

**Agenda Item:** 10.3

**Source:** Nokia

**Title:** **Interaction of Relocation and Other RANAP Procedures**

**Document for:** Decision

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## 1 Introduction

Relocation related procedures are used to transfer the SRNC functionality from one RNC to another. I.e. to change the Lu termination point in UTRAN. Due to this exceptional functionality, some interactions with these and other RANAP procedures have to be defined. In some cases the Source RNC, even still being the Serving RNC, is not able to execute procedures initiated by CN due to ongoing relocation.

This paper introduces mechanisms that are required to be specified to guarantee proper functioning of an multivendor Lu interface in case when continuation of SRNS Relocation and execution other RANAP procedures conflict with each other.

## 2 Discussion

It is seen crucial that the final decision of the relevant importance of different RANAP procedures is done by RNC. E.g. in case of reception of RANAP PAGING from CS domain for a PS active UE, it is very important that the Relocation is canceled, paging is carried to UE, CS Lu connection is established and relocation is re-initiated now with two Lu connections. Otherwise if the relocation is to be done to an RNC in a different Location Area the Paging will be lost.

On the other hand, if a Paging is received just before committing Relocation (hard handover), just when UE is about to loose the radio coverage that can be accessed from source RNC, it is important that the Relocation is continued even though the paging might be lost.

The same principles apply to the relationship between Relocation and any other RANAP procedures, although the relative importance of those procedures may vary.

Following fundamental principles are followed in the additions for the RANAP specification, which are detailed in chapter 3.

- 1) CN is allowed to initiate any RANAP procedure until RELOCATION COMMAND is sent (it is not however forced to do that)
- 2) CN shall hold all RANAP messages between RELOCATION COMMAND and RELOCATION COMPLETE
- 3) RNC shall discard all messages received after RELOCATION COMMAND
- 4) RNC is allowed, before the Relocation Commit is sent, to cancel the ongoing relocation and thus start to process the received RANAP procedure instead.
- 5) RNC is allowed to reject any RANAP class 1&3 procedure with a cause value 'Relocation Triggered'.
- 6) Which choice RNC takes, regarding the point 4 and 5 above, is left for the implementation.
- 7) Common ID is changed to be Class1 procedure by adding Common ID Acknowledge msg

- 8) If a DL air interface transfer of a DL DIRECT TRANSFER NAS-PDU is not completed when RELOCATION COMMIT is to be sent, the uncompleted RANAP DIRECT TRANSFER PDU is forwarded to target RNC in a transparent field of RELOCATION COMMIT.
- 9) RANAP ERROR INDICATION is not used at all to tackle the problems of relocation.
- 10) RNSAP Relocation Commit is sent always regardless whether RRC Handover Command is sent to UE or not (i.,e. regardless whether it is a Relocation or Hard Handover)

## 3 Additions to RANAP Specifications

### 3.1 Relocation Preparation procedure

Following underlined paragraphs are proposed to be inserted to the Relocation Preparation Procedure:

*... Procedure is initiated by the Serving RNC by sending a RELOCATION REQUIRED message to active CN nodes. Timer T(RELOCATION COMMAND) is started, upon transmitting the message. RELOCATION REQUIRED message allows a RNC to request that a relocation is to be carried out for a particular UE, having signalling connection via the serving RNC.*

If RNC decides to initiate Relocation Preparation procedure after it has received a RANAP message initiating a class 1 or 3 RANAP procedure, RNC shall not process further the initiated RANAP procedure and RNC shall reject the initiated procedure by sending appropriate response message to CN.

If, after RELOCATION REQUIRED is sent, RNC receives a RANAP message initiating a RANAP class 1 or 3 procedure, RNC shall either

- cancel the relocation of SRNS (Execute relocation Cancel procedure) and then continue the processing of the initiated RANAP procedure

or

- reject the initiated RANAP procedure by sending appropriate response message to CN.

If, after RELOCATION REQUIRED is sent RNC receives a RANAP message initiating a RANAP class 2 procedure (except Direct Transfer) and the RNC does not decide to cancel the relocation, RNC shall ignore the received RANAP message.

When RELOCATION COMMAND is received from CN all RANAP messages received via the same signalling bearer shall be ignored by RNC.

*As a response to the RELOCATION REQUIRED message the CN sends RELOCATION COMMAND to the source RNC. ...*

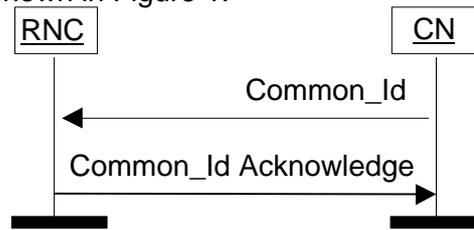
### 3.2 Common ID procedure

### 3.3 Common Id

~~This procedure is needed, if the MM concept will require the UTRAN to send a page message on the existing RRC connection. This procedure is connection oriented.~~

The purpose of the Common Id procedure is to allow the RNC to create a reference between the permanent NAS UE Identity of a user and the RRC connection of that user. This is achieved by sending the permanent NAS UE Identity of a ~~verified~~ user from the CN to the RNC. The RNC is then able to check whether there is already RRC connection signalling bearer to the UE when a CN starts connection establishment by sending Paging message. The RRC connection ~~signaling bearer~~ can be already used by an other CN, and if this is the case, the RNC uses it to send the Paging message to the UE.

The CN sends a COMMON ID message to UTRAN, after it has ensured the identity of UE. The message contains the permanent NAS UE Identity of the user. The RNC associates the permanent identity to the RRC Connection of that user and saves it for the duration of the RRC connection. If this association can be successfully done RNC responds with COMMON ID ACKNOWLEDGE message. The signalling flow for the Common Id procedure is shown in Figure 1.



**Figure 1. Common Id procedure.**

## 4 Proposal

It is proposed that the additions and modifications described in chapter 3 are included into the TS 25.413.