

TSG-RAN Working Group 3 meeting #1
Bonn 2nd - 5th February 1999

TSGW3#1(99)031

Agenda Item:

Source: **Nokia**

Title: **Proposed new presentation for lu RANAP procedure
"Inter RNS hard handover"**

Document for:

Proposed new presentation for Iu RANAP procedure “Inter RNS hard handover”

1 Introduction

It was agreed in ARC EG meeting #9 in Sophia Antipolis that in UMTS ZZ.11 UMTS ZZ.11: Description of Iu interface, Section 9.2.2.2 ‘Inter RNS hard handover’ should be restructured to show the elementary procedures and should also be harmonized with UMTS ZZ.02 UMTS ZZ.02: /2/. This contribution proposes a new structure for the referred section.

2 Proposed new presentation for Section 9.2.2.2 in UMTS ZZ.11 UMTS ZZ.11: Description of Iu interface

The proposed modified text for Section 9.2.2.2 Inter RNS hard handover is as follows:

9.2.2.2 Inter RNS hard handover

[Editor’s note: The RANAP procedures for Inter RNS hard handover have been included from Tdoc SMG2 UMTS ARC 091/98 with the modifications as approved in ARC EG meeting #4.]

[Editor’s note: The contents of this chapter must be restructured to show the elementary procedures over the Iu interface. Also, it need to be aligned with the corresponding procedures in ZZ.02.]

Inter RNS hard handover is used to relocate the serving RNS functionality from one RNS to an other and to change the radio resources assigned for the corresponding UE by a hard change. This procedure can be used within one UTRAN if the Iur interface can not (or is not desired to) be used for active set management, between two UTRANs or at UTRAN side in handovers between two Radio Access systems (e.g. UMTS to GSM).

Inter RNS hard handover is carried over Iu interface, namely by the RANAP protocol. ~~The required functionality is described below by introducing an example Iu interface RANAP procedure for the purpose.~~

9.2.2.2.1 Hard handover required indication

When the serving RNS makes an algorithmic decision to start Inter RNS handover procedure a RANAP message to indicate requirement for hard handover is sent to the Core Network element which is having an active RANAP connection related to the UE in question. ~~The message is the same as for the SRNS relocation, except that it contains an indication that the switching procedure will be performed as it is defined for Inter RNS hard handover instead of as it is defined for SRNS relocation.~~

This HARD HANDOVERRELOCATION REQUIRED message includes essentially the target RNS identifier and an UTRAN information field.

The signalling flow for hard handover required indication is shown in Fig. 6.

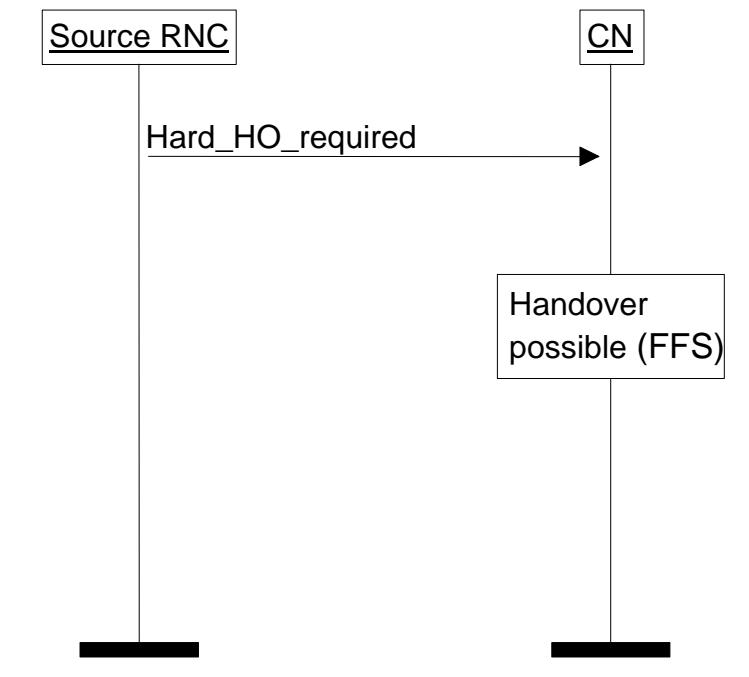


Figure 6. Hard handover required indication.

