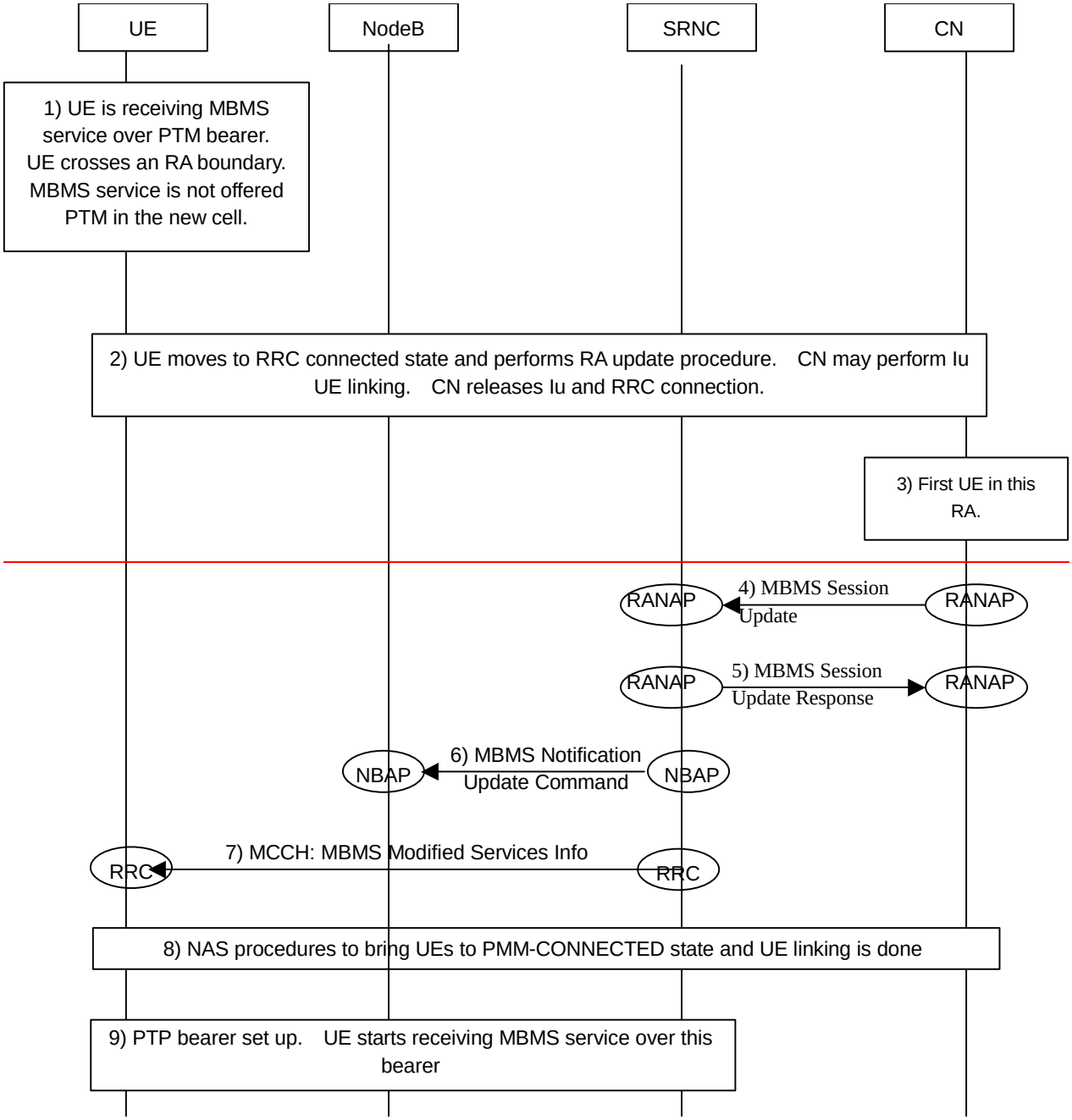
2. End of MBMS data session;

