TSG-SA Working Group 2 meeting #17

Goteborg, Sweden, Feb 26th – March 2nd, 2001

*S2-010813
(S2-010520,
LCS-28)*

Source:	TSG-SA WG2
To:	TSG-RAN WG3
CC:	TSG-RAN WG2, TSG-SA WG1, TSG-SA, TSG-RAN
Title:	Missing LCS QoS, Priority, Request type, Assistance data, Client type, Stop reporting type parameters over Iu interface RANAP 25.413 (LOCATION REPORTING CONTROL and LOCATION REPORT messages).
Contact:	Enrico.Deluca@ericsson.com

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1   Introduction

SA2 has found that some service requirements related to the LCS QoS, LCS priority, LCS Request type, LCS Assistance data, LCS client type and Stop Reporting type defined by LCS stage 1 22.071 (Rel-4) and LCS stage 2 23.171(R99)/23.271(Rel-4) are not supported at stage 3 level by RANAP 25.413.

It is the understanding of SA WG2 that essential corrections to the RANAP signalling protocol on the Iu interface between the core network and the access network are under study in RAN WG3. The current LCS system stage 2 specification 23.271 contains signalling descriptions that apply to the Iu interface. These signalling descriptions have not been changed in substance for a long time and are considered to be fairly stable.

If the missing Iu signalling procedure is not seen feasible from RAN point of view it is urged that a corresponding Change Request is submitted to SA WG2 suggesting functional changes in the LCS System stage 2, TS 23.271. Resulting CRs to the core network stage 3 LCS specifications should also be made available as soon as possible.

It should be realised, however, that substantial changes to the functional split reflected in the current version of 23.271 will make it very difficult to have any improvement at all in UTRAN LCS Rel-4 compared to UTRAN LCS R99.

2   LCS QoS

2.1   Background

In LCS stage 1 §4.3 (v4.2.0 Rel-4) it can be deduced that the LCS horizontal accuracy, the LCS vertical accuracy and the LCS response time are application driven and are some of the negotiable Quality of Service (QoS) parameters between the LCS client and LCS server.

In LCS stage 2 §9.1.1 (v4.0.0 Rel-4) at bullet #8 (MT-LR flow), it is stated that *"The MSC/MSC server sends a Location Request message to RAN. This message includes the type of location information requested, the MS's location capabilities and requested QoS."* .

2.2   Problem

According to RANAP 25.413 v3.4.0 (R99) §9.2.1.16, only a generic accuracy code parameter is defined over Iu interface. This means that there is no possibility to transfer two different accuracy codes for horizontal and vertical accuracy from CN to RAN.

The LCS response time, which might be required by the LCS client, is also missing over Iu interface.

2.3 Proposal

RANAP 25.413 shall allow two different accuracy codes (horizontal and vertical) and the LCS response time in LOCATION REPORTING CONTROL message.

3 LCS Priority

3.1 Background

In LCS stage 1 §4.5 (v4.2.0 Rel-4) it can be deduced that:
1. Location requests for different services may be processed with different levels of priority.
2. The LCS Server may allow different location requests to be assigned different levels of priority. A location request with a higher priority may be accorded faster access to resources than one with a lower priority and may receive a faster, more reliable and/or more accurate location estimate.

3.2 Problem

According to RANAP 25.413 v3.4.0 (R99) §9.2.1.16, there is no possibility to transfer the LCS Priority from CN to RAN.

3.3 Proposal

RANAP 25.413 shall allow the LCS Priority parameter in LOCATION REPORTING CONTROL message.

4 LCS request type & Assistance data

4.1 Background

In LCS stage 2 §9.1.1 (v4.0.0 Rel-4) at bullet #8 (MT-LR flow), it is stated that *"The MSC/MSC server sends a Location Request message to RAN. This message includes the type of location information requested, the MS's location capabilities and requested QoS."* .

In LCS stage 2 §9.2.1.1 (v4.0.0 Rel-4), *"The VMSC/MSC server sends a Location Request message to RAN associated with the Target MS. The message indicates whether a location estimate or location assistance data is requested and includes the MS's location capabilities. If the MS's location is requested, the message also includes the requested QoS. If location assistance data is requested, the message carries the requested types of location assistance data."* .

Still in LCS stage 2 §9.2.1.1 (v4.0.0 Rel-4), *"When a location estimate best satisfying the requested QoS has been obtained or when the requested location assistance data has been transferred to the UE, RAN returns a Location Report to the VMSC/MSC server. This message carries the location estimate or ciphering keys if this was obtained. If a location estimate or deciphering keys were not successfully obtained or if the requested location assistance data could not be transferred successfully to the UE, a failure cause is included in the Location Report."* .