9.2.2.2.2 Hard handover resource allocation

Upon reception of the HARD HANOVERRELOCATION REQUIRED message the Core Network element should check whether the handover is possible to be performed (this check is FFS). In successful case the CN element sends a HARD HANOVERRELOCATION REQUEST to the target RNS. The HARD HANOVERRELOCATION REQUEST contains essentially the UTRAN information field and bearer identifier together with binding identifiers of each bearer to be established to the new Iu interface.

When the target RNS has received all HARD HANOVERRELOCATION REQUEST messages ~~and all active bearers are identified in these~~, it should send a HARD HANOVERRELOCATION PROCEEDING1, message to CN. This message contains essentially the Binding ID for each Iu leg that were already setup before the HARD HANOVER REQUEST was received (in the case when RNC has selected to use such Iu connection) and UTRAN information field (containing the Handover command for the UE).

Fig. 7 shows the signalling flow for hard handover resource allocation.

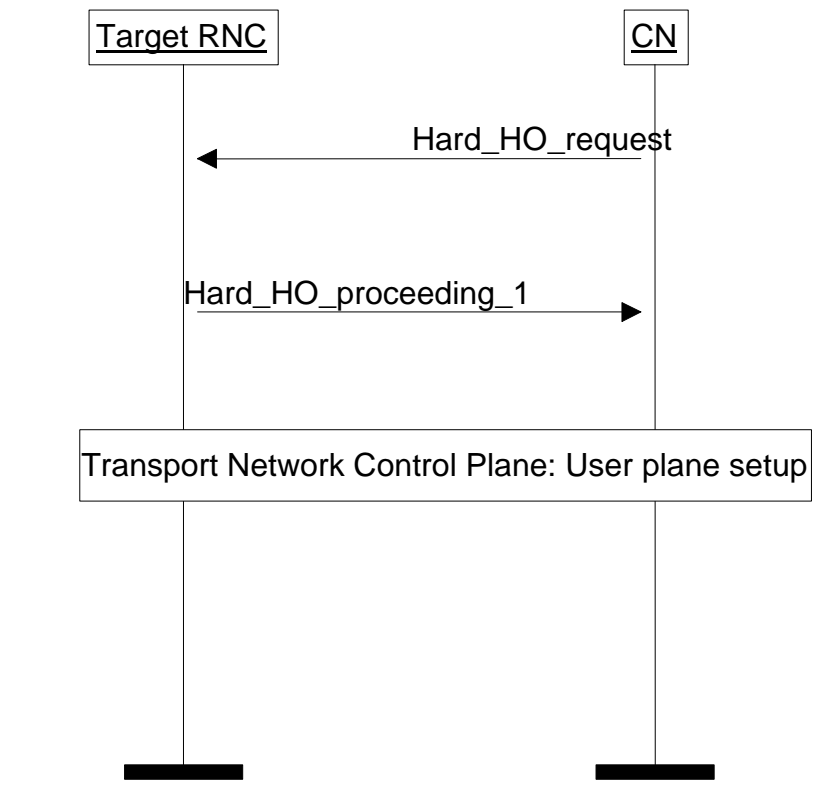


Figure 7. Resource allocation for hard handover.

9.2.2.2.3 Hard handover execution

At source RNS: Upon reception HARD_HANOVERRELOCATION_PROCEEDING1 the CN element should setup necessary Iu legs (and indicate corresponding binding ID to UTRAN). After completion of this the CN element should send a RELOCATION_PROCEEDING2 message to the target RNS and the RAN information field received in the HARD_HANOVERRELOCATION_PROCEEDING1 message to the source RNS in HARD_HANOVER_COMMAND message.

