

(R3-020734, to TSG-RAN) Response to LS (S2-020276) on Restoration of R'96 Any Time Interrogation functionality

|                |   |
|----------------|---|
| <b>Title:</b>  | <b>Reply to LS "Restoration of R'96 Any Time Interrogation functionality"</b> |
| <b>Source:</b> | <b>TSG RAN WG3</b>  |
| <b>To:</b>     | <b>TSG SA, TSG RAN, SA2, RAN2</b>   |
| <b>Cc:</b>     | <b>SA1, GERAN2, CN2, TSG CN</b>   |

**Contact Persons:**

|                        |  |
|------------------------|--|
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**Introduction**

RAN WG3 would like to inform SA2, TSG- SA and TSG-RAN that whilst RAN3 had received S2-020276, on 'Any Time Interrogation Functionality' during RAN3 Meeting #26 – no conclusive outcome was reached during Meeting #26, and an email discussion took place between Meetings #26 & #27.

During RAN3 Meeting #27, still no agreement could be reached in solving the problem outlined in the aforementioned liaison from SA2.

**Discussion**

A summary of the points discussed by RAN3 (Iu SWG) is as follows:

1. A solution to the scenario outlined by SA2 with regards this problem would be the inclusion of an additional new information element *Last Known Service Area* IE to the [RANAP] Location Report message. This IE would be included within the [RANAP] Location Report message in the situation when the UTRAN could not provide an up to date location of the subscriber. Whilst an existing cause value is sent to the CN when a Location Report is unsuccessful, here this new IE is also sent i.e. the last known Service Area of the subscriber and the age of that location i.e. elapsed time in minutes since the reported last known SAI was stored by the RNC.
2. SA2 requested RAN3 to consider how long R99 RANAP would exist in Operator networks and/or identify what features in R4 and R5 were mandatory for the Iu-PS interface:
  - RAN3 interpreted this question as to what functions (post R99) were mandatory.  
ANSWER: No functions in R4 & R5 RANAP are mandatory.
  - Subsequently, one could assume that R99 RANAP would exist in Operator Networks for a considerable amount of time.
3. RAN3 discovered that there is a contradiction between TS 25.305 and TS 23.271(TS 23.171 for R99): TS 25.305 requires the RNC to deliver in the outlined scenario (see S2's LS) the last known location and the age of that location information, whereas TS 23.271 specifies the RNC to report a failure:

#### 8.1.1 UE Cell ID is not known

For UE for which the cell ID is not known at the time the UE Positioning request is received at the SRNC, the UE may be paged to locate its current cell ID. If the UE is in an idle mode and there is a need for it to be paged, then the paging shall be initiated by the CN. If the UE is in URA\_PCH state the paging may be initiated by the SRNC in UTRAN. For example, the UE can be forced to perform a transition to a Cell\_FACH state to define the cell ID of its current cell.

If the UE is in an idle mode, or in a RRC connected state when there is a need to page for the UE to obtain the cell ID, the CN may initiate paging, authentication and ciphering, as specified in [13].

Alternatively, the cell ID may be determined as the one that was used during the last active connection to the UE. This determination should be accompanied by the time-of-day of the last connection in the cell.

Extract from TS 23.171 v3.6.0

#### 8.7.1.3 Location Calculation and Release Procedure

- (10) When a location estimate best satisfying the requested QoS has been obtained, the SRNC returns it to the 3G-MSC in a Location Report message. If a location estimate could not be obtained, the SRNC returns a Location Report message containing a failure cause and no location estimate.

Extract from TS 23.271 v4.4.0

#### 9.1.6.3 Location Calculation and Release Procedure

- 9) When location information best satisfying the requested location type and QoS has been obtained, the RAN returns it to the SGSN in a Location Report message. If a location estimate could not be obtained, the RAN returns a Location Report message containing a failure cause and no location estimate.

TS 25.413 and TS 23.060 follow the procedural description of TS 23.171/TS 23.271.

4. The majority of the delegates believe that the Any Time Interrogation service will work (although not optimally) and that the proposed changes represent an enhancement. This assessment is due to the fact that the SGSN is mandated to memorise the last known location and the age of the location information and therefore the SGSN will reply back valid (although not the latest available information in the system) information if it receives a failure indication from the RNC.

Therefore the majority of RAN3 believes that the proposed changes could be included for R5, whilst some companies are agreeable to having this included in R4. Only Vodafone Group prefers that this change is included for R99 – they consider it as an essential correction.

5. There are also changes foreseen by RAN3 to some specifications that are under SA2 responsibility – details outlined below in the ‘Actions’ section.
6. In case a modification is decided to be included after R99, RAN2 should take care to align R99 (or later) TS 25.305 with TS 23.271/23.171.

## 2. Action

RAN3 believes that this issue shall be decided by RAN and SA plenary. RAN3 asks the concerned groups to provide technically correct CRs and to forward them to the respective Plenary meetings for decision.

### To: SA WG2

However, should any CRs be approved by RAN3 for inclusion into RANAP, RAN3 also recommends – to avoid any future ambiguity – that CRs are made against the following specifications. The subsections listed below are given as a starting point for those CRs:

TS 23.060 Sections 6.3.6, 12.7.5 and 13.2/13.7

TS 23.171 Sections 8.7.1.3 and 8.7.2

TS 23.271 Sections 9.1.4, 9.1.6.3 and 9.4.3

TS 25.305 Sections 7.3.1, and 8.1 (Under RAN2 responsibility)

TS 25.413 Sections 8.20, 9.1.30, 9.3.3, 9.3.4 and 9.3.6 (Under RAN3 responsibility example CRs attached)

A tabular summary of what changes are required to the respective specifications is presented below:

Possibility 1: Essential correction for R99 onwards

TS 23.271/23.171 should be aligned with TS 25.305.

Changes are required to TS 23.060 and TS 25.413

Possibility 2: Modification of a Function for R4 onwards

R99 changes are needed to TS 25.305 i.e. align it to TS 23.171

Rel4/5 changes to TS 23.271, i.e. align it to TS 25.305

Rel4/5 changes to TS 23.060 and TS 25.413

Possibility 3: Enhancement for R5 onwards

R99/Rel4 changes are needed to TS 25.305 to then align it to TS 23.171/23.271

Rel5 changes are then needed to TS 23.271 i.e. to align it to TS 25.305.

Rel5 changes to TS 23.060 and TS 25.413

**To: RAN2**

Be prepared to provide technically correct CRs in order to align TS 25.305 (e.g. sections 7.3.1 and 8.1) with TS 23.171 / TS 23.271 and to forward them to the respective Plenary meetings for decision.

**To: TSG RAN**

Discuss in which release the proposed changes presented by RAN3 are acceptable (either R99, Rel-4 or Rel-5).

**To: TSG SA**

Discuss in which release the proposed changes presented by RAN3, RAN2 and SA2 are acceptable (either R99, Rel-4 or Rel-5) and to approve all the technically correct and presented CRs on this subject accordingly.

### 3. Next Relevant Meeting Dates

RAN3 April 8<sup>th</sup> – 12<sup>th</sup>, Kobe, Japan.

RAN2 April 8<sup>th</sup> – 12<sup>th</sup>, Kobe, Japan.

SA WG2 April 22<sup>nd</sup> – 26<sup>th</sup> Madrid, Spain.

RAN Plenary - Jeju Island, Korea, 5<sup>th</sup> – 8<sup>th</sup> March, 2002

SA Plenary - Jeju Island, Korea, 12<sup>th</sup> – 15<sup>th</sup> March, 2002

### 4. Attachments

Example Rel99 CR under RAN3 responsibility [Possibility 1]:

R3-020731\_CR434rev2\_25413v380\_InclusionofLastKnownServiceAreaIEgroupintoLOCATIONREPORT.doc

Please note that a Rel4 mirror CR (category A) is needed and could be derived from the Rel4 CR prepared for the possibility 2 below.