3. CN invokes RANAP **MBMS Session Stop** message towards all RNC that are explicitly or implicitly registered with the CN. RAB resources and Iu signaling connection are released.
   Parameters: MBMS CN De-registration

4. RNCs send RANAP **MBMS Session Stop Response** messagess back to SGSN.
5. DRNC as CRNC also update and remove all relevant information related to the MBMS Service on the MCCH: RRC **Modified Services Info** message on MCCH. Parameters: TMGI, Release PTM RB; and all RB info on the PTM bearer for the service on RRC. **Common PTM RB Info, Current Cell PTM RB Info, Neighbouring Cell PTM RB Info**
6. UE releases the Radio Bearer for the MBMS service.
7. Iub bearer is released using NBAP Common Transport Bearer release procedure.
8. MBMS services terminates.
9. SGSN sends a RANAP **CN De-Registration Request** message to all RNCs registered with the CN in order to inform the RNC that a certain MBMS Service is no longer available.
   Parameters: TMGI, Global CN-id.
10. RNCs replies with a RANAP **CN De-Registration Response** message back to the SGSN.
11. RNCs removes this MBMS service contexts and De-links all UEs from this service.

7.19.6 RAU during MBMS Session

The following scenario gives an example message flow for an Idle mode UE receiving MBMS service over PTM bearer crossing an RA boundary and performing a RAU update. The RA filtering option is used in the network.


UE
NodeB
SRNC
CN
1) UE is receiving MBMS service over PTM bearer. UE crosses an RA boundary. MBMS service is not offered PTM in the new cell.
2) UE moves to RRC connected state and performs RA update procedure. CN may perform Iu UE linking. CN releases Iu and RRC connection.
3) First UE in this RA.
RANAP
4) MBMS Session Update
RANAP
RANAP
5) MBMS Session Update Response
RANAP
NBAP
6) MBMS Notification Update Command
NBAP
RRC
7) MCCH: MBMS Modified Services Info
RRC
8) NAS procedures to bring UEs to PMM-CONNECTED state and UE linking is done
9) PTP bearer set up. UE starts receiving MBMS service over this bearer