When source serving RNS has received HARD_HANOVER_COMMANDS from each active CN element (and all active bearers are identified in these), a RRC message HANOVER_COMMAND is transmitted to the UE. After this UE sends a HANOVER_ACCESS_REQUEST to the new radio resources (indicated in HANOVER_COMMAND).

The signalling flow between the source RNS and the CN is shown in Fig. 8.

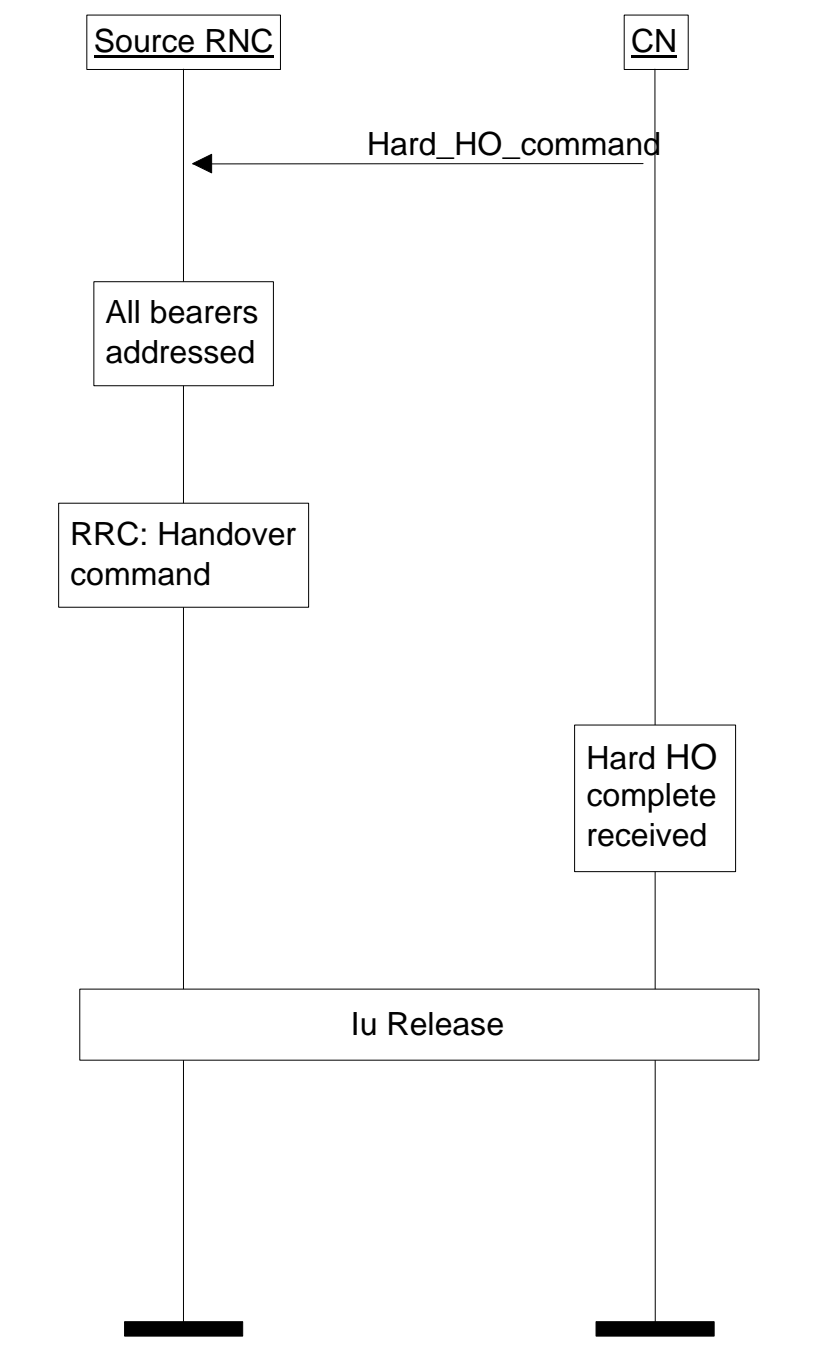


Figure 8. Hard handover execution between source RNS and CN.