Example Rel4 CR under RAN3 responsibility [Possibility 2]:

R3-020732\_CR435rev2\_25413v430\_InclusionofLastKnownServiceAreaIEgroupintoLOCATIONREPORT.doc

Example Rel5 CR under RAN3 responsibility [Possibility 3]:

R3-020733\_CR436rev2\_25413rel5\_InclusionofLastKnownServiceAreaIEgroupintoLOCATIONREPORT.doc

## CHANGE REQUEST

⌘ **25.413 CR 434** ⌘ rev **2** ⌘ Current version: **3.8.0** ⌘

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

**Proposed change affects:** ⌘ (U)SIM  ME/UE  Radio Access Network  Core Network

|                        |   |                 |   |
|------------------------|---|-----------------|---|
| <b>Title:</b>          | ⌘ Inclusion of <i>Last Know Service Area</i> IE group into LOCATION REPORT  |                 |   |
| <b>Source:</b>         | ⌘ Vodafone  |                 |   |
| <b>Work item code:</b> | ⌘ TEI   | <b>Date:</b>    | ⌘ 20 February 2002  |
| <b>Category:</b>       | ⌘ <b>F</b>  | <b>Release:</b> | ⌘ R99   |
|                        | <i>Use one of the following categories:</i><br><b>F</b> (correction)<br><b>A</b> (corresponds to a correction in an earlier release)<br><b>B</b> (addition of feature),<br><b>C</b> (functional modification of feature)<br><b>D</b> (editorial modification)<br>Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> . |                 | <i>Use one of the following releases:</i><br><b>2</b> (GSM Phase 2)<br><b>R96</b> (Release 1996)<br><b>R97</b> (Release 1997)<br><b>R98</b> (Release 1998)<br><b>R99</b> (Release 1999)<br><b>REL-4</b> (Release 4)<br><b>REL-5</b> (Release 5) |

|                                      |   |
|--------------------------------------|---|
| <b>Reason for change:</b>            | ⌘   |
| <b>Summary of change:</b>            | ⌘ Inclusion of Last Know Service Area IE group into LOCATION REPORT with suitable behaviour and cause value when the LOCATION REPORT message is sent as an answer to a request for a direct report of Service Area and the current Service Area can not be determined by the RNC.<br><br>Procedure text, tabular format section and ASN.1 are therefore update accordingly.<br><br>Impact Analysis:<br>Impact assessment towards the previous version of the specification (same release):<br><br>This CR has isolated impact with the previous version of the specification (same release) because the way of handling one particular case - when the LOCATION REPORT message is sent as an answer to a request for a direct report of Service Area and the current Service Area can not be determined by the RNC - has been changed. This would not affect implementations behaving like indicated in the CR, would affect implementations supporting the corrected functionality otherwise.<br><br>The CR has an impact under protocol & functional point of view.<br><br>The impact can be considered isolated because the change affects the Location reporting function and because the inclusion of the <i>Last Know Service Area IE</i> group into LOCATION REPORT is optional. |
| <b>Consequences if not approved:</b> | ⌘   |

**Clauses affected:** ⌘ 8.20.2, 9.1.30, 9.2.3.xx, 9.3.3, 9.3.4 and 9.3.6

|                        |   |                                     |                           |   |  |
|------------------------|---|-------------------------------------|---------------------------|---|--|
| <b>Other specs</b>     | ⌘ | <input checked="" type="checkbox"/> | Other core specifications | ⌘ | TS 23.171 R99, TS 23.271 R4/R5, TS 23.060 R99/R4/R5 and mirror CR against TS 25.413 R4 |
| <b>affected:</b>       |   | <input type="checkbox"/>            | Test specifications       |   |  |
|                        |   | <input type="checkbox"/>            | O&M Specifications        |   |  |
| <b>Other comments:</b> | ⌘ |                                     |                           |   |  |

### How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at: [http://www.3gpp.org/3G\\_Specs/CRs.htm](http://www.3gpp.org/3G_Specs/CRs.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.

## 8.19 Location Reporting Control

### 8.19.1 General

The purpose of the Location Reporting Control procedure is to allow the CN to request information on the location of a given UE. The procedure uses connection oriented signalling.

### 8.19.2 Successful Operation



**Figure 1: Location Reporting Control procedure. Successful operation.**

The CN shall initiate the procedure by generating a LOCATION REPORTING CONTROL message.

The *Request Type* IE shall indicate to the serving RNC whether:

- to report directly;
- to report upon change of Service area, or
- to stop reporting at change of Service Area.

If reporting upon change of Service Area is requested, the Serving RNC shall report whenever the UE moves between Service Areas. For this procedure, only Service Areas that are defined for the PS and CS domains shall be considered.

The *Request Type* IE shall also indicate what type of location information the serving RNC shall report. The location information is either of the following types:

- Service Area Identifier, or
- Geographical area, including geographical coordinates with or without requested accuracy.

A request for a direct report can be done in parallel with having an active request to report upon change of Service Area for the same UE. The request to report upon change of Service Area shall not be affected by this.

#### **Interaction with Relocation:**

The order to perform location reporting at change of Service Area is lost in UTRAN at successful Relocation of SRNS. If the location reporting at change of Service Area shall continue also after the relocation has been performed, the Location Reporting Control procedure shall thus be re-initiated from the CN towards the future SRNC after the Relocation Resource Allocation procedure has been executed successfully.

### 8.19.3 Abnormal Conditions

Not applicable.

## 8.20 Location Report

### 8.20.1 General

The purpose of the Location Report procedure is to provide the UE's location information to the CN. The procedure uses connection oriented signalling.

## 8.20.2 Successful Operation



**Figure 2: Location Report procedure. Successful operation.**

The serving RNC shall initiate the procedure by generating a LOCATION REPORT message. The LOCATION REPORT message may be used as a response for the LOCATION REPORTING CONTROL message. Also, when a user enters or leaves a classified zone set by O&M, e.g. zone where a disaster occurred, a LOCATION REPORT message shall be sent to the CN including the Service Area of the UE in the *Area Identity* IE. The *Cause* IE shall indicate the appropriate cause value to CN, e.g. "User Restriction Start Indication" and "User Restriction End Indication". The CN shall react to the LOCATION REPORT message with CN vendor specific actions.

For this procedure, only Service Areas that are defined for the PS and CS domains shall be considered.

In case reporting at change of Service Area is requested by the CN, then the RNC shall issue a LOCATION REPORT message

- whenever the information given in the previous LOCATION REPORT message or INITIAL UE MESSAGE message is not anymore valid.
- upon receipt of the first LOCATION REPORTING CONTROL message following a Relocation Resource Allocation procedure, with *Request Type* IE set to "Change of Service Area", as soon as SAI becomes available in the new SRNC and the relocation procedure has been successfully completed.

In the case when Service Area is reported, the RNC shall include to the LOCATION REPORT message in the *Area Identity* IE the Service Area, which includes at least one of the cells from which the UE is consuming radio resources.

In the case when the LOCATION REPORT message is sent as an answer to a request for a direct report or at a change of Service Area, the *Request Type* IE from the LOCATION REPORTING CONTROL message shall be included.

If the LOCATION REPORT message is sent as an answer to a request for a direct report of Service Area and the current Service Area can not be determined by the RNC, then the *Area Identity* IE shall be omitted and a cause value shall be included to indicate that the request could not be fulfilled, e.g. "Requested Information Not Available". The RNC may also include the *Last Known Service Area* IE.

If the RNC can not deliver the location information as requested by the CN, due to either the non-support of the requested event or the non-support of the request Report Area, the RNC shall indicate the UE location to be "Undetermined" by omitting the *Area Identity* IE. A cause value shall instead be added to indicate the reason for the undetermined location, e.g. "Requested Request Type not supported".

If the Location Report procedure was triggered by a LOCATION REPORTING CONTROL message, which included a request to report a geographical area with a specific accuracy, the LOCATION REPORT message shall include the *Geographical Area* IE within the *Area Identity* IE containing either a point with indicated uncertainty or a polygon, which both shall fulfill the requested accuracy as accurately as possible. If, on the other hand, no specific accuracy level was requested in the LOCATION REPORTING CONTROL message, it is up to UTRAN to decide with which accuracy to report.

## 8.20.3 Abnormal Conditions

Not applicable.

## 9.1.29 LOCATION REPORTING CONTROL

This message is sent by the CN to initiate, modify or stop location reporting from the RNC to the CN.

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         | ignore               |
| Request Type  | M        |       | 9.2.1.16              |                       | YES         | ignore               |

## 9.1.30 LOCATION REPORT

This message is sent by the RNC to the CN with information about the UE location.

Direction: RNC → CN.

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                 | ignore                 |
| Area Identity                           | O                 |       | 9.2.3.10                 |                       | YES                 | ignore                 |
| Cause                                   | O                 |       | 9.2.1.4                  |                       | YES                 | ignore                 |
| Request Type                            | O                 |       | 9.2.1.16                 |                       | YES                 | ignore                 |
| <a href="#">Last Known Service Area</a> | <a href="#">O</a> |       | <a href="#">9.2.3.xx</a> |                       | <a href="#">YES</a> | <a href="#">ignore</a> |



### 9.2.3.18 NAS Synchronisation Indicator

This information element contains transparent NAS information that is transferred without interpretation in the RNC.

| IE/Group Name                 | Presence | Range | IE type and reference | Semantics description |
|-------------------------------|----------|-------|-----------------------|-----------------------|
| NAS Synchronisation Indicator | M        |       | BIT STRING (4)        |                       |

### 9.2.3.xx Last Known Service Area

This information element is used for indicating the last known Service Area and the elapsed time since the UE was known to be in this Service Area. The last known Service Area is reported when the current Service Area is unknown to the RNC.

| <u>IE/Group Name</u>           | <u>Presence</u> | <u>Range</u> | <u>IE type and reference</u> | <u>Semantics description</u>   |
|--------------------------------|-----------------|--------------|------------------------------|--|
| <u>Last Known Service Area</u> |                 |              |                              |  |
| <u>&gt;SAI</u>                 | <u>M</u>        |              | <u>9.2.3.9</u>               |  |
| <u>&gt;Age of SAI</u>          | <u>M</u>        |              | <u>INTEGER (0..32767)</u>    | <u>The value represents the elapsed time in minutes since the reported last known SAI was stored by the RNC. Value "0" shall not be used. Value "32767" indicates that the age of SAI is at least 32767 minutes old.</u> |