4.2 Problem

According to RANAP 25.413 (R99) v3.4.0 §9.2.1.16, there is no possibility to transfer the Location data request in terms of "assistance data" and "ciphering keys" from CN to RAN. In case of assistance data request, the type of assistance data requested from CN to RAN cannot be transferred as well. In case of ciphering keys request, the ciphering keys parameter is also missing in the RAN to CN direction.

4.3 Proposal

RANAP 25.413 shall allow the Location assistance data request and the Location ciphering keys request as new parameters in LOCATION REPORTING CONTROL message. Furthermore, the need of a new parameter indicating the Location assistance data type is FFS. If this parameter is added to RANAP message, its presence will be conditioned by the presence of the location assistance data request.

It may be seen that only RAN should care about which positioning method should be used to achieve the requested location information. However, it is likely that the user of the UE should be able to define what type of LCS assistance data to request in different situations, especially since the type of assistance data may have a cost impact for the user. The different types of LCS assistance data should be defined from

the user point of view and could be e.g. 'Assisted GPS' or 'Cellular network based LCS assistance data', etc.

RANAP 25.413 shall also allow the Location ciphering keys parameter in LOCATION REPORT message from RAN to CN if requested by the UE during a MO-LR.

5 LCS client type

5.1 Background

As already done in GSM (see R99 BSSAP 08.08 v8.7.0 §3.2.1.71 and BSSAP-LE 09.31 v8.3.0 §5.1.1), for certain LCS Clients, the geographic shape returned by an SRNC(SMLC) may be restricted in UMTS or in national specific standards. For example, in the US, national interim standard TIA/EIA/IS-J-STD-036 restricts the geographic shape for an emergency services LCS client to minimally either an "ellipsoid point" or an "ellipsoid point with uncertainty circle and confidence" as defined in 3GPP TS 03.32.

This means that the SRNC(SMLC) shall be able to return to the CN a limited range of geographical shapes within LOCATION REPORT message depending on which type of LCS client is requesting the location information and in case of national specific standards restrictions.

5.2 Problem

According to RANAP 25.413 (R99) v3.4.0 §9.2.1.16, there is no possibility to transfer the LCS client type from CN to RAN by LOCATION REPORTING CONTROL message.

5.3 Proposal

RANAP 25.413 shall optionally allow the LCS client type as new parameter in LOCATION REPORTING CONTROL message. The LCS client type shall be present if the location type indicates a request for a location estimate and the LCS Client Type is for Emergency Services and is optional otherwise.
In case of emergency LCS client and in case of restrictions exist in national specific standards, the geographical shape returned by the SRNC shall comply with the national specific standard restriction.

6 Stop reporting type

6.1 Background

According to the CRs S2-010775 and S2-010776 approved by SA2 plenary #17, the "Stop Reporting" information carried by LOCATION REPORTING CONTROL RANAP message shall always be sent from CN to RAN when a previous initiated location procedure needs to be cancelled.

The indication about the type of "Stop Reporting" procedure (i.e. if related to a previous "direct" or "upon change of service area" reporting) shall also be sent from CN to RAN in order to avoid possible CN-RAN inter-working problems.

6.2 Problem

According to RANAP 25.413 (R99) v3.4.0 §9.2.1.16, there is no possibility to transfer the "Stop reporting type" from CN to RAN by LOCATION REPORTING CONTROL message.

6.3 Proposal

RANAP 25.413 shall optionally allow the "Stop reporting type" as new parameter in LOCATION REPORTING CONTROL message. The "Stop reporting type" (i.e. if related to a previous "direct" or "upon change of service area" reporting) shall be present if the location request type indicates "Stop reporting".

7 Conclusions

As consequence of the above mentioned LCS requirements and to permit their optional LCS Client/Server negotiation, SA2 is kindly asking RAN3 to make the relevant changes in RANAP 25.413.

For R99 and Rel-4, the following parameter needs to be sent from CN to RAN during a LCS request procedure:
- Stop reporting type.

For Rel-4, the following parameters need to be sent from CN to RAN during a LCS request procedure:
- LCS QoS (i.e. vertical accuracy, horizontal accuracy, response time)
- LCS Priority
- LCS request type (i.e. location estimate, assistance data, ciphering keys)
- LCS client type

and the following parameter is needed from RAN to CN during a LCS response procedure:
- ciphering keys (if requested).

 "LCS assistance data type" parameter is FFS, RAN WG3 is invited to study this issue further and communicate the outcome to SA WG1 and SA WG2.