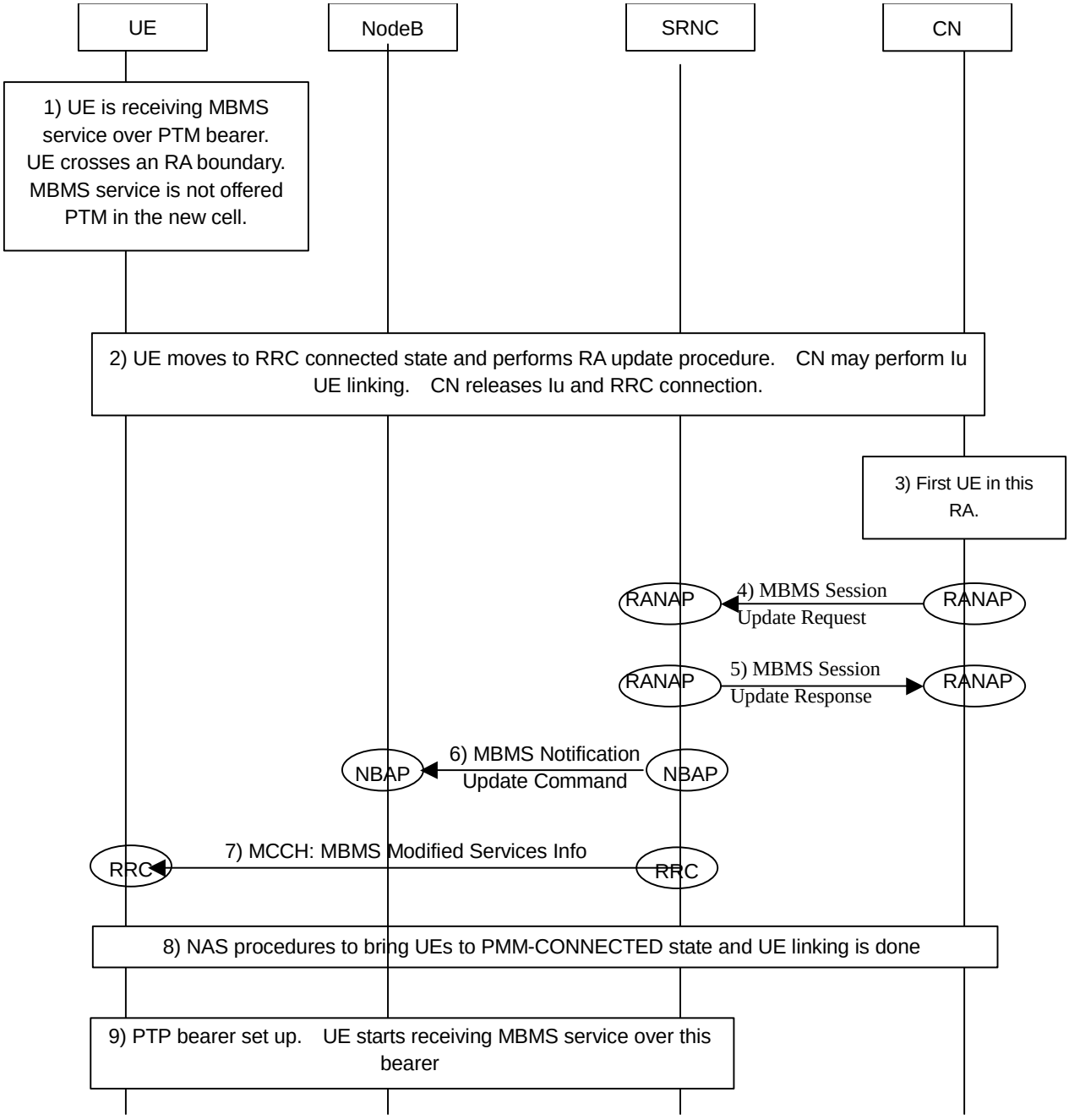


Figure 51: RA update procedure during a MBMS Session~~MBMS Service Activation~~

1. UE in idle mode receiving MBMS service over PTM crosses RA boundry.
2. UE moves to connected mode and performs RA update. CN releases Iu connection on completion of RA udpate procedure. If the CN does not release Iu connection immediately, it must perform UE linking.
3. This is first UE in the RA.
4. ~~RNC~~ Core Network sends an RANAP **MBMS Session Update** message to RNC ~~Core Network~~ after ~~RNC to~~ updating~~e~~ the RA list containing UEs.
   Parameters: Session Update ID, Delta RA list of Idle mode UEs.
5. RNC responds with RANAP **MBMS Session Update Response** message. MBMS Iu bearer was already set up earlier.
   Parameters: Session update Id.
6. RNC sends NBAP **MBMS Notification Update Command** to update the MICH in all the cells that is part of both the MBMS Service Area and one of the RNC´s RAs indicated in the *RA to be added List* IE, if this IE is

included in the *Delta RA List of Idle Mode UEs* IE group.
Parameters: C-ID, Common Physical Channel ID, Modification Period, MICH CFN, NI Information.

7. SRNC as CRNC updates the MCCH using RRC **MBMS Modified Services Info** message on MCCH in all the cells indicated in step 6 to request UE to establish PMM connection. As this is the first UE in the RA, the SRNC does not need to peform counting.
   Parameters: MBMS Transmission id, MBMS Required UE action, Continue MCCH reading.

8. UE establishes PMM connection. CN performs UE linking.

9. SRNC sets up PTP radio bearer. UE starts to receive data over PTP radio bearer.