### 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
    DataVolumeReference,
    AreaIdentity,
    CN-DomainIndicator,
    Cause,
    CriticalityDiagnostics,
    ChosenEncryptionAlgorithm,
    ChosenIntegrityProtectionAlgorithm,
    ClassmarkInformation2,
    ClassmarkInformation3,
    DL-GTP-PDU-SequenceNumber,
    DL-N-PDU-SequenceNumber,
    DataVolumeReportingIndication,
    DRX-CycleLengthCoefficient,
    EncryptionInformation,
    GlobalRNC-ID,
    IntegrityProtectionInformation,
    IuSignallingConnectionIdentifier,
    IuTransportAssociation,
    KeyStatus,
    L3-Information,
    LAI,
    LastKnownServiceArea,
    NAS-PDU,
    NAS-SynchronisationIndicator,
    NonSearchingIndication,
    NumberOfSteps,
    OMC-ID,
    OldBSS-ToNewBSS-Information,
    PagingAreaID,
    PagingCause,
    PDP-TypeInformation,
    PermanentNAS-UE-ID,
    RAB-ID,
    RAB-Parameters,
    RAC,
    RelocationType,
    RequestType,
    SAI,
    SAPI,
    Service-Handover,
    SourceID,
    SourceRNC-ToTargetRNC-TransparentContainer,
    TargetID,
    TargetRNC-ToSourceRNC-TransparentContainer,
    TemporaryUE-ID,
    TraceReference,
    TraceType,
    UnsuccessfullyTransmittedDataVolume,
    TransportLayerAddress,
    TriggerID,
    UE-ID,
    UL-GTP-PDU-SequenceNumber,
    UL-N-PDU-SequenceNumber,
    UP-ModeVersions,

```

UserPlaneMode  
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,

id-AreaIdentity,  
id-CN-DomainIndicator,  
id-Cause,  
id-ChosenEncryptionAlgorithm,  
id-ChosenIntegrityProtectionAlgorithm,  
id-ClassmarkInformation2,  
id-ClassmarkInformation3,  
id-CriticalityDiagnostics,  
id-DRX-CycleLengthCoefficient,  
id-DirectTransferInformationItem-RANAP-RelocInf,  
id-DirectTransferInformationList-RANAP-RelocInf,  
id-DL-GTP-PDU-SequenceNumber,  
id-EncryptionInformation,  
id-GlobalRNC-ID,  
id-IntegrityProtectionInformation,  
id-IuSigConId,  
id-IuSigConIdItem,  
id-IuSigConIdList,  
id-IuTransportAssociation,  
id-KeyStatus,  
id-L3-Information,  
id-LAI,  
id-LastKnownServiceArea,  
id-NAS-PDU,  
id-NonSearchingIndication,  
id-NumberOfSteps,  
id-OMC-ID,  
id-OldBSS-ToNewBSS-Information,  
id-PagingAreaID,  
id-PagingCause,  
id-PermanentNAS-UE-ID,  
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-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-RelocationType,
id-RequestType,
id-SAI,
id-SAPI,
id-SourceID,
id-SourceRNC-ToTargetRNC-TransparentContainer,
id-TargetID,
id-TargetRNC-ToSourceRNC-TransparentContainer,
id-TemporaryUE-ID,
id-TraceReference,
id-TraceType,
id-TransportLayerAddress,
id-TriggerID,
id-UE-ID,
id-UL-GTP-PDU-SequenceNumber
FROM RANAP-Constants;

```

Lots of unaffected ASN1 in 9.3.3 not shown

```

-- *****
--
-- 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 ::= {
{ ID id-LastKnownServiceArea   CRITICALITY ignore EXTENSION LastKnownServiceArea PRESENCE
optional},
    ...
}

```

Lots of unaffected ASN1 in 9.3.3 not shown

### 9.3.4 Information Element Definitions

```
-- *****
--
-- Information Element Definitions
--
-- *****

RANAP-IEs {
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
umts-Access (20) modules (3) ranap (0) version1 (1) ranap-IEs (2) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN
```

Lots of unaffected ASN1 in 9.3.4 not shown

```
-- L

LAC ::= OCTET STRING (SIZE (2))

LAI ::= SEQUENCE {
    PLMNidentity          PLMNidentity,
    LAC                   LAC,
    iE-Extensions        ProtocolExtensionContainer { {LAI-ExtIEs} } OPTIONAL
}

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

LastKnownServiceArea ::= SEQUENCE {
    SAI          SAI,
    ageOfSAI    INTEGER (0..32767),
    ...
}

L3-Information ::= OCTET STRING

-- M
```

Lots of unaffected ASN1 in 9.3.4 not shown

### 9.3.6 Constant Definitions

```
-- *****
--
-- Constant definitions
--
-- *****

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

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN
```

Lots of unaffected ASN1 in 9.3.6 not shown

```
-- *****
--
-- IEs
--
-- *****

id-AreaIdentity                INTEGER ::= 0
id-CN-DomainIndicator          INTEGER ::= 3
id-Cause                       INTEGER ::= 4
id-ChosenEncryptionAlgorithm   INTEGER ::= 5
id-ChosenIntegrityProtectionAlgorithm INTEGER ::= 6
id-ClassmarkInformation2       INTEGER ::= 7
id-ClassmarkInformation3       INTEGER ::= 8
id-CriticalityDiagnostics      INTEGER ::= 9
id-DL-GTP-PDU-SequenceNumber   INTEGER ::= 10
id-EncryptionInformation       INTEGER ::= 11
id-IntegrityProtectionInformation INTEGER ::= 12
id-IuTransportAssociation      INTEGER ::= 13
id-L3-Information              INTEGER ::= 14
id-LAI                         INTEGER ::= 15
id-NAS-PDU                    INTEGER ::= 16
id-NonSearchingIndication      INTEGER ::= 17
id-NumberOfSteps               INTEGER ::= 18
id-OMC-ID                     INTEGER ::= 19
id-OldBSS-ToNewBSS-Information INTEGER ::= 20
id-PagingAreaID               INTEGER ::= 21
id-PagingCause                 INTEGER ::= 22
id-PermanentNAS-UE-ID         INTEGER ::= 23
id-RAB-ContextItem            INTEGER ::= 24
id-RAB-ContextList            INTEGER ::= 25
id-RAB-DataForwardingItem      INTEGER ::= 26
id-RAB-DataForwardingItem-SRNS-CtxReq INTEGER ::= 27
id-RAB-DataForwardingList      INTEGER ::= 28
id-RAB-DataForwardingList-SRNS-CtxReq INTEGER ::= 29
id-RAB-DataVolumeReportItem    INTEGER ::= 30
id-RAB-DataVolumeReportList    INTEGER ::= 31
id-RAB-DataVolumeReportRequestItem INTEGER ::= 32
id-RAB-DataVolumeReportRequestList INTEGER ::= 33
id-RAB-FailedItem             INTEGER ::= 34
id-RAB-FailedList             INTEGER ::= 35
id-RAB-ID                     INTEGER ::= 36
id-RAB-QueuedItem              INTEGER ::= 37
id-RAB-QueuedList             INTEGER ::= 38
id-RAB-ReleaseFailedList      INTEGER ::= 39
id-RAB-ReleaseItem            INTEGER ::= 40
id-RAB-ReleaseList            INTEGER ::= 41
id-RAB-ReleasedItem           INTEGER ::= 42
id-RAB-ReleasedList           INTEGER ::= 43
id-RAB-ReleasedList-IuRelComp  INTEGER ::= 44
id-RAB-RelocationReleaseItem   INTEGER ::= 45
id-RAB-RelocationReleaseList   INTEGER ::= 46
id-RAB-SetupItem-RelocReq      INTEGER ::= 47
id-RAB-SetupItem-RelocReqAck   INTEGER ::= 48
id-RAB-SetupList-RelocReq      INTEGER ::= 49
id-RAB-SetupList-RelocReqAck   INTEGER ::= 50
id-RAB-SetupOrModifiedItem     INTEGER ::= 51
id-RAB-SetupOrModifiedList     INTEGER ::= 52
id-RAB-SetupOrModifyItem      INTEGER ::= 53
```