At target RNS: The target RNS sends a HARD HANDOVER DETECT to the CN and starts to act as an SRNS. (Optionally it is possible to send already handover complete, in case a full set of radio resources is given in HO COMMAND). After having established all necessary radio resources between the new Serving RNS and the UE the new Serving RNS sends a ~~HARD HANDOVERRELOCATION~~ COMPLETE to the CN.

The signalling flow between the target RNS and the CN is illustrated in Fig. 9.

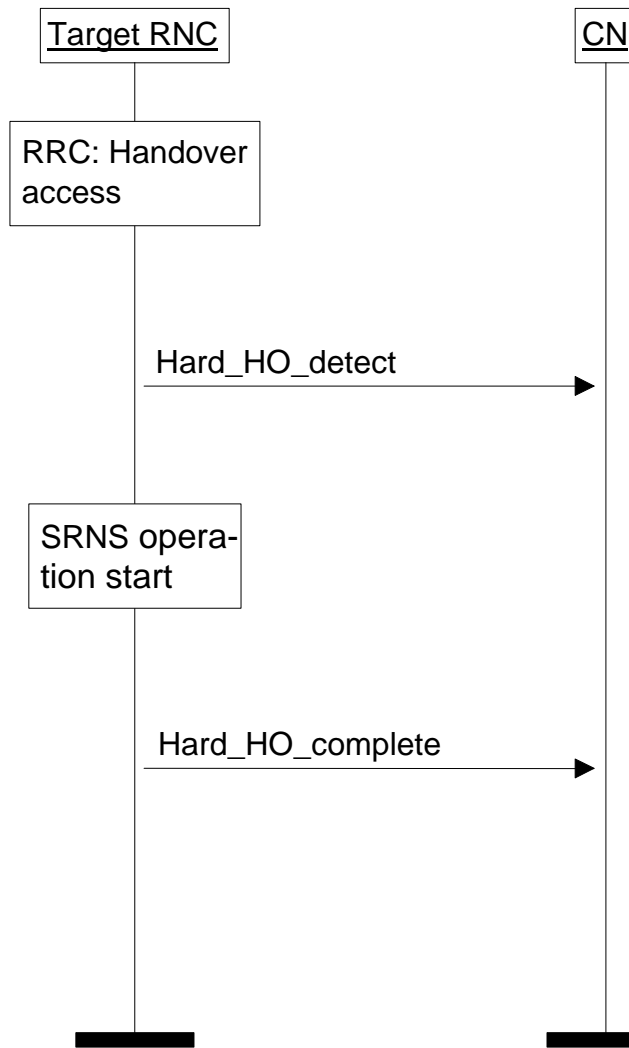


Figure 9. Hard handover execution between target RNS and CN.

CN will then release all bearers (Fig. 8) as described in 9.2.2.4 towards the old serving RNS.

An example of a corresponding message flow at Iu interface in a successful situation is presented in Figure 1.