|   |                       |
|---|-----------------------|
| id-RAB-SetupOrModifyList                        | INTEGER ::= 54        |
| id-RAC  | INTEGER ::= 55        |
| id-RelocationType                               | INTEGER ::= 56        |
| id-RequestType                                  | INTEGER ::= 57        |
| id-SAI  | INTEGER ::= 58        |
| id-SAPI   | INTEGER ::= 59        |
| id-SourceID                                     | INTEGER ::= 60        |
| id-SourceRNC-ToTargetRNC-TransparentContainer   | INTEGER ::= 61        |
| id-TargetID                                     | INTEGER ::= 62        |
| id-TargetRNC-ToSourceRNC-TransparentContainer   | INTEGER ::= 63        |
| id-TemporaryUE-ID                               | INTEGER ::= 64        |
| id-TraceReference                               | INTEGER ::= 65        |
| id-TraceType                                    | INTEGER ::= 66        |
| id-TransportLayerAddress                        | INTEGER ::= 67        |
| id-TriggerID                                    | INTEGER ::= 68        |
| id-UE-ID  | INTEGER ::= 69        |
| id-UL-GTP-PDU-SequenceNumber                    | INTEGER ::= 70        |
| id-RAB-FailedtoReportItem                       | INTEGER ::= 71        |
| id-RAB-FailedtoReportList                       | INTEGER ::= 72        |
| id-KeyStatus                                    | INTEGER ::= 75        |
| id-DRX-CycleLengthCoefficient                   | INTEGER ::= 76        |
| id-IuSigConIdList                               | INTEGER ::= 77        |
| id-IuSigConIdItem                               | INTEGER ::= 78        |
| id-IuSigConId                                   | INTEGER ::= 79        |
| id-DirectTransferInformationItem-RANAP-RelocInf | INTEGER ::= 80        |
| id-DirectTransferInformationList-RANAP-RelocInf | INTEGER ::= 81        |
| id-RAB-ContextItem-RANAP-RelocInf               | INTEGER ::= 82        |
| id-RAB-ContextList-RANAP-RelocInf               | INTEGER ::= 83        |
| id-RAB-ContextFailedtoTransferItem              | INTEGER ::= 84        |
| id-RAB-ContextFailedtoTransferList              | INTEGER ::= 85        |
| id-GlobalRNC-ID                                 | INTEGER ::= 86        |
| id-RAB-ReleasedItem-IuRelComp                   | INTEGER ::= 87        |
| id-MessageStructure                             | INTEGER ::= 88        |
| id-TypeOfError                                  | INTEGER ::= 93        |
| <u>id-LastKnownServiceArea</u>                  | <u>INTEGER ::= x1</u> |

END

CR-Form-v5

## CHANGE REQUEST

⌘ 25.413 CR 436 ⌘ rev 2 ⌘ Current version: 4.3.0 ⌘

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

Proposed change affects: ⌘ (U)SIM  ME/UE  Radio Access Network  Core Network

|                        |  |                 |   |
|------------------------|--|-----------------|---|
| <b>Title:</b>          | ⌘ Inclusion of <i>Last Know Service Area</i> IE group into LOCATION REPORT                     |                 |   |
| <b>Source:</b>         | ⌘ RAN3 Iu-SWG (except Vodafone)  |                 |   |
| <b>Work item code:</b> | ⌘ TEI  | <b>Date:</b>    | ⌘ 20 February 2002                        |
| <b>Category:</b>       | ⌘ <b>B</b>   | <b>Release:</b> | ⌘ REL-5                                   |
|                        | Use <u>one</u> of the following categories:  |                 | Use <u>one</u> of the following releases: |
|                        | <b>F</b> (correction)  |                 | 2 (GSM Phase 2)                           |
|                        | <b>A</b> (corresponds to a correction in an earlier release)                                   |                 | R96 (Release 1996)                        |
|                        | <b>B</b> (addition of feature),  |                 | R97 (Release 1997)                        |
|                        | <b>C</b> (functional modification of feature)  |                 | R98 (Release 1998)                        |
|                        | <b>D</b> (editorial modification)  |                 | R99 (Release 1999)                        |
|                        | Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> . |                 | REL-4 (Release 4)                         |
|                        |  |                 | REL-5 (Release 5)                         |

|                                      |   |
|--------------------------------------|---|
| <b>Reason for change:</b>            | ⌘   |
| <b>Summary of change:</b>            | ⌘ Inclusion of Last Know Service Area IE group into LOCATION REPORT with suitable behaviour and cause value when the LOCATION REPORT message is sent as an answer to a request for a direct report of Service Area and the current Service Area can not be determined by the RNC.<br><br>Procedure text, tabular format section and ASN.1 are therefore update accordingly.<br><br>Impact Analysis:<br>Impact assessment towards the previous version of the specification (previous release):<br><br>This CR has isolated impact with the previous version of the specification (previous release) because the way of handling one particular case - when the LOCATION REPORT message is sent as an answer to a request for a direct report of Service Area and the current Service Area can not be determined by the RNC - has been changed. The CR has an impact under functional point of view.<br><br>The impact can be considered isolated because the change affects the Location reporting function and because the inclusion of the <i>Last Know Service Area IE</i> group into LOCATION REPORT is a new optional feature. |
| <b>Consequences if not approved:</b> | ⌘   |

|                          |  |
|--------------------------|--|
| <b>Clauses affected:</b> | ⌘ 8.20.2, 9.1.30, 9.2.3.xx, 9.3.3, 9.3.4 and 9.3.6   |
| <b>Other specs</b>       | ⌘ <input checked="" type="checkbox"/> Other core specifications ⌘ TS 25.305 R99 and R4, TS 23.271 R5, TS 23.060 R5 |



|                        |                          |                     |  |
|------------------------|--------------------------|---------------------|--|
| <b>affected:</b>       | <input type="checkbox"/> | Test specifications |  |
|                        | <input type="checkbox"/> | O&M Specifications  |  |
| <b>Other comments:</b> | ⌘                        |                     |  |

### How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at: [http://www.3gpp.org/3G\\_Specs/CRs.htm](http://www.3gpp.org/3G_Specs/CRs.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.

## 8.19 Location Reporting Control

### 8.19.1 General

The purpose of the Location Reporting Control procedure is to allow the CN to request information on the location of a given UE. The procedure uses connection oriented signalling.

### 8.19.2 Successful Operation



**Figure 1: Location Reporting Control procedure. Successful operation.**

The CN shall initiate the procedure by generating a LOCATION REPORTING CONTROL message.

The *Request Type* IE shall indicate to the serving RNC whether:

- to report directly;
- to stop a direct report;
- to report upon change of Service area, or
- to stop reporting at change of Service Area.

If reporting upon change of Service Area is requested, the Serving RNC shall report whenever the UE moves between Service Areas. For this procedure, only Service Areas that are defined for the PS and CS domains shall be considered.

The *Request Type* IE shall also indicate what type of location information the serving RNC shall report. The location information is either of the following types:

- Service Area Identifier, or
- Geographical area, including geographical coordinates with or without requested accuracy, response time, priority and the client type.

A request for a direct report can be done in parallel with having an active request to report upon change of Service Area for the same UE. The request to report upon change of Service Area shall not be affected by this.

#### **Interaction with Relocation:**

The order to perform location reporting at change of Service Area is lost in UTRAN at successful Relocation of SRNS. If the location reporting at change of Service Area shall continue also after the relocation has been performed, the Location Reporting Control procedure shall thus be re-initiated from the CN towards the future SRNC after the Relocation Resource Allocation procedure has been executed successfully.

### 8.19.3 Abnormal Conditions

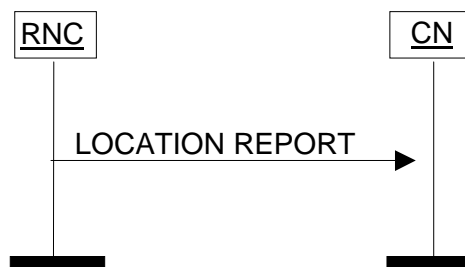
Not applicable.

## 8.20 Location Report

### 8.20.1 General

The purpose of the Location Report procedure is to provide the UE's location information to the CN. The procedure uses connection oriented signalling.

### 8.20.2 Successful Operation



**Figure 2: Location Report procedure. Successful operation.**

The serving RNC shall initiate the procedure by generating a LOCATION REPORT message. The LOCATION REPORT message may be used as a response for the LOCATION REPORTING CONTROL message. Also, when a user enters or leaves a classified zone set by O&M, e.g. zone where a disaster occurred, a LOCATION REPORT message shall be sent to the CN including the Service Area of the UE in the *Area Identity* IE. The *Cause* IE shall indicate the appropriate cause value to CN, e.g. "User Restriction Start Indication" and "User Restriction End Indication". The CN shall react to the LOCATION REPORT message with CN vendor specific actions.

For this procedure, only Service Areas that are defined for the PS and CS domains shall be considered.

In case reporting at change of Service Area is requested by the CN, then the RNC shall issue a LOCATION REPORT message

- whenever the information given in the previous LOCATION REPORT message or INITIAL UE MESSAGE message is not anymore valid.
- upon receipt of the first LOCATION REPORTING CONTROL message following a Relocation Resource Allocation procedure, with *Request Type* IE set to "Change of Service Area", as soon as SAI becomes available in the new SRNC and the relocation procedure has been successfully completed.

In the case when Service Area is reported, the RNC shall include to the LOCATION REPORT message in the *Area Identity* IE the Service Area, which includes at least one of the cells from which the UE is consuming radio resources.

In the case when the LOCATION REPORT message is sent as an answer to a request for a direct report or at a change of Service Area, the *Request Type* IE from the LOCATION REPORTING CONTROL message shall be included.

If the LOCATION REPORT message is sent as an answer to a request for a direct report of Service Area and the current Service Area can not be determined by the RNC, then the *Area Identity* IE shall be omitted and a cause value shall be included to indicate that the request could not be fulfilled, e.g. "Requested Information Not Available". The RNC may also include the *Last Known Service Area* IE.

If the RNC can not deliver the location information as requested by the CN, due to either the non-support of the requested event or the non-suupport of the requested report area, the RNC shall indicate the UE location to be "Undetermined" by omitting the *Area Identity* IE. A cause value shall instead be added to indicate the reason for the undetermined location, e.g. "Requested Request Type not supported".

If the Location Report procedure was triggered by a LOCATION REPORTING CONTROL message, which included a request to report a geographical area with a specific accuracy, the LOCATION REPORT message shall include the *Geographical Area* IE within the *Area Identity* IE containing either a point with indicated uncertainty or a polygon or an other type, which fulfils the requested accuracy as accurately as possible. If, on the other hand, no specific accuracy level was requested in the LOCATION REPORTING CONTROL message, it is up to UTRAN to decide with which accuracy to report.

### 8.20.3 Abnormal Conditions

Not applicable.

## 9.1.29 LOCATION REPORTING CONTROL

This message is sent by the CN to initiate, modify or stop location reporting from the RNC to the CN.

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         | ignore               |
| Request Type  | M        |       | 9.2.1.16              |                       | YES         | ignore               |

## 9.1.30 LOCATION REPORT

This message is sent by the RNC to the CN with information about the UE location.

Direction: RNC → CN.

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                 | ignore                 |
| Area Identity                           | O                 |       | 9.2.3.10                 |                       | YES                 | ignore                 |
| Cause                                   | O                 |       | 9.2.1.4                  |                       | YES                 | ignore                 |
| Request Type                            | O                 |       | 9.2.1.16                 |                       | YES                 | ignore                 |
| <a href="#">Last Known Service Area</a> | <a href="#">O</a> |       | <a href="#">9.2.3.xx</a> |                       | <a href="#">YES</a> | <a href="#">ignore</a> |

9.2.3.21 Requested GPS Assistance Data

This information element is used for indicating the requested GPS assistance data.

This IE is transparent to CN.

| IE/Group Name                 | Presence | Range | IE type and reference      | Semantics description  |
|-------------------------------|----------|-------|----------------------------|--|
| Requested GPS Assistance Data |          |       | OCTET STRING (SIZE(1..38)) | For the corresponding Information Element Definition see "gpsAssistanceData" [22]. |

9.2.3.xx Last Known Service Area

This information element is used for indicating the last known Service Area and the elapsed time since the UE was known to be in this Service Area. The last known Service Area is reported when the current Service Area is unknown to the RNC.

| <u>IE/Group Name</u>           | <u>Presence</u> | <u>Range</u> | <u>IE type and reference</u> | <u>Semantics description</u>   |
|--------------------------------|-----------------|--------------|------------------------------|--|
| <u>Last Known Service Area</u> |                 |              |                              |  |
| <u>&gt;SAI</u>                 | <u>M</u>        |              | <u>9.2.3.9</u>               |  |
| <u>&gt;Age of SAI</u>          | <u>M</u>        |              | <u>INTEGER (0..32767)</u>    | <u>The value represents the elapsed time in minutes since the reported last known SAI was stored by the RNC. Value "0" shall not be used. Value "32767" indicates that the age of SAI is at least 32767 minutes old.</u> |

### 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
BroadcastAssistanceDataDecipheringKeys,
LocationRelatedDataRequestType,
DataVolumeReference,
AreaIdentity,
CN-DomainIndicator,
Cause,
CriticalityDiagnostics,
ChosenEncryptionAlgorithm,
ChosenIntegrityProtectionAlgorithm,
ClassmarkInformation2,
ClassmarkInformation3,
DL-GTP-PDU-SequenceNumber,
DL-N-PDU-SequenceNumber,
DataVolumeReportingIndication,
DRX-CycleLengthCoefficient,
EncryptionInformation,
GlobalCN-ID,
GlobalRNC-ID,
IntegrityProtectionInformation,
IuSignallingConnectionIdentifier,
IuTransportAssociation,
KeyStatus,
L3-Information,
LAI,
LastKnownServiceArea,
NAS-PDU,
NAS-SynchronisationIndicator,
NonSearchingIndication,
NumberOfSteps,
OMC-ID,
OldBSS-ToNewBSS-Information,
PagingAreaID,
PagingCause,
PDP-TypeInformation,
PermanentNAS-UE-ID,
RAB-ID,
RAB-Parameters,
RAC,
RelocationType,
RequestType,
Requested-RAB-Parameter-Values,
SAI,
SAPI,
Service-Handover,
SourceID,
SourceRNC-ToTargetRNC-TransparentContainer,
TargetID,
TargetRNC-ToSourceRNC-TransparentContainer,
TemporaryUE-ID,
TraceReference,
TraceType,
UnsuccessfullyTransmittedDataVolume,
TransportLayerAddress,
TriggerID,

```

```

UE-ID,
UL-GTP-PDU-SequenceNumber,
UL-N-PDU-SequenceNumber,
UP-ModeVersions,
UserPlaneMode,
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,

```

```

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-CriticalityDiagnostics,
id-DRX-CycleLengthCoefficient,
id-DirectTransferInformationItem-RANAP-RelocInf,
id-DirectTransferInformationList-RANAP-RelocInf,
id-DL-GTP-PDU-SequenceNumber,
id-EncryptionInformation,
id-GlobalCN-ID,
id-GlobalRNC-ID,
id-IntegrityProtectionInformation,
id-IuSigConId,
id-IuSigConIdItem,
id-IuSigConIdList,
id-IuTransportAssociation,
id-KeyStatus,
id-L3-Information,
id-LAI,
id-LastKnownServiceArea,
id-NAS-PDU,
id-NonSearchingIndication,
id-NumberOfSteps,
id-OMC-ID,
id-OldBSS-ToNewBSS-Information,
id-PagingAreaID,
id-PagingCause,
id-PermanentNAS-UE-ID,
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-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-RelocationType,
id-RequestType,
id-SAI,
id-SAPI,
id-SourceID,
id-SourceRNC-ToTargetRNC-TransparentContainer,
id-TargetID,
id-TargetRNC-ToSourceRNC-TransparentContainer,
id-TemporaryUE-ID,
id-TraceReference,
id-TraceType,
id-TransportLayerAddress,
id-TriggerID,
id-UE-ID,
id-UL-GTP-PDU-SequenceNumber
FROM RANAP-Constants;

```

Lots of unaffected ASN1 in 9.3.3 not shown

```

-- *****
--
-- 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 ::= {
{ ID id-LastKnownServiceArea   CRITICALITY ignore EXTENSION LastKnownServiceArea PRESENCE
optional},
    ...
}

```

Lots of unaffected ASN1 in 9.3.3 not shown

### 9.3.4 Information Element Definitions

```
-- *****
--
-- Information Element Definitions
--
-- *****
```

```
RANAP-IEs {
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
umts-Access (20) modules (3) ranap (0) version1 (1) ranap-IEs (2) }
```

```
DEFINITIONS AUTOMATIC TAGS ::=
```

```
BEGIN
```

Lots of unaffected ASN1 in 9.3.4 not shown

```
-- L
```

```
LAC ::= OCTET STRING (SIZE (2))
```

```
LAI ::= SEQUENCE {
  pLMNidentity          PLMNidentity,
  LAC                   LAC,
  iE-Extensions         ProtocolExtensionContainer { {LAI-ExtIEs} } OPTIONAL
}
```

```
LAI-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
  ...
}
```

```
LastKnownServiceArea ::= SEQUENCE {
  sAI          SAI,
  ageOfSAI    INTEGER (0..32767),
  ...
}
```

```
LocationRelatedDataRequestType ::= SEQUENCE {
  requestedLocationRelatedDataType RequestedLocationRelatedDataType,
  requestedGPSAssistanceData       RequestedGPSAssistanceData OPTIONAL,
  -- This IE shall be present if the Requested Location Related Data Type IE is set to 'Dedicated
  Assistance Data for Assisted GPS' --
  ...
}
```

```
L3-Information ::= OCTET STRING
```

```
-- M
```

Lots of unaffected ASN1 in 9.3.4 not shown

### 9.3.6 Constant Definitions

```
-- *****
--
-- Constant definitions
--
-- *****

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

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN
```

Lots of unaffected ASN1 in 9.3.6 not shown