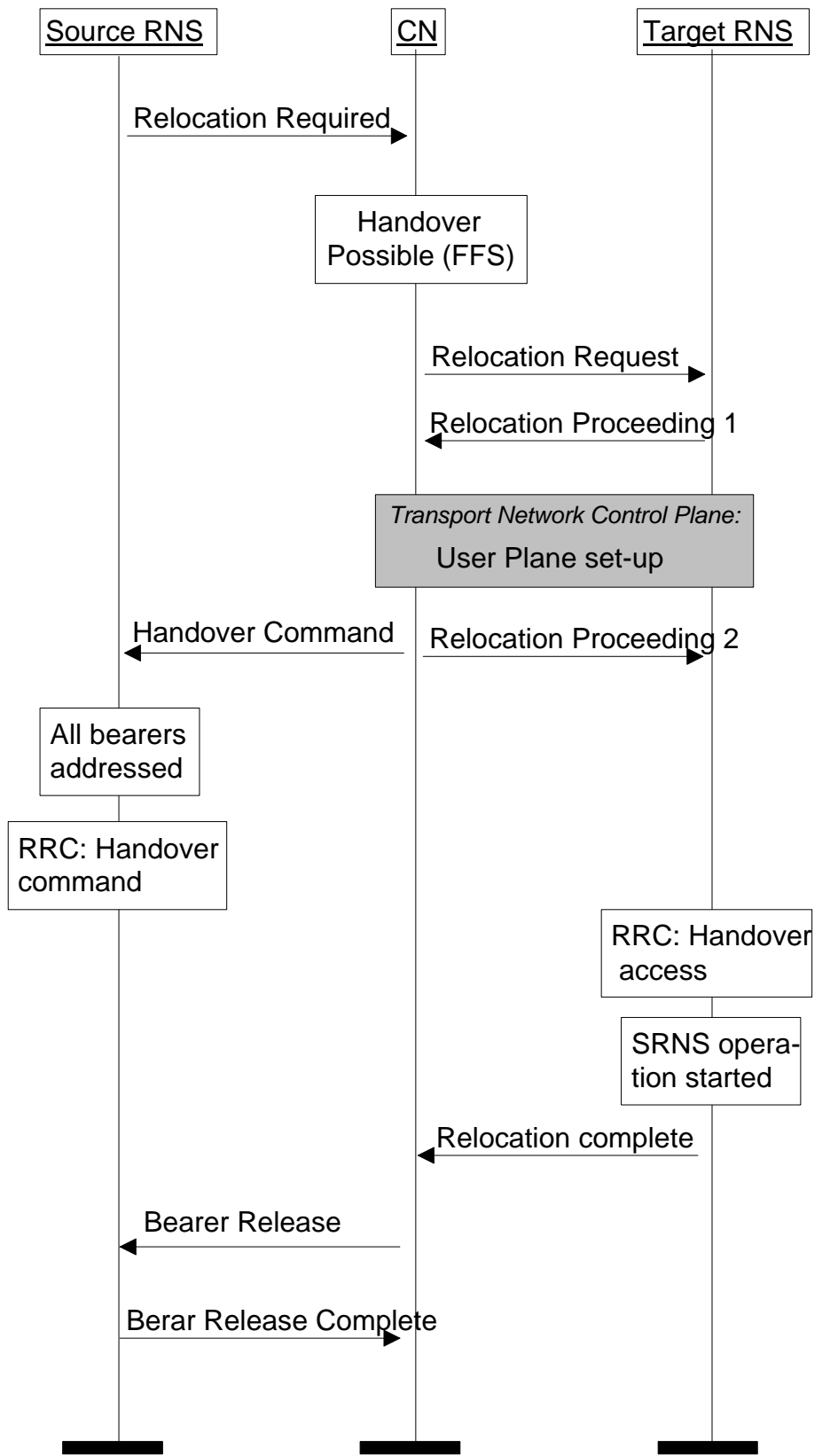


Figure 1. An example RANAP protocol message flow at Iu interface related to Inter-RNS Hard Handover. A successful case.

3 Proposal

| It is proposed to replace the existing text in Ref UMTS ZZ.11; Description of Iu interface~~/4/~~, Section 9.2.2.2 with the text shown in section 2 of this contribution.

4 References

/1/ UMTS ZZ.11; Description of Iu interface

/2/ UMTS ZZ.02; UTRAN Functions, Examples on Signalling Procedures