```
-- *****
--
-- IEs
--
-- *****

id-AreaIdentity                INTEGER ::= 0
id-CN-DomainIndicator          INTEGER ::= 3
id-Cause                       INTEGER ::= 4
id-ChosenEncryptionAlgorithm   INTEGER ::= 5
id-ChosenIntegrityProtectionAlgorithm INTEGER ::= 6
id-ClassmarkInformation2       INTEGER ::= 7
id-ClassmarkInformation3       INTEGER ::= 8
id-CriticalityDiagnostics      INTEGER ::= 9
id-DL-GTP-PDU-SequenceNumber   INTEGER ::= 10
id-EncryptionInformation       INTEGER ::= 11
id-IntegrityProtectionInformation INTEGER ::= 12
id-IuTransportAssociation      INTEGER ::= 13
id-L3-Information              INTEGER ::= 14
id-LAI                         INTEGER ::= 15
id-NAS-PDU                    INTEGER ::= 16
id-NonSearchingIndication      INTEGER ::= 17
id-NumberOfSteps               INTEGER ::= 18
id-OMC-ID                     INTEGER ::= 19
id-OldBSS-ToNewBSS-Information INTEGER ::= 20
id-PagingAreaID               INTEGER ::= 21
id-PagingCause                 INTEGER ::= 22
id-PermanentNAS-UE-ID         INTEGER ::= 23
id-RAB-ContextItem            INTEGER ::= 24
id-RAB-ContextList            INTEGER ::= 25
id-RAB-DataForwardingItem      INTEGER ::= 26
id-RAB-DataForwardingItem-SRNS-CtxReq INTEGER ::= 27
id-RAB-DataForwardingList     INTEGER ::= 28
id-RAB-DataForwardingList-SRNS-CtxReq INTEGER ::= 29
id-RAB-DataVolumeReportItem   INTEGER ::= 30
id-RAB-DataVolumeReportList   INTEGER ::= 31
id-RAB-DataVolumeReportRequestItem INTEGER ::= 32
id-RAB-DataVolumeReportRequestList INTEGER ::= 33
id-RAB-FailedItem             INTEGER ::= 34
id-RAB-FailedList             INTEGER ::= 35
id-RAB-ID                     INTEGER ::= 36
id-RAB-QueuedItem              INTEGER ::= 37
id-RAB-QueuedList             INTEGER ::= 38
id-RAB-ReleaseFailedList      INTEGER ::= 39
id-RAB-ReleaseItem            INTEGER ::= 40
id-RAB-ReleaseList            INTEGER ::= 41
id-RAB-ReleasedItem           INTEGER ::= 42
id-RAB-ReleasedList           INTEGER ::= 43
id-RAB-ReleasedList-IuRelComp  INTEGER ::= 44
id-RAB-RelocationReleaseItem   INTEGER ::= 45
id-RAB-RelocationReleaseList   INTEGER ::= 46
id-RAB-SetupItem-RelocReq     INTEGER ::= 47
id-RAB-SetupItem-RelocReqAck   INTEGER ::= 48
id-RAB-SetupList-RelocReq     INTEGER ::= 49
id-RAB-SetupList-RelocReqAck   INTEGER ::= 50
id-RAB-SetupOrModifiedItem    INTEGER ::= 51
id-RAB-SetupOrModifiedList    INTEGER ::= 52
id-RAB-SetupOrModifyItem      INTEGER ::= 53
```

|   |                |
|---|----------------|
| id-RAB-SetupOrModifyList                        | INTEGER ::= 54 |
| id-RAC  | INTEGER ::= 55 |
| id-RelocationType                               | INTEGER ::= 56 |
| id-RequestType                                  | INTEGER ::= 57 |
| id-SAI  | INTEGER ::= 58 |
| id-SAPI   | INTEGER ::= 59 |
| id-SourceID                                     | INTEGER ::= 60 |
| id-SourceRNC-ToTargetRNC-TransparentContainer   | INTEGER ::= 61 |
| id-TargetID                                     | INTEGER ::= 62 |
| id-TargetRNC-ToSourceRNC-TransparentContainer   | INTEGER ::= 63 |
| id-TemporaryUE-ID                               | INTEGER ::= 64 |
| id-TraceReference                               | INTEGER ::= 65 |
| id-TraceType                                    | INTEGER ::= 66 |
| id-TransportLayerAddress                        | INTEGER ::= 67 |
| id-TriggerID                                    | INTEGER ::= 68 |
| id-UE-ID  | INTEGER ::= 69 |
| id-UL-GTP-PDU-SequenceNumber                    | INTEGER ::= 70 |
| id-RAB-FailedtoReportItem                       | INTEGER ::= 71 |
| id-RAB-FailedtoReportList                       | INTEGER ::= 72 |
| id-KeyStatus                                    | INTEGER ::= 75 |
| id-DRX-CycleLengthCoefficient                   | INTEGER ::= 76 |
| id-IuSigConIdList                               | INTEGER ::= 77 |
| id-IuSigConIdItem                               | INTEGER ::= 78 |
| id-IuSigConId                                   | INTEGER ::= 79 |
| id-DirectTransferInformationItem-RANAP-RelocInf | INTEGER ::= 80 |
| id-DirectTransferInformationList-RANAP-RelocInf | INTEGER ::= 81 |
| id-RAB-ContextItem-RANAP-RelocInf               | INTEGER ::= 82 |
| id-RAB-ContextList-RANAP-RelocInf               | INTEGER ::= 83 |
| id-RAB-ContextFailedtoTransferItem              | INTEGER ::= 84 |
| id-RAB-ContextFailedtoTransferList              | INTEGER ::= 85 |
| id-GlobalRNC-ID                                 | INTEGER ::= 86 |
| id-RAB-ReleasedItem-IuRelComp                   | INTEGER ::= 87 |
| id-MessageStructure                             | INTEGER ::= 88 |
| id-Alt-RAB-Parameters                           | INTEGER ::= 89 |
| id-Ass-RAB-Parameters                           | INTEGER ::= 90 |
| id-RAB-ModifyList                               | INTEGER ::= 91 |
| id-RAB-ModifyItem                               | INTEGER ::= 92 |
| id-TypeOfError                                  | INTEGER ::= 93 |
| id-BroadcastAssistanceDataDecipheringKeys       | INTEGER ::= 94 |
| id-LocationRelatedDataRequestType               | INTEGER ::= 95 |
| id-GlobalCN-ID                                  | INTEGER ::= 96 |
| <a href="#">id-LastKnownServiceArea</a>         | INTEGER ::= xl |

END

## CHANGE REQUEST

⌘ **25.413 CR 435** ⌘ rev **2** ⌘ Current version: **4.3.0** ⌘

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

**Proposed change affects:** ⌘ (U)SIM  ME/UE  Radio Access Network  Core Network

|                        |   |                 |  |
|------------------------|---|-----------------|--|
| <b>Title:</b>          | ⌘ Inclusion of <i>Last Know Service Area</i> IE group into LOCATION REPORT  |                 |  |
| <b>Source:</b>         | ⌘ Ericsson, Nokia   |                 |  |
| <b>Work item code:</b> | ⌘ TEI   | <b>Date:</b>    | ⌘ 20 February 2002   |
| <b>Category:</b>       | ⌘ <b>C</b>  | <b>Release:</b> | ⌘ REL-4  |
|                        | Use <u>one</u> of the following categories:<br><b>F</b> (correction)<br><b>A</b> (corresponds to a correction in an earlier release)<br><b>B</b> (addition of feature),<br><b>C</b> (functional modification of feature)<br><b>D</b> (editorial modification)<br>Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> . |                 | Use <u>one</u> of the following releases:<br>2 (GSM Phase 2)<br>R96 (Release 1996)<br>R97 (Release 1997)<br>R98 (Release 1998)<br>R99 (Release 1999)<br>REL-4 (Release 4)<br>REL-5 (Release 5) |

|                                      |   |
|--------------------------------------|---|
| <b>Reason for change:</b>            | ⌘   |
| <b>Summary of change:</b>            | ⌘ Inclusion of Last Know Service Area IE group into LOCATION REPORT with suitable behaviour and cause value when the LOCATION REPORT message is sent as an answer to a request for a direct report of Service Area and the current Service Area can not be determined by the RNC.<br><br>Procedure text, tabular format section and ASN.1 are therefore update accordingly.<br><br>Impact Analysis:<br>Impact assessment towards the previous version of the specification (same release):<br><br>This CR has isolated impact with the previous version of the specification (same release) because the way of handling one particular case - when the LOCATION REPORT message is sent as an answer to a request for a direct report of Service Area and the current Service Area can not be determined by the RNC - has been changed. This would not affect implementations behaving like indicated in the CR, would affect implementations supporting the corrected functionality otherwise.<br><br>The CR has an impact under protocol & functional point of view.<br><br>The impact can be considered isolated because the change affects the Location reporting function and because the inclusion of the <i>Last Know Service Area IE</i> group into LOCATION REPORT is optional. |
| <b>Consequences if not approved:</b> | ⌘   |

**Clauses affected:** ⌘ 8.20.2, 9.1.30, 9.2.3.xx, 9.3.3, 9.3.4 and 9.3.6

|                        |   |                                     |                           |   |   |
|------------------------|---|-------------------------------------|---------------------------|---|---|
| <b>Other specs</b>     | ⌘ | <input checked="" type="checkbox"/> | Other core specifications | ⌘ | TS 25.305 R99, TS 23.271 R4 and R5, TS 23.060 R4 and R5 |
| <b>affected:</b>       |   | <input type="checkbox"/>            | Test specifications       |   |   |
|                        |   | <input type="checkbox"/>            | O&M Specifications        |   |   |
| <b>Other comments:</b> | ⌘ |                                     |                           |   |   |

### How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at: [http://www.3gpp.org/3G\\_Specs/CRs.htm](http://www.3gpp.org/3G_Specs/CRs.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.

## 8.19 Location Reporting Control

### 8.19.1 General

The purpose of the Location Reporting Control procedure is to allow the CN to request information on the location of a given UE. The procedure uses connection oriented signalling.

### 8.19.2 Successful Operation



**Figure 1: Location Reporting Control procedure. Successful operation.**

The CN shall initiate the procedure by generating a LOCATION REPORTING CONTROL message.

The *Request Type* IE shall indicate to the serving RNC whether:

- to report directly;
- to stop a direct report;
- to report upon change of Service area, or
- to stop reporting at change of Service Area.

If reporting upon change of Service Area is requested, the Serving RNC shall report whenever the UE moves between Service Areas. For this procedure, only Service Areas that are defined for the PS and CS domains shall be considered.

The *Request Type* IE shall also indicate what type of location information the serving RNC shall report. The location information is either of the following types:

- Service Area Identifier, or
- Geographical area, including geographical coordinates with or without requested accuracy, response time, priority and the client type.

A request for a direct report can be done in parallel with having an active request to report upon change of Service Area for the same UE. The request to report upon change of Service Area shall not be affected by this.

#### **Interaction with Relocation:**

The order to perform location reporting at change of Service Area is lost in UTRAN at successful Relocation of SRNS. If the location reporting at change of Service Area shall continue also after the relocation has been performed, the Location Reporting Control procedure shall thus be re-initiated from the CN towards the future SRNC after the Relocation Resource Allocation procedure has been executed successfully.

### 8.19.3 Abnormal Conditions

Not applicable.

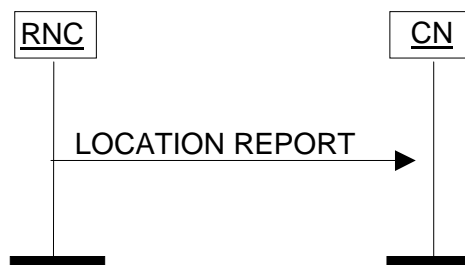


## 8.20 Location Report

### 8.20.1 General

The purpose of the Location Report procedure is to provide the UE's location information to the CN. The procedure uses connection oriented signalling.

### 8.20.2 Successful Operation



**Figure 2: Location Report procedure. Successful operation.**

The serving RNC shall initiate the procedure by generating a LOCATION REPORT message. The LOCATION REPORT message may be used as a response for the LOCATION REPORTING CONTROL message. Also, when a user enters or leaves a classified zone set by O&M, e.g. zone where a disaster occurred, a LOCATION REPORT message shall be sent to the CN including the Service Area of the UE in the *Area Identity* IE. The *Cause* IE shall indicate the appropriate cause value to CN, e.g. "User Restriction Start Indication" and "User Restriction End Indication". The CN shall react to the LOCATION REPORT message with CN vendor specific actions.

For this procedure, only Service Areas that are defined for the PS and CS domains shall be considered.

In case reporting at change of Service Area is requested by the CN, then the RNC shall issue a LOCATION REPORT message

- whenever the information given in the previous LOCATION REPORT message or INITIAL UE MESSAGE message is not anymore valid.
- upon receipt of the first LOCATION REPORTING CONTROL message following a Relocation Resource Allocation procedure, with *Request Type* IE set to "Change of Service Area", as soon as SAI becomes available in the new SRNC and the relocation procedure has been successfully completed.

In the case when Service Area is reported, the RNC shall include to the LOCATION REPORT message in the *Area Identity* IE the Service Area, which includes at least one of the cells from which the UE is consuming radio resources.

In the case when the LOCATION REPORT message is sent as an answer to a request for a direct report or at a change of Service Area, the *Request Type* IE from the LOCATION REPORTING CONTROL message shall be included.

If the LOCATION REPORT message is sent as an answer to a request for a direct report of Service Area and the current Service Area can not be determined by the RNC, then the *Area Identity* IE shall be omitted and a cause value shall be included to indicate that the request could not be fulfilled, e.g. "Requested Information Not Available". The RNC may also include the *Last Known Service Area* IE.

If the RNC can not deliver the location information as requested by the CN, due to either the non-support of the requested event or the non-suupport of the requested report area, the RNC shall indicate the UE location to be "Undetermined" by omitting the *Area Identity* IE. A cause value shall instead be added to indicate the reason for the undetermined location, e.g. "Requested Request Type not supported".

If the Location Report procedure was triggered by a LOCATION REPORTING CONTROL message, which included a request to report a geographical area with a specific accuracy, the LOCATION REPORT message shall include the *Geographical Area* IE within the *Area Identity* IE containing either a point with indicated uncertainty or a polygon or an other type, which fulfils the requested accuracy as accurately as possible. If, on the other hand, no specific accuracy level was requested in the LOCATION REPORTING CONTROL message, it is up to UTRAN to decide with which accuracy to report.

### 8.20.3 Abnormal Conditions

Not applicable.

## 9.1.29 LOCATION REPORTING CONTROL

This message is sent by the CN to initiate, modify or stop location reporting from the RNC to the CN.

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         | ignore               |
| Request Type  | M        |       | 9.2.1.16              |                       | YES         | ignore               |

## 9.1.30 LOCATION REPORT

This message is sent by the RNC to the CN with information about the UE location.

Direction: RNC → CN.

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                 | ignore                 |
| Area Identity                           | O                 |       | 9.2.3.10                 |                       | YES                 | ignore                 |
| Cause                                   | O                 |       | 9.2.1.4                  |                       | YES                 | ignore                 |
| Request Type                            | O                 |       | 9.2.1.16                 |                       | YES                 | ignore                 |
| <a href="#">Last Known Service Area</a> | <a href="#">O</a> |       | <a href="#">9.2.3.xx</a> |                       | <a href="#">YES</a> | <a href="#">ignore</a> |

9.2.3.21 Requested GPS Assistance Data

This information element is used for indicating the requested GPS assistance data.

This IE is transparent to CN.

| IE/Group Name                 | Presence | Range | IE type and reference      | Semantics description  |
|-------------------------------|----------|-------|----------------------------|--|
| Requested GPS Assistance Data |          |       | OCTET STRING (SIZE(1..38)) | For the corresponding Information Element Definition see "gpsAssistanceData" [22]. |

9.2.3.xx Last Known Service Area

This information element is used for indicating the last known Service Area and the elapsed time since the UE was known to be in this Service Area. The last known Service Area is reported when the current Service Area is unknown to the RNC.

| <u>IE/Group Name</u>           | <u>Presence</u> | <u>Range</u> | <u>IE type and reference</u> | <u>Semantics description</u>   |
|--------------------------------|-----------------|--------------|------------------------------|--|
| <u>Last Known Service Area</u> |                 |              |                              |  |
| <u>&gt;SAI</u>                 | <u>M</u>        |              | <u>9.2.3.9</u>               |  |
| <u>&gt;Age of SAI</u>          | <u>M</u>        |              | <u>INTEGER (0..32767)</u>    | <u>The value represents the elapsed time in minutes since the reported last known SAI was stored by the RNC. Value "0" shall not be used. Value "32767" indicates that the age of SAI is at least 32767 minutes old.</u> |

### 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
BroadcastAssistanceDataDecipheringKeys,
LocationRelatedDataRequestType,
DataVolumeReference,
AreaIdentity,
CN-DomainIndicator,
Cause,
CriticalityDiagnostics,
ChosenEncryptionAlgorithm,
ChosenIntegrityProtectionAlgorithm,
ClassmarkInformation2,
ClassmarkInformation3,
DL-GTP-PDU-SequenceNumber,
DL-N-PDU-SequenceNumber,
DataVolumeReportingIndication,
DRX-CycleLengthCoefficient,
EncryptionInformation,
GlobalCN-ID,
GlobalRNC-ID,
IntegrityProtectionInformation,
IuSignallingConnectionIdentifier,
IuTransportAssociation,
KeyStatus,
L3-Information,
LAI,
LastKnownServiceArea,
NAS-PDU,
NAS-SynchronisationIndicator,
NonSearchingIndication,
NumberOfSteps,
OMC-ID,
OldBSS-ToNewBSS-Information,
PagingAreaID,
PagingCause,
PDP-TypeInformation,
PermanentNAS-UE-ID,
RAB-ID,
RAB-Parameters,
RAC,
RelocationType,
RequestType,
Requested-RAB-Parameter-Values,
SAI,
SAPI,
Service-Handover,
SourceID,
SourceRNC-ToTargetRNC-TransparentContainer,
TargetID,
TargetRNC-ToSourceRNC-TransparentContainer,
TemporaryUE-ID,
TraceReference,
TraceType,
UnsuccessfullyTransmittedDataVolume,
TransportLayerAddress,
TriggerID,

```

```

UE-ID,
UL-GTP-PDU-SequenceNumber,
UL-N-PDU-SequenceNumber,
UP-ModeVersions,
UserPlaneMode,
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,

```

```

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-CriticalityDiagnostics,
id-DRX-CycleLengthCoefficient,
id-DirectTransferInformationItem-RANAP-RelocInf,
id-DirectTransferInformationList-RANAP-RelocInf,
id-DL-GTP-PDU-SequenceNumber,
id-EncryptionInformation,
id-GlobalCN-ID,
id-GlobalRNC-ID,
id-IntegrityProtectionInformation,
id-IuSigConId,
id-IuSigConIdItem,
id-IuSigConIdList,
id-IuTransportAssociation,
id-KeyStatus,
id-L3-Information,
id-LAI,
id-LastKnownServiceArea,
id-NAS-PDU,
id-NonSearchingIndication,
id-NumberOfSteps,
id-OMC-ID,
id-OldBSS-ToNewBSS-Information,
id-PagingAreaID,
id-PagingCause,
id-PermanentNAS-UE-ID,
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-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-RelocationType,
id-RequestType,
id-SAI,
id-SAPI,
id-SourceID,
id-SourceRNC-ToTargetRNC-TransparentContainer,
id-TargetID,
id-TargetRNC-ToSourceRNC-TransparentContainer,
id-TemporaryUE-ID,
id-TraceReference,
id-TraceType,
id-TransportLayerAddress,
id-TriggerID,
id-UE-ID,
id-UL-GTP-PDU-SequenceNumber
FROM RANAP-Constants;

```

Lots of unaffected ASN1 in 9.3.3 not shown

```

-- *****
--
-- 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 ::= {
{ ID id-LastKnownServiceArea   CRITICALITY ignore EXTENSION LastKnownServiceArea PRESENCE
optional},
    ...
}

```

Lots of unaffected ASN1 in 9.3.3 not shown



### 9.3.4 Information Element Definitions

```
-- *****
--
-- Information Element Definitions
--
-- *****
```

```
RANAP-IEs {
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
umts-Access (20) modules (3) ranap (0) version1 (1) ranap-IEs (2) }
```

```
DEFINITIONS AUTOMATIC TAGS ::=
```

```
BEGIN
```

Lots of unaffected ASN1 in 9.3.4 not shown

```
-- L
```

```
LAC ::= OCTET STRING (SIZE (2))
```

```
LAI ::= SEQUENCE {
  pLMNidentity          PLMNidentity,
  LAC                   LAC,
  iE-Extensions         ProtocolExtensionContainer { {LAI-ExtIEs} } OPTIONAL
}
```

```
LAI-ExtIEs RANAP-PROTOCOL-EXTENSION ::= {
  ...
}
```

```
LastKnownServiceArea ::= SEQUENCE {
  sAI          SAI,
  ageOfSAI    INTEGER (0..32767),
  ...
}
```

```
LocationRelatedDataRequestType ::= SEQUENCE {
  requestedLocationRelatedDataType RequestedLocationRelatedDataType,
  requestedGPSAssistanceData       RequestedGPSAssistanceData OPTIONAL,
  -- This IE shall be present if the Requested Location Related Data Type IE is set to 'Dedicated
  Assistance Data for Assisted GPS' --
  ...
}
```

```
L3-Information ::= OCTET STRING
```

```
-- M
```

Lots of unaffected ASN1 in 9.3.4 not shown

### 9.3.6 Constant Definitions

```
-- *****
--
-- Constant definitions
--
-- *****

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

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN
```

Lots of unaffected ASN1 in 9.3.6 not shown

```
-- *****
--
-- IEs
--
-- *****

id-AreaIdentity                INTEGER ::= 0
id-CN-DomainIndicator          INTEGER ::= 3
id-Cause                       INTEGER ::= 4
id-ChosenEncryptionAlgorithm   INTEGER ::= 5
id-ChosenIntegrityProtectionAlgorithm INTEGER ::= 6
id-ClassmarkInformation2       INTEGER ::= 7
id-ClassmarkInformation3       INTEGER ::= 8
id-CriticalityDiagnostics       INTEGER ::= 9
id-DL-GTP-PDU-SequenceNumber   INTEGER ::= 10
id-EncryptionInformation        INTEGER ::= 11
id-IntegrityProtectionInformation INTEGER ::= 12
id-IuTransportAssociation       INTEGER ::= 13
id-L3-Information              INTEGER ::= 14
id-LAI                          INTEGER ::= 15
id-NAS-PDU                     INTEGER ::= 16
id-NonSearchingIndication       INTEGER ::= 17
id-NumberOfSteps               INTEGER ::= 18
id-OMC-ID                      INTEGER ::= 19
id-OldBSS-ToNewBSS-Information  INTEGER ::= 20
id-PagingAreaID                INTEGER ::= 21
id-PagingCause                 INTEGER ::= 22
id-PermanentNAS-UE-ID          INTEGER ::= 23
id-RAB-ContextItem             INTEGER ::= 24
id-RAB-ContextList             INTEGER ::= 25
id-RAB-DataForwardingItem       INTEGER ::= 26
id-RAB-DataForwardingItem-SRNS-CtxReq INTEGER ::= 27
id-RAB-DataForwardingList       INTEGER ::= 28
id-RAB-DataForwardingList-SRNS-CtxReq INTEGER ::= 29
id-RAB-DataVolumeReportItem     INTEGER ::= 30
id-RAB-DataVolumeReportList     INTEGER ::= 31
id-RAB-DataVolumeReportRequestItem INTEGER ::= 32
id-RAB-DataVolumeReportRequestList INTEGER ::= 33
id-RAB-FailedItem              INTEGER ::= 34
id-RAB-FailedList              INTEGER ::= 35
id-RAB-ID                      INTEGER ::= 36
id-RAB-QueuedItem              INTEGER ::= 37
id-RAB-QueuedList              INTEGER ::= 38
id-RAB-ReleaseFailedList        INTEGER ::= 39
id-RAB-ReleaseItem             INTEGER ::= 40
id-RAB-ReleaseList             INTEGER ::= 41
id-RAB-ReleasedItem            INTEGER ::= 42
id-RAB-ReleasedList            INTEGER ::= 43
id-RAB-ReleasedList-IuRelComp   INTEGER ::= 44
id-RAB-RelocationReleaseItem    INTEGER ::= 45
id-RAB-RelocationReleaseList    INTEGER ::= 46
id-RAB-SetupItem-RelocReq       INTEGER ::= 47
id-RAB-SetupItem-RelocReqAck    INTEGER ::= 48
id-RAB-SetupList-RelocReq       INTEGER ::= 49
id-RAB-SetupList-RelocReqAck    INTEGER ::= 50
id-RAB-SetupOrModifiedItem      INTEGER ::= 51
id-RAB-SetupOrModifiedList      INTEGER ::= 52
id-RAB-SetupOrModifyItem        INTEGER ::= 53
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|   |                |
|---|----------------|
| id-RAB-SetupOrModifyList                        | INTEGER ::= 54 |
| id-RAC  | INTEGER ::= 55 |
| id-RelocationType                               | INTEGER ::= 56 |
| id-RequestType                                  | INTEGER ::= 57 |
| id-SAI  | INTEGER ::= 58 |
| id-SAPI   | INTEGER ::= 59 |
| id-SourceID                                     | INTEGER ::= 60 |
| id-SourceRNC-ToTargetRNC-TransparentContainer   | INTEGER ::= 61 |
| id-TargetID                                     | INTEGER ::= 62 |
| id-TargetRNC-ToSourceRNC-TransparentContainer   | INTEGER ::= 63 |
| id-TemporaryUE-ID                               | INTEGER ::= 64 |
| id-TraceReference                               | INTEGER ::= 65 |
| id-TraceType                                    | INTEGER ::= 66 |
| id-TransportLayerAddress                        | INTEGER ::= 67 |
| id-TriggerID                                    | INTEGER ::= 68 |
| id-UE-ID  | INTEGER ::= 69 |
| id-UL-GTP-PDU-SequenceNumber                    | INTEGER ::= 70 |
| id-RAB-FailedtoReportItem                       | INTEGER ::= 71 |
| id-RAB-FailedtoReportList                       | INTEGER ::= 72 |
| id-KeyStatus                                    | INTEGER ::= 75 |
| id-DRX-CycleLengthCoefficient                   | INTEGER ::= 76 |
| id-IuSigConIdList                               | INTEGER ::= 77 |
| id-IuSigConIdItem                               | INTEGER ::= 78 |
| id-IuSigConId                                   | INTEGER ::= 79 |
| id-DirectTransferInformationItem-RANAP-RelocInf | INTEGER ::= 80 |
| id-DirectTransferInformationList-RANAP-RelocInf | INTEGER ::= 81 |
| id-RAB-ContextItem-RANAP-RelocInf               | INTEGER ::= 82 |
| id-RAB-ContextList-RANAP-RelocInf               | INTEGER ::= 83 |
| id-RAB-ContextFailedtoTransferItem              | INTEGER ::= 84 |
| id-RAB-ContextFailedtoTransferList              | INTEGER ::= 85 |
| id-GlobalRNC-ID                                 | INTEGER ::= 86 |
| id-RAB-ReleasedItem-IuRelComp                   | INTEGER ::= 87 |
| id-MessageStructure                             | INTEGER ::= 88 |
| id-Alt-RAB-Parameters                           | INTEGER ::= 89 |
| id-Ass-RAB-Parameters                           | INTEGER ::= 90 |
| id-RAB-ModifyList                               | INTEGER ::= 91 |
| id-RAB-ModifyItem                               | INTEGER ::= 92 |
| id-TypeOfError                                  | INTEGER ::= 93 |
| id-BroadcastAssistanceDataDecipheringKeys       | INTEGER ::= 94 |
| id-LocationRelatedDataRequestType               | INTEGER ::= 95 |
| id-GlobalCN-ID                                  | INTEGER ::= 96 |
| <a href="#">id-LastKnownServiceArea</a>         | INTEGER ::= xl |

END